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Appendix I. Comments and Responses to Comments

I.1 Introduction to Comment and Response Appendix

The Final RMPA/EIS has been prepared pursuant to NEPA ([42 U.S.C. § 4321](#) *et seq.*), CEQ Regulations (20 CFR Parts 1500-1508), and BLM’s NEPA Handbook (H-1780-1). Receiving and responding to comments on the Draft RMPA/EIS is an essential part of the environmental review process, with comments and responses becoming part of the Final EIS. The Final EIS will be used by the BLM in the RMPA decision process, which will be documented in a Record of Decision (ROD) issued pursuant to NEPA.

I.1.1 Organization of this Appendix

This Appendix is organized as follows:

- Section I.1, Introduction to Comment and Response Appendix
- Section I.2, General Responses to Common Comments
- Section I.3, Comment Letters
- Section I.4, Responses to All Comments

I.1.2 Summary of Comments Received

During the 90-day public comment period following publication of the Draft RMPA/EIS on January 6, 2017, written comments were submitted by a range of agencies, organizations, industry representatives, and individuals. Written comments received during the comment period are a part of the public record.

In addition, in March 2017, the BLM held three public meetings near Coalinga, Hollister and Salinas. BLM officials were present at the public meetings and notes were taken on all public comments raised at these meetings. The oral comments have been considered in preparing the Proposed RMPA/Final EIS. However, the public meetings were not recorded and the oral comments are not individually responded to in the Proposed RMPA/Final EIS. Appendix H (Public Meetings Summary Report) summarizes the oral comments received during the public meetings.

This volume presents each comment letter and a response to each comment. The comment letters are identified with a letter and number (e.g., A1), and each individual comment within each letter is defined with a bar along the side, and identified with a unique comment number (e.g., A1-1). All comment letters, with the individual comments defined in the margins, are presented in Section I.3.

Section I.2 presents six General Responses that provide detailed responses to comments that were made by several commenters.

Table I-1 lists the agencies, organizations, industry, and individuals that provided written comments on the Draft RMPA/EIS.

Table I-1. Draft RMPA/EIS Public Comments

Comment No.	Date	From
A – Agencies		
A001	3/30/17	California Coastal Commission
A002	4/6/17	Division of Oil, Gas & Geothermal Resources
A003	4/7/17	U.S. Environmental Protection Agency
A004	3/28/17	County of Santa Cruz
A005	N.D.	National Park Service

Table I-1. Draft RMPA/EIS Public Comments

Comment No.	Date	From
B – Organizations		
B001	1/17/17	Center for Biological Diversity #1
B002	4/5/17	Californians Against Fracking & Dangerous Drilling
B003	4/5/17	San Benito Rising
B004	4/5/17	Sierra Club Loma Prieta Chapter
B005	4/6/17	Center for Biological Diversity + Sierra Club
B006	4/6/17	Natural Resources Defense Council
B007	4/6/17	North Coast Rivers Alliance
B008	4/6/17	The Nature Conservancy
B009	3/24/17	Women’s International League for Peace and Freedom
B010	6/1/17	Center for Biological Diversity #2
C – Industry		
C001	3/30/17	California Independent Petroleum Association
C002	4/4/17	Chevron
C003	4/6/17	Western States Petroleum Association
D – Individuals		
D001	3/14/17	Virginia “Polly” Hughes
D002	3/15/17	Polly Hughes
D003	3/15/17	Larry Rebecchi
D004	3/15/17	Lynn Overtree
D005	3/16/17	Peter Muñoz-Cowan
D006	3/16/17	Sylvia Shih
D007	3/16/17	Jay Solis
D008	3/16/17	Natalie U. Gray
D009	3/16/17	Rowan Tauriac
D010	3/16/17	Robert F. Sigala
D011	3/16/17	Brett Garrett
D012	3/16/17	Lucia Calderon
D013	3/16/17	Mike Saint
D014	3/10/17	Rhoda Holabird
D015	3/10/17	Susan Rautine
D016	3/27/17	Diane McElroy
D017	3/28/17	Troy Ishikawa
D018	3/29/17	Ken Reichman
D019	3/30/17	Anne Cassell
D020	4/5/17	Emma Kelsey
D021	3/30/17	Ryan Carle
D022	N.D.	Sharry Jones
D023	4/3/17	Audrey Doocy
D024	4/3/17	Daian Hennington, MSW, LCSW

Table I-1. Draft RMPA/EIS Public Comments

Comment No.	Date	From
D025	4/4/17	Jeannette Langstaff
D026	4/4/17	Constance Rose
D027	4/4/17	John & Carolyn Hernandez
D028	4/4/17	Robert & Denyse Frischmuth #1
D029	4/4/17	Susan Schiavone
D030	4/4/17	Susan DiGirolamo
D031	3/30/17	Kalen Edwards
D032	4/5/17	Emily Coren
D033	4/5/17	Mary Jane Prough
D034	4/5/17	Janet Stahl
D035	4/6/17	Elia & Peter Muñoz-Cowan
D036	4/6/17	Suzie Gabri
D037	4/6/17	Dani
D038	4/6/17	Cherylyn Smith
D039	4/6/17	Marsha Moroh
D040	4/6/17	Dr. & Mrs. Elliott and Lucie Hazen
D041	4/6/17	Suzanne Worcester
D042	4/6/17	Seth Capron
D043	N.D.	Nicholas Brown
D044	3/18/17	Judith Jackson
D045	3/18/17	Kymm Ann Wallin
D046	3/18/17	Susan Moren
D047	3/30/17	Emily Coren
D048	3/31/17	Linda Sherlock
D049	4/1/17	Angelita Gonzalez
D050	4/1/17	Inga Minton
D051	4/1/17	John Mataka
D052	4/1/17	Richard D. Iyall
D053	4/1/17	Rosenda Mataka
D054	4/1/17	Sarah Aird
D055	4/2/17	Alec Kimmel
D056	4/2/17	Kyla Noelle Mitchell
D057	4/2/17	Lynn Jacobeson
D058	4/3/17	Barbara McKinder
D059	4/4/17	Char Biddle
D060	4/4/17	Ronald J. Martin Ph.D.
D061	4/5/17	Alan Chea
D062	4/5/17	Alette Brooks
D063	4/5/17	Barbara Murray
D064	4/6/17	Sara Drost
D065	N.D.	Christie Turano #1

Table I-1. Draft RMPA/EIS Public Comments

Comment No.	Date	From
D066	N.D.	Julie Tell
D067	3/15/17	Melissa West #1
D068	3/15/17	Melissa West #2
D069	3/22/17	Debbie Kirk
D070	3/22/17	Dierdre Means
D071	3/23/17	Margaret
D072	3/23/17	Mona M.
D073	3/24/17	Courtney Connelly
D074	3/24/17	D. Rothchild
D075	3/24/17	Don Hirschaur
D076	3/24/17	Hilary Johnson
D077	3/24/17	Holly Hines
D078	3/24/17	Jennifer
D079	3/24/17	Michael Means
D080	3/24/17	Michelle Hoffman
D081	3/25/17	Anonymous
D082	3/27/17	Kathryn Hyde
D083	3/27/17	Lori Hines #1
D084	3/27/17	Lori Hines #2
D085	3/27/17	Lynn Strandberg
D086	3/31/17	Amy Gorman
D087	3/31/17	Kathleen Baker
D088	4/3/17	Debra Rubin
D089	4/4/17	Laura B.
D090	4/7/17	Jan Cecil
D091	3/16/17	Christie Turano #2
D092	3/20/17	Christine Tucker
D093	3/27/17	Debora Bone
D094	3/27/17	Natasha Wist
D095	3/28/17	Amy Gorman
D096	3/28/17	Norma Block
D097	4/4/17	Robert and Denyse Frischmuth #2
D098	4/5/17	Peter Hain
D099	4/6/17	Sharry Jones
D100	—	See Form Letter individuals listed in Table I-2

The individuals listed in Table I-2 submitted a Form Letter. The exact wording of some of the Form Letters varied slightly, but BLM reviewed all comment letters to ensure that all issues raised in the Form Letters have been addressed in Response to Comment Set D100.

Table I-2. Draft RMPA/EIS Form Letter Comments

Bjopbre50	Sondra Allphin	José Ángel	Lupe Avila	Jackie Barbour
Tasha	Charles Almack	J. Angell	Evangelia Avrampou	Daniel Barboza
Whitefeather	Parisa Almasizadeh	Tina Ann	Margarita Ayala	Erin Barca
Andrew Abate	Paul Alperin	Lisa Annecone	David Aylward	Marilyn Barcellos
Kenneth Able	Susan Alpern	Alex Anshus	Odile Ayrat	Bridget Barefield
June Abner	Ingrid Alpha	Gina Anson	Henry Azama	Denise Barger
Sally Abrams	Catherine Alsafi	Ann Anterasian	Dennis B.	John Barger
Laura-May Abron	Kenneth Althiser	Marie Anthony	Jill B.	Jeff Barile
Ryan Acebo	Laura Altman	Leah Anton	S. B.	Anne Barker
Barb Ackerman	Marie Altman	Linda Antone	Barri Baas	Carolyn Barker
Alberto Acosta	Ann Altstatt	Cory Anttila	Miles Babcock	Carolyn Barkow
Pam Adam	Jessica Altstatt	Brit Apone	Sarah Babcock	Karen Barnaby
Aida Adami	Steve & Rachael	Claire Appelmans	Mary Babineau	Joanne Barnes
Louis Adamo	Alvarez-Jett	Karen Applebaum	Rosie Bachand	Marcia Barnes
Brittany Adams	Ida Alwin	Robert Applebaum	Oona Backers	Pamela Barnes
Lucie Adams	Nicole Amador	Carolyn Arbuckle	Carol Bader	Gary Barnett
Mary Adams	Cristina Amarillas	Nancy Arbuckle	Kent Badger	Susan Barnett
Spencer Adams	Gabriel Amaro	Tracey Archer	Frank Baele	Cara Barnhill
Winnie Adams	George Amaya	Jo Ardell	Barbara Baer	Melia Barnum
Deborah Adatto	Melissa Ambrose	Lani Arellanes-Hansen	Karen Baetz	John Barone
Dalia Adeina	Tracy Calvert Ambrose	Peggy Arevalos	Lisa Baffi	Cherie Baroni
Julie Adelson	Les Amer	Julianne Arfsten	Melinda Bailey	Stephen Barrett
Giusy Adragna	Scott Ames	Christopher Argyros	Michael Bailey	Val Barri
Madona Affezionato	Krista Amigone	Amin Arikat	Mindy Bailey	Lorraine Barrie
Kate Ague	Rise An	Duane Armbruster	Sadie Bailey	Tim Barrington
Marian Ahler	Celeste Anacker	Elisabeth Armendarez	Shayna Bailey	Amy Barron
Miho Aida	Daggie Anders	Lynn Armstrong	Kathryn Bainbridge	Bridget Barron
Ashni J. Akand Karan	Evette Andersen	Sheryl Arndt	Ann Baker	Mikail Barron
Steve Alarcon	Janis Andersen	Jeff Arnett	Mikal Baker	Laura Barry
Barbara Albert	Patricia Andersen	Deborah Aronson	Vickey Baker	Christine Barthes
Cheryl Albert	Carrie Anderson	Reevyn Aronson	Sara Bakker	Sharyn Barthes
Gloria Albert	Charyne Anderson	Ned Arre	Marcelle Bakukla	Janice Bartlett
Gwendolyn Albert	Christine Anderson	Valerie Arsenault	Juan & Maria Balboa	Nancy Bast
Shan Albert	Elaine Anderson	Eileen Arterburn	Earl Balch	Abbie Bates
Deborah Alcaraz	Ellie Anderson	Wendy Arthurs	Ross Balcom	D. L. Bates
Graciela Alderette	James Anderson	Maria E. Arzayus	Barbara Baldock	James Bates
Stefano Aldighieri	Jean Anderson	Hope Ashley	Laura Baldwin	Janis Bates
Sue Aldridge	John Anderson	Kate Ashley	Leland Baldwin	Louria Batson
Rhetta Alexander	Judith Anderson	Dana Ashton	Natylie Baldwin	Jonathan Baty
Deborah Alexzander	Karen Anderson	D. Ashurst	Betty Ball	Alwen Bauer
Alice Alford	Kemp Anderson	Nathan Atkins	Dale Ball	Linda Bauer
Jeff Alford	Kimberlee Anderson	Rhys Atkinson	Lois Ball	Rhona Baum
Jere Alhadeff	Kirk Anderson	Debbie Atlas	Martini Ballard	Michelle Baumann
Halimah Allah	Linda Anderson	April Atwood	Jordan Ballou	Gary Baxel
Edmund Allatt	Mary Anderson	Ellen Atwood	Lidia Baltazar	Ben Baxter
Wayne Allbin	Ray Anderson	Frances Aubrey	Gregg Bambo	Joslyn Baxter
Howard Allen	Richard Anderson	Sylvie Auger	Debra Banes	Ted Bayer
Mike Allen	Sally Anderson	Wayland Augur	Carol Banever	Annelise Bazar
Ross Allen	Sandra Anderson	Rebecca August	Robert Banever	Jon Bazinet
Susan Allen	Stephen Anderson	Sam Austin	Indigo Bannister	Heidi Bean
Vicky Allen	Joan Andersson	Jacquelynn Avakian	Anne Baptiste	Rev. Charlotte Bear
Vinit Allen	Michele Andrade	Joy Avalos	Marco Baracca	Clara Beard
Cheryl Alley	S. Andregg	A.J. Averett	Jane Barbarow	Valerie Beard
Lynn Alley	Laura Angel	Cori Avery	Clara Barber	Jim Bearden

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Timothy Becher	Susan Berlin	Sheila Blake	Mame Boyd	Myrna Britton
Joan Bechtel	Judith Berlowitz	Cydney Blanchard	Mario Boyd	David Broadwater
Kelly Bechtold	Morris Berman	Corinne Blanco	Susan Boyd	Miranda Brocki
Barbara Beck	Nancy Berman	Trudie Blank	David Boyer	Bette Brockman
Connie Beck	Halee Bernard	Michael Blechman	Kathleen Boyer	Zach Bromberg
Brandon Becker	Ben Bernhardt	Mary Blickensderfer	Rebecca Bozarth	Nick Broman
Carol Becker	Mary Berrettini	Tracy Bloch	Taryn Braband	Jennifer Brooks
Gary Beckerman	Jane Berrigan	Daniel Bloxson	Michael Brackney	Linda Brophy
Jonathan Beckett	Cheryl Berry	Janice Blumenkrantz	James Bradbrook	Linda Brosh
Miriam Beckstrom	David Berry	Harry Blumenthal	David Braddy	Danielle Brouqua
Lisa Beebe	John Bertaina	Cheri Bly	Deborah Bradford	Anna Marie Brown
Gary Beeler	Tessa Berwald	Frances Blythe	James& Alice Bradley	Carole Brown
Meg Beeler	Marqui Besneatte	Alison Bodenhemier	Jennifer Bradley	Cecilia Brown
Rob Beemer	Nelle Best	Linda Bodian	Tim Brady	Dace Brown
Katharine Beffa	Deanna Betker	Alan Boehmer	Judith Bragar	Damon Brown
Laurey Behrmann	Marcy Betlach	Stephen Boland	Angelique Brake	Irene Brown
Marilyn Beidler	Suzanne Bevash	Tony Boldetti	Laurie Bramlage	James Brown
Ann Bein	J. Beverly	Susan Bolen	C. Branca	Josh Brown
Keith Bein	Deborah Bevilaqua	Diane Bolman	Myra Brand	Karen Brown
Anne Bekkers	Gail Beyatte	Nadja Bonacina	Tim Brand	Kathleen Brown
Harriet Belkin	Terry Bezner	Gina Bonanno-Lemos	Sara Brandon	Marjorie Brown
William Bell	Guy Biagiotti	Lyzette Bonaparte	Elaine Brandt	Michelle Brown
Bob Bellamy	Dana Bialowas	Mitchell Bonner	Tammy Bransford	Rebecca Brown
Jacque Bellon	Barbara Bibel	Marsha Bonrud	Karen Brant	Sharon Brown
Al Belmonte	Vanessa Bica	Thomas Boo	Teri Brantley	Vera Brown
Annie Belt	Ann Bicking	Joseph Boone	Robert Braseny	Virginia Brown
Paul Belz	Barbara Bieber-Hamby	Carolyn Boor	Stephanie Braseny	Walt Brown
Ken Benau	Annie Bien	Curtis Booraem	John Brasher	Marie-Therese "Tess" Browne
Hilarey Benda	Rebecca Bierbaum	Brian Boortz	Trudy Brasure	Jodi Brownfield
Gary Bender	James Bigger	Patricia Borchmann	Eric Bratcher	Melissa Brownlie
Kae Bender	Jane Biggins	Judith Borcz	Joseph Braus	Shannon Brown-Stayer
Sarah Bender	Monique Biglia	Dana Bordegaray	Jessica Bray	Page Brownton
Cathryn Bendure	Akash Bijlani	Michael Bordenave	Colleena Brazen	Edie Bruce
Susan Benedict	Kathy Bilicke	Chandra Bordes	Anton Brazhnyk	Neville Bruce
Elaine Benjamin	Cathleen Billiski	Nadine Borelli	Chris Brazis	Ken Bruer
Sarah Benjamin	Barbara Bills	Elizabeth Borg	Charmaine Breitengross	Carrie Brummette
Beth Bennion	Sharon Bills	Maria Borges	Brien Brennan	Tawny Brunetta
Bruce Benson	Charles Binckley	Kathi Borgmann	John Brennan	Deborah Brusco
Annette Benton	Vicki Bingaman	Christine Borje	Marie Brennan	Thomas Brustman
Kate Benton	Matthew Bingle	Barbara Boros	Marion Brennan	Donnie Bryan
Mo Berg	Teresa Bippert-Plymate	Marty Bostic	Aida Brenneis	Dianne Bryant
Brad Berger	Kristie Bircumshaw	Vic Bostock	Carol Brenner	Tina Bryant
Christine Berger	Leigh Bittner	Tiffany Boswell	Vicki Brenner	Robert Bryden
Elmer Berger	Judith Kliban Bixby	John Botkin	Rosalind Bresnahan	Robert Buchanan
Karen Berger	LeAnn Bjelle	Richard Boucher	Louise Brew	Deb & Randy Buckler
Colleen Bergh	Chanelle Black	Sylv Boulware	Georgia Brewer	Barbi Buckles
Eileen Bergmann	Hillary Black	Allison Bourdlaies	Ingrid Brewer	Leo Buckley
Joann Bergmann	Josephine Black	Bob Bousquet	John Brewer	Lynne Buckley
Theodore Bergmann	Mrs. Meaghan Black & Mr. Joseph Shavali	Danielle Bower	Laurel Brewer	Susan Buckley
Debi Bergsma	Mr. Joseph Shavali	Patricia Bowers	Laurie Brewer	Christian Bucknell
Wendy Berk	Jean'ne Blackwell	Mary Bowman	Carolyn Bridges	Jan Buckwald
Tricia Berkow	Jill Blackwood	Mavis Bowman	Cheryl Briggs	Dianne Budd MD
Julia Berkowitz	Jill Blaisdell	Esther Boyd	Quanah Brightman	Sharon Budde
Anne Berlin	Debra Blake	Florence Boyd	Lisabette Brinkman	

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Windy Buddenbaum	Tamara Cain	Mary Carroll	Terry Chang	Raquel Cito
Heidi Buech	Jane Calame	Winfield Carson	Hector Chaparro	Jeffrey Clark
Rebecca Buer	Socrates Calderon	Lori Carter	Cathy Chapman	Lucy Clark
Janine Buikema	Connie Call	Michelle Carter	Jnani Chapman	Marisa Clark
Sherron Bull	Krys Call	Shane Carter	Scott Chapman	W. Clark
Barbara Bullock-Wilson	Steven Callan	Walter Carter	Elizabeth Char	Warren Clark
Lauren Bumgardner	Michael Callaway	Carl Cartwright	Stacie Charlebois	JoAnne Clarke
Tiffany Bumpus	Georgia Callian	Mauricio Carvajal	Cindy Charles	Donna Clavaud
Mary Bunting	Patty Callison	Cindy Cary	Danielle Charney	Jacqueline Clayton
S. Burcin	Lisa Caloh	Federico Casagran	Christine Chatwell	Margarita Clayton
Cassandra Burdyslaw	Laura Calvillo	Andre Casanave	Esther Chavez	Mark Clearwater
Cynthia Burdyslaw	Max Calvillo	Eileen Casanova	Michele Chavez	Janice Cleary
Donald Burg	Mickie Calvin	Jennifer Case	Aimee Cheek	Rose Marie Cleese
Linda Burgess	Martha Calvinperez	Tomar Casey	Melvin D. Cheitlin	Britt Clemm
Sarah Burgess	Aiyanna Cameron-	Sharon Casioce	Alyssa Chenoweth	Elizabeth Clemmey
Joyce Burk	Lewis	Patricia Casner	Andrea Cherkola	Clare Cleveland
Marie Annette Burkart,	Colleen Campbell	Debra Cassiero	Shirley Cherry	George Cleveland
NDdeN	Dudley & Candace	Vicky Castellanos	Robert Cherwink	Jim Clough
Frank Burke	Campbell	Selena Castellon	P Gail Chesler	Kristy Clougherty
Caroline Burkett	Greg Campbell	Gwen Castillo	Stella Chesler	Devlon Clouser
N.C. Burky	John Campbell	Ruthie Castro	Leslie Cheung	Judy Cobb
Susan Burlison	Kelly Campbell	Yvette Castro	May Cheung	Robert Cochrane
Jane Burnett	Norma Campbell	Jill Casty	Deborah Chew	Tonya Cockrell
April Burns	June Cancell	Joseph Catania	Antonia Chianis	Shiela Cockshott
Benedict Burns	Denise Canellos	Creed Cate	Katrina Child	Barbara Cody
David Burtis	Seychelle Cannes	Mike Cate	Deborah Childers	Singne Coe
Abigail Burton	Christine Canning	Nisha Catron	Nat Childs	H. Coetzee
Christina Burton	M. Canter	Maria Caturay	Roy Childs	Dinah Coffman
Kelly Burton	D. Cantwell	Mary Cavagnaro	Sharon Chilton	Karly Cogswell
Leszek Burzynski	Theresa Capanis	Susan Cavalieri	Robert Chirpin	Eileen Cohen
Anne Bush	Martina Capannini	Sharon Cavallo	Holly Chisholm	Myrna Cohen
Sakina Bush	Karen Cappa	Linda Cayot	Belinda Chlouber	Richard Cohen
Shawn Busick	Geraldine Card	Joan Cayton	Melissa Choi	Thea Cohen
Ray Bustos	Jacquel Cardona	Richard Ceely	Douglas Chorn	Ellen Cohler
Candy Butler	Elizabeth Carfioli	Beth Cefalu	Albert Chou	Amber Cohn
Clarence Butler	Kathy Carlson	Elaine Cefola	Shelley Chretin	Barbara Cohn
Jami Butler	Launa Carlson	Daniel Celidonio	Melodie Chrislock	Debra Cohn
Julie Butler	Rita Carlson	Marsha S. Center	Vanessa Chrisman	Nancy Cohn
Maggy Butler	Matthew Carlstroem	Robert Cerello	Karen Christensen	Tina Colafranceschi
Margaret Butler	Tracy Carlton	Isabel Cervera	Amy Christenson	Gina Colangelo
Tom Butler	Luzette Carmona	Pamela Cetera	Courtney Christoffer	Paula Colby
Judith Butts	Annie Carpenter	Honda Cevallos	Margaret Christoffer	Bradley Colden
Anne Buttyan	Jo Carpenter	Kathleen Chacon	Karrel Christopher	Diana Cole
Ann Buxie	Cathy Carr	George Chadderton	Martin Christopherson	Lee Cole
Barbora Buzinskaite	Gaile Carr	Seeta Chaganti	Michael Christy	Paul Cole
Andrea Byers	Rhonda Carr	Cleo Chai	Mishka Chudilowsky	Emily Coleman
Rosemary Byrne	Seth Carr	Matt Chalfa	Philip Chudy	Jane Coleman
Jolinda C.	Lisa Carrara	Allegra Chambers	Susan Chung	Lissa Coleman
Joe Caballero	Carmen Carrasco	Claire Chambers	Ann Churchill	Mary Coleman
Vivian Cabrera	Jessica Carrillo	Honey Chambers	Iris Chynoweth	Matthew Coleman
Patricia Cachopo	Lina Carro	B. Chan	Carla Cicchi	Ray Coleman
Rebecca Cadman	Daniel Carroll	Benjamin Chandler	Marco Cimmino	Judith Collas
Susan Cadman	Jane Carroll	Cynthia Chandler	Paul Cirulnick	Judith Collins
Daniel Cain	Leslie Carroll	Taressa Chandra	Val Cisneros	Kelly Collins

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Nicole Collins	Rebecca Cote	Georgann Cunney	Dorothy L. Davies	Brett Dennison
Susan Colosimo	Leslee Cotlow	Alan Cunningham	Merrily Davies	Patricia Depew
Laurie Colton	Marc Couacaud	Debra Cunningham	Abigail Davis	Genevieve Deppong
Lara Colvert	Lynne Coulson	Lesley Cunningham	Chris Davis	David DeRemus
Jean Colvin	David Councilman	Genghis Curameng	Gail Davis	Ray Derrickson
Camilla Comanich	Linda S. Courter	Jim Curland	Julie Davis	Charlotte Derstine
Joan Combes	Ian Courts	Connie Curnow	Karen Davis	Donna DeSalvo
James Comeau	John J. Covas	Danielle Curry	Melissa Davis	Richard DeSantis
Linda Comstock	Sandi Covell	Sean Curtice	Peter Franklin Davis	Sheila Desmond
Deb Conant	Susan Covey	Penelope Curtis	Alexandra Davison	Mark Dettling
Elizabeth Congo	Laurel Covington	Larry Cutler	Iris Davison	Patricia Deuter
Elizabeth Conlan	Deborah Cox	Sandra Cutuli	Kelly Dawn	Kathleen Devaney
Suzanne J. Conlon	Stacie Cox	Scott Cuyjet	Chris Dawson	Deva Devillers
Jean O. Connell	Susan Cox	Laura Czinski	Connie Day	Joey Devine
Kristen Conner	Douglas Coy	Sheila D.	Chris Dayani	Nancy Devine
Patti Conner	Aris Cozart	Michael D'Adamo	John de Forest	Kathleen DeVries
Robert Conner	Justin Cozart	Patricia D'Angelo	Stephanie de los Rios	Jeff DeVuono
James Connolly	Phillip J Crabill	Dr. Rosamani D'Souza	Dana De Nault	Joanna Dewey
Arthur Connor	Ella Craig	Joseph Dadgari	Jessica De Ruiten	Laurie DeWitt
Jamie Conrad	Lori Crain	Eudora Dadpagouh	Brenda De Tomaso	Rachael DeWitt
Niki Conrad	Mary Ann Cramer	San Dafaeeboini	Dolores De Vries	David Dexter
Barbara Consbruck	Julia Cranmer	Lisa Dahill	Luz de Wit	Nancy Deyarmie
Jorge Contreras	Jessica Craven	Eileen Dailey	Rayline Dean	Annette Deyhle
Charlotte Cook	Katherine Crawford	Ryan Dale	Robin Dean	Danyell DeYoung
Craig Cook	Leah Creatura	Sonja Dale	Vic DeAngelo	Kathy Di Meglio
Deaunna Cook	Jeff Creech	Jason Dallmann	Glen Deardorff	Jim Diamond
Katherine Cook	Sheilagh Creighton	Dory Dallugge	Jerome Deaver	Mitchell Diamond
Steven Cook	Jennifer Cressman	John Daly	Therese DeBing	Tina Diamond
Anita Coolidge	Daren Cribley	Sharon Damiata	Sharon DeCelle	Ann Diani
Gretchen Cooper	Whitney Crist	Emily Damm	Christie Deddens	Cristina Dias
Kim Cooper	William Crist	Jerry Daniel	Mary Dederer	Jim Diaz
Mike Cooper	Tobey Crockett	Marinell Daniel	Robert M. Deems	Nicole Diaz-Ordaz
R.J. Cooper	Christopher Cronin	Sheryl Daniel	Robert Deering	Lori Dick
Sandra Cope	Sheri Cronin	Dannie Daniels	Suzanne Deerlyjohnson	Nancy Dick
Alicia Copeland	Charley Cross	Jane Daniels	Malia DeFelice	Helen Dickey
Damon Copeland	Melanie Cross	Elizabeth Daniels-	Megan Deitz	Emily Dickinson-Adams
Kris Cordoca	Donna Crossman	Currey	Francesco Deiure	Agnes Dickson
Teresa Cordova	Dup Crosson	Lori Danko	Zanne deJanvier	Jennifer Didier
Julian Corley	Virginia Croswhite	Casey Coates Danson	Tina deKwaadsteniet	Diane Diernbach
James Cormier	John Crotty	Justine Dantzer	Laila Del Monte	Jessica Dietrich
Carey Corr	Carolyn Crow	Jessica Dardarian	Paloma Cuello del Pozo	Amy Differding
Carlos Corral	Alana Crow Esq	Carrie Darling	Javier Del Valle	Kevin Diggs
Manuel Correa	Michelle Crowe	Michael Darling	David Delagarza	Marisa DiGiovanni
Mary Correro	Lawrence Crowley	Lyn Darnall	Mary Delany	Elizabeth Dill
Jennifer Corrigan	Terry Crownover	Eka Darville	John Delgado	Howard Dillon
Sean Corrigan	Cathy Crum	Sandip Dasgupta	Karen Deli	Michele DiMaggio
Madeleine Corson	Ruth Crump	Amitav Dash	D. Dell	Richard DiMatteo
Lisa Cossettini	Martha Crutchfield	Julia Dashe	Robert DeLucca	Carla Dimondstein
Susan Cossins	John Cruz	Rita Davenport	Shirley DeMarco	Barbara Dincau
Demelza Costa	Marian Cruz	Susan Davenport	Susan Dembowski	David Dingell
Sandra Costa	Melanie Cruz	Barbara Davidson	Pam Den Hartog	Sean Diviny
Arlen Costaine	Tami & James	Carrie Davidson	Jack & Margarita	Sandra Dobbratz
Mary Costello	Culbreath	Kelly Davidson	Denman	David Doering
Paige Costello	Mike Culver	Margaret Davidson	Alison Denning	Ian Dogole

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Helen Doherty	Judy Dutil	Elizabeth Ellwanger	Tom Falvey	Karen Fiene
Pat Doherty	John Dutton	Lola Elmo	Dominick Falzone	Craig Figtree
Michelle Dohrn	Laura Dutton	Dennis Ely	Susang-Talamo Family	Deborah Filipelli PhD
Allen Dollberg	Douglas Dyakon	Glenn Embrey	Donna Fanning	Jeffrey Findeis
Paula Dolliver-Marshall	Barb Dyck	C. Emerson	Sam Fagnoli	Melissa Finder
Bonita Dombrowski	Jym Dyer	Sky Emerson	Bob Farinsky	Lena Fine
Ronald Domin	Sharon Earhart	Susan Emerson	Claire Farmer	Richard Finer
Mari Dominguez	Julia Earl	Rebecca Jean Emigh	Juliet Farmer	Jane Culp Finkelstein
Douglas Donehoo	Bonnie Earls-Solari	Bayle Emlein	Dan Farquhar	Jim Finn
Eileen Donnelly	Faye Easley	Linda Emme	Amy Farrell	Elizabeth Finnerty
Teresa Donovan	Gail Eastwood	Charles Enders	Mary Farrell	Mark J. Fiore
Tim Donovan	Linda Eaton	David Enevoldsen	Kelly Farrow	Bunny Firebaugh
Dawna Dorcas	Laurie Eavey	Russell Eng	Barry Fass-Holmes	Susan Firestone
Kim Dorsey	Isabel Ebert	Bruce England	Mir Faugno	Donald Fischer
Mercedes Dotter	Maryanne Ebner	Dixie English	Maira Fay	Lori Fischer
Thea Doty	Nicole Echave	Elena Ennouri	Alex Faydo	Phil & Lynn Fischer
Billy Douglas	John Ector	Mariel Eplboim	Stephanie Fazzare	Charles Fishburn
Dianne Douglas	Pastor Lyda Eddington	M.S. Epstein	Joy Fedele	Juels Fisher
L. Douglas	Sus Ede	Walter Erhorn	Christine Fedon	Milton Fisher
Deanna Doull	Taylor Edelhart	Kelle Erwin	Nathanael Fehrenbach	Pamela Fisher
Lenore Dowling	Jonathan Eden	Nancy Esajian	James Feichtl	Susan Fisher
Steve Downing	Megan Eding	Christopher Escarcega	Marla Feierabend	Terri Fisher
Wena Dows	Elizabeth Edinger	Susan Eschbach	Barbara Feild	Stephen Fitch
Toni Dragon	Iris Edinger	Grecia Esparza	Stephanie Feiring	Gregory Fite
Mynka Draper	Lorrie Edmonson	Art Espinola	John Feissel	Joel Fithian
Deanna Draudt	Debora Edmunds	Nicholas Esser	Mark Feldman	Linda Fitz
Tim Dressel	Estella Edwards	Michael Essex	Ruth Feldman	Glennis Fitzgerald
Carolyn Drewes	Jane Edwards	Joshua Essoe	Tom Feldman	Mark Fitzgerald
Richard Drossler	Jolene Edwards	Michael Esten	Grace Feldmann	Sharon Fitzgerald
Yvette Dube'	Phyllis Edwards	Carl Estes	Helga Fellay	John FitzRandolph
Maria Duber	Nancy Egelko	George Estonactoc	Kristie Fellows	Allan Fix
Nancy Dubuc	Rebecca Egger	Elizabeth Eszterhas	Lyn Fenex	Lenore Flanders
Monica DuClaud	Shirley Eglinton	Tami Etziony	Victor Feodorov	Marcia Flannery
Siobhan Duff	Jennifer Ehman	Albert Eurs	Carol Ferber	Dylan Flather
Tim Dufks	Annette Ehrlich	Alana Evans	Cindy Ferguson	Kevin Flavia
Charlie Faye Duggan	Olivia Eielson	Ellen Evans	Gene Ferguson	Lis Fleming
Susan Dumas	Karen Eikeland	Holly Evans	Virginia Ferguson	Sherry Fleming
Grace Duncan	Michael Eisenscher	Kersti Evans	Daniel Fernandes	Tova Fleming
Marjorie Dunham	Gregg Eisman	Luci Evanston	Jesse Fernandez	Tracy Fleming
Barbara Dunlap	Carol Ekeland	Melissa Evask	Kathleen Fernandez	Richard Flittie
Diana Dunlap	Steve Eklund	Karla Everett	Sydney Fernandez	Monica Floeck
Irene Dunlap	Christine Elbel	Yuri Evfimiou	John Ferrante	Laurie Flood
Connie Dunn	Melody Elek	Kai Ewert	Sofia Ferrario	Susan Elvira Floran-
Sherry Dunn	Arynne Elfenbein	Robert Ewing	Concetta Ferrell	Bernier
Diane Dunne	Kristen Elgen	Chelsea F.	Thomas Ferrito	Gabriel Flores
Nic Duon	Anaundda Elijah	Ronald C Faas	Andre Ferro	Regina Flores
Michele Dupratt	Carol Elkins	Nancy Faber	Stephen Ferry	Brian Florian
Dani/Donna Duran	Lupe Elkins	Cindy Fabry	Asano Fertig	James Floyd
Eve Duran	Michael Elkins	Heather Fadden	Judy Fessler	Joanne Flynn
Janet Duran	D. L. Ellenburg	Peter Faeastle	Nancy Fetterman	Lindsey Foden
Kira Durbin	Tracy Elliott	Rita Fahrner	Nicole Feuerhelm	Diana Fogarty
Carla Durkin	Clare Ellis	Don Faia	Heidi Fielding	Hilda Foley
M. Dürrenberg	Norm Ellis	Jon Charles Falk	Robin Fielding	Karen Follingstad
Naomi Dutch	Patricia Ellison-Overholt	Catherine Falknor	Carol Fields	Jeri Fonté

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Ann Jo Foo	John Fuhrer	Carole Gathman	Leslie Glass	David Goodrich
Ida Foo	Jed Fuhrman	Dana Gatto	Toni Glass	Bradford Goodwin
Judith Ford	Shirley Fukuhara	Jill Gaughan	Sue Glasscock	Jan Goodwin
Sharon Ford	Rebecca Fuller	Cynthia Gaya	MaryAnne Glazar	Martha Goodwin
Elaine Forester	Fran Fulwiler	Liz Gayle	Barbara Glaze	Shaun Goodwin
Jennifer Formoso	Melissa Funk	B. Sheryl Geddes	Leslie Gleason	Carol Gordon
Patricia Forrest	David Fura	Lauren Gedlinske	Constance Glenn	Jane Gordon
Donna Forst	Carol Fusco	Gretchen Gehres	Cassandra Glickman	Kathleen Gordon
Suzanne Forsyth	Gilda Fusilier	Jennifer Gehrich	Janice Gloe	Mary Gordon
Sarah Fortney	Sherrill Futrell	Elaine Genasci	Sandra Glover	Steve Gorman
Suzy Forwood	M. G.	George Georgalis	Ronald Glusac	Susan Gornor
Matthew Foss	Tamara G.	Laurence George	Nancy Gneiting	Carolyn Gorny
Charles Foster	Querido Galdo	Nancy Georgini	Megan Gnekow	Dan Gotch
Marcy Foster	Beverly Gale	Madeleine Gepner	M. Goddard	Jane Gothold
Margie Fourie	Geoffrey Gallegos	Mark Geraghty	Su Godwin	Judith Gottesman
John Fowler	Julie Long Gallegos	Claudia Gerber	Tracy Goestenkers	B. J. Gould
Kathleen Fox	Mark Gallegos	Glee Gerde	N. Goettler	Elaine Gould
Aranye Fradenburg	Jim Galsterer	Jennifer Gerding	Marie Goewert	Mary Govaars
Wendy Frado	Corrie Galvan	Nancy Gerdt	Frances Goff	Nancy Gowani
Jeremy France	Laura Galvan	Greg German	Ernest Goitein	Erik Grabow
Karla Frandson	Ruben Galvez	Carol Germenis	Carol Gold	Elizabeth Grace
Le Frank	Jacqueline Gamble	Karen Gerst	Jennifer Gold	George Grace
Norman Frank	Jacque Gamboa	Beverly Geuting	Rick Gold	Pema Grace
Pat Frankenfield	Mary Ann Gamma	Monica Geyer	Vicki Gold	Kay Graetz
Constance Franklin	Sarah Gao	Sandra Geyer	Dan Goldberg	Gail Graff
Justin Fransila	Sharma Gaponoff	Sue Ghilotti	Devorah Goldberg	Jacqueline Graham
Candy Frantz-Crafton	Barbara Garcia	Ana Ghosh	Gene Golden	Christine Granados
David Franzetta	Bas Garcia	Karen Gibb	Thomas Goldenberg	Domenico Graniello
Phyllis Frasher	Christine Garcia	Pamela Gibberman	Georgia Goldfarb	Larry Grant
Tom Fray	Evette Garcia	Debbie Gibson	Martha Goldin	F.S. Grassia
Carol Fred	Felipe Garcia	Gale Gibson	Jill Goldman	Caryn Graves
Nancy Freedland	Fernando Garcia	Janet Sue Gibson	Lauren Goldman	Charlotte Gray
Rea Freedom	Isabel Garcia	Kenneth Gibson	Ron Goldman	Elisabeth Gray
Myrna Freeman	Velia Garcia	Phoenix Giffen	Sergi Goldman-Hull	Lisa Gray
Richard Freeman	Vinella Garcia	Ed Giguere	Jane/Rob Goldman-	Lynn Gray
Yvonne Freeman	Henry Garcia-Alvarez	Pat Gilbert	Macdonald	Darlene Grech
Andrew Frey	Jessica Garcia-Blenio	Wendy Gilbert	Chip Goldstein	Jamie Green
Michael Frey	Gardenia Gardener	Sonya Gilbreath	Juliet Goldstein	Nye Green
Julia Frick	Kathe Gardenias	Jes Gildea	Susan Goldstein	Carol Greenberg
Sarah Friedenber	Mary Ann Gardner	Margaret Giles	Armando Gomez	Judyth Greenburgh
Honey Friedman	Nicholas Gardner	Rich Gililand	Kathleen Gonnoud	Chris Greene
Irwin Friedman	Michael Garitty	Thomas Gillespie	James Gonsman	Ford Greene
Leanne Friedman	Leah Garland	Cheryl Gillette	Bernie Gonzales	Jeanne Greene
Leslie Friedman	Helen Garner	Erin Gilligan-Morin	Daniel Gonzales	Judy Greenough
Denyse & Robert	Peter Garner	Ken Gilliland	Tara Gonzales	Evelyn Greenwald
Frischmuth	Lynn Garnica	Skylar Gilmore	Autumn Gonzalez	Green Greenwald
Dennis Fritzing	Jamila Garrecht	Timothy Gilmore	Cecilia Gonzalez	Belisa Grefe
Joyce Frohn	Alisa Garrison	Joe Ginsburg	Gerardo Lobo Gonzalez	Arnold Gregorian
Raymond Fronczak	Chris Gartland	Linda Gioia	Rachell Gonzalez	Phil Grenetz
Ely Fry	Dorene Garvin	Arturo Giraldez	Susan Gonzalez	Carolyn Gribben
Martin Fryc	Kurt Gary	Karen Gitter	Watson Gooch	Beverly Griffin
Nathan Frye	Renate Gase	Carrie Givens	Beth Goode	Erica Griffin
Cassie Fuertez	Heidi Gatica	Mark Glace	Luna Gooding	Pam Griffin
Deborah Fugate	Tamara Gates	Andrea Glass	Cathy Goodrich	Susan Griffin

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Glenda Griffith	Shady Hakim	Tom Harper	Carol Heermance	Susi Higgins
Mason Griffith	Teni Hakopian	Silva Harr	Brooks Heiken	Terrence Higgins
Melody Grigg	Bonnie Hale	Lene Harries	Shelby Heimbach	Howard Higson
Heather Grigsby	Ben Hall	Michael Harrington	Christine Hein	Gene Hikel
Antonio Grijalva	Gayle Hall	David Harris	Bridgett Heinly	Karen Hildebrand
Kathleen Grisso	Holly Hall	Freya Harris	M. Hempel	C. Hildreth
Bruce Grobman	Karen Hall	Jeanie Harris	Clive Henderson	Deborah Hill
Helen Grohman-Collins	Maryann Haller	Jennifer Harris	Michael Henderson	Eugene Hill
Malcolm Groome	Cathy Halley	Leila Harris	Rose Henderson	Kenneth Hill
Anne Gross	Michele Halligan	Nina Harris	Steven Henderson	Misako Hill
Chris Gross	Laurie Hallihan	Jennifer Harrison	Kelly Hendricks	Pamela Hill
Steve Gross	Carol Hallmeyer	Laura Harrison	Trevor Heneveld	Ramona Hillier-O'Hara
Kathleen Groux	Trisha Hamera	Marty Harrison	Marie Henley	Ryan Hills
Shannon Gruber	Ellen Hamilton	Roger Hart	Debbie Hennessey	Eve Himmelheber
Karenina Grun-Louie	Robin Hamlin	Allen Harthorn	Heide-Marie Henniger	Phil Hinkle
Gretchen Grunt	Esther Hamm	Michael Hartley	Steve Henry	S.R. Hinrichs
Horacio Guajardo	F. Hammer	Randall Hartman	Rocio Herbert	Eugene Hinton
Sylvia Guerra	Lisa Hammermeister	Linda Hartmann	Teri Herbst	Bruce Hirayama
Ma. Elena Guillermo	Celeste Hammond	Valerie Hartwell	Elizabeth Herman	Kathy Hirsch
Alan Gulette	James Hampson	Heather Hartwig	Gene Herman	Jeanne Hirshfield
Katharine Gullotta	Anna Hamre	Vanessa Harvell	Jack Herman	Leslie Hixson
Melanie Gunderson	Eric Hamre	Anne Harvey	Wendy Hermosillo	Annette Hobday
Stella Gunther	Alice Hamrick	Sarah Harvey	Carolyn Hernandez	Charles Hochberg
Thayne Gunther	Quentin Hancock	Edward Harwood	Eloy Hernandez	Zora Hocking
J. Barry Gurdin	David Hand	Jordan Hashemi-Briskin	Heather Hernandez	Christina Hodge
Carol Gurunathan	George Handler	Karen Hastings	Martha Hernandez	Bengie Hodges
April Gustafsen	Sherry Handy	Melissa Haswell	Rebecca Hernandez	Suzanne Hodges
Dr. Ricky Gutierrez	Gary Hanks	Christina Hatfield	Steve Hernandez	Julianne Hoehn
Todd Gutmann	Sarah Hanley	Cassie Hauck	Tonie Hernandez	Janet Hoey-Klick
Carla Guyard	Yvonne Hanlon	Stephanie Hausle	Laura Herndon	Ricardo Hofer
Nathalie Guyonvarch	Sean Hanns	Nancy Havassy	Joan Heron	Florence Hoffert
Eryan Gwin	Diana Hansen	Gary Haven	Robert Herrera	Jeff Hoffman
Perry Gx	Julie Hansen	John Hawkins	Christiane Herrmann	Candace Hogan
Samara H V	Paul Hansen	Linda Hawkins	April Herron	Judith Hogan
Maria Haanpää	Phillip Hansen	Paula Hawkins	Barbara Herron	Lisa Hoivik
Dorothygayle Haas	Wendy Hansen	Christine Hayes	Justin Herschel	Deborah Holcomb
Aaron Haase	Cynthia Hanson	Donna Hayes	Randall Herz	Lonner Holden
Nicholas Habben	Nancy Hanson	Janet Hayes	Shirley Hesche	Lisel Holdenried
Brian Haberly	Tim Hanson	Kathryn Hayes	Gary Hesler	Tori Holder
Linda Habuda	Charlotte Harbeson	Sara Hayes	Rilla Heslin	Erika Holderith
Marc Hachey	John Hardesty	Suzu Hayes-Tripp	Allan Hessenflow	Brett Holland
Anthony Hackett	Mary Joan Hardie	Lucie Hazen	Avi Hesterman	Roger Hollander
William Hackett	Joseph Hardin	Yuriko Hazlett	John Hewett	Lynne Holley
Nadia Haddad	Kelly Harding	Carol Head	Carol Hewitt	Sandra Holloway
Christine Haden	Sharon Harding	Kris Head	Judy Hewitt	Lisa Holm
Jer Haelen	Barbara Hardwick	Laura Head	Roger Hewitt	Larry Holme
Marcy Hagen	Leah Hardy	Shannon Healey	Marni Heydt	Magnus Holmen
Sherrill Hagenson	D. J. Hargin	Chuck Heard	Cynthia Hiatt	Christine Holmes
Alan Haggard	John Hargrove	Kevin Hearle Ph.D.	Cynthia Hicks	Kirsten Holmquist
Jennifer Haglund	Lynne Harkins	Sarah (Sally) Hearon	Richard Hieber	Armelle Holt
Bradford Hague	Sheila Harkrider	Allene Hebert	Gabi Hiemann	Lisa Holtzman
George Hague	Gabrielle Harlan	Sally Heckethorn	Richard Hiersch	Jessica Honza
Robert Hahn	Susan Harman	Ken Hedges	Carol Hiestand	Suzanne Hoofnagle
Barbara Haire	Rebecca Harper	Shawna Hedley	Bruce Higgins	Jennifer Hooson

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Ben Hoover	Mark Hurst	Rebecca Jaffe	Frederique Joly	Klinta Karklina
Jeff Hopkins	Robert Husbands	Mark Jajeh	Amelia Jones	Chuck Karp
Julie Anne Hopkins	Steven Huskey	Tom Jakaby	Annamarie Jones	Cassandra Kashanski
Sylvia Hopkins	Erik Husoe	Brown James	Barbara Jones	Sandy Kasper
Nicholas Horne	Charles Husome	Josephine James	Christopher Jones	Peggy Kass
Jerry Horner	Suzanne Hutchinson	Philip Jamtaas	Claire Jones	Michael Kast
Anna Hornick	Graciela Huth	Miranda Janeschild	Edmund Jones	Lise Kastigar
Julie Hornung	Rick Huyett	Nora Jansen	Jackie Jones	Vicki & Rod Kastlie
Yutaka Houlette	Yvonne Hyatt	Hillie Janssen	Jamie Jones	M. Katz
April House	David Hyde	Andrea Jaquette	Jan Jones	Sara Katz
Michael House	Andrea Iaderosa	Susan Alcott Jardine	Jeri Jones	Sherry Katz
Michael Houston	Vonnie Iams	Sue Jarrard	Kathy Jones	Andrea Kaufman
Roseanne Hovey	Jeri Idso	Sherrie Jarrett	Keith Jones	Barry Kaufman
Jeanne Howard	Wallace Imura	Elizabeth Jarvis	Kenneth Jones	Denise Kautter
Lynn Howard	Chris Illes	Jerri Jarvis	Linda Jones	Felicia Kautz
Tracy Hoyt	William Imhoff	Gosia Jarzembowska	Melanie Jones	David Kavanaugh
Ian Hua	Kajsa Ingelsson	Donna Jefferson	Truman Jones	K. Kaweck
Edward Huang	Debra Ingle	Esther Jenkins	Laura Jones-Bedel	Linda Kay
Leilani Hubbard	Anne Ingraham	K. Jenkins	Sirry Jonsdottir	Barbara Kaye
Anne Huber	Francesca Innocenti	Paula Jenkins	James Jordan	Steve Kaye
Joyce Huber	Judy Irving	Angela Jensen	Joanne Jordan	Edie Keating
Caryn Huberman	Samantha Irwin	Connie Jensen	Lance Jordan	Shauna C. Keddy
Molly Huddleston	Joel Isaacson	Donna Jensen	Rebecca Jordan	John M. Keefe
Jerry Hudgins	Mary L. Ishii	Gerry Jensen	Wendy Jordan	Michael Keene
Adam Huggins	Rika Ishii-Price	Lawrence Jensen	Kersten Jordanmaree	Dana Kegaries
Brendan Hughes	Anna Isis-Brown	Melanie Jensen	Nancy Josefosky	Lori Kegler
Gary Hughes	Tasha Isolani	S. Jensen	Jill Joseph	Meghan Keil
John Hughes	Jan Ivanoff	Lee Jesmain	Jessica Josen	Cheri Keisner
Kevin Hughes	Dana Ivey	Geoffrey Jewel	Robert Joy	Sandi Keist
Kim Hughes	Laurie Izzo	Rosemary Jewkes	Martin Joye	Kathy Kelehan
Vicki Hughes	Sandra Jackdon	Jerry Jezowski	Walter Juchert	Kathleen Keller
Virginia Hughes	Joan Jacks	Vanessa Jimenez	Barbara Judd	Lucinda Keller
Mike Hughey	Victoria Jacks	Patricia Jing	Lil Judd	Alice Kelly
David Hukari	Christina Jackson	C.J. Johansen	Mary JuneK	Diane Kelly
Sharon Hull	Donna Jackson	Mike Jöhles	Scott Jung	Janet Kelly
Erica Hummel	Elizabeth Jackson	Brian Johnson	Debra Jurey	Marie Kelly
Jay Hummel	Grace Jackson	Chad Johnson	Kay Justad-Saffon	Lisa Ann Kelly & Family
Jennifer Humphreys	Harold Jackson	Christine Johnson	Charlie K.	Michael Kemper
Tim Humphreys	Jan Jackson	Cliff Johnson	John K.	Lavonne Kendall
Aidan Humrich	Jenice Jackson	Gregg Johnson	SharonLee K.	Vieva Kendig
Michael Hundt	Leroy Jackson	Jennie Johnson	Valerie Kadium	Aaron A. Kenna
Jill Marie Hungerford	Melanie Jackson	Jennifer Johnson	Max Kaehn	Arthur Kennedy
Joan Hunnicutt	Dori Jacob	Joan K. Johnson	David Kajtaniak	Barbara Kennedy
Paul Hunrichs	Ron Jacob	Joel Johnson	Carole Kalous	Clare Kennedy
Daniel Hunt	Jill Jacobs	Joyce Johnson	Scott Kaminski	Ian Kent
Donna Hunt	JoAnne Jacobs	Kristin Johnson	Cindy Kamler	Katherine Kent
Eileen Hunt	Vernon Jacobs	Lisa Johnson	Jan Kampa	Barbara Kenton
Josh Hunt	Brynna Jacobson	Renata Johnson	Benita Kamstock	Nancy Kenyon
Otto Hunt	Gretchen Jacobson	Sage Johnson	Cat Kane	Paul Keough
D. M. Hunter	Jenna Jacobson	Shawn Johnson	Edward Kane	Charlene Kerchevall
Jacki Hunter	Lisa Jacobson	Tamara Johnson	Tami Kannenberg	Miki Kern
Janice Hunter	Karen Jacques	Bonnie Johnstone	Michele Kappel-Stone	Roselyn Kern
Michael Hunter	Nicola Jaeger	Rena Johnston-	Judy Karas	Genevieve Hahn Kerr
Kirsten Huntley	Molly Jaffe	Farrington	Kellie Karkanen	J. Kerr

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Linda Kerr	Cybele Knowles	Gary Kuehn	Serena Laney	Peter Lee
Anna Kerruish	Elena Knox	Elizabeth Kuelbs	Diane Lang	Sandra Lee
Sara Kert	Lisa Knox	Carol Kuelper	Johanna Lang	Sherrie Lee
I. Kessler	Mayumi Knox	Donna Kuge	Karin Langer	Thomas Lee
Kathleen Kestelyn	Julie Knutson	Doris Kuhns	Darlene Langston	Nancy Leech
Aaron Kester	Caroline Ko	Xakan Kukulcan	Michael LaNoue	Dennis & Kathleen Lees
Heather Kettmann	Denise Kobylarz	Jen Kumar	Sandy Lansdale	Jacque Lefler
Dr Mha Atma S. Khalsa	Kristin Koch	Janet KuncI	Renee Lanser	Kyra Legaroff
Rubi Khilnani	Walter Koch	Giar-Ann Kung	Michelle Lanting	Vicki Leidner
John Kidd	Sharon Kocher	Sarah Kupferberg	Ellen Lanzone	Lynda Leigh
Elizabeth Kiely	Kristie Koehler	Jamie Kurnik	Roshanee Lappe	Mindy Leighton-Toth
Paul Kienitz	Karl Koessel	Lloyd Kurzweil	Larry Lapuyade	Bill Leikam
Cassie Kifer	Patti Koger	Susan Kusano	Erin Lareau	Linda Lemerise
Bill Kilbourne	Ellen Koivisto	Lesley Kushner	Adrienne Larimer	Denise Lemmon
Elli Kimbauer	Joyce Kolasa	Edith Kvale	Chris Larimer	Florence Lemoine
Catherine Kimbrough	Marcia Kolb	Maria Kydonieus	Kathryn LaRiviere	Nicholas Lenchner
Kathryn Kind	Luann Koller	Jamie L.	Neil Lark	Kevin Lenhart
Gay King	Diana Kommer	L. L.	Lulu LaRocca	Giovani Leon
Jean King	Carol Kommerstad-	Molly L.	Lucy Larom	Lauren Leonarduzzi
Laurel King	Reiche	Stephanie L.	Brent Larsen	Rita Leone
Michelle King	Henrietta Komras	Nancy La Bash	Marilyn Larsen	Nadine Leonova
Tracey King	Margaret Koopowitz	Rochelle La Frinere	Frances Larson	Robin Lerios
Wilder Kingsley	Gloria Kopp	Isabella La Rocca	Karen Larson	B. Lerner
Allysyn Kiplinger	Greg Korelich	Georgia Labey	Randy Larson	Talia Lesser
John Kirk	Raleigh Koritz	Cathie LaBrecque	Francine Larstein	Chris Lester
Judith Kirk	Dennis Korthauer	Caitlin Lacey	J. Lasahn	Stephen Lester
Sue Kirk	Kristen Koster	Janet Lacey	Lisa Lashaway	Pamela Letourneau
Perry Kirkland	Brian Koukol	Sharon Lacoste	Jody Last	Jon Leupp
Saran Kirschbaum	Betty Kowall	Sharon Lacy	Nancy Lathan	Margaret M. Leusch
Kathleen Kite-Powell	Patricia Kowalski	Linda Lagace	Lesley Lathrop	Horst Leuschner
Jo Ann Kiva	Julie Kramer	Phyllis Lager	Pat Launer	David Levenson
Pat Klaasen	Anna Kraus	Denice LaGrassa	Janet Laur	Jeff Levicke
Cheryl Klatt	Cathy Kraus	Frank Lahorgue	Leann Laurich	Adam Levin
Joel Klayman	Doug Krause	Allen Lam	Inger Marie Laursen	Amanda Levin
Bill Klein	Lisa Krausz	Irina Lamadrid	Vance Lausmann	Larry Levin
Diane Klein	Rebel Kreklow	Ronda Lamagna	Ashley Lauth	Callie LeVina
Joseph Klein	Jennifer Krenzin	Alexandra Lamb	Amanda Law	Aaron Levine
Marilyn Klein	Teresa Krest	Beverly Lambert	Michael Lawler	Chuck Levine
Jamie Klem	Caroline Krewson	Carol Lambert	Ken Lawson	Deedee Levine
Lois Klepin	Evan Jane Kriss	Janet Lambert	William Lawson	Marilyn Levine
Diana Kliche	Sherry Kritzer	Jerome Lambert	David Lay	Sandy Levine
Sue Klick	Zachary Kronkright	Rene Lambert	Wendy Le Master	Sharon Levine
Lauren Klingman	K. Kropp	Susan Lambert	Katherine Leahy	Beth Levinson
Michael Kloby	Renee Krueger	Tracy Lambert	Karin Lease	Lacey Levitt
Elizabeth Kloepfer	Ted Krug	Paul & Kathleen Lanctot	Mario Lecce	Albert Levy
Lorrie Klosterman	Henry Kruger	Martha Land	John LeConte	David Levy
Frank Klug	K. Krupinski	Robin Lande	Dennis Ledden	Stacy Dever Levy
Paul Klunder	Michelle Krupkin	Margaret Lander	Audrey Ledesma	Catherine Lewis
Charles Kluz	Wendy Krupnick	Karine Landers	Barbara Lee	Cynthia Lewis
Julie Kmetzko	Virginia Krutilek	Miriam Landman	Claudia Lee	Laraine Lewis
Harry Knapp	Kevin Krywko	A. Lane	Emily Lee	Rena Lewis
Brooke Knight	Alfredo Kuba	Carol Lane	Janice Lee	Valerie Lewis
Joan Knipe	Marita Kubersky	Priscilla Lane	Jean Lee	William Lewis
Kristeene Knopp	Kathleen Kuczynski	Maureen Laney	Jon Lee	Kimberly Leyden

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Sharon Lieberman	Jaime Lopez	Megan M.	Garrett Mann	Sue Martin
Diedra Liepelt	Jonel Lopez	Catherine Macan	Harold Mann	Antonio Martinez
Cynthia Lieurance	Lori R. Lopez	Edward Macan	Helen Manning-Brown	Daniela Martinez
E. Light	Peggy Lopez	Alison MacArthur	Arthur & Jean	Henry Martinez
Carol Lilleberg	Ralph Lopez	Colin Macaulay	Manoogian	Sheila Martinez
Ken Lim	Victor Lopez	Alex MacCollom	Jone Manoogian	Dyllon Martini
Sonti Lim	Carolyn Lord	Karin Machusic	Shirley Mantyla	Ana-Paula Martins-
Lauren Linda	Robert Lorentzen	Sherry Macias	Marilyn Marco	Fernandes
George Lindelof	Thomas Lorioux	Ingeborg MacKay	Chris Marcus	A. Marts
Dianna Linden	Janet Lott	Marta MacKenzie	Hayley Marcus	Jaime Marx
Patty Linder	Jude Lotz	Michelle MacKenzie	Jewels Marcus	M. Masek
Robert Lindsey	O'Neill Louchard	Susan MacKenzie	Karen Marcus	James Masi
Jean Lindgren	Catherine Loudis	AnaKristina Alexandra	Mel Marcus	Francesco Masiello
Bill Lindner	V. Louie	Mackey	Pam Marden	Dawn Mason
Katie Lindsay	Alanna Louin	Alan Mackillop	Sandra Mardigian	Evelyn Mason
Ron Lindsay	Scott Love	Marina Mackin	Devan Mardyks	Sally Mason
Colin Lindsly	Valerie Love	Mel Mackler	Siri Margerin	Joy Massa
Norma Liner	George Loveday	Andrew MacLaggan	Kirk Margo	Mike Massari
Charlotte Liniger	Todd Loveless	Katherine MacMillan	Natalie Mari	Joel Masser
Betty Lininger	Margot Lowe	Bonnie MacRaith	Angela Marie	Jenifer Massey
Marylen Lininger	Martha Lowe	Claire Maddlone	Marilyn Marilyn	Jim Massey ND
Walter Linsley	Jim Lowery	Tim Madison	J. Marin	Wendy Mastroianni
Ilene Linssen	Avila Lowrance	Benjamin Madley	Antonella Marinelli	Karine Matevossian
Earl Lippold	Lorraine Lowry	Pamela Magathan	Heidi Markel	Debra Matlock
Margaret Lirones	Marsha Lowry	Lisa Magee	Linda Markese	Sarah Mattern
Melissa Liscomb	Rebecca Lowry	Beverly Magid	Clea Markman	Alexa Matthews
Julia Litaker	Adam Lozier	Serafina Magnussen	Goran Markovic	Nan Matthews
Elizabeth Littell	Diana Lubin	Pat Magrath	Jeremy Nathan Marks	Georgia Mattingly
Shannon Littrell	Andrea Lucas	Becky Maguire	Patricia Marlatt	Judith Mattsson
Ann Livingston	Janie Lucas	David Maher	Jennifer Marler	Shirley Matulich
Brandon Llamas-Siddiqi	Ken Lucas	Mary Maher	Judith Marlin	Tamara Matz
Colleen Lobel	Ruby Lyn Lucin	Lee Mahler	Derek Marotta	Barbara Mauk
Ro LoBianco	Aileen Ludlow	Cathy Mahoney	Carolyn Marsden	Margaret S. Maurin
Edith Lobrot	Marlene Ludlow	Jack Mahrt	Craig Marshall	Barbara Mauz
Santo Locascio	Brian Luenow	Dineo Maine	Ian Marshall	David Maxim
Peggy Loe	Mariana Lukacova	Eugene Majerowicz	Jack Preston Marshall	James Maxwell
Margot Loerky	Jeanna Lum	Janet Maker	Katherine Marshall	Michele Maxwell
Sarah Fernald Loft	Quenby Lum	Sayeeda Malachi	Kathy Marshall	Dorian May
Frances Logan	Kirk Lumpkin	Maria Carmen	Nancy Marshall	Karen Mayer
Louise Logan	Jules Luna	Maldonado Urie	Pattie Marshall	Richard Mayer
Pam Logan	Alexandria Luostari	Susan Maletsky	Raymond Marshall	Carol Mazerall
Dana Logston	Gilberte Luron	Parvin Malik	Stephen Marshall	Michael Mazzarella
Nicole Loh	Steve Lustgarden	Annie Malone	Leslie Martensen	Kevin Mazzocco
Wendy Lohman	Irene Lutz	Marsha Malone	Jamey Marth	Lisa Mazzola
Laura Lois	Robert Luvisi	Maureen Maloney	Angela Martin	Kevin McAlister
Francesca Long	Sheryl Luxon	Jan Maltzan	Carol Martin	Luisa McAneny
Glenn Long	Dennis Lynch	Robert Mammon	Diane Martin	Marcine McBride
Kit Long	Michael Lynch	Patrick Manalio	Frank Martin	Beverly McCallister
Larisa Long	Susan Lynch	Jace Mande	Jay Martin	Aislinn McCarthy
Loretta Long	Barbara Lyon	Peter Mandell	Jayne Martin	Anne McCarthy
Jeannette Longtin	Connie Lyons	William Manewal	Jerry & Mary Lee Martin	Jonna McCarthy
Debra Lono	Ronald Lyons	Donna Mangel	Kea Martin	Teri McCartney
Chris Loo	Claudia Lyons-Yerion	Luz Mangurian	Robin Ansley Martin	Kevin McCaskill
Ernie Looney	Keiko M.	Joseph Mankawich	Staci Martin	Karen McChrystal

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Anne McClain	Kadie McShirley	Elizabeth Milenkovic	Julie Miyasaki	Maria Morrow
Lyn McClure	David Meade	Yvonne Miles	Robert Mize	Eugenia Morzenti
Sudi McCollum	Pattie Meade	Jose Milian	Marietta Mnatsakanian	Joyce/Henry Moser
Douglas McCombs	Alexandra Meador	A. Miller	Neal Mock	Rich Moser
Arthur McConn	Shelley Meals	Blair Miller	Anne Moeller	Anna Mosqueda
Teal McConn	D & M Means	Christian Miller	Lorna Moffat	Joanne Moss
Julie McCord	Deborah Meckler	David Miller	Karen Moffitt	John Moss
C. Gene McCormick	Mark Medina	Dianne Miller	Jake Mogan	Steven Most
Douglas McCormick	Debra Medley	Jerre Miller	Elizabeth Molenkamp	John Moszyk
Novalee McCowatt	Eric Meece	Jessie Miller	Nelson Molina	Phyllis Mottola
Linda McCracken	Don Meehan	John Miller	Diana Moll	Carolyn Moy
Tamara McCready	Simone Meeker	Kelly Miller	Carly Molstad	Soultana Mpoulkoura
Erin McCreless	Tobias Meeker	Lynn Miller	Dina Monaghan	Anita Mueller
Laurel McCrink	Helene Carol Meeks	M.E. Miller	Cecelia Mondoc	Kerstin Mueller
Lissa McCullough	Linda Meeks	Melissa Miller	Janet Monfredini	Sarah Mueller
Nancy McCune	Gail Meese	Nancy Miller	Dana Monroe	Kathleen Mugele
Tracy McDermott	Courtney Mehrlich	Pamela Miller	James R. Monroe	Christina Muhlbach
Robert McDonnell	Adil Mehta	Rachelle Miller	Kristen Monsell	Timur Mukminov
Patrick McDowell	Alexis Meir	Robert Miller	Álida Montañez-Salas	Monica Mulanax-Crawford
Molly McEnerney	Lisa Meisinger	Ruth Anne Miller	Anthony Montapert	James Mulcare
Thomas McFarlan	Barbara Meislin	Scott Miller	Debby Montero	Sharon Mulkey
Julia McFarland	Jeff Melin	Stephanie Miller	Ian & Janeane Moody	Terri Mullen
Tanya McGee	Ron Melin	Elizabeth Milliken	Rachel Moody	Joan Mulligan
Kerri McGoldrick	Dan Melius	Erin Millikin	Loba Moon	Glenn Mullins
Dennis McGonagle	Linda Mellen	Aileen Milliman	Terri Moon	Linda Mulvey
Jimmy McGowan	Annette Mello	Paula Millman	Andrea Moore	Robert Mumm
Joanne McGrath	Julio Mendez	Christina Mills	J.D. Moore	Sarah Mundal
Bruce McGraw	Sara MengeMartin	Marlene Mills	Katlyn Moore	Lynne Mundon
Dennis McGuire	Ric Mer	Randy Mills	Kerry Moore	Randy Mundt
Will McGuire	Shirley Mercado	Jack Milton	Malcolm Moore	Charles Mundy
Krista McKee	George Merilatt	Mary Minagro	Onisha Moore	Bon Marie Munier
Lou Anne McKeefery	Alison Merkel	Kent Minault	Pam Moore	Xan Munzer
Caephren McKenna	Karynn Merkel	Ariana Mindelzun	Ryan Moore	Lauren Murdock
Kathleen McKeon	Lisa Merrill	Queenelle Minet	Sasha Moore	Carolyn M Murphey
Channing McKindra	Sheila Messer	Danielle Mingo	Daniel Morales	Garrett Murphy
Laura McKinney	Nikita Metelica	Rita Minjares	Rosy Morales	James Murphy
Marshal McKitrick	Evi Meuris	Doug Minkler	Tony Morales	Jeannine Murphy
Melissa Mcknight	Eric Meyer	Karen Minkowski	Emily Moran	Joanie Murphy
Lynette McLamb	Ian Meyer	Barbara Mintz	Huguette Moran	Mare Murphy
Michael McLaughlin	Lesley Meyer	David Miotke	John Moreau	Melissa Murphy
John McLaurin	Michael Meyer	Michelle Miranda	Carol S Morgan	Stephanie Murphy
Todd McLay	Patricia Meyer	Myriam Misrach	Dan Morgan	Raven Murrah
Jo McLean	Robert Meyer	C.J. Mitchell	Lilian Alecia Morgan	Joan Murray
Carol McMahan	Valerie Meyer	Dorothy Mitchell	Mary Anne Morgan	Margaret Murray
Gillian McManus	Candace Meyers	Greg Mitchell	Steven Morgan	Charlotte Muse
Susan McMullen	Cheri Mezzapelle	Julia Mitchell	William Morgan	Pip Muser
Linda McNair	Marcus Miceli	Marilynn Mitchell	Michael Morganstern	Cyndi Myatt
Lianne McNeal	Veronica Michael	Martha Mitchell	Leigha Morginn	Adele Myers
Shirley McNeal	Oliya Michaela	Robin Mitchell	Louis Morin	Dolores Myers
Susan McNulty	Marina Michel	Ruby Mitchell	Larry Morningstar	James Myers
Jim & Leslee	Susan Michetti	Sylvia Mitchell	Larisa Moroney-Irving	Ronald Myers
McPherson	Kristi Michiels	Kazuko Mitose	Melinda Moros	Sulvia Myrvold
Nancy McQueen	Monique Mierlot	Ken Mitsch	Celia Morr	Sami Mzali
Alicia McQuillen	Shira Miess	Michael Mitsuda	Sharon Morris	

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Jeff Nadler	Paige Nickle	P.K. Odle	Sandy Paganucci	Virgil Pauls
Nikki Nafziger	Sharon Nicodemus	Gregg Oelker	Nancy Page	Nicolette Pavlovics
Dalia Nagel	Michael Nicoletti	Edith Ogella	Janie Painter	Donna Peabody
Barbara Nagy	Jami Nielsen	Mark Ogonowski	S. Pais	Heather Peacock
Jaime Nahman	Kate Nielsen	Melissa OHara	Tami Palacky	Diane Pearl
Laura Naismith	Lynn Nielsen	Jean Okamura	Cathy Palamara	Ed Pearl
Mary Naples	Mimi Niesen	Larry Okamura	Rania Pallad	Juliet Pearson
Jerry Napombhejara	Fjaere Nilssen-Mooney	Laura Okazaki	Michelle Palladine	Richard Pecha
Anna Narbutovskih	Matthew Nishiguchi	Alice Okeefe	Rocio Palma	Karin Peck
Lynn Nardella	Bonnie Nishioka	Peggy Oki	Allie Palmer	Yvonne Peck
Ilona Nason	Mallory Nissen	Audrey OKubo	David Palmer	Cheryl Pedde
Elaine Nations	Ann Nixon	Naomi Okuyama	Sharon Paltin	Donna Pedroza
Lana Navejas	Judith Noll	Sarah Oldfield	Christopher Panayi	David Pedvin
Ren Navez	Katie Noonan	Delmy Oliva	Drew Panico	Elin Pelland
Charles Navigante	Merle Norman	John Oliver	Robert Pann	Natalie Pellolio
Carla Neal	George Norris	Simone Oliver	Bonnie Pannell	Laura Pendel
Charles Neal	Claudia North	William Olkowski	Marie Pappas	Jacob Pendlebury
J. Neal	Ellen North	Donna Olsen	Patrizio Paratelli	Susan Pennington
Traelynn Neal	Debbie Notkin	Janessa Olsen	Linda Parena	Allen Perada
Carol Nealy	Karen Novak	Kari Olsen	Rachel Parham	Michael Percy
E. Ann Neel	William Nowell	Maedie Olsen	Jude Parise	Carmela Perez
Nancy Neely	Deb Nudelman	Allen Olson	Laural Park	Holly Perez
Cindy Neeper	David Nugent	Cyndi Olson	Ruth Park	Louis Perez
Melvyn Nefsky	Paolo Nugent	D. Olson	Dianne Parker	Rich Perez
Julie Neidich	José Rafael Cuerva	Elizabeth Ondyak	Janice Parker	Yecenia Perez
Lisa Neidich	Nunes	Steve Ongerth	Jennifer Parker	Jana Perinchief
Clary Neil	Carlos Nunez	Doug Oostdyk	Marie Parker	J.P. Perino
Cherri Nelson	Tanya Nuter	Ruth Oroshnik	Cheryl Parkins	Lee Perkins
Christian Nelson	Vicki Nygren	Julian Orr	Rebecca Parks	David Perry
Dorothy Nelson	Kate Nyne	Rhian Orris	Karen Parlette	Jim Perry
Ian Nelson	Brigid O'Brien	Gina Ortiz	Anthony Parr	Katherine Perry
Paul Nelson	Eileen O'Brien	Josefina Ortiz	Rosemarie Parris	Ronnie Perry
Sandra Nelson	Floyd O'Brien	Robert Ortiz	Caryl Parrish	S.J. Perry
Cipra Nemeth	Miranda O'Brien	Jessie Osborne	L. Parrish	Susan Perry
Diane Neophytou	Monica O'Brien	Bob Oslie	Ern Parrott	Theresa Perry
Kim Nero	Tarin O'Brien	Okiyo Ososaka	Laura Parrott	Suzann Pershing
Gregory Nerpouni	Elizabeth O'Connor	Aminy Ostfeld	Christopher Parsons	Giancarlo Pertile
Julie Nesnansky	Polly O'Malley	Julie Ostoich	Ron Parsons	Janet Petermann
James Nessheim	Terry O'Neal-O'Rourke	Ann Oswald	Stephen Parsons	Barbara Peters
Lisa Neste	Julie O'Rielly	Cyndi Otero	Stacy Pasetta	Heather Peters
Steven Netkin	Shawn O'Shea	Kristin Otwell	Pamela Patek	Susan Peters
Alice Neuhauser	Wendy O'Terry	Jean Ouellette	Richard Patenaude	Garrine Petersen
Janine Newell	Stori Oates	John Scott Owen	Colleen Patetta	Kathy Petersen
KayLynn Newhart	Julie Oatfield	Julie Owen	Margaret Patino	Betty Peterson
Roberta E. Newman	Gale Obler	Gail Owensmith	Dixie Patterson	Carol Ann Peterson
Laura Newton	Kathleen Obre	Steve Ozoa	Jay Patterson	Celia Peterson
Keefe Nghe	Cecille OBrien	Annie P.	Katherine Patterson	Davin Peterson
Auralynn Nguyen	Jacqueline OBrien	S. P.	Thomas Patterson	Eric Peterson
Guy Nguyen	Kathy OBrien	Sergio P.	Arielle Patton	Linda Peterson
Joy Nguyen	Rick Obryan	Michele Pacheco	Gary Patton	Nancy Peterson
Candy Niccolson	Joan Ochoa	Paulette Packard	James Patton	Suzanne Peterson
Linda Nicholes	Mary Odegaard	Abbie Padgett	Robert Patton	Thomas Peterson
Randy Nichols	Bruce Odelberg	R.J. Padiernos	Shannon Patty	Xavier Petit
Martina Nicholson	Rollin Odell	Michael Pagano	Tanya Paul	Denis Petitt

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Jim Petkiewicz	Nancy Polito	Loretta Quick	Jennifer Reding	Charles Richey
Margaret T.M. Petkiewicz	T.J. Politzer	Mary Quimby	Antonio Garcia-Palao Redondo	Beth Richman
John Petroni	Jeannie Pollak	Patricia Quimby	Catherine Reed	Bruce Richman
Renee Petropoulos	Jeri Pollock	Carrie Quinn	Mary Reed	Charles Richmond
Kelsey Petruk	Joan Pool	Dan Quinn	Robert Reed	Lonna Richmond
Sue Petteway	Wendy Popiel	Deanne Quinn	Roberta Reed	Charles Riddle
Marvin Pettey	Lyra Porcasi	America Quintana	Sally Reed	Nelson Ridgway
Jamaka Petzak	Nancy Porter-Steele	Lynn Quirolo	Joseph Reel	Dale Riehart
Van & Joyce Pewthers	Gosia Porwit	Kevin Quitt	Beth Rees	Josh Riehbauer
Victoria Peyser	Julie Posner	Jack Quon	Drew Reese	Rebecca Rifkin
Peter Pfeiffer	Marianne Post	K. R.	Lenore Reeves	Michael Rifkind
Julie Phalen	Rick Posten	Marion R.	Geoff Regalado	Kristin Riggs
John Pham	Penny Potter	Anna Ragland	Rhea Rehack-Griffith	Lee Riggs
S. Phenicie	Chelsea Potts	Dorrit Ragsosine	Karen Reibel	George Riley
David Philleo	Aaron Poulos	Annette Raible	Karen Reid	Heather Riley
Alma Phillips	Jon Povill	Maria Rainho	Misti Reif	Nancy Riley
Barbara Phillips	Dale Powell	Susan Raja-Rao	Mary K. Reinhart	Laurie Rilling
Bob Phillips	Elizabeth Powell	Jennifer Raju	Robin Reinhart	Paul Ripley
Chip Phillips	Jim Powell	Sandra Rakestraw	Erica Reinheimer	Robert Rippetoe
Danielle Phillips	Kathleen Powell	Jeannette Ralston	Jerrie Reining	Alisa Risso
Gerry Phillips	Meredith Powell	Jannet Valdes Ramirez	Casey Jo Remy	Esmeralda Rivera
Janet Phillips	Miyuki Powell	Jessica Ramirez	Marijeanne Rende	Zurisadai Rivera
Tim Phillips	Jeri Powers	James Rammel	Branham Rendlen	Faustino Riveron Jr.
Andrew Philpot	Linda Prandi	Melodie Rammer	Ann Rennacker	Annamaria Rizzo
Beth Piburn	Susan Prang	Anne Ramsey	Pam Rensch	Kellie Roach
Laureen Picciani	Mikayla Pratt	Elizabeth Ramsey	Walt A. Rentsch	Adam Robbins
Seth Picker	Madeline Preisner	Jeff Ramsey	Matt Reola	Deborah Robbins
Margaret Pierce	Jerami Prendiville	Sherry Rand	Jan Repp	Sallie Robbins-Druian
Amy Pierre	Kim Preston	Phillip Randall	Jeff Resnik	Kimberly Roberson
Gatha Pierucki	Gwen Preszler	Ned Randolph	F Carlene Reuscher	J. Roberto
Jenny Pierucki	Jeremy Price	Sheri Randolph	Debra L. Reuter	Francis Roberts
Barbara Pietrowiak	Marilyn Price	Louise Rangel	Amanda Rewinkel	Gail Roberts
Ruth Piker	Matthew Priebe	Valerie Ranne	Ibrahim Rexhepi	James Roberts
Mike Pincus	Katherine Prince	Fran Ransom	Jennifer Reynes	Janet M. Roberts
René Pineda	Steven J. Prince	Kanchana Rao-Soni	Pierre Reynes	Jeff Roberts
Susan Pinkerton	Fiona Priskich	Camille Rapaport	Jen Reynolds	John Roberts
L. Piquett	Karen Profet	Shana Rapoport	Mary Reynolds	Laura Roberts
Charlotte Pirch	James Provenzano	Hernando Rasay	Nancy Rhee	Les Roberts
Mike Pirich	Lauren Prust	Laura Rasmussen	Joseph Rhoades	Nancy Roberts
Sheldon & Shirl Pitesky	Lois Pryor	Megan Rathfon	Sandra Rhoades	Suzanne Roberts
Tom Pitman	Laurel Przybylski	Karen Ratzlaff	Kirk Rhoads	Wendy Roberts
Chetna Pittea	Gregory Ptucha	Maria Rausis	Janet Rhodes	C. Alton Robertson
Karen Pitts	Richard Puaoi	Kate Ravenstein	Stanley Rhodes	Jana Robertson
J. Pizzo	Felena Puentes	Suzanne Rawlings	Barb Riberts	Jim Robertson
Brian Plaskett	Andrew Pulcheon	Cindy Ray	Bonnie Ricca	Steve Robey
Sandra Plate	Liz Pulcini	Susan Ray	Michelle Rice	Lois Robin
Mary F. Platter-Rieger	Alicia Puppione	Veronica Ray	Judy Rich	Caroline Robinson
Fran Pletschet	Heather Purchase	Margaret Raynor	Denny Richard	Delinda Robinson
Corey Ploutz	Carolyn Putcha	Marla Reagle	Sally & Frank Richards	Gale Robinson
Mary Frances Poh	Melinda Pyle	Casey Ream	Bob Richardson	Kate Robinson
Cathy Pohlman	Bonny Quackenbush	Chance Rearden	Kathryn Richardson	Lee Robinson
Barbara Poland	Pamela Qualley	Stephen Rebello	Tracey Richardson	Michael Robinson
Mark Poland	Robert Quarrick	Denise Redden	Geoff Richcreek	Nancy Robinson
	Barbara Quick	Janice Reding		Candace Rocha

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Carol Roche	Lisa Rothman	Jennife Sahn	Loralei Saylor	Greg Schwartz
Maureen Roche	Janice Roudebush	Martin Saitta	Lynda Sayre	Louise Schwartz
Piper Rochester	Amy Rouillard	Miyoko Sakashita	Sharon Scarborough	Pam Schwartz
Laura Rockow	Rebecca Rouse	Maryam Ali Salamah	Rodolfo Scarpati	Randy Schwartz
Nick Rodin	Stacy Rouse	Cezar Salas	Marylou Scavarda	Susan Schwartz
Lennie Rodoff	Dr. Paul & Roberta	Alicia Salazar	Isha Schaap	Axel Schwarz
Stefanie Rodriguez	Rovner	Isaac Salazar	Tina Schaare	Diana Schweickart
Wil Rodriguez	Cathy Rowbottom	Lisa Salazar	Susan Schacher	Richard Scobey
Steve Roescher	D. Rowe	Maria Salazar	Sandra Schachter	Catherine Scott
Matthew Rogers	Erin Rowe	Natasha Salgado	Sherry Schafer	Celia Scott
Diane Rohn	Suellen Rowlison RN	Andrea Salinas	Raymond Schamel	David Scott
Linda Rolf	Carol Rozier	Georgia Salmon	Cynthia Scheinberg	Gregory Scott
Nancy L. Roll	Claire Rubach	Tony Salome	Barbara Scheinman	John Scott
Richard Rollins	Angelic Rubalcava	Erin Salter	Lee Schelin	John Scott
Sharon Rollins	Scott Rubel	Rosalie Salvato	Alan Schenck	L.D. Scott
Sheri Rollison	Renee Rubin	Dennis Salvo	Janice Schenfisch	Laurel Scott
Michele Roma	Jacki Fox Ruby	Allen Salyer	Nancy Schenk	Marcia Scott
Mercedes Roman	Valerie Rudd	Helen Salyers	Teresa Scherzer	Pamela Scott
Gwen Romani	Susan Rudnicki	Antoinette Samardzic	Karen Scheuermann	Peter Scott
Maria Teresa Romani	Judith Rudolph	Barbara Samii	Susie Schlesinger	Shannon Scott
Pilar Romero	Laurel Rudy	Max Sampson	Nadya Schmeder	O. Bisogno Scotti
Raluca Romero	Suzi Rugg	Johana Sanabria	Joyce Schmidt	Julie Scribner
Valerie Romero	Sylvia Ruiz	Ariahna Sanchez	Shannon Schmidt	Lawrence Scrima
Roberto Romo	Luz Rule	Eddie Sanchez	Richard Schmitt	T. Scruggs
Linda Ronberg	Syd Rumford	Kaitlynn Sanchez	Brian Schmoldt	Pauline Seales
Chad Rooney	Tom Rummel	Ralph Sanchez, L.Ac.,	Kathryn Schneider	Al Sears
Jessie Root	Karen Rusiniak	CNS, D.Hom	Lisa Schneider	Chris Seaton
Chris Rose	Angela Russell	Jan Sanderlin	Michelle Schneider	Guy Seaton
Desiree Rose	Elaine Russell	Robert Sanders	Arlene Schneir	Winston Secrest
Sharon Rose	Jennifer Russell	Judith Sandoval	Uschi Schnell	Tina Sedonne
Sheryl Rose	Kat Russell	Thekla Sanford	Karlee Schnyder	Oliver Seely
Laura Rose-Fortmueller	John Russett	V. R. Sansone MD	Arnie Schoenberg	Cindy Segal
Shary Rosenbaum	Carl Russo	Kathryn Santana	Marc Schoenberg	Avis Segedy
Alycia Rosenberg	Gia Russo	Deirdre Santaniello	Susan Schoenung	Serena Seidner
Larry Rosenberg	Robert Russo	Deborah & Joe Santone	Anna Schofield	Fredrick Seil
Roy Rosenblatt	Samantha Russo	Michele Santoro	Sidney Scholl	Kanwaldeep Sekhon
Holly Rosenblum	Katharine Ruthroff	Jane Santorumn	Vera Scholl	Suzanne Selby
Stephen Rosenblum	Ben Ruwe	Terry Santos	Emily Schoof	Jodi Selene
Marcy Rosendale	Indira Ryan	Walter Santucci	Sara School	Frank Selig
D. Rosengrant	Susan Ryan	Bill Saponaro	Linda Schoppert	Louise Sellon
Resa Rosenstein	Susan Schell Ryan	Dawn Sare	Heather Schraeder	Mary Ann Seltzer
Julie Rosenthal	Therese Ryan	Susan Sargis	Beatrix Schramm	Rob Seltzer
Steve Rosin	Tim Ryan	Arbi Sarkissian	Stewart Schrauger	Richard Semel
Lizbeth Rosner	Matthew Rydzik	Audrey Sarn	Bryna Schreier	Aaron Senegal
Glenn Ross	Alex S.	Fiona Sarn	Mary Schriver	George Senko
JoAnn Ross	C. S.	Unnikrishnan	Marie Schroeder	Ellen Sennewald
Kathleen Ross	Ron S.	Sasidharan	Sarah Schuerhoff	Jon Senour
Kathy Ross	Terry S.C.	John Satchell	Judy Schultz	Lynn Sentenn
Shelly Ross	Darl Sabraw	Judi Satchell	Lesley Schultz	Christine Sepulveda
Susan Ross	Judy Sachter	Roslyn Satten	Ed Schulz	Hector Serrano
Jim Rosvall	Scott Safechuck	Patricia Savage	Kevin Schuster	Kinsey Service
Kathie Rosvall	Rachel Sage	Elke Savala	Marcia Schuth	Angela Serviss
Kristy Rotermund	Chantal Sagouspe	Carol Savary	Greg & Laurie Schwaller	Sara Sexton
Stephen Roth	Roland Saher	Jillian Saxty	Barry Schwartz	Danae Shadburn

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Linda Shadle	Joleen Siebert	Diane Smader	Monica Soto	Bonnie Steiger
Amelie Shadout	Martha Siegel	Laura Small	P.P. Soucek	Amy Stein
Koorosh Shahidzadeh	Connie Siegenthaler	Judy Smario-Johnson	Mike Souza	Claudia Stein
Gerald Shaia	Eric Siegmann	Janet Smarr	Stan Souza	Julie Stein
Teresa Shajirat	Nancy Siepel	Anneret Smit	Margaret Spak	Ken Stein
Steve Shaker	M. Sievers	Christian Smit	Jewell Spalding	M.A. Steinberger
Vicki Shandera	Teri Sigler	Anna Smith	Juliet Spalding	Lorenz Steininger
Gopal Shanker	Virginia Signorelli	Bradley Smith	Dena Spat	Kate Stenberg
Christine Shannon	Stephanie Silen	Candace Smith	Ann Spaulding	Elise Stengle
Pam Shaouy	Susan Silver	Deborah Smith	Jack Spector	Marti Stephen
Susan Shapira	Joan Silverman	Doina Smith	Susan Speier	Chandra Stephens
Donna Sharee	Dana Silvernale	Dorea Smith	Nancy Spejcher	Kelli Sterling
Delia Shargel	Kathy Silvey	E. Smith	James Spellman	Herb Stern
Nancy Sharmer	Johanna Simmons	George Smith	D.R. Spencer	Kim Stevens
Lynn Shauinger	M. Simmons	Gerald Smith	Jennifer Spencer	Mark Stevens
Connelee Shaw	Susan Simmons	Jessica Smith	Jeremy Spencer	Elizabeth Stevenson
Katie Shaw	Tracey Simmons	Jm Smith	Sarah Spengeman	Martin Stevenson
Phyllis Shaw	Violet Simmons	Joan Smith	Constance Spenger	Bob Stewart
S.S. Shaw	Jill Simon	Joy Smith	Mary Ellen Sperling	Christine Stewart
Mike Shea	Leslie Simon	Judith Smith	Marnie Sperry	Jim Stewart
F. J. Sheffield	Patricia Simone	Kate Smith	Mark Spevak	John Stewart
Jerry Sheffield	Tom Simonian	Larry Smith	stephanie Spiers	Katie Stewart
Sarah Shelley	Claire Simonich	Linda Smith	Zoe Spiropoulou	Dr. John D. Stickle, D.C.
Carole Shelton	Jesse Simons	Lori Smith	Nancy Spittler	Monica Stigliano-
Justine Shelton	Margaret Simonsen	Nancy Smith	Jon Spitz	Stormo
Bea Shemberg	Suzanne Simpson	Sandra Smith	Sandra Spiwak-Wallin	Sarah Stiles
Miles Shephard	Tom Simpson	Susan Smith	Richard Spotts	Linda Stock
Marilyn Shepherd	Becky Sims	Velda Smith	Cindy Sprecher	Caitlin Stocker
Mike Sheppard	Scott Sinclair	Eleanor Smithwick	Sharon Sprouse DVM	Ari Stocking
Marcia Sherman	Ruth Sinfuego	Michele Smolen	Andrew Spurgin	R. Stockstill
Robyn Sherrill	Gidon Singer	Mark Smollin	Katie Spurlock	Stuart Stoddard
Neela Sheth	Nan Singh-Bowman	P. Smouse	Arthur Squillante	Laurie Stoker
Heather Shields	Christina Singleton	Susan Smyth	Julie Squire	Denese Stokes
Theresa Shiels	Mrinal Sinha	Trina Snow	Suneet Srivastava	Nelson Stoll
Nina Shilling	Theresa Siskind	Cynthia Snyder	Lesley Sstansfield	Connie Stomper
Yuko Shima	Rico Sisney	Hon. Tiffany Snyder	Elizabeth St. Aubin	Erin Stone
Yael Shimshon	Kenneth Sisson	Joanne Snyder	Art St. Clair	Jeffrey Stone
Carolyn Shine	Kathy Skaggs	Keith Snyder	Lynne St. John	Mika Stonehawk
Donna Shine	Steve Sketo	Patricia Snyder	Rick Stack	Colleen Stoyas
Rosemarie Shishkin	Lawrence Skidmore	Sara Snyder	V. Stack	Faith Strailay
Mary Shisler	Kelly Skrimstad	Susan Snyder	Dale Staley	Katlyn Stranger
Judy Shively	Nick Slater	Irwin Sobel	Gail Staley	Eileen Straus
Martha Shogren	Pam Slater-Price	Naomi Sobo	Jan Staley	Faye Straus
P. Shontz	Nicole Slaton	Richard Solomon	Jerre Stallcup	Dan Streeter Jr.
Brian Short	Crissy Slaughter	Dorina Solymar	Andrea Stanley	Louise Streiff
Tami Shotts	Kevin Slauson	Martha Somers-	Robin Stano	Kerstin Strobl
Tina Shull	Marsha Sleeth	Sekander	Erica Stanojevic	Grace Strong
Joseph Shulman	Holly Sletteland	Carolyn Sorensen	Lesley Stansfield	Vladimir Strugatsky
Marguerite Shuster	Cathy Sleva	Jason Soriano	Neil Stanton	Sue Struthers
John Shutt	Georgia Sliker	Susanna Sorin	Rhonda Starr	Toni Stuart
Laura Rasay Siasoco	Susan Sloan	Eliza Sosa	Judi Stauffer	Jeremy Stuckwisch
Kay Sibary	Marsha Slosburg	Gabriela Sosa	Karen Steele	Sandy Stuhaan
Judith Sibert	Amanda Sloss	David Soto	Mary Steele	Virginia Sturken
Cindy Sidaris	Terry Slotnick	Leticia Soto	Charleen Steeves	J. Stutzman

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Glory Styles	Noach Tangeras	Pat Thompson	Philip Traynor MPA	Kathleen Van Every
Brittany SU6	Karen Tanner	Paula Thompson	Christine Trela	Shannon Van Kuren
Jessica Suess	Paulette Tansey	Robertta Thompson	Dennis Trembly	James Van Scoyoc
P. Sugarman	Carol Tao	Stacy Thompson	Tovah Trimming	John Van Straalen
Steve Sugarman	Alec Taratula	Stephanie Thompson	Wendy Tripp	Betty J. Van Wicklen
Kirsten Sullivan	Sheila Tarbet	T.J. Thompson	Susan Trivisonno	Ali Van Zee
Kristin Sullivan	Fred Tashima	Sheila Thorne	Mary Ann Trombadore	Martin Vandamme
Mary Sullivan	Miriam Tasini	Mary Thornton	Darrell Trombley	Aliz Vanilia
Noreen Sullivan	Leslie Tate	Nancy Thorwaldson	Rebecca Troon	Laurie Vann
Rebecca M. Summer	Suzanne Tate	Barbara Thrasher	Michelle Trospier	Sandi Vare
Patricia Summers	Kathy Tawa	Ann Thryft	Kayla Trotter	Cheryl Varella
Susan Summers	Ellen Taylor	Marilyn Tiaven	James True	John Varga
Jeanne Sumner	Gregory Taylor	Paula Tice	Hal Trufan	Pia Vartabedian
L.D. Sumner	J. Holley Taylor	Nadya Tichman	Diana Trujillo	Bill Vartnaw
Amber Coverdale	Jamie Taylor	Bonnie Tillotson	Brad Trusso	Crystal Vassil
Sumrall	Jennifer Taylor	Judith Tillson	Laura Tryon	Pamela Vaughn
Susan Suntree	Jeremy Taylor	Dana Timms	Anita Tsang-Ling	Ayesha Vavrek
Penny Sur	Llew Taylor	Virginia Tincher	Roy Tuckman	Patricia Vazquez
Catherine D. Susman	Nancy Taylor	Lisa Titus	Lynette Tudorache	Julie Vazquez-Souza
Austin Sutta	R. Taylor	Elaine Todd	Paul Tuff	Louis Vega
Devon Sutton	Robert Taylor	Jude Todd	Tera Tukey	Marcia Vega
Malinda Svorny-Moore	Romney Taylor	Kalita Todd	Steven Tupper	Bathsheba Veghte
Kay Swalm	Timothy Taylor	Zachary Todd	Gabriella Turek	Myrna Velasco
Sharon Swan	Elizabeth Taylor-Schott	Margaret Tollner	Dee Turner	Ana Velazquez
Shirley Swan	Kimberly Tays	Tatiana Tomacelli	Susan Turner	Tina Velissartos
Karen Swanepoel	Diane Tegtmeier	Michael Tomczyszyn	Ari Turrentine	Julie Veney
Rebecca Swanson	Laura Tegtmeier	Caitlin Tomelden	Jana Tuschman	Monica Ventrice
Carolyn Sweeney	Sara Templeton	Michael Tomlinson	Cynthia Tuthill	Martha Vest
Mary Sweeney	Teri TencerCutler	Rose Tomlinson	Glen A Twombly	Marc Vezian
Kelly Swenson	Joanne Tenney	Marina Tonkonogy	Steve Tyler	Myrna Vickery
Kent Swenson	Vakila ter Veld	Manmeet Toor	Daniel Tyson	K.C. Victor
Patrick Swift	Kimiko Teramoto	joan topp-ek	Canan Tzelil	Barbara Vieira
Steve Swihart	Joan Terry	Mauro Torelli	Catherine Uchiyama	Barbara Vienneau
Sophie Swirczynski	Lynetta Terry	Frank Toriello	Bayne Ullrich	Joanie Vigh
David Swire	Michael Terry	Michele Tornabene	Linda Ullrich	Radha Vignola
William Swisher	Elizabeth Tessier	Sigfrido Torreiro	Erik Ulman	Kelsey Villarino
Cary Syamken	Tiffany Theden	Elsetta Torres	Doreen Uphouse	Stephanie Villasenor
Mandi T.	Leasa Thernes	Reli Tote	A. Urbach	Brad Villemagne
Kenneth Tabachnick	Maureen Theunissen	Jennifer Toth	Shauna Urban	Saul Villicana
Lisa Tadmor	Janet & Mark Thew	Lana Touchstone	Kelley Urry	Anna Vinogradoff
Jayne Taggart	Joanne Thielen	Susan Tova	Martha Utz	Joanne Vinton
Kathleen Taggart	John Thies	Dan Tovell	A. Utzman	Mikhail Vizek
Ann Tait	Donna Thomas	Alan Townsend	M. V.	Andreas Vlasiadis
Bianca Tak	Eleanor Thomas	Marilyn Townsend	Judie V.L.	Pascale Vlemincx
Mark Takaro	Eva Thomas	Ryan Trahan	Paloma Vachon	Janny Vogel
Naomi Takasu	Holly Thomas	Theresa Trahan	Marcy Vaj	Lara Volkman
Joy Takemoto	Jason Thomas	Ben Trainer	Medi Valaji	Kalila Volkov
Junko Takeya	Jeff Thomas	Jackie Tran	Dorothy Valdez	Alex Vollmer
Margaret Talbot	Mort Thomas	June Trask	Karen Valentine	Ivan Volschenk
Michael Talbot	Valerie Thomas	Christine Tratnyek	Jenny Valenzuela	Marsha Vomastic
Roman Talkowski	Carol Thompson	Adam Trauger	Pat Valian	Melitta von Abele
Betty Tallarida	Katherine Thompson	Beti Webb Trauth	Elaina Valzania	Margaret Von Schulze
Sharon Ryals Tamm	Kathleen Thompson	Jacob Travers	Reba Van Andel	Nathaniel Vose
Linda Tanenbaum	Lawrence Thompson	L.J. Travers	Christine Van Dewark	Ricarda Voss

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Citizen Voter	Caroline Warren	Kenny Weiss	Carol Wiley	Marcia Witrogen
Tamara Voyles	Jennifer Warren	Roberta Weissglass	Kimberly Wiley	Barbara Witt
Richard Vreeland	John & Sandra Warren	Jean Weitensteiner	Gail Wilke	Kenna Witt
Libby W.	Nancy Warren	Stephen Weitz	Wendy Wilke	Wendy Wittl
Christine Waddell	Rahima Warren	Dana Welch	Sara Wilken	Susan Wizer
Jeanie Waddell	Ronald Warren	Dawn Welden	Gillian Wilkerson	Elizabeth "Betsy" Wobus
Julie Waddell	Donna Warshaw	Jeannette Welling	Teresa Wilkie	David Wodhams
Donna Wade	Ann Wasgatt	Susan Wells	Angie Williams	Johanna Woestijne
Tracy Wade	Martin Washington	Tom Wendel	Bethany Williams	Rachel Wohlander
Victoria Wade	Glenna Waterman	Kara Wenrich	Carolyn Williams	Heather Wokusch
Herman Waetjen	Maria Watkins	Joseph Wenzel	Cassandra Williams	Susan Wold
D.J. Wagner	Warren/Janis Watkins	Klara Werle	Cheryl Williams	Anne Wolf
Donna J Wagner	William Watkins	Tim Werthman	Connie Williams	Lori Wolf
Inge Wagner	Claire Watson	Julie Wescott	Denis Williams	Nathan Wolf
Marinna Wagner	Courtney Watson	Margaret Wessels	Glen Williams	Amy Wolfberg
Teresa Wagner	Crystal Watson	April West	Judi Williams	Carol Wolfe
Krista Waite	Elaine Watson	Brandi West	Judy Williams	Jessica Wolfe
Ruth Waldhauer	Lori Watson	Jeffrey West	Margery Williams	Penny Wolfsohn
Steven Waldrip	M. Watson	Lori West	Martin Williams	Roberta Wombacher
Lin Waldron	Virginia Watson	Thomas R West	R.Terra Williams	Manuel Wong
Stephanie Waldroup	Julie Watt	Peter Wetmore	Sandy Williams	Christine Wood
Constance Walker	Elizabeth Watzke	Marly Wexler	Sheila Williams	Elizabeth Wood
David Walker	Sandra Wawrytko	Chris Whalley	Sunny Williams	Mary Wood
James Walker	Sean Wayland	Amber Wheat	Bruce Williamson	Charlene Woodcock
Joan Walker	Carole Wayne	Leslie Wheaton	Sherry Williamson	William E. Woodcock
Kaitlin Walker	Donna Weatherall	Keith Wheldon	Tessa Williamson	Elaine Woodruff
Lisa Walker	Kathy Weaver	Thamar Wherrit	Karen Willner	JoAnn Woodring
Lori Walker	Kerrie Weaver	Dave Whipple	Alan Willson	Kathy Anne Woodruff
Stephanie Walker	William Weaver	Gretchen Whisenand	Cameron Wilson	Amanda Woods
Verla D. Walker	Bethany Webb	Howard Whitaker	Deborah Wilson	Enel Woods
Willie Walker	Glenn Webb	Carrie White	Debra Wilson	Kate Woods
Melanie Wallace	Sally & Don Webb	Guy White	Derek Wilson	Chris Worcester
Susan Wallace	Catherine Webb DDS	Lori White	Jason Wilson	Mindy Worel
Leland Walmsley	(ret)	Mark White	Jennifer Wilson	Scott Workinger
Ken Walsh	Jana Lynne	Matthew White	Jim Wilson	Gerrit Woudstra
Patricia Walsh	Webb Muhar	Angelica Whitefeather	Joy Wilson	Dale Wright
Nancy Walter	Andrea Weber	Meghan Whitfield	Juliet Wilson	Danna Wright
Donna Walters	Shoshana Wechsler	Linda Whitley	Kat Wilson	Edmund Wright
Ernie Walters	Annie Wei	Lizanne Whitlow	Laura Wilson	Gregory Wright
Ivonne Walters	Annemarie Weibel	Adam Whitney	Paul Wilson	Holly Wright
Kari Walters	Cheryl Weiden	Sue Whitney	Shawn Wilson	Jerilyn Wright
Betsy Walton	Wendy Weikel	Helene Whitson	Wynne Wilson	Judith Wright
John Walton	James Weil	Erika Whitton	Lori Wilson-Hopkins	Pam Wright
Abby Wanamaker	Janet Weil	Elaine Whooley	William Winburn	Lara Wright, MD
Li-hsia Wang	Kate Weil	Nicole Wichert	Janet Windesheim	Blake Wu
Lydia Wang	Beth Weinberger	Marlene Widmann	Marjorie Wing	Connie Wulf
Nancy Wang	Mark S. Weinberger	Chuck Wieland	Cami Winikoff	Christina Wyle
Jennifer Wanslow	Rodney Weiner	Elaine Wieland	Joie Winnick	Andrew Wysotski
Linda Ward	Garrett Weinstein	Katherine Wiese	Tiffany Winslow	Ivona Xiezopolski
Lisa Warden	Joe Weis	Kevin Wightman	Theresa Winters	Ruth A. Yacko
Tessa Wardle	Heidi Weisbaum	Kayla Wilburn	Bill Wiseman	L. Yaco
Bret Warner	Charlotte Weiser	Ingrid Wilcox	Kim Wiseman	Joanne Yadao
Katherine Warner	Lynne Weiske	Wandis Wilcox	Chris Withrow	Michi Yamamoto
Carol Warren	Jeffrey Weiss	Joy Wilder	Linda Withrow	

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R. Yamauchi	Holly Yokoyama	Jean Yun	Christine Zazueta	Louise Zimmer
Steviann Yanowitz	Kari Yorkey	David Yusem	Ingrid Ze	Tricia Zimmerman
Anthony Yates	Candace Yoshida	Christine Zack	Julian Zener	Sue Zipp
Heather Yates	Elwood Youman	Cindy Zacks	Elizabeth Zenker	Karin Zirk
Teri Yazdi	Jo Young	Leila Zaharopoulos	Cheryl Zepp	Jeff Zittrain
Aja Yee	Michele Young	J.A. Zaitlin	Pete Zerbato	Richard Zoah- Henderson
Danny Yee	Ria Young	Jacqueline Zaleski	Cathy Zernhelt	Judie Zoerhof
Daphne Yee	Noah Youngelson	Fera Zalt	Paula Zerzan	Ken Zontek
Shane Yellin	Sandra Younger	Rachel Zanetti	Clara Zhang	Bonnie Zotos
Kathy Yeomans	Louise Yount	Diane Zastovnik	Sherry Ziadeh	Arlene Zuckerman
Alexander Yeung	J. Yudell	Rebeca Zavaleta	Herbert C. Ziegler	
Patricia Yoder	Lois Yuen	Joan Zawaski	Katherine Ziegler	

I.2 Responses to Comments – General Responses

Several comments received on the Draft RMPA/EIS addressed topics with common themes. To facilitate the responses to comments process, the following section presents answers to these comments, referred to as general comments and responses. The general responses to comments address the following topics:

- GR-1: Local Bans on Well Stimulation Treatments and Oil and Gas Development
- GR-2: Alternatives Considered But Not Analyzed in Detail
- GR-3: Development of the Reasonably Foreseeable Development Scenario
- GR-4: Water Supply and Contamination
- GR-5: Induced Seismicity
- GR-6: Renewable Energy Development on Federal Lands

General Response GR-1 – Local Bans on Well Stimulation Treatments and Oil and Gas Development

A number of commenters requested an update on the status of local measures prohibiting well stimulation treatments within the Planning Area, how these measures were considered in the development of alternatives, and/or whether they have been found to warrant any modifications to the Preferred Alternative.

Background on the bans in four counties within the Planning Area is provided as follows:

- **San Benito County.** In November 2014, San Benito County passed a ban (Measure J) on hydraulic fracturing and related gas and oil extraction activities, as well as other "high-intensity petroleum operations" including acid well stimulation and cyclic steam injection within the County. A lawsuit against San Benito County to overturn the ban was filed with the County's Superior Court by Citadel Exploration on February 27, 2015, but was dropped April 3, 2015.
- **Monterey County.** In November 2016, Monterey County passed a ban (Measure Z) on hydraulic fracturing and related activities, acid well stimulation, and other well treatments within the County. Measure Z also banned new oil and gas operations and called for phasing out operational oil and gas wells. Two separate lawsuits against Monterey County to overturn the ban were filed by Chevron and Aera in December 2016. In addition, a group of South County mineral rights owners filed a lawsuit on March 3, 2017 and Eagle Petroleum filed a lawsuit on March 17, 2017. A community outreach meeting was held by the Monterey County Resource Management Agency on March 8, 2017 to start the process of developing procedures to implement Measure Z.

On November 16, 2017, legal arguments concluded and the Monterey County Superior Court Judge Thomas Wills issued his ruling on December 21, 2017. The judge did not lift the ban on hydraulic fracturing but found that state and federal laws pre-empt county laws regarding the regulation of injecting underground oil wells with water and steam and the prohibition of new oil wells. Both sides in the case have an opportunity to file judgments and writs with the court before the judge’s decision becomes final¹.

In response, Protect Monterey County, which backed Measure Z, filed an appeal against the ruling in March 2018, and Monterey County filed a notice of intent to appeal around the same time in a stated effort to preserve its legal right the challenge the ruling. However, on May 15, 2018, the Monterey County Board of Supervisors unanimously approved a settlement agreement with a number of oil industry interests who challenged the initiative. The settlement promised that Monterey County would not appeal the judge’s ruling provided the plaintiffs would not seek from the county payment of attorney’s fees and legal costs associated with the case. Therefore, Protect Monterey County and its legal representation with the Center for Biological Diversity are the only remaining challengers of the judge’s ruling on the initiative, but plaintiffs have opined that they believe the judge erred on the fracking ban issue and may seek an appeal.²

- **Santa Cruz County.** On May 20, 2014, Santa Cruz County Board of Supervisors voted to change its General Plan, building on the existing referendum and banning oil development facilities in the County.
- **Alameda County.** On July 19, 2016, Alameda County passed an ordinance banning hydraulic fracturing and other "extreme oil and gas extraction" measures in the County.

Within the CCFO Planning Area, acreages of Federal mineral estate within existing oil and gas fields in each county with aforementioned regulations are shown in the table below. Appendix B (Reasonably Foreseeable Development [RFD] Scenario) in the Draft RMPA/EIS describes the existing oil and gas activity and the RFD Scenario for oil and gas in the four counties.

Federal Mineral Estate within Active Oil and Gas fields by County

County	BLM-Administered Surface Estate	BLM Split Estate	Federal Mineral Estate within Active Oil and Gas Fields
San Benito	75,225	145,446	12,254
Monterey	30,478	203,643	343
Santa Cruz	6	300	0
Alameda	0	3,591	0
CCFO Planning Area	231,050	561,380	12,597

The BLM's guidance for resource management plans says they “shall be consistent with officially approved and adopted plans of other Federal agencies, State and local governments, and Indian tribes to the maximum extent the BLM finds consistent with the purposes of FLPMA and other Federal laws and regulations applicable to public lands, and the purposes, policies, and programs implementing such laws and regulations.” (43 CFR 1610.3-3). The RMPA/EIS cannot anticipate what other local measures regarding oil and gas drilling may be developed or litigated during the planning process because they are subject to change. However, local ordinances were reviewed during the process of drafting the RMPA/EIS and would be implemented to the extent they are consistent with FLPMA and other federal law and regulations. For these reasons the alternatives did not warrant modifications to address the bans.

¹ Leyde, Tom. 2018. Judge Issues Ruling on Measure Z. The Californian. January 2. [online]: <http://www.thecalifornian.com/story/news/2018/01/02/judge-issues-ruling-measure-z/998276001/>.

² Johnson, Jim. 2018. Monterey County settles with oil industry, won’t appeal Measure Z ruling. Monterey Herald. May 15. [online]: <http://www.montereyherald.com/government-and-politics/20180515/monterey-county-settles-with-oil-industry-wont-appeal-measure-z-ruling>.

Note that Alternative B, which is analyzed in the RMPA/EIS, would meet the intent of some local measures that restrict oil and gas development (to the extent feasible), because there would be no reasonably foreseeable development under this alternative in Monterey, Santa Cruz, or Alameda Counties.

General Response GR-2 – Alternatives Considered but Not Analyzed in Detail

A number of commenters propose to halt oil and gas development or ban well stimulation treatments. Land management options to achieve these aims were considered in Section 2.12 (Alternatives Considered but Not Analyzed In Detail) of the Draft RMPA/EIS. Specifically, Section 2.12.4 (Close All Lands Except Existing Leases) of the Draft RMPA/EIS considers an alternative where all lands would be closed to oil and gas leasing and development *except* for existing leases and Section 2.12.5 (Close All Lands to Oil and Gas Leasing) discusses an alternative that would close all federal mineral estate to oil and gas leasing and development. Section 2.12.3 (Ban Well Stimulation Technologies) considers an alternative where the use of well stimulation treatments would not be allowed on federal mineral estate lands open to oil and gas leasing and development. As described in the Draft RMPA/EIS, all three of these alternatives would be contrary to BLM's mission and policies, which dictate management of public lands for multiple-uses and encourage energy development.

BLM Land Use Planning Handbook H-1601-1 states that, for oil and gas decisions, “[w]hen applying leasing restrictions, the least restrictive constraint to meet the resource protection objective should be used.” An alternative banning well stimulation technologies in the Planning Area would be inconsistent with the basic policy objectives for management of oil and gas resources in BLM, because it is not the least restrictive constraint to meet the resource protection objectives. Other alternatives or stipulations serve to protect the resources and the public interest.

Section 1.2.2 (Planning Approach) of the Draft RMPA/EIS explains that oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. Environmental review under NEPA is required at each phase under which the site-specific analysis would consider protection to resources and potential alternatives.

Ban Well Stimulation Technologies. As described in Section 2.12.3 (Ban Well Stimulation Technologies) of the Draft RMPA/EIS, this alternative was eliminated from further consideration because while BLM has the authority to deny individual permits, it does not have authority to deny all future well stimulation technologies as this would not be the least restrictive constraint to meet the resource protection objective. Rather, BLM has a responsibility under the FLPMA to act as a steward for the development, conservation, and protection of Federal lands, by implementing multiple use principles and recognizing, among other values, the Nation's need for domestic sources of energy from the public lands. The BLM achieves this responsibility by implementing appropriate stipulations and ensure compliance with State or local laws and regulations that are consistent with FLPMA, such as SB4. A ban or moratorium would not satisfy the BLM's multiple-use responsibilities under the FLPMA. Therefore, an alternative that would eliminate well stimulation treatments was eliminated from further consideration in the Draft RMPA/EIS

Close All Lands to Oil and Gas Leasing. Furthermore, as described in Section 2.12.5 (Close All Lands to Oil and Gas Leasing) of the Draft RMPA/EIS, the BLM considered an alternative that would close all Federal mineral estate to oil and gas leasing and development. For the same reasons discussed above regarding a Ban Well Stimulation Technologies alternative within the Draft RMPA/EIS, this alternative (Close All Lands to Oil and Gas Leasing) would be contrary to BLM's mission and policies, which dictate management of public lands for multiple-uses and encourage energy development. Therefore, an alternative that would close all lands to oil and gas leasing was eliminated from further consideration in the Draft RMPA/EIS.

General Response GR-3 – Development of the Reasonably Foreseeable Development Scenario

BLM developed the Reasonably Foreseeable Development (RFD) Scenario in 2015 in accordance with BLM Handbook 1624-1, paying great attention to the current and future use of well stimulation technologies, including hydraulic fracturing, acid matrix stimulation, and acid fracturing, as well as future uses of enhanced oil recovery. BLM Handbook 1624-1 (Planning for Fluid Minerals Management) prescribes a sequence of steps by which mineral occurrence potential or development potential is applied to make oil and gas lease stipulation planning and allocation decisions, and dictates the requirements for development of the RFD Scenario and its analysis for each alternative (BLM Handbook 1624-1, Chapter III). Furthermore, BLM Instructional Memorandum (IM) 2004-89 requires that the RFD Scenario project a baseline scenario of activity assuming all potentially productive areas are open to leasing under standard terms and conditions with the exception of those areas closing to leasing by law. Therefore, the RFD Scenario is a reasonable, technical, and scientific estimate of anticipated oil and gas activity based on current information and data available.

As explained in Section 2.3 (Reasonably Foreseeable Development Scenario) in the Draft RMPA/EIS, the 2015 RFD Scenario, which assumes 3 to 5 exploratory wildcat wells and between zero and 32 development wells on Federal mineral estate in the Planning Area, is a planning tool to help the BLM project the reasonably foreseeable impacts of oil and gas development within the Planning Area. “Reasonably foreseeable development” does not include scenarios that are merely speculative or only have a remote possibility of occurring. Therefore, the 2015 RFD Scenario assumes that the current development trends in this region are likely to continue for the next 15 to 20 years.

Given the limited extent of area of Federal mineral estate within the entire Planning Area, it is unlikely that more than a total of 37 new exploratory and/or development wells will be drilled on new or existing Federal oil and gas leases over the next 15 to 20 years. Even if there are advances in science and technology that resolve some of the uncertainty associated with the Monterey Formation source rock, these advances are not likely to alter the RFD Scenario for federal minerals in the planning area for the next 15 to 20 years due to the geology of the region. Therefore, all available scientific, industry, and government information indicates that absent currently unforeseen changes in oilfield technology, future oil and gas development within the Planning Area will continue as it has over the last 10 or 20 years. As a worst-case scenario, well stimulation technologies and enhanced oil recovery techniques are assumed to be used on any or all of these wells. Therefore, the assumptions in the 2015 RFD Scenario are likely to occur, and thus are reasonable to be used to analyze the impacts of each alternative in this RMPA/EIS.

As discussed above, the 2015 RFD Scenario is a planning tool to help the BLM project the reasonably foreseeable impacts of oil and gas development within the Planning Area under each alternative. It does not, in and of itself, represent a decision to authorize oil and gas development, nor is it a goal or target for oil and gas development in the Planning Area. However, because the 2015 RFD Scenario forecasts a greater amount of development as compared to the RFD Scenario developed for the 2007 RMP, there is a need to consider whether the land use plan decisions in the 2007 RMP should be adjusted. This consideration has resulted in preparation of this RMPA/EIS. Similarly, if the level of oil and gas development forecasted in the 2015 RFD Scenario becomes outdated or warrants revisions then BLM would consider whether a RMPA would be warranted as well. As explained in Section 1.2.3 (Monitoring, Evaluation and Adaptive Management), as part of the implementation of the oil and gas decisions in this amendment, and standard land use planning monitoring and evaluation, the BLM will periodically consider whether planning decisions remain relevant or if the BLM should consider new planning decisions in light of changed circumstances or new information.

Furthermore, Section 1.2.2 (Planning Approach) of the Draft RMPA/EIS explains that oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and

authorization. Environmental review under NEPA is required at each phase. Thus, over the course of the planning period and as future oil and gas development may occur on Federal mineral estate, BLM will continue to consider the applicability of the 2015 RFD Scenario and whether an amendment, such as has been completed herein, may be warranted.

General Response GR-4 – Water Supply and Contamination

Several comments reflect concerns related to groundwater quality and the quantity of water used during well stimulation treatments, and some comments reference a recent U.S. Environmental Protection Agency (EPA) report on these issues.³ This response summarizes and clarifies the impacts assessment for groundwater resources as presented in Draft RMPA/EIS Section 4.7 (Groundwater Resources).

As stated in Section 4.7.2 (Impacts Common to All Alternatives) of the Draft RMPA/EIS, well stimulation treatment regulations were adopted by the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) in July 2015 in compliance with Senate Bill (SB) 4, which contain numerous protective measures for groundwater. In June 2015, the DOGGR completed the Final Environmental Impact Report for the Analysis of Oil and Gas Well Stimulation Treatments in California (Final EIR). A summary of the key protective measures in the DOGGR regulations was provided in the Final EIR (DOC, 2015, see Section 10.14.5, Impact Analysis and Mitigation Measures for Groundwater Resources).⁴ Also included in the DOGGR Final EIR were mitigation measures to work in combination with DOGGR regulations to avoid potential impacts to both groundwater quantity and groundwater quality on a programmatic basis.

BLM has a 2012 Memorandum of Understanding (MOU) with DOGGR, in which the two agencies lay out their respective roles for regulating oilfield operations on BLM-administered lands. The MOU provides that, on BLM-administered lands, DOGGR is responsible for regulating well operations and appropriate surface facilities, for the protection of hydrocarbon reservoirs, groundwater, and health and safety. Therefore, DOGGR’s SB 4 regulations and the mitigation measures in the Final EIR that are described herein would be implemented on Federal mineral estate.

Eight mitigation measures were developed in the DOGGR Final EIR to directly address the identified impacts on groundwater: two mitigation measures (MMs GW-1a and MM GW-1b) were developed for groundwater quantity and six mitigation measures (MM GW-4a, MM GW-4b, MM GW-4c, MM GW-5a, MM GW-6a and MM GW-7a) for groundwater quality. Descriptions of the final mitigation measures for groundwater impacts are provided in DOGGR Final EIR, and are summarized in the following table (Section 10.14.5 and Table 10.14-20 from DOC, 2015).

Summary of Impacts and Mitigation Measures – Groundwater Resources

Impact GW-1. Cause or contribute to overdraft conditions

Mitigation Measure(s)	GW-1a: Use Alternative Water Sources to the Extent Feasible GW-1b: Minimize Groundwater Impacts
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Impact GW-2. Lower groundwater levels through pumping, resulting in significant and unreasonable inelastic land subsidence or significant and unreasonable impacts to nearby water wells or interconnected surface water

Mitigation Measure(s)	GW-1a: Use Alternative Water Sources to the Extent Feasible GW-1b: Minimize Groundwater Impacts
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³ A final report by the US EPA (December 2016) describes how activities in the hydraulic fracturing water cycle can impact and have impacted drinking water resources and the factors that influence the frequency and severity of those impacts. “Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources,” (available at <https://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=332990>).

⁴ The DOGGR Final EIR (2015) is available at: http://www.conservation.ca.gov/dog/Pages/SB4_Final_EIR_TOC.aspx

Summary of Impacts and Mitigation Measures – Groundwater Resources

Impact GW-3. Adversely impact groundwater quality through surface spills or leaks during well stimulation	
Mitigation Measure(s)	HAZ-1a: Ensure that Spill Contingency Plan Provides Adequate Protection Against Leaks or Discharges of Dangerous Fluids and Other Potentially Dangerous Materials
Impact GW-4. Migration of well stimulation fluids or formation fluids including gas to protected groundwater through non-existent or ineffective annular well seals	
Mitigation Measure(s)	GW-4a: Demonstrate that Wells within the ADSA Have Effective Cement Well Seals and Monitor Wells during Well Stimulation Treatment GW-4b: Install a Well Seal across Protected Groundwater for New Wells Subject to Well Stimulation Treatments GW-4c: Install Methane Sensors on Wells Subject to Well Stimulation Treatments
Impact GW-5. Migration of well stimulation fluids or formation fluids including gas to protected groundwater through damaged or improperly abandoned wells	
Mitigation Measure(s)	GW-5a: Conduct Surface Geophysical Surveys or Apply Other Field Methods to Locate Improperly Abandoned Wells and Mitigate
Impact GW-6. Improper disposal of flowback in injection wells could potentially impact groundwater quality	
Mitigation Measure(s)	GW-6a: Require Wastewater Disposal Wells to Inject Only into Exempted Aquifers to Protect Groundwater
Impact GW-7. Inability to identify specific impacts to groundwater quality from well stimulation activities	
Mitigation Measure(s)	GW-7a: Add a Tracer to Well Stimulation Fluids or Develop a Reasonable Method to Distinguish Well Stimulation Fluids in the Environment

Source: DOC, 2015; available at: http://www.conservation.ca.gov/dog/Pages/SB4_Final_EIR_TOC.aspx.

The regulatory framework, regional setting and current conditions for groundwater resources are described in Section 3.7 (Groundwater Resources) of the Proposed RMPA/Final EIS. The regulatory setting includes relevant groundwater and oil and gas regulations that focus on groundwater protection. The regional setting identifies the groundwater basins within the CCFO Planning Area that contain Federal mineral estate. The current conditions describe these groundwater basins and subbasins with an emphasis on the overlap between oil and gas fields and groundwater subbasins.

Section 4.7 of the RMPA/EIS presents an impacts analysis common to all alternatives, including water quantity and quality. For all alternatives, the RFD Scenario is assumed, which includes up to 37 new oil and gas wells to be drilled and undergo well stimulation in the CCFO Planning area in the next 15 to 20 years. The impacts analysis is based primarily on the impacts identified in CCST’s 2014 report on well stimulation technologies, prepared to provide BLM with information to be used for “future planning, leasing, development decisions regarding oil and gas issues on the Federal mineral estate in California” (CCST, 2014). For purposes of the impact analysis for groundwater, 10,000 mg/L TDS is the water quality threshold for evaluating potential impacts on groundwater resources.

The impacts analysis in the RMPA/EIS for groundwater quantity focuses on the water use estimates for the RFD Scenario. The analysis documents ranges of water use for conventional and water-intensive well stimulation treatments and estimated water use for each RFD Scenario. The analysis found that the maximum amount of groundwater use would be 1,110 AF (approximately 360 million gallons) for the 37 wells over the 15 to 20 year period. Compared to the resources present in any of the groundwater basins, this small amount would not likely result in any discernable impact. Nonetheless, any increase in groundwater use in a basin or subbasin in overdraft would contribute to overdraft conditions.

Two mitigation measures were identified in the DOGGR Final EIR under SB 4 to avoid the impact of overdraft: GW-1a and GW-1b. Mitigation Measure GW-1a requires an applicant to use alternative water sources to the extent feasible. To determine whether a well stimulation treatment is contributing or causing overdraft, mitigation measure GW-1b requires an independent assessment by a Certified Hydrogeologist; the review considers ongoing groundwater management in the project-specific groundwater basin or

subbasin. Mitigation Measure GW-1b also requires DOGGR to ensure that groundwater use does not cause or substantially contribute to undesirable results. Undesirable results include lowering of groundwater levels, reduction of groundwater storage, degraded water quality, inelastic land subsidence, and depletions of interconnected surface water.

The impacts analysis for groundwater quality identifies both surface and subsurface pathways for well stimulation fluids/flowback to potentially reach usable groundwater. The analysis includes a discussion of the chemical mixtures used for hydraulic fracturing in California and the potential chemical composition of flowback and produced water. Both potential surface and subsurface release pathways are examined, including surface spills, storage and disposal of flowback and produced water, fractures that may connect to abandoned wells, geologic faults, and the well. The pathway via wells discusses mitigation measure GW-4b, which requires a 500 foot well seal across the base of usable water if the hydraulic fracturing zone is below the base of usable water.

As stated in Section 4.7 of the RMPA/EIS, the mitigation measures in the DOGGR Final EIR along with the permanent DOGGR regulations would reduce potential impacts to groundwater from well stimulation treatments. In addition, oil and gas leasing and development on Federal mineral estate requires multiple stages of environmental analysis prior to BLM authorization. Environmental review under NEPA for the development of leased parcels (including well stimulation techniques) would include a site-specific analysis of potential impacts and conditions of approval to avoid, minimize, or mitigate impacts to groundwater resources.

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General Response GR-5 – Induced Seismicity

Numerous comments expressed concerns about induced seismicity from oil and gas development and well stimulation technologies, citing increased seismic activity in Oklahoma as an example.

Background and Recent Literature Review

Induced seismicity, or earthquakes along existing faults caused by fluid injection, has surged in oil producing regions of the midcontinent United States since about 2008 (Keranen, 2014). The induced seismicity has been linked with oil field waste water disposal, and in some cases to hydraulic fracturing. In Oklahoma, a region of historic low seismicity, a sharp rise of seismicity began in 2009; in 2015 approximately 900 earthquakes of Magnitude (M) greater than 3 were widely felt in north-central Oklahoma (Langenbruch and Zoback, 2016). The increase in seismicity and related earthquake damage led Oklahoma regulators to require a 40 percent reduction of waste water injection volumes during 2016 compared to 2014 levels, over two large areas of north-central Oklahoma. The areas of reduced injection volume were expanded following M 4 earthquakes in late 2016 (Jacobs, 2016b). The overall rate of earthquakes has reduced since the injection volume reduction was enforced. Damaging earthquakes of M 5.0 and M 4.6 occurred in November 2016, indicating that although earthquake frequency had been reduced, the potential for large earthquake magnitudes has not diminished (Jacobs, 2016b). Oklahoma regulators are estimating that 18 months of injection volume reduction will be required before a significant reduction in earthquakes is achieved (Jacobs, 2016b). Another Oklahoma example identified hydraulic fracturing as triggering a sequence of 86 earthquakes ranging from M 0.6 to M 2.9 (16 earthquakes greater than M 2.0) in 2011

(Holland, 2013). These relatively small earthquakes are larger than the typical microseismicity (M 0.0 or less) traditionally associated with hydraulic fracturing (Holland, 2013). These small earthquakes occurred in a densely faulted area, at depths of 2 to 3 km (6,500 to 9,800 feet), and extended to 2.5 km (1.6 miles) from the one source well. The earthquake sequence spanned 7 days, beginning 24 hours after the start of hydraulic fracturing and ended 11 hours after the hydraulic fracturing ceased.

Hydraulic fracturing of oil wells in western Canada was also linked to induced seismicity (Atkinson, et al., 2016). Although more than half of the M 3 or greater earthquakes occurred in close proximity (time and space) to hydraulic fracturing operations, only 0.3 percent of hydraulic fracturing can be linked to associated seismicity (Atkinson, et al., 2016). Based on the increased frequency of seismicity proximate to hydraulic fracturing operations, Atkins, et al. (2016) conclude that more of the induced seismicity in western Canada is a result of hydraulic fracturing than waste water disposal injection, and that multiple hydraulic fracturing operations may compound the hazard.

Study of petroleum-related induced seismicity in the Los Angeles basin is complicated by the co-location of many oil fields along major faults that are responsible for tectonic earthquakes that are deeper than the sediments where oil is produced and fluids disposed (Hauksson, et al., 2015). Oil fields cover approximately 17 percent of the Los Angeles basin where nearly 100 years of petroleum production has occurred. Large historic earthquakes in the basin occurred near major oil fields: 2014 M 5.1 La Habra sequence near several oil fields; 1933 M 6.4 Long Beach earthquake near Long Beach oil field; and 1987 M 5.9 Whittier Narrows earthquake near the Montebello oil field. These earthquakes occurred more than 5 km below the oil field reservoirs and are not linked to oil field activities (Hauksson, et al., 2015). Petroleum operations, including oil extraction and waste water injection, were analyzed and compared to the instrument record (1935 to 2014) of seismic activity inside and outside the oil fields. No significant difference in the seismic character was identified, and Hauksson, et al. (2015) conclude that the practice of balanced oil production and fluid injection appears to reduce the risk of induced seismicity in the oil fields. A separate study by Hough and Page (2016) evaluated earthquakes prior to 1935 and petroleum production in the Los Angeles basin. Hough and Page (2016) identified a link between the initial Los Angeles oil boom and earthquakes between 1915 and 1932 based on felt reports (no earthquake instrument catalog). The June 1920 Inglewood earthquake and the July 1929 Whittier earthquake might have been associated with oil field practices at that time (oil production without reinjection) (Hough and Page, 2016).

A California case study identified an earthquake swarm began 150 days after the start of waste water injection at the southern end of the Central Valley (Goebel, et al., 2014). The injection triggering involved multiple mechanisms, including injection into a permeable fault zone, a large increase in injection rate, and diffusion pressure migration to deeper seismogenic levels where the injected fault intersects the active White Wolf fault. This geologic setting resulted in relatively large earthquakes: one M 4.5 earthquake on September 22, 2005, followed by three large earthquakes the same day (two at M 4.7 and one M 4.3) (Goebel, et al., 2014). Goebel et al (2014) conclude that more detailed assessments of the geologic setting close to injection wells is required to explain the lack of large scale injection induced earthquake activity in California hydrocarbon basins.

Discussion

Section 4.3 (Geology) of the Draft RMPA/EIS addresses the occurrence of induced seismicity in the Planning Area based on a literature review and the limited association of earthquakes and oil field practices in the literature. As new studies identify site-specific geologic settings or oil field practices that may cause induced seismicity, the assessment of the hazard may progress. However, in general, the recent data and studies identified induced seismicity occurs near injection wells, result from high volume injection, are associated with changes in injection rates and volumes, larger earthquakes may occur in complex geologic settings, and generally have low to moderate magnitude compared to tectonic earthquakes that occur along major active faults of California. Van der Elst, et al. (2016) statistically tests induced earthwork data and

concludes that large earthquake magnitudes are possible, the largest induced earthquakes occur randomly rather than linked to injection volume or duration, and the number of induced earthquakes (not magnitude) are proportional to the injection volume. Consequently, van der Elst, et al. (2016) concludes, the hazard of induced seismicity should be treated the same as the probabilistic hazard assessment currently applied to tectonic earthquakes, and the hazard assessment would benefit from increased access to injection data (van der Elst et al., 2016).

As described in Section 4.3 (Geology) of the Draft RMPA/EIS, oil and gas developers would be required to comply with DOGGR's Well Stimulation Treatment Regulations, Section 1785.1, to monitor and cease hydraulic fracturing activities if an earthquake of Magnitude 2.7 or greater occurs within a radius of five times the maximum axial dimensional stimulation area. In addition, individual oil production and injection plans (that identify the local geologic setting, proximity to known faults, active faults, injection zones, etc.) would be submitted to DOGGR prior to the development of new drilling, extraction, and injection projects in each oil field or exploration area within the Planning Area.

Likewise, any risks of induced seismicity would be evaluated by BLM through the project-level NEPA analysis, including analysis of the proposed drilling and fracturing operations. Section 4.3 of the Draft RMPA/EIS includes Mitigation Measures GEO-1 (Avoid Active Fault Zones), GEO-2 (Prepare an Earthquake Response Plan) and GEO-3 (Prepare a Geotechnical/Geologic Report), which would be required to be implemented before granting a lease or would be included as a lease stipulation to reduce any induced-seismic effects.

Mitigation Measures GEO-1, GEO-2 and GEO-3 in the RMPA/EIS along with Section 1785.1 of the permanent regulations for well stimulation provide for an adequate level of earthquake monitoring, and DOGGR's existing requirements for injection of wastewater and flowback protect against the potential for induced seismicity to occur.

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General Response GR-6 – Renewable Energy Development on Federal Lands

Many comments support the development of renewable energy resources as an alternative to oil and gas facilities leasing. As discussed in Section 1.6 (Related Federal, State, and Local Laws and Plans) of the Draft RMPA/EIS, the FLPMA of 1976 establishes the authority and provides guidance for how public lands are to be managed by the BLM. It defines BLM’s mission to manage public lands on the basis of multiple use and sustained yield. BLM has a responsibility under the FLPMA to act as a steward for the development, conservation, and protection of Federal lands, by implementing multiple use principles and recognizing, among other values, the Nation’s need for both domestic sources of minerals and energy, including renewable energy, generation from the public lands.

With regard to solar energy development on public land, BLM’s Western Solar Plan established an initial set of 17 Solar Energy Zones (SEZ) in 2012. These zones, which total about 285,000 acres of public lands, define areas with access to transmission corridors and high solar potential. Two SEZs were designated in 2013 in California and Arizona. If fully built out, projects in the designated areas could produce as much as 27,000 MW of solar energy. The BLM anticipates a continued interest in the use of public lands for renewable energy development alongside the potential for oil and gas exploration and development. However, the Central Coast Field Office is outside the BLM’s designated Solar Energy Zones so this scale of renewable energy development is not likely to occur on public lands in the Planning Area.

In addition to solar energy development, BLM also manages more than 20 million acres of public lands with wind energy potential in 11 Western states. Since completing a comprehensive wind-energy focused programmatic environmental review of wind energy on public lands, the BLM has amended 52 regional RMPs and crafted policy guidance on the administration of wind energy authorizations and best management practices (BMPs) to mitigate potential impacts on birds, wildlife habitat, and other resource values. However, none of the Central Coast Field Office Planning Area is mapped as having good wind resource potential so wind energy development is unlikely to occur on public lands.

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Comment Set A1 – California Coastal Commission

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY

EDMUND G. BROWN, JR., GOVERNOR

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
 SAN FRANCISCO, CA 94105-2219
 VOICE (415) 904-5200
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March 30, 2017

Melinda Moffitt
 BLM, California State Office
 Attn: CCFO O&G Leasing DEIS
 2800 Cottage Way, Rm. W-1623
 Sacramento, CA 95825
 BLM_CA_OGEIS@blm.gov

Via E-mail

Subject: Draft Resource Management Plan (RMP) Amendment and Draft Environmental Impact Statement (EIS) for Oil and Gas Leasing and Development for the Central Coast Field Office

Dear Ms. Moffitt:

California Coastal Commission (Commission) staff has reviewed the above-referenced Draft Resource Management Plan (RMP) Amendment and Draft Environmental Impact Statement (EIS) published by the Bureau of Land Management (BLM) for Oil and Gas Leasing and Development for the Central Coast Field Office. BLM is seeking comments on the Draft RMP Amendment and its analysis of the potential environmental effects of several alternatives for the planning and management of oil and gas leasing and development on public lands and Federal mineral estate within the Central Coast Planning Area.

The Coastal Commission is a state regulatory agency responsible for implementing the California Coastal Act (Division 20 of the California Public Resources Code). The Coastal Act includes specific policies that address the protection of public access and recreation, terrestrial and marine habitat, visual resources, commercial and recreational fisheries, water quality, archaeological resources, and other resources within the coastal zone, which varies in width on land from several hundred feet in highly urbanized areas up to five miles in certain rural areas, including the Big Sur coastline of Monterey County. These policies constitute the enforceable policies of the California Coastal Management Program (CCMP), which the Commission uses in reviewing federal agency and federally-permitted projects and activities pursuant to the federal Coastal Zone Management Act (CZMA).¹ The CZMA gives state coastal management agencies with federally-certified CMPs federal consistency review authority over federal agency activities occurring within the coastal zone, or wherever they may occur (i.e., landward or seaward of the respective coastal zone boundaries fixed under state law) if the activity will affect coastal resources.

As described in the Draft RMP Amendment, no new oil and gas leasing and development activities are anticipated for public lands or federal mineral estate within the coastal zone, and development stemming from the RMP Amendment is unlikely to result in effects to coastal resources. Thus, federal consistency review of the RMP amendment is not required at this time. If future changes to the RMP would result in new leasing or development with the potential to affect the coastal zone and

¹ 16 U.S.C. Section 1456, with implementing regulations at 15 CFR Part 930

A1-1

Comment Set A1 – California Coastal Commission (cont.)

Letter to Melissa Moffitt, BLM

March 27, 2017

coastal resources, a consistency determination may need to be submitted to the Commission. This regulatory requirement arises under Section 307 of the CZMA. If one is needed, the consistency determination should include a finding as to whether the activities are consistent to the maximum extent practicable with the CCMP and the necessary information to support that conclusion, including an analysis of the project's consistency with Chapter 3 of the Coastal Act. (See CFR Section 930.39 for a full listing of the information required for a complete consistency determination.) Commission staff would be happy to provide guidance on the federal consistency process in the event changes to the leasing and development program are contemplated.

Thank you for the opportunity to comment on the Draft RMP/DEIS. Please contact me at joseph.street@coastal.ca.gov or at (415) 904-5249 should you have questions regarding these comments or the federal consistency process.

Sincerely,



Joseph Street
Environmental Scientist
Energy, Ocean Resources and Federal
Consistency Division

cc: CCC – South Central Coast District

A1-1 cont.

Comment Set A2 – Division of Oil, Gas & Geothermal Resources



State of California • Natural Resources Agency
 Department of Conservation
Division of Oil, Gas, and Geothermal Resources
 801 K Street • MS 18-05
 Sacramento, CA 95814
 (916) 445-9686 • FAX (916) 319-9533

Edmund G. Brown Jr., Governor
 Kenneth A. Harris Jr., State Oil and Gas Supervisor

April 6, 2017

Mr. Jerome E. Perez, California State Director
 Bureau of Land Management
 California State Office
 Attn: CCFO O&G Leasing EIS
 2800 Cottage Way, Suite W-1623
 Sacramento, CA 95825

COMMENTS ON THE BLM CENTRAL COAST FIELD OFFICE DRAFT RESOURCE MANAGEMENT PLAN AMENDMENT/DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR OIL AND GAS LEASING AND DEVELOPMENT

Dear Mr. Perez:

The California Division of Oil, Gas, and Geothermal Resources (DOGGR) has reviewed the above-referenced document (hereinafter referred to as Draft RMPA/EIS) prepared by the Bureau of Land Management (BLM) and appreciates the Bureau taking on this planning effort. DOGGR appreciates the opportunity to review this document, and offers the following comments for your consideration.

Consistency with State WST Requirements

We noted in our review that various discussions of California requirements for review and approval of well stimulation treatment (WST) applications are inconsistent between different sections of the Draft RMPA/EIS (see detailed comments in Table 1.0 enclosure). DOGGR wants to impart the need for BLM to continue to manage WST operations on BLM leases to be at least consistent with, or exceed, California's requirements for WST operations.

Half-Mile Buffer Area

In Section 2.7 Alternative B and elsewhere in the document, the Draft RMPA/EIS refers to a 0.5-mile buffer area used for analysis in DOGGR's 2015 *Analysis of Oil and Gas Well Stimulation Treatments in California*; however, we disagree with that characterization because it implies that this measurement has importance in DOGGR's oilfield management. The 0.5-mile buffer was developed solely as a buffer area around each oil field to factor in potential development or new find that could be brought into production for impact analysis based on industry production estimates. This buffer has no significance in DOGGR's statutes, regulations, or policies and should not be implied as such. All references to this buffer in the Draft RMPA/EIS should be revised to state that BLM is applying the same 0.5-mile buffer utilized in DOGGR's 2015 EIR to accommodate moderate growth around each oil field for use in impact analysis.

Miscellaneous Comments

DOGGR's detailed comments have been compiled sequentially in the enclosed Table 1.0: *DOGGR Comments to BLM Draft RMPA/EIS* for purposes of organization and to facilitate the incorporation of these comments into the final EIS.

A2-1

A2-2

Comment Set A2 – Division of Oil, Gas & Geothermal Resources (cont.)

Mr. Jerome E. Perez
April 6, 2017
Page 2

A2-3

Again, DOGGR appreciates the opportunity to review and comment on the Draft RMPA/EIS. Please send our office one copy of the final EIS, once it is completed. Should you have any questions or concerns, please feel free to contact either Ms. Cathi Slaminski (916-319-8221 or cathi.slaminski@conservation.ca.gov) or Ms. Teresa Fung (916-233-2324 or teresa.fung@conservation.ca.gov) of our CEQA Unit.

Sincerely,



Kenneth A. Harris Jr.
State Oil and Gas Supervisor
Division of Oil, Gas, and Geothermal Resources

Enclosure

cc: DOC CEQA Unit
Coastal District
Inland District
Northern District

Comment Set A2 – Division of Oil, Gas & Geothermal Resources (cont.)

Page 1

Enclosure

Table 1.0: DOGGR Comments on BLM Draft RMPA/EIS

Page No.	Comment	
1-1 Paragraph 3	A clearer definition of an 'unconventional' reservoir would be reservoir resources that 'require the use of technology to increase hydrocarbon flow rate and/or reduce the fluid viscosity to produce the oil and gas at commercially economic rates, although stimulation can increase rates even in otherwise commercial wells' (CCST 2014 pg. 27). The key is that technology is needed, but it does not necessarily mean well stimulation is required.	A2-3 cont.
1-4 Paragraph 1	Applications to conduct oil and gas activities on BLM leases in a project area requiring BLM's approval are likely also to require, depending on the activity, approval from DOGGR (Title 14 California Code of Regulations (14 CCR) Sections 1712 and 1714 among others). Please revise paragraph to include this information.	A2-4
1-5 Paragraph 5	Please add that DOGGR regulations and policies apply to all oil and gas well developments in California.	A2-5
1-15	In Section 1.6 "Related Federal, State, and Local Laws and Plans," please add the following to the list: <p>"California Environmental Quality Act: The California Environmental Quality Act (CEQA) defines procedures for environmental review and impact analysis of projects that need approval by local or state agencies. The National Environmental Policy Act (NEPA) does the same for projects that need approval by federal agencies. Both laws require that the potential environmental impacts of a proposed project be assessed, quantified, disclosed, minimized, and eliminated whenever possible. Both statutes encourage a joint Federal and state review where a project requires both Federal and state approvals. Indeed, in such cases, a joint review process can avoid redundancy, improve efficiency and interagency cooperation, and be easier for applicants and citizens to navigate. Despite the similarities between NEPA and CEQA, there are several differences that require careful coordination between the Federal and state agencies responsible for complying with NEPA and CEQA. Conflict arising from these differences can create unnecessary delay, confusion, and legal vulnerability."</p>	A2-6
2-1 Paragraph 2	Revise the last sentence to: BLM's Draft RMPA/EIS alternatives should also be consistent with current California laws and regulations.	A2-7
2-7 Table 2-1	Revise the last sentence to: "Data collected regarding all uses of acid and bottomhole pressures applied to the formation above pore pressure." Change "permits" to "applications."	A2-8
2-8 Table 2-1	For monitoring during well stimulation treatment, after "20%" add to sentence, "than the calculated pressure increase." For monitoring of seismic activity, add "five times" before "the area of treatment." For management of recovered fluids, add "and produced" between the words recovered and fluids. Edit the Public Disclosure sentence to read: Within 60 days after treatment, the operator must publicly disclose detailed information about the treatment, including the identity and concentration of the additives and maximum concentration of each and every constituent in the fluids used.	A2-9

Comment Set A2 – Division of Oil, Gas & Geothermal Resources (cont.)

Page 2

Table 1.0: DOGGR Comments on BLM Draft RMPA/EIS

Page No.	Comment	
3.2-2 Paragraph 3	Revise the first sentence to: DOGGR’s regulatory authority is not limited to private lands. DOGGR regulates all oil, gas, and geothermal resources in California (federal, state, and private lands) – onshore and offshore.	A2-10
3.2-3 Paragraph 3	In sentence 3, insert “well” between DOGGR and regulations. DOGGR may require an oil and/or gas well to be abandoned or repaired, when it fails a mechanical integrity test under the Idle Well Program. DOGGR defines an idle well as a well that has not produced oil and/or gas or has not been used for fluid injection for 6 consecutive months during the past 5 years (14 CCR 1723.9). As of January 1, 2018, the definition of an ‘idle well’ will change according to AB 2729. Please use the following revised definition, consistent with our new regulation: “Idle well” means any well that has had 24 consecutive months of not either producing oil or natural gas, producing water to be used in production stimulation, enhanced oil recovery, or reservoir pressure management, or being used for injection.”	A2-11
3.3-1 Paragraph 3	DOGGR requires operators to disclose geologic features including known faults in applications for evaluation (14 CCR 1784(a)(3)). The Draft RMPA/EIS text suggests DOGGR’s requirements are less stringent than the BLM rule.	A2-12
3.3-1 Paragraph 5	Replace “URIC” with “UIC” for Underground Injection Control.	A2-13
3.3-4 Paragraph 3	Recommend changing the first sentence to: Under Senate Bill 4 (SB 4), well stimulation, including hydraulic fracturing, stimulation fluid constituents, and anticipated recovered fluid disposal are regulated under 14 CCR Sections 1780 through 1790. Currently, DOGGR is not regulating chemicals used in stimulation fluids. Seismic monitoring is based on the area of the five times the maximum “axial dimensional stimulation area” (ADSA), not at “each point of fracture” as stated in the Draft RMPA/EIS.	A2-14
3.4-9 Paragraph 4	Material Safety Data Sheets (MSDS) are now referred to as “Safety Data Sheets (SDS).” This is per OSHA’s HazCom Standard revised in 2012 to align with Globally Harmonized System of Classification and Labelling of Chemicals (GHS).	A2-15
3.4-11 Paragraph 2	DOGGR regulates geothermal resources in addition to those listed in document. Delete the sentence “The State Oil and Gas Supervisor supervises the drilling” and replace with the following: The State Oil and Gas Supervisor oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells, and removal or abandonment of tanks and facilities attendant to oil and gas production, including pipelines that are within an oil and gas field, so as to prevent, as far as possible, damage to life, health, property, and natural resources.	A2-16

Comment Set A2 – Division of Oil, Gas & Geothermal Resources (cont.)

Page 3

Table 1.0: DOGGR Comments on BLM Draft RMPA/EIS (cont'd)

Page No.	Comment	
3.4-11 Paragraph 2	DOGGR regulates geothermal resources in addition to those listed in document. Delete the sentence "The State Oil and Gas Supervisor supervises the drilling" and replace with the following: The State Oil and Gas Supervisor oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells, and removal or abandonment of tanks and facilities attendant to oil and gas production, including pipelines that are within an oil and gas field, so as to prevent, as far as possible, damage to life, health, property, and natural resources.	A2-17
3.4-18 Paragraph 1	Delete "air injection" after the San Ardo oil and gas field. That technique is outdated and no longer used at this field.	A2-18
3.4-18 Paragraph 2	Delete "proprietary" in front of "chemicals." California regulations require operators to disclose chemical constituent representative of the stimulation fluid composition in WST application and in detail after the stimulation treatment. There have not been any chemicals used as stimulation constituents that have been reported as proprietary. In California, hydraulic fracturing usually occurs in tight sandstones and diatomite. It is rarely applied to carbonate rocks. The dearth of carbonate rocks is also the reason that the HCL step is not typically used in CA as stated in the paragraph 3 on the same page.	A2-19
3.6-2 Paragraph 4	BLM should also coordinate with DOGGR on updating standards to 'reduce wasteful venting, flaring, and leaks of natural gas, from oil and gas wells.'	A2-20
3.7-8 Paragraph 5	DOGGR does not have the authority to designate exempt aquifers or change exemption status. That authority resides solely with the U.S. EPA. Please revise this paragraph.	A2-21
3.7-8 Paragraph 6	The first sentence in this paragraph only cited DOGGR regulations for approval and data requirements of UIC projects. DOGGR regulations for well construction are under 14 CCR 1722.2 and 1723.2.	A2-22
3.7-9 Paragraph 1	DOGGR has regulations regarding casing strings and cement plugs for the plugging and abandonment of a well (14 CCR 1723-1723.8). These regulations also are in place to protect groundwater resources. Please include this information.	A2-23
3.7-18 Paragraph 4	DOGGR recorded 962 well stimulation treatments between 1/2/2014 and 6/22/2015 instead of 903 . Based on the disclosure records of these treatments, the average volume of water used for each stimulation is approximately 110,000 gallons. Hydraulic fracturing is not a common operation in oilfields located in the BLM Draft RMPA/EIS project area because it has not been proven to be productive; especially in the Monterey formation, because it is naturally fractured. Since Enhanced Oil Recovery techniques, such as steam and waterflood, have been found to be productive in oilfields within the BLM project area, it is expected that operators would continue to use these as the main production techniques.	A2-24
3.7-31 Paragraph 5	The EPA has since released the final of <i>Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources</i> . BLM should update the Draft RMPA/EIS with assessment results.	A2-25
3.7-4 Paragraph 4	DOGGR regulates the wise development of oil, gas, and geothermal resources in the State and ensures "... to prevent, as far as possible, damage to life, health, property and natural resources"... DOGGR should also be contacted if a "spill or leak[age] of oil, gas, produced water, toxic liquids, or waste materials, and blowouts" occur.	A2-26

Comment Set A2 – Division of Oil, Gas & Geothermal Resources (cont.)

Page 4

Table 1.0: DOGGR Comments on BLM Draft RMPA/EIS (cont'd)

Page No.	Comment	
3.20-2 Paragraph 4	At the state level, DOGGR regulates petroleum and gas pipelines not regulated by CPUC, PHMSA and the State Fire Marshall. The Division’s regulatory oversight of pipelines typically applies to pipelines that contain oil and gas prior to the products being metered and sold (14 CCR 1774, 1774.1, and 1774.2).	A2-27
4.3-2 Paragraph 4	Seismic monitoring for wells subject to well stimulation treatment is based on the area five times the maximum “axial dimensional stimulation area” (ADSA), not “each point of fracture” as stated in the Draft RMPA/EIS.	A2-28
4.4-6 Paragraph 5	Re: Fluid Surveys. Per 14 CCR 1723.9, the operator is to measure the fluid level in the well by a reliable means or other diagnostic tests as approved by the Supervisor.	A2-29
4.4-7 Paragraph 2	DOGGR uses the term Fluid Level Tests. This test is typically performed on idle wells. Such wells need not be temporarily abandoned to conduct this test.	A2-30
4.4-11 Paragraph 5	Replace the term “prepare” with “include.” DOGGR requires spill contingency plans under 14 CCR 1743, which requires identification of where in the operators’ (already prepared and approved) spill contingency plan handling of well stimulation fluid and additives has been addressed. 14 CCR 1786 requires storage and handling of WST fluids to be covered in those already prepared and approved plans.	A2-31
4.4-13 Paragraph 6	The fifth sentence is incorrect. 14 CCR 1784.1 (1) requires that all cemented casing strings and tubulars strings utilized in the well stimulation treatment operations be pressure tested for 30 minutes at a pressure equal to 100 percent of the maximum surface pressure anticipated during the well stimulation treatment. 14 CCR 1784.1 (2) requires that surface equipment must be tested to 125 percent of the maximum surface pressure anticipated during the well stimulation treatment, but no greater than the manufacturer’s pressure rating for the equipment.	A2-32
4.4-23 Paragraph 2	The intent of the phrase “if available, the State-approved SB 4 permit” is unclear. This statement contradicts that in page 2-6 paragraph 4, where the Draft RMPA/EIS states that according to the BLM’s Instruction Memorandum No. CA-2014-031, the operator should follow up with copies of the final State-approved (stimulation) permits. The BLM should clarify whether a DOGGR approved well stimulation permit (instead of SB 4 permit) is required for BLM’s consideration of an operator’s application to conduct well stimulation on a federal mineral estate.	A2-33
4.7-7 Paragraph 4	<p>The statement that “...388 wells whose status is unknown because they were constructed before 1976 (CCST 2015b pg. 122)” is inaccurate. The original statement in the SB 4 Independent Scientific Study stated that “... the status of 388 wells is unknown, i.e., these are pre-1976 wells whose status is only on a hard copy file.” BLM’s statement is misleading by omitting the fact that information on these wells is available in hard copy. As conversion of these hard copy files to an electronic format is in process; DOGGR offers assistance to anyone requesting information on those well files.</p> <p>The statement “SB 4 requires operators to locate abandoned wells, but does not require operators to test the condition of the abandoned wells” is misleading. During the well stimulation application review process, DOGGR engineers assess wellbores, including abandoned wells, nearby to the proposed treatment well for their potential risk to act as a migration pathway. DOGGR has the discretion to deny a permit, if there is a high risk.</p>	A2-34

Comment Set A2 – Division of Oil, Gas & Geothermal Resources (cont.)

Page 5

Table 1.0: DOGGR Comments on BLM Draft RMPA/EIS (cont'd)

Page No.	Comment	
4.7-9 Paragraph 5	Per 14 CCR 1784(a)(3), operators currently are required to identify faults within five times the ADSA of a proposed stimulation treatment and must evaluate whether the feature may act as a pathway and assess the risk that the stimulation treatment will communicate with the feature. This evaluation is part of DOGGR's well stimulation application review process. The second sentence, as currently written, suggests that DOGGR's requirements are less stringent than the BLM's final rule.	A2-35
4.8-3 Paragraph 4	In the California Office of Emergency Services (CalOES) spill notification database, there are fewer than five reported petroleum spills that were reported to be located in oil fields within the two counties for the year 2013.	A2-36
4.8-4 Paragraph 3	DOGGR's surface water protections include, but are not limited to, prohibitions from locating oilfield sumps in natural drainage channels (14 CCR 1770); requirement of secondary containment for all production facilities storing and or processing fluids (14 CCR 1773.1); installation and maintenance of a leak detection system, when tank bottoms are replaced (14 CCR 1773.2); and proper management and disposal of oilfield wastes and refuse (14 CCR 1775).	A2-37
4.8-5 Paragraph 7	The regulation citation for the definition of projects subject to well stimulation regulation should be revised. The definition is paraphrased incorrectly, it should be revised to: SB 4 (14 CCR Section 1761) applies to hydraulic fracturing and any other well stimulation treatment designed to enhance oil and gas production or recovery by increasing the permeability of the formation.	A2-38
4.8-5 Paragraph 8	DOGGR requires spill contingency plans for all oil and/or gas wells under 14 CCR 1743. 14 CCR 1783.1 requires identification of where in the operators' (already prepared and approved) spill contingency plan handling of well stimulation fluid and additives has been addressed. 14 CCR 1786 requires storage and handling of WST fluids to be covered in those already prepared and approved plans. As described in the Draft RMPA/EIS, if the BLM final rule remains in place, the effect regarding storage is more stringent under SB 4.	A2-39
4.8-6 Paragraph 2	Replace the second-to-last word in this paragraph from "flow back" with "recovered." Recovered fluid covers a broader range of post-treatment fluids and is consistent with DOGGR regulation terminology.	A2-40
4.8-13 Paragraph 1	Same comment as immediately above. Replace the second-to-last word in this paragraph from "flow back" with "recovered." Recovered fluid covers a broader range of post-treatment fluids and is consistent with DOGGR regulation terminology.	A2-41
Ap. B-25 Paragraph 8	Delete "air injection" after the San Ardo oil and gas field. That technique is outdated and no longer used at this field.	A2-42

Comment Set A3 – U.S. Environmental Protection Agency



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

APR 7 2017

Mr. Sky Murphy
Planning and Environmental Coordinator
Central Coast Field Office, Bureau of Land Management
940 2nd Avenue
Marina, California 93933

Subject: Central Coast Field Office Draft Resources Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development (EIS No. 20160319)

Dear Mr. Murphy:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. EPA is a cooperating agency for this RMP/EIS and provided scoping comments on February 25, 2014 and comments on the Administrative Draft RMP/EIS on August 5, 2015. EPA also provided input through our role on the Air Quality Technical Working Group (AQTWG) for this planning effort, in accordance with the *Memorandum of Understanding Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the NEPA Process* (MOU) signed by EPA, U.S. Department of Interior, and U.S. Department of Agriculture.

When finalized, the Central Coast RMP/EIS will identify which lands are open or closed to oil and gas leasing and which stipulations would be applied on oil and gas exploration and development activities in order to protect environmental resources. EPA supports BLM's preparation of an EIS that analyzes the effects of oil and gas drilling activities in the planning area, and we commend the BLM for convening an AQTWG for this RMP/EIS to facilitate communication and the sharing of expertise regarding air quality and Air Quality Related Values analyses. EPA looks forward to continuing to work with BLM and the other federal land managers on the AQTWG, as needed, to assist BLM in finalizing the RMP, as well as to advise on future project specific analyses carried out under this EIS at the Application for Permit to Drill (APD) phase of development.

Based on our review of the Draft RMP/EIS, we have rated the preferred alternative and the document as *Environmental Concerns – Insufficient Information* (EC-2) (see enclosed EPA Rating Definitions). EPA appreciates BLM's coordination efforts to address a number of the comments we provided during development of the Draft RMP/EIS. Our primary remaining concerns pertain to potential air quality impacts to nonattainment and Class I areas; the potential for aquifer overdraft and pollution of current or future underground sources of drinking water; and the potential deterioration of water quality and the hydrological function of surface waters. These and other issues are discussed further in the enclosed Detailed Comments along with recommendations to ensure effective implementation of the aforementioned MOU.

A3-1

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

As noted in the Appendix B to the Draft RMP/EIS, there are wide ranging estimates for potentially recoverable oil and gas resources in the planning area. In light of the 450,000 federal mineral estate acres identified as “high potential” and the possibility for further technological advancements in mineral extraction, we recommend that the Final RMP/EIS include a commitment by BLM to confirm, during future NEPA analyses at the APD phase, that the Reasonably Foreseeable Development (RFD) assumptions underlying BLM’s analyses still hold, including the maximum number of 37 new wells over the 20-year planning horizon. If, at any time the RFD assumptions are determined to have underestimated the area’s extraction potential, an amendment of the RMP may be warranted.

A3-2

EPA is aware that some local jurisdictions within the planning area have adopted measures prohibiting well stimulation treatments. We recommend that the Final RMP/EIS provide an update on the status of such measures, and discuss how they were considered in the development of the alternatives in the RMP/EIS and whether they have been found to warrant any modifications to the preferred alternative.

A3-3

We appreciate the opportunity to review this Draft RMP/EIS, and are available to discuss our comments. When the Final RMP/EIS is released for public review, please send one hard copy and one CD-ROM to the address above (Mail Code: ENF-4-2). In addition, we acknowledge BLM’s commitment to conduct future NEPA analyses at the APD phase of development, and request that BLM provide federal land managers, EPA, and the public with adequate notice and opportunity to provide further input at that time. If you have any questions, please contact me at 415-972-3521, or contact Tom Plenys, the lead reviewer for this planning effort. Tom can be reached at 415-972-3238 or plenys.thomas@epa.gov.

A3-4

Sincerely,



Kathleen Martyn Goforth, Manager
Environmental Review Section

Enclosure: Summary of the EPA Rating System
EPA’s Detailed Comments

Cc: Catherine Collins, US Fish and Wildlife Service
Trent Proctor, US Forest Service
John Notar, National Park Service
Patia Siong, San Joaquin Air Pollution Control District
Rick M. Bottoms, Army Corps of Engineers

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

U.S. EPA DETAILED COMMENTS ON THE CENTRAL COAST DRAFT RESOURCE MANAGEMENT PLAN AMENDMENT AND ENVIRONMENTAL IMPACT STATEMENT, CALIFORNIA, APRIL 7, 2017

Air Quality

Consistency of Air Quality Analyses and Mitigation with MOU

The “Federal Class I Areas” subsection in Chapter 4.5 of the Draft RMP/EIS indicates that any project that is anticipated to result in emissions that constitute a “major source” would be reviewed for potential impacts to sensitive receptors, including mandatory Class I Areas, at the site specific NEPA stage (p. 4.5-6). Per Section V.E.3 of the *Memorandum of Understanding Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the NEPA Process* (MOU), signed by EPA, U.S. Department of Interior and the U.S. Department of Agriculture, the Lead Agency may need to model air quality impacts at the planning stage, if an action would occur in proximity to a Class I area and either cause a “Substantial Increase in Emissions” or materially contribute to potential adverse cumulative air quality impacts, as determined under NEPA. Such analyses are not limited to whether the project constitutes a “major source”. Because the proposed action is the first in California for which BLM has implemented the MOU, it is important that the Final RMP/EIS clearly explain how it has been applied.

Recommendations:

- Clarify, in the Final RMP/EIS, the applicability of the MOU regarding air quality analyses and mitigation for federal oil and gas decisions to this RMP, and describe how the MOU was utilized to inform the air quality analysis for this project.
- Update the sections on Federal Class I Areas in Chapters 3 and 4 to ensure consistency with the MOU and to reflect the appropriate level of analysis, as recommended in MOU Section V.E.3.
- Disclose, in Chapter 4.5, whether the emissions for the project would cause a “Substantial Increase in Emissions” as defined in the MOU.
- Include, in accordance with Section V of the MOU, support for the decision whether or not to model air quality impacts. If the BLM concludes that modeling is not required, document that decision as part of the qualitative narrative analysis of the impacts to air quality and Air Quality Related Values (AQRVs) in Chapter 4.5 of the Final RMP/EIS.
- Include, in the Final RMP/EIS, a commitment to coordinate with the federal land managers on future AQRV analyses carried out under this EIS at the Application for Permit to Drill (APD) phase of project development.

A3-6

A3-7

A3-8

A3-9

A3-10

Emission Inventory

The Draft RMP/EIS considers the potential for up to 37 additional oil and gas wells on federal leases in the planning area under the Reasonably Foreseeable Development Scenario (RFD). While Tables 4.5-1 and 4.5-2 include estimates for well exploration, stimulation and development, the Draft RMP/EIS and the appendices do not provide the basis for these emission estimates with sufficient detail to verify that the inventory is comprehensive and accurate.

Recommendations:

- Provide, in the Final RMP/EIS, the basis for the emission estimates in Tables 4.5-1 and 4.5-2. Include a breakout of emissions calculated for individual equipment and area sources, as well as emission estimates for transportation (e.g. related to equipment, water, waste hauling, etc.). Include details such as emission factors, horsepower, type of engines, load factors, number of units, and expected duration of equipment use. Provide this updated emission

A3-11

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

inventory to the AQTWG for review, and consider any comments from the AQTWG prior to finalizing the RMP/EIS.

- Include a comparison of the emission factors and equipment use duration estimates utilized for each development and production source of emissions to those of other existing oil and gas developments in productive basins.
- Clarify, in Chapter 4.5, whether emissions estimates for well stimulation are based on horizontal versus vertical drilling and whether historical California averages for development and production would be representative of future activities in the planning area, given the latest technological and emission control developments.

A3-11
cont.

A3-12

A3-13

General Conformity

Table 4.5-2 estimates that annual reactive organic gases (ROG) and oxides of nitrogen (NO_x) emissions would fall just below the San Joaquin Valley Air Basin (SJVAB) *de minimis* threshold of 10 tons per year for each pollutant. The estimate assumes that no more than three wells would be developed in any given year. It appears that developing more than three wells in a given year could result in the exceedance of *de minimis* levels for NO_x when combined with production emissions. Similarly, production of more than 37 wells could result in the exceedance of the *de minimis* threshold for ROGs. The Draft RMP/EIS does not include any stipulations that caps the numbers of wells to be developed and operated per year. Without any such stipulation, EPA is concerned about the potential for actual emissions to exceed the estimate developed for the RFD.

A3-14

Recommendations:

- Consider, in the Final RMP/EIS, a limit on the number of wells to be developed and operated annually for the planning area through APD approvals until such time that regional modeling can be conducted to provide an appropriate basis upon which to continue with a reasonable level of development (see modeling recommendations below).
- In the Final RMP/EIS, either definitively explain the reason that general conformity does not apply to the proposed action or demonstrate conformity for all pollutants that exceed the applicable *de minimis* levels in the SJVAB.
- Include, in the Final RMP/EIS, a commitment that BLM will confirm, during future NEPA analyses at the APD phase, that development and operation of all wells covered by this RMP would fall within the RFD assumptions and not exceed *de minimis*.

A3-15

A3-16

Near Field Impact Analysis

The Draft RMP/EIS does not include a discussion on air quality modeling. EPA believes that near field dispersion modeling, at this stage, to assess the potential impacts of foreseeable development with respect to criteria and hazardous air pollutants would maximize BLM's ability to identify, evaluate and implement important land management decisions and air quality mitigation measures that could be applied to all future APDs.

A3-17

Recommendations:

- Conduct near field dispersion modeling, and analyze the results to inform the Final RMP/EIS.
- Absent such analysis at the planning stage, we recommend the following to ensure such modeling occurs prior to future authorizations to drill.
 - Include, in the Final RMP/EIS, a commitment to consult with other federal land managers (e.g. National Park Service and Forest Service), as well as the EPA, regarding air quality modeling when further site-specific NEPA analysis will begin and the APD phase will commence.

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

- Consider, in the Final RMP/EIS, a stipulation that would require near-field dispersion modeling at the APD phase for any future wells in the planning area

A3-17
cont.

Far-Field Impacts/Cumulative Impacts

The Draft RMP/EIS does not provide sufficient information to understand the contribution of the planning area's oil and gas development to cumulative impacts on ambient ozone and PM_{2.5} concentrations and on Class I and Sensitive Class II AQRVs. According to the Draft RMP/EIS, there are already over 4,000 active wells in the planning area. A robust cumulative impact analysis is particularly important due to the current compromised air quality in and around the planning area and the potential for development in close proximity to Class I areas.

A3-18

Recommendation: Discuss in the Final RMP/EIS how BLM will ensure that continued development of federal minerals does not further degrade air quality in nonattainment areas. To evaluate the contribution of the planning area's oil and gas development to cumulative impacts, utilize a suitable existing photochemical grid model. If such a model does not exist, consider options for developing a platform that could be used for this RMP, future project-specific NEPA analyses, as well as future BLM RMPs in the region (e.g. Bakersfield RMP).

Mitigation

BLM has incorporated EPA's previous air quality mitigation recommendations into AQ-1 and AQ-2 in Section 4.5-3 of the document as mitigation measures that may be added as stipulations to individual project proposals. In light of the planning area's poor air quality, and given that emissions of ROG and NO_x from the RMP's RFD are estimated to fall just under the *de minimis* threshold for general conformity, greater assurance that the most protective measures would be consistently required appears warranted. In addition, a regulation currently under development by the California Air Resources Board proposes to establish greenhouse gas emission standards for oil and gas facilities. The RMP provides an opportunity to avoid unnecessary project delays later by planning for compliance with that regulation and considering practicable mitigation to minimize greenhouse gas emissions.

A3-19

Recommendations:

- Consider adopting, in the Final RMP/EIS, the most protective mitigation measures from AQ-1 and 2 as Conditions of Approval (COA) for operators at the APD phase.
- Consider updating AQ-2 to require Tier 4 engines for all nonroad vehicles and equipment, and further strengthening the measure to require electrification of drilling rigs, as appropriate.
- Update Appendix D to reflect the mitigation measures highlighted in Chapter 4.5, identify measures that will be required at the APD phase, and ensure that all Best Management Practices (BMP) are current. For example, we note that the BMP on page D-3 of Appendix D requires an update: "Use cleaner diesel engine power (shift from Tier 1 to Tier 4) as manufacturers phase in newer engines between 2011 and 2014."
- Consider incorporating additional practicable measures, such as those discussed in Chapter 4.6, as COAs for operators at the APD phase to reduce greenhouse gas emissions, such as using energy efficient machinery and equipment and implementing cost-effective measures to reduce methane emissions. See e.g., <https://www.epa.gov/natural-gas-star-program/recommended-technologies-reduce-methane-emissions>. If the California Air Resources Board finalizes greenhouse gas emission standards for crude oil and natural gas facilities prior to completion of the Final RMP/EIS, reference those standards in Chapter 4.6. If they are not finalized prior to completion of the Final RMP/EIS, consider incorporating as BMP's appropriate components of the proposed rule as practicable mitigation.

A3-20

A3-21

A3-22

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

Groundwater Resources

Water Use

The Draft RMP/EIS estimates that water-intensive well stimulation treatments could require 3.2 to 6.5 million gallons per well. As the document notes, water demand for well stimulation events occurs over a short period of time; therefore, groundwater resources can be stressed if well stimulation occurs during the driest times of the year or if multiple well stimulation jobs are being conducted at the same time in the same geographic area (p. 4.7-4).

Recommendations:

- Include, in Section 4.7, estimates of weekly or monthly water use that could occur if multiple stimulation jobs drawing from the same or connected groundwater resources were to occur at the same time.
- Include an analysis of potentially affected groundwater basins/subbasins and identify, as appropriate, potential lease stipulations that would ensure groundwater resources are not stressed by well stimulations during dry times of the year or from multiple well stimulation jobs in the same geographic area.

A3-23

A3-24

The Draft RMP/EIS identifies six groundwater basins in the planning area on California Department of Water Resource's Draft List of Critically Overdrafted Basins, including four with Federal mineral estate (p. 3.7-17). The preferred alternative would open leasing acreage potentially impacting three of these basins, as presented in Table 4.7-3. The Draft RMP/EIS references the Final Environmental Impact Report for California State Senate Bill 4, which indicated that any increase in groundwater use in a basin/subbasin in overdraft would contribute to overdraft conditions and be considered a substantial impact if not mitigated (p. 4.7-4).

A3-25

Recommendation: Consider closing acreages overlying Critically Overdrafted Basins to leasing across all alternatives in the Final RMP/EIS. In addition, consider including a stipulation, as a COA at the APD stage, that would prohibit groundwater withdrawal from any Critically Overdrafted Basin.

Potential Impacts to Groundwater

When Underground Sources of Drinking Water (USDWs) are used to supply fluids for well stimulations, the potential long-term impacts of well stimulations and dewatering on groundwater and potential sources of drinking water could be severe if not managed appropriately. Aquifers are presumed to be USDWs (as defined in 40 CFR§144.3) unless they have been specifically exempted by EPA, or clearly shown to not meet the definition of USDWs (e.g., total dissolved solids levels are higher than 10,000 mg/L). Contamination associated with well stimulations in the planning area could threaten the suitability of the aquifers for future use. EPA is concerned about the presence of wells that could be intersected by induced fractures. If these wells are not constructed, closed, or sealed properly, they could provide a possible conduit for contaminant dispersal.

A3-26

Recommendations:

- Consider adopting, in the Final RMP/EIS, a COA that the operator complete an inventory of existing wells (including both old and abandoned wells) surrounding the proposed drilling site (Area of Review) within a radius equivalent to the planned and modeled hydraulic fracture length *before* well stimulation begins. EPA recommends that all wells within the Area of Review be examined for their mechanical integrity, and their construction records be evaluated to determine whether they have been sealed and cemented properly and to ensure

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

that they do not provide a viable pathway for potential contamination associated with hydraulic fracturing, well stimulation, or other injection activity.

- Incorporate abandonment procedures, as a COA, for sealing wells no longer in use, to reduce the potential for inactive wells to serve as the conduits for fluid movement between production zone(s) and aquifer(s). This is particularly important where existing wells do not have surface casing set into the base of USDWs and lack sufficient production casing cement.

A3-26
cont.

A3-27

The Draft RMP/EIS highlights various findings from a report by the California Council on Science and Technology (CCST), including CCST's conclusion that a more complete assessment of the hazards associated with well stimulation fluids in California is necessary and that their study did not include an assessment of fracturing fluids in flowback and produced water (p. 4.7-5).

A3-28

Recommendations:

- Provide, in the Final RMP/EIS, an update on current research to assess well stimulation fluids in flowback and produced water in California. Commit to incorporate future findings into subsequent NEPA documents for APD-phase projects in the planning area.
- Provide and discuss sample results of produced water following well stimulation as well as sample results 30 days after commencing production. We note that the Draft RMP/EIS indicates that such sampling was required starting in July 2015 (p. 4.7-5).

A3-29

CCST concluded that the potential for induced fractures to reach groundwater aquifers may be higher in California than in other states (p. 4.7-7). CCST also noted that California tends to use well stimulation fluids that require smaller amounts of water than the national average, but contain higher concentrations of chemicals. Given that most of the hydraulic fracturing in California occurs in relatively shallow wells, this often results in fluids with concentrated chemicals being used in close vertical proximity (less than 2,000 ft) to usable groundwater. The Draft RMP/EIS notes that the CCST document referenced a study that suggested a minimum separation of 2,000 feet is recommended between shale reservoirs and overlying groundwater resources (p. 4.7-7).

A3-30

Recommendation: Consider whether more stringent measures to protect groundwater should be required in areas in areas with less than a specified amount of separation between a shale reservoir and overlying non-exempt groundwater resource, and explain the basis for the amount of separation selected as the trigger. Incorporate such measures into Appendix D, as appropriate.

Mitigation

The Central Coast Field Office has included mitigation measures that could be required at the project level or the APD phase to minimize impacts to groundwater resources. Appropriate groundwater protection measures can vary depending on hydrologic conditions and the presence of drinking water resources.

A3-31

Recommendations:

- Consider including the following additional mitigation measures in the Final RMP/EIS. If any are sufficiently covered by existing State of California (State) requirements, note such stipulations in the Final RMP/EIS.
 - COAs requiring closed loop drilling, monitoring of water quality and water levels, closure and monitoring of reserve pits, and lining and monitoring of evaporation ponds.
 - Setback stipulations, such as NSO for oil and gas activities, where appropriate, to minimize the potential for impacts to current and potential drinking water resources,

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

including both domestic and public water supply wells. EPA recommends a minimum 500-foot setback for private wells. Setbacks provide an opportunity for released contaminants to attenuate before reaching a water supply well, and may afford an opportunity for a release to be remediated before it can impact a well, or for an alternate water supply to be secured.

- A mitigation plan for remediating future unanticipated impacts to groundwater or drinking wells from RMP activities, such as requiring the operator to remedy those impacts through treatment, replacement, or other appropriate means.
- Include in the Final RMP/EIS a general oil and gas production well schematic that depicts the following: casing strings; cement outside and between the various casing strings; and the relationship of the well casing design to potentially important hydro-geological features such as confining zones and aquifers or aquifer systems that meet the definition of a USDW. We recommend discussing how the generalized design would achieve effective isolation of USDWs from production activities and prevent migration of fluids of poorer quality into zones with better water quality.

A3-31
cont.

A3-32

Monitoring

The State Water Board has approved a regional groundwater monitoring program (Model Criteria); however, the program will be implemented in phases, with the first phase taking approximately five years to implement (p. 3.7-10). Requirements established under recently passed State legislation, such as the Sustainable Groundwater Management Act, have timeframes that extend well into the 15 to 20-year planning horizon of this RMP. The Draft RMP/EIS does not discuss whether any specific measures will be needed prior to full implementation of the State Water Board’s program or the SGMA.

A3-33

Recommendations:

- Clarify, in Chapter 4.7 of the Final RMP/EIS, whether interim stipulations would be necessary to ensure protection comparable to that which would be afforded through the implementation of state regulations such as the State Water Board’s regional monitoring program and the Sustainable Groundwater Management Act.
- Clarify, in the Final RMP/EIS, the BLM’s authority and means to investigate any reports of potential USDW or drinking water well contamination occurring after well completion and, if necessary, require remediation.
- In the absence of groundwater modeling to determine the distance from the project at which impacts may occur, consider adopting, in the Final RMP/EIS, requirements for monitoring to occur in private wells within one mile of an oil and/or gas project area. Such monitoring would help ensure that mitigation measures are adequate and water resources are being fully protected.
- Consider requiring fracture monitoring, where appropriate, in order to protect surface water and groundwater resources. Fracture monitoring uses microseismic and tiltmeter surveys to achieve real-time mapping of a hydraulic fracturing treatment in progress.
- Consider utilizing EPA’s Underground Injection Control (UIC) permitting guidance specific to oil and gas hydraulic fracturing activities using diesel fuels. Although developed specifically for hydraulic fracturing where diesel fuels are used, many of the guidance’s recommended practices are consistent with best practices for hydraulic fracturing in general, including those found in state regulations and model guidelines for hydraulic fracturing developed by industry and stakeholders. See "Permitting Guidance for Oil and Gas Hydraulic Fracturing Activities Using Diesel Fuels: Underground Injection Control Program Guidance #84" at: http://www.epa.gov/sites/production/files/2015-05/documents/revised_dfhf_guid_816r14001.pdf

A3-34

A3-35

A3-36

A3-37

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

Surface Waters and Wetlands

A3-38

Surface Water Characterization

The Draft RMP/EIS does not include a preliminary assessment of the reach and extent of Waters of the U.S. in the planning area. Having such information readily available during future project planning would enable BLM to better protect wetland and riparian areas by focusing management practices on areas where sensitive resources are most at risk of being impacted, and by planning mitigation for unavoidable impacts to Waters of the U.S.

Recommendations:

- Include a preliminary assessment of the reach and extent of Waters of the U.S., including wetlands, in the Final RMP/EIS. In the absence of a current National Wetlands Inventory for the full planning area, we suggest that the BLM commit to prepare an inventory of aquatic resources, characteristics, functions and overall ecological health, and describe, in the Final RMP/EIS, how it plans to undertake such an inventory.
- If there is any question as to the jurisdictional status of waters in the planning area, consult with the local U.S. Army Corps of Engineers office.
- Include a COA, in Chapter 4.8 of the Final RMP/EIS, that jurisdiction will be determined in future NEPA analyses at the APD phase. EPA encourages BLM to require delineation and marking of waters (e.g. seeps, springs and wetlands) on maps and on the ground before development so operators can avoid impacts to them.

A3-39

Quantification of Impacts

While the Draft RMP/EIS discusses the types of activities that can result in impacts to surface waters, the document does not provide a quantification of such impacts. Including an estimate, or a quantified range of impacts, for each alternative would help inform the selection of the final preferred alternative.

A3-40

Recommendation: Provide an estimate, for each alternative in the Final RMP/EIS, of the extent to which waters such as wetlands, riparian areas and floodplains could be impacted by potential activities, including with respect to: stream structure and channel stability; streambed substrate, including seasonal and spawning habitats; stream bank vegetation, riparian habitats, and aquatic biota; and the cumulative effects of increased levels of erosion and sedimentation.

Existing Requirements Versus Proposed BLM Rule

According to the Draft RMP/EIS, the BLM rule on hydraulic fracturing complements existing regulations (43 CFR 3162.3-1 and Onshore Oil and Gas Orders 1, 2, and 7). It is unclear whether the requirements summarized on page 3.8-2 are pursuant to the BLM rule, which is currently stayed by the courts, or BLM's existing regulations.

A3-41

Chapter 3.8 also describes requirements regarding disposal of fluids recovered during well stimulation. It is unclear whether this requirement results from BLM proposed rule or existing regulations. The Draft RMP/EIS states that pits are allowed for disposal only if the distance to the nearest intermittent stream watercourse is 300 feet or more, the distance to the nearest perennial watercourse is 500 feet or more, and in a manner that would not interfere with the hydrologic function of the 100-year flood. EPA does not believe that this measure, as described, is protective of surface waters. It is also unclear why this measure excluded other waters such as ephemeral streams or wetlands. Establishing an appropriate buffer between surface waters and disposal pits would depend on the geomorphological setting as well as the hydrology of the waters at risk. Additionally, EPA has concerns regarding the sixth requirement

A3-42

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

highlighted: “Avoidance of riparian areas, floodplains, lakeshores and/or wetlands *except as approved in a plan of operations*” (emphasis added). Such resources should be protected to the greatest extent feasible. Where such waters are jurisdictional, a more appropriate caveat would be “except as authorized by a Clean Water Act section 404 permit from U.S. Army Corps of Engineers”.

A3-42
cont.

Recommendations:

- Clarify, in the Final RMP/EIS, whether the requirements highlighted in Chapter 3.8 stem from BLM’s proposed rule for well completions or from existing regulations. Identify all requirements to protect surface water resources that BLM would require as COAs in the absence of BLM’s proposed rule. If State requirements would result in more protective measures than existing BLM regulations, identify those requirements in Chapter 3.8 or 4.8.
- Consider, in the Final RMP/EIS, adopting NSO stipulation for new pits within the 100-year floodplain of riverine systems in the planning area. If pits will not be allowed in the planning area under state requirements, include this provision as a COA in Chapter 4.8 and update Chapter 3.8.
- Include, in the Final RMP/EIS, a commitment under each alternative to require, at the APD phase, a hydrologic assessment to ensure all NSO stipulations are sufficient. Such analysis should consider the geomorphological setting as well as the hydrology of the waters at risk.

A3-43

A3-44

No Surface Occupancy and Setback Requirements

EPA believes that NSO buffers are, in most circumstances, an effective method to protect aquatic resources, particularly in areas where high value water resources are in close proximity to areas with oil and gas development potential that may result in a high density of wells. We recommend NSO to minimize potential deterioration of water quality and to maintain natural hydrologic function of stream channels, stream banks, floodplains and riparian communities. We note that, in response to our prior comments, Alternative E now includes NSO stipulations for 12-digit Hydrologic Unit Code (HUC) subwatersheds with the highest aquatic intactness score, as defined by the Conservation Success Index, in addition to four other NSO stipulations. The other action alternatives do not currently have similar NSO provisions. Under those alternatives, even if protective measures such as closed looped drilling are adopted, the supporting hydrology would be more vulnerable to contamination and may not be restorable to its prior conditions.

A3-45

Recommendation: Include in the selected alternative the five NSO stipulations proposed under Alternative E.

Page 4.8-4 states that BLM rules for hydraulic fracturing and well stimulation activities include setbacks from intermittent and perennial streams; however, sections 3.8 and 4.8 do not identify setback requirements other than the aforementioned disposal pit setbacks and the requirement to not apply or store chemicals within 100 feet of perennial streams or channels with beneficial use(s) recognized by the State. Similarly, page 4.10-4 includes the BMP, “Avoid vernal pools, natural ponded waters, and washes during geophysical exploration”. This measure does not include setbacks from these or other water resources nor does it cover drilling and completion activities.

A3-46

Recommendations:

- Update Section 4.8 to include the setback requirements that would be required, with and without BLM’s proposed rule, to ensure that surface waters, including ephemeral streams and wetlands, are protected from the direct and secondary impacts of well stimulation activities.

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

- Amend the BMPs on page 4.10-4 and in Appendix D to include avoidance of all surface water resources (including ephemeral streams) during not only geophysical exploration, but also drilling, completion and production. A3-47
- Consider amending the language on page 4.8-4 that currently reads “Damaged wetlands and riparian areas are to be restored where restoration of such systems will abate polluted runoff”. Clarify that wetland and riparian areas should be adequately protected to avoid any impacts to their functions. In the event that such resources are impacted, restoration should not be dependent on whether they would help to abate polluted runoff. A3-48
- In addition to the NSO stipulations in Alternative E, consider including the following mitigation measures, in Chapter 4.8 of the Final RMP/EIS: A3-49
 - A development buffer to protect wetlands, riparian areas and floodplains. A buffer would help to prevent: erosion and sedimentation impacts in sensitive soils; possible spills or leaks from reaching surface water resources; impacts to wetland plants in unique wetlands such as springs and seeps, which can be difficult to replace (e.g., compensatory mitigation through restoration or creation may not be feasible); or disturbance to surface or groundwater hydrology, which could impact the viability of wetlands.
 - A mitigation measure to offset the loss of acreage and function of waters impacted.
- Consider whether any high value wetland or riparian area would warrant protection through a NSO stipulation and integrate such protections into Appendix D.

303(d) Impaired Waters

The planning area may include water bodies that are not meeting applicable EPA-approved State water quality standards and have been designated by the State or EPA as “impaired”, pursuant to Section 303(d) of the Clean Water Act. Where Total Maximum Daily Loads have been established for such waters, restrictions on pollutant loading may be in effect. Surface disturbances near such waters could contribute to pollutant loading and exacerbate exceedance of water quality standards. A3-50

Recommendations:

- Identify in the Final RMP/EIS all water bodies or segments in the planning area that appear on the latest EPA-approved 303(d) list and, for each, disclose the nature of the impairment, whether or not a TMDL has been established, and any load allocations in effect that may apply to projects conducted pursuant to the RMP.
- Clarify, in Chapter 4.8, any existing requirements for setbacks from impaired waters, and identify any COAs that would be required at the APD phase to ensure that impaired waters would not be further degraded from proposed development or operational activities within and/or downstream of the planning area. A3-51

Potential Impacts to Surface Waters from Groundwater Drawdown

EPA is concerned that, should groundwater be used to supply the needs for future oil and gas development, surface waters could be impacted due to hydrological connections. The Draft RMP/EIS mentions that local short-term surface water stresses in the form of decreases in river flow could occur from groundwater pumping for the RFD scenario (pg. 4.8-8). The document indicates that these impacts would require a site-specific analysis to evaluate. A3-52

Recommendations:

- Commit in the Final RMP/EIS to include site-specific analysis of surface water/groundwater hydrologic connections and the potential impacts of proposed water usage in the NEPA analysis for each APD decision.

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

- Describe, in Chapter 4.8, how water quality monitoring in the planning area will occur prior to, during, and after anticipated development to detect impacts to surface water from groundwater drawdown. A3-53
- Consider, in the Final RMP/EIS, adopting a stipulation that encourages operators to recycle produced water for use in well drilling and stimulation, and discuss to what extent this could help alleviate the need for water withdrawals and minimize associated impacts. A3-54

Biological Resources

BLM proposes to open lands for fluid mineral leasing within the range of federally listed endangered or threatened species. The Draft RMP/EIS indicates that BLM is currently operating under the Biological Opinion issued in 2007 by the US Fish and Wildlife Service for the 2007 Hollister RMP/EIS and that additional consultation with the USFWS regarding this RMP/EIS is ongoing. A3-55

Recommendations:

- Provide an update on the consultation process in the Final RMP/EIS. We recommend including all relevant new or updated Biological Opinions as an appendix.
- Include in the Final RMP/EIS any mitigation and monitoring measures that result from consultation with USFWS to protect sensitive biological resources.

Cultural Resources and Coordination with Tribal Governments

According to the Draft RMP/EIS, many of the surface disturbing actions identified in the RFD Scenario could result in adverse effect determinations for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA) (pg. 4.15-3). In 2014, BLM initiated Section 106 consultation with 28 tribal individuals, organizations and federally recognized tribes identified as having interest in the planning area. Chapter 6.3 indicates that at least one tribe responded with a letter indicating a desire for consultation. Chapter 4.15 highlighted that additional site-specific NEPA analyses and Section 106 review will be conducted on future individual projects. A3-56

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000), was issued in order to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Indian tribes.

Executive Order 13007, Indian Sacred Sites (May 24, 1996), requires federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian Religious practitioners, and to avoid adversely affecting the physical integrity, accessibility, or use of sacred sites. It is important to note that a sacred site may not meet the National Register criteria for a historic property and that, conversely, a historic property may not meet the criteria for a sacred site.

Recommendations:

- Provide an updated discussion, in the Final RMP/EIS, on tribal consultation and describe how any concerns raised by Tribes were addressed in the selection of the preferred alternative. We recommend that all measures to reduce impacts to tribal and cultural resources be adopted in the Record of Decision, including a commitment to Section 106 review for future site-specific analyses carried out under this EIS.

Comment Set A3 – U.S. Environmental Protection Agency (cont.)

- Address Executive Order 13007, distinguish it from Section 106 of the NHPA, and update the discussion in Chapter 4.15, as necessary, on how the BLM will avoid adversely affecting the physical integrity, accessibility, or use of sacred sites, if they exist in the planning area.

A3-57

Comment Set A4 – County of Santa Cruz



County of Santa Cruz

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March 28, 2017

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940 2nd Avenue
Marina, CA 93933

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2017 MAR 31 AM 9:11

Dear Bureau of Land Management,

I am writing to you in regards to the proposed sale of new oil and gas leases in our area. This effort will not yield successful results in Santa Cruz County, and I urge you to reconsider any sales in our County.

In the 1980's our county played a leadership role in protecting our coastline from the establishment of offshore oil derricks. With an overwhelming vote of the community, we adopted regulations that prevent the creation of onshore oil facilities in Santa Cruz County. Throughout the years, this policy continues to be widely supported.

In response to growing concerns about the controversial hydraulic fracturing drilling process, our Board of Supervisors, at the request of the community, voted to change our General Plan to build on the existing referendum and ban oil development facilities in our County. This action prevents any oil and gas development in Santa Cruz County.

Therefore, I urge you to refrain from offering oil and gas leases on federal land, and other lands (private or public), with federal mineral rights within the County of Santa Cruz. As you are likely aware, the California Constitution reserves the authority over land use and zoning to local government. The people and the Board of Supervisors in Santa Cruz County have determined that oil and gas exploration is a land use that is not permitted in our County.

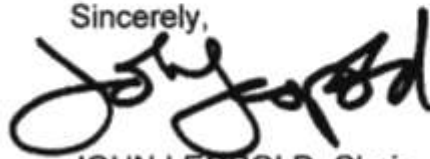
A4-1

Comment Set A4 – County of Santa Cruz (cont.)

Page 2
March 28, 2017

Please respect our rights as the land use authority in Santa Cruz and do not sell oil and gas leases in our County.

A4-1
cont.

Sincerely,

JOHN LEOPOLD, Chair
Board of Supervisors

JL:jfr

Comment Set A5 – National Park Service



United States Department of the Interior

NATIONAL PARK SERVICE
Pacific West Region
333 Bush Street, Suite 500
San Francisco, California 94104-2828



IN REPLY REFER TO:

N3615 (PWRO_NR)

Joe Stout
Acting California State Director
Bureau of Land Management
2800 Cottage Way, Suite W-1618
Sacramento, CA 95825

Re: Draft Resource Management Plan Amendment and Draft Environmental Impact Statement (EIS)
for Oil and Gas Leasing and Development, BLM Central Coast Field Office

Dear Mr. Stout:

We greatly appreciate the opportunity to comment on the Bureau of Land Management's Central Coast Field Area's Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development. Please see the detailed comments attached and also refer to our Notice of Intent comment letter dated September 23, 2013, also attached.

We would like to reiterate the desire, from our Administrative Draft EIS comments, to include an NPS representative as a member of the Air Quality Technical Work Group (AQTWG). The AQTWG is a requirement of the Oil and Gas Exploration Memorandum of Understanding between NPS, BLM, the United States Forest Service and the Environmental Protection Agency. The purpose of this group is to assure the level of air pollution impacts associated with oil and gas development is calculated consistently nationwide. Please add Kirsten King, a modeler with the NPS Air Resources Division, as the NPS representative on the AQTWG for this development area.

Thank you for the opportunity to comment on BLM's Central Coast Field Area's Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development. We look forward to a continued dialogue regarding oil and gas development in this area. Please contact Judy Rocchio, Regional Air Quality Program Coordinator, 415-623-2203, if you have questions regarding our comments.

Sincerely,

A handwritten signature in cursive script that reads "Laura E. Joss".

Laura E. Joss
Regional Director, Pacific West Region

A5-1

Comment Set A5 – National Park Service (cont.)

Attachments (2)

cc:

Sky Murphy, BLM_CA_OGEIS@blm.gov; BLM CA State Office, Energy and Mineral Division

Karen Beppler-Dorn, Superintendent, Pinnacles National Park

Naomi Torres, Superintendent, Juan Bautista de Anza National Historic Trail

Kirsten King, NPS Air Resources Division

A5-1
cont.

Comment Set A5 – National Park Service (cont.)

National Park Service Comments on the Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development, BLM Central Coast Field Office

Pinnacles National Park (NP) and portions of the Juan Bautista de Anza National Historic Trail (NHT) are within the DEIS study area and are managed by the National Park Service (NPS) to preserve and protect park resources and visitor experience, now and for future generations. Pinnacles National Park (NP) is a Class I area under the Clean Air Act, as such the NPS has the affirmative responsibility to protect Air Quality Related Values (AQRVs). To be effective at protecting AQRVs, the NPS needs to work with the Bureau of Land Management (BLM) to consider impacts not only from major pollution sources (those that emit 100 tons per year or more of any criteria pollutant), but also from non-major sources of air pollution, such as individual oil and gas well development. AQRVs at Pinnacles NP include water quality, air quality, dark night skies, vegetation, wildlife, visibility and viewsheds. We are especially concerned about how the effects to air quality from the proposed activity will impact several endangered species which move in and out of Pinnacles NP boundaries including California condors, tiger salamanders and California red legged frogs.

Key points from the Pinnacles NP and Juan Bautista de Anza (NHT) perspective:

- NPS is concerned about potential impacts to the federally endangered California condor within the Central California flock's range.
- NPS is concerned about potential impacts to water quality and quantity of local aquifers.
- NPS is concerned about archaeological resources, visual resources, recreation, and noise

The federally endangered California condor has been reintroduced at Pinnacles National Park and along the Big Sur coast. This Central California flock of 88 wild condors regularly utilizes public lands managed by the Bureau of Land Management (BLM) Central Coast Field Office.

The potential impacts to the Central California flock of Condors associated with the proposed activity as stated in the DEIS include: ingesting oilfield materials and colliding with structures and power lines; habituation to humans can increase the likelihood of human-condor interactions; and noise from activities can disrupt roosting and nesting behavior, and place condor chicks at risk. Condors can become coated with oil from well cellars, leaks, and spills or become entangled in equipment or fences. We are concerned about the potential impacts on the endangered condor from oil and gas leasing and development.

From a population low of 22 birds in the mid-1980s, California condors are making a slow and tenuous recovery through captive breeding, intensive wild release programs and public education efforts. Today, the total population includes 200 California condors in captivity and 250 in the wild. Reintroduced to their ancestral nesting range at Pinnacles NP in 2003 and along the Big Sur coast by the Ventana Wildlife Society in 1997, the Central California flock is made up of 88 condors that use inland and coastal habitats. Pinnacles NP and Ventana Wildlife Society biologists monitor condors on a daily basis and have radio tracked birds on lands managed by the BLM Central Coast Field Office.

San Benito and Monterey Counties are unique and desirable locations for farming, ranching, recreation, and wildlife conservation. Recovery efforts of the federally endangered California condor have benefited directly from ranching and hunting traditions in San Benito and Monterey counties on both private and public lands. Condors regularly utilize livestock troughs as a source of water, forage on carcasses left behind from ranching and hunting operations, and find nesting habitat on public and

A5-1
cont.

A5-2

Comment Set A5 – National Park Service (cont.)

private open lands. NPS is also concerned about potential impacts to this area's scarce water resources, both to water quality and quantity due to the disposal of oil development waste products and requirements for large quantities of water. Both counties have bans on the use of fracking and injection wells for oil and gas development due to potential adverse impacts to groundwater.

A5-3

This programmatic DEIS is limited to the drilling of no more than 37 total wells, 32 development wells and 3-5 exploratory wells, within the Central Coast Field Area. The DEIS assures that there will be an individual environmental assessment completed for each future proposed well. Also, no more than 206 acres of surface disturbance have been proposed in each alternative. It is our understanding that if 37 wells and 206 acres of disturbance turn out to be a low estimate, then BLM will be required to initiate a new EIS planning process.

A5-4

To provide broader protection for the AQRVs of Pinnacles NP, especially the California condors, and resources of the Juan Bautista de Anza National Historic Trail, NPS suggests the final selected alternative include all 14 management practices identified in Table 2-5 and below.

A5-5

1. Close Wilderness Study Areas and Wilderness Areas
2. Closure of Fort Ord
3. Availability of public lands for energy and mineral development
4. Environmental and multiple-use management constraints
5. Stipulations and mitigation for special status species
6. No Surface Occupancy (NSO) on Recreation & Public Purpose (R&PP) lease areas
7. NSO in special status species habitat in areas of critical environmental concern (ACECs)
8. Closure of lands outside of Division of Oil, Gas, and Geothermal Resources (DOGGR) fields and buffer areas
9. Controlled surface use (CSU) stipulations on open lands
10. Closure of moderate, low, and no occurrence potential
11. NSO to protect habitat and recreation
12. Closure of split estate
13. Closure to protect groundwater basins
14. NSO to protect surface waters

Comment Set A5 – National Park Service (cont.)

OFFICIAL CORRESPONDENCE BY ELECTRONIC MAIL
NO HARD COPY TO FOLLOW

DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Pacific West Regional Office
333 Bush Street, Suite 500
San Francisco, California, 94104-2828

Schmierer
Lee
Lehnertz

23 SEP 2013

L7619 (PWR)

Sara Acridge, Project Lead
BLM California State Office
2800 Cottage Way
Sacramento CA 95825
BLM_CA_OGEIS@blm.gov

Dear Ms. Acridge:

Re: ER 13-0172 Prepare Oil and Gas Development EIS and Possibly Amend Hollister RMP

The NPS appreciates the opportunity to respond to the BLM scoping request for information to inform their environmental planning process to address oil and gas development on public lands and Federal mineral estate in the Hollister Field Area (Notice of Intent dated August 5, 2013). We understand that this process to prepare an oil and gas leasing and development EIS (OGEIS) may also provide information needed for the BLM to potentially amend the 2006 Hollister RMP in order to establish additional stipulations, conditions of approval, best management practices, or terms and conditions to further guide safe and responsible lease development practices. The OGEIS will also analyze various current or reasonably foreseeable well completion and stimulation practices, including hydraulic fracturing and the use of horizontal drilling, in the Hollister Field Area.

A5-6

We have the following comments regarding preparation of the OGEIS:

Pinnacles National Park

The federally endangered California condor has been reintroduced at Pinnacles National Park and along the Big Sur coast. This central California flock of 60 wild condors regularly utilizes public lands managed by the BLM Hollister Field Office. NPS is concerned about potential impacts to the California condor from proposed oil and gas development within the central California flock's range, and also has concerns about potential impacts to water quality and quantity of local aquifers.

From a population low of 22 birds in the mid-1980s, California condors are making a slow but tenuous recovery through captive breeding, intensive wild release program and public education efforts. Today, the total population includes 200 California condors in captivity and 230 in the wild. Reintroduced to their ancestral nesting range at Pinnacles National Park in 2003 and along the Big Sur coast by Ventana Wildlife Society in 1997, the central California flock is made up of 60 condors that use inland and coastal habitats. Pinnacles National Park and Ventana Wildlife Society biologists monitor condors on a daily basis and have radio tracked birds on some lands managed by Hollister BLM.

Comment Set A5 – National Park Service (cont.)

NPS is concerned about the potential impacts on the endangered condor that could result from oil and gas leasing and development within the range of the central California flock. Recovery efforts of the federally endangered California condor have benefited directly from ranching and hunting traditions in San Benito and Monterey counties on both private and public lands. Condors regularly utilize livestock troughs as a source of water, forage on carcasses left behind from ranching and hunting operations, and find nesting habitat on public and private open lands.

A5-6
cont.

NPS is also concerned about potential impacts to this area's scarce water resources both of water quality and quantity due to the disposal of oil development waste products and requirements for large quantities of water.

San Benito and Monterey Counties are unique and desirable locations for farming, ranching, recreation, and wildlife conservation. The open working landscapes that define San Benito County and areas of Monterey County are not only essential to our community's rural traditions, economic stability and food production but also to the conservation of our natural and cultural resources.

For further information, please contact Karen Beppler-Dorn, Superintendent, Pinnacles National Park, 5000 Highway 146, Paicines, CA 95043 (831) 389-4486 x233.

Juan Bautista de Anza National Historic Trail

The Juan Bautista de Anza National Historic Trail (Anza Trail) is located within the Hollister RMP project area. Oil and gas leasing and development has the potential for negative effects on the Anza Trail, including, but not limited to, archaeological resources, visual resources, recreation, and noise. NPS is the overall administrator and coordinator for implementation and interpretation of the Anza Trail, and we request the opportunity to review and comment on the EIS for the RMP amendment when it is available for review. The RMP amendment should identify the Anza Trail corridor, recognize our planning goals, and incorporate protections and plans for the Anza Trail consistent with the BLM's National Scenic and Historic Trails Manual (No. 6250 & 6280).

A5-7

For further information about Anza Trail cultural and natural resources and visitor recreational opportunities, please contact Naomi Torres, Superintendent, Juan Bautista de Anza National Historic Trail, 333 Bush St., Ste. 500, San Francisco, CA 94104 (415) 623-2340.

Air Quality

If oil and gas activities proposed under the Hollister RMP may result in increased air emissions, the EIS may need to evaluate the impacts to air quality and air quality related values (AQRVs) in NPS Class I and sensitive Class II areas, as outlined in an Air Quality Memorandum of Understanding (MOU) among the U.S. Department of Agriculture, U.S. Department of the Interior and the U.S. Environmental Protection Agency¹. The air quality MOU provides a consistent approach to analyzing air quality and AQRV impacts in NEPA documents for federal oil and gas decisions. It also outlines the expectations for collaboration among the five signatory agencies. We request the opportunity to work with the BLM on the air quality analysis should the air quality MOU apply to the Hollister Field Office RMP Revision.

A5-8

Assessing potential air quality and AQRV impacts at the RMP phase is imperative, as it establishes the desired conditions and goals for air resources, and provides direction for all subsequent oil and gas leasing and permitting decisions, including identifying necessary mitigation measures, as stipulations or conditions of approval, to ensure adequate resource protection into the future. The NPS believes that the RMP is the most appropriate stage in the planning process to ensure that cumulative air quality mitigation is consistently employed across the field office and region for both leased and un-leased areas. This is consistent with BLM policy outlined in the BLM Land Use Planning Handbook H-1601-1 (Appendix C, Part H, Fluid Minerals: Oil and Gas, Tar Sands, and Geothermal

¹ Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation For Federal Oil and Gas Decisions Through the National Environmental Policy Act Process, Implemented June, 2011.

Comment Set A5 – National Park Service (cont.)

Resources), which lists the land use planning decisions for Fluid Minerals that are to be identified in the land use planning document. Among other things, the plan should identify "Whether constraints identified in the land use plan for new leases also apply to areas currently under lease." This approach ensures that mitigation is consistently applied in the field office and regionally through a coordinated planning effort.

For further information, please contact Tonnie Cummings, Air Resources Specialist, National Park Service, Pacific West Region, 612 E. Reserve Street, Vancouver, WA 98661 (360) 816-6201

Sincerely,

/s/ PATRICIA L. NEUBACHER
FOR

Christine S. Lehnertz
Regional Director, Pacific West Region

Cc:
PINN pinn_superintendent@nps.gov
JUBA juba_superintendent@nps.gov
WASO-AQ tonnie_cummings@nps.gov
WASO-ER waso_eqd_extrev@nps.gov

FNP:ASchwierer:as:9\19\13:(415)623-2315(er130172HollisterR<MP)

Sent electronically by KD on 9/24/13

A5-8
cont.

Comment Set B1 – Center for Biological Diversity



CENTER for BIOLOGICAL DIVERSITY

Because life is good.

January 17, 2017

via electronic mail to mmoffitt@blm.gov; jperez@blm.gov

Jerome Perez, California State Director,
Bureau of Land Management
California State Office
2800 Cottage Way, Suite 1623,
Sacramento, CA 95825

Melinda Moffitt, Project Manager,
Bureau of Land Management
California State Office
2800 Cottage Way, Room W-1618,
Sacramento, CA 95825

Dear Mr. Perez and Ms. Moffitt:

Re: NOTICE OF AVAILABILITY OF THE DRAFT CENTRAL COAST RESOURCE MANAGEMENT PLAN AMENDMENT AND DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR OIL AND GAS LEASING AND DEVELOPMENT, CALIFORNIA – REQUEST FOR PUBLIC HEARINGS

I refer to the abovementioned notice, published in the Federal Register on January 6, 2017 (82 Fed. Reg. 1754 (Jan. 6, 2017)), and to the BLM Central Coast Field Office Draft Resource Management Plan Amendment and Draft Environmental Impact Statement (“DRMPA/ DEIS”) released on the same date. As you are aware, the purpose of the DRMPA is to determine which BLM-managed lands and mineral estate within the geographic jurisdiction of the BLM Central Coast Field Office are open and closed to oil and gas leasing. The consequences of the BLM’s decisions around the DRMPA/ DEIS will undoubtedly impact those living and working near these federal lands and mineral estates, as well as those who recreate on BLM-managed lands in the region. They will also affect other communities throughout the Central Coast Field Office region, including coastal communities disproportionately harmed by climate change and sea level rise resulting from fossil fuel combustion, and communities that bear the burden of air pollution from fossil fuel combustion.

The DRMPA/ DEIS states that the “overall vision” of the DRMP is “to provide a collaborative community based planning approach to update the existing management decisions and resource

B1-1

[Alaska](#) · [Arizona](#) · [California](#) · [Florida](#) · [Minnesota](#) · [Nevada](#) · [New Mexico](#) · [New York](#) · [Oregon](#) · [Vermont](#) · [Washington, DC](#)

Clare Lakewood, Climate Staff Attorney · 1212 Broadway, Suite 800 · Oakland, CA 94612
Phone: 510-844-7100 x 321 · Fax: 510-844-7150 · clakewood@biologicaldiversity.org

Comment Set B1 – Center for Biological Diversity (cont.)

allocations for oil and gas leases.” (DRMPA/ DEIS (Dec., 2016), ES-2). Yet neither the DRMPA/DEIS nor the Federal Register notice provide details as to whether, where, or when public hearings on the DRMP and DEIS will be held, nor how a public hearing may be requested.

In order to better involve the communities who may be most impacted by the consequences of decisions relating to this Resource Management Plan, we request that the BLM host public hearings on the DRMP and the DEIS in the following locations, all of which are within the Central Coast Field Office region and therefore the DRMP and DEIS:

- (1) Monterey, Monterey County;
- (2) Salinas, Monterey County;
- (3) San Francisco, City of San Francisco.

Thank you for your consideration.



Clare Lakewood
Staff Attorney, Climate Law Institute
Center for Biological Diversity

B1-1
cont.

Comment Set B2 – Californians Against Fracking



Monday, April 10, 2017

Bureau of Land Management, California State Office
 O&G Leasing DEIS Comments
 2800 Cottage Way Suite W-1623
 Sacramento, CA 95825

To Whom It May Concern:

These comments are submitted on behalf of the members of Californians Against Fracking & Dangerous Drilling, to express our opposition to current and new leases that open public lands to oil and gas extraction. Our public lands are a common resource belonging to everyone. We have a duty to current and future generations to protect these precious resources from dangerous development. We are dismayed that the BLM did not consider an alternative option that would halt oil and gas development, which is the best way to protect the environment and people's health and safety.

B2-1

Along with confronting climate change, California is home to some of the most polluted air and water in the United States. As shown by the severe drought the state has recently suffered under, California faces frequent stresses on groundwater supplies, and this plan puts those all too limited supplies at risk. As just one example, the Environmental Impact Statement notes that about 5 to 10 million gallons of water is typically required for both exploratory drilling and hydraulic fracturing in the Monterey formation. Furthermore, this amount of water depletion could harm federally listed species such as the threatened steelhead trout or California condor whose critical habitat lies within the boundaries of high oil and gas potential areas. Information from 2015 alone shows that operators in California have been dumping wastewater into hundreds of unpermitted open pits. The truth is, we don't know what will happen if we allow waste injection into our aquifers, and how it may impact our underground water resources. We are going need that valuable groundwater in the future.

B2-2

B2-3

B2-4

In addition to localized impacts to human health and the environment, opening up hundreds of thousands of acres to oil and gas development will push us further toward irreversible climate change. California has some of the most carbon-intensive oil fields in the world. Climate change is requiring us to move away from fossil fuels, and BLM is suggesting we go backward by giving our lands to the oil industry.

B2-5

Many local jurisdictions have banned fracking already. The BLM's EIS does not adequately address these ordinances. Of the 10 counties within the area considered, 4 have banned fracking and/or waste injection. Opening up our land to fossil fuel leasing would undermine the will of the voters. Therefore, we urge BLM to cancel current and proposed leases for oil and gas extraction, and to be proactive about protecting what our health and the natural resources we rely on for life—clean air, water, and soil.

B2-6

Sincerely,

Dr. Garoupa White

Dr. Catherine Garoupa White, Coordinator, Californians Against Fracking & Dangerous Drilling

Comment Set B3 – San Benito Rising

San Benito Rising
P.O. Box 340, San Juan Bautista, CA 95045
sanbenitorising2@gmail.com

To: BLM, California State Office
2800 Cottage Way, Room W-1623
Sacramento, CA 95825

Attn: CCFO O&G Leasing EIS

April 5, 2017

This letter is in regards to the draft resource management plan amendment that concerns federal land in San Benito County and intentions to consider leases for oil extraction. San Benito Rising is a local grassroots group of residents in San Benito County that has dedicated themselves to a brighter environmental, economical and socially sustainable future for generations. We appreciate the opportunity to hear about potential amendments at the Central Coast Field Office March 15 meeting. The BLM representatives were knowledgeable and gracious.

B3-1

The draft RMPA/EIS would affect approximately 793,000 acres of public land in twelve north/central coast counties by opening them up for extreme oil extraction methods such as fracking and steam injection.

So it was very disconcerting that in all of the BLM literature, the RFD scenarios for hydraulic fracturing, acid matrix stimulation and acid fracturing, there was not one mention that every option stands in direct opposition to the fracking ban, Measure J, that was championed by San Benito Rising and was overwhelmingly pass in 2014. San Benito County supervisors Rivas, Bothelo and Muenzer have spoken publicly on our behalf for the need for self determination and respect of California state law.

There are a few significant omissions in what was presented at the March 15 CCFO BLM meeting.

B3-2

Of great concern is that the EIS and CCST assessment does not even address our local Ohlone Costanoan archeological recorded and unrecorded sites on BLM land. We must protect our cultural natural heritage in order to honor the past to shape the future.

San Benito County is surrounded by three active earthquake faults. Major earthquakes have a history of causing severe devastation to this rural community. Oil and gas activity in California and elsewhere has been linked to seismic activity, including the Central Coast region. USGS research has linked much of the increased earthquake activity and several of the largest earthquakes in the U.S. mid-continent in recent years to the disposal of fracking wastewater into deep injection wells. We all live within a precarious distance of a major earthquake fault and it is irresponsible to consider waste water injection in any San Benito County vicinity.

B3-3

The five planned alternative amendments for oil and gas leases on BLM land are not compatible with our sustainable San Benito County vision. We know from geological research that water travels great distances (Sierra to San Benito and New Idria to the SF bay); the isolation of BLM land is no barrier to ground water contamination.

B3-4

CCST 5.5 #17 out of 41 statements, Conclusion Comments: In General, monitoring effects near well stimulation in the U.S. haven't been extensive, and data on potential contamination in ground water not easily available. Lack of Baseline Data on Groundwater Quality impedes clearly assessing key water related risks of Hydraulic Fracturing and Well Stimulation Treatments (WST).

B3-5

California faces frequent stresses on groundwater supplies. Fracking requires an enormous amount of water, as much as 5 million gallons per well.

Submitted by Sara Steiner, San Benito Rising representative, contact: sanbenitotea@gmail.com

Comment Set B3 – San Benito Rising (cont.)

San Benito Rising

P.O. Box 340, San Juan Bautista, CA 95045
sanbenitorising2@gmail.com

It routinely employs numerous toxic chemicals, including methanol, benzene, naphthalene and trimethylbenzene. About 25% of fracking chemicals are potential carcinogens according to scientists with the Endocrine Disruption Exchange. Evidence is mounting through the country that these chemicals are making their way into aquifers and drinking water. Injection of hydraulic fracturing fluids into wells with inadequate mechanical integrity, allow gases or liquids to move to groundwater resources. However many chemicals used in fracking remain undisclosed. This lack of transparency makes it impossible to fully know the risks.

B3-6

At the very least 10% of all oil wells show integrity failure. Hydraulic fracturing fluids can end up injected directly into groundwater resources. With federal promise to significantly reduce EPA funding, who will monitor these sites? It is unacceptable that over 1,000 California wells continue to illegally inject toxic oil industry waste into groundwater aquifers, while regulators are asking the Environmental Protection Agency to grant a pardon and waive the aquifer protections of the Safe Drinking Water Act.

Agriculture and it's support system is San Benito County's #1 employer, providing food for the county, state, country and export. A large percent is dedicated to organic farming and the county's largest employer, Earthbound Farms, processes organic produce. We cannot afford the risk of contamination. Oil field jobs would most likely be filled by experienced workers from the central valley or Monterey County and few benefits would be seen here.

B3-7

Clean and plentiful water is key to provide a sustainable environment for the county's exponential population growth. Surveys have shown that local residents value open space and agriculture as a healthy environment for raising their families.

Pinnacles National Park located in south San Benito County is the home to a successful California Condor breeding program. The area was chosen for its rural and undisturbed environment. The park and its attractions are a wonderful addition with growing opportunities for agro-tourism. Turning the area into an industrial zone is counter to all of those intentions.

B3-8

The extraction and consumption of fossil fuels must be reduced, not encouraged. Climate change and ocean acidification are REAL and should be a part of any discussion concerning new leases for oil drilling. The most important thing that the government can do with our federal land to keep the oil sequestered and promote open space to mitigate carbon emissions.

B3-9

Among BLM's decision is to possibly allow a plan for the other California Field Offices: Bakersfield, Palm Springs – South Coast, Mother Lode and Ukiah. It is not just the 368,800 acres opened (out of CCOF's 793,000 acres) for potential oil/gas leases but possibly a million plus acres in our state. This needs to be noticed by the people and stopped right now with the current Central Coast Draft Plan!

B3-10

The BLM Plan lists 5 Alternatives for us, as residents to decide on one. Even Plan B with 39,000 acres opened to new leases is unacceptable. Whereas, 2.12, p 2-20 BLM Central Coast Leases, 2017 – shows five more alternatives "considered but not analyzed". One is to ban well stimulation technologies. We declare this to be a practical and feasible alternative due to technical, economic, and legal and policy considerations.

Sincerely,

Jeannette Langstaff

Ann-Marie Sayers

Sara Steiner

San Benito Rising BLM Response Committee

Submitted by Sara Steiner, San Benito Rising representative, contact: sanbenitotea@gmail.com

Comment Set B4 – Sierra Club Loma Prieta Chapter



SIERRA CLUB
LOMA PRIETA

Sierra Club Loma Prieta Chapter
Serving San Mateo, Santa Clara and San Benito Counties

April 5, 2017

Subject: Response to the BLM-CCFO's RMPA/EIS for Oil and Gas Leasing and Development

Since none of the five Alternatives in the Proposed Resource Management Plan Amendment avoids the problems listed below, none of this land should be developed for oil and gas activity.

- Injection wells in places such as Oklahoma have been linked definitively to an increase in seismic activity. (<https://earthquakes.ok.gov/faqs/>) The proposed area in this plan is directly adjacent to the San Andreas and many other faults. The risk of earthquakes induced from oil and gas activity is unacceptable.
- Central California can't afford to allocate 5 to 10 million gallons for exploratory drilling or hydraulic fracturing stimulation, while farmers frantically drill deeper wells to tap groundwater supplies and urban folks are subjected to rationing. Plus, disposal of wastewater into open pits or injection wells may contaminate or alter these underground aquifers. (<https://www.rt.com/usa/194620-california-aquifers-fracking-contamination/>)
- Drilling and fracking release large amounts of methane, a potent global-warming gas. (<https://www.scientificamerican.com/article/epa-will-regulate-methane-emissions-from-oil-and-gas-wells/>)
- People living near wells have increased rates of serious neurological and respiratory problems and higher risk of cancer. (<https://www.usnews.com/news/articles/2014/09/10/respiratory-skin-problems-soar-near-gas-wells-study-says>)
- Tourism is a big industry in California. Adding oil derricks to the skyline will not enhance the view. Once these areas are developed they will never return to their natural state. BLM lands should be keep pristine for future generations.
- And last but not least, local voters in San Benito County passed Measures J – a ban on fracking and waste injection – by a wide margin in 2014. The BLM needs to respect the will of the voters.

B4-1

B4-2

B4-3

B4-4

B4-5

B4-6

As Michael Brune, the Executive Director of the Sierra Club, has said, "The Sierra Club opposes opening any new areas for oil and gas drilling . . . Instead of leasing land for more dirty fuel drilling, the . . . administration needs to double down on clean energy."

B4-7

His statement continues to represent the position of the Club in general and specifically the Loma Prieta Chapter, which encompasses San Benito, Santa Clara, and San Mateo Counties. Instead of promoting this toxic industry, our state and nation should be looking forward and investing in renewable energy technologies. The BLM should be a leader in this movement.

Sincerely yours,

Michael Kerhin

Michael Kerhin
Chairperson, Fracking Action Committee
Sierra Club Loma Prieta Chapter

Loma Prieta Chapter, Sierra Club • 3921 East Bayshore Rd., Suite 204 • Palo Alto, CA 94303

Comment Set B5 – Center for Biological Diversity & Sierra Club



CENTER for BIOLOGICAL DIVERSITY

Because life is good.

*working through science, law and creative media to secure a future for all species,
great or small, hovering on the brink of extinction.*

April 6, 2017

VIA ELECTRONIC MAIL AND FED EX

Sky Painter Murphy
 Planning & Environmental Coordinator
 Bureau of Land Management, Central Coast Field Office
 940 2nd Ave.
 Marina, CA 93933
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RE: Center for Biological Diversity's and Sierra Club's Comments on the Draft Resource Management Plan Amendment and Environmental Impact Statement for Oil and Gas Leasing and Development within the Central Coast Field Office

Dear Mr. Murphy:

The Center for Biological Diversity (“Center”) and Sierra Club write to submit the following comments on the Draft Resource Management Plan Amendment/Draft Environmental Impact Statement (“RMP”/“DEIS”) for the Bureau of Land Management (“BLM”) Central Coast Field Office. The Planning Area consists of about 6.8 million acres of public land which includes about 793,000 acres of Federal mineral estate managed by the Central Coast Field Office. Of these 793,000 acres of Federal mineral estate, 368,800 acres are deemed to be “high oil and gas occurrence potential areas.”

Oil and gas exploration and development of the lands covered by the RMP likely involves highly controversial and severely harmful extraction methods, including horizontal drilling and hydraulic fracturing (or “fracking”). The extraction and burning of fossil fuels worsens the climate crisis; endangers water, air, wildlife, public health, and local communities; and further undermines the protection of our public lands. Because new fossil fuel leasing within the Planning Area will contribute to worsening the climate crisis, the vast majority of all *proven* fossil fuels must be kept in the ground to preserve any chance of averting catastrophic climate disruption. Opening up new areas to oil and gas exploration and unlocking new sources of greenhouse gas pollution would only fuel greater warming and contravenes FLPMA’s mandate that BLM manage the public lands “without permanent impairment of the productivity of the land and the quality of the environment.”¹ In addition, full compliance with the spirit and objectives of NEPA and other federal environmental laws and regulations requires BLM to avoid

¹ See 43 U.S.C. §§ 1701(a)(7), 1702(c), 1712(c)(1), 1732(a) (emphasis added); see also *id.* § 1732(b) (directing Secretary to take any action to “prevent unnecessary or undue degradation” of the public lands).

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local and regional impacts as well as contributing to climate change by ending all new leasing in the Planning Area and all other areas that it manages in order to limit the climate change effects of its actions.

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The DEIS as prepared is unlawfully deficient. First, it takes an arbitrarily cabined view of the amount of development that could be foreseen. BLM is considering opening up 793,000 acres to oil and gas leasing. A “person of ordinary prudence” would take into account the possibility that more than one in four thousand of these acres would be subject to surface-disturbing oil and gas activity, but BLM excluded this foreseeable possibility from analysis. Second, the DEIS fails to analyze all reasonable alternatives raised in scoping, and to take a hard look at significant and foreseeable impacts to air, water, threatened and endangered species, induced seismicity, and public health and safety.

This comment letter focuses on BLM’s failure to adequately analyze and disclose the direct, indirect, and cumulative impacts of fossil fuel leasing and development that would be authorized and made available by BLM in the DEIS, and correspondingly, the impact that such development will have on air, water, human health, and climate change. Adopting the proposed RMP would be dramatically out of step with the realities facing modern public lands management because it ignores current science and national policy on climate change. Therefore we request that BLM (1) reassess reasonably foreseeable development to include the potential for greater oil and gas development; (2) consider and analyze “no-leasing” and “no-fracking” alternatives that would bar new fossil fuel leases in the Central Coast Field Office Planning Area; (3) fully consider current scientific and economic information, especially regarding climate change; and (4) strengthen its “hard look” at impacts to air, water, induced seismicity and human health, including by conducting a Health Impact Assessment. and (3) BLM take a hard look at impacts to air, water, human health (which must include a detailed Health Impact Assessment), induced seismicity, wildlife, and sensitive species.

I. The DEIS Underestimates Activities Likely to Occur

BLM arbitrarily assumed for the purposes of the EIS that each alternative would result in no more than 37 exploratory and development wells on new Federal oil and gas leases, and no more than 206 acres of associated disturbance from well pads, roads, and other facilities over the 15- to 20-year period of analysis. BLM provided no explanation for these unreasonably low estimates, other than the conclusory statement that:

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Given the limited extent of area of federal mineral estate within the entire planning area, it is unlikely that more than a total of 37 exploratory and development wells will be drilled on federal oil and gas leases. Well stimulation technologies and enhanced oil recovery techniques are assumed to be used on any or all of these wells.

However, the “limited extent of area of federal mineral estate within the entire planning area” amounts to 793,000 acres, 368,800 acres of which are deemed to “high oil and gas occurrence potential areas.”

A. BLM’s Reasonably Foreseeable Development Scenario is Inadequate

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BLM’s Reasonably Foreseeable Development Scenario (“RFDS”) for the Hollister Field Office (“HFO,” now known as the Central Coast Field Office or CCFO) area² relies on unsupported assumptions to conclude that future oil and gas development will continue at levels consistent with historic development trends, and fails to take into account new relevant scientific information. As a result, the BLM’s projection of 37 new wells and 206 acres of land disturbance drastically underestimates the potential future development of the area. Without a realistic evaluation of future oil and gas development, the DEIR improperly masks the extent of environmental impacts to air, climate, water, biological resources, and other areas. Accordingly, the RFDS must be revised to reflect possible future production growth from both conventional and unconventional oil and gas resources in order to ensure that potential environmental impacts are properly evaluated under NEPA.

As described in BLM Instructional Memorandum 2004-89, Policy for Reasonably Foreseeable Development (RFD) Scenario for Oil and Gas (IM 2004-89)³, “The baseline RFD scenario provides the mechanism to analyze the effects that discretionary management decisions have on oil and gas activity. The RFD also provides basic information that is analyzed in the National Environmental Policy Act (NEPA) document under various alternatives.”⁴

The RFDS underpins the entire NEPA analysis. It is therefore critical, as stated in IM 2004-89 and acknowledged in the RFDS, that it be “based on the best available information and data at the time of the study.”⁵

B. The RFDS Relies on Unsupported Assumptions

BLM concludes in the RFDS that “leasing and exploration will continue at levels consistent with historic development. In other words, oil and gas leasing and exploration trends are not likely to increase or decrease. Rather, oil and gas activity within the HFO area over the next 15 to 20 years is likely to remain sporadic and primarily on non-federal lands. Furthermore, additions of new reserves are expected to continue the decline begun in 1990 in all management areas.”⁶ However, BLM provides no reason or evidence for why oil and gas activity within the CCFO are likely to continue at historic levels, especially since this assumption seems to ignore new technology that has been developed in recent years. BLM does not offer any substantive

² U.S. Department of the Interior, Bureau of Land Management. 2016. Central Coast Field Office Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development. Appendix B. Hollister Field Office Area – Reasonably Foreseeable Development Scenario for Oil and Gas. January 5 2017 (“BLM 2016, HFO RFDS”). [online] https://eplanning.blm.gov/epl-front-office/projects/lup/67003/94015/113329/Appendix_B_-_Reasonably_Foreseeable_Development_Scenario.pdf. Accessed March 28, 2017.

³ U.S. Department of the Interior, Bureau of Land Management. 2004. Instruction Memorandum No. 2004-89, Policy for Reasonably Foreseeable Development (RFD) Scenario for Oil and Gas. January 16 2004 (“BLM 2004, IM NO. 2004-89”). [online] https://www.blm.gov/wo/st/cn/info/regulations/Instruction_Memos_and_Bulletins/national_instruction.html. Accessed March 28, 2017.

⁴ *Id.* at 1-1.

⁵ *Id.* at 1-3; BLM 2016, HFO RFDS at Ap.B-1.

⁶ BLM 2016, HFO RFDS at Ap.B-15.

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analysis to validate its conclusion, often relying on unsupported assumptions, and fails to fully analyze available information and data that may contradict this conclusion.

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BLM states in the RFDS that it considered “three general categories of prospective target areas for oil production involving well stimulation in California, including within the HFO area. These targets include: (1) continued or increased oil production from discovered oil fields or similar undiscovered reservoirs; (2) organic-rich shales located deep in the basins within the oil window; and (3) oil-bearing shales in basins where little oil production has occurred.”⁷ However, BLM’s analysis of these three general categories falls short, as discussed in greater detail below in subsections “c” and “d,” and must be revised to take into account all available information and data and assess all reasonable development scenarios.

C. BLM Fails to Adequately Assess Continued or Increased Oil Production from Discovered Oil Fields or Similar Undiscovered Reservoirs

BLM failed to consider the possibility of production and/or reserve growth in discovered oil fields or similar undiscovered reservoirs, and how such growth would impact future drilling and production rates. In 2015, the United States Geological Survey (USGS) published a fact sheet entitled “Assessment of Remaining Recoverable Oil in Selected Major Oil Fields of the San Joaquin Basin, California” that estimated the “volumes of technically recoverable, conventional oil that could eventually be added to reserves in nine selected major oil fields in the San Joaquin Basin in central California.”⁸ One of the fields USGS assessed was the Coalinga Field, which is the second most productive oil field in the HFO/CCFO area.⁹ USGS estimated that a mean volume of 705 million barrels of additional oil (“MMBO”) is potentially recoverable from Coalinga. USGS concluded that much of the additional estimated oil production in the San Joaquin Basin could come from improved recovery in diatomite reservoirs of the Monterey Formation, which requires well stimulation. It also concluded that enhanced oil recovery (“EOR”) methods – including those used at the Coalinga field – may also be used to increase production, stating that:

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Additional volumes of oil could come from continued application of thermal-recovery technologies to shallow reservoirs containing heavy oil, although the oil remaining in such reservoirs is more difficult to recover than in similar reservoirs already exploited. In a few reservoirs, particularly deep sandstone reservoirs containing relatively light oil such

⁷ *Id.* at Ap.B-14.

⁸ Tennyson, M.E. et al., Assessment of remaining recoverable oil in selected major oil fields of the San Joaquin Basin, California: U.S. Geological Survey Fact Sheet 2012–3050 (2012).

⁹ BLM incorrectly states in the RFDS at Ap.B-9 that “[t]he Coalinga Field, located in western Fresno County, is the most productive field in the HFO area and is currently the eighth largest oil and gas field in California.” According to production records from the California Division of Oil, Gas, and Geothermal Resources, in 2016, Coalinga produced approximately 6.4 million barrels of oil and 247 million cubic feet of natural gas, making it the 9th most productive oil field in the state and second most productive in the HFO. The most productive oil field in the HFO and 8th most productive in California is San Ardo, which in 2016 produced approximately 7.9 million barrels of oil and 1 billion cubic feet of natural gas.

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as sandstone reservoirs within the Monterey Formation at Elk Hills field, additional oil could be recovered with injection of carbon dioxide.¹⁰

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Although USGS's analysis only examined future production from large oil fields, it also acknowledged that contributions from smaller fields could also be significant, stating that "[o]il reserves will also continue to be added in fields within the San Joaquin Basin that were not included in this analysis. Most such fields are smaller than the fields studied, and their additions to reserves will also be smaller, although they may be significant."

As noted above, BLM states that "additions of new reserves are expected to continue the decline begun in 1990 in all management areas" but does not describe in detail how reserve additions have declined during that time or how the USGS assessment described above may alter that decline. In its Independent Scientific Assessment of Well Stimulation in California¹¹, the California Council on Science and Technology found that,

Growth of reserves in existing fields of the San Joaquin Basin has been the most important source of additional reserves in California in recent decades. The large remaining resource potential of these reasonably well understood oil accumulations suggests that additional development of the San Joaquin Basin oil fields is likely to continue to be an important source of reserve additions in California for years to come. In addition to the potential of the intensively developed large fields, some less developed smaller fields of the San Joaquin Basin also have significant potential as well.¹²

The 1995 USGS assessment of the Salinas Basin (the most recent available) notes that a significant part of the Salinas Basin has only been lightly explored, with the potential for many more discoveries, and some geologists believe that one or more very large fields (possibly comparable to San Ardo) may be present near the southern border of Monterey County.¹³ The USGS concludes that it is much more likely that, if any additional fields are discovered, they will be very small. According to the USGS, San Ardo is estimated to contain 530-860 million barrels of oil; the median expected size of a new discovery is 2 million barrels of oil. Nevertheless, the exploration for and development of such fields would result in environmental impacts and those impacts must be assessed. BLM considers some types of surface disturbance associated with such a new discovery in Subsection 7 of the RFDS, but ultimately does not incorporate that

¹⁰ Tennyson, M.E. et al., Assessment of remaining recoverable oil in selected major oil fields of the San Joaquin Basin, California: U.S. Geological Survey Fact Sheet 2012-3050 (2012).

¹¹ California Council on Science and Technology. 2015. An Independent Scientific Assessment of Well Stimulation in California. Volume 1: Well Stimulation Technologies and their Past, Present, and Potential Future Use in California. Prepared by California Council on Science and Technology, Lawrence Berkeley National Laboratory. January ("CCST 2015"). [online]: http://www.ccst.us/projects/hydraulic_fracturing_public/SB4.php. Accessed March 28, 2017.

¹² *Id.* at 211.

¹³ Stanley, R. G., 1995, Central Coastal Province (2011) with a section on Cuyama Basin, by M.E. Tennyson, in Gautier, D. L., Dolton, G.L., Takahashi, K.I., and Varnes, K.L., ed., 1995 National assessment of United States oil and gas resources--Results, methodology, and supporting data: U.S. Geological Survey Digital Data Series DDS-30, Release 2, one CD-ROM.

Available at: <http://certmapper.cr.usgs.gov/data/noga95/prov11/text/prov11.pdf>

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scenario in the RFDS on the basis that it is “extremely unlikely to occur.”¹⁴ However, BLM’s previous analysis does not adequately demonstrate that this conclusion is correct. The CCST also found that, “Within the large area of the Central Coastal basins, the Salinas Basin, in particular, has significant potential for undiscovered conventional petroleum accumulations and for further development of heavy oil within the giant San Ardo field.”¹⁵

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BLM’s assessment of potential increased production from conventional fields in the HFO/CCFO area, particularly within the San Joaquin and Salinas Basins, is inadequate and must be revised to reflect all available information and data.

D. BLM Fails to Adequately Assess Oil Production from Organic-Rich Shales Located Deep in the Basins within the Oil Window

While estimates of the size of the Monterey source rock play are highly uncertain, multiple independent experts conclude that the potential resource is significant. The CCST found that,

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Most known oil, and in all likelihood most yet-to-be discovered and developed oil as well, was generated through the thermal alteration of organic matter in the Monterey Formation. In short, the Monterey is a prolific petroleum source rock. Recent direct production of oil from source rocks (so-called shale oil) in other parts of the country have drawn attention to the possibility of producing oil directly from the Monterey source rocks as well. Although no such production has yet been demonstrated, the possibility exists for “source-rock system (shale oil) plays” in the deeper parts of a number of California basins, including the San Joaquin, Los Angeles, Ventura, Santa Maria, and Salinas basins. If these postulated resources exist and could be developed, their production would probably entail the widespread application of WST in hundreds or thousands of new wells.¹⁶

Specifically within the HFO/CCFO, CCST found that, “[t]he source rock intervals of the San Joaquin Basin are the most likely candidates for high-volume shale oil production,”¹⁷ and “[t]he existence of the giant San Ardo oil field also demonstrates the presence of active and effective Monterey-equivalent petroleum source rocks deep in the basin. Therefore a source-rock system ‘shale oil’ play with significant recoverable resources is considered a real possibility in the Salinas Basin.”¹⁸

The potential development of this resource is not adequately assessed in the RFDS. BLM simply assumes that the Monterey source rock play will not be developed within the time period considered in the RFDS, stating,

¹⁴ BLM 2016, HFO RFDS at Ap.B-28.

¹⁵ CCST 2015 at 198.

¹⁶ *Id.* at 251.

¹⁷ *Id.*

¹⁸ *Id.* at 198.

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Even if there are advances in science and technology that resolve some of the uncertainty associated with the Monterey Formation source rock, these advances are not likely to alter the RFDS for federal minerals in the planning area for the next 15 to 20 years due to the geology of the region. Therefore, all available scientific, industry, and government information indicates that absent currently unforeseen changes in oilfield technology, future oil and gas development within the HFO area will continue as it has over the last 10 or 20 years.¹⁹

No substantive assessment is provided to support this conclusion. Rather, this conclusion is simply repeated over and over with no further analysis. BLM states in Section 2.5, Future Oil and Gas Development, that “[g]iven the level of uncertainties regarding the distribution and abundance of oil retained in deep Monterey source rocks, or how successful production could occur, significant future production of this target is not expected. Even if some of the uncertainties are resolved, these advances are not likely to alter the RFDS for federal minerals in the Planning Area for the next 15 to 20 years due to the geology of the region (see Section 3, RFDS Assumptions).”²⁰

However, Section 3 also does not include any discussion of the information or data that supports BLM’s conclusion, but simply refers back to Section 2.5, “[a]s discussed in Section 2.5 (Future Oil and Gas Development), given the level of uncertainties regarding the Monterey Formation source rock, significant future production of this target is not expected (CCST, 2015, pp. 15 to 19).”²¹

BLM implies that it is not required to assess potential development of the Monterey source rock play by stating in the RFDS that, “[r]easonably foreseeable does not include scenarios that are merely speculative or only have a remote possibility of occurring.”²² However, IM 2004-89 contradicts this, including the statement that, “[t]he RFD projection *can range from speculative estimates in unexplored frontier areas* to estimates with higher levels of confidence in maturely developed producing areas,”²³ (emphasis added).

Moreover, the RFDS fails to include recent information and data that can help remove some of the uncertainties and help guide the assessment of potential development of the Monterey source rock play. In 2015, the USGS published a fact sheet entitled Assessment of Undiscovered Continuous Oil and Gas Resources in the Monterey Formation, San Joaquin Basin Province, California, 2015,²⁴ in which they concluded that,

This USGS analysis, based on drilling results to date, concluded that some recoverable oil probably remains in the source rock, but success rates (proportion of drilled wells that produce at least 2,000 barrels) will be low, and the estimated ultimate recovery will be

¹⁹ BLM 2016, HFO RFDS at Ap.B-16.

²⁰ *Id.* at Ap.B-14.

²¹ *Id.* at Ap.B-15.

²² *Id.* at Ap.B-1.

²³ BLM 2004, IM NO. 2004-89 at 1-3.

²⁴ Tennyson, M.E., et al., Assessment of undiscovered continuous oil and gas resources in the Monterey Formation, San Joaquin Basin Province, California, 2015: U.S. Geological Survey Fact Sheet 2015-3058 (2015).

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low for even successful wells (table 1). Wells will be relatively tightly spaced, as they are in producing Monterey reservoirs in conventional traps such as those at the Buena Vista and Lost Hills fields. Anticipated extraction methods are mostly vertical (rather than horizontal) wells, acid stimulation, and hydraulic fracturing.

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USGS estimated that the calculated mean average drainage area of wells in the two assessment units considered would be 18 acres. In other words, on average, one well would be required every 18 acres to produce the Monterey reservoirs in the San Joaquin Basin province.

BLM should use this information and data on well spacing and anticipated extraction methods to revise the RFDS to include development scenarios for the more than 4,000 acres of federal mineral estate overlaying the Monterey Formation play in the HFO area.

In sum, and as described above, the RFDS must be revised to reflect possible future production growth from both conventional and unconventional oil and gas resources in order to ensure that potential environmental impacts are properly evaluated under NEPA.

BLM's drastic underestimate of the activities likely to occur as a result of the lease sale, and its limitation of the analysis to the impact of only 37 wells and 206 acres of surface disturbance, infected every aspect of BLM's analysis in the DEIS.²⁵ In particular, BLM minimized potential environmental impacts and failed to analyze the nature, intensity, and extent of the lease sale's actual effects, discussed in greater detail below.

II. The DEIS Is Not in Accordance with Local Laws and Regulations

The DEIS does not contain any meaningful discussion of local ordinances that prohibit land uses related to oil and gas development within HFO/CCFO jurisdiction. These include the following measures:

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A. Measure J

On November 4, 2014, San Benito County voters passed a ballot initiative titled "Protect Our Water and Health: Ban Fracking Initiative," designated Measure J. Measure J amended the county general plan to protect local communities from the dangers of high-intensity petroleum operations. The new law states:

The development, construction, installation, or use of any facility, appurtenance, or above-ground equipment, whether temporary or permanent, mobile or fixed, accessory or principal, in support of High-Intensity Petroleum Operation(s) is prohibited on all lands within the County's unincorporated area.²⁶

²⁵ See, e.g., DEIS at 4.6-2 (BLM estimated quantities of greenhouse gas emissions for the drilling of only 37 wells), and, *id.*, at 4.7-3 ("groundwater is assumed to be used for all drilling and well stimulation activities for the maximum of 37 wells in the 2015 RFD Scenario.")

²⁶ San Benito General Plan, Land Use Policy 41 (2014).

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The prohibition on land uses supporting High-Intensity Petroleum Operations applies to (1) Well Stimulation Treatments and/or (2) the operation of Enhanced Recovery Wells as defined in Measure J.²⁷ In addition, oil and gas development of any type is prohibited in all land designated for residential use.²⁸

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Aside from fleeting references noting Measure J's existence, the DEIS contains no analysis of the ordinance as it relates to BLM's oil and gas leasing.

B. Measure Z

On November 8, 2016, voters of Monterey County passed a ballot initiative titled, "Protect Our Water: Ban Fracking and Limit Risky Oil Operations Initiative," later named Measure Z for purposes of the ballot. Measure Z's land use restrictions, which apply to all unincorporated parts of the County, consisted of:

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- (1) A ban on land use in support of hydraulic fracturing and other forms of enhanced well stimulation treatments like acidizing;
- (2) A ban on land use in support of wastewater injection and wastewater impoundment; and
- (3) A ban on land use in support of drilling new oil and gas wells.²⁹

The DEIS does not mention Measure Z and it is thus impossible to know how the BLM plans to address this local ordinance.

C. Santa Cruz Oil and Gas Ban

In 2014, the Santa Cruz County Board of Supervisors passed an ordinance imposing a permanent ban on fracking as well as all other oil and gas development.³⁰

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The DEIS acknowledges the need to consider local ordinances related to geotechnical studies, "safety elements," seismic safety provisions, construction regulations, soil and rock analyses, grading and erosion control, reporting and disclosure requirements, and more.³¹ But critically, local laws that apply directly to oil and gas activity receive no discussion.

III. The BLM Fails to Demonstrate Conformity with the Clean Air Act

BLM asserts that it is not obliged to perform a full and complete "conformity determination" in the Central Coast draft RMP to comply with the Clean Air Act's requirement that federal actions conform to the applicable state implementation plan ("SIP"). DEIS at 4.5-6;

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²⁷ *Id.*

²⁸ *Id.*, Land Use Policy 42.

²⁹ Monterey County Elections, Ballot Measure: Full Text of Measure Z, Land Use sections 1.21, 1.22, and 1.23, available at http://www.montereycountyelections.us/a_measures_NOVEMBER_2016_EN_MZ.html (2016).

³⁰ Santa Cruz Board of Supervisors Resolution Amending the Santa Cruz County General Plan Regarding Prohibition on Oil and Gas Exploration and Development (May 20, 2014).

³¹ DEIS at 3.3-4.

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See also 42 U.S.C. § 7506. BLM’s position is based on erroneous interpretations of the Clean Air Act and its underlying regulations, and unsubstantiated emissions estimates which indicate that BLM’s proposed resource management plan will continue to fuel dangerous levels of ozone pollution in the region, jeopardizing public health.

Implementation of the Clean Air Act exemplifies cooperative governance between the states and the federal government. The Clean Air Act aims “to protect and enhance the quality of the Nation’s air resources” 42 U.S.C. § 7401(b)(1). The Clean Air Act states that, “No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity” that does not conform to an approved state air quality implementation plan. 42 U.S.C. § 7506(c)(1). “The assurance of conformity . . . shall be an affirmative responsibility of the head of such . . . agency.” To ensure conformity, agency actions must not “cause or contribute to any new violation of any [air quality] standard” or “increase the frequency or severity of any existing violation of any standard in any area.” *Id.* § 7506(c)(1)(B). This statute is very broadly applicable.

A SIP is a federally approved set of state regulations that are designed to prevent air quality deterioration and to restore clean air in areas that are out of attainment with federal standards. Conformity to a SIP as defined in the Clean Air Act, 42 U.S.C. § 7506(c)(1)(AB), means:

- (A) conformity to an implementation plan’s purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and
- (B) that such activities will not—
 - (i) cause or contribute to any new violation of any standard in any area;
 - (ii) increase the frequency or severity of any existing violation of any standard in any area; or
 - (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The “assurance of conformity” to a SIP “shall be an affirmative responsibility” of a federal agency. 42 U.S.C. § 7506(c)(1). For Federal actions not related to transportation plans, “a conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by a Federal action would equal or exceed. . . 10/25/50/100 [tons/year.]”. 40 C.F.R. § 95.153(b).

There are certain limited exceptions to general conformity requirements under the Clean Air Act, such as when emissions from federal actions are below de minimis thresholds. Portions of federal actions that require a permit under the Clean Air Act’s new source review program, as set forth under 42 U.S.C. §§ 7410(a)(2)(c) and 7503, are also not subject to general conformity requirements. See 40 C.F.R. § 93.150(d).

The purpose of general conformity is to “prevent the Federal Government from interfering with the States’ abilities to comply with the CAA’s requirements.” *Dep’t of Transp. v.*

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Pub. Citizen, 541 U.S. 752, 758 (2004). An action “delays attainment only if its implementation postpones attainment beyond the date by which it would have been achieved without the project.” *Nat. Res. Def. Council v. E.P.A.*, 661 F.3d 662, 665 (D.C. Cir. 2011).

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Before action is taken, a federal agency must make a determination that the federal action conforms to “certain threshold emission rates set forth in § 93.153(b).” *Pub. Citizen*, 541 U.S. at 771. If the action’s direct and indirect emissions will exceed *de minimis* levels, then the agency must demonstrate conformity. *Ctr. for Biological Diversity v. Bureau of Land Mgmt.*, 833 F.3d 1136, 1148 (9th Cir. 2016); *see also* 40 C.F.R. § 93.153(b)(1) (defines *de minimis* emission rates). Because “[n]either the federal nor the state rule identify the form an agency must use when deciding whether a project necessitates a full-scale conformity determination,” courts have found it sufficient for an agency to explain their conformity decision in a NEPA document. *California ex rel. Imperial Cty. Air Pollution Control Dist. v. U.S. Dep’t of the Interior*, 767 F.3d 781, 799 (9th Cir. 2014). Thus, “[a]n agency need not prepare a stand-alone document explaining such a decision.” *Id.* Likewise, the Federal Land Policy and Management Act (FLPMA) requires the Secretary of the Interior, in developing and revising land use plans, to “provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans.” 43 U.S.C. § 1712(c)(8).

For purposes of conformity, direct emissions are those emissions that are “caused or initiated by the Federal action . . . occur at the same time and place as the action and are reasonably foreseeable.” 40 C.F.R. § 93.152. Indirect emissions are defined “as being (1) caused by federal action but occurring at a different time or place as the action, (2) reasonably foreseeable, (3) practically controlled by the agency, and (4) under the continuing program responsibility of the agency.” *California ex rel. Imperial Cty. Air Pollution Control Dist.*, 767 F.3d at 799; *see also* § 93.152. “[T]he EPA has made clear that for purposes of evaluating causation in the conformity review process, some sort of ‘but for’ causation is sufficient.” *Pub. Citizen*, 541 U.S. at 772. To demonstrate causation, projected emission concentrations with and without the project are compared. *Nat. Res. Def. Council*, 661 F.3d at 665. If “the project’s emissions would result in either a new or aggravated violation relative to the initial emissions trajectory,” then the project does not conform. *Id.*

Ozone is a criteria pollutant under the federal Clean Air Act, 42 U.S.C. § 7408. The Clean Air Act establishes a National Ambient Air Quality Standard (“NAAQS”) for each criteria pollutant that represents the maximum allowable concentration of each pollutant that can occur in the air and still protect public health. *See* 42 U.S.C. § 7409. In 2008, EPA published a final rule strengthening the ozone NAAQS by lowering the 8-hour standard to 0.075 ppm. 73 Fed. Reg. 16,436 (March 27, 2008). In response to evolving science and public health needs, in 2015 EPA again lowered the 2008 ozone NAAQS, setting a new, more stringent 8-hour limit of 0.070 ppm. 80 Fed. Reg. 65,292 (Oct. 26, 2015). According to EPA, the new limit was necessary “to provide requisite protection of public health and welfare, particularly for at-risk groups including children, older adults, people of all ages with lung diseases such as asthma, and people who are active outdoors, both for recreational and work purposes. It will also improve the health of trees, plants, and ecosystems.” *Id.*

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EPA’s decision to strengthen the ozone standard was based on numerous human health studies conducted over the past decade documenting the adverse effects of ozone on public health. Ozone concentrations are measured on an hourly basis. 40 C.F.R. § 50.15. An exceedance of the ozone standard occurs if the average of eight consecutive hourly readings exceeds 0.075 ppm, which is the 2008 NAAQS for ozone. *Id.* A violation of the standard occurs when the “3-year average of the annual fourth-highest 8-hour” ozone concentrations exceeds 0.075 ppm. *Id.*

When the 3-year average for ozone levels for any given region falls below 0.075ppm, the region is considered to be in attainment with the ozone NAAQS. 42 U.S.C. § 7407(d)(1)(A)(ii). Conversely, when the 3-year ozone average is above 0.075 ppm, the region is considered a nonattainment area for ozone. 42 U.S.C. § 7407(d)(1)(A)(i). EPA will promulgate final area ozone designations for California based on the new 2015 ozone NAAQS by October 1, 2017.³² The California Air Resources Board will then formally adopt the new designations, implementing the new 2015 ozone standard state-wide. Until the 2015 ozone designation process is complete, the 2008 0.075 ppm standard applies across all air districts in California

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A 2011 interagency guidance memorandum of understanding, signed by the Department of Interior, outlines a commitment by the agency to undergo detailed analyses of air quality compliance, with a particular focus on non-attainment areas. The MOU establishes “a clearly defined, efficient approach to compliance with [NEPA] regarding air quality . . . in connection with oil and gas development on Federal lands.”³³ The MOU “provides for early interagency consultation throughout the NEPA process; common procedures for determining what type of air quality analyses are appropriate and when air modeling is necessary; specific provisions for analyzing and discussing impacts to air quality and for mitigating such impacts; and a dispute resolution process to facilitate timely resolution of differences among agencies.”³⁴ The goal of this process is to ensure that “[F]ederal oil and gas decisions do not cause or contribute to exceedances of the National Ambient Air Quality Standards (NAAQS).”³⁵ The MOU outlines recommended technical, quantitative procedures to follow, which include identifying the reasonably foreseeable number of oil and gas wells and conducting an emissions inventory of criteria pollutants. Further air quality modeling is required if certain criteria are met, based on the level of emissions impact and the geographic location of the action.³⁶ The MOU indicates that “[e]xisting reasonably foreseeable development scenarios can be used to identify the number of wells.”³⁷

In response to this interagency MOU, BLM implemented internal regulations in 2012 establishing a 10-step process for conducting a general conformity determination in compliance

³² California Air Resources Board, Federal Standard Area Designations (2017), available at <https://www.arb.ca.gov/desig/feddesig.htm>.

³³ Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the National Environmental Policy Act Process, Preamble (2011), available at: <https://www.epa.gov/sites/production/files/2014-08/documents/air-quality-analyses-mou-2011.pdf>.

³⁴ *Id.* at 4.

³⁵ *Id.* at 1, 2.

³⁶ *Id.* § V.E.1., pg. 9.

³⁷ *Id.*

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with the Clean Air Act section 176(c).³⁸ The erroneous and unsubstantiated analysis at issue in the draft Central Coast RMP/EIS hinges on BLM’s application of IM 2013-025 steps 4-6 which require BLM to:

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cont.

4. Conduct an Air Quality impact analysis. This section should contain estimates of emissions that are caused by the project and located in the nonattainment or maintenance area. According to the EPA rules, the emissions estimates should include all reasonably foreseeable direct and indirect emissions from the proposed action.
5. Compare results to applicable SIP provisions and rules. Under this section, the project with its emission estimates and mitigations needs to be compared to the SIP to see if it complies with the provisions of the SIP, including the application of control measures required in the SIP and acquisition of all necessary air permits...
6. Write a Conclusion Statement. At this point, a statement needs to be made as to whether the project is in conformity (if not, the project cannot proceed), whether the emissions exceed the de minimus levels (40 CFR 93.153) and a formal determination is necessary, or it is below de minimus levels and no further analysis would be necessary. This statement should also include the mechanism through which any required mitigation will be established and enforced (i.e., in the Record of Decision, the Conditions of Approval (COAs) on an Application for Permit to Drill (APD), etc.).

BLM essentially skipped step 4 in the Central Coast RMP/DEIS. BLM’s so-called “air quality impacts analysis” consists of a few emissions estimates reported in Tables 4.5-1 and 4.5-2 for development and long-term production, operations and maintenance of the 37 wells estimated in the RFD scenario for this planning area. DEIS at 4.5-4, 4.5-5. BLM cites *no* source or reference for the calculations of these emissions estimates, yet quickly and conveniently concludes that all potential emission thresholds fall within “de minimis” levels, releasing the agency from obligations to conduct a full General Conformity Determination for this RMP. DEIS at 4.5-6. De minimis levels under EPA’s General Conformity regulations are as follows (40 CFR 93.153(b)):

(I) For purposes of paragraph (b) of this section the following rates apply in nonattainment areas (NAA’s):

	Tons/year
Ozone (VOC’s or NOX):	
Serious NAA’s	50
Severe NAA’s	25
Extreme NAA’s	10
Other ozone NAA’s outside an ozone transport region	100
Other ozone NAA’s inside an ozone transport region:	
VOC	50
NOX	100

³⁸ United States Department of the Interior, Bureau of Land Management, Instruction Memorandum No. 2013-025, *Guidance for Conducting Air Quality General Conformity Determinations* (December 4, 2012) found at https://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-025.html.

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cont.

Carbon Monoxide: All maintenance areas	100
SO ₂ or NO ₂ : All NAA's	100
PM ₁₀ :	
Moderate NAA's	100
Serious NAA's	70
PM _{2.5} (direct emissions, SO ₂ , NO _x , VOC, and Ammonia):	
Moderate NAA's	100
Serious NAA's	70
Pb: All NAA's	25
(2) For purposes of paragraph (b) of this section the following rates apply in maintenance areas:	
	Tons/year
Ozone (NO _x), SO ₂ or NO ₂ :	
All maintenance areas	100
Ozone (VOC's)	
Maintenance areas inside an ozone transport region	50
Maintenance areas outside an ozone transport region	100
Carbon monoxide: All maintenance areas	100
PM ₁₀ : All maintenance areas	100
PM _{2.5} (direct emissions, SO ₂ , NO _x , VOC, and Ammonia)	100
All maintenance areas	100
Pb: All maintenance areas	25

In the draft Central Coast RMP/EIS, the NO_x emissions estimate of 8.4 tons per year falls just below the de minimis threshold of 10 tons per year established by the California Air Resources Board for the San Joaquin Valley Air Basin which is currently classified as “extreme” non-attainment for ozone. DEIS at 4.5-5. NO_x and VOCs are pre-cursors that form ground-level ozone, therefore the agency must demonstrate that additional emissions of either NO_x or VOCs meet the NAAQS. BLM fails to cite *any* authority or resource in calculating these potential emissions, thereby failing its affirmative duty to demonstrate to the public that health-protective air quality standards will be met with approval of increased oil and gas development in the planning area.

The need for BLM to ensure conformity is underscored by the fact that California is failing to bring the San Joaquin Valley ozone “extreme” nonattainment area into attainment with the 2008 0.075 ppm ozone NAAQS. Given the inability of the current San Joaquin ozone air quality plan to ensure attainment with the ozone NAAQS, as required by the Clean Air Act, it appears clear that the BLM’s decision will not only cause or contribute to violations of the NAAQS, but increase their severity and frequency. Not to speak of the more stringent 0.070 ppm ozone standard adopted by EPA in 2015. The San Joaquin Air Resources Control Board acknowledges that meeting the new more stringent ozone NAAQS means “NO_x emissions reductions in the Valley must be reduced by an additional 90% in order to attain the latest federal ozone and PM_{2.5} standards that now encroach on natural background levels. This air quality challenge is unmatched by any other region in the nation.”³⁹ A conformity determination is

³⁹ San Joaquin Valley Air Pollution Control District, *2016 Plan for the 2008 8-Hour Ozone Standard*, at ES-5 (June 16, 2016) found at http://www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm.

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especially necessary in this case. BLM must prove to the public that their estimated emission calculations are accurate, justified and enforceable. BLM fails to provide any information to support their air emissions estimates in this RMP, which also puts them in direct conflict with requirements under NEPA.

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NEPA regulations repeatedly emphasize the need for effective and accurate public notice and involvement. NEPA procedures must ensure “environmental information is available to public officials and citizens before decisions are made and before actions are taken.” 40 C.F.R. § 1500.1(b). NEPA regulations make it crystal clear that “[T]he information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA.” *Id.* Accordingly, “agencies shall to the fullest extent possible...encourage and facilitate public involvement in decisions.” *Id.* § 1500.2(d) (emphasis added).

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NEPA’s implementing regulations require that the agency “shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions,” and shall ensure the scientific accuracy and integrity of environmental analysis. *Id.* § 1502.24. The agency must disclose if information is incomplete or unavailable and explain “the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts.” *Id.* § 1502.22(b)(1). The agency must also directly and explicitly respond to dissenting scientific opinion. *Id.* § 1502.9(b).

Courts interpret these regulations as requiring a high level of accuracy in the information provided to the public, and the burden falls on the agency to meet this high standard. “[W]ith respect to public involvement, the way in which the information is provided is less important than that a sufficient amount of environmental information – *as much as practicable* – be provided so that a member of the public can weigh in on the significant decision that the agency will make in preparing the EIS. *WildEarth Guardians v. Mont. Snowmobile Ass’n*, 790 F.3d 920, 926 (9th Cir. 2015) (quoting *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 964 (9th Cir. 2005) (citing 40 C.F.R. § 1500.1(b)) (“To take the required ‘hard look’ at a proposed project’s effects, an agency may not rely on incorrect assumptions or data in an EIS. It surely follows that the data the Forest Service provides to the public to substantiate its analysis and conclusions must also be accurate. If the wolverine habitat prediction map does not accurately depict the big game winter range, and the Forest Service ultimately worked from a different, accurate map, then it is the accurate map that must be disclosed to the public.”)(internal quotations omitted).

It is the agency’s duty to provide clear, consistent and accurate information so that the public is fully informed of the scope of the agency action. BLM utterly failed to meet this fundamental pillar of NEPA review.

In addition to NEPA information accuracy requirements, courts also interpret EPA CAA General Conformity regulations to include the latest, most accurate information. In *Border Power Plant Working Group v. DOE*, the Court clarified the legal standard for general conformity determinations, stating that a Federal action’s conformity determination must rely “on the most recent estimates of emissions,” (42 U.S.C. § 7506(c)(1)) and that the EPA requires

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“the latest and most accurate emission estimation techniques available . . . (2) such as actual stack test data from stationary sources which are part of the conformity analysis.” 467 F. Supp. 2d 1040, 1054 (S.D. Cal. 2006) (quoting 40 C.F.R. § 51.859(b)(2)). BLM offered absolutely no analysis as the basis for the potential emissions listed in Tables 4.5-1 and 4.5-2 and proceeds to exempt itself from a full conformity determination based on said non-existent analysis. BLM’s failure to meet both NEPA information accuracy and CAA conformity requirements are clear in this draft RMP.

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Additionally, BLM is not clear whether the air emissions estimates reflect direct or indirect air emissions or both. Direct emissions alone are not the basis for a requirement to perform a conformity determination. A general conformity determination is required if indirect emissions would also exceed 10 tons per year of target pollutants in extreme non-attainment areas. 40 CFR § 93.153(b)(1). Indirect emissions are defined as those:

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- (1) That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action;
- (2) That are reasonably foreseeable;
- (3) That the agency can practically control; and
- (4) For which the agency has continuing program responsibility.

40 C.F.R. § 93.152.

BLM can practically control those emissions in a number of ways including, but not limited to, by choosing not to lease certain areas or by including stipulations that require limits on emissions or emitting practices. The agency has continuing program responsibility for those emissions, both through subsequent permit actions and ongoing inspection and enforcement oversight. BLM provides no emissions inventory or analysis of potential direct and indirect emissions based on oil and gas industry standards for development, operations and ongoing maintenance. Again, BLM fails to document or provide sources for their potential emissions tables, in violation of CAA general conformity requirements.

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Mitigation measures outlined in the draft RMP EIS are vague and inadequate to address the principle sources of ozone emissions from future oil and gas operations, discussed in great detail below. DEIS 4.5-7-10. BLM asserts that it will analyze additional mitigation measures at the project development stage. DEIS 4.5-7. BLM’s attempt to “kick the can down the road” runs afoul of the 9th circuit decision in *Conner v. Burford*. The court held that the “government’s inability to fully ascertain the precise extent of the effects of mineral leasing [in an EIS]... is not, however, a justification for failing to estimate what those effects might be before irrevocably committing to the activity.” *Conner v. Burford*, 836 F.2d 1521 at 1531 (9th Cir. 1988). Indeed, the court specifically denounced BLM’s “approve now and ask questions later” approach as blatantly incompatible with the purpose and spirit of NEPA. *Id.*

Finally, BLM’s estimate of the number of new wells expected is unsupported. The potential for far greater expansion and intensification of oil and gas activity has been studied and documented, as discussed above. The artificially low number of expected wells projected in the

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DEIS also improperly reduces the air emission impacts. Each should be reevaluated in light of the studies provided.

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IV. The DEIS Violates the National Environmental Policy Act (“NEPA”)

The National Environmental Policy Act (“NEPA”), 42 U.S.C. § 4321 *et seq.*, and its implementing regulations, promulgated by the Council on Environmental Quality (“CEQ”), 40 C.F.R. §§ 1500.1 *et seq.*, is our “basic national charter for the protection of the environment” achieving its purpose through “action forcing procedures. . . requir[ing] that agencies take a hard look at environmental consequences.” 40 C.F.R. § 1500.1; *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (citations omitted). This includes the consideration of best available information and data, as well as disclosure of any inconsistencies with federal policies and plans.

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Recognizing that “each person should enjoy a healthful environment,” NEPA ensures that the federal government uses all practicable means to “assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings,” and to “attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences,” among other policies. 43 U.S.C. § 4331(b).

NEPA regulations explain, in 40 C.F.R. §1500.1(c), that:

Ultimately, of course, it is not better documents but better decisions that count. NEPA’s purpose is not to generate paperwork – even excellent paperwork – but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

Thus, while “NEPA itself does not mandate particular results, but simply prescribes the necessary process,” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989), agency adherence to NEPA’s action-forcing statutory and regulatory mandates helps federal agencies ensure that they are adhering to NEPA’s noble purpose and policies. *See* 42 U.S.C. §§ 4321, 4331.

A. BLM Has a Legal Obligation to Consider All Reasonable Alternatives

NEPA requires federal agencies to pause before committing resources to a project and consider the likely environmental impacts of the preferred course of action as well as reasonable alternatives. *See* 42 U.S.C. § 4331(b) (congressional declaration of national environmental policy); *U.S. Dep’t of Transp. v. Public Citizen*, 541 U.S. 752, 756–57 (2004). NEPA’s regulations require BLM to “rigorously explore and objectively evaluate all reasonable alternatives” to the proposed action in comparative form, so as to provide a “clear basis for choice among the options” open to the agency. 40 C.F.R. § 1502.14. The agency should address all reasonable alternatives to the proposed action. *See Colorado Env’tl. Coal. v. Salazar*, 875 F. Supp. 2d 1233, 1245 (D. Colo. 2012). An alternative is “reasonable” if it falls within the agency’s statutory mandate, and meets at least a part of the agency’s purpose and need.

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Westlands Water Dist. v. U.S. Dep't of the Interior, 376 F.3d 853, 868 (9th Cir. 2004); *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1520 (9th Cir. 1992).

BLM received 734 comments from the public in scoping.⁴⁰ A majority of the comments that expressed opinions on what future management direction the BLM should take regarding allowing hydraulic fracturing on public lands urged BLM to ban such extraction methods and to consider a “no leasing” alternative. Despite the public’s demands for serious consideration of these alternatives, the DEIS declined to analyze in detail any such alternatives that would (1) ban the use of well stimulation technologies on Federal mineral estate, (2) close all lands except existing leases, and (3) close all lands to oil and gas leasing,⁴¹ on the grounds that a ban or moratorium would not satisfy the BLM’s multiple-use responsibilities under the FLPMA.⁴² However, FLPMA does not mandate that every use be accommodated on every piece of land; rather, “multiple use” requires management of the public lands and their numerous natural resources so that they can be used for economic, recreational, and scientific purposes *without the infliction of permanent damage.* *Public Lands Council v. Babbitt*, 167 F.3d 1287, 1290 (10th Cir. 1999) (citing 43 U.S.C. § 1702 (c)) (emphasis added). BLM’s obligation to manage for multiple use does not mean that development *must* be allowed on a particular piece of public lands. *New Mexico ex rel. Richardson*, 565 F.3d at 710. Development is a *possible* use, which BLM must weigh against other possible uses—including conservation to protect environmental values, which are best assessed through the NEPA process. *Id.* Thus, an alternative that closes the proposed public lands to development does not necessarily violate the principle of multiple use, and the multiple use provision of FLPMA is not a sufficient reason to exclude more protective alternatives from consideration. *Id.*

BLM further claimed that while has the authority to deny individual permits, it does not have authority to deny all future well stimulation technologies. BLM does not provide any legal or factual basis for this claim, however. Courts have interpreted BLM’s authority under the Mineral Leasing Act (“MLA”) as discretionary and not as an absolute mandate to lease. In fact, the Ninth Circuit held that the MLA “allows the Secretary to lease such lands, but does not require him to do so . . . [T]he Secretary has discretion to refuse to issue any lease at all on a given tract” and affirmed the district court’s holding that the agencies failed to give the no action alternative meaningful consideration and thereby violated NEPA. *Bob Marshall All. v. Hodel*, 852 F.2d 1223, 1229-30 (9th Cir. 1988) (internal citations omitted).

BLM’s rejection of the no-fracking and no-leasing alternatives in this RMP is unsubstantiated and relies on a very narrow and outdated interpretation of BLM’s leasing and planning authority, particularly in an EIS development context. Because BLM is conducting an EIS review for this RMP, the requirement for analyzing or dismissing these alternatives is heightened. *See W. Watersheds Project v. Bureau of Land Mgmt.*, 721 F.3d 1264, 1274-75 (10th Cir. 2013) (“Regulations require both documents to incorporate a range of reasonable alternatives, but the depth of discussion and analysis required is different depending on whether the document is an EIS or an EA. For example, section 40 C.F.R. §1502.14 provides that an EIS

⁴⁰ DEIS, Appendix E Scoping Report at 2-1.

⁴¹ DEIS at 2-20.

⁴² DEIS at 2-23.

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cont.

should '[r]igorously explore . . . all reasonable alternatives,' and '[d]evote substantial treatment to each alternative' with 'detail.' *Id.* at (a)-(b).")

Thus BLM was required to “rigorously” explore all “reasonable” alternatives, and therefore to devote “substantial treatment” to the no-fracking and no-leasing alternatives. The reasonableness of the alternatives considered is measured against two guideposts. First, when considering agency actions taken pursuant to a statute, an alternative is reasonable only if it falls within the agency’s statutory mandate. *Westlands*, 376 F.3d at 866. Second, reasonableness is judged with reference to an agency’s objectives for a particular project.⁴³ See *Colo. Env’t Coalition v. Dombeck*, 185 F.3d 1162, 1174–75 (10th Cir. 1999); *Simmons v. U.S. Army Corps of Eng’rs*, 120 F.3d 664, 668–69 (7th Cir. 1997); *Idaho Conservation League v. Mumma*, 956 F.2d 1508, 1520 (9th Cir. 1992). The no-fracking and no-leasing alternatives are both reasonable alternatives because they meet both of these tests.

Under the first test, the BLM has explicit legal authority under NEPA, as well as under FLPMA and MLA, to adopt no-leasing or no-fracking alternatives as necessary to respond to the threats posed by climate change. BLM has broad discretion in determining when, how, and if fossil fuel resources are made available for leasing. The MLA states: “All lands subject to disposition under this Act which are known or believed to contain oil or gas deposits *may* be leased by the Secretary.” 30 U.S.C. § 226(a) (emphasis added); see also *Udall v. Tallman*, 30 U.S. 1, 4 (1965) (MLA “left the Secretary discretion to refuse to issue any lease at all on a given tract”); *Burglin v. Morton*, 527 F.2d 486, 488 (9th Cir. 1975) (“The permissive word ‘may’ in Section 226(a) allows the Secretary to lease such lands, but does not require him to do so.”). Although the MLA states that, for oil and gas, “[l]ease sales shall be held for each State where eligible lands are available at least quarterly,” quarterly leasing is *not required* if no lands are “eligible” and “available” due to factors including withdrawal from the operation of the MLA under FLPMA, allocation decisions under an applicable land management plan, need for additional environmental review, or exercise of Secretarial discretion. 30 U.S.C. § 226(b)(1)(A); see also 43 C.F.R. § 3120.1-1; U.S. Bureau of Land Management, Oil and Gas Leasing Reform, Instruction Memorandum No. 2010-117 (“Eligible lands include those identified in 43 C.F.R. § 3120.1-1 as being available for leasing (BLM Manual 3120, Competitive Leases). They are considered available for leasing when all statutory requirements have been met, including compliance with the NEPA, appropriate reviews have been conducted, and *lands have been allocated for leasing in the RMP* (BLM Handbook H-3101-1, Issuance of Leases).”) (emphasis added). Thus, a decision to allocate an area as ineligible for leasing through the planning process is contemplated by BLM’s regulations, contradicting any perceived requirement that BLM must lease the area.

The Secretary of the Interior also has authority under FLPMA to “withdraw” an area of federal land from oil and gas leasing to “maintain . . . public values” or for a “particular public purpose.” FLPMA defines a withdrawal as:

⁴³ While an agency may restrict its analysis to alternatives that suit the “basic policy objectives” of a planning action, *Seattle Audubon Soc’y v. Moseley*, 80 F.3d 1401, 1404 (9th Cir. 1996), it may do so only as long as “the statements of purpose and need drafted to guide the environmental review process . . . are not unreasonably narrow,” *Dombeck*, 185 F.3d at 1175.

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withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program . . .

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43 U.S.C. § 1702(j). FLPMA further provides that Congress declares that it is the policy of the United States that “the public lands [shall] be managed in a manner that will protect the quality of . . . air and atmospheric . . . values.” 43 U.S.C. § 1701(a)(8).

Furthermore, as stated previously, under FLPMA’s “multiple use and sustained yield” management directive, *id.* § 1701(a)(7), the federal government must manage public lands and resources in a manner that “takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land[.]” *id.* § 1702(3). Further, “[i]n managing the public lands the Secretary shall . . . take any action necessary to prevent unnecessary or undue degradation of the lands.” *Id.* § 1732(b).

Under these authorities, BLM is required not only to evaluate the impacts of federal oil and gas leasing to public lands, water, and wildlife resources, but to avoid harm to those resources whenever possible. Accordingly, the MLA and FLPMA provide BLM the legal authority to either decide not to lease particular lands, or to withdraw large tracts from leasing.⁴⁴

As to the second test, both of the no-fracking and no-leasing alternatives meet BLM’s objectives for the RMP. As set out in Section 1.1 of the DEIS, Purpose and Need for Amending the 2007 Hollister Resource Management Plan, BLM states:

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Through the RMPA, the BLM will identify which lands are open or closed to oil and gas leasing and which stipulations would be applied on oil and gas exploration and development activities *in order to protect environmental resources*.⁴⁵

Thus alternatives that prohibit or strictly limit new fossil fuel leasing meet the proposed action’s purpose and need. Banning the use of well stimulation technologies on Federal mineral estate and barring new leases to achieve national, regional and local greenhouse gas reduction goals would constitute protection of environmental resources for the Planning Area. A desired

⁴⁴ Even if BLM concludes that the agency lacks authority to bar new oil and gas leasing throughout the planning area, it should still consider such an alternative because it is otherwise reasonable. Federal courts hold that agencies have the duty to consider reasonable alternatives that are outside the jurisdiction of the agency or that require a change of law to implement. *See* 40 C.F.R. § 1502.14(c) (an EIS “shall” “[i]nclude reasonable alternatives not within the jurisdiction of the lead agency”); Council on Environmental Quality, Executive Office of the President, Publication of Memorandum to Agencies Containing Answers to 40 Most Asked Questions on NEPA Regulations, 46 Fed. Reg. 18,026–01 at 18,027 (1981) (“An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable”); *Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 814 (9th Cir. 1999) (setting aside EIS for failure to address alternative requiring Congressional action).

⁴⁵ DEIS at 1-3 (emphasis added).

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outcome for a reasonable alternative could be reducing the Planning Area’s contribution to climate pollution. It would establish that certain uses—oil and gas production—would be allowable only on current leases, and it would enable BLM to achieve a desired outcome of reducing the chance of catastrophic climate change and increasing the chance for the U.S. to reach its greenhouse gas reduction goals set by the Paris Agreement. As discussed above, such management direction would adhere to the law and BLM’s multiple use mandate. As such, a no or limited fossil fuel leasing alternative would meet the purpose and need for the RMP.

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The DEIS’s contemplated range of alternatives fails to satisfy its statutory obligation under FLPMA, as well as the purpose and need of the RMP. All of the DEIS alternatives propose to leave available extensive lands for fossil fuel leasing and development. Although acreage may reflect subtle differences between alternatives, there is virtually no change in the foreseeable range of oil and gas leasing and development, or in greenhouse gas emission rates across alternatives. Any difference in BLM’s range of alternatives is mere window-dressing for an RMP aimed at leaving all foreseeable fossil fuel resources fully available to exploitation. In effect, the agency’s alternatives analysis becomes little more than an exercise of form over substance. Not only is further consideration of no-leasing and no-fracking alternatives necessary in light of new information, science, and national policy related to climate change, but this information underscores the unreasonableness of the DEIS’s alternatives. This is particularly true of BLM’s preferred Alternative C, which leaves 368,800 acres open to oil and gas leasing, and commits the Planning Area to potentially several million tons of greenhouse gas emissions, every year, for the foreseeable future. This type of status quo approach to federal lands management is unhinged from current reality and the demands of the time.

B5-17

BLM failed in its basic obligation to consider all reasonable alternatives, including alternatives that would significantly reduce planning area greenhouse gas emissions, and in particular an alternative that considers not leasing public lands for fossil fuel development. 40 C.F.R. § 1502.14.

B. BLM Failed to Take a Hard Look at the Direct, Indirect and Cumulative Impacts of Fossil Fuel Development on Resource Values in the Planning Area

NEPA also imposes “action forcing procedures ... requir[ing] that agencies take a *hard look* at environmental consequences.” *Methow Valley*, 490 U.S. at 350 (citations omitted) (emphasis added). As discussed in greater detail below, the DEIS failed to take a hard look at several foreseeable and significant environmental consequences, including impacts to water resources, air quality, climate change, induced seismicity, human health and safety, and endangered, threatened, or other special status species.

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These “environmental consequences” may be direct, indirect, or cumulative. 40 C.F.R. §§ 1502.16, 1508.7, 1508.8. A cumulative impact – particularly important here – is defined as:

[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes

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such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

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40 C.F.R. § 1508.7.

It is general practice to evaluate the impacts of several related projects with cumulative impacts proposed or reasonably foreseeable in the same geographic region in a single, comprehensive, analysis.⁴⁶ The DEIS failed to include alternatives based on a cumulative impacts assessment. For example, the DEIS fails to consider the cumulative impact of oil and gas leases when aggregated with the environmental harm resulting from other types of land use, particularly those authorized by BLM leasing. Grazing activities in the CCFO/HFO jurisdiction already have a considerable impact on upland and riparian habitats and species. Failing to evaluate these impacts together with oil and gas leasing renders the DEIS cumulative impact analysis deficient.

We discuss below the several foreseeable and significant environmental impacts that the DEIS should have but failed to consider, including impacts to water resources, air quality, climate change, induced seismicity, human health and safety, and endangered, threatened, or other special status species.

V. BLM Failed to Take a Hard Look at Certain Impacts to Air Quality

Fugitive emissions can occur at every stage of extraction and production, often leading to high volumes of gas being released into the air. Oil and gas operations emit large amounts and a wide array of toxic air pollutants,⁴⁷ also referred to as Hazardous Air Pollutants, which are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.⁴⁸ Air pollutants emitted by unconventional oil and gas production include toxic BTEX compounds (benzene, toluene, ethylbenzene, and xylene); volatile organic compounds (VOCs) such as methylene chloride; nitrogen oxides (NOx); particulate matter (including diesel exhaust); alkanes (methane, ethane, propane); formaldehyde; hydrogen sulfide; silica; acid mists; sulfuric oxide; and radon gas.⁴⁹ These toxic air contaminants and smog-forming chemicals (such as VOCs, NOx, methane and ethane) threaten local communities and regional air quality.

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The reporting requirements recently implemented by the California South Coast Air Quality Management District (“SCAQMD”) have shown that at least 44 chemicals known to be

⁴⁶ See *Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976) (“when several proposals for . . . actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.”)

⁴⁷ Sierra Club et al. comments on New Source Performance Standards: Oil and Natural Gas Sector; Review and Proposed Rule for Subpart OOOO (Nov. 30, 2011) (“Sierra Club Comments”) at 13.

⁴⁸ See “About Hazardous Air Pollutants” at U.S. Environmental Protection Agency, Hazardous Air Pollutants, <https://www.epa.gov/haps> (accessed Jan 5, 2017)

⁴⁹ McKenzie, Lisa M. et al., Human Health Risk Assessment of Air Emissions From Development of Unconventional Natural Gas Resources, 424 *Science of the Total Environment* 79 (2012) (“McKenzie 2012”); Shonkoff, Seth B.C. et al., Environmental Public Health Dimensions of Shale and Tight Gas Development, 122 *Environmental Health Perspectives* 787 (2014) (“Shonkoff 2014”).

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air toxics have been used in fracking and other types of oil and gas operations in California.⁵⁰ Through the implementation of these new reporting requirements, it is now known that operators have been using several types of air toxics, including crystalline silica, methanol, hydrochloric acid, hydrofluoric acid, 2-butoxyethanol, ethyl glycol monobutyl ether, xylene, amorphous silica fume, aluminum oxide, acrylic polymer, acetophenone, and ethylbenzene. Many of these chemicals also appear on the U.S. EPA's list of hazardous air pollutants.⁵¹ EPA has also identified six "criteria" air pollutants that must be regulated under the National Ambient Air Quality Standards (NAAQS) due to their potential to cause primary and secondary health effects. As detailed below, concentrations of many of these pollutants—ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead—have been shown to increase in regions where unconventional oil and gas recovery techniques are permitted.

VOCs, from car and truck engines as well as the drilling and completion stages of oil and gas production, make up about 3.5 percent of the gases emitted by oil or gas operations.⁵² The VOCs emitted include the BTEX compounds – benzene, toluene, ethyl benzene, and xylene – which are listed as Hazardous Air Pollutants.⁵³ There is substantial evidence showing the grave harm from these pollutants.⁵⁴ Recent studies and reports confirm the pervasive and extensive amount of VOCs emitted by unconventional oil and gas extraction.⁵⁵ For example, a study covering sites near oil and gas wells in five different states including Colorado, Wyoming, Ohio, Pennsylvania, and Arkansas, found that concentrations of eight toxic volatile chemicals, including benzene, formaldehyde and hydrogen sulfide, exceeded federal health and safety standards, at times by several orders of magnitude.⁵⁶ Another study determined that vehicle traffic and engine exhaust were likely the sources of intermittently high dust and benzene concentrations observed near well pads.⁵⁷ Recent studies have found that oil and gas operations are likely responsible for elevated levels of hydrocarbons such as benzene downwind of the

⁵⁰ Center for Biological Diversity, *Air Toxics One Year Report* (June 2014) at 1.

⁵¹ U.S. Environmental Protection Agency, *The Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants*, Technology Transfer Network Air Toxics Web Site, available at <http://www.epa.gov/ttnatw01/orig189.html> (accessed July 29, 2015).

⁵² Brown, Heather, Memorandum to Bruce Moore, U.S.EPA/OAQPS/SPPD re Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking, July 28, 2011 ("Brown Memo") at 3.

⁵³ 42 U.S.C. § 7412(b).

⁵⁴ Colborn, T. et al., *Natural Gas Operations from a Public Health Perspective*, 17 *Human and Ecological Risk Assessment* 1039 (2011) ("Colborn 2011"); McKenzie 2012.

⁵⁵ McCawley, Michael., *Air, Noise, and Light Monitoring Plan for Assessing Environmental Impacts of Horizontal Gas Well Drilling Operations (ETD-10 Project)*, West Virginia University School of Public Health, Morgantown, WV (2013) ("McCawley 2013"), available at <http://www.dep.wv.gov/oil-and-gas/Horizontal-Permits/legislativestudies/Documents/WVU%20Final%20Air%20Noise%20Light%20Protocol.pdf>; Center for Biological Diversity, *Dirty Dozen: The 12 Most Commonly Used Air Toxics in Unconventional Oil Development in the Los Angeles Basin* (Sept. 2013).

⁵⁶ Macey, Gregg P. et al., *Air Concentrations of Volatile Compounds Near Oil and Gas Production: A Community-Based Exploratory Study*, 13 *Environmental Health* 82 (2014) at 1.

⁵⁷ McCawley 2013.

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Denver-Julesburg Fossil Fuel Basin, north of Denver.⁵⁸ Another study found that oil and gas operations in this area emit approximately 55 percent of the VOCs in northeastern Colorado.⁵⁹

VOCs, NO_x, methane, and ethane are potent ground-level (tropospheric) ozone precursors that are emitted by oil and gas drilling and fracking operations. Ozone can result in serious health conditions, including heart and lung disease and mortality.⁶⁰ Exposure to elevated levels of ozone is estimated to be cause ~10,000 premature deaths per year in the United States.⁶¹ VOCs can form ground-level (tropospheric) ozone when combined with nitrogen oxides (“NO_x”) from compressor engines, turbines, other engines used in drilling, and flaring,⁶² in the presence of sunlight. This reaction can diminish visibility and air quality and harm vegetation. Many regions around the country with substantial oil and gas operations are now suffering from extreme ozone levels due to heavy emissions of these pollutants.⁶³ A recent study of ozone pollution in the Uintah Basin of northeastern Utah, a rural area that experiences hazardous tropospheric ozone concentrations, found that oil and gas operations were responsible for 98 to 99 percent of VOCs and 57 to 61 percent of NO_x emitted from sources within the Basin considered in the study’s inventory.⁶⁴

Ground-level ozone can also be caused by methane, which is leaked and vented at various stages of unconventional oil and gas development, as it interacts with nitrogen oxides and sunlight.⁶⁵ In addition to its role as a potent greenhouse gas, methane’s effect on ozone concentrations can be substantial. One paper modeled reductions in various anthropogenic ozone precursor emissions and found that “[r]educing anthropogenic CH₄ emissions by 50% nearly halves the incidence of U.S. high-O₃ events”⁶⁶

⁵⁸ Pétron, G. et al., Hydrocarbon Emissions Characterization in the Colorado Front Range – A Pilot Study, 117 *J. Geophysical Research* D04304 (2012) at 8, 13 (“Pétron 2012”).

⁵⁹ Gilman, Jessica B. et al., Source Signature of Volatile Organic Compounds from Oil and Natural Gas Operations in Northeastern Colorado, 47 *Environmental Science & Technology* 1297 (2013) at 1297, 1303 (“Gilman 2013”).

⁶⁰ U.S. Environmental Protection Agency, Integrated Science Assessment (ISA) for Ozone (O₃) and Related Photochemical Oxidants (2013).

⁶¹ Caiazzo, Fabio et al., Air Pollution and Early Deaths in the United States. Part I: Quantifying the Impact of Major Sectors in 2005, 79 *Atmospheric Environment* 198 (2013).

⁶² See, e.g., U.S. Environmental Protection Agency, Oil and Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution: Background Technical Support Document for Proposed Standards at 3-6 (July 2011); Armendariz, Al, Emissions for Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements (2009) (“Armendariz 2009”) at 24.

⁶³ Armendariz 2009 at 1, 3, 25-26; Koch, Wendy, *Wyoming’s Smog Exceeds Los Angeles’ Due to Gas Drilling*, USA Today (May 9, 2011); Craft, Elena, Environmental Defense Fund, Do Shale Gas Activities Play a Role in Rising Ozone Levels? (2012); Colorado Dept. of Public Health and Environment, Conservation Commission, Colorado Weekly and Monthly Oil and Gas Statistics (July 6, 2012) at 12.

⁶⁴ Lyman, Seth & Howard Shorthill, Final Report: 2012 Uintah Basin Winter Ozone & Air Quality Study, Utah Department of Environmental Quality (2013) (“Lyman 2013”); see also Gilman 2013.

⁶⁵ Fiore, Arlene et al., Linking Ozone Pollution and Climate Change: The Case for Controlling Methane, 29 *Geophys. Res. Letters* 19 (2002) (“Fiore 2002”); U.S. Environmental Protection Agency, Oil and Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews Proposed Rule, 76 Fed. Reg. 52,738 (Aug 23, 2011).

⁶⁶ Fiore 2002; see also Martin, Randal et al., Final Report: Uinta Basin Winter Ozone and Air Quality Study Dec 2010 - March 2011 (2011) at 7.

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Ethane is also a potent precursor of ground-based ozone pollution as it breaks down and reacts with sunlight to create smog, as well as being a greenhouse gas. Ethane emissions have risen steeply in recent years due to U.S. oil and gas production. A recent study documented that ethane emissions in the Northern Hemisphere increased by about 400,000 tons annually between 2009 and 2014, with the majority coming from North American oil and gas activity, reversing a decades-long decline in ethane emissions.⁶⁷ Shockingly, about 60 percent of the drop in ethane levels that occurred over the past 40 years has already been made up in the past five years. At this rate, U.S. ethane levels are expected to hit 1970s levels in about three years. About two percent of global ethane emissions originate from the Bakken Shale oil and gas field alone, which emits 250,000 tons of ethane per year.⁶⁸ Because global ethane levels were decreasing until 2009, the U.S. shale gas boom is thought to be responsible for the global increase in levels since 2010.

Oil and gas operations can also emit hydrogen sulfide. The hydrogen sulfide is contained in the natural gas and makes that gas “sour.”⁶⁹ Hydrogen sulfide may be emitted during all stages of operation, including exploration, extraction, treatment and storage, transportation, and refining. Long-term exposure to hydrogen sulfide is linked to respiratory infections, eye, nose, and throat irritation, breathlessness, nausea, dizziness, confusion, and headaches.⁷⁰

The oil and gas industry is also a major source of particulate matter. The heavy equipment regularly used in the industry burns diesel fuel, generating fine particulate matter⁷¹ that is especially harmful.⁷² Vehicles traveling on unpaved roads also kick up fugitive dust, which is particulate matter.⁷³ Further, both NO_x and VOCs, which as discussed above are heavily emitted by the oil and gas industry, are also particulate matter precursors.⁷⁴ Some of the health effects associated with particulate matter exposure are “premature mortality, increased hospital admissions and development of chronic respiratory disease.”⁷⁵

Fracking results in additional air pollution that can create a severe threat to human health. One analysis found that 37 percent of the chemicals found at fracked gas wells were volatile, and that of those volatile chemicals, 81 percent can harm the brain and nervous system, 71 percent

⁶⁷ Helmig, Detlev et al., Reversal of Global Atmospheric Ethane and Propane Trends Largely Due to US Oil and Natural Gas Production. 9 *Nature Geoscience* 490 (2016).

⁶⁸ Kort, Eric A. et al., Fugitive Emissions From the Bakken Shale Illustrate Role of Shale Production in Global Ethane Shift. 43 *Geophysical Research Letters* 4617 (2016).

⁶⁹ Sierra Club Comments.

⁷⁰ U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Report to Congress on Hydrogen Sulfide Air Emissions Associated with the Extraction of Oil and Natural Gas (EPA-453/R-93-045) at i (Oct. 1993) (“USEPA 1993”).

⁷¹ Earthworks, *Sources of Oil and Gas Pollution* (2011).

⁷² Bay Area Air Quality Management District, *Particulate Matter Overview, Particulate Matter and Human Health* (2012).

⁷³ U.S. Environmental Protection Agency, *Regulatory Impact Analysis for the Proposed Revisions to the National Ambient Air Quality Standards for Particulate Matter* (June 2012).

http://www.epa.gov/tneacas1/regdata/RIAs/PMRIACombinedFile_Bookmarked.pdf 2-2, (“EPA RIA”)

⁷⁴ EPA RIA at 2-2.

⁷⁵ U.S. Environmental Protection Agency, *National Ambient Air Quality Standards for Particulate Matter Proposed Rule*, 77 Fed. Reg. 38,890, 38,893 (June 29, 2012).

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can harm the cardiovascular system and blood, and 66 percent can harm the kidneys.⁷⁶ The SCAQMD has identified three areas of dangerous and unregulated air emissions from fracking: (1) the mixing of the fracking chemicals; (2) the use of the silica, or sand, as a proppant, which causes the deadly disease silicosis; and (3) the storage of fracking fluid once it comes back to the surface.⁷⁷ Preparation of the fluids used for well completion often involves onsite mixing of gravel or proppants with fluid, a process which potentially results in major amounts of particulate matter emissions.⁷⁸ Further, these proppants often include silica sand, which increases the risk of lung disease and silicosis when inhaled.⁷⁹ Finally, as flowback returns to the surface and is deposited in pits or tanks that are open to the atmosphere, there is the potential for organic compounds and toxic air pollutants to be emitted, which are harmful to human health as described above.⁸⁰

The EIS should study the potential for oil and gas operations sites in the planning area to emit such air toxics and any other pollutants that may pose a risk to human health, paying particular attention to the impacts of air pollution on environmental justice communities that already bear the burden of disproportionately high levels of air pollution.

The EIS should rely on the most up-to-date information regarding the contribution of oil and gas operations to air pollution levels. Numerous studies demonstrate that state and federal emissions inventories significantly underestimate the levels of hazardous air pollution coming from oil and gas drilling and fracking operations. For example, aerial surveys of more than 8,000 oil and gas wells in seven US regions found that well pads emit considerably more methane and VOCs that captured by existing inventories.⁸¹ Recent studies in Weld County, Colorado, show that existing emissions inventories likely underestimate the contribution of oil and gas operations to VOC levels by at least a factor of two, and that benzene emissions are underestimated by four to nine times.⁸² These studies suggest that the health risk assessments conducted using these inventories are inaccurate and underestimate exposures and health risks.⁸³ Similarly, the assessment of fracking in California by the California Council on Science and Technology found that current inventory methods underestimate methane and VOC emissions from oil and gas operations.⁸⁴

⁷⁶ Colborn 2011 at 8.

⁷⁷ South Coast Air Quality Management District, Draft Staff Report on Proposed Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (January 2013), at 15 (“SCAQMD Draft Staff Report PR1148-2”).

⁷⁸ *Id.*

⁷⁹ South Coast Air Quality Management District, Response to Questions re Air Quality Risks of Hydraulic Fracturing in California, Submission to Joint Senate Hearing (2013) at 3.

⁸⁰ SCAQMD Draft Staff Report PR1148-2 at 15.

⁸¹ Lyon, David R. et al., Aerial Surveys of Elevated Hydrocarbon Emissions From Oil and Gas Production Sites, 50 *Environmental Science & Technology* 4877 (2016).

⁸² Pétron 2012 at 1, 18 (noting state and federal inventories likely underestimate hydrocarbon emissions from oil and gas operations by as much as factor of two); Pétron, Gabrielle et al., A New Look at Methane and Non-Methane Hydrocarbon Emissions from Oil and Natural Gas Operations in the Colorado Denver-Julesburg Basin, 119 *J. Geophysical Research: Atmospheres* 6836 at 6836 (“Pétron 2014”).

⁸³ Pétron 2014.

⁸⁴ Brandt, Adam et al., Air quality impacts from well stimulation. In California Council on Science and Technology, *An Independent Assessment of Well Stimulation in California*, Volume 2, Chapter 3 (2015) (“CCST 2015”).

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1. California

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Experimental studies of air quality in California indicate that current inventory methods underestimate methane and VOC emissions from oil and gas operations.⁸⁵ One recent analysis found that NO_x emissions from oil and gas operations in Kern County are significantly underestimated.⁸⁶ Numerous studies also indicate that methane emissions in California may be underestimated by 30 to 80 percent by the state greenhouse gas inventory.⁸⁷ In the Los Angeles Basin, fossil fuel sources are the primary source of methane emissions, estimated to contribute 56 to 70 percent of total methane, with leakage from natural gas infrastructure and local oil and gas operations being the most important contributors.⁸⁸ One recent state-wide study estimated that methane emissions from the oil and gas production sector were 3 to 7 times higher than reflected in the state inventory.⁸⁹

An independent analysis by the California Council on Science and Technology (CCST) determined that fracking in California occurs disproportionately in areas already suffering from serious air quality problems. The two largest oil and gas-producing regions in California are in the San Joaquin and South Coast air basins which are classified as “extreme” nonattainment areas for ozone.⁹⁰ According to an analysis by the CCST, in the San Joaquin Valley, oil and gas facilities “emit significant air toxics,” including 30 percent of sulfur oxides, 70 percent of hydrogen sulfide, and 8 percent of anthropogenic VOCs, which in turn react with nitrogen oxides (NO_x) to create ozone.⁹¹ Another study estimated that 22 percent of VOCs in the San Joaquin Valley came from petroleum operations, which was higher than the state inventory.⁹² In Kern County, oil and gas production is the dominant sources of hydrogen sulfide (96 percent) and a major contributor to emissions of benzene (9 percent), formaldehyde (26 percent), hexane (11 percent), and xylene (14 percent).⁹³

⁸⁵ CCST 2015.

⁸⁶ Sahu, Ranajit, On the Underestimation of NO_x Emissions from Oil Well Drilling Activities in Kern County, CA (2015).

⁸⁷ Hopkins, Francesca M. et al., Spatial Patterns and Source Attribution of Urban Methane in the Los Angeles Basin, 121 *J. Geophysical Research: Atmospheres* 249 (2016) (“Hopkins 2016”); Jeong, Seongeun et al., Estimating Methane Emissions in California’s Urban and Rural Regions Using Multitower Observations, 121 *J. Geophysical Research: Atmospheres* 13031 (2016).

⁸⁸ Wennberg, Paul O. et al., On the Sources of Methane to the Los Angeles Atmosphere, 46 *Environmental Science & Technology* 9282; Peischl, Jeff et al., Quantifying sources of methane using light alkanes in the Los Angeles basin, California, 118 *J. Geophysical Research Atmospheres* 1 (2013); Hopkins 2016.

⁸⁹ Jeong, Seongeun et al., Spatially Explicit Methane Emissions from Petroleum Production and the Natural Gas System in California, 48 *Environmental Science & Technology* 5982 (2014).

⁹⁰ Long, Jane C.S. et al., Introduction, In California Council on Science and Technology, *An Independent Assessment of Well Stimulation in California*, Volume 2, Chapter 1 (2015) (“Long CCST 2015”) at 44; See also Center for Biological Diversity Map of Nonattainment Areas in the Central Coast Field Office Planning Area (2017), attached as Exhibit A.

⁹¹ Long CCST 2015 at 42.

⁹² Gentner, Drew et al., Emissions of Organic Carbon and Methane from Petroleum and Dairy Operations in California’s San Joaquin Valley, 14 *Atmospheric Chemistry and Physics* 4955 (2014).

⁹³ Shonkoff, Seth & Donald Gautier, A Case Study of the Petroleum Geological Potential and Potential Public Health Risks Associated with Hydraulic Fracturing and Oil and Gas Development in The Los Angeles Basin, In California Council on Science and Technology, *An Independent Assessment of Well Stimulation in California*, Volume 3, Chapter 4 (2015).at 268.

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The CCST analysis highlights that while many toxic air pollutants are being used in well stimulation, there are significant information gaps on how much of these chemicals escape into the air, how far they travel, and how big the risk of exposure to those living nearby. Air contaminants known to be emitted during the well-stimulation-enabled oil and gas development in California include toxic BTEX compounds, formaldehyde, hydrogen sulfide, particulate matter, nitrogen oxides, sulfur dioxide, polycyclic aromatic, aliphatic, and aromatic hydrocarbons, and volatile organic compounds.⁹⁴ Although many air contaminants used in well stimulation are hazardous to human health, there are no studies of air quality impacts of well stimulation in California,⁹⁵ including how much of these chemicals escape into the air.⁹⁶ What is known is that people living close to oil and gas production have higher potential exposure to toxic air emissions and higher risk of associated health harms.⁹⁷

More fundamentally, there are significant data gaps regarding what chemicals are used in oil and gas extraction. State disclosure requirements only cover hydraulic fracturing and other types of well stimulation. There are no disclosure requirements for drilling, well completion, well maintenance, enhanced oil recovery, and other processes.⁹⁸ As a result, there is little information regarding what kinds of chemicals are being used, and what risks they pose to public health and safety and the environment. Still others are protected under claims of trade secrecy.⁹⁹ Even for chemicals that have been identified, many have little to no publicly available information regarding their toxicity.¹⁰⁰

What little information we have regarding chemicals used in these processes reveals that many pose a threat to health and the environment. A recent survey found that, of the chemicals that could be identified, 46 were potential chemicals of concern.¹⁰¹ Of the 173 different chemical additives used in the oil and gas development process, over a third could not be identified.¹⁰²

2. Sources of Air Emissions

Harmful air pollutants are emitted during every stage of oil and gas development, including drilling, completion, well stimulation, production, and disposal, as well as from

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⁹⁴ Long CCST 2015 at 410.

⁹⁵ *Id.* at 250.

⁹⁶ *Id.* at 183, 250, 409.

⁹⁷ *Id.* at 44.

⁹⁸ Shonkoff, Seth et al., Preliminary Hazard Assessment of Chemical Additives Used in Oil and Gas Fields that Reuse Their Produced Water for Agricultural Irrigation in The San Joaquin Valley of California, PSE Healthy Energy (2016). (“Shonkoff 2016”)

⁹⁹ Shonkoff 2016 at 7 (finding 38 percent of chemicals withheld from disclosure to California Regional Water Quality Control Board investigation).

¹⁰⁰ *Id.* at 13.

¹⁰¹ *Id.*

¹⁰² *Id.*

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transportation of water, sand, chemicals, and to and from the well pad.¹⁰³ The well stimulation stage can emit diesel exhaust, VOCs, particulate matter, ozone precursors, silica, and acid mists.¹⁰⁴ Drilling and casing the wellbore require substantial power from large equipment. The engines used typically run on diesel fuel, which emits particularly harmful types of air pollutants when burned. Similarly, high-powered pump engines are used in the fracturing and completion phase. This too can amount in large volumes of air pollution. Flaring, venting, and fugitive emissions of gas are also a potential source of air emissions. Gas flaring and venting can occur in both oil and gas recovery processes when underground gas rises to the surface and is not captured as part of production. Emissions from flaring typically include carbon monoxide, nitrogen oxides, benzene, formaldehyde and xylene, but levels of these smog-forming compounds are seldom measured directly.¹⁰⁵

Fugitive emissions can occur at every stage of extraction and production, often leading to high volumes of gas being released into the air. Methane emissions from oil and gas production is as much as 270 percent greater than previously estimated by calculation.¹⁰⁶ Recent studies show that emissions from pneumatic valves (which control routine operations at the well pad by venting methane during normal operation) and fugitive emissions are higher than EPA estimates.¹⁰⁷

Fracking can pollute air hundreds of miles from the well pad. For example, ethane pollution in Baltimore, Maryland and Washington, D.C., has been attributed to the rapidly increasing natural gas production in the upwind, neighboring states of Pennsylvania and West Virginia.¹⁰⁸

Evaporation from pits can also contribute to air pollution. Pits that store drilling waste, produced water, and other waste fluid may be exposed to the open air. Chemicals mixed with the wastewater—including the additives used to make fracking fluids, as well as volatile hydrocarbons, such as benzene and toluene, brought to the surface with the waste—can escape into the air through evaporation. Some pits are equipped with pumps that spray effluents into the air to hasten the evaporation process. For example, evaporation from fracking waste pits in western Colorado was found to have added tons of toxic chemicals to the air, increasing air

¹⁰³ McCawley, Michael, Abstract: Air Contaminants Associated with Potential Respiratory Effects from Unconventional Resource Development Activities, 36 *Seminars in Respiratory and Critical Care Medicine* 379 (2015); Shonkoff 2014.

¹⁰⁴ *Id.*

¹⁰⁵ Physicians for Social Responsibility and Concerned Health Professionals of NY, *Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking*, Fourth Edition, November 17, 2016 (“PSR 2016”).

¹⁰⁶ Miller, S. M. et al. Anthropogenic Emissions of Methane in the United States, *Proc. Natl. Acad. Sci.* Early Edition, DOI: 10.1073/pnas.1314392110 (2013).

¹⁰⁷ Allen, David et al., Measurements of Methane Emissions at Natural Gas Production Sites in The United States, 110 *PNAS* 17768 (2013) (“Allen 2013”); Harriss, Robert et al., Using Multi-Scale Measurements to Improve Methane Emission Estimates from Oil and Gas Operations in the Barnett Shale Region, Texas, 49 *Environ. Sci. Technol.* 7524 (2015) (“Harriss 2015”).

¹⁰⁸ Vinciguerra, Timothy et al., Regional Air Quality Impacts of Hydraulic Fracturing and Shale Natural Gas Activities: Evidence From Ambient VOC Observations. 110 *Atmospheric Environment* 144 (2015).

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pollution in Utah.¹⁰⁹ In Texas, toxic air emissions from fracking waste pits are unmonitored and unregulated.¹¹⁰ In California, unlined disposal pits for drilling and fracking waste are documented sources of contamination.¹¹¹ Even where waste fluid is stored in so-called “closed loop” storage tanks, fugitive emissions can escape from tanks.

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As mentioned above, increased truck traffic will lead to more air emissions. Trucks capable of transporting large volumes of chemicals and waste fluid typically use large engines that run on diesel fuel. Air pollutants from truck engines will be emitted not only at the well site, but also along truck routes to and from the site.

The EIS must provide an adequate analysis and disclosure of the effects the lease sale could have on air quality, including the impacts that would result from fracking. The EAs cannot postpone the discussion of air pollution and climate change impacts until site-specific plans are proposed. Because BLM must analyze impacts at “the earliest practicable time,” and no benefit would be gained from postponing the analysis, BLM must discuss these cumulative impacts before the lease sale.

3. Impact of Increased Air Pollution

The potential harms resulting from increased exposure to the dangerous air pollutants from unconventional oil and gas development are serious and wide ranging. A growing body of scientific research has documented adverse public health impacts from unconventional oil and gas development, including studies showing air pollutants at levels associated with reproductive and developmental harms and the increased risk of morbidity and mortality.¹¹² A comprehensive review of the risks and harms of fracking to public health came to several key findings related to air pollution: (1) “drilling and fracking emissions contribute to toxic air pollution and smog (ground-level ozone) at levels known to have health impacts,” (2) “public health problems associated with drilling and fracking, including reproductive impacts and occupational health and safety problems, are increasingly well documented”; and (3) “fracking infrastructure poses serious potential exposure risks to those living near it.”

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¹⁰⁹ Maffey, Brian, *Utah grapples with toxic water from oil and gas industry*, The Salt Lake Tribune, August 28, 2014, available at <http://archive.sltrib.com/story.php?ref=/sltrib/news/58298470-78/danish-flats-ponds-company.html.csp>; The company responsible for the waste pits was found to have operated without a permit, underreported emissions and provided erroneous data to regulators.

¹¹⁰ Hasemyer, David & Zahra Hirji, *Open pits offer cheap disposal for fracking sludge, but health worries mount*, Center for Public Integrity (2014)

¹¹¹ Stringfellow, William T. et al., *Impacts of Well Stimulation on Water Resources*, In California Council on Science and Technology, *An Independent Assessment of Well Stimulation in California*, Volume 2, Chapter 2 (2015) (“Stringfellow CCST 2015”) at 110-113.

¹¹² Hays, Jake & Seth B.C. Shonkoff, *Towards an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature*, 11 PLoS ONE e0154164 (2016); Shonkoff 2014; Webb, Ellen et al., *Developmental and reproductive effects of chemicals associated with unconventional oil and natural gas operations*, 29 *Rev Environ Health* 307 (2014); McKenzie 2012; Clean Air Task Force, *Fossil Fumes: A Public Health Analysis of Toxic Air Pollution From the Oil and Gas Industry*, June 2016, available at <http://www.catf.us/resources/publications/files/FossilFumes.pdf>.

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Air toxics and hazardous air pollutants, by definition, can result in harm to human health and safety. Understanding the full extent of the health effects of exposure is still far from being complete, but already there are numerous studies that have found these chemicals to have serious health consequences for humans exposed to even minimal amounts. The negative effects of criteria pollutants are well documented and are summarized by the U.S. EPA's website:

Nitrogen oxides (NO_x) react with ammonia, moisture, and other compounds to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. NO_x and volatile organic compounds react in the presence of heat and sunlight to form ozone.

Particulate matter (PM) - especially fine particles - contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease, increased mortality, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.¹¹³

Sulfur Dioxide (SO₂) – has been shown to cause an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms.¹¹⁴ Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.¹¹⁵

Carbon Monoxide (CO) can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death.¹¹⁶ Exposure to CO can reduce the oxygen-carrying capacity of the blood. People with several types of heart disease already have a reduced capacity for pumping oxygenated blood to the heart, which can cause them to experience myocardial ischemia (reduced oxygen to the heart), often accompanied by chest pain (angina), when exercising or under increased stress.¹¹⁷ For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion.¹¹⁸

¹¹³ U.S. Environmental Protection Agency, Particulate Matter, (PM) <http://www.epa.gov/airquality/particlepollution/health.html> (accessed July 30, 2015); Ostro, Bart et al., Long-term Exposure to Constituents of Fine Particulate Air Pollution and Mortality: Results from the California Teachers Study, 118 *Environmental Health Perspectives* 3 (2010).

¹¹⁴ U.S. Environmental Protection Agency, Sulfur Dioxide <http://www.epa.gov/airquality/sulfurdioxide/health.html>, available at (accessed July 29, 2015).

¹¹⁵ *Id.*

¹¹⁶ U.S. Environmental Protection Agency, Carbon Monoxide, available at <http://www.epa.gov/airquality/carbonmonoxide/health.html> (accessed July 29, 2015).

¹¹⁷ *Id.*

¹¹⁸ *Id.*

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Ozone (O₃) can trigger or worsen asthma and other respiratory ailments.¹¹⁹ Ground level ozone can have harmful effects on sensitive vegetation and ecosystems. Ozone may also lead to loss of species diversity and changes to habitat quality, water cycles, and nutrient cycles.

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cont.

The range of illnesses that can result from the wide array of air pollutants from fracking were summarized in a study by Dr. Theo Colburn, which charts which chemicals have been shown to be linked to certain illnesses.¹²⁰ This study analyzed air samples taken during drilling operations near natural gas wells and residential areas in Garfield County, and detected 57 chemicals between July 2010 and October 2011, including 44 with reported health effects.¹²¹ For example:

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Thirty-five chemicals were found to affect the brain/nervous system, 33 the liver/metabolism, and 30 the endocrine system, which includes reproductive and developmental effects. The categories with the next highest numbers of effects were the immune system (28), cardiovascular/blood (27), and the sensory and respiratory systems (25 each). Eight chemicals had health effects in all 12 categories. There were also several chemicals for which no health effect data could be found.¹²²

The study found extremely high levels of methylene chloride, which may be used as cleaning solvents to remove waxy paraffin that is commonly deposited by raw natural gas in the region. These deposits solidify at ambient temperatures and build up on equipment.¹²³ While none of the detected chemicals exceeded governmental safety thresholds of exposure, the study noted that such thresholds are typically based on “exposure of a grown man encountering relatively high concentrations of a chemical over a brief time period, for example, during occupational exposure.”¹²⁴ Consequently, such thresholds may not apply to individuals experiencing “chronic, sporadic, low-level exposure,” including sensitive populations such as children, the elderly, and pregnant women.¹²⁵ For example, the study detected polycyclic aromatic hydrocarbon (PAH) levels that could be of “clinical significance,” as recent studies have linked low levels of exposure to lower mental development in children who were prenatally exposed.¹²⁶ In addition, government safety standards do not take into account “the kinds of effects found from low-level exposure to endocrine disrupting chemicals..., which can be particularly harmful during prenatal development and childhood.”¹²⁷

¹¹⁹ U.S. Environmental Protection Agency, Ground Level Ozone, available at <http://www.epa.gov/airquality/ozonepollution/health.html> (accessed July 29, 2015).

¹²⁰ Colborn 2011; Colborn, Theo et al., An Exploratory Study of Air Quality Near Natural Gas Operations, 20 Human and Ecological Risk Assessment: An International Journal 1 (2012) (“Colborn 2012”); see note 120 & accompanying text below.

¹²¹ Colborn 2012 at pp. 21-22 (pages refer to page numbers in attached manuscript and not journal pages).

¹²² Colborn 2012 at 11.

¹²³ *Id.* at 10.

¹²⁴ *Id.* at 11-12.

¹²⁵ *Id.* at 12.

¹²⁶ *Id.* at 10-11.

¹²⁷ *Id.* at 12.

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cont.

Adverse health impacts documented among residents living near drilling and fracking operations include reproductive harms, increased asthma attacks, increased rates of hospitalization, ambulance runs, emergency room visits, self-reported respiratory problems and rashes, motor vehicle fatalities, trauma, and drug abuse. A recent review concluded:

By several measures, evidence for fracking-related health problems is emerging across the United States. In Pennsylvania, as the number of gas wells increase in a community, so do rates of hospitalization. Drilling and fracking operations are correlated with elevated motor vehicle fatalities (Texas), asthma (Pennsylvania), self-reported skin and respiratory problems (southwestern Pennsylvania), ambulance runs and emergency room visits (North Dakota), infant deaths (Utah), birth defects (Colorado), high risk pregnancies (Pennsylvania), premature birth (Pennsylvania), and low birthweight (multiple states). Benzene levels in ambient air surrounding drilling and fracking operations are sufficient to elevate risks for future cancers in both workers and nearby residents, according to studies. Animal studies show that two dozen chemicals commonly used in fracking operations are endocrine disruptors that can variously disrupt organ systems, lower sperm counts, and cause reproductive harm at levels to which people can be realistically exposed.¹²⁸

A rigorous study by Johns Hopkins University, which examined 35,000 medical records of people with asthma in Pennsylvania, found that people who live near a higher number of, or larger, active gas wells were 1.5 to 4 times more likely to suffer from asthma attacks than those living farther away, with the closest groups having the highest risk.¹²⁹ Increased asthma risks occurred during all phases of well development. A recent Yale University study identified numerous fracking chemicals that are known, probable, or possible human carcinogens (20 air pollutants) and/or are linked to increased risk for leukemia and lymphoma (11 air pollutants), including benzene, 1,3-butadiene, cadmium, diesel exhaust, and polycyclic aromatic hydrocarbons.¹³⁰

Numerous studies suggest that higher maternal exposure to fracking and drilling can increase the incidence of high-risk pregnancies, premature births, low-birthweight babies, and birth defects. A study of 9,384 pregnant women in Pennsylvania found that women who live near active drilling and fracking sites had a 40 percent increased risk for having premature birth and a 30 percent increased risk for having high-risk pregnancies.¹³¹ Another study found that pregnant women who had greater exposure to gas wells (measured in terms of proximity and density of wells) had a much higher risk of having low-birthweight babies; the researchers identified air

¹²⁸ PSR 2016 at 93.

¹²⁹ Rasmussen, Sara G. et al., Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations, 176 JAMA Internal Medicine 1334 (2016).

¹³⁰ Elliott, Elise G. et al., A Systematic Evaluation of Chemicals in Hydraulic-Fracturing Fluids and Wastewater for Reproductive and Developmental Toxicity, 27 Journal of Exposure Science and Environmental Epidemiology 90 (2016).

¹³¹ Casey, Joan A., Unconventional Natural Gas Development and Birth Outcomes in Pennsylvania, USA, 27 Epidemiology 163 (2016).

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cont.

pollution as the likely route of exposure.¹³² In rural Colorado, mothers with greater exposure to natural gas wells were associated with a higher risk of having babies with congenital heart defects and possibly neural tube defects.¹³³

Other studies have found that residents living closer to drilling and fracking operations had higher hospitalization rates¹³⁴ and reported more health symptoms, including upper respiratory problems and rashes.¹³⁵

Workers suffer high risks from toxic exposure and accidents.¹³⁶ As summarized by a recent review:

Drilling and fracking jobs are among the most dangerous jobs in the nation with a fatality rate that is five times the national average and shows no sign of abating. Occupational hazards include head injuries, traffic accidents, blunt trauma, burns, inhalation of hydrocarbon vapors, toxic chemical exposures, heat exhaustion, dehydration, and sleep deprivation. An investigation of occupational exposures found high levels of benzene in the urine of wellpad workers, especially those in close proximity to flowback fluid coming up from wells following fracturing activities. Exposure to silica dust, which is definitively linked to silicosis and lung cancer, was singled out by the National Institute for Occupational Safety and Health as a particular threat to workers in fracking operations where silica sand is used. At the same time, research shows that many gas field workers, despite these serious occupational hazards, are uninsured or underinsured and lack access to basic medical care.¹³⁷

Methods of collecting and analyzing emissions data often underestimate health risks by failing to adequately measure the intensity, frequency, and duration of community exposure to toxic chemicals from fracking and drilling; failing to examine the effects of chemical mixtures; and failing to consider vulnerable populations.¹³⁸ Of high concern, numerous studies highlight that health assessments drilling and fracking emissions often fail to consider impact on

¹³² Stacy, Shaina L. et al., Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania. 10 PLoS ONE e0126425 (2015).

¹³³ McKenzie, Lisa M., Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, 122 Environmental Health Perspectives 412 (2014).

¹³⁴ Jemielita, Thomas et al., Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates. 10 PLoS ONE e0131093 (2015).

¹³⁵ Rabinowitz, Peter M. et al., Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania, 123 Environmental Health Perspectives 21 (2015).

¹³⁶ Esswein, Eric J. et al., Occupational Exposures to Respirable Crystalline Silica During Hydraulic Fracturing, 10 Journal of Occupational and Environmental Hygiene 347 (2013); Esswein, Eric et al., Evaluation of Some Potential Chemical Exposure Risks during Flowback Operations in Unconventional Oil and Gas Extraction: Preliminary Results, 11 Journal of Occupational and Environmental Hygiene D174 (2013); Harrison, Robert J. et al., Sudden Deaths Among Oil and Gas Extraction Workers Resulting from Oxygen Deficiency and Inhalation of Hydrocarbon Gases and Vapors — United States, January 2010–March 2015, 65 Morb Mortal Wkly Rep 6 (2016); PSR 2016.

¹³⁷ PSR 2016 at 80

¹³⁸ Brown, David et al., Understanding Exposure From Natural Gas Drilling Puts Current Air Standards to the Test, 29 Reviews on Environmental Health 277 (2014).

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vulnerable populations including environmental justice communities¹³⁹ and children.¹⁴⁰ For example, a recent analysis of oil and gas development in California found that 14 percent of the state’s population (5.4 million people) live within a mile of at least one oil and gas well. More than a third of these people (1.8 million) also live in areas most burdened by environmental pollution.¹⁴¹

B5-23
cont.

The DEIS should incorporate a literature review of the harmful effects of each of these chemicals known to be used in fracking and other types of oil and gas operations. Without knowing the effects of each chemical, the DEIS cannot accurately project the true impact of unconventional or conventional oil and gas extraction.

VI. BLM Failed to Take a Hard Look at Climate Change Impacts

The DEIS contains a highly generalized discussion of climate change, in its description of “current conditions and trends” citing to the 2009 Biennial Report of the California Climate Action Team, and in its discussion of greenhouse gas emissions. However, the DEIS’s analysis of direct and indirect greenhouse gas emissions (GHGs) resulting from new oil and gas development and the proposed mitigation measures are wholly inadequate.

B5-24

A. BLM Failed to Provide Any Evidence or Basis for its Greenhouse Gas Emission Estimates

The DEIS failed to provide any of the sources, calculations and rationale for the development phase GHG emissions estimates presented in Table 4.6-1 and the production phase GHG emissions estimates presented in Table 4.6-2, making it impossible for the public to evaluate these estimates. The DEIS also failed to provide any sources, calculations, or explanation for the 317,718 barrels of crude oil anticipated to be produced annually.¹⁴² BLM must provide transparency and show its work.

Furthermore, scientific studies indicate that fugitive emissions can occur at every stage of production, often leading to high volumes of greenhouse gases being released into the air. For example, a recent state-wide study estimated that methane emissions from the oil and gas production in California are 3 to 7 times higher than reflected in the state inventory.¹⁴³ The production phase GHG estimate in Table 4.6-2 apparently includes GHGs from vents and fugitive emissions, but these emissions are not specified in the table or text. BLM must provide

¹³⁹ NRDC [Natural Resources Defense Council], *Drilling in California: Who’s At Risk?*, October 2014 (“NRDC 2014”); Clough, Emily & Derek Bell, *Just Fracking: A Distributive Environmental Justice Analysis of Unconventional Gas Development in Pennsylvania, USA*, 11 *Environmental Research Letters* 025001 (2016); McKenzie, Lisa M. et al., *Population Size, Growth, and Environmental Justice Near Oil and Gas Wells in Colorado*, 50 *Environmental Science & Technology* 11471 (2016).

¹⁴⁰ Webb, Ellen et al., *Potential Hazards of Air Pollutant Emissions From Unconventional Oil and Natural Gas Operations on The Respiratory Health of Children And Infants*, 31 *Reviews on Environmental Health* 225 (2016).

¹⁴¹ NRDC 2014.

¹⁴² DEIS at 4.6-3.

¹⁴³ Jeong, Seongeun et al., *Spatially Explicit Methane Emissions from Petroleum Production and the Natural Gas System in California*, 48 *Environmental Science & Technology* 5982 (2014).

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an actual estimate, backed by a science-based rationale, for GHGs coming from venting and fugitive emissions since these can be substantial.

B5-24
cont.

B. BLM’s Inaccurate Estimates for Greenhouse Gas Emissions are a Result of its Arbitrary Assumptions in its Reasonably Foreseeable Development Scenario

As we explained above, BLM’s underestimate of the activities likely to occur as a result of the lease sale, and its limitation of the analysis to the impact of only 37 wells and 206 acres of surface disturbance, infected every aspect of BLM’s analysis in the DEIS, including its estimates for greenhouse gas emissions. BLM arbitrarily assumed that future oil and gas development will continue at levels consistent with historic development trends but failed to provide any evidence to support its assumption. The RFDS and BLM’s estimates of greenhouse gas emissions must be revised to reflect possible future production growth from both conventional and unconventional oil and gas resources.

B5-25

Furthermore, the estimates for indirect GHG emissions under “full buildout of the RFD Scenario” (presented in Table 4.6-3) are unrealistically low because they do not account for the higher climate impact of the heavy, carbon-intensive crude oil that is most likely to be produced from the project. The DEIS states in Appendix B that most of the projected well development is expected to occur in the Coalinga, San Ardo, Lynch Canyon, and Jacalitos fields,¹⁴⁴ with the vast majority of oil likely to come from two fields—Coalinga and San Ardo—following recent patterns.¹⁴⁵

B5-26

According to California Air Resources Board data, the San Ardo and Coalinga oil fields supply among the heaviest and most climate-damaging crude oil produced in, or imported into, the state. Carbon intensity measures the GHG emissions associated with all stages of production, including exploration, well development, extraction and transport. The carbon intensity for the production of crude oil in the San Ardo oil field (28.82 gCO₂e/MJ) is more than two and a half times the average carbon intensity for crudes used in California (11.19 gCO₂e/MJ).¹⁴⁶ The carbon intensity for crude produced from the Coalinga oil field (25.36 gCO₂e/MJ) is more than twice the state average.¹⁴⁷

A recent comprehensive analysis of California crude oil highlights that California’s oil resources are heterogeneous in their GHG impacts, with some California crudes as high-emitting as Canadian tar sands oil.¹⁴⁸ The study calculated total emissions of crude oils from oil fields in California by summing production, refining, and combustion emissions. This analysis flagged the crude oil from the San Ardo and Coalinga oil fields as “high GHG” crudes. The study

¹⁴⁴ DEIS at Appendix B-16.

¹⁴⁵ DEIS at Table 4 at Appendix B-4.

¹⁴⁶ From the California Air Resources Board, Calculation of 2015 Crude Average Carbon Intensity Value, released June 2016, at https://www.arb.ca.gov/fuels/lcfs/crude-oil/2015_crude_average_ci_value_final.pdf

¹⁴⁷ *Id.*

¹⁴⁸ Gordon, D. & S. Wojcicki, Need to Know: The Case for Oil Transparency in California. March 15, 2017. Carnegie Endowment for International Peace (2017), <http://carnegieendowment.org/2017/03/15/need-to-know-case-for-oil-transparency-in-california-pub-68166> (“Gordon 2017”)

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calculated total emissions for San Ardo crude at 760 kgCO₂e/bbl, and 700 kgCO₂e/bbl for Coalinga crude, which are among the highest emitting crudes in the state.¹⁴⁹

B5-26
cont.

Based on these estimates, the GHG emissions associated with 318,718 bbl per year produced by 37 wells in the full buildout of the RFG scenario¹⁵⁰ would be 242,226 mtCO₂e per year based on producing San Ardo oil and 223,103 mtCO₂e per year based on producing Coalinga oil.¹⁵¹ These GHG emissions are significantly higher than estimated by the DEIS in Tables 4.6-1, 4.6-2, and 4.6-3, which estimate combined development, production, and end use emissions at 160,146 mtCO₂e per year.

C. The DEIS Arbitrarily Underestimates the Impact of Methane Emissions

The DEIS uses the incorrect global warming potential (GWP) for methane which substantially underestimates its climate impact. The DEIS states that it uses a GWP for methane of 25 over a 100-year time period.¹⁵² However the 2013 IPCC Fifth Assessment Report clearly establishes a GWP of 36 for fossil fuel sources of methane over a 100-year time period.¹⁵³ Importantly, the GWP of methane over a 20-year period is 87,¹⁵⁴ meaning that methane is 87 times stronger in trapping heat than CO₂ over a 20 year period, which is a particularly relevant time frame for meeting California's GHG goals and avoiding crossing dangerous climate tipping points. According to the IPCC Fifth Assessment Report, the GWP for N₂O is 268 over 20 years and 298 over 100 years.¹⁵⁵

B5-27

In light of serious controversy and uncertainties regarding GHG pollution from oil and gas development, it is critical that BLM's quantitative assessment account for methane's long-term (100-year) global warming impact and, also, methane's short-term (20-year) warming impact using the latest peer-reviewed science to ensure that potentially significant impacts are not underestimated or ignored. See 40 C.F.R. § 1508.27(a) (requiring consideration of "[b]oth short- and long-term effects"). BLM has significantly underestimated the near-term benefits of keeping methane emissions out of the atmosphere. 40 C.F.R. §§ 1502.16(e), (f); *id.* at 1508.27. These estimates are essential given the noted importance of near term action to ameliorate climate change – near term action that scientists say should focus, *inter alia*, on preventing the emission of short-lived but potent GHGs like methane while, at the same time, stemming the ongoing increase in the concentration of carbon dioxide.¹⁵⁶

¹⁴⁹ Gordon 2017.

¹⁵⁰ DEIS at 4.6-3.

¹⁵¹ For San Ardo, 318,718 bbl/year*760 kgCO₂e/bbl*0.001 mtCO₂e/kgCO₂ = 242,226 mtCO₂e per year.

For Coalinga, 318,718 bbl/year*700 kgCO₂e/bbl*0.001 mtCO₂e/kgCO₂ = 223,103 mtCO₂e per year.

¹⁵² DEIS at 3.61.

¹⁵³ Myhre, G., D. Shindell et al., Ch. 8: Anthropogenic and Natural Radiative Forcing, in *Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change IPCC*, Stocker, T.F. et al., eds. Cambridge University Press, Cambridge UK and New York USA (2013) at Table 8.7.

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ See, e.g., Scripps Institution of Oceanography, *Limiting Global Warming: Variety of Efforts Needed Ranging from 'Herculean' to the Readily Actionable, Scientists Say*, Science Daily (May 4, 2010), available at: <http://www.sciencedaily.com/releases/2010/05/100503161328.htm>; see also, Ramanathan, V. et. al., *The Copenhagen Accord for Limiting Global Warming: Criteria, Constraints, and Available Avenues* (Feb. 2010).

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In addition, the DEIS does not discuss the impact of the March 28, 2017 Executive Order that directs the Secretary of Interior to review BLM’s final rule entitled “Waste Prevention, Production Subject to Royalties, and Resource Conservation” (the “methane waste rule”)¹⁵⁷ and conform the rule with newly created executive policies.¹⁵⁸ If the rule is rescinded, methane emissions could be far greater than the volume emitted with the rule in place. The BLM’s itself estimates an emissions reduction of 175,000 to 180,000 tons of methane per year under the rule.¹⁵⁹ Given the potential change in law, the BLM’s analysis should include methane emissions that will result if the methane waste rule is not in place when BLM intends to lease its land or when actual drilling and production occurs.

B5-27
cont.

The DEIS’s assertion that the GHG emissions and associated direct and indirect impacts “would be minor”¹⁶⁰ is therefore unfounded.

D. BLM Must Limit Greenhouse Gas Emissions by Keeping Federal Fossil Fuels in the Ground

The urgent need to prevent the worst impacts of climate change means that the world in general – and California in particular – cannot afford to invest in new fossil fuel development and infrastructure that locks in carbon intensive oil production for years into the future.

B5-28

A robust body of scientific research has established that most fossil fuels must be kept in the ground to avoid the worst dangers of climate change. The severe impacts of global warming from the 1°C warming that the planet has already experienced highlight the urgency for stronger climate action to avoid truly catastrophic dangers to people and planet. Human-caused climate change is already causing widespread damage from intensifying global food and water insecurity, the increasing frequency of heat waves and other extreme weather events, flooding of coastal regions by sea level rise and increasing storm surge, the rapid loss of Arctic sea ice and Antarctic ice shelves, increasing species extinction risk, and the worldwide collapse of coral reefs.¹⁶¹ The Third National Climate Assessment makes clear that “reduc[ing] the risks of some of the worst impacts of climate change” will require “aggressive and sustained greenhouse gas emission reductions” over the course of this century.¹⁶²

The United States has committed to the climate change target of holding the long-term global average temperature “to well below 2°C above pre-industrial levels and to pursue efforts

¹⁵⁷ U.S. Bureau of Land Management, Final Rule: Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 83008 (November 18, 2016).

¹⁵⁸ The White House, Presidential Executive Order on Promoting Energy Independence and Economic Growth (March 28, 2017), available at <https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economy-1>

¹⁵⁹ 81 Fed. Reg. 83069.

¹⁶⁰ DEIS at 4.6-4.

¹⁶¹ Melillo, Jerry M., “Climate Change Impacts in the United States: The Third National Climate Assessment,” Terese (T.C.) Richmond, and Gary W. Yohe, Eds., U.S. Global Change Research Program, (2014).

¹⁶² Melillo, Jerry M., at 13, 14, and 649.

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cont.

to limit the temperature increase to 1.5°C above pre-industrial levels¹⁶³ under the Paris Agreement.¹⁶⁴ The United States signed the Paris Agreement on April 22, 2016 as a legally binding instrument through executive agreement,¹⁶⁵ and the treaty entered into force on November 4, 2016. The Paris Agreement codifies the international consensus that climate change is an “urgent threat” of global concern.¹⁶⁶ The Agreement also requires a “well below 2°C” climate target because 2°C of warming is no longer considered a safe guardrail for avoiding catastrophic climate impacts and runaway climate change.¹⁶⁷

Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming well below 2°C rise above pre-industrial levels. The IPCC Fifth Assessment Report and other expert assessments have established global carbon budgets, or the total amount of carbon that can be burned while maintaining some probability of staying below a given temperature target. According to the IPCC, total cumulative anthropogenic emissions of CO₂ must remain below about 1,000 gigatonnes (GtCO₂) from 2011 onward for a 66 percent probability of limiting warming to 2°C above pre-industrial levels, and to 400 GtCO₂ from 2011 onward for a 66 percent probability of limiting warming to 1.5°C.¹⁶⁸ These carbon budgets have been reduced to 850 GtCO₂ and 240 GtCO₂, respectively, from 2015 onward.¹⁶⁹ Given that global CO₂ emissions in 2015 alone totaled 36 GtCO₂,¹⁷⁰ humanity is rapidly consuming the remaining carbon budget.

¹⁶³ See United Nations Framework Convention on Climate Change, Conference of the Parties, Nov. 30-Dec. 11, 2015, Adoption of the Paris Agreement Art. 2, U.N. Doc. FCCC/CP/2015/L.9 (Dec. 12, 2015), <http://unfccc.int/resource/docs/2015/cop21/eng/109.pdf> (“Paris Agreement”).

¹⁶⁴ On December 12, 2015, 197 nation-state and supra-national organization parties meeting in Paris at the 2015 United Nations Framework Convention on Climate Change Conference of the Parties consented to the Paris Agreement committing its parties to take action so as to avoid dangerous climate change.

¹⁶⁵ See United Nations Treaty Collection, Chapter XXVII, 7.d Paris Agreement, List of Signatories (2015); U.S. Department of State, Background Briefing on the Paris Climate Agreement (Dec. 12, 2015). Although not every provision in the Paris Agreement is legally binding or enforceable, the U.S. and all parties are committed to perform the treaty commitments in good faith under the international legal principle of *pacta sunt servanda* (“agreements must be kept”). Vienna Convention on the Law of Treaties, Art. 26.

¹⁶⁶ *Id.*

¹⁶⁷ See Paris Agreement, at Recitals.

¹⁶⁸ See the comprehensive scientific review under the United Nations Framework Convention on Climate Change (UNFCCC) of the global impacts of 1.5°C versus 2°C warming: U.N. Subsidiary Body for Scientific and Technological Advice, “Report on the Structured Expert Dialogue on the 2013-2015 review,” FCCC/SB/2015/INF.1 (2015), <http://unfccc.int/resource/docs/2015/sb/eng/inf01.pdf>; Schleussner, Carl-Friedrich, et al., Differential climate impacts for policy-relevant limits to global warming: the case of 1.5C and 2C, 7 Earth Systems Dynamics 327 (2016).

¹⁶⁹ IPCC, “2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change; Summary for Policymakers (2013), at 25; IPCC, Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, R.K. Pachauri and L.A. Meyer (eds.) (2014), at 63-64 and Table 2.2.

¹⁷⁰ Rogelj, Joeri et al., Differences between carbon budget estimates unraveled, 6 Nature Climate Change 245 (2016), at Table 2.

¹⁷¹ See Le Quéré, Corinne et al., Global Carbon Budget 2016, 8 Earth Syst. Sci. Data 605 (2016), www.globalcarbonproject.org/carbonbudget/16/data.htm.

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B5-28
cont.

According to a large body of scientific research, the vast majority of global and US fossil fuels must stay in the ground in order to hold temperature rise to well below 2°C.¹⁷¹ Studies estimate that 68 to 80 percent of global fossil fuel reserves must not be extracted and burned to limit temperature rise to 2°C based on a 1,000 GtCO₂ carbon budget.¹⁷² For a 50 percent chance of limiting temperature rise to 1.5°C, 85 percent of known fossil fuel reserves must stay in the ground.¹⁷³ Effectively, fossil fuel emissions must be phased out globally within the next few decades.¹⁷⁴

A 2016 analysis found that potential carbon emissions from developed reserves in currently operating oil and gas fields and mines would lead to global temperature rise beyond 2°C.¹⁷⁵ Excluding coal, currently operating oil and gas fields alone would take the world beyond 1.5°C.¹⁷⁶ To stay well below 2°C, the clear implication is that no new fossil fuel extraction or transportation infrastructure should be built, and governments should grant no new permits for new fossil fuel extraction and infrastructure.¹⁷⁷ Moreover, some fields and mines, primarily in rich countries, must be closed before fully exploiting their resources. The analysis concludes that, because “existing fossil fuel reserves considerably exceed both the 2°C and 1.5°C carbon budgets, [i]t follows that exploration for new fossil fuel reserves is at best a waste of money and at worst very dangerous.”¹⁷⁸

According to a U.S. focused analysis,¹⁷⁹ the United States alone has enough recoverable fossil fuels, split about evenly between federal and non-federal resources, that if extracted and

¹⁷¹ The IPCC estimates that global fossil fuel reserves exceed the remaining carbon budget for staying below 2°C by 4 to 7 times, while fossil fuel resources exceed the carbon budget for 2°C by 31 to 50 times. See Bruckner, Thomas et al., Ch. 7: 2014: Energy Systems, in *Climate Change 2014: Mitigation of Climate Change, Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (2014), http://ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter7.pdf, at Table 7.2.

¹⁷² To limit temperature rise to 2°C based on a 1,000 GtCO₂ carbon budget from 2011 onward, studies indicate variously that 80 percent (Carbon Tracker Initiative, *Unburnable Carbon – Are the world’s financial markets carrying a carbon bubble?* (2013) (“Carbon Tracker Initiative 2013”), <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>), 76 percent (Raupach, Michael et al., “Sharing a quota on cumulative carbon emissions,” 4 *Nature Climate Change* 873 (“Raupach 2014”), and 68 percent (Oil Change International, *The Sky’s Limit: Why the Paris Climate Goals Require A Managed Decline of Fossil Fuel Production*, (September 2016) (“Oil Change International 2016”)) of global fossil fuel reserves must stay in the ground. See Carbon Tracker Initiative 2013; Raupach 2014; Oil Change International 2016.

¹⁷³ Oil Change International 2016 at 6.

¹⁷⁴ Joeri Rogelj et al. (2015) estimated that a reasonable likelihood of limiting warming to 1.5° or 2°C requires global CO₂ emissions to be phased out by mid-century and likely as early as 2040-2045. See Rogelj, Joeri et al., *Energy system transformations for limiting end-of-century warming to below 1.5°C*, 5 *Nature Climate Change* 519 (2015). Climate Action Tracker indicated that the United States must phase out fossil fuel CO₂ emissions even earlier—between 2025 and 2040—for a reasonable chance of staying below 2°C. See, e.g. Climate Action Tracker, “USA” (last updated 25 January 2017), <http://climateactiontracker.org/countries/usa>

¹⁷⁵ Oil Change International 2016 at 5.

¹⁷⁶ *Id.*, at 5.

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*, at 17.

¹⁷⁹ Ecoshift Consulting, et al., *The Potential Greenhouse Gas Emissions of U.S. Federal Fossil Fuels*, Prepared for Center for Biological Diversity & Friends of the Earth (2015). <http://www.ecoshiftconsulting.com/wpcontent/uploads/Potential-Greenhouse-Gas-Emissions-U-S-Federal-Fossil-Fuels.pdf>

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burned, would exceed the global carbon budget for a 1.5°C limit, and would consume nearly the entire global budget for a 2°C limit.¹⁸⁰ Specifically, the analysis found:

- Potential greenhouse gas emissions of federal fossil fuels (leased and unleased) if developed would release up to 492 gigatons (Gt) of carbon dioxide equivalent pollution (CO₂e), representing 46 percent to 50 percent of potential emissions from all remaining U.S. fossil fuels.
- Of that amount, up to 450 Gt CO₂e have not yet been leased to private industry for extraction;
- Releasing those 450 Gt CO₂e (the equivalent annual pollution of more than 118,000 coal-fired power plants) would be greater than any proposed U.S. share of global carbon limits that would keep emissions well below 2°C.¹⁸¹

Fracking has also opened up vast resources that otherwise would not be available, increasing the potential for future greenhouse gas emissions.

The long-lived GHG emissions and fossil fuel infrastructure that would result from this project will contribute to undermining national and state climate commitments and increase climate change impacts, at a time when there is urgent need to keep most fossil fuels in the ground.

E. The DEIS Fails to Address Whether the Alternatives Considered Are Consistent with State and National Climate Plans, Policies, Regulations, or Goals

NEPA regulations require agencies to account for conflicts with existing laws and requirements imposed for the protection of the environment when engaging in environmental analysis.¹⁸² For example, BLM must disclose whether each of the proposed plan alternatives would interfere with efforts to meet federal and international greenhouse gas emission reduction targets.¹⁸³ As explained by the CEQ in its Final Climate Guidance, federal agencies evaluating the climate impacts of their decisions should “discuss relevant approved federal, regional, state, tribal, or local plans, policies, or laws for GHG emission reductions or climate adaptation to

¹⁸⁰ *Id.*, at 4.

¹⁸¹ For the United States, Raupach et al. (2014) provided a mid-range estimate of the U.S. carbon quota of 158 GtCO₂ for a 50 percent chance of staying below 2°C, using a “blended” scenario of sharing principles for allocating the global carbon budget among countries. This study estimated US fossil fuel reserves at 716 GtCO₂, of which coal comprises the vast majority, indicating that most fossil fuel reserves in the US must remain unburned to meet a well below 2°C carbon budget. Raupach 2014 at Supplementary Figure 7.

¹⁸² See 40 C.F.R. § 1506.2(d) (EISs must discuss inconsistencies with state law); 40 C.F.R. § 1508.27(b)(10) (when examining whether actions are “significant” within the meaning of NEPA, agencies must consider whether the action “threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.”).

¹⁸³ See 40 C.F.R. § 1506.2(d); 40 C.F.R. § 1508.27(b)(10).

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make clear whether a proposed project’s GHG emissions are consistent with such plans or laws.”¹⁸⁴

The DEIS arbitrarily concludes that the GHG emissions from oil and gas development “would not be likely to conflict with any applicable plan, policy, regulation, or goals adopted for the purpose of reducing GHG emissions.”¹⁸⁵ However, the proposed RMP is inconsistent not only with United States’ climate commitments under the Paris Agreement (discussed above in Section VI (D)) but also with California’s mandates for rapid statewide GHG emissions reductions, as well as the Clean Power Plan.

The Governor’s Executive Order B-30-15 and Senate Bill 32 establish a mid-term greenhouse gas emissions reduction target for California of 40 percent below 1990 levels by 2030. Executive Order S-3-05 calls for the state to reduce emissions levels by 80 percent below 1990 levels by 2050. These targets require increasingly steep reductions in emissions over the next three decades. Yet the science shows this is precisely the time period during which the carbon emitted from new oil and gas development will increase atmospheric CO₂ levels. At a time when we need to reduce emissions dramatically in the short term and keep them down, this project would contribute to undermining California’s climate goals.

Furthermore continued leasing and development of federal fossil fuel resources commits the world to extremely dangerous warming well beyond the 2°C threshold. As one study put it, “the disparity between what resources and reserves exist and what can be emitted while avoiding a temperature rise greater than the agreed 2°C limit is therefore stark.”¹⁸⁶ In short, *any* new leasing of federal fossil fuel resources is inconsistent with a carbon budget that would seek to avoid catastrophic climate change.

The DEIS asserts that:

California’s regulatory setting, including reporting of GHG and the Cap-and-Trade Program (Section 3.6.2, Regulatory Framework), provides oversight and management of GHG directly emitted during development and production and indirectly emitted by end users of the petroleum products. The GHG emissions and the associated direct and indirect impacts would be minor.¹⁸⁷

The DEIS further assumes that reporting requirements and “controlling GHG through permit conditions or participation by the operators in mandatory programs for GHG management” will prevent all potential disruption of the statewide emissions reduction goals set by the Global Warming Solutions Act of 2006 (AB 32) and subsequent programs.¹⁸⁸ However, BLM provides no scientific evidence, data, or analyses showing that compliance with Cap-and-

¹⁸⁴ Council on Environmental Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews, 81 Fed Reg 51866 (Aug 5, 2016).

¹⁸⁵ DEIS at 4.6-4.

¹⁸⁶ McGlade at 188.

¹⁸⁷ DEIS at 4.6-4.

¹⁸⁸ *Id.* at 4.6-5.

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Trade Program provisions or reporting requirements would guarantee that California’s overall GHG emissions remain consistent with statewide-targeted levels.

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Suppliers of transportation fuels and the end-use of oil and gas as a transportation fuel in California would need to comply with California’s Low Carbon Fuel Standard (LCFS). Under this program, transportation fuel suppliers must demonstrate that the mix of fuels they provide meet the carbon intensity standards of the LCFS, where the carbon intensity is a measure of the GHG emissions associated with the various production, distribution, and use steps in the “life-cycle” of the fuel. This ensures that downstream use of oil and gas as a transportation fuel would meet the LCFS. Additionally, fuel suppliers, including refiners, pipeline companies and railroads, generally bear the compliance obligation in the Cap-and-Trade Program for the GHG from end-use of the petroleum products for fuel users not otherwise covered. This means that the combustion emissions of the fuel delivered to all end-users are covered in the Cap-and-Trade Program.”

F. The DEIS’s Proposed Mitigation Measures Are Inadequate

The only required mitigation for GHG emissions and resulting climate change impacts is the Best Management Practices and Standard Operating Procedures for Air Quality, which is inadequate to mitigate the substantial GHG emissions that would be emitted over the lifetime of this project and the harms that would result from these emissions.

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VII. BLM Failed to Take an Adequately Hard Look at Impacts to Human Health

In addition to climate change effects, oil and gas leasing and fracking entail significant public health risks that should compel BLM to consider a ban on these practices. Although the DEIS identifies a few example mitigation measures that “could be implemented to lessen the degree of potential adverse public safety impacts,”¹⁸⁹ it fails to take a hard look, despite the public’s concerns as stated in scoping, at the potential threats that oil and gas leasing poses to human health and safety, such as carcinogenic, developmental, reproductive, and endocrine disruption effects.

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Ample scientific evidence indicates that well development and well stimulation activities have been linked to an array of adverse human health effects, including carcinogenic, developmental, reproductive, and endocrine disruption effects. The DEIS does not consider how close development could potentially take place to schools, residences, and businesses. Just as troubling, is how much is *unknown* about the chemicals used in well stimulation activities.¹⁹⁰ The potential human health dangers and the precautionary principle should further compel BLM to consider not allowing further development of oil and gas minerals in the areas for lease. In comparing the no-leasing and no-fracking alternatives to leasing and continued unconventional well development scenarios, BLM should include a health impact assessment, or equivalent, of

¹⁸⁹ DEIS at 4.4-22.

¹⁹⁰ See, e.g. U.S. Environmental Protection Agency, Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, External Review Draft at 5-73, 10-7 (June 2015) available at http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=523539 (“EPA 2015”).

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the aggregate impact that unconventional extraction techniques, including fracking, will have on human health and nearby communities.

Due to the heavy and frequent use of chemicals, proximity to fracked wells is associated with higher rates of cancer, birth defects, poor infant health, and acute health effects for nearby residents who must endure long-term exposure:

- In one study, residents living within one-half mile of a fracked well were significantly more likely to develop cancer than those who live more than one-half mile away, with exposure to benzene being the most significant risk.¹⁹¹
- Another study found that pregnant women living within 10 miles of a fracked well were more likely to bear children with congenital heart defects and possibly neural tube defects.¹⁹² A separate study independently found the same pattern; infants born near fracked gas wells had more health problems than infants born near sites that had not yet conducted fracking.^{193, 194} Further studies have raised substantial questions regarding air pollution from Uinta Basin drilling for example and its public health effects on stillborns.¹⁹⁵
- A study analyzed Pennsylvania birth records from 2004 to 2011 to assess the health of infants born within a 2.5-kilometer radius of natural-gas fracking sites. They found that proximity to fracking increased the likelihood of low birth weight by more than half, from about 5.6 percent to more than 9 percent.¹⁹⁶ The chances of a low Apgar score, a summary measure of the health of newborn children, roughly doubled, to more than 5 percent.¹⁹⁷ Another recent Pennsylvania study found a correlation between proximity to unconventional gas drilling and higher incidence of lower birth weight and small-for-gestational-age babies.¹⁹⁸

¹⁹¹ McKenzie, L. et al., Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources, 424 *Science of the Total Environment* 79 (2012) (“McKenzie 2012”).

¹⁹² McKenzie, L. et al., Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, *Advance Publication Environmental Health Perspectives* (Jan. 28, 2014), <http://dx.doi.org/10.1289/ehp.1306722> (“McKenzie 2014”).

¹⁹³ Hill, Elaine L., *Unconventional Natural Gas Development and Infant Health: Evidence from Pennsylvania*, Cornell University (2012).

¹⁹⁴ Whitehouse, Mark, Study Shows Fracking is Bad for Babies, *Bloomberg View*, Jan. 4, 2014, *available at* <http://www.bloombergview.com/articles/2014-01-04/study-shows-fracking-is-bad-for-babies>.

¹⁹⁵ See Siddika N et al., Prenatal ambient air pollution exposure and the risk of stillbirth: systematic review and meta-analysis of the empirical evidence, *Occup Environ Med.* (May 24, 2016) doi: 10.1136/oemed-2015-103086; see also Knox, Annie, “At Vernal forum, questions about air pollution, pregnancies, research,” *Salt Lake Tribune* (April 19, 2015); Solotaroff, Paul, What’s Killing the Babies of Vernal, Utah? *Rolling Stone Magazine* (June 22, 2015), <http://www.rollingstone.com/culture/features/fracking-whats-killing-the-babies-of-vernal-utah-20150622>

¹⁹⁶ *Id.*, citing Janet Currie of Princeton University, Katherine Meckel of Columbia University, and John Deutch and Michael Greenstone of the Massachusetts Institute of Technology.

¹⁹⁷ *Id.*

¹⁹⁸ Stacy, Shaina L. et al., Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania, 10 *PLoS ONE* 6: e0126425, doi:10.1371/journal.pone.0126425 (2015), *available at* <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126425>.

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- A recent study found increased rates of cardiology-patient hospitalizations in zip codes with greater number of unconventional oil and gas wells and higher well density in Pennsylvania.¹⁹⁹ The results suggested that if a zip code went from having zero wells to well density greater than 0.79 wells/km², the number of cardiology-patient hospitalizations per 100 people (or “cardiology inpatient prevalence rate”) in that zip code would increase by 27%. If a zip code went from having zero wells to a well density of 0.17 to 0.79 wells/km², a 14% increase in cardiology inpatient prevalence rates would be expected. Further, higher rates of neurology-patient hospitalizations were correlated with zip codes with higher well density.
- Recently published reports indicate that people living in proximity to fracked gas wells commonly report skin rashes and irritation, nausea or vomiting, headache, dizziness, eye irritation and throat irritation.²⁰⁰
- In Texas, a jury awarded nearly \$3 million to a family who lived near a well that was hydraulically fractured.²⁰¹ The family complained that they experienced migraines, rashes, dizziness, nausea and chronic nosebleeds. Medical tests showed one of the plaintiffs had more than 20 toxic chemicals in her bloodstream.²⁰² Air samples around their home also showed the presence of BTEX — benzene, toluene, ethylbenzene and xylene — colorless but toxic chemicals typically found in petroleum products.²⁰³

Chemicals used for fracking also put nearby residents at risk of endocrine disruption effects. A study that sampled water near active wells and known spill sites in Garfield County Colorado found alarming levels of estrogenic, antiestrogenic, androgenic, and antiandrogenic activities, indicating that endocrine system disrupting chemicals (EDC) threaten to contaminate surface and groundwater sources for nearby residents.²⁰⁴ The study concluded:

[M]ost water samples from sites with known drilling-related incidents in a drilling-dense region of Colorado exhibited more estrogenic, antiestrogenic, and/or antiandrogenic activities than the water samples collected from reference sites[,] and 12 chemicals used in drilling operations exhibited similar activities. Taken together, the following support an association between natural gas drilling

¹⁹⁹ Jemielital, T. et al., Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates. 10 PLoS ONE 7: e0131093 (2015), available at

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131093>.

²⁰⁰ Rabinowitz, P.M. et al., Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania. Environmental Health Perspectives Advance Publication (2014); Bamberger, Michelle and R.E. Oswald, Impacts of Gas Drilling on Human and Animal Health, 22 New Solutions 51 (2012); Steinzor, N. et al., Gas Patch Roulette: How Shale Development Risks Public Health in Pennsylvania, Earthworks Gas & Oil Accountability Project (2012).

²⁰¹ *Parr v. Aruba Petroleum, Inc.*, Case No. 11-01650-E (Dallas Cty., filed Sept. 13, 2013).

²⁰² Deam, Jenny, Jury Awards Texas family Nearly \$3 million in Fracking Case, Los Angeles Times (Apr. 3, 2014) <http://www.latimes.com/nation/la-na-fracking-lawsuit-20140424-story.html>.

²⁰³ *Id.*

²⁰⁴ Kassotis, Christopher D. et al., Estrogen and Androgen Receptor Activities of Hydraulic Fracturing Chemicals and Surface and Ground Water in a Drilling-Dense Region, 155 Endocrinology 3:897 (2014), <http://press.endocrine.org/doi/full/10.1210/en.2013-1697>.

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operations and EDC activity in surface and ground water: [1] hormonal activities in Garfield County spill sites and the Colorado River are higher than those in reference sites in Garfield County and in Missouri, [2] selected drilling chemicals displayed activities similar to those measured in water samples collected from a drilling-dense region, [3] several of these chemicals and similar compounds were detected by other researchers at our sample collection sites, and [4] known spills of natural gas fluids occurred at these spill sites.

The study also noted a linkage between EDCs and “negative health outcomes in laboratory animals, wildlife, and humans”:

Despite an understanding of adverse health outcomes associated with exposure to EDCs, research on the potential health implications of exposure to chemicals used in hydraulic fracturing is lacking. Bamberger and Oswald (26) analyzed the health consequences associated with exposure to chemicals used in natural gas operations and found respiratory, gastrointestinal, dermatologic, neurologic, immunologic, endocrine, reproductive, and other negative health outcomes in humans, pets, livestock, and wildlife species.

Of note, site 4 in the current study was used as a small-scale ranch before the produced water spill in 2004. This use had to be discontinued because the animals no longer produced live offspring, perhaps because of the high antiestrogenic activity observed at this site. There is evidence that hydraulic fracturing fluids are associated with negative health outcomes, and there is a critical need to quickly and thoroughly evaluate the overall human and environmental health impact of this process. It should be noted that although this study focused on only estrogen and androgen receptors, there is a need for evaluation of other hormone receptor activities to provide a more complete endocrine-disrupting profile associated with natural gas drilling.²⁰⁵

Operational accidents also pose a significant threat to public health. For example in August 2008, Newsweek reported that an employee of an energy-services company got caught in a fracking fluid spill and was taken to the emergency room, complaining of nausea and headaches.²⁰⁶ The fracking fluid was so toxic that it ended up harming not only the worker, but also the emergency room nurse who treated him. Several days later, after she began vomiting and retaining fluid, her skin turned yellow and she was diagnosed with chemical poisoning.²⁰⁷

Harmful chemicals are also found in the flowback fluid after well stimulation events. Flowback fluid is a key component of oil-industry wastewater from stimulated wells. A survey of chemical analyses of flowback fluid dating back to April 2014 in California revealed that concentrations of benzene, a known carcinogen, were detected at levels over 1,500 times the

²⁰⁵ *Id.*, p. 905.

²⁰⁶ Wiseman, Hannah, *Untested Waters: the Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 115 *Fordham Env'tl. Law Rev.* 138 (2009).

²⁰⁷ *Id.*

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federal limits for drinking water.²⁰⁸ Of the 329 available tests that measured for benzene, the chemical was detected at levels in excess of federal limits in 320 tests (97 percent).²⁰⁹ On average, benzene levels were around 700 times the federal limit for drinking water.²¹⁰ Among other carcinogenic or otherwise dangerous chemicals found in flowback fluid from fracked wells are toluene and chromium-6.²¹¹ These hazardous substances were detected in excess of federal limits for drinking water in over one hundred tests. This dangerous fluid is commonly disposed of in injection wells, which often feed into aquifers, including some that could be used for drinking water and irrigation.

Acidizing presents similarly alarming risks to public health and safety. In acidizing operations, large volumes of hydrochloric and hydrofluoric acid are transported to the site and injected underground. These chemicals are highly dangerous due to their corrosive properties and ability to trigger tissue corrosion and damage to sensory organs through contact.

While many risks are known, much more is unknown about the hundreds of chemicals used in fracking. The identity and effects of many of these additives is unknown, due to operators' claims of confidential business information. But, as the EPA recognizes, chemical identities are "necessary to understand their chemical, physical, and toxicological properties, which determine how they might move through the environment to drinking water resources and any resulting effects."²¹² Compounds in mixtures can have synergistic or antagonistic effects, but again, it is impossible to know these effects without full disclosure.²¹³ The lack of this information also precludes effective remediation: "Knowing their identities would also help inform what chemicals to test for in the event of suspected drinking water impacts and, in the case of wastewater, may help predict whether current treatment systems are effective at removing them."²¹⁴

Even where chemical identities are known, chemical safety data may be limited. In EPA's study of the hazards of fracking chemicals to drinking water, EPA found that "[o]ral reference values and oral slope factors meeting the criteria used in this assessment were not available for the majority of chemicals used in hydraulic fracturing fluids [87%], representing a significant data gap for hazard identification."²¹⁵ Without this data, EPA could not adequately

²⁰⁸ California Department of Conservation Division of Oil, Gas, & Geothermal Resources, California Well Stimulation Public Disclosure Report, available at <http://www.conservation.ca.gov/dog/Pages/WellStimulationTreatmentDisclosure.aspx>. The highest concentration was 7,700 parts per billion (ppb) for a well with API number 03052587. The US EPA's maximum contaminant level for benzene is 5 ppb.

²⁰⁹ *Id.*

²¹⁰ *Id.*, see also Cart, J., High Levels of Benzene Found in Fracking Wastewater, Los Angeles Times (Feb. 11, 2015), <http://www.latimes.com/local/california/la-me-fracking-20150211-story.html#page=1>.

²¹¹ *Id.*; see also Center for Biological Diversity, Cancer-causing Chemicals Found in Fracking Flowback from California Oil Wells (2015), available at http://www.biologicaldiversity.org/news/press_releases/2015/fracking-02-11-2015.html.

²¹² EPA 2015 at 10-18.

²¹³ Souther, Sara et al, Biotic Impacts of Energy Development from Shale: Research Priorities and Knowledge Gaps, 12 Front Ecol Environ 6: 334 (2014).

²¹⁴ EPA 2015 at 10-18.

²¹⁵ *Id.* at 10-7, 9-7.

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assess potential impacts on drinking water resources and human health.²¹⁶ Further, of 1,076 hydraulic fracturing fluid chemicals identified by the EPA, 623 did not have estimated physiochemical properties reported in EPA’s toxics database, although this information is “essential to predicting how and where it will travel in the environment.”²¹⁷ The data gaps are actually much larger, because EPA excluded 35% of fracking chemicals reported to FracFocus from its analysis because it could not assign them standardized chemical names.²¹⁸

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The DEIS fails to incorporate a literature review of the harmful effects of each of the chemicals known to be used in fracking and other unconventional oil and gas extraction methods. Without knowing the effects of each chemical, the DEIS cannot accurately project the true impact of unconventional oil and gas extraction.

The DEIS also fails to study the human health and safety impacts of noise pollution, light pollution, and traffic accidents resulting from oil and gas development. A recent study found that automobile and truck accident rates in counties in Pennsylvania with heavy unconventional oil and gas extraction activity were between 15 and 65 percent higher than accident rates in counties without unconventional oil and gas extraction activities.²¹⁹ Rates of traffic fatalities and major injuries may be higher in areas with heavy drilling activity than areas without.²²⁰

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1. BLM Must Conduct a Health Impact Assessment.

NEPA requires that the BLM employ at least the same level of effort to analyze human health impacts as it does to promote industry’s interest in development when preparing the RFD and associated analyses regarding projected drilling levels. BLM did not conduct a health impact assessment, or equivalent analysis, and, as a result, the DEIS does not satisfy NEPA and its implementing regulations.

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A health impact assessment (“HIA”) or equivalent analysis would fulfill the regulations governing NEPA, to examine human health impacts “to the fullest extent possible.” A HIA would be forward-looking and attempt to identify all of the potential direct, indirect, and cumulative links between a proposed activity and the health and well-being of affected communities, and to develop mitigation measures to minimize harms and maximize benefits. The DEIS does not include this type of analysis of human health impacts.

The U.S. EPA has posted on its website an excellent document on the utility of an HIA as part of the NEPA analysis of federal agencies where public health impacts are at issue.²²¹ HIA “provides a systematic process and methodology to anticipate and proactively address the

²¹⁶ *Id.* at 9-37-38.

²¹⁷ *Id.* at 5-73.

²¹⁸ *Id.* at 9-38.

²¹⁹ Graham, J., Irving et al., Increased Traffic Accident Rates Associated with Shale Gas Drilling in Pennsylvania. 74 Accident Analysis and Prevention 203 (2015).

²²⁰ *Id.*

²²¹ See U.S. Environmental Protection Agency, Human Impact Partners, Frequently Asked Questions About Integrating Health Impact Assessment into Environmental Impact Statement (2015), available at: <http://www.epa.gov/region9/nepa/PortSHIA/pdfs/FAQIntegratingHIA-EIA.pdf>.

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potential health consequences of a program or policy in order to maximize the potential benefits and minimize adverse outcomes.”²²² Steps in the HIA process include:

1. Screening: Determines whether an HIA is necessary, and whether it is likely to be useful.
2. Scoping: Establish the population to which the HIA applies, the scope of health problems to be analyzed, the HIA team, methods to be used in the assessment, and data sources.
3. Assessment: describe the baseline health status and determinants of health in the population and assess likely impacts through a literature review and qualitative or quantitative analysis.
4. Decision and recommendations to minimize adverse impacts and maximize benefits.
5. Monitoring and reassessment plan: select a set of outcomes likely to be sensitive/accurate indicators of the changes predicted, such as health outcomes and develop a plan to monitor and then reassess if needed.

The BLM did not conduct these steps, and did not analyze the impacts to the population within the planning area, considering how many people might be exposed to health impacts, analyze where development would take place relative to water sources or residences, or assess the likely impacts to the actual population in the area, including particularly vulnerable populations. It also omitted significant potential impacts. For example, the DEIS did not include any potential impacts from the illness caused by the stress and mental anguish associated with living near intensive oil and gas development.

According to the U.S. Centers for Disease Control, “HIA can be used to evaluate objectively the potential health effects of a project or policy before it is built or implemented. It can provide recommendations to increase positive health outcomes and minimize adverse health outcomes. A major benefit of the HIA process is that it brings public health issues to the attention of persons who make decisions about areas that fall outside of traditional public health arenas, such as transportation or land use.”²²³

VIII. BLM Failed to Take a Hard Look at Impacts to Water Resources

BLM has not adequately evaluated potential impacts to groundwater and surface water.²²⁴ The EIS must be revised to account for impacts from Enhanced Oil Recovery (EOR) operations and development of additional conventional and unconventional resources. Additional mitigation measures must also be adopted to address potential impacts to groundwater and surface water.

A. BLM Has Not Analyzed the Impacts of EOR Operations

²²² See Wernham, Aaron, Inupiat Health and Proposed Alaskan Oil Development: Results of the First Integrated Health Impact Assessment/Environmental Impact Statement for Proposed Oil Development on Alaska’s North Slope, 4 *EcoHealth* 500, doi: 10.1007/s10393-007-0132-2 (2007).

²²³ Centers for Disease Control, Health Impact Assessment, available at: <http://www.cdc.gov/healthyplaces/hia.htm>.

²²⁴ See Center for Biological Diversity Map of Lakes and Rivers in Central Coast Field Office Planning Area (2017), attached as Exhibit C.

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As acknowledged in the Reasonably Foreseeable Development Scenario, EOR is critical to oil production within the HFO:

EOR is the main recovery method used within the HFO area. About 85 percent of the production from the Coalinga Field is from thermal recovery projects (DOGGR, 2010, p. 43). EOR techniques are utilized in all of the most productive oil and gas fields within the HFO area, which are discussed in Section 1 and listed as follow (DOGGR, 2010, pp. 177 to 191):

- Coalinga Oil and Gas Field with Coalinga East Extension Oil and Gas Field (steam flood, cyclic steam, and water flood);
- San Ardo Oil and Gas Field (steam flood, cyclic steam, water flood, and air injection);
- Lynch Canyon Oil and Gas Field (cyclic steam);
- Jacalitos Oil and Gas Field (cyclic steam and water flood);
- Kettleman North Dome Oil and Gas Field (water flood); and
- Sargent-Hollister Oil and Gas Field (cyclic steam).

Therefore, similar to well stimulation technologies discussed above, it is estimated that EOR techniques (i.e., cyclic steam and steam flood) and secondary recovery techniques (water flood) may be used on any or all wells under this RFDS.²²⁵

The EOR techniques used in the HFO require large volumes of water. As shown below in Table 1, according to DOGGR’s Report of California Oil and Gas Production Statistics, in 2015 more than 100 million barrels (4 billion gallons) of water and/or steam were injected for EOR into four fields in the HFO.²²⁶ The source of the fluids was not disclosed in DOGGR’s report but data reported to fulfill the requirements of Senate Bill 1281 indicate that the injected fluid consists of produced water from oil and gas wells and oil field water source wells.²²⁷ BLM is obligated to analyze how such water use may impact ground and surface water quantity and quality and develop mitigation measures to reduce any impacts.

Table 1. 2015 volume of steam and water injected into fields in the HFO that currently or in the past utilize EOR. Source: DOGGR

STEAM & WATER INJECTION BY FIELD (BBL) - 2015				
Field	Cyclic Steam	Steam Flood	Water Flood	Total

²²⁵ U.S. Bureau of Land Management. 2016. Central Coast Field Office Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development. Appendix B. Hollister Field Office Area – Reasonably Foreseeable Development Scenario for Oil and Gas at Ap.B-26. January 5 2017. Available at https://eplanning.blm.gov/epl-front-office/projects/lup/67003/94015/113329/Appendix_B_-_Reasonably_Foreseeable_Development_Scenario.pdf (accessed March 28, 2017).

²²⁶ California Department of Conservation, Division of Oil, Gas, and Geothermal Resources. 2015. 2015 Report of California Oil And Gas Production Statistics. Sacramento. Available at ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2015/PR03_2015.pdf

²²⁷ California Department of Conservation, Division of Oil, Gas, and Geothermal Resources. 2016. “SB 1281 Data and Reports.” 2015 Fourth Quarter Data Files. Available at <ftp://ftp.consrv.ca.gov/pub/oil/SB1281/2015/2015%20Q4/Data%20Files>

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Coalinga & Coalinga East Extension	4,996,254	32,871,256	11,182,994	49,050,504
San Ardo	3,447,155	43,551,844	3,761,455	50,760,454
Lynch Canyon	414,952	872,548	0	1,287,500
Jacalitos	0	0	252,677	252,677
Kettleman North Dome	0	0	0	0
Sargent/Hollister	0	0	0	0
Total	8,858,361	77,295,648	15,197,126	101,351,135

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cont.

B. BLM Has Not Adequately Analyzed the Water Quantity Impacts of New Development

As described in Section I(A) - (D), BLM's Reasonably Foreseeable Development Scenario (or "RFDS") does not adequately reflect possible future production growth from both conventional and unconventional oil and gas resources. Given that the anticipated environmental consequences described in the EIS are based in large part on the RFDS, BLM's analysis of impacts is inherently flawed. The potential environmental impacts to groundwater and surface water must be revised to take into account the possibility of production growth on BLM-administered leases.

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BLM provides end members for a range of total water use by assuming that all 37 wells anticipated to be drilled under the RFD scenario will be either:

- 1) Conventional vertical wells with well stimulation treatments involving one to three stages; or,
- 2) Water-intensive horizontal wells with well stimulation treatments involving up to 20 stages.

As noted in our comments on the RFDS, BLM may be significantly underestimating the number of new conventional and unconventional wells that may be drilled. BLM assumes that the high water-use end member would be based on the use of long horizontal wells with multi-stage horizontal fracturing. However, recent data and information from the USGS indicate that if the Monterey source rock play is developed, the anticipated extraction method would be mostly vertical, rather than horizontal, wells.²²⁸ In addition, USGS anticipates that these wells would be tightly spaced with, on average, one well every 18 acres. Although the use of vertical rather than horizontal wells may decrease the per well water needs, the large number of wells that would be required to develop the Monterey could result in significant water use, which in turn may result in significant impacts to water quantity and quality. For example, if the 28,200 acres of federal mineral estate just within active oil and gas fields was developed on 18 acre spacing, that would result in the drilling of more than 1,500 additional wells. Using BLM's minimum estimate of water use of 0.79 – 1.17 acre feet (AF) per well, more than 1,500 well operations would require an estimated 1,238 – 1,833 AF (403,400,000 – 597,280,000 gallons) of water.

²²⁸ Tennyson, M.E., et al., Assessment of undiscovered continuous oil and gas resources in the Monterey Formation, San Joaquin Basin Province, California, 2015: U.S. Geological Survey Fact Sheet 2015-3058 (2015).

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cont.

BLM's current estimated maximum water use is 1,110 AF of water. BLM summarily dismisses any potential impacts that may result from this upper-end estimate of water use, stating that, "[c]ompared to the resources present in any of the groundwater basins, this small amount would not likely result in any discernable impact." BLM does not state what the current and future water supply and demand in these groundwater basins is and offers no analysis to support this conclusion. Moreover, as stated by the U.S. Environmental Protection Agency²²⁹ and the CCST²³⁰, and acknowledge by BLM in the EIS, impacts from water use are likely to be local and site-specific. As such, simply stating that the total available groundwater resources in a region are large compared to estimated water use is completely insufficient to assess potential impacts and necessary mitigation. BLM also claims, with no support, that because the impacts would be site-specific, they cannot be quantified at this time. BLM can and must develop reasonable scenarios for potential water use based on the location of existing oil fields and areas with high potential for oil and gas development, the location of federal minerals, and current and future water supply and demand in those areas. Based on that assessment, BLM must identify potential impacts and any necessary mitigation measures.

It is especially imperative that BLM conduct an adequate analysis of water quantity impacts, given recent droughts and concerns about water use. A study published in 2016 quantified water volumes used and produced by conventional oil production and hydraulic fracturing in California, and showed that despite a 25% decrease in conventional oil production from 1999 to 2012, total water use increased by 30% and freshwater use increased by 46% due to increased freshwater-intensive tertiary oil production.²³¹

In sum, BLM must revise the RFDS to reflect potential future growth in both conventional and unconventional production and reassess potential impacts to water resources and necessary mitigation based on the updated RFDS. The assessment of impacts and mitigation must consider local, site-specific conditions, given that this is the scale at which impacts are expected to occur.

C. BLM Has Not Adequately Analyzed Potential Impacts to Water Quality or Necessary Mitigation Measures

BLM identifies numerous potential pathways by which water quality may be impacted including:

- Surface spills and leaks during the transport of chemicals, during pre-stimulation chemical mixing, or during well stimulation treatment;
- Accidental surface releases of flowback and produced water associated with storage and disposal;

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²²⁹ U.S. Environmental Protection Agency, *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States (Final Report)*, EPA/600/R-16/236F, (2016)

²³⁰ California Council on Science and Technology, *An Independent Scientific Assessment of Well Stimulation in California, Volume II: Potential Environmental Impacts of Hydraulic Fracturing and Acid Stimulations* (July 2015).

²³¹ Tiedeman, K., et al., *Recent Trends in Water Use and Production for California Oil Production*. *Environ. Sci. Technol.*, 2016, 50 (14), pp 7904–7912, DOI: 10.1021/acs.est.6b01240 (May 13, 2016).

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- Disposal of flowback and/or produced water in unlined pits;
- Reuse of produced water for irrigated agriculture;
- Fracture created by well stimulation that may connect to a higher permeable zone or to existing faults or abandoned wells; and,
- Migration of well stimulation fluids in the well or well annuli between the casing and the formation or through abandoned wells.

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cont.

BLM concludes that, “[c]ollectively, the DOGGR regulations, mitigation measures provided in the Final EIR, and the BLM final rule serve to reduce potential impacts to the quantity or quality of usable groundwater,” and does not propose any additional mitigation measures. However these regulations and mitigation measures do not adequately address the threats identified above and therefore this mitigation strategy is inadequate.

In addition, the effects of fracking may be worse in California. The US EPA’s study on hydraulic fracturing also identified six factors that increase the risk to water resources. All six risk factors apply to hydraulic fracturing in California²³²:

1. Water withdrawals for hydraulic fracturing in times or areas of low water availability, particularly in areas with limited or declining groundwater resources:
2. Spills during the handling of hydraulic fracturing fluids and chemicals or produced water that result in large volumes or high concentrations of chemicals reaching groundwater resources:
3. Injection of hydraulic fracturing fluids into wells with inadequate mechanical integrity, allowing gases or liquids to move to groundwater resources:
4. Injection of hydraulic fracturing fluids directly into groundwater resources:
5. Discharge of inadequately treated hydraulic fracturing wastewater to surface water:
6. Disposal or storage of hydraulic fracturing wastewater in unlined pits resulting in contamination of groundwater resources:

Among the most commonly cited environmental impacts of oil and gas production are degradation of soils and water caused by releases of hydrocarbons and co-produced brine, known as “produced water.”²³³ The critical importance of properly mitigating the risk of spills and leaks is demonstrated by the many tens of studies describing the environmental impacts of

²³² U.S. Environmental Protection Agency, *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States (Final Report)*, EPA/600/R-16/236F, (2016)

²³³ Kharaka, Y. K., & Dorsey, N. S., *Environmental issues of petroleum exploration and production: Introduction*. 12 *Environmental Geosciences* 2 (2005)

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cont.

hydrocarbon and produced water releases.²³⁴ A multi-year, interdisciplinary study of hydrocarbon and produced water releases at an oil production site in Oklahoma undertaken by the United States Geological Survey (“USGS”) found that soil and groundwater at the site were still polluted after more than 60 years of natural attenuation.²³⁵ Contamination caused by releases of hydrocarbons and produced water can be extremely technologically and financially difficult to remediate, if not impossible. As such, the best way to protect the environment is to halt oil and gas development altogether. BLM’s failure to include the most basic safeguards as mitigation measures further demonstrates the inadequacy of the DEIS. Among the mitigation measures that are omitted are:

- Secondary containment must be required for all well stimulation equipment and material including flowback fluid tanks; waste handling tanks; additive containers; and chemical and waste transport, mixing, and pumping equipment. Such secondary containment must:
 - Be designed and constructed in accordance with good engineering practices;
 - Be constructed, coated or lined with materials that are chemically compatible with the environment and the substances to be contained;
 - Provide adequate freeboard;
 - Be protected from heavy vehicle or equipment traffic; and
 - Have a volume of at least 110 percent of the largest storage tank within the containment area.
- The disposal of flowback and produced water into unlined pits should be prohibited;
- Reuse of produced water for irrigated agriculture should be prohibited.

Proper well design and construction are crucial first step to ensuring long-term mechanical integrity. Both California’s and BLM’s current well construction rules are outdated and inadequate and must be updated to reflect technological advancements in oil and gas extraction techniques. The following additional mitigation measures should be required:

- In areas where the depth to the deepest protected groundwater is not known, operators must estimate this depth. This depth should then be verified by running petrophysical logs, such as resistivity logs, after drilling to the estimated depth. If the depth to the deepest protected water is deeper than estimated, an additional string of casing is required. Surface casing must be of sufficient diameter to allow the use of one or more strings of intermediate casing. All instances of protected water not anticipated on the permit application must be reported including the formation depth and thickness and water flow rate, if known or estimated.
- A formation integrity test (FIT) must be performed immediately after drilling out of all surface and intermediate casing. The test should demonstrate that the casing shoe will maintain integrity at the anticipated pressure to which it will be subjected while drilling the next section of the well, no flow path exists to formations above the casing shoe, and that the casing shoe is competent to handle an influx of formation fluid or gas without

²³⁴ Otton, J. K., Environmental aspects of produced-water salt releases in onshore and estuarine petroleum-producing areas of the United States - a bibliography. U.S. Geological Survey Open-file report 2006-1154 (2006). http://pubs.usgs.gov/of/2006/1154/pdf/of06-1154_508.pdf

²³⁵ Kharaka, Y. K., Otton, J. K., & eds., Environmental impacts of petroleum production - Initial results from the Osage-Skiatook Petroleum Environmental Research Sites, Osage County, Oklahoma, U.S. Geological Survey Water-Resources Investigations Report 03-4260 (2003).

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breaking down. If any FIT fails, the operator must contact the regulator and remedial action must be taken to ensure that no migrations pathways exist. The casing and cementing plan may need to be revised to include additional casing strings in order to properly manage pressure.

- All surface, intermediate, and production casing strings must stand under pressure until a compressive strength of 500 psi is reached before drilling out, initiating testing, or disturbing the cement in any way. In no case should the wait-on-cement (WOC) time be less than 8-hours.
- All surface, intermediate, and production casing strings must be pressure tested. Drilling may not be resumed until a satisfactory pressure test is obtained. Casing must be pressure tested to a minimum of 0.5 psi/foot of casing string length or 1500 psi, whichever is greater, but not to exceed 80% of the minimum internal yield. If the pressure declines more than 10% in a 30-minute test or if there are other indications of a leak, corrective action must be taken.
- Surface casing setting depth must be shallower than any hydrocarbon-bearing zones and must be set at least 100' but not more than 200' into a competent confining zone below the base of the deepest protected groundwater and be fully cemented to surface by the pump and plug method.
- Intermediate casing must be used where necessary to isolate protected water, anomalous pressure zones, lost circulation zones, or other drilling hazards. Casing setting depth must be based on local engineering and geologic factors and be set at least 100' below the deepest protected water, anomalous pressure zones, lost circulation zones, and other drilling hazards. Intermediate casing must be set to protect groundwater if surface casing was set above the base of protected water, and/or if additional protected water was found below the surface casing shoe. When intermediate casing is installed to protect groundwater, the operator shall set a full string of new intermediate casing to a minimum depth of at least 100 feet below the base of the deepest strata containing protected water and cement to the surface. The location and depths of any hydrocarbon strata or protected water strata that is open to the wellbore above the casing shoe must be confirmed by coring, electric logs or testing and shall be reported as part of the post-treatment report.
- If both surface casing and intermediate casing are used as water protection casing, or if intermediate casing is not used, a full string of production casing is required. A production liner may be hung from the base of the intermediate casing and used as production casing as long as the surface casing is used as the water protecting casing and intermediate casing is set for a reason other than isolation of protected water.
- When intermediate casing is installed to protect groundwater, it must be fully cemented to surface. When intermediate casing is set for a reason other than to protect strata that contain protected water, it must be fully cemented to surface unless doing so would result in lost circulation. If not cemented to the surface, intermediate casing shall be cemented with sufficient cement to fill the annular space from the casing shoe to at least 600 feet above fluid-bearing formations, lost circulation zones, oil and gas zones, and anomalous pressure intervals, or other drilling hazards. Where the distance between the casing shoe and shallowest zone to be isolated makes this technically infeasible, multi-stage cementing must be used to isolate any hydrocarbon- or fluid-bearing formations or abnormally pressured zones and prevent the movement of fluids.

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- When intermediate casing is not used, production casing must be fully cemented to surface unless doing so would result in lost circulation. If not cemented to the surface, production casing shall be cemented with sufficient cement to fill the annular space from the casing shoe to at least 600 feet above fluid-bearing formations, lost circulation zones, oil and gas zones, anomalous pressure intervals, or other drilling hazards. Where the distance between the casing shoe and shallowest zone to be isolated makes this technically infeasible, multi-stage cementing must be used to isolate any hydrocarbon- or fluid-bearing formations or abnormally pressured zones and prevent the movement of fluids. Sufficient cement shall also be used to fill the annular space to at least 100 feet above the base of the freshwater zone, either by lifting cement around the casing shoe or cementing through perforations or a cementing device placed at or below the base of the freshwater zone.
- If fluid returns, lift pressure, displacement and/or other operations indicate inadequate cement coverage, the operator must (i) run a radial cement evaluation tool, a temperature survey, or other test approved by the Division to identify the top of cement, (ii) submit a plan for remedial cementing to the Division for approval and (iii) implement such plan by performing additional cementing operations to remedy such inadequate coverage prior to continuing drilling operations.
- Prior to cementing the hole must be prepared to ensure an adequate cement bond by circulating at least two hole volumes of drilling fluid and ensuring that the well is static and all gas flows are killed. Top and bottom wiper plugs and spacer fluids must be used to separate drilling fluid from cement and prevent cement contamination. Casing must be rotated and reciprocated during cementing when possible and when doing so would not present a safety risk.
- Cement should be pumped at a rate and in a flow regime that inhibits channeling of the cement in the annulus. During placement of the cement, operator shall monitor pump rates to verify they are within design parameters to ensure proper displacement efficiency. Throughout the cementing process operator shall monitor cement mixing in accordance with cement design and cement densities during the mixing and pumping.
- All cement must have a 72-hour compressive strength of at least 1200 psi and free water separation of no more than two milliliters per 250 milliliters of cement, tested in accordance with the current API RP 10B. Cement must conform to API Specification 10A and gas-blocking additives must be used. Cement mix water chemistry must be proper for the cement slurry designs. At a minimum, the water chemistry of the mix water must be tested for pH prior to use, and the cement must be mixed to manufacturer's recommendations. An operator's representative must be on site verifying that the cement mixing, testing, and quality control procedures used for the entire duration of the cement mixing and placement are consistent with the approved engineered design and meet the cement manufacturer recommendations, API standards, and the requirements of this section.
- Compressive strength tests of cement mixtures without published performance data must be performed in accordance with the current API RP 10B and the results of these tests must be provided to the regulator prior to the cementing operation. The test temperature must be within 10 degrees Fahrenheit of the formation equilibrium temperature at the top of cement. A better quality of cement may be required where local conditions make it necessary to prevent pollution or provide safer operating conditions.

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cont.

- For surface, intermediate, and production casing, at a minimum, centralizers are required at the top, shoe, above and below a stage collar or diverting tool (if used) and through all protected water zones. In non-deviated holes, a centralizer shall be placed every fourth joint from the cement shoe to the ground surface or to within one joint of casing from the bottom of the cellar, or casing shall be centralized by implementing an alternative centralization plan approved by the Division. In deviated holes, the Division may require the operator to provide additional centralization. All centralizers must meet API Spec 10D (Recommended Practice for Casing Centralizers – for bow string centralizers) or API Spec 10 TR4 (rigid and solid centralizers) and 10D-2 (Petroleum and Natural Gas Industries, Equipment for Well Cementing, Part 2, Centralizer Placement and Stop Collar Testing).
- For any section of the well drilled through fresh water-bearing formations, drilling fluids must be limited to air, fresh water, or fresh water based mud and exclude the use of synthetic or oil-based mud or other chemicals.
- To reduce the risk of external casing corrosion all potential flow zones – as defined in API RP 65-2, Isolating Potential Flow Zones During Well Construction – must be properly isolated. Failure to isolate flow zones can also result in annular overpressurization, which can lead to a loss of mechanical integrity, putting groundwater at risk, and/or allow crossflow of subsurface fluids, potentially into protected water if it has not been properly isolated. All well construction materials must be compatible with fluids with which they may come into contact and be resistant to corrosion, erosion, swelling, or degradation that may result from such contact.
- Internal and external well mechanical integrity must be assessed at least yearly.

Older wells in particular may have been designed and constructed with practices not acceptable by today's standards and endanger groundwater. In particular, shallow wells in the state have sometimes been constructed without water protective casing and/or with a single string of casing, including in areas with protected groundwater. The annular space in these wells may also not be fully cemented.

Newer wells typically have at least two and often three barriers between protected water and fluids contained in the well: 1) surface casing 2) production casing 3) production tubing. Wells lacking surface casing/redundant barriers put protected water at serious risk in the case of a well integrity failure due to the fact that both protected water and hydrocarbon-bearing zones are contained behind the same string of casing.

Casing strings that isolate protected water should not be perforated for the purposes of stimulation, production, or injection. Communication between offset wells during stimulation is a serious problem, risking blow outs in adjacent wells and/or aquifer contamination during well stimulation. A New Mexico oil well recently experienced a blowout, resulting in a spill of more than 8,400 gallons of fracturing fluid, oil, and water. The blowout occurred when a nearby well was being hydraulically fractured and the fracturing fluids intersected this offset well.²³⁶ The incident led the New Mexico Oil Conservation Division to request information about other

²³⁶ Jensen, T., Fracking Fluid Blows Out Nearby Well. EarthWorks. October 19, 2013 available at https://www.earthworksaction.org/media/detail/fracking_fluid_blows_out_nearby_well#.WOavI_nyIU.

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cont.

instances of communication between wells during drilling, completion, stimulation or production operations.²³⁷ Incidents of communication between wells during stimulation have been documented in British Columbia,²³⁸ Pennsylvania,^{239,240} Texas, and other states across the country.²⁴¹

The Alberta Energy Regulator (AER), the oil and gas regulator in Alberta, Canada, recognized that communication between wells during fracturing is a serious risk to well integrity and groundwater after a number of spills and blowouts resulted from communication between wells during fracturing. As a result, AER created requirements to address the risk of communication and reduce the likelihood of occurrence.²⁴² Similarly, Enform, a Canadian oil and gas industry safety association, published recommended practices to manage the risk of communication.²⁴³ Neither California's nor BLM's rules adequately address the risk of communication between offset wells. Oil and gas projects under BLM's leasing program do not have even the most basic safeguards, including the following::

- For all wells within the Axial Dimensional Stimulation Area (ADSA), the operator must:
 - Evaluate the adequacy of the well design and construction methods to achieve the goal of isolating protected water
 - Assess the internal and external mechanical integrity of each well identified
 - Prepare a plan for performing corrective action if any of the wells identified are improperly designed, constructed, completed, plugged, or abandoned.
 - Perform an assessment to determine the risk that the stimulation treatment will communicate with each well identified.
 - For each well identified as at-risk for communication, prepare a plan for well control, including but not limited to:
 - A method to monitor for communication
 - A determination of the maximum pressure which the at-risk well can withstand
 - Actions to maintain well control
 - If the at-risk well is not owned or operated by the owner/operator of the well to be stimulated, a plan for coordinating with the offset well operator to prevent loss of well control.

The EIS fails to consider three conceptual pathways through which groundwater could be contaminated by well stimulation activities: 1) direct injection of fluids into or above an

²³⁷ State of New Mexico, Energy, Minerals and Natural Resources Department, Aztec District III - Request for Information. n.p. (Oct 22, 2013).

²³⁸ BC Oil and Gas Commission, Safety Advisory 2010-03, Communication During Fracture Stimulation. n.p. (May 20, 2010).

²³⁹ Detrow, S., Perilous Pathways: How Drilling Near An Abandoned Well Produced a Methane Geyser. StateImpact Pennsylvania, National Public Radio (Oct 9, 2012).

²⁴⁰ Pennsylvania Department of Environmental Protection, Bureau of Oil and Gas Management., Draft Report - Stray Natural Gas Migration Associated with Oil and Gas Wells (Oct 28, 2009).

²⁴¹ Vaidyanathan, G., When 2 wells meet, spills can often follow, EnergyWire, E&E News (Aug 5, 2013).

²⁴² Alberta Energy Board, Directive 083: Hydraulic Fracturing - Subsurface Integrity (May 2013).

²⁴³ Enform Canada, Interim IRP 24: Fracture Stimulation: Interwellbore Communication: An Industry Recommended Practice For the Canadian Oil and Gas Industry, 24 Interim 1st Edition (Mar 27, 2013).

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underground source of drinking water 2) movement of fluids from an injection zone through the confining strata; and 3) lateral movement of fluids from within an injection zone into a protected portion of that stratum²⁴⁴.

B5-36
cont.

i. Direct Injection of Contaminants into Usable Water

Much of California's oil production occurs in relatively shallow formations that often also contain high quality water that may have beneficial uses. In fact, water in these zones often meets the U.S. Environmental Protection Agency's (EPA) definition of an Underground Source of Drinking Water (USDW). Stimulation fluids are injected directly into these waters, potentially resulting in contamination.

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ii. Migration of Contaminants Vertically into Protected Water Due to a Lack of Confining Zone

A geologic confining zone can be generally defined as a geologic formation with sufficient areal extent, impermeability, and absence of transmissive faults and fractures such that it can prevent the vertical migration of injected stimulation fluids or displaced formation fluids into protected water. If an appropriate confining zone is not present, injected or displaced fluids may migrate into groundwater, resulting in contamination. As documented in the EIS, there is frequently little or no vertical separation between hydrocarbon-bearing zones and zones containing protected water in California, another reason BLM should halt leasing altogether.

B5-38

The DEIS fails to include even the most basic mitigation measures requiring that wells that will be stimulated must be sited such that a suitable confining zone is present. The owner or operator must demonstrate to the satisfaction of the regulator that the confining zone:

1. Is of sufficient areal extent to prevent the movement of injected or displaced fluids into protected water;
2. Is sufficiently impermeable to prevent the vertical migration of injected or displaced fluids;
3. Is free of transmissive faults or fractures that could allow the movement of injected or displaced fluids above the stimulated zone; and
4. Contains at least one formation of sufficient thickness and with geomechanical characteristics capable of preventing or arresting vertical propagation of fractures.
5. BLM may require the operator to identify and characterize additional zones that will impede or contain vertical fluid movement.

iii. Migration of Contaminants Laterally from Non-Protected Water into Protected Water

²⁴⁴ U.S. Environmental Protection Agency, Office of Drinking Water, Statement of Basis and Purpose, Underground Injection Control Regulations (1980), http://www.epa.gov/ogwdw/uic/pdfs/rept_uic_statemt_basis_purpose_uic_1980.pdf

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The quality of water contained in a groundwater aquifer may vary laterally, such that protected or usable water may be present in some portions of the aquifer but not others. It is possible that stimulation fluids injected into a portion of an aquifer that does not contain protected or usable water may migrate into a portion an aquifer that does contain protected or usable water.

B5-39

The DEIS fails to include even the most basic mitigation measures requiring that operators of stimulated wells predict, using site characterization, monitoring and operational data, and computational modeling, the projected lateral and vertical migration of stimulation fluids and formation fluids in the subsurface and demonstrate that injected or displaced fluids will not migrate laterally into protected or usable water. This includes but is not limited to:

1. Maps, cross-sections, and models delineating aquifer extents, volume, and chemistry.
2. Maps, cross-sections, and models delineating the physical and chemical extent of stimulation operations including hydraulically induced fractures, injected fluids, and displaced formation fluids, based on site-specific data. The physical extent would be defined by the modeled length and height of fractures (if any), horizontal and vertical penetration of stimulation fluids and proppant, and horizontal and vertical extent of the displaced formation fluids. The chemical extent would be defined by that volume of rock in which chemical reactions between the formation, hydrocarbons, formation fluids, or injected fluids may occur, and must take into account potential migration of fluids over time.

IX. BLM Failed to Adequately Address Potential Impacts to Wildlife and Sensitive Species

A large and growing body of published scientific research has documented that fracking and other oil and gas development activities have wide-ranging, adverse impacts on species and ecosystems.²⁴⁵ The DEIS states that over 300 species of birds, mammals, reptiles, and amphibians occur or have the potential to occur within the Planning Area. These include eighty-three species of rare, threatened, and endangered plants and animals, including but not limited to the San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, California tiger salamander, California red-legged frog, Vernal pool fairy shrimp, steelhead, California condor and purple amole.²⁴⁶ BLM failed to adequately address the potential impacts from the proposed oil and gas leasing on these species and others.

B5-40

One of the obvious failures of the DEIS is postponing determinations of those areas that are inappropriate for development in all alternatives to a later time, after the RMP has been

²⁴⁵ See Center for Biological Diversity Review of the Impacts of Fracking and Other Oil and Gas Development Activity on Wildlife (March 30, 2017), attached hereto as Exhibit E; see also Center for Biological Diversity Review of Impacts of Oil and Gas Exploration and Development on Wildlife in California (February 13, 2014), attached hereto as Exhibit F.

²⁴⁶ See, e.g., Center for Biological Diversity's Map of California Central Coast Field Office RMP Threatened and Endangered Species (2017), attached as Exhibit B available at <http://center.maps.arcgis.com/apps/View/index.html?appid=3089adfd974487fb6ac263612b9e0a1>

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adopted. As presented below, adequate data is available now in the public domain alone to identify many of the areas that must be set aside for conservation purposes in order to promote recovery for numerous rare, threatened and endangered species. At minimum, BLM must consider limiting all oil and gas activities in these areas.

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cont.

The DEIS furthermore fails to present an alternative that would prohibit oil and gas development in the essential and critical habitats for rare, threatened, and endangered species, effectively failing to provide even one alternative that does not push these species closer towards the brink of extinction. In addition we could find no requirement in the draft RMP for protocol level surveys for the listed and sensitive species that the wildlife agencies have established such protocols for. Protocol level surveys need to be a requirement in the RMP

In addition, thorough, seasonal surveys must be performed for sensitive plant species and vegetation communities, and animal species under the direction and supervision of the BLM and resource agencies such as the US Fish and Wildlife Service and the California Department of Fish and Wildlife for any areas that are considered for leasing under the draft RMP. When additional surveys are conducted for site specific oil and gas activities, the BLM's RMP must also require full disclosure of survey methods and results to the public and other agencies without limitations imposed by the applicant/lessee to assure full NEPA/ESA compliance. Confidentiality agreements or non-disclosure agreements regarding environmental resources must not be required of any biologists participating in the surveys on public lands or regarding public mineral estate in support of any proposed project.

Species-specific concerns are detailed below:

A. The San Joaquin kit fox

The highly imperiled San Joaquin kit fox was first listed as federally endangered in 1967 and in 1971 as a state endangered species – 50 and 46 years ago respectively. The San Joaquin kit fox is considered an “umbrella” species because of its formerly broad distribution and requirement for relatively large areas of conserved habitat that includes habitat for other rare, threatened and endangered species. Conserving kit fox and its habitat will result in the protection of many other species. The 1998 Recovery Plan for the Upland Species of the San Joaquin Valley (“1998 Recovery Plan”) states that the kit fox is “one of the species that will be hardest to recover.”²⁴⁷

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Tragically, this statement from the 1998 Recovery Plan is born out in 2008 modeling of habitat acquisitions for the San Joaquin kit fox that found that the mean time to extinction for San Joaquin kit foxes in the San Joaquin Valley was 24 years.²⁴⁸ We are within 15 years of reaching a tipping point at which the amount of conserved habitat will be inadequate to sustain the kit fox in the wild, potentially relegating it to the fate of the long-eared kit fox of southern

²⁴⁷ U. S. Fish & Wildlife Service, Recovery Plan for the Upland Species of the San Joaquin Valley. USFWS Region 1, Portland, OR (1998), http://ecos.fws.gov/docs/recovery_plan/980930a.pdf at pg.ix

²⁴⁸ McDonald-Madden, Eve et al., Subpopulation Triage: How to Allocate Conservation Effort among Populations, 22 Conservation Biology 3: 656 (2008), <http://cosb.us/Solargen/feir/v2/b026refs/McDonald-Madden%20et%20al%202008%20Subpopulation%20Triage.pdf>.

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California which was declared extinct in 1910. While a stronghold for the San Joaquin kit fox has been in the larger Bakersfield metropolitan area, these foxes are now also declining due to mange, threatening the integrity of the last stable kit fox population on the planet.²⁴⁹

While no range-wide monitoring is currently occurring for the kit fox, habitat continues to be converted to uses incompatible for kit foxes persistence and recovery. The planning area includes the northern most core area for the species – the Ciervo-Panoche core area – as well as at least four satellite population areas and numerous habitat linkages identified by USFWS²⁵⁰ as well as other key habitat areas.²⁵¹ And specifically, the proposed HOGPAs overlap the Ciervo-Panoche core area as well as critical linkage and satellite population areas. The 1998 Recovery Plan identifies the key role for San Joaquin kit fox habitat in the Planning area: “A sound, conservative strategy hinges on the enhanced protection and management of three geographically-distinct core populations, which will anchor the spine of the metapopulation.”²⁵² Ciervo-Panoche is one of the three remaining core areas and is the most northerly core area, which increases its importance for conservation as the effects of climate change continue and encourage animals to move north and upslope.

Based on limited monitoring, this valuable species is in significant decline outside of the Bakersfield metropolitan area as well,²⁵³ and further development proposed in the planning area from oil and gas drilling will only promote additional declines by impacting core population areas essential for breeding and recovery, and fragmenting satellite populations, linkages and movement corridors. The DEIS fails to acknowledge the importance of the Planning Area to the continued existence much less the recovery of the San Joaquin kit fox. It also fails to adequately assess how allowing oil and gas exploration activities within the “spine” of the recovery effort in a core area, linkages and satellite recovery areas will affect core and recovery habitat, effect the connectivity between populations, or effect on the persistence of smaller, satellite populations as well as the population as a whole. Clearly this missing analysis of potential impacts to kit fox habitat and its implications for survival and recovery must be included in a supplemental or recirculated EIS.

Although the planning area covers so much of the habitat necessary for kit fox persistence,²⁵⁴ the DEIS fails to evaluate how the species and its habitat will be impacted by direct and indirect impacts in the Plan Area. How much recovery habitat (core, satellite and

²⁴⁹ U.S. Fish & Wildlife Service, Outfoxing mange in the San Joaquin kit fox, Sacramento Office (2017), https://www.fws.gov/sacramento/outreach/Featured-Stories/Outfoxing_Mange/outreach_featured-stories_outfoxing_mange.htm

²⁵⁰ U.S. Fish & Wildlife Service, San Joaquin Kit Fox 5-Year Review (2010), http://ecos.fws.gov/docs/five_year_review/doc3222.pdf at pg. 12-14.

²⁵¹ http://www.canids.org/app/images/journal/16/san_joaquin_kit_fox_habitat_suitability.pdf

²⁵² U.S. Fish & Wildlife Service, Recovery Plan for the Upland Species of the San Joaquin Valley, USFWS Region 1, Portland, OR (1998), http://ecos.fws.gov/docs/recovery_plan/980930a.pdf at pg. 132

²⁵³ Stafford, Robert et al., Abstract: Long term population and density estimates for San Joaquin Kit Fox on the Carrizo Plain National Monument (2000-2014): Implications for Conservation, presented at TWS-WS 2015 Annual Meeting (2015), http://wildlifeprofessional.org/western/tws_abstract_detail.php?abstractID=906

²⁵⁴ Cypher, B.L et al., Quantity and Distribution of Suitable Habitat for San Joaquin Kit Fox: Conservation Implications, 16 Canid Conservation and Biology 7:25 (2013), http://www.canids.org/app/images/journal/16/san_joaquin_kit_fox_habitat_suitability.pdf

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linkages) will be directly affected by the potential oil and gas development under each alternative? How much habitat (core, satellite and linkages) will be indirectly affected under each alternative? What are the cumulative impacts to these habitats? Such considerations must be analyzed in order to limit development in key areas for sensitive species in general and the kit fox in particular.

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cont.

Absent a thorough analysis of the alternatives from development impacts, the DEIS cannot adequately evaluate the appropriate avoidance, minimization and mitigation for impacts associated with oil and gas leasing or development to the highly imperiled and beleaguered San Joaquin kit fox.

Rather than conducting the required environmental review, BLM assumes that the Best Management Practices (“BMPs”) listed in Appendix D of the DEIS will minimize negative impacts of management actions to wildlife. However, BLM does not actually provide any analysis, scientific evidence, or any data regarding the effectiveness of these BMPs. The proposed BMPs for the San Joaquin kit fox, for example, are inadequate for the following reasons:

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- “Survey for dens in the project area.” The BMPs only mention conducting surveys for dens. The surveys, however, should be for the San Joaquin kit fox themselves in addition to their dens. The DEIS appears to assume that dens are the only habitat features important to the kit fox. However, the absence of a den does not indicate that kit fox do not use the area for foraging and other activities crucial to maintain the population.
- “Protect dens and establish no-disturbance buffers. Employ passive relocation of non-natal dens.” The DEIS provides a buffer of 200 feet for unoccupied natal dens, and 100 feet for known, occupied, and potential non-natal dens. However, protection of dens needs to extend beyond the breeding/pupping season. Passive relocation activities if allowed at all, must be conducted pursuant to an incidental take permit from the U.S. Fish and Wildlife Service and in coordination with the California Department of Fish and Wildlife.
- “Conduct blasting, seismic surveys, and other non-fatal disturbance outside of breeding season.” As noted above, disturbance does not only effect breeding but also other essential activities and may result in abandonment of the area by San Joaquin kit fox. These activities will also require an incidental take permit from the U.S. Fish and Wildlife Service and be conducted in coordination with the California Department of Fish and Wildlife.

B. Blunt-nosed leopard lizard

The blunt-nosed leopard lizard is one of a number of fully-protected species potentially present in the planning area, protected under California law (Fish and Game Code §5050),²⁵⁵ meaning that individuals of the species may not be “taken” (as defined in the Fish and Game

B5-43

²⁵⁵California Department of Fish and Wildlife, Fully Protected Animals, CA.gov (2017), http://www.dfg.ca.gov/wildlife/nongame/t_e_spp/fully_pro.html.

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Code) at any time, unless a Natural Communities Conservation Plan is prepared and implemented. All of the RMP alternatives include allowing activities to occur in habitat for the blunt-nosed leopard lizard, yet the DEIS does not discuss the requirements of “taking” a blunt-nosed leopard lizard from impacts in the Planning Area. This issue needs to be comprehensively addressed in a revised EIS.

The blunt-nosed leopard lizard is also a federally endangered species that has been under endangered species act protection for over 40 years. The most recent five-year review by the USFWS for the blunt-nosed leopard lizard²⁵⁶ lays out the requirements for down-listing as follows:

“1) Protection of five or more areas, each about 5,997 acres or more of contiguous, occupied habitat, including one each on (addresses Listing Factor A):

- A) Valley floor in Merced or Madera Counties;
- B) Valley floor in Tulare or Kern Counties;
- C) Foothills of the Ciervo-Panoche Natural Area;
- D) Foothills of western Kern County; and
- E) Foothills of the Carrizo Plain Natural Area.

2) Management Plan approved and implemented for all protected areas identified as important to the continued survival of blunt-nosed leopard lizard that includes survival of the species as an objective (addresses Listing Factor C and E).

3) Each protected area has a mean density of 2 or more blunt-nosed leopard lizards 1 per acre through one precipitation cycle (addresses Listing Factor E)”

Of particular concern here is the Ciervo-Panoche Natural Area. For that area, the USFWS 2010 five-year review states:

Within the Ciervo-Panoche Natural Area, two Areas of Critical Environmental Concern (ACEC), separated by 2 miles, protect 4,800 acres and 3,800 acres of contiguous blunt-nosed leopard lizard habitat, respectively.²⁵⁷

The 2010 five-year review determined that the recovery criterion for protection of 5,997 acres of contiguous habitat had not been achieved in the four of the five specified recovery areas including the Ciervo-Panoche recovery area. All of the alternatives in the DEIS Planning Area allow for oil & gas development in the area between the two existing Areas of Critical Environmental Concern in the larger Ciervo-Panoche Natural Area. Therefore, as proposed, the

²⁵⁶ U.S. Fish & Wildlife Service, Blunt-nosed leopard lizard (*Gambelia sila*) 5-Year Review: Summary and Evaluation (2010), http://www.fws.gov/ecos/ajax/docs/five_year_review/doc3209.pdf.

²⁵⁷ *Id.* at pg. 5

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RMP would preclude the down-listing of the blunt-nosed leopard lizard forever because it would allow activities to go forward in that area that would never allow the protection of the lands between the two existing ACEC's in order to meet the down-listing criteria, much less the more stringent recovery goals. BLM must propose and analyze alternatives for the RMP that could support and contribute to achieving the *recovery goals* of the suite of imperiled species that occur within the Planning Area including the blunt-nosed leopard lizard. The impacts of the proposed RMP on the blunt-nosed leopard lizard and its habitat must be comprehensively addressed in a revised and recirculated DEIS.

B5-43
cont.

The proposed Best Management Practices for the blunt-nosed leopard lizard are inadequate for the following reasons:

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- “Survey for burrows in the project area.” The surveys should be for the lizards, not just burrows. While blunt-nosed leopard lizards use burrows constructed by ground squirrels and kangaroo rats, in the absence of such burrows, they also construct shallow, simple tunnels in earth berms or under rocks²⁵⁸
- “Avoid and protect burrows.” This should be expanded to protect all escape areas for blunt-nosed leopard lizards.
- “Contact BLM if a blunt-nosed leopard lizard is observed in the project area or along access route and comply with any additional measures required by BLM.” The state and federal wildlife agencies should also be alerted to the presence of the blunt-nosed leopard lizard at the sites and they too may require additional measure.
- “Conduct daily monitoring of the work area and access routes. Submit monitoring reports to BLM. Submit an Operations and Maintenance Plan describing impact avoidance measures to BLM.” As above, state and federal wildlife agencies should also receive monitoring reports and they would also need to evaluate and approve the Operations and Maintenance Plans.
- “Conduct project activities at night when possible.” This requirement could conflict with the avoidance of nocturnal species including the San Joaquin kit fox and giant kangaroo rat, therefore more analysis is needed to determine whether it is prudent in this area with multiple species present.
- “Control vehicle speed. Check under vehicles and equipment prior to operation. Conduct vehicle escorts in occupied areas.” The BMPs need to include specific speed limits shown to be effective in avoiding impacts to lizards. Both speed limits and vehicle escorts for another rare lizard, the Mojave fringe-toed lizard in the desert were ineffective alone in eliminating mortalities along an access road to the construction site for the Colorado River substation. Vehicle escorts and pre-clearance of roads by biologist for *each pass* of vehicles and equipment is needed.

C. South-Central Coast Steelhead

Proposed development in high potential oil and gas areas (“HOGPAs”) on California Central Coast BLM lands overlaps with important rivers for protected steelhead trout

B5-45

²⁵⁸ U.S. Fish & Wildlife Service, Blunt-nosed leopard lizard (*Gambelia sila*) 5-Year Review: Summary and Evaluation (2010), http://www.fws.gov/ecos/ajax/docs/five_year_review/doc3209.pdf.

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cont.

(*Oncorhynchus mykiss*) populations. Steelhead which inhabit the San Benito River and Salinas River, as well as the San Antonio River (a tributary of the Salinas River), are part of the South-Central California Coast Distinct Population Segment (DPS) of steelhead trout, which is listed as threatened under the Endangered Species Act. The National Marine Fisheries Service also considers some resident “rainbow trout” in these river systems that are above migration barriers to be part of the listed steelhead DPS, since they play an important role in population dynamics and the evolutionary potential of steelhead populations. Steelhead trout in the San Benito and Salinas rivers are identified by NMFS as high priority “core recovery populations.”

Steelhead in the South-Central California Coast DPS have declined dramatically, from an estimated 25,000 returning adults historically, to currently less than 500 returning adults in the whole region. The Salinas basin in particular has steelhead runs significantly reduced in size from historical levels, and the current steelhead run is at critically low levels. Monitoring from 2011-2013 found a mean of only 22 adult upstream migrant steelhead per year in the Salinas River. South-Central California Coast DPS steelhead already face significant threats due to agriculture, mining, urbanization, water diversions, loss of riparian and estuarine habitat, climate change, drought, and impacts from invasive fish.²⁵⁹ The DEIS fails to adequately address direct, indirect and cumulative impacts to the steelhead populations from potential oil and gas activities including from surface run off and hydrocarbon pollution of streams. The impacts of the proposed RMP on the steelhead populations and habitats must be comprehensively addressed in a revised and recirculated EIS.

The proposed Best Management Practices for the steelhead are inadequate. The BMPs will not prevent potential oil spills into steelhead streams from wells, pipelines, and other infrastructure. The BMPs do not stop the proliferation of roads resulting from oil and gas development, which cause excessive sediment to enter streams and damage steelhead habitat.

D. Giant Kangaroo Rat

The Plan area includes core habitat for the state and federally endangered giant kangaroo rats (GKR). Now relegated to the west side of the San Joaquin Valley and the adjacent coast range foothills, the amount of GKR habitat currently extant is only 3% of its historic habitat²⁶⁰. Because GKR are known preferred prey items for kit fox²⁶¹ clearly the Plan area is excellent habitat for both GKR and kit fox.

B5-46

²⁵⁹ National Marine Fisheries Service, South-Central California Coast Steelhead Recovery Plan. West Coast Region, California Coastal Area Office, Long Beach, California (2013); National Marine Fisheries Service, 5-Year Review: Summary and Evaluation of South-Central California Coast Steelhead Distinct Population Segment, National Marine Fisheries Service, West Coast Region, California Coastal Office, Santa Rosa, California (2016); National Oceanic and Atmospheric Administration, Updated status of federally listed ESUs of West Coast salmon and steelhead, NOAA Tech. Memo NMFS-NWFSC-66 (2005).

²⁶⁰ Loew, S.S. et al., Population structure and genetic variation in the endangered Giant Kangaroo Rat (*Dipodomys ingens*), 6 Conservation Genetics 495 (2005) (Lowe et al 2005).

²⁶¹ U.S. Fish & Wildlife Service Endangered Species Recovery Program, Recovery Plan for Upland Species of the San Joaquin Valley, California, USFWS Region 1, Portland, OR (1998) (USFWS 1998).
<http://esrp.csustan.edu/publications/pubhtml.php?doc=sjvrp&file=cover.html>.

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In USFWS' five year review for the GKR, recommendations for the core area of the Ciervo-Panoche unit is to conserve 100% of occupied habitat, include all 95,000 acres of existing habitat of which only 17% was conserved by 2010²⁶². In addition USFWS' Recovery Plan for Upland Species of the San Joaquin Valley²⁶³ states that for GKR, "Where populations of giant kangaroo rats and associated, listed species appear to be robust, land use should *not be changed* when ownership or conservation status of parcels changes unless there are compelling reasons to do so." [Emphasis added] None of these recommendations are acknowledged the DEIS, even as part of an avoidance, minimization or mitigation strategy. As with the kit fox, identification and analyses of movement corridors and linkages are conspicuously absent and must be identified and analyzed for impacts as well as conservation opportunities. Conservation of occupied GKR habitat, maintenance of connectivity and enhancement of effective dispersal between populations are the keys to recovering this imperiled species²⁶⁴

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While the DEIS mentions the Panoche Solar project (at 3.2-4), which is under construction, project has been allowed to move forward in one of the densest GKR habitats currently known. This large cumulative impact to the GKR population makes the conservation of other parts of the core area and peripheral populations even more important.

The impacts of the proposed RMP on the GKR and its habitat must be further identified and analyzed in a revised and recirculated EIS.

E. California Tiger Salamander

California tiger salamanders (CTS) that are listed as threatened under the federal ESA are known to occur within the Planning Area. While breeding habitat is of course crucial for the salamander's survival, extensive, contiguous upland habitat is as important as the breeding site in conserving CTS populations. Land use changes in the Planning Area that would reduce the size and availability of upland habitat will adversely affect populations. CTS need at least 300-350 acres of contiguous upland habitat around any breeding sites which are crucial for foraging, estivation, and over-wintering and to protect the breeding adult population. Habitat connections between such upland-aquatic sites are also crucial for long-term metapopulation stability. The DEIS fails to discuss any strategy to prioritize areas for conservation in order to protect foraging, estivation, and over-wintering sites for the breeding adult population of CTS. The impacts of the proposed RMP on the CTS and its habitat must be further identified and analyzed in a revised and recirculated EIS.

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F. California Red-Legged Frog

The federally threatened California red-legged frog is known from the Planning Area. This red-legged frog is California's state amphibian and is in decline throughout its range. Development or impacts to crucial habitat for the red-legged frog will decrease the recoverability of the species as it fails to "Protect known populations" as recommended by U.S. Fish and

B5-48

²⁶² U.S. Fish & Wildlife Service, Giant kangaroo rat (*Dipodomys ingens*) 5 Year Review: Summary and Evaluation, Sacramento Office (2010) at pg. 38.

²⁶³ USFWS 1998.

²⁶⁴ Loew et al. 2005.

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Wildlife Service’s Recovery Plan.²⁶⁵ The Recovery Plan also recognizes that oil and gas development is a threat to the California red-legged frog and that “There is always a risk of leakage or breakage [of oil and gas pipelines] near stream crossings.”²⁶⁶

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cont.

The DEIS fails to put the impacts to the red-legged frog into context with regards to the ongoing worldwide amphibian extinction crisis²⁶⁷, and fails to identify the numerous impacts of expanded oil and gas drilling on the California red-legged frog and its habitat. Planning with inadequate identification and evaluation of impacts can lead to a “death by a thousand cuts” (or in this case, extinction by a thousand cuts) scenario. We believe significantly more safeguards need to be put in place to protect the red-legged frog populations in the Planning Area from further declines. The DEIS is wholly inadequate in the impact analysis for this species. The impacts of the proposed RMP on the California red-legged frog and its habitat must be further identified and analyzed in a revised and recirculated EIS.

G. Vernal Pool Fairy Shrimp

The U.S. Fish and Wildlife Service’s Recovery Plan for Vernal Pool Ecosystems of Northern California and southern Oregon²⁶⁸ identifies that 80% of all occurrences of vernal pool fairy shrimp need to be conserved in order for delisting to be considered. The DEIS relies on inadequate language of “Specialized habitats such as riparian areas, vernal pools, other wetlands, floodplains, native perennial grasses, saltbrush, and oak woodlands would be avoided by surface disturbing activities *when practical and feasible alternatives exist.*” [Emphasis added] (at pg.4.11-7). This vague requirement does nothing to ensure avoidance of impacts. The DEIS also suggests that mitigation ratio of 5:1 (acquisition:disturbance) will be used instead of in-place preservation. However, mitigation still results in net loss of habitat for the species. The DEIS needs to include clearer avoidance requirements and a hard limit for a disturbance cap for existing vernal pools in the Planning Area for those rare instances where impacts are truly unavoidable. We recommend a disturbance cap of 5% or less of the vernal pools that contain vernal pool fairy shrimp, so that the goals of the Recovery Plan can ultimately be achieved. The impacts of the proposed RMP on the vernal pool fairy shrimp and its habitat must be further identified and analyzed in a revised and recirculated EIS.

B5-49

H. Santa Lucia Purple Amole and Other Rare and Imperiled Plants

The Planning Area and HOGPA include habitat for the highly imperiled Santa Lucia purple amole (*Chlorogalum purpureum* var. *purpureum*) including federally designated critical

B5-50

²⁶⁵ U.S. Fish & Wildlife Service, Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*), USFWS Region 1, Portland, OR (1998), http://ecos.fws.gov/docs/recovery_plan/020528.pdf.

²⁶⁶ *Id.* at pg. 20.

²⁶⁷ Bishop, P.J. et al., The amphibian extinction crisis – what will it take to put the action into the Amphibian Conservation Action Plan? 5 S.A.P.I.E.N.S. 2 (2012), available at https://www.researchgate.net/profile/Phillip_Bishop/publication/236858285_The_Amphibian_Extinction_Crisis_-_what_will_it_take_to_put_the_action_into_the_Amphibian_Conservation_Action_Plan/links/00b7d519976a250885000000.pdf

²⁶⁸ U.S. Fish & Wildlife Service, Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon, USFWS Region 1, Portland, OR (2005).

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habitat.²⁶⁹ While there is no recovery plan for this extremely narrow endemic, the development of oil and gas in the Planning Area in and near the purple amoles' habitat has the potential to impact the plants and habitat. Because this species has been observed to grow on undisturbed soils that are cryptogamic or with cryptogamic crusts,²⁷⁰ any soil disturbance could be detrimental to their persistence over the long-term.

B5-50
cont.

The DEIS fails to analyze the potential serious impact that oil and gas development in the Planning Area may have on the Santa Lucia purple amole. While the critical habitat lies outside of the San Ardo Oil and Gas Field (DEIS at Figure 3.12-1b), it is unclear if BLM has surveyed for the amole on its surface estate in the area. It is also unclear, and perhaps less likely that surveys for the amole have occurred on the split estate because of the private surface rights. If surveys have been done, the results must be provided. The DEIS mentions the amole in only two places: in Table 3.12-2 and that "Santa Lucia purple amole is located in the vicinity of lease lands" (at pg. 3.12-28). The DEIS does state that "Field surveys would be required to determine if these species are present or potentially present on the lease lands" (at pg 3.12-28). For purposes of adequate analysis in this DEIS, surveys determining the presence of the species is essential in order to ensure that occupied habitat is precluded from being included in the lease or development areas.

Furthermore, the Environmental Consequences section provides no safeguards for any rare plant populations including the Santa Lucia purple amole stating only: "Listed plant populations *usually* would be avoided by development." (at pg. 4.12-12) [Emphasis added.] This language is totally inadequate when coupled with the lack of surveys in the Planning Area. Because the purple amole is a herbaceous perennial plant, it spends most of its time under the soil surface, undetectable except when it is above ground in flower and fruit.

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Much greater safeguards must be put in place for the rare plants that could be affected by oil and gas development in the area including the endangered purple amole. We suggest at a minimum, the revised DEIS include requirements for appropriate surveys for all rare plants following the California Native Plant Society (CNPS) and California Department of Fish and Game (CDFG) floristic survey guidelines²⁷¹ and should be documented as recommended by CNPS²⁷² and California Botanical Society policy guidelines.

²⁶⁹ U.S. Fish & Wildlife Service, Final Designation of Critical Habitat for *Chlorogalum purpureum*, a Plant From the South Coast Ranges of California; Correction, 79 Fed Reg 20083 (April 24, 2003), https://ecos.fws.gov/docs/federal_register/fr4084.pdf

²⁷⁰ U.S. Fish & Wildlife Service, Purple Amole (*Chlorogalum purpureum*) Five-year Review: Summary and Evaluation (September 2008), https://ecos.fws.gov/docs/five_year_review/doc1996.pdf

²⁷¹ California Native Plant Society, Rare Plant Program: CNPS Botanical Survey Guidelines (2011), <http://www.cnps.org/cnps/rareplants/inventory/guidelines.php>; California Department of Fish and Game, Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (Nov 24, 2009), <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline>; and U. S. Fish & Wildlife Service, Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants (Sept 23, 1996), http://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/Listed_plant_survey_guidelines.PDF

²⁷² California Native Plant Society, Policy with Regard to Plant Collecting for Educational Purposes (1993), <http://www.cnps.org/cnps/archive/collecting.php>

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The impacts of the proposed RMP on the purple amole and its habitat and other rare plants in the planning area must be further identified and analyzed in a revised and recirculated EIS.

B5-51
cont.

I. California Condor

The Planning Area is known habitat for the highly imperiled California condor which is a state and federally listed endangered species and a fully protected species in California. Despite the relative success that the California condor recovery efforts over the past decades,²⁷³ lead poisoning and other threats continue to require substantial management efforts. The Planning Area is also included in the Ridley-Tree Condor Preservation Act, which requires use of non-lead ammunition in condor habitat to help eliminate the threat of lead poisoning to California condors. However, the development of more oil and gas within the Planning Area will increase the threats to California condors, potentially mooting the benefits of this important legislation.

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The DEIS downplays the potential serious impact of oil and gas development in the Planning Area may have on the California condor. This species is in such dire circumstances and requires such large swaths of habitat that every acre of occupied habitat is needed for its ongoing recovery. Oil and gas development on foraging habitat reduces the amount of contiguous habitat safely available to the condor and causes a range contraction, which the California condor cannot afford.

Impacts to California condors can occur even from condors simply landing on oil pads, from noise associated with drilling new wells, reactivating and/or reworking existing wells (including converting the wastewater well to an oil and gas well), landing in or near waste ponds and sumps, and habituation impacts can occur well beyond the boundaries of an oil pad. These impacts should be evaluated, avoided, minimized and mitigated. Oil development has harmed California condors and their habitat on several occasions. In April 2002, the U.S. Fish and Wildlife Service had to flush condor number 100 from an oil pad, and later recorded oil on its face and wings. The U.S. Fish and Wildlife Service determined that the condor became oiled while trying to tear an oily rag from a pipe. Photographs and reports demonstrate habituation of condors to oil drilling equipment. The U.S. Forest Service also noted in 2005 that a condor became oiled due to “a small spill of oil that occurred when the condor was present and flew down to the spill before the workers could remove the oil.” Other condors have been found with oil on their heads as well, according to FWS. See e.g. photo of condor with oil on its head, attached as Exhibit D,²⁷⁴ to see how oil and gas drilling may impact California condors.

While the DEIS includes Best Management Practices and SOPs specifically for California condors (at pg.4.12-4), many of them are wholly inadequate as follows:

B5-53

²⁷³ U.S. Fish & Wildlife Service, California Condor Recovery Program 2015 Annual Condor Population Status Update (2015), <https://www.fws.gov/cno/es/pdf%20files/Ca-Condor-Recovery-Prog2015PopulationStatus.pdf>

²⁷⁴ U.S. Fish & Wildlife Service, California Condor Recovery Program 2015 Annual Report, Hopper Mountain National Wildlife Refuge Complex (2015) https://www.fws.gov/cno/es/CalCondor/PDF_files/2015_Annual_HMNWRC_Condor_Field_Report_Final_24AUG_2016.pdf

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- Appendix D states that drilling and well completion activities “may be” restricted to “certain time periods” to reduce impacts. BLM however does not have a strict requirement for reducing impacts and does not specify what time periods it means. Are these seasonal, or temporal restrictions? What impacts would these restrictions reduce?
- BLM also claims that operators will “designate a representative to oversee compliance.” Because BLM would be the authorizing agency, the representative overseeing compliance needs to be a BLM employee and answerable to the agency, not a private company.
- The DEIS also vaguely claims that “direct contact with California condors shall be avoided.” This statement leaves open the possibility of direct contact (i.e. avoid does not assure no contact) with condors. Therefore, an incidental take permit would be required from US Fish and Wildlife Service for any contact by individuals. Close coordination with the California Department of Fish and Game is also required because the California condor is a fully protected species under State law, and therefore no lethal take is allowed.
- The DEIS states that all equipment and work-related materials, as well as liquids “shall be contained in closed containers” and that any spills of hazardous liquids shall not be left unattended until clean-up is complete.” Despite the best of intentions, as identified above, condors can still sustain impacts from oil spills. The RMP requirements need to be stricter and more specific to reduce and avoid impacts to the condor from equipment and work related materials.
- The DEIS states that landing deterrents will be attached to walking beams on pumping units. A clear definition of “walking beams” needs to be provided. Condors are known to land on pumping units,²⁷⁵ (see photo attached as Exhibit D) and deterrents need to be installed on all surfaces of pumping units to deter condor landings. If any active deterrence is proposed to be used, such as various forms of hazing, a federal ESA incidental take permit would be required for each operator as well as approvals from the California Department of Fish and Game.
- The DEIS states that power lines will not span canyons or be located on ridgelines, and that bird deflectors will be installed on power lines, and that these power lines will be designed with “sufficient separation” to prevent electrocution of condors. Actually U.S. Fish and Wildlife Service’s Condor Recovery Program recommends relocating power lines underground or encasing them in insulated tree wire, which improves visibility to condors, to minimize the potential for collisions and electrocutions.²⁷⁶ This strategy needs to be incorporated into the avoidance and minimization measures in the RMP.

Because the impacts of the proposed RMP for oil and gas leasing and operations on the California condor and its habitat are not adequately identified or analyzed in the DEIS, it must be revised and recirculated for public comment.

²⁷⁵ Los Padres Forest Watch, California Condor: *Gymnogyps californianus*, <http://lpfw.org/our-region/wildlife/california-condor/> (accessed April 6, 2017).

²⁷⁶ U.S. Fish & Wildlife Service, Threats to California Condor Survival, USFWS Pacific Southwest Region, <https://www.fws.gov/cno/es/CalCondor/Condorthreats.html> (accessed April 6, 2017).

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X. BLM Failed to Take a Hard Look at the Risks of Induced Seismicity or Other Geological Hazards

Despite the foreseeability of a higher risk of induced earthquake activity resulting from new oil and gas development, the DEIS does not discuss the direct or indirect impacts that more and greater induced earthquakes are likely to have on the resources in the areas to be leased, including harms to people, property, and the environment. As detailed below, the DEIS mischaracterizes the state of scientific research on induced seismicity from oil and gas development; ignores the large and growing body of scientific evidence linking wastewater disposal, fracking, and other oil and gas development practices to induced earthquakes in California and other parts of the country, including damaging earthquakes; has a fundamentally flawed cumulative effects analysis; and proposes wholly inadequate mitigation measures.

A. The DEIS mischaracterizes the state of scientific research on induced seismicity from oil and gas development

The DEIS mischaracterizes the state of the science on seismic risks from oil and gas development, by inaccurately reporting the conclusions of the CCST (2014) report and by ignoring the findings of the large and growing body of scientific research on induced seismicity.

The DEIS inaccurately cites the CCST (2014) report to assert that the potential for induced seismicity due to wastewater disposal in California is “considered to be low.”²⁷⁷ This is incorrect. The CCST (2014) report repeatedly states that the potential seismic hazard from wastewater disposal is “uncertain,” in large part due to lack of research and data limitations resulting from DOGGR’s failure to require needed data from the oil and gas industry.²⁷⁸ Although the CCST (2014) report states that the fracking as currently carried out in California “is not considered to pose a high seismic risk,”²⁷⁹ the report concludes that an increase in fracking activity and the resultant increase in oil and gas production in California could increase seismic hazards.²⁸⁰

The DEIS fails to disclose other important findings from the CCST (2014) report on the seismic risks and hazards stemming from oil and gas development in California, including the following:

²⁷⁷ DEIS at 4.3-1 (“The potential for induced seismicity due to hydraulic fracturing or fluid disposal in Class II injection wells as they are currently carried out is considered to be low (CCST, 2014).”); DEIS at 5-6 (“The current risk of induced seismicity from wastewater disposal in California is small”).

²⁷⁸ CCST (2014) at 267-268 (“However, the potential seismic hazard posed by current water disposal in California is uncertain because possible relationships between seismicity and wastewater injection have yet to be studied in detail.”); CCST (2014) at 303 (“the relationship between seismicity and wastewater injection in California has not been fully evaluated. Therefore, the potential level of seismic hazard posed by wastewater disposal is at present uncertain”).

²⁷⁹ CCST (2014) at 303 (“Therefore, based on experience elsewhere, hydraulic fracturing as currently carried out in California is not considered to pose a high seismic risk.”).

²⁸⁰ CCST (2014) at 268 (“Injection of larger volumes of produced water from increased well stimulation activity and the subsequent increase in oil and gas production could conceivably increase the hazard”).

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cont.

- The risk of induced earthquakes, and the size of those earthquakes, may be as great or greater in California as in the central US: “Based just on the observed depths of earthquakes relative to injection depths in the reported cases of induced seismicity discussed in Section 4.3.5, it would appear that the overall potential for seismicity to be induced by wastewater injection may be at least as high in California as in the central U.S. Furthermore, some M5-6 events are observed to occur at relatively shallow depths in California, which suggests that induced earthquakes could be at least as large as those experienced to date in the continental interior.”²⁸¹
- “[T]he overall likelihood of nuisance from wastewater injection-induced earthquakes is relatively high.”²⁸²
- Many of California’s wastewater disposal wells are close to active faults: “Across all six oil-producing basins, over 1,000 wells are located within 2.5 km (1.5 miles) of a mapped active fault, and more than 150 within 200 m (650 ft).”²⁸³
- Future injection could increase the likelihood of triggering earthquakes on the San Andreas Fault, which runs through the project area: “If future high-volume injection took place in or close to these existing oilfields, it is plausible that the likelihood of triggering earthquakes on the SAF could increase.”²⁸⁴
- Gaps in the DOGGR injection database “seriously limit its usefulness for investigating induced seismicity in California”: (1) DOGGR requires the industry to report injection rates and wellhead pressures as monthly averages, instead of providing the needed finer scale data, and (2) injection depths are not reported for majority of injection wells (more than 85% have no depth data).²⁸⁵

Several key findings of the CCST (2014) report are also outdated as the science on induced seismicity has rapidly evolved in recent years, but this is not acknowledged by the DEIS. As detailed below, studies published subsequent to the CCST (2014) report have documented wastewater-injection-induced earthquakes in California and at least eight other states, as well as fracking-induced earthquakes ranging up to magnitude 4.6. New studies also suggest that there is no upper bound on the size of fracking and wastewater-induced earthquakes, meaning that large and dangerous earthquakes can be induced by oil and gas development activities.²⁸⁶ For example, Van der Elst (2016) concluded that

If induced earthquakes occur on tectonic faults oriented favorably with respect to the tectonic stress field, then they may be limited only by the regional tectonics

²⁸¹ CCST (2014) at 280.

²⁸² *Id.* at 303.

²⁸³ *Id.* at 30.

²⁸⁴ *Id.* at 303-304.

²⁸⁵ *Id.* at 299.

²⁸⁶ Atkinson, G.M. et al., Hydraulic fracturing and seismicity in the Western Canada Sedimentary Basin⁸⁷ *Seismological Research Letters* May/June (2016); Van der Elst, N.J. et al., Induced earthquake magnitudes are as large as (statistically) expected, 121 *J. Geophys. Res. Solid Earth* 4575 (2016) (“Van der Elst 2016”).

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and connectivity of the fault network. In this study, we show that the largest magnitudes observed at fluid injection sites are consistent with the sampling statistics of the Gutenberg-Richter distribution for tectonic earthquakes, assuming no upper-magnitude bound... [T]he results imply that induced earthquake magnitudes should be treated with the same maximum magnitude bound that is currently used to treat seismic hazard from tectonic earthquakes.²⁸⁷

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cont.

B. The DEIS ignores scientific research linking wastewater injection and other oil and gas development practices with induced earthquakes in California

The DEIS fails to acknowledge scientific studies that have linked oil and gas wastewater injection and fluid withdrawal to induced earthquakes in California. Research published in February 2016 linked wastewater injection in the Tejon oil field near Bakersfield with an earthquake swarm in 2005, in which two earthquakes reached magnitude 4.7.²⁸⁸ These earthquakes occurred about five miles from the injection wells linked to the seismic activity. In a related 2015 study, researchers identified at least three other cases in Kern County where wastewater injection likely induced earthquakes, including earthquakes greater than magnitude 4.²⁸⁹ The seismologists cautioned that the damage from induced earthquakes in California can be disastrous: “considering the numerous active faults in California, the seismogenic consequences of even a few induced cases can be devastating.”²⁹⁰ The researchers also cautioned that fluid flow from injection wells may be extensive in areas with active faults, meaning that siting injection wells at a prescribed distance from the nearest active fault “may not be sufficient to mitigate a potential seismic hazard increase.”²⁹¹

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A retrospective analysis of early twentieth-century earthquakes in the Los Angeles basin concluded that several highly damaging earthquakes were likely induced by oil and gas production.²⁹² The study suggested that the earthquakes were induced by fluid (oil and water) withdrawal, and influenced by the proximity of wells to active faults and well depth. Although not examined by the study, the researchers noted that several other damaging earthquakes, including the 1925 Santa Barbara, 1927 Ventura, and 1952 Kern County earthquakes may have also been induced by oil and gas development activities. A U.S. Geological Survey report noted that earthquake swarms in the San Ardo oil field ranging up to magnitude 4.5 were likely induced by oil industry fluid withdrawal.²⁹³

²⁸⁷ Van der Elst 2016 at 4575.

²⁸⁸ Goebel, Thomas et al., Wastewater disposal and earthquake swarm activity at the southern end of the Central Valley, California, 43 *Geophys. Res. Lett.* doi:10.1002/2015GL066948 (2016)

²⁸⁹ Goebel, T.H.W. et al., An objective method for the assessment of fluid injection-induced seismicity and application to tectonically active regions in central California, 120 *J. Geophys. Res. Solid Earth* 7013 (2015).

²⁹⁰ Goebel, T.H.W. et al. 2016 at 1098.

²⁹¹ Goebel, T. et al., A probabilistic assessment of wastewater injection induced seismicity in central California, Abstract of presentation at 2014 Meeting of American Geophysical Union, San Francisco (2014)

²⁹² Hough, S.E. and M. Page, Potentially induced earthquakes during the early twentieth century in the Los Angeles Basin, 106 *Bulletin of the Seismological Society of America* 2419 (2016).

²⁹³ Rosenberg, L.L. and J.C. Clark, Map of the Rinconada and Reliz Fault Zones, Salinas River Valley, California, U.S. Geological Survey (2009) at 21.

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Scientific research has established that high volumes, pressures, and duration of injection can increase the risks of induced seismicity,²⁹⁴ yet DOGGR continues to allow the oil industry to inject high volumes, rates, and pressures of wastewater near faults.²⁹⁵ Published research, not acknowledged by the DEIS, highlights that many of California's wastewater disposal wells are injecting at rates associated with an increased risk of induced seismicity (e.g., greater than 100,000 barrels per month),²⁹⁶ and extremely high injection rates of 600,000 barrels per month are common.²⁹⁷ Moreover, wastewater injection volumes in California more than doubled between 2000 and 2015, according to Department of Conservation data,²⁹⁸ which is associated with higher seismic risk.

Table 2. Total Wastewater Injected Statewide in CA.

Year	barrels (bbl)	gallons
1995	450,050,232	18,902,109,744
1996	437,773,845	18,386,501,479
1997	434,207,137	18,236,699,758
1998	397,756,658	16,705,779,636
1999	350,708,918	14,729,774,556
2000	363,047,553	15,247,997,226
2001	362,232,993	15,213,785,706
2002	397,467,282	16,693,625,844
2003	416,969,361	17,512,713,162
2004	455,295,784	19,122,422,928
2005	463,777,827	19,478,668,734
2006	535,871,677	22,506,610,434
2007	558,816,108	23,470,276,536
2008	553,762,144	23,258,010,048
2009	635,517,685	26,691,742,770
2010	700,422,410	29,417,741,220
2011	761,797,881	31,995,511,002
2012	819,588,712	34,422,725,904
2013	829,734,622	34,848,854,124
2014	904,632,098	37,994,548,116
2015	916,590,308	38,496,792,936

²⁹⁴ Rubinstein, J.L. and A.B. Mahani, Myths and facts on wastewater injection, hydraulic fracturing, enhanced oil recovery, and induced seismicity, 86 *Seismological Research Letters* July/August (2015); Weingarten, M. et al., High-rate injection is associated with the increase U.S. mid-continent seismicity, 348 *Science* 1336 (2015).

²⁹⁵ Goebel, T.H.W. et al. 2015.

²⁹⁶ Goebel, T.H.W. et al. 2015, at 7016

²⁹⁷ Goebel, T.H.W. et al. 2015, at 7022

²⁹⁸ Wastewater injection data from California Department of Conservation. 2015. Oil and Gas: Online Data, Division of Oil, Gas, and Geothermal Resources. Accessed at http://ftp.consrv.ca.gov/pub/oil/monthly_production_reports

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More than 38 billion gallons (~917 million barrels) of wastewater were injected into California disposal wells in 2015 alone.²⁹⁹ The use of extreme, water-intensive oil and gas recovery techniques, such as fracking, waterflood, and cyclic steam injection, has contributed to this significant rise in wastewater production.

Furthermore, many of California's wastewater disposal wells are close to active faults, which increases the risks of induced seismicity.³⁰⁰ When recently active faults are considered (e.g., faults that have caused earthquakes within the past 200 years), a recent analysis found that 87 of California's active wastewater disposal wells are injecting within one mile of fault, while 350 are injecting within five miles of a fault.³⁰¹ When all known faults are considered, nearly one-fifth of California active wastewater injection wells are within one mile of a fault (302 wells), while half are within five miles of a fault (808 wells).³⁰²

Despite the documented risks from induced seismicity, California's Underground Injection Control (UIC) regulations fail to address the seismic hazards from injection operations. DOGGR does not require the oil and gas industry to report, and make publicly available, the fluid injection data needed for researchers to adequately detect and monitor induced seismicity near injection wells, such as hourly injection rates, wellhead pressure, and downhole pressures, despite calls from seismologists for this crucial data.³⁰³

DOGGR similarly does not require adequate seismic monitoring in California oil fields needed to precisely locate earthquakes, including earthquakes of low magnitudes (e.g., 1.5 and 2) that provide important early warnings that large and potentially dangerous faults are being reactivated by fluid injection before larger earthquakes occur.³⁰⁴ Moreover, DOGGR's UIC regulations fail to require even the most basic best practices recommended by the Environmental Protection Agency for monitoring and mitigating induced seismicity hazards.³⁰⁵

C. The DEIS fails to acknowledge the large body of research linking induced seismicity to fracking, wastewater disposal, and other oil and gas development activities across the United States

²⁹⁹ California Department of Conservation, Oil and Gas: Online Data, Division of Oil, Gas, and Geothermal Resources (2015), ftp://ftp.consrv.ca.gov/pub/oil/monthly_production_reports

³⁰⁰ CCST (2014) at 30; Arbalaez, Jhon et al., On Shaky Ground: Fracking, Acidizing, and Increased Earthquake Risk in California, Earthworks, Center for Biological Diversity, and Clean Water Action (March 2014), <http://www.shakyground.org/wp-content/uploads/2014/02/ShakyGround-FINAL1.pdf> (Arbalaez 2014)

³⁰¹ Arbalaez 2014.

³⁰² *Id.*

³⁰³ McGarr, A. et al., Coping with earthquakes induced by fluid injection, 47 Science 830 (2015); Rubinstein, J.L. and A.B. Mahani. 2015

³⁰⁴ *Id.*

³⁰⁵ U.S. Environmental Protection Agency, Minimizing and Managing Potential Impacts of Injection-Induced Seismicity From Class II Disposal Wells: Practical Approaches, Underground Injection Control National Technical Workgroup. (2015).

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The DEIS fails to acknowledge the large and growing body of published scientific research documenting that oil and gas development activities, including fracking, wastewater injection, enhanced oil recovery, and fluid (oil and water) extraction, have induced earthquakes across many regions of the United States.³⁰⁶

Notably, the DEIS fails to disclose that fracking can induce larger earthquakes than previously thought, and that fracking is increasingly recognized as a significant source of seismic hazard.³⁰⁷ Scientific research has linked fracking with induced earthquakes ranging up to magnitude 4.6.³⁰⁸ Induced earthquakes have been linked to fracking in Ohio³⁰⁹ and Oklahoma,³¹⁰ England,³¹¹ British Columbia and Alberta,³¹² including larger events of magnitudes 3 and 4. Research also indicates that maximum earthquake size induced by fracking may be controlled by the size of the fault surface in a critical stress state, rather than the net injected fluid volume, meaning that large fracking-induced earthquakes are possible.³¹³

Atkinson et al. (2016) cautioned that fracking in the United States may be causing higher-than-recognized induced earthquake activity that is being masked by more abundant wastewater-induced earthquakes:

In the United States basins where the pace of development has been even greater [than in Canada], previous assertions that hazards from HF [fracked] wells are negligible (National Research Council, 2013) warrant re-examination. In particular, it is possible that a higher-than-recognized fraction of induced earthquakes in the United States are linked to hydraulic fracturing, but their identification may be masked by more abundant wastewater-induced events.³¹⁴

Although not discussed by the DEIS, the injection of oil and gas wastewater, often associated with fracking, has been linked to the dangerous proliferation of earthquakes in many

³⁰⁶ Ellsworth, W.L., Injection-induced earthquakes, 341 *Science* 1225942 (2013); Nicholson, C. and R. Wesson, Triggered earthquakes and deep well activities, 139 *Pure Appl. Geophys.* 561 (1992); National Research Council, *Induced Seismicity Potential in Energy Technologies*, National Academies Press (2013).

³⁰⁷ Atkinson, G.M. et al. 2016.

³⁰⁸ Schultz, R. et al., Hydraulic fracturing and the Crooked Lake Sequences: Insights gleaned from seismic networks, 42 *Geophysical Research Letters* (2015); Schultz, R. et al., A seismological overview of the induced earthquakes in the Duvernay play near Fox Creek, Alberta, 122 *J. Geophys. Res. Solid Earth* 492 (2017)

³⁰⁹ Skoumal, R., et al., Earthquakes induced by hydraulic fracturing in Poland Township, Ohio, *Bulletin of the Seismological Society of America* 105 (2015); Friberg, P.A. et al., Characterization of an earthquake sequence triggered by hydraulic fracturing in Harrison County, Ohio, 85 *Seismological Research Letters* 6 (2014).

³¹⁰ Holland, A., Earthquakes Triggered by Hydraulic Fracturing in South-Central Oklahoma, 103 *Bulletin of the Seismological Society of America* 3:1784 (2013).

³¹¹ Clarke, H. et al., Felt seismicity associated with shale gas hydraulic fracturing: The first documented example in Europe, 41 *Geophysical Research Letters* 8308 (2014).

³¹² Farahbod, A.M. et al., Investigation of regional seismicity before and after hydraulic fracturing in the Horn River Basin, northeast British Columbia, 52 *Canadian Journal of Earth Sciences* 112 (2014); Atkinson, G. et al., Abstract: Ground motions from three recent earthquakes in Western Alberta and Northeastern British Columbia and their implications for induced-seismicity hazard in eastern regions, *Seismological Research Letters* (2015); Schultz, R. et al. 2015); Atkinson, G.M. et al. 2016.

³¹³ Atkinson, G.M. et al. 2016.

³¹⁴ Atkinson, G.M. et al. 2016, at 13.

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parts of the country, including damaging earthquakes.³¹⁵ For example, a magnitude 5.8 induced earthquake near Pawnee, Oklahoma, in 2016 caused at least one injury and severe structural damage; a magnitude 5.7 induced earthquake outside Oklahoma City in 2011³¹⁶ injured two people, destroyed 14 homes, and caused millions of dollars' worth of damage to buildings and infrastructure.³¹⁷ A magnitude 5.3 induced earthquake near Trinidad, Colorado, in 2011³¹⁸ and magnitude 4.8 near Timpson, Texas, in 2012³¹⁹ also caused significant structural damage. In the central and eastern U.S., a U.S. Geological Survey analysis found that 7 million people live and work in areas vulnerable to damaging injection-induced earthquakes.³²⁰

Published research has linked oil and gas wastewater injection to induced earthquakes in at least nine states, including California. Oklahoma's earthquake activity has skyrocketed because of the massive amounts of wastewater disposal resulting from fracking.³²¹ In 2015 earthquake activity was 600 times greater than it was prior to 2008 according to the Oklahoma Geological Survey,³²² and earthquake swarms are occurring over ~15% of the state's area.³²³ Large earthquakes linked to wastewater injection in Oklahoma include the 2016 magnitude 5.8 earthquake near Pawnee which was the largest in the state's history; the 2011 magnitude 5.7 near Prague; the 2016 magnitude 5.2 near Fairview; and the 2016 magnitude 5.0 near Cushing beneath the US's largest oil storage facility.³²⁴

In Texas, recent analysis indicates that oil and gas development activities have induced earthquakes in many regions of Texas over the past 90 years due wastewater injection, fluid withdrawal, and enhanced oil recovery, with recent increases in induced earthquake activity attributed primarily to wastewater injection.³²⁵ Published research has linked wastewater injection to induced earthquakes in the heavily populated Dallas-Fort Worth region,³²⁶

³¹⁵ Ellsworth, W.L. 2013.

³¹⁶ Keranen, K.M. et al., Potentially induced earthquakes in Oklahoma, USA: Links between wastewater injection and the 2011 M_w 5.7 earthquake sequence, 41 *Geology* 699 (2013); Keranen, K.M. et al., Sharp increase in Central Oklahoma seismicity since 2008 induced by massive wastewater injection, 345 *Science* 448 (2014).

³¹⁷ Yeck, W.L. et al., Oklahoma experiences largest earthquake during ongoing regional wastewater injection hazard mitigation efforts, 44 *Geophys. Res. Lett.* 711 (2017).

³¹⁸ Rubinstein, J. et al., The 2001-present induced earthquake sequence in the Raton Basin of northern New Mexico and southern Colorado, 104 *Bulletin of the Seismological Society of America* 5 (2014).

³¹⁹ Frohlich, C. et al., The 17 May 2012 $M4.8$ earthquake near Timpson, East Texas: An event possibly triggered by fluid injection, 119 *Journal of Geophysical Research* 581 (2014).

³²⁰ Petersen, M.D. et al., One-year seismic hazard forecast for the Central and Eastern United States from induced and natural earthquakes, U.S. Geological Survey Open-File Report 2016-1035 (2016)

³²¹ Keranen, K.M. et al. 2014.

³²² Oklahoma Geological Survey, Statement on Oklahoma Seismicity (April 21, 2015)

http://wichita.ogs.ou.edu/documents/OGS_Statement-Earthquakes-4-21-15.pdf

³²³ *Id.*

³²⁴ Yeck, W.L. et al., Far-field pressurization likely caused one of the largest injection induced earthquakes by reactivating a large preexisting basement fault structure, 43 *Geophys. Res. Lett.* 10,198 (2016).

³²⁵ Frohlich, C. et al., A historical review of induced earthquakes in Texas, 87 *Seismological Research Letters* 1 (2016).

³²⁶ Frohlich, C. et al., The Dallas-Fort Worth earthquake sequence: October 2008 through May 2009, the Leading Edge (March 2010); Hornbach, M.J. et al., Ellenburger wastewater injection and seismicity in North Texas, 261 *Physics of the Earth and Planetary Interiors* 54 (2016).

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Timpson,³²⁷ Azle and Reno,³²⁸ and Cleburne.³²⁹ Enhanced oil recovery was linked to magnitude 4.6 earthquake near Snyder, Texas.³³⁰

Scientific research has also linked oil and gas wastewater injection to induced earthquakes in Colorado, including a 5.3 quake near Trinidad³³¹; Kansas including a 4.9 quake³³²; Arkansas including a 4.7 quake near Guy³³³; Ohio including a 3.9 quake³³⁴; southeastern New Mexico³³⁵; and Utah.³³⁶

Fluid extraction (oil and water) has also been documented to induce earthquakes. A recent study investigating earthquake activity near Azle, Texas, concluded that “[i]t is notable that we observe earthquake swarms in the Ellenburger [i.e., the area of study] apparently associated with extraction, not just injection.”³³⁷ The authors explained:

Earthquakes caused by fluid extraction near faults are not a new phenomenon in the United States or even Texas. Induced seismicity is often associated with subsurface pressure changes, and extensional stresses will concentrate on the boundary of the fluid draw-down region, promoting normal faulting. It is therefore perhaps no coincidence that we observe swarms of normal-faulting events in regions where more significant near fault stress changes occur.³³⁸

Another study in Texas found that “the majority of small earthquakes may be triggered/induced by human activity” in this region and “are more often associated with fluid

³²⁷ Frohlich, C. et al., The 17 May 2012 *M*_{4.8} earthquake near Timpson, East Texas: An event possibly triggered by fluid injection, 119 *Journal of Geophysical Research* 581 (2014); Shirzaei, M. et al. 2016. Surface uplift and time-dependent seismic hazard due to fluid injection. *Science* 353: 1416-1419

³²⁸ Hornbach, M.J. et al., Causal factors for seismicity near Azle, Texas, 6 *Nature Communications* 6728 (2016).

³²⁹ Justinic, A.H. et al., Analysis of the Cleburne, Texas, Earthquake Sequence from June 2009 to June 2010, 103 *Bulletin of the Seismological Society of America* 6 (2013).

³³⁰ Gan, W. and C. Frohlich, Gas injection may have triggered earthquakes in the Cogdell oil field, Texas, 110 *PNAS* 18786 (2013).

³³¹ Rubinstein, J. et al., The 2001-present induced earthquake sequence in the Raton Basin of northern New Mexico and southern Colorado, 104 *Bulletin of the Seismological Society of America* 5 (2014)

³³² Choy, G.L. et al., Abstract: A Rare Moderate-Sized (*M*_w 4.9) Earthquake in Kansas: Rupture Process of the Milan, Kansas, Earthquake of 12 November 2014 and Its Relationship to Fluid Injection, 87 *Seismological Research Letters* 1433 (2016).

³³³ Horton, S., Disposal of hydrofracking waste fluid by injection into subsurface aquifers triggers earthquake swarm in Central Arkansas with potential for damaging earthquake, 83 *Seismological Research Letters* 2:250 (2011); Ogwari, P.O. et al., Characteristics of induced/triggered earthquakes during the setup phase of the Guy-Greenbrier earthquake in North-Central Arkansas, 87 *Seismological Research Letters* 3 (2016)

³³⁴ Kim, W-Y, Induced seismicity associated with fluid injection into a deep well in Youngstown, Ohio, 118 *Journal of Geophysical Research* 3506 (2013).

³³⁵ Zhang, Y. et al. Exploring the potential linkages between oil-field brine reinjection, crystalline basement permeability, and triggered seismicity for the Dagger Draw Oil field, southeastern New Mexico, USA, using hydrologic modeling, 16 *Geofluids* 971 (2016).

³³⁶ Brown, M.R.M. and M. Liu, Injection-induced seismicity in Carbon and Emery Counties, central Utah, 16 *Geofluids* 801 (2016).

³³⁷ Hornbach, M.J. et al., Causal factors for seismicity near Azle, Texas, 6 *Nature Communications* 6728 (2016).

³³⁸ *Id.* at 7.

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extraction than with injection.³³⁹ The study noticed several examples of increased fluid extraction (i.e., oil and water) preceding earthquakes of substantial magnitude (3.4 to 4.8), suggesting a link between the two.³⁴⁰

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The National Resource Council's review of human induced seismicity notes the well-documented causes of induced seismicity resulting from fluid extraction:

Fluid extraction from a reservoir can cause declines in the pore pressure that can reach hundreds of bars. The declining pore pressure causes large contraction of the reservoir, which itself induces stress changes in the surrounding rock (Segall, 1989), in particular increasing horizontal stresses above and below the reservoir that could lead to reverse faulting (Figure 2.2). Grasso (1992) estimates that volume contraction of reservoirs from fluid withdrawal can cause earthquakes up to M 5.0.³⁴¹

D. The DEIS must analyze the full suite of geologic hazards stemming from oil and gas development

The DEIS must analyze all potential geologic hazards stemming from oil and gas development, including the impacts from induced earthquakes that damage well integrity, pipelines, and other fossil fuel infrastructure which could result in dangerous and environmentally damaging oil and gas leaks.

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E. The DEIS's cumulative impacts analysis is fundamentally flawed

The DEIS's cumulative effects analysis for geologic hazards is fundamentally flawed in (1) failing to analyze the potential cumulative impacts of new oil and gas development in increasing induced earthquake risks and hazards, and (b) by incorrectly limiting the geographic scope of analysis.

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BLM must address the cumulative effects that new oil and gas development could have in contributing to the increased risk of earthquakes, for example, through increased fluid injection from fracking and wastewater disposal. As detailed above, it is highly likely that new oil and gas development, and increased fracking and wastewater injection associated with new development, would cumulatively increase the risk of increased earthquake activity, and larger quakes. For example, scientific research has established that higher volumes and pressures of fluid injection can increase the risks of induced seismicity.³⁴² Multiple fracking operations that are close in time and space can also increase seismic risks:

³³⁹ Frohlich, Cliff and Michael Brunt, Two-year survey of earthquakes and injection/production wells in the Eagle Ford Shale, Texas, prior to the MW4.8 20, 402 Earth and Planetary Science Letters 15, 257 (Sept. 2014)

³⁴⁰ *Id.* at 263.

³⁴¹ National Research Council. 2013, at 44-45.

³⁴² Rubinstein, J.L. and A.B. Mahani. 2015; Weingarten, M. et al. 2015.

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In the case of HF [fracking] operations, high injection rates and the relatively large spatial footprint of the stimulated region produces transient risks that may be compounded by multiple operations that are proximate in time and space.³⁴³

Second, BLM incorrectly limited the geographic area considered for cumulative effects related to geologic hazards to only a half-mile radius of open areas for all alternatives. BLM's reason is based on the assertion that "impacts resulting from seismic events are localized in nature and are unlikely to extend beyond the actual oil and gas occurrence boundaries":

The majority of the Federal mineral estate lands where the RFD Scenario would occur for Alternatives A, C, D, and E are not within 0.5-miles of other cumulative projects or existing infrastructure except within existing oil and gas fields. Cumulative effects due to ground shaking and other seismic events would therefore be limited in nature . . .

The potential for cumulative induced seismicity due to the combination of the RFD Scenario and the reasonably foreseeable future actions is low as there are only three cumulative oil and gas projects presented in Table 5-1 and it is unknown if they would undergo well stimulation activities. In addition, the current use of well stimulation technologies (including hydraulic fracturing) in California is not considered to pose a significant seismic hazard.³⁴⁴

This is incorrect. Numerous studies have established that cumulative pressure increases from injection may induce swarms of earthquakes on faults located tens of kilometers or more from injection wells.³⁴⁵ One study suggests far-field pressurization from clustered, high-rate wells greater than 12 km from an earthquake sequence in Fairview, Oklahoma (of five earthquakes with Mw 4.4 or larger) induced these earthquakes, and points to the far-reaching impact of wastewater injection.³⁴⁶ A study in northern Texas concluded that the cumulative pressure increase from wastewater injection "may trigger earthquakes on faults located tens of kilometers or more from injection wells," including earthquakes affecting the heavily populated Dallas area.³⁴⁷ Wastewater-injection-induced earthquakes in California occurred about five miles from the injection wells linked to the seismic activity.³⁴⁸

Accordingly, it is highly likely that new oil and gas development, and increased wastewater injection associated with new development, would cumulatively increase the risk of increased earthquake activity, and larger quakes.

In sum, BLM cannot assume that opening up potentially 793,000 acres for oil and gas development will have no or minimal impact on seismic activity. BLM must analyze the

³⁴³ Atkinson, G.M. et al. 2016, at 13.

³⁴⁴ DEIS at 5-6.

³⁴⁵ Keranen, K.M. et al. 2014; Hornbach, M.J. et al., Ellenburger wastewater injection and seismicity in North Texas, 261 *Physics of the Earth and Planetary Interiors* 54 (2016)

³⁴⁶ Yeck, W.L. et al. 2016.

³⁴⁷ Hornbach, M.J. et al., Ellenburger wastewater injection and seismicity in North Texas, 261 *Physics of the Earth and Planetary Interiors* 54 (2016)

³⁴⁸ Goebel, T.H.W et al. 2016.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

potential for fracking and wastewater disposal to induce earthquakes, and the possible risks of induced seismicity in the specific areas for lease. These risks could possibly include significant property damage, injuries, or even death.

B5-58
cont.

F. The mitigation measures are wholly inadequate

The proposed mitigation measures – a non-binding and non-specific setback measure and monitoring and reporting only by the operators themselves – do nothing to mitigate the impacts for induced seismicity. Because the consequences of induced seismicity from well stimulation and underground waste disposal could be catastrophic, it is essential that the DEIR fully and accurately analyze this issue and propose comprehensive mitigation measures.

B5-59

Conclusion

Oil and gas development not only fuels the climate crisis but entails significant public health risks and harms to the environment. Accordingly, the analyses and information omitted from the DEIS is critical and must be reflected in the agency’s Final Environmental Impact Statement.

B5-60

For the reasons described above, we urge BLM to prepare a supplemental EIS that: (1) analyzes the foreseeable environmental impacts from the disturbance of more than only 206 acres, given that BLM is proposing to open 793,000 acres to oil and gas leasing, nearly half of which is considered High Oil and Gas Potential Areas; (2) fully considers a range of alternatives, including “no-leasing” and “no-fracking” alternatives; (3) fully considers current scientific and economic information, especially regarding climate change; and (4) strengthens its “hard look” at impacts to air, water, induced seismicity and human health, including by conducting a Health Impact Assessment.

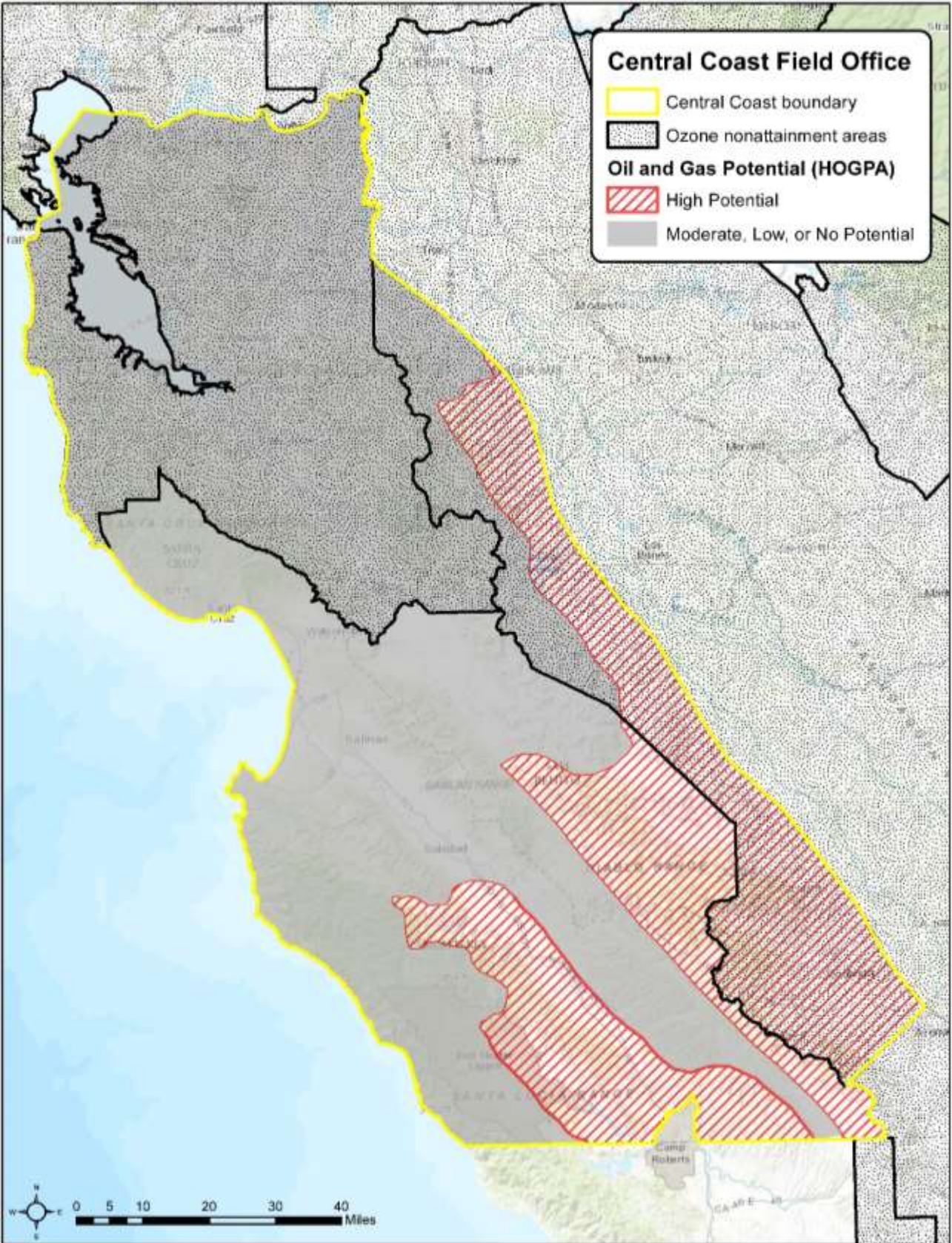


My-Linh Le, Legal Fellow,
Hollin Kretzmann, Staff Attorney,
Center for Biological Diversity

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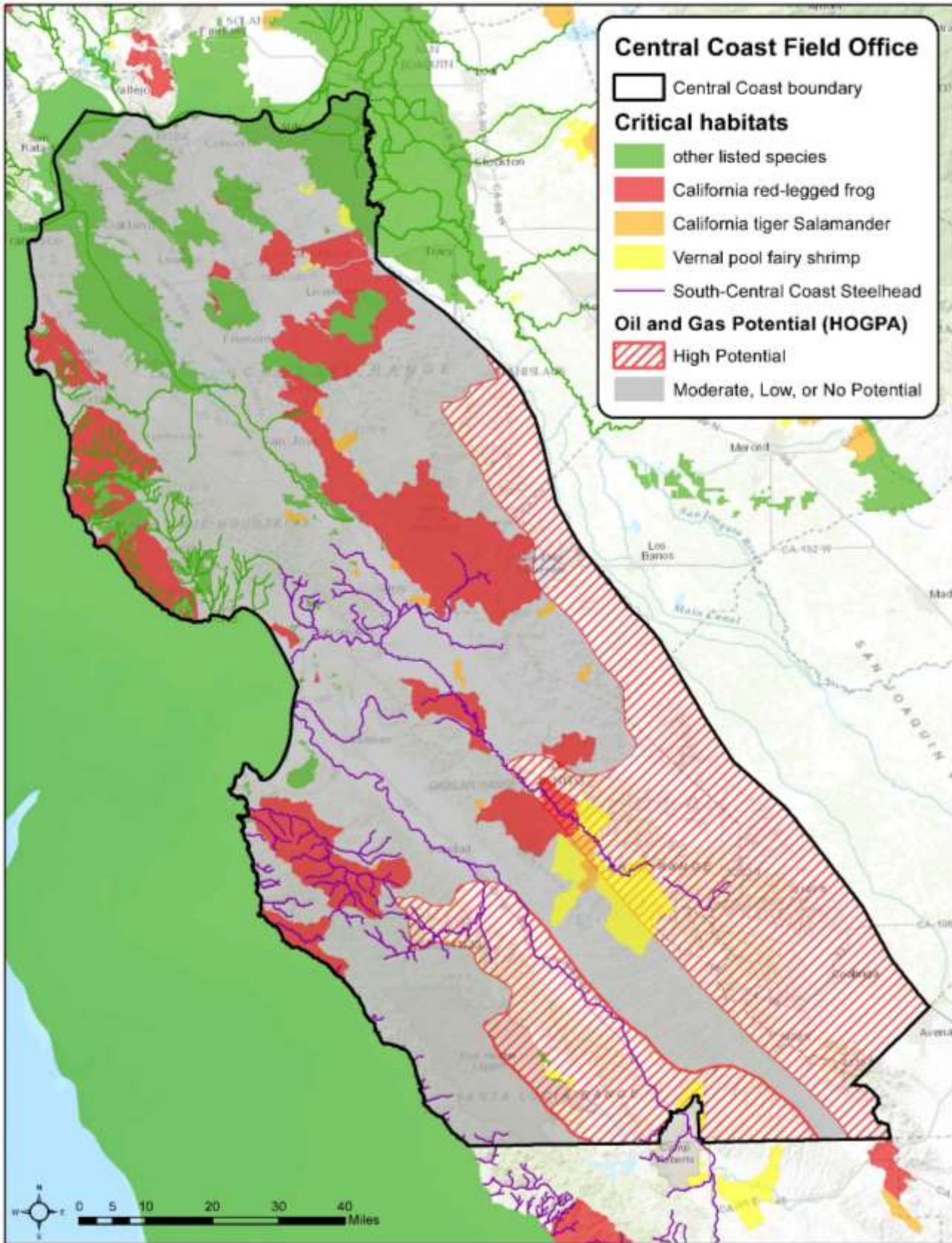
Nathan Matthews, Staff Attorney
Sierra Club

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)



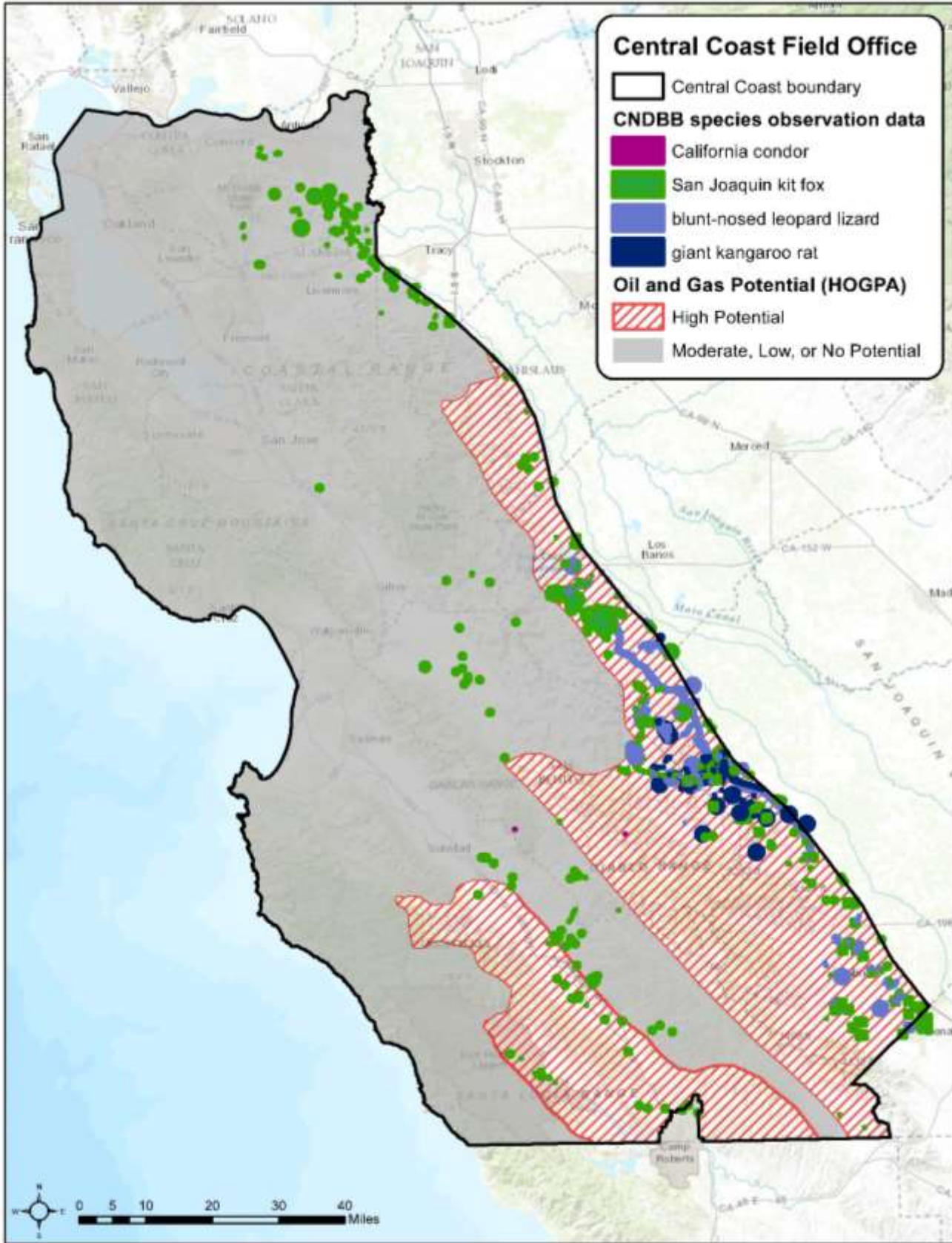
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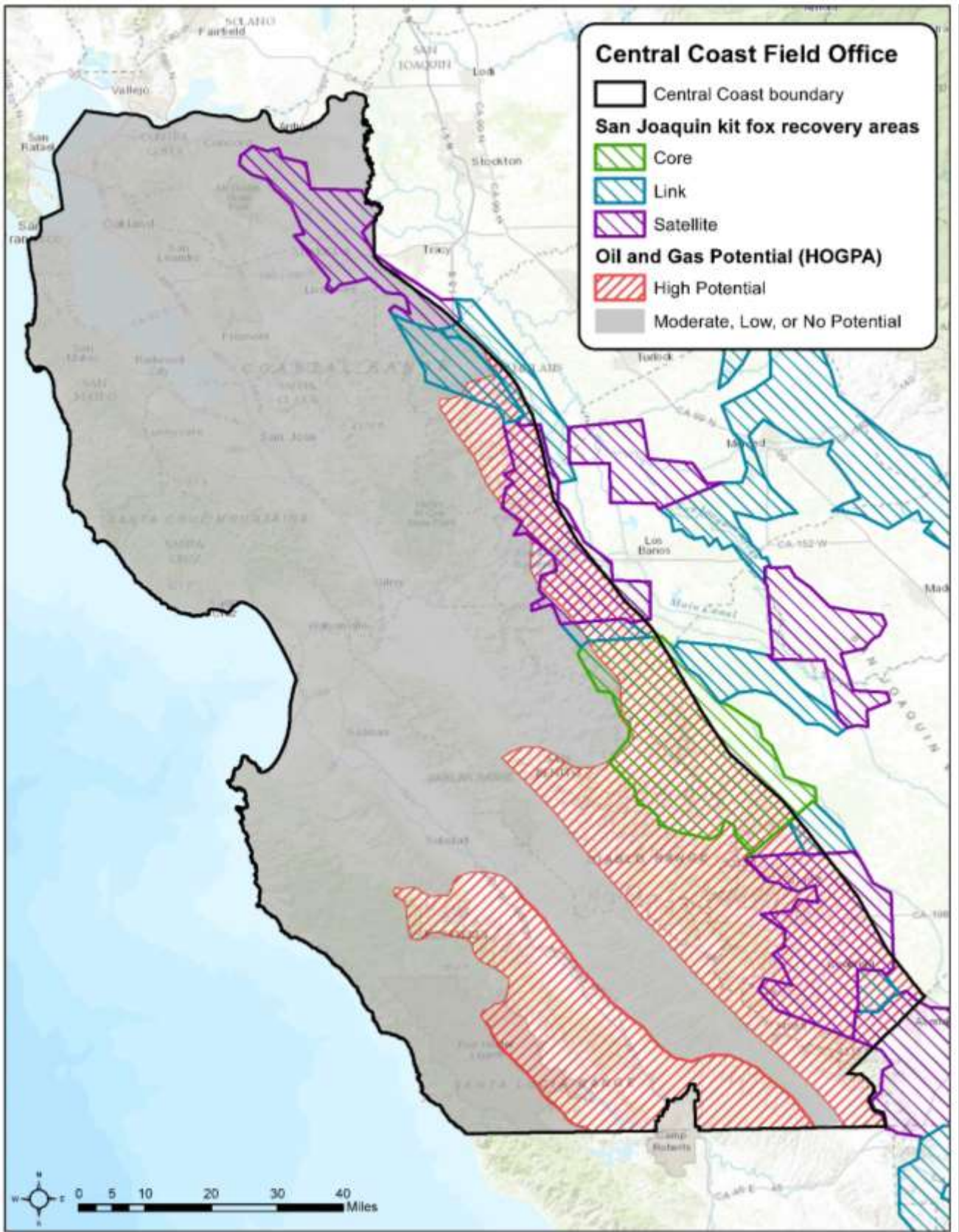
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Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)



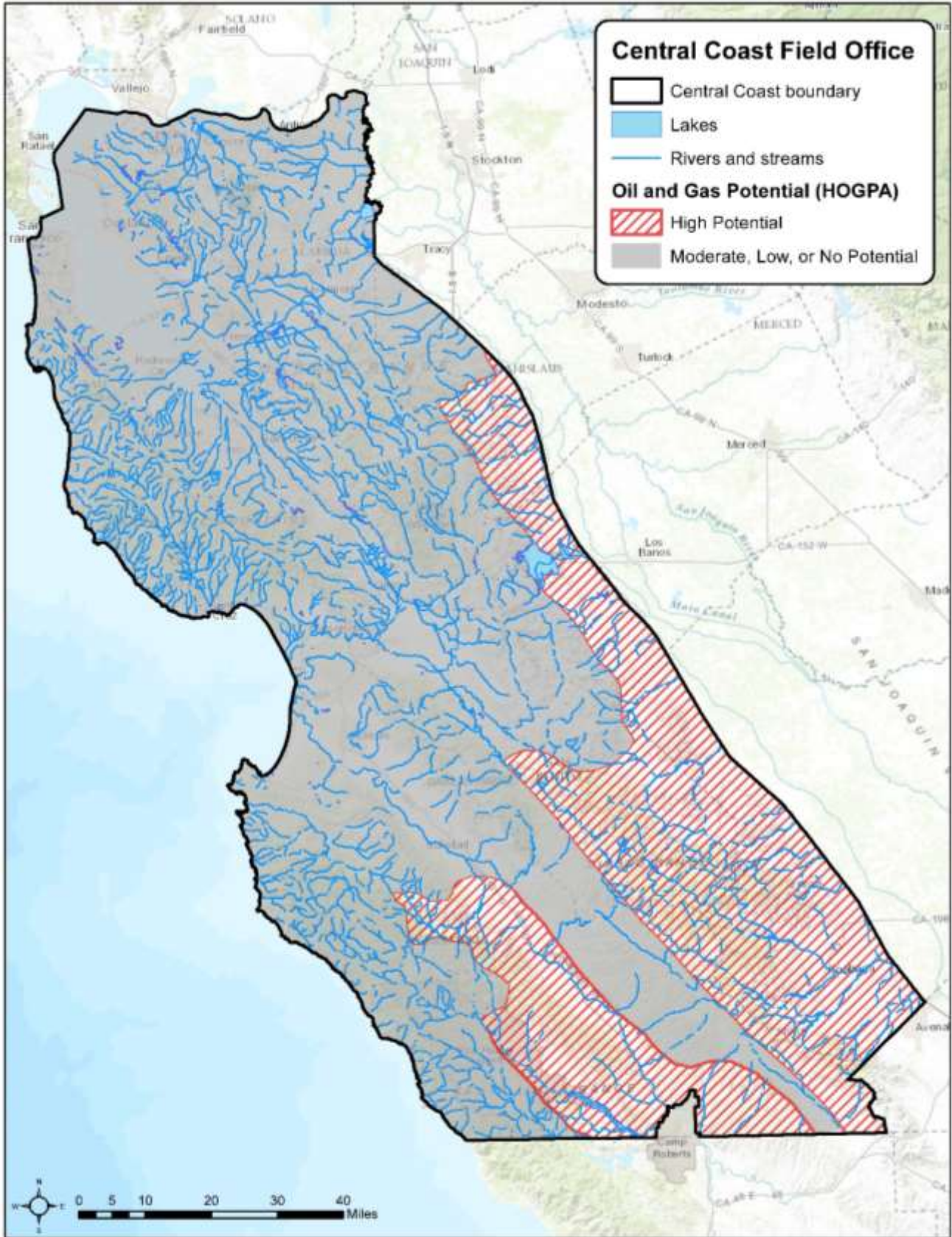
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Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)



B5-64



Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

B5-65

Review of the Impacts of Fracking and Other Oil and Gas Development Activity on Wildlife

Center for Biological Diversity

Updated March 30, 2017

A large and growing body of published scientific research has documented that fracking and other oil and gas development activities have wide-ranging, adverse impacts on species and ecosystems. Key ecological impacts from oil and gas development include habitat loss, fragmentation and degradation; habitat avoidance; decreased water quality and quantity; disrupted hydrology; human disturbance; noise, light, air and water pollution; and increased climate disruption. These impacts have resulted in mortality, lower reproductive success, and negative health effects; declines in density and abundance; and loss of ecosystem function and resilience, as detailed below.

I. Scientific Reviews of the Ecological Impacts of Fracking and Other Unconventional Oil and Gas Development

Several recent reviews have highlighted the wide range of ecological harms from fracking and other unconventional oil and gas development activity in the United States. A review by Souther et al. (2014) of the biotic impacts of fracking identified key harms from habitat loss and fragmentation; surface and groundwater contamination; diminished stream flow; stream siltation; localized air, noise, and light pollution; climate change; and cumulative impacts. Brittingham et al. (2014) reviewed current knowledge of the effects of hydraulic fracking on terrestrial and aquatic ecosystems in the United States, and identified numerous ecological impacts including habitat fragmentation, human disturbance, noise pollution, decreases in water quality and quantity, and cumulative effects on habitats and species of concern, all of which were expected to increase in magnitude as shale resource development continues to expand. The review concluded that species and habitats at particular risk include those with extensive overlap between a species' range or habitat type and a shale play, as well as those with limited ranges, small population size, specialized habitat requirements, and high sensitivity to disturbance such as core forest habitat and forest specialists, sagebrush habitat and specialists, vernal pond inhabitants, and stream species. Kiviat (2013) identified the ecological impacts from fracking in the Marcellus and Utica shale plays, including pollution by toxic synthetic chemicals, salt, and radionuclides; landscape fragmentation by wellpads, pipelines, and roads; alteration of stream and wetland hydrology; and increased truck traffic. The study highlighted particularly vulnerable groups, such as freshwater species (e.g., brook trout, freshwater mussels), fragmentation-sensitive species (e.g., forest-interior breedingbirds, forest orchids), and species with restricted geographic ranges (e.g., Wehrle's salamander, tongue-tied minnow).

Brittingham, M.C., K.O. Maloney, A.M. Farag, D.D. Harper, and Z.H. Bowen. (2014). Ecological risks of shale oil and gas development to wildlife, aquatic resources and their habitats. *Environmental Science and Technology* 48: 11034-11047.

Kiviat, E. (2013). Risks to biodiversity from hydraulic fracturing for natural gas in the Marcellus and Utica shales. *Annals of the New York Academy of Sciences* 1286: 1-14.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Souther, S., M.W. Tingely, V.D. Popescu, D.T.S. Hayman, M.E. Ryan, T.A. Graves, B. Hartl, and K. Terrell. (2014). Biotic impacts of energy development from shale: research priorities and knowledge gaps. *Frontiers in Ecology and the Environment* 12: 330-338.

B5-65
cont.

II. Habitat Loss, Fragmentation, and Degradation

Many studies have found that the construction of well pads, roads, pipelines, wastepits, seismic lines, and other infrastructure from oil and gas development has led to massive habitat loss and fragmentation in areas where fracking and other oil and gas development has proliferated. Habitat loss and fragmentation negatively affect species by reducing home range size, reducing patch size below what is needed for foraging and life history activities, increasing habitat isolation, altering physical characteristics such as light, moisture, and temperature, facilitating the spread of invasive species, and altering species dynamics, including movement patterns, interactions, and abundance (i.e., see Brittingham et al. 2014).

In the central United States and Canada, fracking has encouraged an average of 50,000 new wells per year since 2000, with associated large-scale habitat loss and fragmentation (Allred et al. 2015). In the Marcellus Shale of Pennsylvania, while each drilling pad and associated infrastructure results in the clearing of 8.8 acres of forest, each drilling pad affects 30 acres of forest after accounting for ecological edge effects (Johnson 2010). Similarly, in the Big Piney-LaBarge field in Wyoming, a study found that while the overall area of oil and gas infrastructure, including roads, pipelines, pads, and wastepits covered 4% of the total area, 97% of the total area fell within one-quarter mile of oil and gas infrastructure (Weller et al. 2002). As a result, oil and gas infrastructure impacted all the habitat of the greater sage-grouse in the area and road densities adversely affected elk. Studies on habitat loss and degradation are detailed below.

- **Massive loss of habitat and ecosystem services lost to oil and gas development**

A comprehensive study investigating the ecological impacts of recent oil and gas development across the central United States and Canada found that horizontal drilling and high-volume hydraulic fracturing have encouraged an average of 50,000 new wells per year since 2000, as well as large-scale vegetation loss, habitat fragmentation, and loss of ecosystem function and resilience. According to the study, unconventional oil and gas development is “transforming millions of hectares of the Great Plains into industrialized landscapes.” Vegetation removal by oil and gas development from 2000 to 2012 resulted in the loss of 10 teragrams (i.e., 10 million metric tons) of dry biomass, which reduces ecosystem resilience to drought and is “likely long-lasting and potentially permanent, as recovery or reclamation of previously drilled land has not kept pace with accelerated drilling.” The land area occupied by well pads, roads, and storage facilities built from 2000 to 2012 was ~3 million hectares. Oil and gas development increased fragmentation that can “sever migratory pathways, alter wildlife behavior and mortality, and increase susceptibility to ecologically disruptive invasive species.” The study also calculated that fracking removed between about 7 billion and 34 billion cubic meters of water from 2000 to 2012, and nearly half of wells drilled occurred in already highly or extremely water-stressed regions.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Allred, B.W. et al. (2015). Ecosystem services lost to oil and gas in North America. *Science* 348: 401-402.

- **Edge effects from drilling pads significant increase habitat loss**

Of the almost 250 drilling pads studied in the Marcellus shale of Pennsylvania, an average of 8.8 acres of forest had been cleared for each drilling pad, along with associated infrastructure. After accounting for ecological edge effects, it was found that each drilling station actually affected 30 acres of forest. The study predicted area-sensitive species such as the black-throated blue warbler and the scarlet tanager would be adversely affected by drilling infrastructure.

Johnson, N. (2010). "Pennsylvania energy impacts assessment: Report 1: Marcellus shale natural gas and wind," Nature Conservancy – Pennsylvania Chapter, <http://www.tcgasmap.org/media/PA%20Assessment%20of%20Gas%20Impacts%20TNC.pdf>, (accessed June 26, 2012)

- **Dense oil and gas infrastructure adversely impacts greater sage-grouse and elk habitat**

In the Big Piney-LaBarge field, Wyoming, the overall area of oil and gas infrastructure, including roads, pipelines, pads, and wastepits covers 4% of the total area, but the effect of that infrastructure on resident wildlife is much greater. 97% of the total area falls within one-quarter mile of infrastructure, thus impacting all the habitat of the greater sage-grouse in the area. The vast majority of the area also has road densities greater than two miles of road per square mile of the total area, which has adverse effects on elk.

Weller, C., J. Thomson, and G.Aplet. (2002). *Fragmenting Our Lands: The Ecological Footprint from Oil and Gas Development*. The Wilderness Society 80221(303):1-30.

- **Unconventional drilling leads to significant habitat loss and fragmentation in Appalachian forests**

Unconventional drilling for natural gas in the central Appalachians led to fragmentation of regional forests. Construction of gas well pads and infrastructure (e.g., roads, pipelines) contributed to an overall 4.5% loss in forest cover, a 12.4% loss in core forest, and a 51.7% increase in forest edge density.

Farwell, L.S. et al. (2016). Shale gas development effects on the songbird community in a central Appalachian forest. *Biological Conservation* 201: 78-91.

- **Fracking for natural gas causes significant habitat loss and damage**

A U.S. Forest Service scientific team documented the impacts of natural gas development on the natural and scientific resources of the Fernow Experimental Forest in West Virginia where fracking a natural gas well occurred between 2007 and 2009.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)B5-65
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The observed impacts that were expected included (1) the permanent deforestation of the well pad, access road, and pipeline right of way; (2) the reshaping and contouring of the site which led to the removal of all ground vegetation within the perimeter and ground disturbance; and (3) significant soil erosion associated with the construction (an “underestimate” of 2.1 metric tons of eroded material per hectare was provided). The pipeline introduced 3,000 meters of hard edge that increased fragmentation, is likely to change the microclimate, and may change rates of nest predation and increase dispersal of invasive exotic plants and animals. In addition, the wellbore drilled through three caves in an important karst region (the deepest cave 50 meters below surface with fresh water 120 m below surface), and the impacts to the cave ecosystem are unknown.

Unexpected impacts included (1) extensive damage from drill pit fluids in three different locations, which was not anticipated since no brine was indicated within the geology of the well site; this damage included extensive short-term and long-term damage to the forest and soil caused by land application of fracking fluids at two locations, as summarized in Adams (2013) below, and damage to two dozen trees immediately adjacent to the well pad likely due to loss of control of drill bore and aerial release of materials; (2) heavier-than-expected road damage during site development and drilling due to heavy equipment use, causing collapse of drainage ditches and significant road erosion; (3) last-minute changes in procedure for installing a pipeline across a tributary and wetland in a way likely to cause greater harm; and (4) equipment failures and truck accidents causing harm.

Adams, M.B., P.J. Edwards, W.M. Ford, J.B. Johnson, T.M. Schuler, M. Thomas-Van Gundy, and F. Wood. (2011). Effects of development of a natural gas well and associated pipeline on the natural and scientific resources of the Fernow Experimental Forest. US Department of Agriculture Forest Service, Northern Research Station. General Technical Report NRS-76. Newtown Square, PA.

III. Declines in Density, Species Richness, and Population Size

Declines in the density, species richness, and abundance of sage-grouse, songbirds, mule deer, fish and other aquatic species have been linked to oil and gas development.

• Greater sage-grouse leks decline in size near natural gas development

Coal-bed natural gas (CBNG) development has negative effects on greater sage-grouse in the Powder River Basin of Wyoming and Montana, including lower numbers of males observed on leks in CBNG fields compared to leks outside of CBNG, negative effects of CBNG development within 0.8 km and 3.2 km of the lek, and a time lag between CBNG development and lek disappearance. Current lease stipulations that prohibit development within 0.4 km of sage-grouse leks on federal lands are inadequate to ensure lek persistence and may result in impacts to breeding populations over larger areas. Other indirect effects such increased livestock grazing due to newly available water or changes in predator abundance due to drilling infrastructure may also negatively impact sage-grouse populations.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Walker, B.L., D.E. Naugle, and K.E. Doherty. (2007). Greater Sage-Grouse Population Response to Energy. *Journal of Wildlife Management* 71(8): 2644-54.

- **Presence of oil and gas wells contributes to decline in greater sage-grouse populations**

This study evaluated responses in lek attendance by male greater sage-grouse to the presence of oil and gas wells at 704 leks over 12 years in Wyoming. The presence of oil and gas wells adjacent to greater sage-grouse leks resulted in lower male lek attendance in 5 of 7 study areas, contributing to the decline in greater sage-grouse populations.

Harju S.M., M.R. Dzialak, R.C. Taylor, L.D. Hayden-Wing, and J.B. Winstead. (2011). Thresholds and Time Lags in Effects of Energy Development on Greater Sage-Grouse Populations. *Journal of Wildlife Management* 74: 437-448.

- **Sage-grouse lek attendance declines with increasing oil and gas well density**

Oil and gas development in Wyoming was associated with declines in lek attendance of male sage-grouse in Wyoming. Between 1984 and 2008, lek attendance of male sage-grouse declined by approximately 2.5 percent per year and was negatively related to oil and gas well density.

Green, A.W. et al. (2017). Investigating impacts of oil and gas development on greater sage-grouse. *The Journal of Wildlife Management* 81: 46-57.

- **Songbird species declines are associated with higher well density**

Increasing density of oil and gas wells in Wyoming was associated with decreased numbers of Brewer's sparrows, Sage sparrows, and Vesper sparrows. The abundance of several species was lowest in the oldest gas field, which suggests that the impacts of oil and gas development may compound over time, rather than showing signs of recovery or acclimation.

Gilbert, M.M. and A.D. Chalfoun. (2011). Energy Development Affects Populations of Sagebrush Songbirds in Wyoming. *The Journal of Wildlife Management* 75(4): 816-824

- **Increased well density is associated with decreases in grassland bird species**

In a study of the effect of gas wells and associated infrastructure on grassland bird populations in Canada, researchers found the Sprague's Pipit and Baird's Sparrow decreased with increased well density while Savannah Sparrow increased. The study hypothesized that harms from oil and gas development are likely responsible for these declines, including altered reproductive behavior due to vehicle and human disturbance associated with well maintenance, invasion by non-native species facilitated by oil and gas development, and reluctance of some species to cross trails and roads.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Dale B.C., T.S. Wiens, and L.E. Hamilton. (2008). Abundance of three grassland songbirds in an area of natural gas infill drilling in Alberta, Canada. *Proceedings of the Fourth International Partners in Flight Conference: Tundra to Tropics* 4: 194-204.

- **Natural gas well density lowers the density of some grassland birds**

In studying whether lower (9 wells/2.59km²) versus higher (16 wells/2.59km²) well densities affect grassland birds in Alberta, Canada, researchers found a negative effect of natural gas well densities on the Sprague's Pipit due to anthropogenic disturbance. The Savannah Sparrow occurrence and abundance was higher in areas with high well densities which reflects the species' general tolerance of human disturbances.

Hamilton L.E., B.C. Dale, and C.A. Paszkowski. (2011). Effects of disturbance associated with natural gas extraction on the occurrence of three grassland songbirds. *Avian Conservation and Ecology* 6: 7.

- **Natural gas development leads to declines in forest birds**

Shale gas development in Appalachian forested regions had negative effects on forest songbird species. Synanthropic species, which tend to be habitat generalists with wide geographic ranges, replaced forest specialists as the habitat became more fragmented and less suitable due to shale gas development.

Barton, E.P. et al. (2016). Bird community response to Marcellus Shale gas development. *The Journal of Wildlife Management* 80: 1301-1313.

Unconventional drilling for natural gas in the central Appalachians led to fragmentation of regional forests and was associated with the decline in species-richness of forest-interior birds. Construction of gas well pads and infrastructure (e.g., roads, pipelines) contributed to an overall 4.5% loss in forest cover, a 12.4% loss in core forest, and a 51.7% increase in forest edge density. Forest-interior bird guild richness declined, while early-successional and synanthropic bird guild richness increased, altering avian communities.

Farwell, L.S. et al. (2016). Shale gas development effects on the songbird community in a central Appalachian forest. *Biological Conservation* 201: 78-91.

- **Songbird densities decline adjacent to roads in natural gas development areas**

This study examined songbird responses to roads associated with natural gas development in sagebrush steppe habitat in the Jonah Field II and PAPA gas fields in Wyoming. The density of sagebrush obligates, particularly Brewer's and Sage Sparrow, was reduced by 39%-60% within a 100-m buffer around dirt roads with low traffic volumes. The density of roads created during natural gas development and extraction compounds the effects on songbirds, and the area of impact can be substantial.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Ingelfinger, F. and A. Anderson. (2004). Passerine response to roads associated with natural gas extraction in a sagebrush steppe habitat. *Western North American Naturalist* 64: 385-395.

- **Populations of mule deer decline significantly in areas of displacement by oil and gas development**

A 5-year study of mule deer (Sublette herd in Western Wyoming) in areas of displacement by oil and gas development found evidence of a declining population that was 30% greater in the developed area compared to the overall herd.

Wyoming Game and Fish Department. (2010). Recommendations for development of oil and gas resources within important wildlife habitats: Wyoming Game and Fish Department.12.

- **Oil and gas development contributes to the decline of woodland caribou**

Industrial development, including the large footprint from oil and gas development and infrastructure, is significantly contributing to habitat fragmentation and the decline, local extirpation, and possible extinction of woodland caribou populations in Canada.

Johnson, C.J. et al. (2015). Witnessing extinction – Cumulative impacts across landscapes and the future loss of an evolutionarily significant unit of woodland caribou in Canada. *Biological Conservation* 186: 176-186.

- **Abundances of sensitive fish species declines with increasing natural gas well density**

A preliminary study investigated the relationships between stream fish abundance and natural gas well density at 13 sites throughout the Fayetteville Shale within the Boston Mountain and Arkansas Valley ecoregions, using sites with similar catchment areas and stream size, and encompassing a gradient of gas well densities (0 to 3.26 wells per km²). The study examined fish species richness, fish density, percent sensitive taxa, percent darters, and percent green sunfish. The proportional abundance of sensitive taxa and darters were negatively correlated with gas well density, while the proportional abundance of the common species green sunfish was positively correlated with gas well density. The researchers concluded: “our preliminary results suggest a negative response in some community level variables to natural gas development.”

The study noted that in the Fayetteville Shale of central Arkansas, hydraulic fracturing has increased extensively over the last eight years, with over 4,000 gas wells currently in existence. Potential disturbances associated with gas extraction are siltation from pad, road, and pipeline construction, along with improper disposal of production water. Siltation of streams can alter substrates vital for successful reproduction in fishes and habitat for macro-invertebrates.

Green, Jessie J., G.L. Adams, and R. Adams. (2012). Examining community level variables of fishes in relation to natural gas development. Southeastern Fishes Council, Annual Meeting Program, November 8-9, 2012, New Orleans, Louisiana.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

- **Decreased species richness and increased water pollution found in streams near natural gas drilling activity**

A preliminary study investigating the effects of drilling for natural gas on stream life and water quality found reduced aquatic species richness in streams close to drilling activity. They reported, “as the density of well pads increased, the number of types of stream insects decreased.” They also reported higher levels of water pollutants in areas with high density drilling.

Phillips, S. “Researchers Wade Into Streams to Study Gas Drilling Impacts,” State Impact, NPR, October 6, 2011, <http://stateimpact.npr.org/pennsylvania/2011/10/06/researchers-wade-into-streams-to-study-gas-drilling-impacts/> (accessed June 26, 2012)

IV. Lower Survival, Lower Reproductive Success, and Negative Health Effects

- **Young greater-sage grouse have lower reproductive success and survival near natural gas infrastructure**

Young greater-sage grouse avoid mating near natural gas infrastructure, and those that were reared near infrastructure had lower annual survival rates and were less successful at establishing breeding territories compared to those reared away from infrastructure.

Holloran, M.J., R.C. Kaiser, and W.A. Hubert. (2010). Yearling Greater Sage-Grouse Response to Energy Development in Wyoming. *Journal of Wildlife Management* 74(1): 65-72.

- **Sage-grouse nest survival decreases near oil and gas development and wastewater reservoirs**

Nest survival for female sage-grouse in a natural gas field in the Powder River Basin, Wyoming, was highest in relatively unaltered habitats followed by mitigated areas, and then non-mitigated natural gas areas. Reservoirs constructed for holding gas wastewater were strongly associated with nest failure, while an increase in sagebrush cover was positively related to nest survival.

Kirol, C.P. et al. (2015). Mitigation effectiveness for improving nesting success of greater sage-grouse influenced by energy development. *Wildlife Biology* 21: 98-109.

- **Nest survival rates of sagebrush birds decline with oil and gas development**

Nest survival rates of three sagebrush-obligate bird species -- Brewer’s sparrow, sagebrush sparrow, and sage thrasher -- decreased with surrounding habitat loss due to natural gas development in Wyoming.

Hethcoat, M.G. and A. D. Chalfoun. (2015). Energy development and avian nest survival in Wyoming, USA: A test of common disturbance index. *Biological Conservation* 184: 327-334.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

B5-65
cont.

- **Exposure to fracking flowback and produced water causes endocrine disruption and other health harms to rainbow trout**

A study of the effects of exposure to fracking flowback fluid and produced water on rainbow trout found evidence for endocrine disruption, biotransformation, and oxidative stress. The researchers concluded that wastewater exposure “could cause significant adverse effects on fish, and the organic contents might play the major role in its toxicity.”

He, Y. et al. (2017). Effects on biotransformation, oxidative stress, and endocrine disruption in rainbow trout (*Oncorhynchus mykiss*) exposed to hydraulic fracturing flowback and produced water. *Environmental Science and Technology* 51: 940-947.

- **Songbirds accumulate metals associated with fracking in areas where fracking occurs**

A riparian songbird, the Louisiana Waterthrush, was found to have accumulated metals associated with fracking in watersheds where hydraulic fracturing occurs in both the Marcellus and Fayetteville shale regions. Barium and strontium were found at significantly higher levels in feathers of birds in sites with fracking activity than at sites without fracking. The authors concluded that “[o]ur finding of similarly elevated levels of metals associated with fracking in two geographically distant shale formations suggests hydraulic fracturing may be contaminating surface waters and underscores the need for additional monitoring and study to further assess ecological and human health risks posed by the increasingly widespread development of unconventional sources of natural gas around the world.”

Latta, S. C., L. C. Marshall, M. W. Frantz, and J. D. Toms. (2015). Evidence from two shale regions that a riparian songbird accumulates metals associated with hydraulic fracturing. *Ecosphere* 6(9): 144.

- **Exposure to fracking activity is associated with negative health impacts to wildlife, pets, and domestic animals**

Animal owners and veterinarians were surveyed in six states affected by gas drilling: Colorado, Louisiana, New York, Ohio, Pennsylvania, and Texas. The following cases of negative health impacts related to exposure to fracking infrastructure or wastewater were reported. Among wildlife, fish experienced sudden death and dermatological abnormalities, and song birds and amphibians experienced sudden death as well. Pet dogs and cats experienced various systemic impacts, and also sudden death. Farm animals such as bovines, horses, poultry, and llamas suffered a range of impacts, from poor reproduction and systemic problems, to sudden death. Some health impacts also resulted from accidental spills of fracking wastewater.

Bamberger, M. and R.E. Oswald. (2012). Impacts of gas drilling on human and animal health. *New Solutions* 22(1): 51-77.

- **Long-term health effects on humans and animals associated with unconventional drilling operations**

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

B5-65
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In this longitudinal study, researchers followed up on 21 epidemiological cases regarding residents and their animals living within a 2-mile radius of an oil or gas well. More than half of all exposures were related to drilling and hydraulic fracturing operations, and more than a third of all exposures were associated with wastewater, processing and production operations. The interviews revealed reproductive, neurological, gastrointestinal, dermatological, respiratory, and musculoskeletal health effects in humans, food animals and companion animals across the initial and follow-up interview approximately 25 months later. Animals also experienced sudden death. Food animals displayed a significant spike in reproductive symptoms, which the researchers attributed to extreme initial exposure to toxic chemicals from the extraction site. Health issues decreased when residents and animals moved out of the 2-mile radius, or in areas where gas and oil extraction ceased activity.

Bamberger, M. and R.E. Oswald (2015) Long-term impacts of unconventional drilling operations on human and animal health. *Journal of Environmental Science and Health, Part A* 50: 447-459.

- **Thyroid function modulation was found in nestling tree swallows adjacent to oil sands mine tailings**

A study of the plasma and thyroid glands of nestling tree swallows in wetlands partly filled with oil sands mine tailings showed endocrine disruption potential of Oil Sands Process Materials chemicals. Results suggested a modulation of thyroid function which may negatively affect metabolism, behavior, feather development, molt and compromise post-fledging survival.

Gentes M.L., A. McNabb, C. Waldner C. and J.E.G. Smits. (2007). Increased thyroid hormone levels in tree swallows (*Tachycineta bicolor*) on reclaimed wetlands of the Athabasca oil sands. *Arch Environ Con Tox* 53: 287-292.

- **Death and deformities in domestic animals in Garfield County, Colorado**

In an interview with the New York Times, a family living near natural gas wells and storage tanks reported congenital abnormalities in goats born on their property, as well as the death of their poultry.

Olsen, E. "Natural Gas and Polluted Air," *The New York Times*, February 2011, <http://video.nytimes.com/video/2011/02/26/us/100000000650773/natgas.html> (accessed June 26, 2012)

- **Mortality in pets and domestic animals to the Monongahela Basin Watershed Group**

An individual living near a seven-acre impoundment pool reported deaths of dogs and goats. An autopsy revealed arsenic in a dog, and a horse on the property also became sick. The Pennsylvania Department of Environmental Protection (PADEP) detected Ethyl glycol and arsenic in water samples on the property.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Upper Monongahela River Association, “WV/PA Monongahela Area Watersheds compacts, Minutes – Seventh Meeting,” March 23, 2011, http://www.uppermon.org/Mon_Watershed_Group/minutes-23Mar11.html (accessed June 26, 2012)

- **Potential impacts of shale gas development to bats in the northeastern US**

A report by Bat Conservation International discusses the hazards posed by fracking to northeastern bat populations, which are already severely threatened by white-nose syndrome. Bat species of particular concern are the federally endangered Indiana Bat, the little brown bat, and two bat species that have been petitioned for Endangered Species Act protection—the northern long-eared bat and the eastern small-footed bat. Threats to bat from fracking include water withdrawal, water contamination and toxic exposure, habitat loss and degradation, and greenhouse gas emissions and associated climate change.

Hein, C.D. (2012). Potential impacts of shale gas development on bat populations in the northeastern United States. An unpublished report submitted to the Delaware Riverkeeper Network, Bristol, Pennsylvania by Bat Conservation International, Austin, Texas.

V. Avoidance of Areas with Oil and Gas Development

Studies have documented that wildlife species decrease use of preferable habitat areas or avoid habitat areas altogether in areas with increasing densities of oil and gas development, leading to indirect habitat loss. For example, several studies have found that mule deer are significantly less likely to occupy areas in proximity to well pads than those farther away (Sawyer et al. 2006, 2010). One study found that mule deer have a significantly lower likelihood of using habitat within 2.7 to 3.7 kilometers of well pads, concluding that “indirect habitat losses may be substantially larger than direct habitat losses” (Sawyer et al. 2006). In addition, changes in habitat selection appeared to be immediate with no evidence of well-pad acclimation, leading to increasing use of non-preferred habitats. Each of these studies is summarized below.

- **Pronghorn avoid high-quality habitat near natural gas development**

The Jonah and PAPA (Pinedale Anticline Project Area) gas fields occur in the wintering home range of the pronghorn — the country’s longest terrestrial migrant. The habitat choices of female pronghorn demonstrated a fivefold decrease in the use of high-quality habitat patches and the abandonment of areas with the greatest habitat loss and industrial footprint. These results indicate a decline in the availability of high-quality habitat for pronghorn due to the behavioral impacts of habitat alteration associated with gas field development.

Beckmann, J.P., K. Murray, R.G. Seidler, and J. Berger. (2012). Human-mediated shifts in animal habitat use: Sequential changes in pronghorn use of a natural gas field in Greater Yellowstone. *Biological Conservation* 147(1): 222-3

- **Elk avoid the industrial footprint of natural gas fields**

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

In a study of Rocky Mountain elk that occupy a region where 2900 natural gas wells have been drilled, researchers found a strong avoidance by elk of the industrial development footprint in the gas field during the day. Human activity played a larger role than maternal status in shaping the elk's resource use.

Dzialak M.R., S.M. Jarju, R.G. Osborn, J.J. Wondzell, L.D. Hayden-Wing, J.B. Winstead, et al. (2011). Prioritizing conservation of ungulate calving resources in multiple-use landscapes. *Plos One* 6(1): e14597. doi:10.1371/journal.pone.0014597.

- **Female mule deer avoid winter habitat near natural gas development**

Sawyer et al. (2006) examined winter habitat selection patterns of adult female mule deer before and during the first 3 years of development in a natural gas field in western Wyoming. Mule deer were less likely to occupy areas in close proximity to well pads than those farther away. Changes in habitat selection appeared to be immediate (i.e., year 1 of development), and no evidence of well-pad acclimation occurred; rather, mule deer selected areas farther from well pads as development progressed. The distribution of deer shifted toward less-preferred and presumably less-suitable habitats.

In 2006 the Bureau of Land Management found that mule deer suffered indirect habitat loss 38-63% more often in areas where gas well pads were present than in areas with no well pads. This loss was expected to be sustained over the average 40 year production life of the gas wells in that area.

Sawyer, H., R.M. Nielson, F. Lindzey, and L.L. McDonald. (2006). Winter Habitat Selection of Mule Deer Before and During Development of a Natural Gas Field. *Journal of Wildlife Management* 70(2): 396-403

Sawyer, H., M.J. Kauffman, and R.M. Nielson. (2010). Influence of well pad activity on winter habitat selection patterns of mule deer. *Journal of Wildlife Management* 73: 1052-1061, page 1058 (citing Bureau of Land Management. 2006. Supplemental environmental impact statement for the Pinedale Anticline Oil and Gas Exploration and Development Project. Wyoming State Office, Cheyenne, USA.)

Natural gas development in Colorado altered behavior of mule deer in more than half of the critical winter range during the day and in more than a quarter of the critical winter range at night. The most substantial impacts were deer avoidance of well pads with active drilling to a distance of at least 800 meters. Deer avoided oil and gas infrastructure more during the day than at night.

Northrup, J.M. et al. (2015). Quantifying spatial habitat loss from hydrocarbon development through assessing habitat selection patterns of mule deer. *Global Change Biology* 21: 3961-3970.

- **Greater sage-grouse avoid habitat containing coal-bed natural gas development**

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Female greater sage-grouse in the Powder River Basin of Wyoming and Montana were 1.3 times more likely to occupy winter sagebrush habitats that lacked coal-bed natural gas (CBNG) wells within a 4-km² area, compared to habitat that had the maximum density of 12.3 wells per 4-km² allowed on federal lands.

Doherty, K.E., D.E. Naugle, B.L. Walker, and J.M. Graham. (2008). Greater sage-grouse winter habitat selection and energy development. *Journal of Wildlife Management* 72: 187-195.

- **Grassland birds avoid unconventional oil extraction sites**

Grassland birds avoided unconventional oil extraction sites (i.e. developed with hydraulic fracturing and horizontal drilling techniques) and associated roads in North Dakota, meaning that oil development caused significant loss of suitable habitat for grassland bird species. On average, grassland birds avoided areas within 150 m of roads, 267 m of single-bore well pads, and 150 m of multi-bore well pads, although species showed different sensitivities. For example, Sprague's pipit avoided areas within 350 m of single-bore well pads.

Thompson, S.J. et al. (2015). Avoidance of unconventional oil wells and roads exacerbates habitat loss for grassland birds in the North American great plains. *Biological Conservation* 192: 82-90.

- **Increasing densities of wells, facilities and transportation routes adversely affect wildlife until they no longer use affected areas**

Transportation route densities are known to adversely affect wildlife, including the pronghorn antelope, elk, and sage grouse in Western Wyoming's Pinedale Anticline field (Thomson 2006).

Moreover, a Wyoming Game and Fish Report from 2010 states: "As densities of wells, roads, and facilities increase, the effectiveness of adjacent habitats can decrease until most animals no longer use these areas. Animals that remain within the affected zones are subjected to increased physiological stress. This avoidance and stress response impairs habitat function by reducing the capability of wildlife to use the habitat effectively."

Thomson J.L, T.S. Schaub, N.W. Culver, and P. Aengst. (2006). *Wildlife at a Crossroads: Energy Development in Western Wyoming*. 8th Biennial Scientific Conference on the Greater Yellowstone Ecosystem. 206-7 ("Thomson 2006").

Wyoming Game and Fish Department (2010). *Recommendations for development of oil and gas resources within important wildlife habitats*: Wyoming Game and Fish Department.10.

VI. Noise Pollution

- **Noise pollution from natural gas compressors alters ecosystem function**

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

This study looked at the effects of noise pollution from natural gas compressors on pollination, seed dispersal and seedling establishment in an area with a high density of natural gas wells in New Mexico. Noise pollution indirectly increased artificial flower pollination by hummingbirds, but had an indirect negative effect on seedling establishment of a dominant species, piñon pine, by altering the composition of animals preying upon or dispersing seeds. This study concluded that noise pollution could have dramatic long-term effects on ecosystem structure and diversity.

Francis C.D., N.J. Kleist, C.P. Ortega, and A. Cruz. (2012). Noise pollution alters ecological services: enhanced pollination and disrupted seed dispersal. *Proceedings of the Royal Society B: Biological Sciences*, 2727-2735.

- **Noise pollution reduces male attendance at sage-grouse leks**

A decrease in abundance of leks with noise from natural gas drilling and associated roads was found in a study monitoring abundance with and without noise. In groups exposed to intermittent anthropogenic sounds associated with natural gas drilling and roads male attendance (i.e., abundance) at leks decreased up to 73%.

Blickley, J.L. et al. (2012). Experimental Evidence for the Effects of Chronic Anthropogenic Noise on Abundance of Greater Sage-Grouse at Leks. *Conserv Biol* 26: 461-471.

- **Noise pollution can cause elevated stress levels in sage-grouse**

In a study of greater sage-grouse in areas with noise from natural gas drilling and roads and an area with no noise, researchers found elevated immunoreactive corticosterone metabolites from fecal samples of male sage-grouse, supporting evidence of the impact noise can have on the birds' stress levels.

Blickley, J.L. et al. (2012). Experimental Chronic Noise is Related to Elevated Fecal Corticosteroid Metabolites in Lekking Male Greater Sage-Grouse (*Centrocercus urophasianus*). *PLoS ONE* 7(11): e50462. doi:10.1371/journal.pone.0050462

- **Chronic noise pollution from compressor stations lowers forest bird abundance**

Areas near noiseless energy facilities (wellpads) had a total songbird density 1.5 times higher than areas near noise-producing sites (compressor stations) in the boreal forest of Alberta Canada, indicating avoidance of noise producing infrastructure. White-throated Sparrow, Yellow-rumped Warbler, and Red-eyed Vireo were less dense in noisy areas.

Bayne E.M., L. Habib, and S. Boutin. (2008). Impacts of Chronic Anthropogenic Noise from Energy-sector Activity on the abundance of songbirds in the boreal forest. *Conservation Biology* 22(5): 1186-93.

- **Pairing success of ovenbirds lower at compressor stations**

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

At noisy compressor sites, ovenbird pairing success was reduced and greater proportions of inexperienced birds bred compared to noiseless well-pad sites in the boreal forests of Alberta, Canada.

Habib, L., E.M. Bayne E.M., and S. Boutin. (2007). Chronic industrial noise affects pairing success and age structure of ovenbirds *Seiurus aurocapilla*. *Journal of Applied Ecology* 44(1): 176-184.

VII. Facilitation of Invasive Species Spread

- **Natural gas development activity and associated disturbance may facilitate the establishment of non-native plants.**

Bergquist, E., P. Evangelista, T.J. Stohlgren, and N. Alley. (2007). Invasive species and coal bed methane development in the Powder River Basin, Wyoming. *Environ Monit Assess* 128: 381-394.

VIII. Decreases in Water Quality and Quantity

- **Fracking decreases water quality and quantity**

A review of the impacts from fracking to surface water identified impacts from increased erosion and sedimentation, increased risk to aquatic ecosystems from chemical spills or runoff, habitat fragmentation, loss of stream riparian zones, altered biogeochemical cycling, and reduction of available surface and hyporheic water volumes because of withdrawal-induced lowering of local groundwater levels.

Burton, G.A. et al. (2014). Hydraulic “fracking”: Are surface water impacts an ecological concern. *Environmental Toxicology and Chemistry* 33: 1679-1689.

- **High levels of pollutants found in fracking wastewater**

A study of Marcellus and Fayetteville hydraulic fracturing flowback fluids and Appalachian conventional produced waters found high levels of bromide, iodide, and ammonium in these fluids at levels that could impact stream ecosystems and promote the formation of toxic brominated-, iodinated-, and nitrogen disinfection byproducts during chlorination at downstream drinking water treatment plants. The study concluded that “our findings indicate that discharge and accidental spills of OGW to waterways pose risks to both human health and the environment.”

Harkness, J.S. et al. (2015). Iodide, bromide, and ammonium in hydraulic fracturing and oil and gas wastewaters: environmental implications. *Environmental Science and Technology* 49: 1955-1963.

- **Produced water from coal bed natural gas extraction can be lethal to aquatic species**

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

This study evaluated the acute toxicity to 13 aquatic species of sodium bicarbonate (NaHCO_3), which is found at high levels in produced waters from coal bed natural gas extraction in the Powder River Basin of Wyoming and Montana. Of the 13 species tested, 7 showed acute toxicity at sodium bicarbonate concentrations well below those documented in produced waters in the Powder River Basin. The most sensitive species included freshwater mussels, pallid sturgeon, and shovelnose sturgeon.

Harper, D.D. et al. (2014). Acute toxicity of sodium bicarbonate, a major component of coal bed natural gas produced waters, to 13 aquatic species as defined in the laboratory. *Environmental Toxicology and Chemistry* 33: 525-531.

- **Biocides used in fracking fluids have unstudied and potentially damaging ecological consequences**

The routine use of biocides used in fracking fluids, such as glutaraldehyde and quaternary ammonium compounds, has spurred concern regarding the impact of inadvertent releases into the environment on ecosystem and human health. This study identified important toxicological properties of biocides and knowledge gaps surrounding their use, including: “(1) many biocides are short-lived or degradable through abiotic and biotic processes, but some may transform into more toxic or persistent compounds; (2) understanding of biocides’ fate under downhole conditions (high pressure, temperature, and salt and organic matter concentrations) is limited; (3) several biocidal alternatives exist, but high cost, high energy demands, and/or formation of disinfection byproducts limits their use.”

Kahrilas, G. et al. (2014). Biocides in hydraulic fracturing fluids: a critical review of their usage, mobility, degradation, and toxicity. *Environmental Science and Technology* 49: 16-32.

- **Fracking wastewater suspected to be cause of fish abnormalities in Susquehanna River**

There is intense natural gas drilling in the basin of the Susquehanna River, and over 15 water treatment plants in Pennsylvania had been accepting waste water from hydraulic fracturing activity, subsequently discharging it into streams (Piette 2012). Fish in the Susquehanna River have been exhibiting abnormalities. For example, 40% of adult small-bass within one river section had black spots and lesions (Piette 2012), and in some cases, 90-100% of fish observed were cases of intersex, possibly due to endocrine disruption (PA Fish & Boat Commission 2012).

Piette, B. “BP oil spill, fracking cause wildlife abnormalities,” *Workers World*, April 27, 2012, http://www.workers.org/2012/us/bp_oil_spill_fracking_0503/ (accessed June 26, 2012).

Pennsylvania Fish & Boat Commission, “Ongoing problems with the Susquehanna River smallmouth bass, A case for impairment,” May 23, 2012, www.fish.state.pa.us/newsreleases/2012press/senate_susq/SMB_ConservationIssuesForum_Lycoming.pdf (accessed June 26, 2012).

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

- **Fracking fluid causes short term and long term damage of forest trees and surface soil in West Virginia**

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In June 2008, 303,000 liters of fracking fluid from a natural gas well were applied to a 0.20-ha area of mixed hardwood forest on the Fernow Experimental Forest, West Virginia, since land application is permitted in West Virginia as a means of disposing fracking fluids. During application, severe damage and mortality of ground vegetation was observed, followed about 10 days later by premature leaf drop by the overstory trees. Two years after fluid application, 56% of the trees within the fluid application area were dead. American beech was the tree species with the highest mortality, and red maple was the least affected, although all tree species present on the site showed damage symptoms and mortality. Surface soil concentrations of sodium and chloride increased 50-fold as a result of the land application of fracking fluids and declined over time. Soil acidity in the fluid application area declined with time, perhaps from altered organic matter cycling.

The study notes that land application of fracking fluids is permitted by some states as a means of disposal, among them West Virginia, Arkansas, and Colorado, although relatively little information exists in the scientific literature about the effects of these fracking fluids on natural resources and, in particular, the potential environmental impacts of land application of fracking fluids. In West Virginia, to be permitted, the well operator must document that the fluids meet the following criteria: <12,500 mg L⁻¹ chloride, pH between 6 and 10, and total iron <6.0 mg L⁻¹ (West Virginia Office of Oil and Gas General Water Pollution Control Permit; GP-WV-1-88). The Well Operator's Report indicated that the concentration of chlorides was 7500 mg L⁻¹ and met all the other requirements for land application at Fernow Experimental Forest, indicating that the current requirements are not precautionary enough.

Adams, M.B. (2011) Land Application of Hydrofracturing Fluids Damages a Deciduous Forest Stand in West Virginia. *Journal of Environmental Quality* 40: 1340-1344.

- **The discharge of produced water into native streams affects water chemistry and water availability, thus disturbing native ecosystems.**

Bureau of Land Management (BLM). (2003). Final environmental impact statement and proposed plan amendment for the powder river basin oil and gas project. Volume 1 of 4. WY-070-02-065. US Department of the Interior, Bureau of Land Management, Buffalo Field Office.

- **Fracking depletes water levels in streams, affecting the overall health of the aquatic ecosystem**

“Where... fracking water comes from is one of the major threats to fisheries. Trucking water in is expensive; it's cheaper to run a fire hose to a local source. Because well sites are often in undeveloped highlands, these sources are often small trout streams. Regulations for drawing water vary among the states, and there are questions about how well current regulations protect waterways. There is also a question of enforcement. Four gas companies have already been caught withdrawing water from Pennsylvania trout streams without permission.”

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Licata, A. "Natural gas drilling threatens trout in Pennsylvania (and other Appalachian states)," July 24, 2009, Field and Stream, <http://www.troutrageous.com/2009/08/field-stream-pa-natural-gas-drilling.html>, (accessed June 27, 2012)

"The overall health of an aquatic habitat derives from the condition of the entire watershed including the uplands, riparian corridor and the stream channel. Impacts to the upland plant community and environment can have a very immediate impact on an aquatic system, because the condition of vegetation throughout a watershed is the major factor determining the quantity and quality of the associated flow regime."

Wyoming Game and Fish Department. (2010). Recommendations for development of oil and gas resources within important wildlife habitats. Wyoming Game and Fish Department. 11.

- **A shale drilling company illegally filled in an acre of exceptional wetland**

"The Department of Environmental Protection inspected a Bloss Township, Tioga County, site in March and found that Seneca Resources Corp. of Brookville had filled nearly one acre of 'exceptional value' wetland without authorization, improperly built an impoundment, and caused sediment runoff by failing to institute erosion control best management practices. The unauthorized fill in a wetland and sediment runoff were violations of the Pennsylvania Clean Streams Law and the Dam Safety and Encroachments Act."

Department of Environmental Protection, Commonwealth of Pennsylvania. "DEP Fines Seneca Resources Corp. \$40,000 for Violations at Marcellus Operation in Tioga County," July 10, 2010, <http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=14655&typeid=1> (accessed June 26, 2012).

IX. Harms from Wastewater Disposal Pits

- **Oil field wastewater disposal facilities cause bird mortality**

Hydraulic fracturing fluids are sometimes disposed of in commercial and centralized oilfield wastewater disposal facilities (COWDFs), which are used in California, Colorado, New Mexico, Utah, and Wyoming. Birds are attracted to these large ponds which can potentially cause wildlife mortality. Field inspections in Wyoming found 269 bird carcasses – most commonly grebes and waterfowl. Sodium toxicity and surfactants – which are found in hydraulic fracturing fluids – were suspected to be the cause of death at three of the inspected COWDFs.

Ramirez, P. Jr. (2010). Bird Mortality in Oil Field Wastewater Disposal Facilities. Environmental Management 46(5): 820-6.

- **Documented mortality in oil pits numbers thousands of birds of 172 species**

From 1995-2005, USFWS found a minimum of 2060 individual birds were identified from remains recovered from oil pits, representing 172 species from 44 families.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Trail, P. (2006). Avian mortality at oil pits in the United States: a review of the problem and efforts for its solution. *Environmental Management* 38: 532-544.

- **Wildlife mortality in reserve pits is related to oil and gas drilling**

This report produced by the US Fish and Wildlife Service analyzes risks to migratory birds from reserve pits, which are commonly used for the disposal of drilling muds and well cuttings in oil and natural gas fields. The pits contain many toxic chemicals used to drill wells, along with the oil residue. Many species of birds are attracted to the insects stuck in the pits, and become entrapped within the sticky substance, which then attracts larger predators. Additionally, the chemicals in the pit decrease surface tension of water, and so waterfowl will begin to experience hypothermia as water is able to penetrate through the feathers and coat their skin. Birds that do escape usually suffer from health and reproductive issues from oil exposure. Mortality can be high; in one example, 77 bird carcasses were recovered from a reserve pit in Carbon County, Wyoming between the months of July and September 2008. The report recommends the elimination of open reserve pits and the use of closed-loop drilling, down-hole disposal of drill cuttings, and implementation of fences and screening around existing reserve pits to prevent wildlife and cattle from venturing into the steep pits.

Ramirez, P. Jr. (2009) Reserve Pit Management: Risks to Migratory Birds. U.S. Fish and Wildlife Service Region 6: Environmental Contaminants Program.

- **Coalbed methane extraction, which commonly utilizes hydraulic fracturing, is linked to an increased risk of West Nile Virus to threatened greater sage-grouse**

The survival rate of the greater sage-grouse in Wyoming has declined by 25% in recent years. Coalbed methane development in the area causes large volumes of water to be discharged and impounded during natural gas extraction, which creates aquatic habitats that can support mosquito development. There was a 75% increase in potential habitat for mosquito larvae due to an increase in small discharge ponds in this region. The mosquito *Culex tarsalis*, which is found in the area, spreads West Nile Virus to susceptible species. This implies the Greater Sage-grouse is at increased risk of exposure to West Nile Virus due to coalbed methane development.

Zou, L., S.N. Miller, and E.T. Schmidtman. (2006). Mosquito Larval Habitat Mapping Using Remote Sensing and GIS: Implications of Coalbed Methane Development and West Nile Virus. *J Med Entomol* 43(5): 1034-41

- **Exposure of birds to oilfield brine discharges increased the presence of petroleum hydrocarbons in the birds' stomach tenfold**

A study of the effects of oilfield brine on western sandpipers in Texas showed "total aromatic petroleum hydrocarbon concentration in stomach contents of birds collected at the discharge site was over tenfold greater than at the reference site." The study also found chronic exposure to petroleum hydrocarbons based on petroleum aromatic hydrocarbon concentrations in food items, carcass aliphatic contaminant burdens, and reduced liver weight of sandpipers collected at the oilfield discharge site.

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Rattner, B.A., J.L. Capizzi, K.A. King, L.J. LeCaptain, M.J. Melancon. (1995). Exposure and Effects of oilfield brine discharges on Western Sandpipers (*Califris mauri*) in Nueces Bay, Texas. Bull. Environ. Contam. Toxicol. 54: 683-689

- **Tailings ponds from open pit bitumen extraction causes avian mortality**

A study of annual avian mortality in the tailings ponds of the Athabasca tar sands region in northeastern Alberta, Canada, showed and estimated annual mortality rate in the range of 458 to over 5,000 birds a year.

Timoney K.P. and R.A. Ronconi. (2010). Annual Bird Mortality in the Bitumen Tailings Ponds in Northeastern Alberta, Canada. Wilson Journal of Ornithology 122: 569-576.

X. Harms from Wastewater Discharges and Spills

Numerous cases of pipeline spills, blowouts, and trucking accidents have exposed fish and other wildlife to wastewater from unconventional oil and gas development. These contamination incidents, both accidental and intentional, have caused large-scale fish kills, kills of federally threatened species, and a range of negative health effects to wildlife and domestic animals. Wastewater disposal pits have resulted in the mortality of numerous bird species and increased the risk of mosquito-borne disease.

- **Unlawfully discharged fracking fluids kill aquatic invertebrates and fish, including Blackside Dace, a federally threatened species**

A company in Kentucky illegally discharged fracking fluids into a stream, contaminating it with hydrochloric acid and other chemicals, and killing federally threatened Blackside Dace. According to the U.S. Fish and Wildlife Service report, “the discharges killed virtually all aquatic wildlife in a significant portion of the fork, including fish and invertebrates.” Blackside Dace, a fish species listed as threatened under federal law, were among the aquatic species killed (USFWS 2010).

In 2007, fracking fluids used during the development of four natural gas wells in Knox County, Kentucky, were released into Acorn Fork creek in the upper Cumberland River basin; the fracking effluent overflowed the retention pits directly into Acorn Fork. The hydrochloric acid and dissolved metals from the fracking fluid significantly reduced stream pH from pH 7.5 to 5.6 and created a thick orange-red flocculent. Fish and aquatic invertebrates were killed or displaced for months in over 2.7 kilometers of the approximately 5 kilometers of affected waters in the stream. The federally threatened Blackside Dace was among the fish killed. It is not known how many dace were killed overall since peak mortality was likely missed before researchers arrived, but one dead, one moribund, and several living but distressed Blackside Dace were observed. An analysis of the water quality of Acorn Creek and fish tissues (analysis of Creek Chub and Green Sunfish tissues since Blackside Dace were not available) a month after fracking found that (1) fish exposed to affected Acorn Creek waters showed general signs of stress and had a higher

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

incidence of gill lesions, and (2) the abrupt and persistent changes in post-fracking water quality resulted in toxic conditions (Papoulias et al. 2013).

U.S. Fish and Wildlife Service, Office of Law Enforcement, Case at a Glance: U.S. v. Nami Resources Company, LLC. www.fws.gov/home/feature/2009/pdf/NamiInvestigation.pdf (accessed on July 20, 2010).

Papoulias, D.M. and A.L. Velasco. (2013). Histopathological analysis of fish from Acorn Fork Creek, Kentucky, exposed to hydraulic fracturing fluid releases. *Southwestern Naturalist* 12 (Special Issue 4): 92-111.

- **Accidental discharge of wastewater causes death of fish and invertebrates**

In Washington County, PA, a pipeline at Cross Creek Wells accidentally discharged an estimated 4,200 gallons of wastewater, as well as sediments. A report by the Oil and Gas Management Program of the Department of Environmental Protection concluded, “The creek was impacted by sediments all the way down to the lake and there was evidence of a fish kill as invertebrates and fish were observed lying dead in the creek.”

Department of Environmental Protection, Commonwealth of Pennsylvania, Inspection Report, May 27, 2009. www.marcellus-shale.us/pdf/CC-Spill_DEP-Insp-Rpt.pdf (accessed on June 26, 2012).

- **Drilling fluid and fracking fluid spills cause wildlife mortality**

Table of incidents of wildlife mortality associated with Natural Gas drilling operations

Location	State	Year	Main Issue Reported	Damage
Dimock	PA	2009	Spill of lubricant gel used in fracture fluid at the drilling site due to failed pipe connections	Contaminated wetland, caused fish kill
Hopewell Township	PA	2009	Broken transmission line led to spill of 7,750 barrels of diluted fracture fluids	Contaminated stream, killing over 100 fish in area rich in biodiversity

MIT Energy Initiative. (2011). “The future of Natural Gas, An Interdisciplinary MIT study.” <http://web.mit.edu/mitei/research/studies/natural-gas-2011.shtml> (accessed June 26, 2012)

- **A truck runs off the road and spills fracking liquid, causing the death of minnows**

In Washington County, PA, a tanker truck hauling fracking liquid ran off a road and spilled almost 5,000 gallons of liquid. The spill resulted in the contamination of a stream and several dead minnows were observed.

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Warco, K.O. "Fracking truck runs off road; contents spill", The Observer-Reporter, October 21, 2010. <http://www.observer-reporter.com/OR/Story/10-21-2010-fracking-truck-rolls> (accessed July 20, 2012).

- **Accidental blowout contaminates high-quality fishery**

In Clearfield County, PA, a blowout released nearly 1 million gallons of wastewater into nearby creeks. This accident led to the uncontrolled discharge of wastewater into a tributary of Little Laurel Run, a high-quality coldwater fishery.

Michaels, C., J.L. Simpson, and W. Wegner. 2010. "Fractured Communities, Case studies of the environmental impacts of industrial gas drilling," Riverkeeper, www.riverkeeper.org/wp-content/uploads/2010/09/Fractured-Communities-FINAL-September-2010.pdf (accessed June 26, 2012)

- **Natural gas drilling fluids spilled into wetland and coldwater fishery**

A spill of used natural gas drilling fluids in Bradford County, PA, sent 4,200-6,300 gallons of fluids into a wetland and a tributary of Webier Creek, which drains into a coldwater fishery.

Department of Environmental Protection, Commonwealth of Pennsylvania, "DEP Fines Talisman Energy USA for Bradford County Drilling Wastewater Spill, Polluting Nearby Water Resource," August 2, 2010, <http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=13249&typeid=1> (accessed June 26, 2012).

- **Contaminated liquids cause cattle and wildlife mortality in New Mexico**

In Rosa Mesa, NM, contaminated groundwater (or "produced water") often leaks from storage tanks or is dumped, and antifreeze leaks from compressors used in gas production. This toxic standing liquid is consumed by cattle and wildlife. Ranchers frequently report death of their cattle, and observe carcasses of deer, elk, and other small mammals.

Williams, T. "The Mad Gas Rush," March 2004, Audubon, <http://archive.audubonmagazine.org/incite/incite0403.html> (accessed June 26, 2012).

- **Inadequate prevention of harm to wildlife by drilling operators**

Industrial gas drilling operators in Colorado committed numerous violations including "failure to prevent unauthorized exploration and production waste discharges; ... failure to install appropriate fencing to prevent significant adverse environmental impacts resulting from access to a pit by wildlife, migratory birds, domestic animals, or members of the general public..."

Michaels, C., J.L. Simpson, and W. Wegner. 2010. "Fractured Communities, Case studies of the environmental impacts of industrial gas drilling," Riverkeeper, [www.riverkeeper.org/wp-](http://www.riverkeeper.org/wp-content/uploads/2010/09/Fractured-Communities-FINAL-September-2010.pdf)

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<content/uploads/2010/09/Fractured-Communities-FINAL-September-2010.pdf> (accessed June 26, 2012)

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cont.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Review of Impacts of Oil and Gas Exploration and Development on Wildlife in California

Center for Biological Diversity

Updated February 13, 2014

Summary:

This report summarizes studies which document some of the impacts of oil and gas development in California on wildlife and ecosystems. While there is a general lack of scientific research and documentation of such impacts, the studies listed here collectively illustrate numerous impacts which began in the first few decades of the 20th Century and which continue today. Habitat loss, fragmentation and degradation, particularly in areas of concentrated oil and gas development such as Kern County and the Southern San Joaquin Valley, represent a profound impact this industry has had on wildlife. Other impacts from associated pollution such as oil and wastewater spills and releases, chemical runoff, and microtrash, as well as impacts from increases in vehicle traffic in and around development areas, have resulted in mortality, lower reproductive success, and population declines of a variety of species. Affected species include some that are federally listed under the U.S. Endangered Species Act, such as the San Joaquin Kit Fox, California Condor, and Giant Kangaroo Rat.

SPECIES

1. San Joaquin Kit Fox

The San Joaquin Kit Fox (SJKF), which is listed as Endangered under the U.S. Endangered Species Act, has a long history of being negatively affected by petroleum development in the southern half of the San Joaquin Valley. Decades of development has diminished a large historical habitat that included most of the San Joaquin Valley from southern Kern County north to Tracy. This diminished habitat is being further encroached upon by current oil development such as roads, well pads, tank settings, pipelines, and waste pits and their related oil and gas production activities. Their existing habitat and ability to survive is degraded by increased noise, ground vibrations, venting of toxic and noxious gases, and the ongoing release of petroleum products and waste waters. For example, specific incidences of recent SJKF mortality has been attributed to increased traffic in and around oil fields.

Spiegel, L.K., L. San Joaquin Kit Fox (*Vulpes macrotis mutica*). 2006. Recovery Plan for Upland Species of the San Joaquin Valley, California, Endangered Species Recovery Program, California State University Stanislaus, <http://esrp.csustan.edu/publications/pubhtml.php?doc=sjvrp&file=chapter02L.00.html#decline>

A study of the effects of oilfield activities on the San Joaquin Kit Fox at the Naval Petroleum Reserves (NPRC) in California from 1983 to 1995 estimated that 18 percent of habitat was disturbed by oilfield activities. The study attributed the deaths of 43 kit foxes

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

to oilfield-related causes. Of these “35 were hit by vehicles on NPRC roads, 1 was accidentally entombed in a den, 3 drowned in spilled oil, 1 drowned in an oil sump, 2 died when entrapped in pipes, and 2 died when entrapped in an oil well cellar.” Kit fox abundance was significantly lower in oil-developed areas than in undeveloped areas during 6 years of the 13-year study. Between 1980 and 1985, reproductive success in developed areas declined from 100% to 33%, whereas “no such trend was evident in undeveloped areas.” The presence (capture rate) of kangaroo rats and all rodents, which comprise the primary food source for San Joaquin Kit Foxes, was significantly lower in developed areas when compared to undeveloped areas.

Cypher B.L., Warrick G.D., Otten M. R. M., O’Farrell T. P., Berry W. H., Harris C.E., et al. 2000. Population dynamics of San Joaquin Kit Foxes at the Naval Petroleum Reserves in California, *Wildlife Monographs* 145:1-43, 23-24, 36.

A second study by the U.S. Environmental Protection Agency (USEPA) in 2008 analyzed the findings of Cypher et al. (2000) to determine the cause of the co-occurrence of the decline of San Joaquin kit fox (SJKF) population between 1980 and 1986 and the development of oil and gas in their habitat during the same time period. USEPA found the leading cause of SJKF mortality to be predation by coyotes, whose population also increased in the developed areas during that time. The second leading cause of SJKF mortality was determined to be vehicle traffic which increased during the period of SJKF decline and oil and gas development. The cause of the increase in coyote population was determined by USEPA to be unclear. Additionally, SJKF were exposed to chemicals in developed areas from oil spills, drilling fluids in sumps or deposited on land, and chemical spills, including hexavalent chromium which was spilled on at least 65 sites.

United States Environmental Protection Agency. 2008. Analysis of the causes of a decline in the San Joaquin Kit Fox population on the elk Hills, Naval Petroleum Reserve #1, California. EPA/600/R-08/130.

2. California Condor

California Condors, which are listed as Endangered, are known to visit oil development sites, including landing or attempting to land on oilpads, oil rigs, and vehicles. This has exposed them to oil, wasteponds, power lines and microtrash at the developed areas and has changed behavior patterns due to exposure to human habitation and the noise generated by drilling activities. A pair of condors that were exposed to drilling activity in the Hopper Mountain area of California suffered “repeated nest failure” (2003, 2004, and 2005) with chicks ingesting large quantities of trash in all years.

Mee, A., J.A. Hamber, and J. Sinclair. 2007. “California Condors in the 21st Century - conservation problems and solutions” in *California Condors in the 21st Century*, 243-279, 269.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

Microtrash is one of the leading causes of injury and death to California Condors. Over the course of one month in 2013, ForestWatch field inspectors visited 12 well pads in the Sespe Oil Field, all of which are located on federal land and all of which are within condor habitat. In one month the ForestWatch inspectors found a total of 1,756 pieces of microtrash, or an average of 146 pieces of microtrash per pad. Inspectors also found several open containers containing crude oil, chemicals and other hazardous substances, accessible to condors and other animals.

Los Padres Forest Watch. 2013. Trashing the Sespe: How the Oil Industry is Littering our Public Lands and Endangering Wildlife.

In 2007 at least 2,100 gallons of industrial wastewater and more than 200 gallons of crude oil spilled into Tar Creek in the Los Padres Forest, threatening endangered condors from nearby Sespe Condor Sanctuary and other wildlife. Spills in the same area have occurred at least 13 times.

Los Padres Forest Watch. "Oil Spill Reported Near Condor Sanctuary in Los Padres Forest," February 1, 2007, available at <http://venturacountytrails.org/News/0192-LasPadresOilSpill/NewsPage.htm>

3. Kangaroo Rat

Brine from oil production overflowed a drainage channel in southern San Joaquin Valley and contaminated Bear Creek. The spill resulted in the known deaths of 116 mammals and 2 doves. Among the mammals were 11 endangered Giant Kangaroo Rats (*Dipodomys ingens*). In the clean-up approximately 20,000 tons of oil-laden material was removed.

Simons E.A. and Akin M. 1987. Dead Endangered Species in a California Oil Spill. International Oil Spill Conference Proceedings: April 1987, Vol. 1987, No. 1, pp. 417-418.

A 2011 study of the effect of seismic surveys on kangaroo rats (*Dipodomys* spp.) did not detect adverse impacts to kangaroo rat abundance, survival, or condition.

Cypher B.L., Saslaw L.R., Van Horn Job C. L. Westall T. L., and Madrid A. Y. 2012. Kangaroo Rat population response to seismic surveys for hydrocarbon reserves. California State University Stanislaus.

4. Fish and Mussels

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Researchers looked for the presence of heavy metals in three species of whole fish at both offshore oil platforms and in natural areas off the Southern California coast. While they did not find a significant difference in the presence of heavy metals in fish at offshore oil platforms versus natural areas, they did find amounts exceeding toxicity levels of aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, gallium, iron, lead, lithium, manganese, mercury, nickel, rubidium, selenium, strontium, tin, titanium, vanadium, and zinc in all three species.

Love M.S., Saiki M. K., May T. W., Yee J. L. 2013. Whole-body concentrations of elements in three fish species from offshore oil platforms and natural areas in the Southern California Bight, USA, *Bulletin of Marine Science*. 39(3):717-734.

Mussels in the Monterey Bay area of central California were tested for concentrations of petroleum hydrocarbons, synthetic organic hydrocarbons, and trace metals. Resident mussels were found to have higher-than-expected petroleum hydrocarbon body burdens in Carmel Bay. Additionally PCB 1254 and pp DDE were measured at Año Nuevo Island and were found to be high in relation to the remainder of coastal United States and Baja California. The Monterey Harbor Jetty location showed the second highest lead concentrations in mussels for the California coast.

Martin M. and Castle W. 1984. Petrowatch: Petroleum hydrocarbons, synthetic organic compounds, and heavy metals in mussels from the Monterey Bay area of central California, *Marine Pollution Bulletin* 15(7):259-266.

ECOSYSTEMS

1. Vernal Pools

Existing vernal pools in California which intersect known areas of oil and gas development and activity are located in the Solano-Colusa and San Joaquin Valley Vernal Pool regions, the Carrizo Vernal Pool Region, the Santa Barbara Vernal Pool Region, Monterey, San Benito, Ventura and Los Angeles counties, and areas within the Los Padres National Forest. Examples of this can be seen by comparing maps from California Division of Oil, Gas, and Geothermal Resources (DOGGR) online well mapping which show the location of producing wells and the maps provided by the U.S. Fish & Wildlife Service (Sacramento Office) in their *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (2005) showing the location of core areas for vernal pools (e.g. see the maps for the Colusa core area or the San Benito core area in the recovery plan and the corresponding DOGGR well locations for the same area). Development in sensitive areas is ongoing, as evidenced by DOGGR's recent permitting of a cyclic steaming well (API No. 069-20082 'Indian Well I') which is in the middle of the San Benito core area.

Comment Set B5 – Center for Biological Diversity & Sierra Club (cont.)

In its *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (2005), U.S. Fish and Wildlife warns that toxic chemicals from petroleum products may wash into vernal pools located adjacent to oil and gas development, contaminating water and threatening the habitat of a variety of species including 6 species of federally-listed branchiopods and the federally listed vernal pool shrimp. Habitat of vernal pool species is further threatened by fragmentation from road development and development of industrial sites. Additionally pools adjacent to existing developments are in danger of being contaminated by roadway contaminants in surface runoff, such as grease, oil, and heavy metals.

U.S. Fish and Wildlife Service, *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon*, Executive Summary, Introduction, and , Region 1 U.S. Fish and Wildlife Service Portland Oregon, December 15, 2005.

California Dept of Conservation Division of Oil, Gas and Geothermal Resources. 2012. Producing wells and production of oil, gas, and water by county, 2011 Preliminary Report of California Oil and Gas Production Statistics.

California Dept of Conservation Division of Oil, Gas and Geothermal Resources. 2013. Permit to Conduct Well Operations for “Indian Well 1” API No. 069-20082.

California Dept of Conservation Division of Oil, Gas and Geothermal Resources. 2014. Section Map of wells located in Colusa County, California, Division of Oil, Gas and Geothermal Resources Well Finder.

California Dept of Conservation Division of Oil, Gas and Geothermal Resources. 2014. Section Map of wells located in San Benito County, California, Division of Oil, Gas and Geothermal Resources Well Finder.

Center for Biological Diversity. 2012. California Counties with Confirmed and Suspected Fracking.

2. Saltbush Scrub Habitat

The effect of oil field development on ecological communities in saltbush scrub habitat in the southern San Joaquin Valley found a shift in diversity which favored colonization by species not typically found in undisturbed saltbush scrub habitat, but resulted in a decline of special status species including LeConte’s thrashers (*Toxostoma lecontei*), burrowing owls (*Athene cunicularia*), San Joaquin antelope squirrels (*Ammospermophilus nelsoni*), short-nosed kangaroo rats (*Dipodomys nitratoides brevinasus*), American badgers (*Taxidea taxus*), and San Joaquin Kit Foxes (*Vulpes macrotis mutica*).

Fiehler, C.M. and Cypher B. L.. 2011. Ecosystem analysis of oilfields in Western Kern County, California, Endangered Species Recovery Program, California State University, Stanislaus.

Comment Set B6 – Natural Resources Defense Council



April 6, 2017

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California State Office
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Sky Painter Murphy
Planning & Environmental Coordinator
Bureau of Land Management, Central Coast Field Office
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Attn: CCFO O&G Leasing EIS

Submitted electronically via BLM_CA_OGEIS@blm.gov

Dear Mr. Murphy,

On behalf of the Natural Resources Defense Council (NRDC) and our more than two million members and activists, we write to comment on the Draft Resource Management Plan Amendment and Draft Environmental Impact Statement (Draft RMPA/EIS) for the planning and management of oil and gas development on public lands and split mineral estate lands administered by the Bureau of Land Management (BLM), Central Coast Field Office (CCFO) (formerly the Hollister Field Office). We appreciate the opportunity to comment on this docket and thank you in advance for your engagement on these important issues.

NRDC is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. For more than three decades, we have been deeply engaged in efforts to protect the publicly-owned lands and resources under the jurisdiction of the Department of the Interior and specifically, lands managed by the BLM. In California, NRDC also has a longstanding and active interest in reducing the environmental and public health impacts from oil and gas production and ensuring that such resources are responsibly developed.

Pursuant to its statutory authority, BLM has a vital and evolving role to play in carrying out the Federal Land Policy and Management Act's (FLPMA) "multiple use mandate," including the need to protect

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important environmental, scenic, cultural, and biological resources,¹ and unfortunately the Draft RMPA/EIS falls short in this regard. This comment letter is focused on a narrow range of issues identified by the Draft RMPA/EIS, and we also support and incorporate by reference the more extensive comments being submitted by the Center for Biological Diversity.

We urge BLM to revise the Draft RMPA/EIS by incorporating more accurate analyses of the Reasonably Foreseeable Development Scenario (RFDS) and a range of alternatives truly tied to such forecasts, as well as supplemental environmental review directly addressing foreseeable development impacts. BLM must also provide meaningful opportunities for public comment and notice on any revisions.² The following recommendations, described in more detail below, are fundamental to a successful land use plan amendment process for the CCFO and must be addressed before finalizing the RMPA/EIS and issuing a Record of Decision (ROD):

- Include an action alternative that closes all lands to new oil and gas development except existing leases and ensure that environmental impacts from such existing development are thoroughly described—thereby providing a more effective and realistic baseline impact analysis;
- Revise the preferred alternative to explain how areas identified as open to oil and gas leasing and associated impacts are the highest and best use of those areas, specifically including the interest in those lands being allocated for resource extraction—we believe that this analysis will assuredly lead to reconsideration of leasing areas for exploratory drilling and closing those areas to new development due to little development interest and significant resource protection values;

Incorporate a “No New Leasing” Alternative in the EIS

New oil and gas leasing on the 284,000 acres of BLM-administered public lands and roughly 793,000 acres of Federal mineral estate managed by the CCFO—which encompass lands within twelve counties in north-central coastal California—will have significant negative impacts on the region’s air, water, fish, and wildlife, while also undermining our nation’s progress in reducing greenhouse gas emissions and combating climate change. This coupled with continued uncertainty and controversy over the timing, pace, location, and full prospective magnitude of conventional and unconventional drilling, including risks associated with hydraulic fracturing (fracking) necessitates a thorough examination of development scenarios and associated impacts. Unfortunately, the Draft RMPA/EIS fails to do this.

¹ Under FLPMA, BLM must manage the public lands consistent with its statutory direction “goals and objectives be established by law as guidelines for public land use planning, and that management that be on the basis of multiple use and sustained yield unless otherwise specified by law.” 43 U.S.C. 1701(a)(7). FLPMA also directs that “the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use...” 43 U.S.C. § 1701(a)(8).

² 43 U.S.C. § 1712(f).

Comment Set B6 – Natural Resources Defense Council (cont.)

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cont.

BLM expects that the RMPA will guide the management of all future oil and gas development in the CCFO for the next 15-20 years. While determining land use allocations and goals for these public lands, the agency must acknowledge that the highest and best use may very well include protection from any additional resource extraction—this determination falls squarely within BLM’s authority under FLPMA to protect natural areas for future generations and to balance land use management across multiple uses, for which energy development is one and preserving public lands in their natural condition is another.³ The Draft RMPA/EIS considered, but eliminated from detailed analysis, a “No New Leasing” alternative because the “alternative would be contrary to BLM’s mission and policies, which dictate management of public land for multiple-uses and encourage energy development.”⁴ BLM’s application of this policy and justification for deleting this alternative from consideration is plainly wrong.

With respect to amending land use plans in particular, it is important to note that in addition to observing the principles of multiple use and encouraging energy production, BLM is also directed to:

- “(5) consider present and potential uses of the public lands;
- (6) consider the relative scarcity of the values involved and the availability of alternative means (including recycling) and sites for realization of those values;
- (7) weigh long-term benefits to the public against short-term benefits;
- (8) provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans;...”⁵

This means that BLM should explicitly include action alternatives that protect natural areas and limit development, and especially in relation to the relative need for the use (e.g. RFDS) and long-term public benefits. As BLM acknowledges in the RFDS, oil and gas development on the federal mineral estate in the CCFO planning area has historically been extremely limited with little apparent interest in additional oil and gas development—which is one reason the BLM incorrectly assumes impacts will be limited, as described more fully below—while simultaneously providing a host of other highly valued public resource needs, e.g. with respect to water resources. As BLM describes in the RFDS, “[i]n the last two years, two Applications for Permit to Drill (APD) on existing BLM leases in the Coalinga area have been submitted to the HFO; these are the first APDs submitted to the HFO in the last 20 years.”⁶

BLM also cannot ignore growing local concern surrounding impacts from new conventional and unconventional oil and gas leasing, as well as the strong desire to preserve open space and our natural resource values within the planning area. Voters recently approved local measures, Measure Z in

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³ 43 U.S.C. § 1701(a)(8).

⁴ Central Coast Field Office Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development, Index No. BLM/CA/PL-2017/001+1610+1675+1793, Bureau of Land Management, California State Office (December 2016), 2-24. [Draft RMPA/EIS]

⁵ 43 U.S.C. § 1712(c).

⁶ U.S. Department of the Interior, Bureau of Land Management. 2016. Central Coast Field Office Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development. Appendix B. Hollister Field Office Area – Reasonably Foreseeable Development Scenario for Oil and Gas at Ap.B-26. January 5 2017. [online] https://eplanning.blm.gov/epl-front-office/projects/lup/67003/94015/113329/Appendix_B_-_Reasonably_Foreseeable_Development_Scenario.pdf. Accessed March 28, 2017.

Comment Set B6 – Natural Resources Defense Council (cont.)

Monterey County and Measure J in San Benito County,⁷ which directly address this issue by banning hydraulic fracturing and placing additional restrictions on new oil and gas production throughout the counties—counties which encompass the majority of existing and likely new oil and gas development in the CCFO.⁸ BLM must consider related state and local laws and policy, and would be best positioned to directly address such coordination.

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cont.

With this in mind, we urge BLM to incorporate and thoroughly analyze an action alternative in the Draft RMPA/EIS that closes all areas to new oil and gas leasing. This would provide a much needed and more realistic baseline environmental impact analysis. Under the National Environmental Policy Act (NEPA), BLM is required to consider a full range of alternatives, thereby paving the way to informed decision-making and a thorough analysis of environmental impacts for the public to consider.⁹ A “No New Leasing” Alternative is reasonable and required in the context of the CCFO RMPA/EIS.

Revise the Preferred Alternative Accordingly

Following the recommendation above, we further urge BLM to revise the Preferred Alternative accordingly after any additional analyses are completed, such as that which would be included in a “No New Leasing” Alternative as well as any other new information on substantive topic areas, for example those described in more detail below.

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Our preliminary analysis finds that a more robust and accurate environmental review would dictate a closing of all federal lands outside existing oil fields to new leasing in the Preferred Alternative. As stated in the RFDS, less than 1 percent of wells in the CCFO are classified as “wildcats” (wells located outside the administrative boundary of existing oil and gas fields). As such, there is little reason to believe that exploratory development outside of existing oil fields is likely and that therefore that such areas are necessary to be open for development. Rather, the environmental impacts associated with dispersed development would far outweigh the minimal need for expanded exploration in this planning area, as an updated RFDS would help demonstrate. BLM itself states that does not expect high demand for exploratory drilling, which therefore begs the question as to why new leases are proposed as open to oil and gas development in this land use plan amendment.

At a minimum, BLM must explain how areas identified as open to oil and gas leasing and associated impacts are the highest and best use of those public lands. As BLM notes, development of large-scale unconventional oil and gas resources such as those that have led to drilling booms in other parts of the country is unlikely in California. In its Independent Scientific Assessment of Well Stimulation in

⁷ See http://www.montereycountyelections.us/a_measures_NOVEMBER_2016_EN_MZ.html, <http://www.montereycountyelections.us/Election%20Result.htm>, and <http://www.mercurynews.com/2014/11/04/san-benito-countys-measure-j-voters-back-anti-fracking-plan/> [Visited April 5, 2017].

⁸ See Draft RMPA/EIS, Figure 1-1.

⁹ An EIS must “provide full and fair discussion of significant environmental impacts and shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.” 40 C.F.R. § 1502.1.

Comment Set B6 – Natural Resources Defense Council (cont.)

California¹⁰, the California Council on Science and Technology (CCST) found that while development of a Monterey source rock play is possible, the prospects for doing so and the size of the resource are both highly uncertain.

Additionally, CCST concluded that if the Monterey source rock play were developed, it would largely occur within currently producing oil and gas regions rather than new areas:

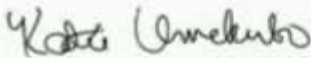
“Any potential for production in the Monterey Formation would be confined to those parts of the formation in the “oil window,” that is, where Monterey Formation rocks have experienced the temperatures and pressures required to form oil. The surface footprint of this subset of the Monterey Formation expands existing regions of oil and gas production rather than opening up entirely new oil and gas producing regions... No part of this footprint is more than 12 miles (~20 km) from existing production. Any potential future development of Monterey Formation source rocks would likely involve hydraulic fracturing or acid stimulation and would occur in the vicinity of current oil and gas producing regions with their existing infrastructure and economy.”

As such, it is clear that opening new areas of BLM land to oil and gas development is likely unnecessary, even if unconventional resources are successfully developed in the future.

Conclusion

Given the lack of industry interest in developing oil and gas resources on federal mineral estate in the CCFO and the fact that any new development is likely to occur in existing oil and gas producing areas, opening new areas to leasing is not the highest and best use of these federal lands. Thank you for your consideration of these comments.

Respectfully submitted,



Katie Umekubo
Staff Attorney



Briana Mordick
Senior Scientist

¹⁰ California Council on Science and Technology. 2015. An Independent Scientific Assessment of Well Stimulation in California. Volume 1: Well Stimulation Technologies and their Past, Present, and Potential Future Use in California. Prepared by California Council on Science and Technology, Lawrence Berkeley National Laboratory. January. [online]: http://www.ccst.us/projects/hydraulic_fracturing_public/SB4.php. Accessed March 28, 2017.

Comment Set B7 – North Coast Rivers Alliance

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April 6, 2017

VIA EMAIL AND U.S. MAIL
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Re: Comments of North Coast Rivers Alliance on Draft Central Coast Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development

To BLM California State Office:

On behalf of the North Coast Rivers Alliance we submit the following comments on the Draft Central Coast Resource Management Plan Amendment (“Draft RMP Amendment”) and Draft Environmental Impact Statement (“DEIS”) for Oil and Gas Leasing and Development. The DEIS fails to adequately examine the risks associated with oil and gas leasing, and improperly excludes reasonable alternatives. As such, the DEIS and Draft RMP must be revised.

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A. BLM MUST STUDY A REASONABLE RANGE OF ALTERNATIVES AND HAS FAILED TO DO SO

NEPA requires that agencies consider a reasonable range of alternatives to a proposed course of action “whenever those actions ‘involve[] unresolved conflicts concerning alternative uses of available resources.’” *Bob Marshall Alliance v Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988) (citing 42 U.S.C. § 4332(2)(E)); see also 42 U.S.C. § 4332(2)(C)(iii), requiring EISs to evaluate alternatives; 40 C.F.R. § 1502.14; *Western Watersheds Project v. Abbey*, 719 F.3d 1035, 1046 (9th Cir. 2013) (“Council on Environmental Quality regulations require an EIS to . . . consider a reasonable range of alternatives”). An EIS must “[r]igorously explore and objectively evaluate all reasonable alternatives” so that “reviewers may evaluate their comparative merits.” 40 C.F.R. § 1502.14. Indeed, the alternatives analysis “is the heart of the [EIS].” *Id.* Under NEPA, “[t]he existence of a viable but unexamined alternative renders an environmental impact statement inadequate.” *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1038 (9th Cir. 2008). “Informed and meaningful consideration of alternatives – including the no action alternative – is thus an integral part of [NEPA].” *Bob Marshall Alliance*, 852 F.2d at 1228.

Comment Set B7 – North Coast Rivers Alliance (cont.)

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Here, the reviewing agencies impermissibly eliminated feasible alternatives from careful review, in violation of NEPA. As noted, “any proposed federal action involving unresolved conflicts as to the proper use of resources triggers NEPA’s consideration of alternatives requirement” regardless whether an EIS is also required. *Bob Marshall Alliance*, 852 F.2d at 1229. Here, the RMP Amendment “cannot be divorced from post-leasing exploration, development, and production,” and therefore “involves unresolved conflicts concerning alternative uses of available resources.” *Id.* at 1229. Where, as here, an EIS is also required, the duty to consider a reasonable range of alternatives is all the greater. 42 U.S.C. § 4332(2)(C)(iii); *Bob Marshall Alliance*, 852 F.2d at 1228-1230. “NEPA therefore requires that alternatives – including the no-leasing option – be given full and meaningful consideration.” *Id.* at 1229. Because BLM failed to consider a reasonable range of alternatives, the EIS violates NEPA as further discussed below.

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 cont.

1. **BLM’S STATEMENT OF PURPOSE AND NEED FOR THE PROJECT PROVIDES NO BASIS TO SUMMARILY DISMISS ALTERNATIVES**

B7-2

BLM’s DEIS declares that the purpose for amending the 2007 Hollister Field Office RMP “is to determine which BLM-managed lands or subsurface Federal minerals are open or closed to oil and gas leasing, and which stipulations or restrictions apply to protect specific resources, based on an analysis of oil and gas exploration and development in excess of levels evaluated in the 2007 RMP.” DEIS 1-3.

On its face, this purpose and need statement does not mandate any specific amount of land being left open to leasing. Indeed, this statement of purpose leaves open the possibility that *no* “BLM-managed lands or subsurface Federal minerals are open” to oil and gas leasing. DEIS 1-3. Because the purpose and need statement leaves open the possibility of a no-lease alternative, and that alternative is required for analysis under NEPA, the FEIS must include a no-lease alternative. 42 U.S.C. § 4332(2)(C)(iii), (E); 40 C.F.R. § 1502.14; *Bob Marshall Alliance*, 852 F.2d at 1228-1230; *Friends of Yosemite Valley*, 520 F.3d at 1038.

Similarly, this statement of purpose and need does not limit the restrictions that BLM can place on the types of oil and gas extraction technology allowed in the RMP. DEIS 1-3. The plain language of the purpose and need statement indicates that this amendment is intended “to determine . . . which stipulations or restrictions apply to protect specific resources.” Like the no-lease alternative, BLM must also consider an alternative limiting the types, locations, and circumstances of well stimulation. 42 U.S.C. § 4332(2)(C)(iii), (E); 40 C.F.R. § 1502.14; *Friends of Yosemite Valley*, 520 F.3d at 1038; *Bob Marshall Alliance*, 852 F.2d at 1228-1230.

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BLM, ATTN: CCFO O&G Leasing DEIS

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2. **BLM IMPROPERLY HIDES BEHIND FLPMA, THE MINERAL LEASING ACT AND THE MINING AND MINERALS POLICY ACT OF 1970 TO AVOID STUDYING REASONABLE ALTERNATIVES**

B7-3

BLM claims that FLPMA, the Mineral Leasing Act of 1920, and the Minerals and Mining Policy Act of 1970 mandate that BLM not close all land – or all land except existing leases – from oil and gas development. *See* DEIS 2-23 to 2-24. Further, BLM claims that FLPMA and the Minerals and Mining Policy Act preclude it from analyzing any alternative that would prevent the use of well stimulation. DEIS 2-23. Yet the multiple use and sustained yield goals of FLPMA and the Minerals and Mining Policy Act do not mandate that BLM authorize activities that would impair or destroy the surrounding environmental resources.

Rather, FLPMA mandates that public lands and resources be managed “so that they are utilized in the combination that will best meet the present and future needs of the American people,” including the “harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.” 43 U.S.C. § 1702(c); *see* 43 U.S.C. § 1701(a)(7). Similarly, the Minerals and Mining Policy Act calls for the “orderly and economic development of domestic mineral resources . . . to help assure satisfaction of industrial, security and environmental needs.” 30 U.S.C. §21a(2). Under each authority, the focus is on balancing the multiple proposed uses – *including* protection of the environment – necessitating here the consideration of additional alternatives in the FEIS.

Because BLM must consider a reasonable range of alternatives that consider not just the RMP Amendment’s proposed commitment of public resources to private oil and gas development, but also full protection of the affected environment, the FEIS must analyze both a no-lease alternative and an alternative that considers limitations on well stimulation. 40 C.F.R. § 1502.14. Contrary to the DEIS’ claim that it need not consider these alternatives, as noted FLPMA and the Minerals and Mining Policy Act of 1970 *require* that these alternatives be considered. DEIS 2-23 to 2-24; 43 U.S.C. §§ 1701, 1702; 30 U.S.C. §21(a). Without such consideration, BLM fails to meet the mandates set forth in these laws for consideration of *all* potential uses, including environmental preservation.

Illogically, BLM invokes its duty to *consider* multiple uses as an excuse to *exclude* alternatives that close the lands within the Central Coast Field Office Planning Area to oil and gas leases and impose limitations on well stimulation. DEIS 2-23 to 2-24. Only by impermissibly *prioritizing* oil and natural gas production *over* other reasonable uses can BLM claim that FLPMA and the Minerals and Mining Policy Act support this erroneous outcome. As explained, both this multiple use mandate and NEPA require analysis of a reasonable range of alternatives, including both a no-lease alternative and a limited well stimulation alternative. 42 U.S.C. § 4332(2)(C)(iii), (E); 40 C.F.R. § 1502.14; 43 U.S.C. §§ 1701, 1702; 30 U.S.C. §21(a).

Comment Set B7 – North Coast Rivers Alliance (cont.)

BLM, ATTN: CCFO O&G Leasing DEIS

April 6, 2017

Page 4

B. BLM MUST EVALUATE THE IMPACTS OF LEASING ALLOWED UNDER THE RMP AMENDMENT

B7-4

Under NEPA, an EIS must take a “hard look” at the environmental impacts of proposed major federal actions and provide a “full and fair discussion” of those impacts. 40 C.F.R. §§ 1502.1, 1502.16; *see also National Parks & Conservation Association v. Babbitt*, 241 F.3d 722, 733 (9th Cir. 2001). This “hard look” informs agencies about “how the choices before them affect the environment,” and requires them to “place their data and conclusions before the public.” *Western Watersheds Project*, 719 F.3d at 1047 (citing *Oregon Natural Desert Association v. BLM*, 625 F.3d 1092, 1099 (9th Cir. 2008)). “General statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided.” *Id.* (citing *Western Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 491 (9th Cir. 2011)). Here, however, the DEIS’s discussion of many of the Project’s environmental impacts is absent or inadequate, as explained below.

The action alternatives vastly differ in the number of acres opened and closed to oil and gas leasing, ranging from 39,000 acres open in Alternative B to 487,200 acres open in Alternative E. The alternative with the most open acres is Alternative A, the No-Action Alternative, with 683,800 acres open for leasing. DEIS 2-15 to 2-19. Despite the extreme differences between alternatives, the DEIS generally uses BLM’s 2015 Reasonably Foreseeable Development (“RFD”) Scenario to assume that development would be limited to approximately 206 acres¹ under all alternatives, and between 32 and 37 wells (up to 5 exploratory and up to 32 development wells). *See e.g.* DEIS 4.2-1, 4.3-1, 4.4-5, 4.5-3, 4.6-2, 4.9-1, 4.13-3, 4.14-1, 4.16-4, 4.17-2, 4.18-2, 4.19-2, 4.20-1. Thus, the DEIS posits the main distinction between the action alternatives as being *where* the RMP Amendment will allow the approximately 206 acres of land disturbance and 32 to 37 new wells to be sited, rather than *whether* development of the far greater acreages actually open to leasing might in fact take place – resulting in far different (and more severe) impacts.

Yet nothing in the RMP Amendment would prevent BLM from issuing leases that allow additional wells or ground disturbance, so long as the leases occurred in the areas designated as open under the alternative adopted. While the 2015 RFD Scenario examines the trend of oil and gas development and projects that trend forward, that projection assumes that neither changes in global crude prices nor advances in technology will alter the rate of new development in the Central Coast Field Office Area. DEIS Ap.B-15 to Ap.B-16. The 2015 RFD Scenario projects up to 3,150 wells in the next 15 years within the Coalinga, San Ardo, Lynch Canyon and Jacalitos oil fields, but states that only 32 of those wells, or roughly 1 percent, would be

¹ The upper limit of approximately 206 acres is contradicted by the impacts discussion for vegetative resources, which states that any disturbance amount discussed “does not include disturbance within previously disturbed areas and the total disturbance area could potentially be greater than 206 acres.” DEIS 4.10-4.

Comment Set B7 – North Coast Rivers Alliance (cont.)

BLM, ATTN: CCFO O&G Leasing DEIS

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developed on the federal mineral estate. DEIS Ap.B.-16 to Ap.B-17. Unless the RMP Amendment *caps* the amount of development at the 2015 RFD Scenario limit, however, BLM’s use of that rather implausible scenario to *completely* curtail the DEIS’s discussion of impacts fails to disclose the far greater *potential* impacts of the RMP Amendment. *Native Village of Point Hope v. Jewell*, (9th Cir. 2014) 740 F.3d 489, 505 (once an agency determines “that oil production is reasonably foreseeable, NEPA requires [it] to base its analysis on the full range of likely production if oil production were to occur”). Because BLM limited all of its impact assumptions to approximately 206 acres of disturbed land and up to 37 new wells, it vastly and impermissibly *understates* the potential impacts of the RMP Amendment.

B7-4
cont.

Further, the DEIS fails to provide sufficient detail regarding the potential impacts of each alternative on each impact area. For example, when discussing biological resource impacts, the DEIS assumes that all actions undertaken as part of the RMP Amendment will “be assessed in accordance with [NEPA] and the Federal Endangered Species Act” at some unstated time in the future. DEIS 4.10-2, 4.11-1 to 4.11-2, 4.12-1 to 4.12-2. At that indeterminate future date, BLM assumes that someone will consult, if necessary, with the Fish and Wildlife Service – but strangely not the National Marine Fisheries Service, despite the presence of coho and steelhead habitat in the affected environment – regarding impacts on special status species. *Id.* While Appendix D includes proposed best management practices for oil and gas leases that mention protection of steelhead critical habitat, the environmental consequences section does not address the potential adverse consequences to such habitat in the event that oil and gas operations contaminate spawning or rearing streams. DEIS Ap.D-15 to Ap.D-16. Instead the DEIS mentions only in passing that contaminated groundwater may impact fisheries. DEIS 4.11-6. By deferring any analysis of the potential impacts of oil and gas leasing on coho and steelhead to each individual leasing decision, the DEIS fails to fairly disclose the impacts of the RMP Amendment itself, including its cumulative effects.

B7-5

C. CONCLUSION

BLM’s DEIS fails to consider a reasonable range of alternatives, instead claiming that it need not consider either a no-lease or a limited well stimulation alternative. But FLPMA and the Minerals and Mining Policy Act, as well as NEPA, require consideration of those alternatives. Furthermore, the DEIS’ impact analysis fails to distinguish between the alternatives and the impacts they will cause, precluding the “hard look” that NEPA requires and eliminating any possibility of mitigating those impacts. Therefore, BLM must revise its analysis to consider a reasonable range of alternatives and analyze the impacts of *each* alternative – on all affected

B7-6


Comment Set B7 – North Coast Rivers Alliance (cont.)

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Page 6

resources, including imperiled coho and steelhead – in its FEIS. And, it must consider the impacts of full development of the lands that are open to leasing, rather than a small fraction of that acreage.

B7-6
cont.

Very truly yours,



Stephan C. Volker
Attorney for North Coast Rivers Alliance

SCV:taf

Comment Set B8 – The Nature Conservancy



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April 6, 2017

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California State Office
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Sacramento, CA 95825

Submitted by email to: BLM_CA_OGEIS@blm.gov

Re: Comments of The Nature Conservancy on the Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for oil and gas leasing and development in the BLM's Central Coast Field Office

Introduction

The Nature Conservancy (the Conservancy) is an international non-profit conservation organization working around the world to protect ecologically important lands and waters for nature and people, seeking to preserve the lands and waters upon which all life depends.

The Conservancy appreciates the opportunity to comment on the Draft Resource Management Plan Amendment and Draft Environmental Impact Statement (Draft RMPA/EIS) for oil and gas (O&G) leasing in the Central Coast Field Office.

In 2014, the Conservancy submitted scoping comments on the proposal to issue a Hollister Field Office DEIS for oil and gas development. Those comments, which express valid continuing recommendations about issues the Draft RMPA/EIS should address, are attached (Attachment A).

The Conservancy's comments on the Draft RMPA/EIS are principally focused on avoiding and minimizing impacts of oil and gas leasing, including hydraulic fracturing, to the terrestrial habitats, species and aquatic resources in the Central Coast of California that our organization has spent decades protecting.

In summary, the Preferred Alternative (C) of the Draft RMPA/EIS would take necessary steps towards closing areas of ecological importance to O&G leasing, but there are several areas where important corrections must be made before issuing a final RMPA/EIS and Record of Decision (ROD). Specifically,

- The Ciervo-Panoche Natural Area should be closed to leasing, as analyzed and proposed in Alternative D.

B8-1

Comment Set B8 – The Nature Conservancy (cont.)

- The one-half of the Panoche/Coalinga ACEC that is proposed to be open to leasing with Controlled Surface Use stipulations in the Preferred Alternative (C), should be closed, or at a minimum, subject to No Surface Occupancy stipulations (as analyzed in and proposed in both Alternative A and Alternative D).
- The final RMP/EIS and ROD must improve the approach to compensatory mitigation for impacts to species, habitat, and groundwater withdrawal.

B8-1
cont.

The Conservancy's detailed comments on the Draft RMPA/EIS follow and focus on four areas:

1. Landscape-scale planning – balancing O&G development terrestrial impacts and conservation
2. Leasing and production projections used in the alternatives analysis
3. Groundwater analysis and mitigation
4. Compliance with California State Law (SB4)

1. Landscape-scale planning – balancing oil & gas development terrestrial impacts and conservation

The San Joaquin desert hills are rich in biological diversity, cultural and paleontological resources, and energy resource potential. For these reasons, a comprehensive landscape-scale plan is needed to balance energy development and conservation for people and nature.

B8-2

The Conservancy's scoping comments (Appendix A of this letter) detail the importance of using landscape-scale planning to balance energy development and conservation. To summarize, landscape-scale planning employs the mitigation hierarchy, which seeks first to **avoid** development in the most important ecological areas, second, to **minimize** impacts of development through siting, design, and operations, and third, to **compensate/mitigate** for remaining impacts in ways that contribute to larger, regional conservation priorities. Full implementation of the mitigation hierarchy within the Draft RMPA/EIS would allow large blocks of natural habitat, including areas for threatened & endangered (T&E) species, such as the San Joaquin kit fox, to remain connected – and would facilitate a more strategic protection strategy that would evaluate recovery at a regional and statewide scale versus at the site- and species-specific-scale.

Avoidance

BLM has evaluated differing approaches to avoiding oil and gas leasing in the most important ecological areas in the Central Coast and San Joaquin desert hills across the range of EIS alternatives. Based upon the Reasonably Foreseeable Development Scenario (RFDS), which assumes a maximum of 37 wells would be drilled, creating 206 acres of disturbance (the RFDS is explored further in Section 2), there is a strong case to limit oil and gas leasing to existing oil and gas fields (excepting a 0.5-mile buffer), as proposed in Alternative B.

B8-3

Comment Set B8 – The Nature Conservancy (cont.)

We appreciate that in the Preferred Alternative (C), BLM has proposed to close to leasing core population areas of the giant kangaroo rat (GKR) (*Dipodomys ingens*) near Panoche, Griswold, Tumey, and Ciervo Hills, and to keep areas closed under the 2007 RMP closed: Wilderness, WSAs, Clear Creek Serpentine ACEC, Ft. Ord National Monument. Closing leasing in core population areas for GKR is a positive step forward.

B8-3
cont.

While the Preferred Alternative (C) of the Draft RMPA/EIS does take necessary steps in closing some areas of ecological importance to O&G leasing, there are several areas where important corrections must be made before BLM issues a final RMPA/EIS and ROD. These key changes are set forth below in recommendations 1.1-1.6.

Recommendation 1.1: We strongly recommend that BLM close the entire Ciervo-Panoche Natural Area to leasing, as proposed in Alternative D. The Ciervo-Panoche Natural Area is important to the recovery and de-listing of the T&E upland species of the San Joaquin Valley. Conservation actions in the Ciervo-Panoche Natural Area are key recovery criteria¹ for several species, including giant kangaroo rat, blunt-nosed leopard lizard, and San Joaquin kit fox.

B8-4

Recommendation 1.2: We also strongly recommend that BLM close T&E critical habitat to leasing, instead of opening critical habitat to leasing subject to NSO stipulations, as is proposed in the Preferred Alternative (C).

B8-5

Minimization

The Draft RMPA/EIS specifies minimization provisions and other measures to limit impacts of oil and gas leasing and development on public lands that may have conservation values but would be open to future leasing. These measures include no surface occupancy (NSO) and controlled surface use (CSU) provisions, timing limitations, best management practices (BMPs), oil and gas standard operating procedures (SOPs), and Implementation Guidelines, as well site specific conditions imposed when applications to drill (APDs) are approved, or in sundry notices authorizing surface disturbance. However, the application of each of these measures to leases is left to lease-by-lease decision-making, and BLM has reserved authority in the permitting process to waive or modify virtually any restrictive condition designed to protect ecological resources². It is far better to resolve conflicts at the regional plan level by avoiding opening key habitats to development rather than expending agency and public resources on negotiating site by site permit conditions.

B8-6

Recommendation 1.3: Given that CSUs and other minimization measures can be waived, it is important that areas of ecological importance be closed to leasing (*avoidance*) or, at a minimum, subject to NSO stipulations. Specifically, the one-half of the Panoche/Coalinga ACEC that is open to leasing with CSUs in the Preferred Alternative (C), should be closed, or at a minimum, subject to NSO stipulations (as analyzed and proposed in Alternative A and Alternative D).

B8-7

¹ <http://esrp.csustan.edu/publications/pubhtml.php?doc=sjvrp&file=chapter03.html>

² Appendix C, at page C-1. These criteria lack reasonable decision standards.

Comment Set B8 – The Nature Conservancy (cont.)

B8-8

Compensation/Mitigation

Apart from leasing activities in San Joaquin Valley, the Draft RMPA/EIS is vague on when and whether compensatory mitigation would be required for oil and gas development. The general statement about offsets is not specific: "Off-site compensation that would satisfactorily offset the loss of habitat **may** be required" (Appendix C, page C-2 and C-3 regarding CSU conditions for oil and gas development in critical habitat for protected species. *emphasis supplied*). Thus, compensatory mitigation for most of the Central Coast region appears to be almost totally discretionary, with few standards for when it would be required or how and where the offset area would be located.

Some compensation conditions (once the decision is made to require offsets) are delineated in Appendix D at pp. D-19-20³. It is not made clear why development activities in habitat areas in the Central Coast field office area outside the San Joaquin Valley would not carry similar mandatory compensatory mitigation requirements. Similar compensatory mitigation requirements should apply across the Central Coast region.

We recognize that important steps that have been taken to address the first two steps related to mitigation: 1) avoidance of unacceptable impacts through identification of places that should be managed for conservation and where development is not allowed (e.g., core areas for GKR, areas that remain closed from the 2007 RMP), and 2) minimization of impacts (via NSO, CSU and other lease-specific stipulations). However, the BLM has not addressed the need to effectively design compensatory mitigation of remaining impacts in ways that will 1) facilitate investment in key conservation priorities in the region or 2) ensure transparency and consistency in mitigation decisions.

The BLM must improve its approach to compensatory mitigation to effectively require and direct mitigation investments in ways that will address and mitigate for impacts associated with O&G development and will achieve the greatest benefits for conservation of species and habitats.

³ Specific compensatory mitigation requirements are imposed for activities within the San Joaquin Valley but not across the Central Coast region. These include for every habitat acre permanently disturbed, 3 acres are set aside as compensation. For temporary disturbance, 1.1 acre is set aside. These ratios apply within the San Joaquin Valley, with the following exceptions: Within the Ciervo-Panoche Natural Area the compensation ratio will be 4:1 for permanent impacts. The compensation ratio for vernal pool habitat will be 5:1 with a replacement element. For protected lands (such as Federal lands, State wildlife areas, conservation banks) a replacement component will be added to the compensation ratio. Compensation of habitat must be in kind. Land used for compensation must be of equal value or better than the land impacted. The same species must be present and habitat must be of an equal or greater value. Lands used for compensation for project impacts on San Joaquin woolly-threads, California jewelflower, blunt-nosed leopard lizard, and giant kangaroo rat must support these species or be approved by the USFWS for these species. Lands used to compensate for impacts on a kit fox natal den must support breeding populations of kit foxes. These compensatory mitigation requirements are apparently derived from the previous version of the Hollister RMP.

Comment Set B8 – The Nature Conservancy (cont.)

B8-8
cont.

Recommendation 1.4: The final RMP/EIS must define standards for when mandatory offsets will be required and how selection of compensation locations, ratios and in-lieu conditions will be determined.

Recommendation 1.5: BLM must require compensatory mitigation requirements similar to the ones outlined for the San Joaquin Valley in Appendix D (at pp. D-19-20) across the entire Central Coast region.

Recommendation 1.6: BLM must include in the final RMPA/EIS and ROD a requirement that the central Coast oil and gas leasing program include a regional mitigation planning process that will address the selection of compensatory offsets and their application across the landscape.

2. The Draft RMPA/EIS should analyze a broader range of leasing and production projections.

While forecasts of significant near-term production from the Monterey shale, especially outside existing oilfields, have been decreased to more minimal levels (see Appendix B of the DRMPA/EIS at pages 5 and 6), over the long term, there is still the possibility that the Monterey shale formation might be more intensively developed in new areas using technologically advanced methods.

B8-9

In the Draft RMPA/EIS, BLM based its alternatives and analysis of impacts on a small range of likely oil and gas development that heavily weights the history of development⁴. It thus predicts minimal oil and gas activities in the region both inside and outside existing oilfields, to arrive at development predictions for a 15-20-year period (DEIS Section 2.3 and Appendix B, Reasonably Foreseeable Development Scenario (RFDS) for Oil and Gas): a maximum of 37 wells and 206 acres of disturbance. As a result of the RFDS, the Preferred Alternative permits oil & gas leasing across several hundred thousands of acres of public land and BLM mineral estate outside of areas already drilled. However, it is challenging, if not impossible, to predict what oil and gas development might happen in the next two decades given that fluctuations in crude prices and technological advancements (e.g., further improvements in horizontal drilling, hydraulic fracturing, 3D seismic imaging—or other technologies) can dramatically influence the economic feasibility of development.

Recommendation 2.1: We recommend that BLM include in the final RMPA/EIS a broader range of possible development scenarios in analyzing impacts of the alternatives. The final RMPA/EIS should analyze, and the RMPA and ROD should include, consideration of how potentially significant expansions in oil and gas activities would be handled.

⁴ We note that BLM did a thorough job surveying and evaluating information that informed the agency's opinion about future oil development. However, within the last two decades, there has also been rapid and unpredicted large scale development of shale oil plays in Texas and South Dakota using multi-stage hydraulic fracturing and horizontal drilling accompanied by wide swings in crude. As demonstrated by the development in these locations, historic drilling may not adequately predict future drilling over a 20-year period.

Comment Set B8 – The Nature Conservancy (cont.)

3. Groundwater analysis and mitigation

The Draft RMPA/EIS acknowledges that oil and gas development requires water, and the source of that water is very likely groundwater. (The Draft RMPA/EIS assumes that all 37 wells assumed in the Reasonably Foreseeable Development Scenario [RFDS] would use groundwater). Surface water is already allocated to other uses in this arid environment, and many groundwater basins in this region are already stressed.

The quantity of water (i.e., groundwater) required for oil and gas development is highly variable, and depends on the technology employed and site specific conditions. Wells employing hydraulic fracturing in California statewide, for example, have used from 4,200 gallons to almost 5 million gallons per well, with BLM estimating that multi-stage hydraulic fracturing treatments could exceed 6 million gallons (Draft RMPA/EIS at pages 4.7-2 and 3). In the Central Coast region, the single well that was cited in the state hydraulic fracturing study (in the Gujarral Hills in Fresno County) used over 2 million gallons of water. Id at page 4.7-2 To date, conventional wells and vertically fracked wells, common in California, have used far less water.

The RFDS, which attempts to predict oil and gas development on federal mineral estate recommended for lease over a 20-year period, provides two alternative scenarios for water usage for the predicted maximum of 37 wells that it believes will be drilled over the 20-year period (Table 4.7-2 at page 4.7-4). The estimates range from 1.5 acre feet per year to 55.5 acre feet per year; total water use could range from a low of 30 acre feet to 1,110 acre feet, a 3700% difference, depending on whether the wells are conventional or employ well stimulation (e.g., hydraulic fracturing).

More importantly, several of the groundwater basins that are proposed for BLM leasing in the Draft RMPA/EIS Preferred Alternative are already severely overdrafted — listed in the CASGEM program high priority ranking category for controls under the Sustainable Groundwater Management Act (SGMA) by the California Department of Water Resources (CDWR) (on the agency's draft "critically overdrafted" list⁵). Others are listed by CDWR as medium priority risk for overdraft conditions. (See Table 4.7-3 at page 4.7-11.)

The impact analysis for groundwater usage in BLM's EIS/RMPA relies heavily on a scientific study conducted by the State of California's California Council on Science and Technology (CCST) pursuant to SB4, California's recently enacted law governing well stimulation practices. This analysis concludes that any additional pumping of groundwater in a basin or subbasin in overdraft would have substantial impacts if not mitigated.

An impact analysis (by CCST) of groundwater quantity in the Final EIR for SB 4 noted that many groundwater basins had already been critically impacted according to rankings by CDWR, including basins/subbasins with overdraft conditions. **As**

⁵ "... two of the fields which include Federal mineral estate are within portions of critically overdrafted basins: the Coalinga field is within a portion of the Westside subbasin and the San Ardo field is within a portion of the Paso Robles Area subbasin." EIS at page 3.7-18.

Comment Set B8 – The Nature Conservancy (cont.)

noted in the Final EIR, any increase in groundwater use in a basin/subbasin in overdraft would contribute to overdraft conditions, a process considered to be a substantial impact if not mitigated. (emphasis added) (Draft RMPA/EIS, page 4.7-4).

B8-10
cont.

Despite significant uncertainties over the amounts of groundwater that would be used in oil and gas drilling, especially in overdrafted and stressed basins, the Draft RMPA/EIS seems to largely minimize the impacts of oil and gas leasing on groundwater withdrawals from public lands and federal mineral estate by comparing that expected withdrawal to other water uses, noting the few wells expected on federal mineral estate versus the total oil and gas use and the size of target basin aquifers. However, in its assessment of cumulative impacts on groundwater resources, the Draft RMPA/EIS states:

Nonetheless, recognizing the pressure placed on scarce water resources during the ongoing California drought, it is reasonable to assume that any increase in groundwater use could result in a cumulative adverse effect on groundwater quantity, especially in a basin already subject to overdraft. DRMPA/EIS, Section 5.3.7 at page 5-9

There are several issues with the Draft RMPA/EIS analysis of groundwater impacts:

First, although the RFDS predicts that only a maximum of 37 wells will be drilled over a 15-20-year period on the federal mineral estate to be opened for leasing, there is certainly no guarantee that the number of wells will not be far greater, including, for example, wells using horizontal, multi-stage fracking technology newly tailored to conditions in the Monterey shale. Given this uncertainty, water use could be far greater (e.g., up 6 million gallons per well, according to the CCST study) than the amount assumed by the Draft RMPA/EIS. And, while groundwater use by oil and gas activities on federal mineral estate leases may turn out to be comparatively small, impacts of even modest pumping in stressed or overdrafted basins, especially in light of drought and secular climate change, may well not be. While BLM's conclusion that limits on groundwater withdrawals for oil and gas development are matters for site by site determination is reasonable, BLM proposes no standards for how those determinations will be guided and made.

B8-11

Second, BLM places responsibility for protection of groundwater and groundwater dependent resources in the hands of state and local authorities. The Draft RMPA/EIS ignores BLM's shared responsibility under the Federal Land Policy and Management Act of 1976 (FLPMA) to protect these resources on BLM managed lands, including subsurface estate managed by the agency. BLM has not included any analysis or required any studies of where groundwater dependent ecological resources may exist in the Central Coast area. Neither has BLM detailed what measures are needed to protect groundwater dependent ecological resources, including the option to close lands and subsurface to leasing where groundwater withdrawals would cause unacceptable impacts.

B8-12

Third, transfer of interests in federal lands that will use groundwater should require mitigation and development requirements, similar to the requirements that BLM required

B8-13

Comment Set B8 – The Nature Conservancy (cont.)

in the Desert Renewable Energy Conservation Plan (DRECP) for the development of renewable energy (Attachment B). For example, BLM should require developers to develop a working understanding of groundwater aquifers and to model and predictively monitor the effects of pumping on ecological resources. BLM should establish “trigger” conditions to modify or stop pumping where adverse effects are likely. Additionally, groundwater withdrawal from any basin in overdraft or exhibiting stressed conditions should require compensatory mitigation in the form of acquisition and retirement of other actively used groundwater rights.⁶

B8-13
cont.

Recommendation 3.1: The final RMPA/EIS and ROD must require minimization measures, or best practices, to minimize use of groundwater.

B8-14

Recommendation 3.2: The final RMPA/EIS must provide standards for how decisions on groundwater withdrawals will be made site by site, including circumstances that will require lessees to obtain water from sources other than stressed or overdrafted aquifers.

B8-15

Recommendation 3.3: The final RMPA/EIS and ROD must contain the same requirements for groundwater pumping associated with oil and gas development in the Central Coast as BLM required for renewable energy development in California’s deserts. Specifically, for any basin in stressed or overdraft conditions, BLM must require oil and gas development to meet the modeling, monitoring, and compensatory mitigation requirements detailed in the Desert Renewable Energy Conservation Plan’s Conservation Management Actions for groundwater withdrawal. Compensatory mitigation should be in the form of acquisition and retirement of other actively used groundwater rights.

B8-16

4. Compliance with California State Law (SB4)

We strongly support the commitment in the draft RMPA/EIS to comply with the requirements of SB4 for well stimulation practices, including hydraulic fracturing, protection of water resources and other aspects of well drilling and development.

B8-17

Recommendation 4.1: The final RMPA/EIS and ROD must affirm BLM’s commitment to comply fully with the requirements of SB 4.


⁶ BLM recently issued the Desert Renewable Energy Conservation Plan (DRECP) that adopts these conditions in the set of Conservation Management Actions as mandatory conditions for all desert development proposing to use groundwater. BLM should provide consistent and equally protective requirements for activities in the Central Coast Area, where concerns about the effects of increases in groundwater use are equally strong. See, DRECP Land Use Plan Amendment, Section II.4.2.1.11 at pages 141-148, September 2016.

Comment Set B8 – The Nature Conservancy (cont.)

Conclusion

The Conservancy greatly appreciates the opportunity to comment on the BLM Central Coast Field Office O&G Leasing Draft RMPA/EIS. If you have questions about our comments, I can be reached at ebrand@tnc.org or (415) 281-0451

Sincerely,



Erica Brand
The Nature Conservancy

cc:
Danielle Chi, Acting Deputy State Director, California Bureau of Land Management
(dchi@blm.gov)

Comment Set B8 – The Nature Conservancy (cont.)

Attachment A

Comment Set B8 – The Nature Conservancy (cont.)



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February 21, 2014

To:
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2800 Cottage Way, Rm. W-1623
Sacramento, CA 95825

Re:
Scoping Comments of The Nature Conservancy on
BLM Hollister Field Office Resource Management Plan
Environmental Impact Statement
Analyzing the Effects of Oil and Gas Leasing

Transmitted via email

Introduction

The Nature Conservancy (TNC) is an international non-profit conservation organization working around the world to protect ecologically important lands and waters for nature and people, seeking to preserve the lands and waters upon which all life depends. We are known for our science-based collaborative approach to developing creative solutions to conservation and development challenges. We carry out on-the-ground conservation work in all 50 states and across the globe with the support of approximately one million members, and have protected nearly 15 million acres of land in the US and Canada, including 1.5 million acres in the State of California.

Thank you for the opportunity to comment on the scoping of the BLM Hollister Field Office Resource Management Plan Environmental Impact Statement (EIS) to analyze the effects of oil and gas leasing. We are offering comments today principally because we are concerned that widespread development of California's Monterey shale formation could fragment and destroy terrestrial and aquatic habitats that our organization has spent decades protecting and restoring. We thus strongly agree that the Bureau should reevaluate oil and gas leasing in California, focused on averting potential landscape-scale adverse effects and limiting consumptive use of water resources, especially in new areas that are not now subject to the impacts of drilling and producing oil and gas.

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Comment Set B8 – The Nature Conservancy (cont.)

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The agency's existing rules and guidance applicable to oil and gas leasing and operations were crafted to deal with conventional oil and gas exploration and development, and need updating, at a minimum, to address leasing and operational standards for shale oil and gas production and to address risks posed by technologies such as horizontal drilling, hydraulic fracturing and acidization. These technological advances open the possibility of accessing and producing oil from unconventional reserves, potentially affecting a much larger landscape, requiring additional water resources, and causing environmental impacts that have not been evaluated by the Bureau. The Conservancy submitted comments on BLM's national hydraulic fracturing rules, which present aspects of our views, highlighted below, relevant to the development of the Monterey shale and this proceeding. Those comments are attached, and we ask that they be included in the Hollister record.

Our comments to the scope of the EIS focus on three areas:

1. Application of landscape-scale planning and the mitigation hierarchy to oil and gas leasing
2. Geographic scope of the EIS
3. Other Scoping Recommendations: Conventional and Unconventional Oil and Gas Development, Groundwater, Fragmentation, and State and Local Coordination

1. Application of Landscape-scale Planning and the Mitigation Hierarchy for Oil and Gas Leasing.

In California, the Conservancy participates actively in large-scale energy siting and mitigation issues. We contributed extensively to the BLM's Solar Programmatic Environmental Impact Statement and to the ongoing state and federal Desert Renewable Energy Conservation Plan processes. We also worked with the Bureau, the U.S. Fish and Wildlife Service, and California state agencies in evaluating mitigation approaches to solar energy development proposals on private land in the Carrizo Plain. Our primary focus has been to advocate the use of landscape-level analysis and planning as the foundation for making siting and mitigation decisions. We believe that our work, centered to date on renewable energy development, has been useful to permitting agencies, energy developers, and key stakeholders.

In addition, The Nature Conservancy has been an active participant in working with the Department of Interior on ways to improve mitigation for impacts to public lands. In October, Secretary Jewell issued Secretarial Order 3330 to establish a Department-wide mitigation strategy for development on public lands. We want to emphasize three components of this Secretarial Order as important for this EIS:

1. In the order, the term "mitigation" refers to the entire mitigation hierarchy: avoidance first, then minimization of impacts, and finally offsets to compensate for unavoidable impacts.
2. The Order specifically applies to oil and gas development

Comment Set B8 – The Nature Conservancy (cont.)

3. Five elements are central to Departmental mitigation strategy and should be incorporated into this EIS:
 - a. use of a landscape-scale approach to identify and facilitate investment in key conservation priorities in a region;
 - b. early integration of mitigation considerations in project planning and design;
 - c. durability of mitigation measures over time;
 - d. transparency and consistency in mitigation decisions; and
 - e. mitigation efforts that improve the resilience of our nation's resources in the face of climate change.

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The Conservancy thus strongly supports implementation of the ideas included in the Secretarial Order in the Hollister EIS, including an evaluation of how the Bureau will incorporate the mitigation hierarchy and other aspects of the Order in the pending oil and gas environmental impact statement and accompanying scientific study. In particular the analysis should set standards for those effects on lands and water resources that must be avoided (e.g., habitat), how effects will be minimized (including limiting surface disturbance through the use of smaller multi-well pads, co-locating roads and pipeline infrastructure, etc.), and how unavoidable adverse effects will be offset.

Specifically, the first step of the mitigation hierarchy—avoidance—is critical to achieving a number of objectives, including protecting nature, maintaining the benefits that ecosystems provide, promoting the sustainable yield and management of natural resources, and conserving species. Avoidance is the principle that development (in this case oil and gas development) occur in locations that entirely avoid the most ecologically important and/or sensitive habitats. As part of the oil and gas EIS, it is particularly important that the BLM identify landscapes that are not appropriate for oil and gas development. This evaluation requires criteria that reach beyond those that have been used for current protective designations¹. These areas should be identified as oil and gas lease avoidance areas, and permanently withdrawn from leasing consideration. Master Leasing Plans, very recently endorsed by Secretary Jewell as planning pathways to implement oil and gas leasing while avoiding conflicts with ecological resources across a landscape, should be considered as one option to establish avoidance areas, supplementing, on a finer scale, the agency's resource management plan toolbox.

The second step of the mitigation hierarchy -- minimization -- includes the siting and operation of oil development in a manner that minimizes harm to habitats and species. Critical to achieving minimization of impacts is the identification, development and employment of best management practices (BMPs) that avert or limit site-specific harm to habitats and species. BMPs also specify monitoring and

¹ These criteria include, but are not limited to, habitat that is important for the long-term viability of species, given adaptation and connectivity requirements, and protection of riparian corridors and groundwater dependent species and habitats.

Comment Set B8 – The Nature Conservancy (cont.)

enforcement mechanisms, including adaptive management provisions that require corrective action by lessees, for inclusion in development permits. Adaptive management is the modification of projects based on the results of monitoring actual ecological impacts, as distinct from projected impacts, taking into account variances over time from the ecological conditions that may have been initially presumed to be stable over the projected life of the project. Again, Master Leasing Planning could assist the agency in establishing these requirements.

Hydraulic fracturing, especially when used to stimulate oil and gas production from a shale resource, customarily requires large quantities of water. In arid landscapes such as California, the use of surface or groundwater supplies should be minimized and mitigated so that there is no net consumptive use of water. Where water use for hydraulic fracturing would threaten ecologically important resources, leasing should be precluded.

For unavoidable impacts that remain following avoidance and minimization, effective measures must be taken to offset unavoidable negative impacts to affected habitats and species to ensure the viability of species and habitats over time.

This landscape-scale analytic approach is especially important as a key basis for BLM's analysis of the effects of its oil and gas leasing program, as leasing expands into new areas employing advanced well drilling and stimulation practices to reach unconventional hydrocarbon formations, particularly because there is the potential for habitats and water resources to be affected on a large scale.

In the August 2013 comments TNC submitted on BLM's proposed agency-wide hydraulic fracturing rules (attached), we cited with approval BLM's use of landscape scale analysis, combined with avoidance requirements and compensatory mitigation that the agency implemented in Wyoming's Pinedale Anticline oil and gas leasing and development. We believe that model should serve as a prototype here.

2. Geographic and Substantive Scope of the EIS

We believe that the geographic scope of the proposed Hollister Field Office Environmental Impact Statement (EIS) is too narrow. In the Hollister notice, BLM implicitly acknowledges the need to examine the effects of oil and gas leasing more broadly: "The BLM may also use this process to consider amending RMPs for other field offices in California with oil and gas leasing and development ..."²

² It is not clear whether BLM is suggesting expanding the geographic scope of the Hollister EIS, initiating additional EIS analyses for other field offices, or somehow tiering from this EIS to serve as the basis to modify other resource management plans. We prefer that BLM expand the Hollister EIS and scientific review to state-wide proceedings.

Comment Set B8 – The Nature Conservancy (cont.)

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At a minimum, BLM should conduct an EIS for all BLM-administered lands and sub-surface resources in California, analyzing both its oil and gas leasing practices and the full extent of its associated impacts, rather than limiting the scope to the area under the management of the Hollister field office.³ BLM manages 15 million acres of surface and 47 million acres of mineral estate in California. A recent DOE Energy Information Agency report projected that California's widespread Monterey shale formation may contain as many as 13.7 billion barrels of technically recoverable oil. The agency will undoubtedly have under future consideration—as it does now in the Hollister area—many leased areas where the development target is the Monterey shale, and where new well drilling practices and stimulation methods, including hydraulic fracturing and horizontal drilling, will be proposed. We support BLM's accompanying proposal to conduct an independent scientific review of the impact of well drilling practices in California, and that study should extend state-wide as well.

Both the Hollister EIS and the BLM scientific review should be closely coordinated with the new programs and scientific and technical reviews required by California's Senate Bill 4, recently signed into law by Governor Brown. In the past, BLM has accepted and applied State regulatory programs to federal oil and gas leases in addition to the federal requirements. We believe that it is appropriate to reexamine the nature of the state-federal relationship in oil and gas development in light of changes in regulatory standards and drilling practices.

The 2010 Environmental Assessment for the recently challenged Hollister field office leases proposed for Fresno and Monterey Counties stated:

BLM's 2008 MOU with CDOGGR⁴ agrees to apply State regulations for oil and gas drilling to applications for permits to drill on Federal mineral estate to prevent surface and groundwater contamination and ensure protection of sensitive resources. However, BLM and CDOGGR both consider hydraulic fracturing to be a "routine" drilling operation, so there are no special

³ In previous comments on BLM's proposed fracking rules (TNC comments dated August 23, 2013 at pp 2-3), The Nature Conservancy advocated that BLM conduct a programmatic EIS on the effects of its overall oil and gas leasing program, noting that the potentially drastic effects of hydrocarbon extraction using hydraulic fracturing and horizontal drilling and other well stimulation techniques required more than the environmental assessment and finding of no significant impact that BLM had proposed. Based on potentially significant alterations in land and water use across BLM's domain we strongly recommend that the agency commit to a programmatic EIS that analyzes the impacts—including the cumulative effects—of changes propelled by all of BLM's oil & gas leasing programs. In any event, the results of the Hollister analysis should be used to inform and revise, where appropriate, the national rules.

⁴ CDOGGR is the California Division of Oil Gas, and Geothermal Resources, the state agency that regulates oil and gas activity and that has been newly assigned the task by the legislature (in Senate Bill 4) to assemble a revised oil and gas regulatory program dealing with well stimulation practices and permitting development.

Comment Set B8 – The Nature Conservancy (cont.)

regulations for the use of this technology on private or Federal mineral estate in California.

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We believe that hydraulic fracturing can no longer be regarded by either state or federal authorities as a routine drilling operation; the practice must be fully evaluated in accord with the requirements of both NEPA and SB 4's new provisions. In the Hollister EIS notice, BLM proposed to conduct a peer reviewed independent scientific assessment of industry well stimulation and completion practices in California. This analysis is of critical importance and should focus on state-wide practices and impacts. That study and the federal EIS should be closely coordinated with the parallel state scientific study and Environmental Impact Report required by SB 4, and any differences between state and federal study conclusions and regulatory approaches fully discussed and justified.

3. Other Scoping Recommendations: Conventional and Unconventional Oil and Gas Development, Groundwater, Fragmentation, and State and Local Coordination

BLM's Federal Register announcement recounts a reasonably inclusive list of preliminary scoping issues to be addressed by the EIS. These include surface water, groundwater, air quality, greenhouse gases and climate change, the environmental effects of fracking chemicals, potential for induced seismicity, endangered and threatened species, public health and safety and socioeconomics. We concur that the EIS should fully address all of these issues.

Conventional and Unconventional Oil and Gas Development

To date, the majority of oil and gas development that has occurred in California has been from conventional reservoirs. However, the application of well stimulation in combination with other techniques (e.g., horizontal drilling) has allowed for development of unconventional oil and gas development in other parts of the United States and may allow for similar development in California. To understand the full range of potential environmental impacts from oil and gas development, the BLM should analyze separately the development of conventional oil and gas reservoirs as distinct from development of unconventional oil and gas resources.

Development of methods to economically extract crude oil from very extensive largely untapped formations, such as the Monterey Shale, could greatly increase the pace, scale and geographic scope of oil and gas development. The purpose of evaluating the environmental impacts of unconventional oil and gas development separately from conventional oil and gas development should be to understand the potential incremental or differing impacts associated with this type of development, recognizing that extraction technologies may be applied differently, and cause impacts, that are distinct from —and greater than -- those occasioned by historic practices.

Comment Set B8 – The Nature Conservancy (cont.)

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For both conventional and unconventional oil and gas development, the EIS should:

- Identify and map all existing oil and gas development in California, including all development on BLM-managed lands and sub-surface resources and all BLM existing oil and gas leased tracts in the state.
- Identify all existing wells in which well stimulation practices have been used, and, for these wells, any reports or information evidencing well failures, casing or cement failures, spills, or groundwater or surface contamination.

In addition, for unconventional oil and gas development, the EIS should map areas where the Monterey Shale and other shale resources exist and analyze where new oil and gas development is reasonably likely to occur.

Biological Resources. While most well stimulation activity occurs below ground or within the immediate vicinity of the well and well pad, such operations can still dramatically affect surface resources. Biological resources are likely to be subjected to new environmental impacts because advances in well stimulation technology will likely enable exploration and extraction of unconventional oil and gas resources that heretofore have not been exploited in areas that historically have not seen this industry. The potential impacts to these resources stems from the well stimulation treatments themselves, the disposal of waste water from such activity, the transport of materials to and from the well site, the drilling of new wells, and construction of roads, pipelines and other associated infrastructure. The EIS should analyze both the direct and indirect land use impacts of expanded (conventional and unconventional) oil and gas development on biological resources. In particular, the EIS should:

- Identify the presence and habitat of sensitive, rare, and threatened, and endangered species under the Endangered Species Act, including rare and listed plant species and Species of Concern identified by the Bureau of Land Management, within BLM-managed lands and resources overlying or including the Monterey Shale formation as well as other conventional and unconventional plays, and assess the likelihood that these resources would be affected by oil and gas field development, including but not limited to impacts from habitat loss, fragmentation, sedimentation in freshwater and marine systems, and water use (e.g., withdrawal of groundwater).
- Identify wildlife corridors within areas likely to see oil and gas development and assess impacts to these corridors.
- Examine potential impacts on USFWS recovery plans

Hydrology and Water Quality. The increased use of scarce groundwater resources and the potential contamination of drinking water and irrigation water resources by chemicals used in well stimulations treatments for the unconventional development of oil and gas are of paramount concern. The EIS should analyze the range of

Comment Set B8 – The Nature Conservancy (cont.)

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potential impacts to water sources and water quality from both conventional and unconventional oil and gas development. To do this, the EIS should identify water resources within the geographic region that may be used or developed for conventional and unconventional oil and gas production and analyze the potential that these sources will be contaminated by well stimulation activity. This analysis should also take into account the disposal of wastewater, including the recycling or reuse of wastewater, resulting from well stimulation treatments and related oil and gas development activities. Finally, the amount of water used in well stimulation treatments for unconventional development of oil and gas needs to be estimated and the EIS must analyze the impact this use will have on further constraining the available water supply for both human uses and biological resources. Specific recommendations include:

- Groundwater aquifers and existing (and new) groundwater wells should be identified and mapped, along with an indication of whether the aquifer supports important biological resources or is used for a particular human use (e.g., agriculture, residential drinking water).
- Surface water resources (lakes, rivers, streams, springs, wetlands, etc.) should be identified and mapped.
- The EIS should analyze potential wastewater disposal impacts on water and land resources and seismicity for unconventional oil and gas development.
- The EIS should analyze the effects of using ranges of water quantities in well stimulation activities for conventional and unconventional oil and gas development. The EIS should also analyze the impacts on groundwater-dependent and freshwater systems if groundwater is pumped to supply the well stimulation activities, across the broader area where conventional and unconventional oil and gas development could occur.
- The chemicals used in well stimulation activities and likely to be encountered in flowback and produced fluids should be identified and their impacts on drinking water and agricultural water should be analyzed.
- The EIS should analyze impacts to freshwater systems from sedimentation due to land disturbance activities from both conventional and unconventional oil and gas development.

In many states, including California, the regulation of groundwater pumping is inadequate to prevent harm to important ecological resources. Despite the predominant role of state regulation of groundwater, the BLM has an independent duty, found in its organic act and other authorities, to protect the ecological resources of federal lands. That duty includes maintaining sufficient water to support natural communities that depend on it. BLM's scientific and environmental study should include an assessment of the effects of the use of significant quantities of water in conventional and unconventional hydrocarbon production.

State and Local Coordination

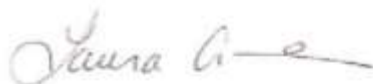
Comment Set B8 – The Nature Conservancy (cont.)

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Lastly, the EIS should evaluate how state and local regulation and controls will be accommodated in federal leasing and development areas. As noted above, the State of California enacted new legislation requiring a scientific study of the effects of well stimulation practices and set up permit requirements for oil and gas production using well stimulation practices. It is important for BLM's EIS to include an evaluation of how state--and especially county and local jurisdiction--requirements will affect and be accommodated in BLM's oil and gas leasing programs.

We appreciate the opportunity to comment on this important subject and look forward to further participation in the BLM's process. If you have any questions, please feel free to contact me at (415) 418-6513 or at Lcrane@tnc.org.

Respectfully submitted,



Laura Crane
Director, California Energy Initiative
The Nature Conservancy

Comment Set B8 – The Nature Conservancy (cont.)

Attachment A

The Nature Conservancy's Comments on the Bureau of Land Management's Proposed Rule-Making for the Development of Oil and Gas Development related to Hydraulic Fracturing

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Comment Set B8 – The Nature Conservancy (cont.)

August 23rd, 2013

U.S. Department of the Interior
Director (630), Bureau of Land Management
Mail Stop 2134 LM
1849 C St., NW, Washington, DC 20240

Re: 1004–AE26 Proposed Rule-making Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands

Thank you for the opportunity to comment on BLM’s proposed rule-making for oil and gas development related to hydraulic fracturing.

The Nature Conservancy (Conservancy) is an international non-profit conservation organization working around the world to protect ecologically important lands and waters for nature and people, seeking to conserve the lands and waters on which all life depends. We are known for our science-based, collaborative approach to developing creative solutions to conservation challenges. We carry out on-the-ground conservation work in all 50 states and more than 35 foreign countries with the support of approximately one million individual members. We have helped protect nearly 15 million acres of land in the United States and Canada and more than 102 million acres with local partner organizations globally. The Conservancy works with communities, industry, and governments in areas affected by the recent boom in shale and other unconventional oil and gas development. We advocate the application of conservation science to siting decisions and the adoption of best management practices to reduce the environmental impacts of development.

The Conservancy supports BLM’s efforts to develop a comprehensive rule to protect water and other environmental resources from the adverse effects of hydraulic fracturing (fracking) used in the production of oil and gas. The agency properly recognizes the importance of chemical disclosure, well casing and cementing integrity requirements, and prudent management of produced and flowback fluids as essential elements of the new rule. We also note BLM’s proposals for ways to accommodate state regulatory programs where they are at least equivalently protective of resources as the proposed federal regime, as much important work has been accomplished at the state level and should not be ignored. However, we believe the rule could be strengthened in important ways specific to the proposed scope and operation; our recommendations follow.

Implementation & Enforcement

We are concerned that BLM may have weakened implementation provisions of the proposed rule to the extent that it may be unable to ensure compliance that would sufficiently protect human and ecological communities. BLM’s proposal to significantly reduce pre-approval steps called for in the previous draft that would have governed well drilling activities—after the fact reporting of well data and the practical elimination of cement bond logging (CBL) for all but “test” and problem wells—does not seem designed to provide adequate safeguards for ecological and human resources. Even though casing strings in each well will be subjected to a one-time mechanical integrity test, we suggest that additional verification of the cement integrity isolating the well from water sources is needed, especially since BLM’s proposed rule so heavily depends on reporting and verification by operators after the fact. We also recommend additional monitoring of recovery fluids.

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Comment Set B8 – The Nature Conservancy (cont.)

Additionally, BLM has not established a rationale for the extent or adequacy of penalties for violations, especially misreporting, nor explained how it intends to enforce these rules. We recommend BLM clearly articulate how it intends to review monitoring data and enforce these rules, especially given limited agency resources.

Comprehensive NEPA Review of BLM's Oil & Gas Program

The Conservancy believes that BLM should take this opportunity to undertake a full review of its oil and gas leasing program. While this draft rule comprises only one element of that program, hydraulic fracturing combined with horizontal drilling are critical technologies that have greatly expanded access to previously uneconomical oil and gas resources across the U.S. Accordingly, BLM should revisit, via a comprehensive NEPA review, how application of its current regulatory regime affects the rapidly expanding development of conventional and unconventional oil and gas on BLM-administered resources. Energy exploration and development on public lands (including Indian lands and the federal mineral estate) using fracking and horizontal drilling are highly likely to result in significant cumulative effects on habitats, species, air and water resources, and human communities. The potential for rapid, large-scale changes in land use warrants full consideration for how the agency intends manage the associated impacts.

In another setting—where BLM faced intense demand for public lands to support utility scale solar energy development in the US southwest—the agency recently conducted a programmatic Environmental Impact Statement (EIS) to assess the effects of that development on ecological resources and the human environment. That assessment led the agency to adopt prudent principles of landscape level planning, and to require that facility approvals follow the tenets of the mitigation hierarchy. The effects of BLM's oil and gas leasing program are even more widespread, and demand a similar programmatic analysis that would guide and control the provisions of individual APD's and resource management plans.

To address the effects of oil and gas exploration and development on public lands in the Pinedale Anticline in Wyoming, BLM focused an EIS on landscape-level effects, including wildlife, groundwater and air quality. The agency placed sensible conditions on drilling and other related development on public lands: it eliminated access to ecologically sensitive lands, set surface access, drilling practice, and adaptive management conditions, and required developers to contribute to a robust mitigation fund to address harm to resources that could not be avoided or minimized¹. While the Pinedale EIS and regulatory program addressed only a single resource management plan and a 200,000-acre area in one state, the analytic methodology and regulatory approach should serve as models for BLM's overall assessment of its unconventional oil and gas leasing program, including fracking.

Other experts reviewing the effects of unconventional hydrocarbon production have also observed a need for landscape-scale planning. The Secretary of Energy Advisory Board's Shale Gas Production Subcommittee 90-day final report includes, as recommendation #15, the need for a comprehensive environmental analysis, including planning on a regional level to limit ecological harm:

Managing short-term and cumulative impacts on communities, land use, wildlife, and ecologies: Each relevant jurisdiction should pay greater attention to the combination of impacts from multiple drilling, production and delivery activities (e.g., impacts on air quality, traffic on roads, noise, visual pollution, and make efforts to plan for shale development impacts on a regional

¹ For details, see BLM's 2008 Pinedale Anticline Project Area Supplemental Environmental Impact Statement

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scale.²

BLM proposes to issue this rule based on an Environmental Assessment (and FONSI), characterizing the rule as having little environmental impact³. This is inadequate - even though this rule replaces a prior version, this rule will be used to support and justify an expected major expansion of production of oil and gas from public resources. The fact that the expansion is already underway on federal lands is not justification for ignoring the true import of these provisions to the human environment. BLM has in the past continued to approve activities subject to NEPA analysis, using a cutoff period to determine the applicability of any new requirements flowing from the analysis⁴.

In sum we strongly urge BLM to perform an EIS that looks at the broader, cumulative effects of oil and gas development on public resources, and to set conditions based on the results of that analysis. Those conditions should provide reasonable flexibility and include criteria for designating areas that are off limits to development based on ecological values, mitigation to limit and compensate for harm, and controls on the use and protection of surface and groundwater resources.

Specific Comments

Surface & Groundwater Resources

BLM's proposed rule unreasonably defers to states and tribal authorities in regulating groundwater use in hydraulic fracturing activities. In the explanation of the rule BLM properly recognizes its statutory duty to protect ecological resources, including water resources. However, the draft rule would only require that operators submit information on the source of water to be used:

FLPMA directs the BLM to manage the public lands so as to prevent unnecessary or undue degradation. FLPMA also requires that the public lands be managed in a manner that will protect the quality of resources, i.e. ecological, environmental, and water resources. Regulating wellbore construction meets these mandates. The revised proposed regulations at sections 3162.3-3(d)(3) and 3162.3-3(i)(2) would require submission of information on water sources to assist the BLM in assessing the environmental effects of individual drilling operations. The National Environmental Policy Act and the implementing regulations by the Council on Environmental Quality require that Federal agencies assess the environmental impacts of their proposed actions and inform their decision-making. The information on water sources will be part of an environmental assessment regarding how water is being supplied for the hydraulic fracturing operation. The BLM does not intend to regulate water use, but instead to acquire information on the water used incidental to oil and gas operations on Federal and Indian lands.

BLM's reliance on state and tribal authority over water use is insufficient. The agency has an independent obligation to assess whether water used in hydraulic fracturing would affect ecological and water-dependent resources committed to its care, and it is unclear when and under what circumstances

² Retrieved from http://www.shalegas.energy.gov/resources/111811_final_report.pdf

³ Proposed rule at page 153. The rationale for the decision not to prepare an Environmental Impact Statement—on this rule or the wider changes occasioned by hydraulic fracturing—is not explained. BLM notes: The EA and the draft Finding of No Significant Impact are available for review and on file in the BLM Administrative Record at the address specified in the ADDRESSES section.

⁴ For example, BLM's solar Programmatic Environmental Impact Statement process established classes of permit actions that would be covered by or exempt from new requirements that the PEIS ROD established.

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an environmental assessment would be pursued and what its scope of review would be. Significant quantities of water (as many as 5 million gallons per fracture event) can be required for fracking operations, and given the expected expansion of oil & gas development in the near-term, this rule should offer more than a promise of a future review of the effects of such large withdrawals of water for development.

Additionally, the Conservancy supports the proposed rule's definition (in Section 3160.0-5) of "usable water" as that containing up to 10,000 parts per million (ppm) of total dissolved solids, without requiring the water to have been formally designated for a specific use. This provision will help to protect the quality (but not the quantity) of water that supports groundwater-dependent ecosystems (GDEs) such as springs, streams, and wetlands, though it is likely inadequate to fully assure that those resources will not be degraded.

More importantly, the Conservancy does not support exemptions for (aquifer) "Zones which the State (for Federal lands) or the tribe (for Indian lands) has designated as exempt from any requirement to be isolated or protected from oil and gas operations." There are no prescribed limits on which aquifers can be exempted by the states or tribes and how (or if) BLM will review the exemptions. Under this provision, BLM would default all authority over groundwater resources to the states or tribes. The general 10,000 ppm TDS definition could thus be rendered virtually meaningless if states and tribes may simply declare any aquifer exempt, including drinking water aquifers and groundwater flows that sustain entire ecosystems.

This concern is particularly important in light of the fact that most states do not protect groundwater quantity and quality for purposes of maintaining GDEs, and only protect groundwater for drinking, irrigation, and livestock uses. In other contexts, including renewable energy permitting, BLM has asserted its authority and responsibility to monitor and protect groundwater resources, especially where surface and near-surface protected ecological resources are dependent, even long term, on flow from groundwater aquifers⁵. At the very least there should be specific limitations to this exemption and BLM should retain federal review and approval authority for all water use in wells on Federal or Indian lands where groundwater ecological dependent resources may be affected, irrespective of state exemptions.

Inclusion of Well Stimulation

The Conservancy does not support the elimination of well stimulation from the revised scope of this rule. We believe that the rule should cover additional forms of well stimulation for oil and gas recovery. In particular, we are concerned that the rule does not cover acidizing. For example, in California production from the Monterey oil shale may require acidization or other well stimulation techniques, rather than, or in addition to, hydraulic fracturing. BLM's rule should be flexible enough to cover additional well stimulation methods to extract oil and gas that pose similar risks to those presented by fracking.

⁵ The BLM/DOE Solar Programmatic Environmental Impact Statement incorporates best management practices and mitigation requirements for groundwater use by solar facilities. BLM's California and Nevada state directors asserted protective monitoring and mitigation provisions, for example, in the Bright Source Hidden Hills solar facility permitting proceeding conducted by the California Energy Commission.

Comment Set B8 – The Nature Conservancy (cont.)

Use of Type Wells

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We recommend BLM require complete information for each well, including cement evaluation logs (CELs), not just for “type wells”. It may be adequate to use “type” well characteristics for a pre-drilling notice of intent, however, after the well is drilled its individual characteristics should be recorded and the CEL should be evaluated before fracking operations occur as described below. For example, the draft rule allows the depths of usable water to be based on the drill log of a “type” well. That is *not* acceptable because the depths will vary from well to well, depending on local hydro-geologic conditions.

We also recommend BLM to require additional well information--about the tops, bottoms, and geologic descriptions of all confining zones. Confining zones separate aquifers from other geologic formations. For unconfined (water table) aquifers, the depth to usable water should consider annual and seasonal fluctuations. The top of a usable unconfined aquifer should be defined as a safe distance above the highest expected water table elevation.

The draft rule should stipulate a format for reporting well locations and depths. These data are of critical importance for identifying pollution sources if water becomes contaminated and for predicting contaminant transport if well integrity is compromised. All locations should be reported as latitude and longitude, and depths should be reported as elevations relative to a specified datum. Estimated depths may be reported for purposes of the Notice of Intent, but actual depths should be reported after drilling. This information should be reported for every well – not just for “type” wells -- based on actual drilling logs because the depths of different subsurface zones vary across a well field.

Cement Integrity

The draft rules require every well to have the cement flow rate, density, and treating pressure monitored during installation, however only “type” or problem wells are required to have CELs of the usable water zones. The previous draft rule would have required CBLs on each protective casing string. BLM has justified this change based on reduced review time and costs, however it has not addressed whether this change will adequately protect environmental resources and groundwater.

Similar to our comments above, requiring CELs only on the first well in a series is insufficient. The fact that one well’s cement job was adequate does not assure that the next ones in the series will be adequate. Subsurface conditions can vary from well to well, even for relatively closely spaced wells. It is imperative that quality and integrity of all cement jobs is documented through multiple means, including CBLs. Without this information, BLM would not have evidence of how and why well a failure occurred, and neglected a good source of data from which adaptive requirements might be designed.

We request BLM to adopt the recommendations of the Secretary of Energy Advisory Board’s Shale Gas Production Subcommittee 90 day final report, much of which was supported by industry, and which is cited with approval by BLM in the discussion of the draft rule. That report recommended well integrity steps (recommendation #10) beyond what BLM has included in its draft rule:

Adopt best practices in well development and construction, especially casing, cementing, and pressure management. Pressure testing of cemented casing and state-of-the-art cement bond logs should be used to confirm formation isolation. Microseismic surveys should be carried out to assure that hydraulic fracture growth is limited to the gas producing formations. Regulations and inspections are needed to confirm that operators have taken prompt action to

Comment Set B8 – The Nature Conservancy (cont.)

repair defective cementing jobs. The regulation of shale gas development should include inspections at safety-critical stages of well construction and hydraulic fracturing.⁶

The American Petroleum Institute has also noted the need to utilize for multiple tools, including CELs, to assure cement integrity. API Standard 65, Part 2 at 7.2, states:

Field evidence of a properly executed (cement) job may include records of spacer density and rheology, slurry density control, pump rates, pump pressures and observed returns which conform to the cementing plan. Based on the job objectives, multiple techniques are available which include temperature, noise, acoustic and ultrasonic cement logs. Caution should be exercised when using cement evaluation logs as the primary means of establishing the hydraulic competency of a cement barrier. The interpretations of cement evaluation logs are opinions based on inferences from downhole measurements. As such, the interpretation of cement evaluation logs can be highly subjective.⁷

Storage of Recovered Fluids

We strongly recommend that the rule require all recovered fluids to be stored in closed tanks or lined pits; storage in unlined pits should be strictly prohibited. In cases of lined pit storage, monitoring requirements should be stringent, the storage duration should be limited to no more than 90 days and extensions should not be granted, and birds and other wildlife should be protected from exposure.

BLM asked for input on the distinction between flowback fluid and produced water. Conceptually, flowback fluid is the hydrofracking fluid that is injected into the well, whereas produced water naturally occurs in the geologic formation. For practical reasons, the draft rules make the distinction based on when oil and gas production begins: fluids that flow out of the well prior to production are called flowback fluid, and fluids that flow out during production are called produced water. The draft rule treats produced water as if it is less hazardous than flowback fluid, when in fact both are potentially hazardous and may include heavy salt, NORM, metals and hydrocarbons, radioactive elements, etc., mostly derived from the target formation. Moreover, fracking fluid continues to flow out of the well along with produced water after oil and gas production commences, so the artificial distinction based on time allows for unduly lenient treatment of flowback fluids.

Distinguishing flowback from produced water is nearly impossible—flowback and produced water can be commingled for some time after frac jobs, and even after production begins. For these reasons, we do not think that BLM should make a distinction between the two, but rather the rule should apply consistently to all waste fluids from wells, irrespective of when they are produced. Further, we do not think the distinction, if made in the final rule, should allow produced water to default to Onshore Order 7, which allows the use of unlined pits for produced water. Instead, we recommend covered, lined pits or tanks for storage of all produced fluids.

Additionally, we recommend BLM require regular monitoring of recovered fluid (flowback and produced water if the final rule distinguishes between the two), focusing on constituents that are the most troublesome contaminants or would serve as good tracers for detecting spills and leaks. Finally, the draft rules do not address fluid disposal. We recommend BLM include a preference for re-use and

⁶ Retrieved from http://www.shalegas.energy.gov/resources/111811_final_report.pdf

⁷ Retrieved from www.shalegas.energy.gov/resources/65-2_e2.pdf

Comment Set B8 – The Nature Conservancy (cont.)

recycling of recovered fluids in future hydraulic fracturing operations, and stipulate that fluids that cannot be re-used must be disposed of at wastewater treatment facilities with technology to adequately treat any hazardous materials present in the fluids.

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cont.

Reporting and Disclosure

We support BLM's commitment to collect fracking fluid, well completion, and monitoring information in an appropriate database(s). In addition to the information required in this section, we recommend BLM require operators to collect background information on surface and groundwater resources. And, we urge BLM to require periodic sampling of the constituents of recovered fluids. As mentioned above, the rule should specifically require that all locations be reported as latitude and longitude, and depths should be reported as elevations relative to a specified datum.

The draft rule requires disclosure of chemicals used in the fracking fluid be provided to BLM *after* the fracking operation has been completed. The comments provided by BLM explain that the chemical composition of fracking fluid cannot be determined *a priori*. However, not providing chemical information before fracking precludes BLM and adjacent land owners from conducting baseline analyses of groundwater and surface water quality. Area well owners need advance warning and should know exactly what constituents to analyze in the sample water. Chemical analyses are specific to the particular constituents of concern; analyzing for suites or "scans" of similar constituents (like volatile organic compounds, for example) is expensive and still misses tens of thousands of known chemicals.

BLM's comments explain that the draft rules do not require baseline water testing because BLM cannot authorize operators to enter non-Federal land. At the very least, BLM should notify adjacent landowners and other stakeholders of where and when fracking will occur, and provide information on how to test their water to document baseline conditions; that information necessarily must include the chemical composition of fracking and formation fluids. Without baseline data and chemical compositions of these fluids, owners of contaminated wells will never be able to prove in court that a fracking operation caused the contamination.

Additionally, the draft rule does not require the chemical composition of recovered fluids to be reported. These fluids, which are composed of fracking fluid mixed with geological formation fluid, may be hazardous and they should be stored in tanks, and transported and disposed of properly. In order to determine the proper disposal method, their chemical composition should be reported. This information is also needed to identify source(s) of potential water contamination in the future.

BLM asked for comments on whether it should deem compliance with disclosure requirements if a State or Tribe requires submission of the same or more information about the chemical constituents of hydraulic fracturing fluids. We believe that all information about fracking chemicals should be collected in a single, searchable, Internet database with uniform data fields to which the public has easy access. Therefore, the State or Tribe should only be deemed in compliance if there is a process in place for ensuring that the information is entered into a BLM-designated database.

We would like to express our support for specific inclusion in the rule that operators are responsible for actions taken by and information supplied by its (sub) contractors. While drilling /fracking contractors largely control the process and technology, it makes very good sense to make the well owner specifically responsible for the actions of all of their contractors. Operators might be liable as a matter of agency law, but specifically designating responsibility in the agency rules and permits would back this up and avoid disputes over responsibility for well failures.

Comment Set B8 – The Nature Conservancy (cont.)

The draft rule requires operators to keep information claimed to be trade secrets – and therefore exempt from disclosure – for 6 years. We consider this inadequate - the information should be stored in perpetuity, preferably by the agency. This information should be readily accessible to health and regulatory authorities, if necessary. Health impacts of industrial pollution are commonly chronic and take decades or even generations to manifest. When they do, effective treatment and prevention of further impacts will depend on knowing what chemicals are likely responsible; therefore trade secret information should be kept for much longer than 6 years.

BLM asked for comments regarding whether to incorporate or to defer to State or tribal standards or requirements. First and foremost, BLM's rules should assure reasonable consistency across state boundaries for hydrocarbon production on Federal and Indian lands. BLM's deferral to states for any activity relating to drilling on Federal lands or mineral estate should be cabined by limitations similar to those EPA uses for transferring NPDES and SDWA authority to states.

However, we would like to highlight that there is a considerable need for greater national uniformity in how fracking and other aspects of the current expansion in oil and gas production are regulated. State regulations vary considerably. Resources for the Future recently completed a study which reveals that state laws, regulations, and enforcement in shale gas are very uneven and in need of greater consistency.⁸ BLM, with its massive mineral and surface estate spread across much of the West, should be a leader in developing that consistency with solid, progressive rules.

We greatly appreciate the opportunity to provide comment, and strongly support BLM's development of rules to govern fracking on public lands and resources. Please contact Amanda Reed at (703) 841-4879 or areed@tnc.org with any questions or concerns with these comments.

Sincerely,

Michael Powelson
North America Director of Energy Programs
The Nature Conservancy

⁸ Retrieved from www.rff.org/rff/documents/RFF-Rpt-StateofStateRegs_Report.pdf

B8-18
cont.

Comment Set B8 – The Nature Conservancy (cont.)

Attachment B

Comment Set B8 – The Nature Conservancy (cont.)

LUPA-SW-10: The extent of additional sensitive soil areas (cryptobiotic soil crusts, hydric soils, highly corrosive soils, expansive soils, and soils at severe risk of erosion) shall be mapped if it is anticipated that an activity will impact these resources. To the extent possible, avoid disturbance of desert biologically intact soil crusts, and soils highly susceptible to wind and water erosion.

LUPA-SW-11: Where possible, side casting shall be avoided where road construction requires cut- and-fill procedures.

Surface Water

Refer to the biological resources CMAs for desert vegetation types, and Focus and BLM Special Status Species for setbacks and CMAs for wetlands and riparian areas (seeps, springs, perennial and intermittent streams), including but not limited to the LUPA-BIO-RIPWET CMAs.

LUPA-SW-12: Except in DFAs, exclude long-term structures in, playas (dry lake beds), and Wild and Scenic River corridors, except as allowed with minor incursions (see definition in the Glossary of Terms).

LUPA-SW-13: BLM will manage all riparian areas to be maintained at, or brought to, proper functioning condition.

LUPA-SW-14: All relevant requirements of Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) will be complied with.

LUPA-SW-15: Surface water diversion for beneficial use will not occur absent a state water right.

LUPA-SW-16: The 100-year floodplain boundaries for any surface water feature in the vicinity of the project will be identified. If maps are not available from the Federal Emergency Management Agency (FEMA), these boundaries will be determined via hydrologic modeling and analysis as part of the environmental review process. Construction within, or alteration of, 100-year floodplains will be avoided where possible, and permitted only when all required permits from other agencies are obtained.

Groundwater

For any activity that proposes to utilize groundwater resources, the following stipulated CMAs shall apply, regardless of project location.

LUPA-SW-17: An activity's groundwater extraction shall not contribute to exceeding the estimated perennial yield for the basin in which the extraction is taking place.

Comment Set B8 – The Nature Conservancy (cont.)

Perennial yield is that quantity of groundwater that can be withdrawn from the groundwater basin without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical, chemical, or biological integrity. It is further clarified arithmetically below.

LUPA-SW-18: Water extracted or consumptively used for the construction, operation, maintenance, or remediation of the project shall be solely for the beneficial use of the project or its associated mitigation and remediation measures, as specified in approved plans and permits.

LUPA-SW-19: Water flow meters shall be installed on all extraction wells permitted by BLM.

LUPA-SW-20: After application of applicable avoidance and minimization measures, all remaining unavoidable residual impacts to surface waters from the proposed activity shall be mitigated to ensure no net loss of function and value, as determined by the BLM.

LUPA-SW-21: Consideration shall be given to design alternatives that maintain the existing hydrology of the site or redirect excess flows created by hardscapes and reduced permeability from surface waters to areas where they will dissipate by percolation into the landscape.

LUPA-SW-22: All hydrologic alterations shall be avoided that could reduce water quality or quantity for all applicable beneficial uses associated with the hydrologic unit in the project area, or specific mitigation measures shall be implemented that will minimize unavoidable water quality or quantity impacts, as determined by BLM in coordination with USFWS, CDFW, and other agencies, as appropriate. These beneficial uses may include municipal, domestic, or agricultural water supply; groundwater recharge; surface water replenishment; recreation; water quality enhancement; flood peak attenuation or flood water storage; and wildlife habitat.

LUPA-SW-23: A Water (Groundwater) Supply Assessment shall be prepared in conjunction with the activity's NEPA analysis and prior to an approval or authorization. This assessment must be approved by the BLM in coordination with USFWS, CDFW, and other agencies, as appropriate, prior to the development, extraction, injection, or consumptive use of any water resource. The purpose of the Water Supply Assessment is to determine whether over-use or over-draft conditions exist within the project basin(s), and whether the project creates or exacerbates these conditions. The Assessment shall include an evaluation of existing extractions, water rights, and management plans for the water supply in the basin(s) (i.e., cumulative impacts), and whether these cumulative impacts (including the proposed project) can maintain existing land uses as well as existing

B8-19
cont.

Comment Set B8 – The Nature Conservancy (cont.)

aquatic, riparian, and other water-dependent resources within the basin(s). This assessment shall identify:

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cont.

- All relevant groundwater basins or sub-basins and their relationships.
- All known aquifers in the basin(s), including their dimensions, whether confined or unconfined, estimated hydraulic conductivity and transmissivity, groundwater surface elevations, and direction and movement of groundwater.
- All surface water basin(s) related to water runoff, delivery, and supply, if different from the groundwater basin(s).
- All sites of surface outflow (springs or seeps) contained within the basin(s), including historic sites.
- All other surface water bodies in the basins(s), including rivers, streams, ephemeral washes/drainages, lakes, wetlands, playas, and floodplains.
- The water requirements of the proposed project and the source(s) of that water.
- An analysis demonstrating that water of sufficient quantity and quality is available from identified source(s) for the life of the project.
- An analysis of potential project-related impacts on water quality and quantity needed for beneficial uses, reserved water rights, existing groundwater users, or habitat management within or down gradient of the groundwater basin within which the project would be constructed.
- The above analyses shall be in the form of a numerical groundwater model. The model extent shall encompass the groundwater basin within which the project would be constructed, and any groundwater-dependent resources within or down gradient of that basin.

The primary product of the Water Supply Assessment shall be a baseline water budget, which shall be established based on the best-available data and hydrologic methods for the identified basin(s). This water budget shall classify and describe all water inflow and outflow to the identified basin(s) or system using best-available science and the following basic hydrologic formula or a derivation:

$$P - R - E - T - G = \Delta S$$

where P is precipitation and all other water inflow or return flow, R is surface runoff or outflow, E is evaporation, T is transpiration, G is groundwater outflow (including consumptive component of existing pumping), and ΔS is the change in storage. The volumes in this calculation shall be in units of either acre-feet per year or gallons per

Comment Set B8 – The Nature Conservancy (cont.)

year. The water budget shall quantify the existing perennial yield of the basin(s). Perennial yield is defined arithmetically as that amount such that

$$P - R - E - T - G \geq 0$$

Water use by groundwater-dependent resources is implicitly included in the definition of perennial yield. For example, in many basins the transpiration component (T) includes water use by groundwater-dependent vegetation. Similarly, groundwater outflow (G) includes discharge to streams, springs, seeps, and wetlands. If one or more budget components is altered, then one or more of the remaining components must change for the hydrologic balance to be maintained. For example, an increase in the consumptive component of groundwater pumping can lower the water table and reduce transpiration by groundwater-dependent vegetation. The groundwater that had been utilized by the groundwater-dependent vegetation would then be considered “captured” by groundwater pumping. Similarly, increased groundwater consumption can capture groundwater that discharges to streams, springs, seeps, wetlands and playas. These changes can occur slowly over time, and may require years or decades before the budget components are fully adjusted. Accordingly, the water/groundwater supply assessment requires that the best-available data and hydrologic methods be employed to quantify these budgets, and that groundwater consumption effects on groundwater-dependent ecosystems be identified and addressed.

The Water Supply Assessment shall also address:

- Estimates of the total cone of depression considering cumulative drawdown from all potential pumping in the basin(s), including the project, for the life of the project through the decommissioning phase
- Potential to cause subsidence and loss of aquifer storage capacity due to groundwater pumping
- Potential to cause injury to other water rights, water uses, and land owners
- Changes in water quality and quantity that affect other beneficial uses
- Effects on groundwater dependent vegetation and groundwater discharge to surface water resources such as streams, springs, seeps, wetlands, and playas that could impact biological resources, habitat, or are culturally important to Native Americans
- Additional field work that may be required, such as an aquifer test, to evaluate site specific project pumping impacts and if necessary, establish trigger points that can be used for a Groundwater Water Monitoring and Mitigation Plan
- The mitigation measures required, if there are significant or potentially significant impacts on water resources include but are not limited to, the use of specific

B8-19
cont.

Comment Set B8 – The Nature Conservancy (cont.)

technologies, management practices, retirement of active water rights, development of a recycled water supply, or water imports

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cont.

LUPA-SW-24: A Groundwater Monitoring and Reporting Plan, and Mitigation Action Plan shall be prepared to verify the Water Supply Assessment and adaptively manage water use as part of project operations. This plan shall be approved by BLM, in coordination with USFWS, CDFW, and other agencies as appropriate, prior to the development, extraction, injection, or consumptive use of any water resource. The quality and quantity of all surface water and groundwater used for the project shall be monitored and reported using this plan. Groundwater monitoring includes measuring the effects of a project's groundwater extraction on groundwater surface elevations, groundwater flow paths, changes to groundwater-dependent vegetation, and of aquifer recovery after project decommissioning. Surface water monitoring, if applicable, shall monitor for changes in the flows, water volumes, channel characteristics, and water quality as a result of a project's surface water use. Monitoring frequency and geographic scope and reporting frequency shall be decided on a project and site-specific basis and in coordination with the appropriate agencies that manage the water and land resources of the region. The geographic scope may include at the very least, all basins/sub-basins that potentially receive inflow from the basin where the proposed project may be sited, and all basins/sub-basins that may potentially contribute inflow to the basin where the proposed project is located. The plan shall also detail any mitigation measures that may be required as a result of the project. This plan and all monitoring results shall be made available to BLM. BLM will make the plan and results available to USFWS, CDFW, and other applicable agencies.

LUPA-SW-25: Where groundwater extraction, in conjunction with other cumulative impacts in the basin, has potential to exceed the basin's perennial yield or to impact water resources, one or more "trigger points," or specified groundwater elevations in specific wells or surface water bodies, shall be established by BLM. If the groundwater elevation at the designated monitoring wells falls below the trigger point(s) (or exceeds the trigger pumping rate), additional mitigation measures, potentially including cessation of pumping, will be imposed.

LUPA-SW-26: Groundwater pumping mitigation shall be imposed if groundwater monitoring data indicate impacts on water-dependent resources that exceed those anticipated and otherwise mitigated for in the NEPA analysis and ROD, even if the basin's perennial yield is not exceeded. Water-dependent resources include riparian or phreatophytic vegetation, springs, seeps, streams, and other approved domestic or industrial uses of groundwater. Mitigation measures may include changes to pumping rates, volume, or timing of water withdrawals; coordinating and scheduling groundwater pumping activities in conjunction with other users in the basin; acquisition of project water

Comment Set B8 – The Nature Conservancy (cont.)

from outside the basin; and/or replenishing the groundwater resource over a reasonably short timeframe. For permitted activities, permittees may also be required to contribute funds to basin-wide groundwater monitoring networks in basins such as those encompassed by the East Riverside DFA or in the Calvada Springs/South Pahrump Valley area, and to cooperate in the compilation and analysis of groundwater data.

LUPA-SW-27: Water-conservation measures shall be required in basins where current groundwater demand is high and has the future potential to rise above the estimated perennial yield (e.g., Pahrump Valley). These measures may include the use of specific technology, management practices, or both. A detailed discussion and analysis of the effectiveness of mitigation measures must be included. Application of these measures shall be detailed in the Groundwater Water Monitoring and Mitigation Plan.

LUPA-SW-28: Groundwater extractions from adjudicated basins, such as the Mojave River Basin, may be subject to additional restrictions imposed by the designated authority; examples include the Mojave Water Agency and San Bernardino County (see County Ordinance 3872). Where provisions of the adjudication allow for acquisition of water rights, project developers could be required to retire water rights at least equal in volume to those necessary for project operation or propose an alternative offset based on the conditions unique to the adjudicated basin.

LUPA-SW-29: Groundwater pumping mitigation may be imposed if monitoring data indicate impacts on groundwater or groundwater-dependent habitats outside the DRECP area, including those across the border in Nevada. See **LUPA-SW-26** for potential mitigation measures.

LUPA-SW-30: Activities shall comply with local requirements for any long term or short term domestic water use and wastewater treatment.

LUPA-SW-31: The siting, construction, operation, maintenance, remediation, and abandonment of all wells shall conform to specifications contained in the California Department of Water Resources Bulletins #74-81 and #74-90 and their updates.

LUPA-SW-32: Colorado River hydrologic basin - The concepts, principles and general methodology used in the Colorado River Accounting Surface Method, as defined in U.S. Geological Survey Scientific Investigations Report 2008-5113 (USGS 2009), and existing and future updates or a similar methodology, are considered the best available data for assessing activity/project related ground water impacts in the Colorado River hydrologic basin. The best available data and methodology shall be used to determine whether activity/project-related pumping would result in the extracted water being replaced by water drawn from the Colorado River. If activity/project-related groundwater pumping results in the static groundwater level at the well being near (within 1 foot), equal to, or

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cont.

Comment Set B8 – The Nature Conservancy (cont.)

below the Accounting Surface in a basin hydrologically connected to the Colorado River, that consumption shall be considered subject to the Law of the River (Colorado River Compact of 1922 and amendments). In such circumstances, BLM shall require the applicant to offset or otherwise mitigate the volume of water causing drawdown below the Accounting Surface. Details of such mitigation measures and the right to the use of water shall be described in the Groundwater Water Monitoring and Mitigation Plan.

Soil, Water, and Water-Dependent Resources Restricted to Specific Areas on BLM Lands

LUPA-SW-33: Stipulations for groundwater development in the proximity of Devils Hole: Any development scenario for an activity within 25 miles of Devils Hole shall include a plan to achieve *zero-net* or *net-reduced* groundwater pumping to reduce the risk of adversely affecting senior federal reserved water rights, the designated critical habitat of the endangered Devils Hole pupfish, and the free-flowing requirements of the Wild and Scenic Amargosa River. This plan will require operators to acquire one or more minimization water rights (MWRs) in the over-appropriated, over-pumped, and hydraulically connected Amargosa Desert Hydrographic Basin in Nevada. The MWR(s) shall be: (1) an amount equal (at minimum) to that which is needed for construction and operations; (2) historically fully utilized, preferably for agricultural use; and (3) senior and closer to Devils Hole than the proposed point of diversion.

LUPA-SW-34: Stipulations for groundwater development in the Calvada Springs/South Pahrump Valley area: Activities in this area shall be required to acquire one or more MWRs in the Pahrump Valley Hydrographic Basin in Nevada. The acquired MWR(s) must: (1) be at least equal to the amount proposed to be required and actually used for project construction and operations; and (2) be fully utilized for at least the prior ten years.

LUPA-SW-35: Stipulations for activities in the vicinity of Death Valley National Park, Joshua Tree National Park, or Mojave National Preserve: The NEPA for activities involving groundwater extraction that are in the vicinity of Death Valley National Park, Joshua Tree National Park, or the Mojave National Preserve shall analyze and address any potential impacts of groundwater extraction on Death Valley National Park, Joshua Tree National Park, or Mojave National Preserve. BLM will consult with the National Park Service on this process. The analysis or analyses shall include:

- Potential impacts on the water balances of groundwater basins within these parks and preserves
- A map identifying all potentially impacted surface water resources in the vicinity of the project, including a narrative discussion of the delineation methods used to discern those surface waters in the field

Comment Set B9 – Women's International League for Peace and Freedom

Women's International League for Peace & Freedom
Fresno Branch
Earth Democracy Issues Group
P.O. Box 5114, Fresno, CA. 93755
March 24, 2017

BLM, California State Office
2800 Cottage Way, Rm. W-1623
Sacramento, CA. 95825

RE: Central Coast Oil & Gas Leasing & Development RMPA

To the Attention of CCFO O&G Leasing EIS Director:

We are opposed to Alternatives A, B, C, D, and E presented in the BLM Draft Resources Management Plan Amendment for Oil & Gas Leasing & Development in California's Central Coast Regions.

In the 2012 Federal Land Policy Management Act, BLM established priorities for land management: America's Great Outdoors Initiative; New Energy Frontier; Cooperative Landscape Conservation; Youth In The Great Outdoors; and Climate Change. These priorities appear to have been established to more closely align BLM with its mission "to sustain health, diversity, and productivity of public lands for the use and enjoyment of present and future generations."

For too many years, the oil & gas industry has enriched itself at the expense of the American taxpayer and our country and world's environmental health. They have made billions of dollars renting our public lands for basically nothing, and have consumed countless hours and monies of our federal, state, and county agencies charged with monitoring their plunder. These corporations pay little to no tax, offer token public support, and make extreme profits selling our public resources at home and now for export.

Historically, the oil & gas industry has been held minimally accountable, and too often not at all accountable, for environmental degradation – degradation which includes dumping, spills, wastewater ponds, soil contamination, methane releases, ozone-forming VOC emissions, crop damage, well abandonment, land subsidence, forest loss, wildlife loss, and aquifer contamination. They know our regulatory agencies are under funded, understaffed, overworked, and spread too thinly to properly address their responsibilities. They also know fines, when levied, are easily affordable for a billionaire corporation to pay. This industry funds huge PACs and lobbies in both Washington, DC and Sacramento, and has no limit to the amount of money it will spend to influence, buy, or maintain favorable business-as-usual conditions.

The BLM Climate Change Priority recognizes public lands are being affected, and these affects could impact our quality of life. BLM lands in CA. have experienced drought, wildfires, species loss, forest loss, insect invasions, landslides, flooding, land subsidence, and higher than normal temperatures year round. If these were isolated occurrences climate change could be dismissed; however, they are not and their intensity and frequency is escalating.

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Comment Set B9 – Women's International League for Peace and Freedom (cont.)

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GROUNDWATER BASINS

California has experienced extreme drought conditions for a number of years, which has placed additional burden on our groundwater resource. Although some areas received temporary relief with above normal precipitation in 2016, since 2013, the areas the BLM is offering for lease remain within the scope of abnormally dry to severe drought conditions. They are situated in either Medium or High-Priority Groundwater Basins (US Drought Monitor).

In 2014 Governor Brown declared an Emergency Drought Proclamation mandating extreme water-use cutbacks for the public, agriculture, and its industries. The oil & gas industry was exempted.

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WATER MISUSE, CONTAMINATION & WASTE

Oil drilling is quickly depleting our groundwater resource. For every barrel (42 gallons) of oil captured, 9 – 13 barrels of wastewater are rendered. This wastewater could have been used as drinking water, or had the potential to be used for drinking water with minimal treatment.

Hydraulic fracturing and acid-matrix stimulation wells waste and contaminate 2 – 10 million gallons of water just to initiate oil capture; millions more are wasted/contaminated in the on-going process (US EPA Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources 2-07-11). The BLM has no way of regulating fracking or enhanced oil recovery methods.

WATER RECLAMATION

The oil and gas industry does not reclaim water. They dispose of millions of gallons of water daily by either injecting it into deep disposal wells, or by pipeline and truck conveyance to disposal sumps where the contaminants laden with Prop 65 cancer-causing chemicals leech into our soils and aquifers, while polluting our atmosphere with emissions of ozone-forming and noxious volatile organic compounds which are affecting our personal health and environment.

If these lands are opened to lease, where shall all of this wasted/contaminated water go? What effects will the VOCs have on our air quality? How will our native species be affected?

WASTEWATER DISPOSAL

In 2011 Governor Brown fired the CA. Department of Oil, Gas, and Geothermal Resources (CDGGR) Director David Chernow and Supervisor Elena Miller who, after inspecting a number of Kern County sites with safety and environmental violations (including a fatality), decided to slow down the wastewater injection permit process to protect our aquifers and bring CDGGR into compliance with standards for federally-protected aquifers. They also wanted to assure local oil and gas operations were in compliance with the US EPA standards for hydraulic fracturing and acidizing well stimulation methods.

In 2011 Governor Brown received \$750,000 from the oil and gas industry to promote his campaign for higher state income taxes. A few months later, the Governor bowed to the industry and the local politicians indebted to them, and began a “more flexible approach” which resulted in the annual 50 permits skyrocketing to 1575 annually.

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Comment Set B9 – Women's International League for Peace and Freedom (cont.)

WILPF 3 of 5

From 2011- 2015 1,172 Class II Injection Wells injected production fluids and waste into federally-protected aquifers more than 1,150 times (US EPA & CDDGR). One hundred and seventy injection wells had been permitted in drinking water aquifers; in twenty-seven cases the water quality was suitable for drinking without treatment.

In 2014 the Central Valley Regional Water Quality Control Board (CVRWQCB) counted 933 wastewater sumps in Kern County. Five hundred and seventy-eight were actively being filled, while 355 were inactive. Only 378 of the active sumps were permitted, leaving 208, or 56% not. Most of the sumps are unlined and unnetted. Many are not even fenced off. CDDGR has tallied 208 sumps within 1500 ft., 326 within ½ mile, and 366 within 1 mile of a waterway. CVRWQCB has also discovered a one mile long plume of wastewater emanating from a sump and moving towards the Kern River Flood Channel and the CA. Aqueduct, both sources of drinking water.

While all of these illegal and egregious dumpings and injections were occurring, the oil and gas industry was making enormous profits. According to the US Energy Administration, the price for a barrel of oil from Kern County's Midway-Sunset Oilfield in 2011 averaged \$92.44; 2012 - \$94.91; 2013 - \$92.83; and 2014 - \$84.93.

In 2015 the CA. Natural Resources Agency admitted at least a dozen times, oil and gas regulators authorized drilling into protected aquifers on land controlled by the BLM. Where was your agency oversight? We believe BLM should concentrate on managing the 600 oil and gas leases with 7,900 wells producing 8% of our state's oil and 10% of its natural gas in Kern County, rather than increasing its scope of responsibility and the resultant and inexcusable environmental damage.

The bottom line is once an aquifer is contaminated there is little to nothing that can be done to restore it. It is an irreplaceable and vital resource that belongs to everyone and every living being. We also do not want our drinking water sources or watersheds contaminated with parent formation arsenic, asbestos, radon, thallium, nitrates, and well as oil well stimulation chemicals. BLM should be protecting our aquifers and not selling them to the highest (low) bidder.

LAND SUBSIDENCE

The overuse of groundwater has caused an enormous problem in the Central Valley. Not only are we facing costly problems with infrastructure damage and well failure, we are also losing the water holding capacities of our aquifers and the subsequent reduction in water quality. The oil and gas industry would like us to believe the sole villain is agriculture, but it is the reliance on fossil fuels that has caused annual higher than normal temperatures, reduced snowpack, and drought conditions which has increased groundwater pumping. The most significant land subsidence (a 2ft. drop since 2014) has occurred on the border of Tulare and Kern Counties, where the oil and gas industry wastes millions of gallons of water daily.

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cont.

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Comment Set B9 – Women's International League for Peace and Freedom (cont.)

WILPF 4 of 5

EARTHQUAKE POTENTIAL

In 2015 the United States Geologic Survey (USGS) released the first comprehensive maps which pinpoint over a dozen areas of central and eastern United States that have been jolted by drilling-triggered earthquakes. The USGS attributes the quakes to injections of wastewater deep underground activating dormant faults.

In Oklahoma from 2013 – 2016, there were 2,214 quakes measuring at least 3 on the Richter Scale. The Oklahoma Office of the Secretary of Energy and Environment, the Oklahoma Geologic Survey, and the USGS have documented the “relationship between wastewater disposal and triggered seismic activity” (earthquakes.ok.gov).

In 2015 in the Wasco/Shafter area of Kern, there were 2 earthquakes with epicenters in the area where 32 injection wells dispose of 3.5 million gallons of wastewater monthly. There are also 10 fracked wells within a 10 mile radius.

All four regions you are proposing to open are geologically active, with many significant transverse and dormant faults. The San Andreas fault is overdue for significant movement. The USGS monitoring equipment has determined both the LA Basin and the San Francisco area are under enormous stress. With earthquakes now occurring on a regular basis in atypical places like Texas, Arkansas, Ohio, Oklahoma – some large enough to cause injury and property damage, how can the BLM justify playing a losing game of roulette with people’s lives and futures?

B9-5

METHANE POLLUTION

One third of all US methane emissions come from the oil and gas industry. Methane is the second largest contributor to US greenhouse gas emissions. Methane is also at least twenty-five more times heat trapping than carbon dioxide. The amount of methane currently in our atmosphere is causing the Arctic permafrost to melt at an alarming rate, and if not stopped, will release untold tons of carbon dioxide and methane into earth’s atmosphere. In Kern County methane is continually flared off and residents have experienced burning eyes, sore throats, and increased asthma. One flare is actually situated less than 1/8 mile from an elementary school. If the BLM has set Climate Change as a priority, does it make any sense to increase methane emissions by expanding the number of contributing wells?

B9-6

THE FREE RIDE

The BLM is probably one of the world’s most beneficent landlords, offering our acreage for a minimum of \$2 Acre. Forty percent of all rental fees on existing leases have been secured for that paltry sum. Royalty fees have not increased since the 1920 Mineral Leasing Act. Bonding fees remain so low, they are insufficient to cover the cost of closing an orphaned well, or cleaning up and reclaiming an environmental mess left behind by a bankrupt oiler. BLM even leases to wildcat operations and allows sub-leasing to occur.

B9-7

The world has changed a lot since the passage of the Mineral Leasing Act. BLM’s decisions should not be based on the green of a dollar, but rather on the green of our nation’s future.

Comment Set B9 – Women's International League for Peace and Freedom (cont.)

WILPF 5 of 5

B9-7
cont.

NO FRACKING/ENHANCED OIL RECOVERY BAN INITIATIVES

Voters in San Benito, Monterey, Santa Cruz, and Alameda Counties have all approved legislative initiatives that ban fracking and enhanced oil recovery methods in their counties. Why would the BLM ignore this legislation and the will of the citizens?

THE NEW ENERGY FRONTIER

Sadly, government regulatory agencies seem to focus their oversight when newsworthy events such as spills, leaks, significant property damages, poisonings, or fatalities catalyze action. A visit to Kern County is proof of the government's impotence when it comes to handling the breadth and scope of their responsibilities. No sooner does an issue fade from the public eye, the violators are able to resume their business-as-usual practices. As existing problems are not being adequately addressed, we feel any gas and oil leases on these lands would be problematic and against approved legislation.

The role the oil and gas industry has played in climate change can no longer be dismissed. We cannot depend on "rapid regional assessments" to enlarge the broader picture.

We applaud BLM for the solar and wind projects now contributing to a more sustainable California; however, we feel BLM should be more assertive in securing more renewable energy generating projects when it comes leasing public lands.

The lands you have been entrusted to manage for our present and future are extremely important to our planet's survival. It may not always seem easy or comfortable to do the right thing, but when that is the case, recognize the need for change and the necessity of the right action.

What shall your legacy be?

Bureau of Land Management
California State Office

APR 05 2017

Respectfully,

Catherine Fowler 3-24-17
Catherine Fowler

Received
Kyla Mitchell 3/30/17
Kyla Mitchell

Jean Hayes DLS
Jean Hayes

Sandra Kios-Balderama 3/28/17 DLS
Sandra Kios-Balderama

Ann Carruthers 3-24-17
Ann Carruthers

Jay Hubbell 3-29-17 DLS
Jay Hubbell

Donna Salwasser 3/24/17
Donna Salwasser

Jean Poss

Janet Capella 3-24-17
Janet Capella

Betty Sempadian DLS

Melissa Fry DLS

Ber Fitzpatrick DLS

Joyce Kauder Joyce Kauder

Comment Set B10 – Center for Biological Diversity



CENTER for BIOLOGICAL DIVERSITY

Because life is good.

June 1, 2017

Via email and Federal Express

Sky Painter Murphy
 Planning & Environmental Coordinator
 Bureau of Land Management, Central Coast Field Office
 940 2nd Ave.
 Marina, CA 93933
 BLM_CA_OGEIS@blm.gov

RE: Supplemental Comments on the Draft Resource Management Plan Amendment and Environmental Impact Statement for Oil and Gas Leasing and Development within the Central Coast Field Office

Dear Mr. Murphy:

The Center for Biological Diversity (“Center”) writes to submit the following supplemental comments on the Draft Resource Management Plan Amendment/Draft Environmental Impact Statement (“RMP”/“DEIS”) for the Bureau of Land Management (“BLM”) Central Coast Field Office.

The Center and Sierra Club submitted detailed comments on the Central Coast RMP/DEIS on April 6, 2017, which highlighted numerous deficiencies, including the failure of the RMP/DEIS to provide the basis and sources for its air quality emissions estimates reported in Tables 4.5-1 and 4.5-2 or the greenhouse gas (GHG) emissions estimates reported in Tables 4.6-1 and 4.6-2. As we noted in our comments, it is BLM’s duty under NEPA to provide clear, consistent, and accurate estimates for levels of air pollutants and greenhouse gases generated by potential oil and gas development authorized in this RMP. The San Joaquin Valley Air Basin is already classified as in “extreme” non-attainment for ozone, and the RMP/DEIS estimates for nitrogen oxide (NOx) and reactive organic gases (ROG) fall just below the de minimis threshold to require a full conformity determination under the Clean Air Act section 176(c).

On March 27, 2017, the Center sent a FOIA request to BLM’s Central Coast Field Office asking for information underlying the air quality and greenhouse gas emissions estimates, including:

All technical sources, calculations and rationale for all air emissions estimates in section 4.5.2 of the Draft Environmental Impact Statement (“DEIS”), specifically in Tables 4.5-1 and 4.5-2 (pages 4.5-4 and 4.5-5) related to oil and gas development and production air emissions estimates based on the 2015 Reasonably Foreseeable Development Scenario.

B10-1

Comment Set B10 – Center for Biological Diversity (cont.)

All sources, calculations, and rationale for the greenhouse gas emissions estimates for the development phase presented in the DEIS and RMP Table 4.6-1 and for the production phase presented in Table 4.6-2.¹

B10-1

BLM responded to our FOIA request on April 26, 2017, with two spreadsheets and a letter that referred us to sections of the RMP/DEIS.²

We have reviewed the spreadsheets and the referenced RMP/DEIS sections and citations. These materials still fail to provide adequate information to understand or verify how BLM derived the air quality estimates in Tables 4.5-1 and 4.5-2, or the development and production phase GHG estimates in Tables 4.6-1 and 4.6-2. Based on the FOIA materials, it also appears that BLM under-reported the GHG emissions that would be generated during the production phase of the project.

A. BLM’s Air Quality Emissions Inventory Is Unsupported.

The spreadsheet titled “AQ-GHG Emissions Inventory for Oil and Gas RFDS” does not provide adequate information to understand the basis for BLM’s estimates of criteria air pollutants. The spreadsheet lists several reports as references for the information provided in the spreadsheet, but no page numbers are provided, and after careful examination of the cited reports, we cannot find the sources for the emissions factors reported in the spreadsheet. The mere reference to these sources does not constitute adequate disclosure or analysis for air quality emissions.

B10-2

For example, the largest source of ROG and NO_x emissions reported in the spreadsheet is from Operations and Maintenance, but it is impossible to trace the basis for BLM’s emissions estimates in the cited references. Walking through it step by step, on page 4 of the spreadsheet in the section entitled “Subtotal Production: Operations and Maint, including EOR,” BLM provides a single set of emissions factors (measured in lb per day per well) for six criteria air pollutants. The emissions factors appear to encompass emissions from Well Operations, Maintenance, Plugging and Abandonment, including emissions from Enhanced Oil Recovery (cyclic steam and steam flood) and secondary recovery techniques (water flood). For ROG, the emissions factor is separated into emissions from Oil and Gas Production and ROG vents and fugitives. The emissions factors reported on page 4 of the BLM spreadsheet are as follows:

	ROG	NO _x	CO	SO _x	PM10	PM2.5
Oil and Gas Production	0.01961	0.53165	0.03068	0.1534	0.26272	0.26272
ROG vents and fugitives	1.36738					

The spreadsheet indicates that the sources for the criteria air pollutant emissions factors are (1) the “ARB Almanac for criteria air pollutants [which] includes combustion and ROG separated for vents, fugitives,” with the reference specified as ““Ref: ARB 2013 Almanac for Oil and Gas Production (average emissions per active well)””; and (2) “ARB 2007 Survey Results include

¹ Center FOIA request, March 27, 2017.

² BLM FOIA response, April 26, 2017, Central Coast Field Office, BLM-2017-00439.

Comment Set B10 – Center for Biological Diversity (cont.)

inventory of GHG from vents, fugitives, and combustion (Steam Generators; CHP / Cogeneration; IC Engines)” with the reference specified as “Ref: ARB 2013 Report on Oil and Gas 2007 Survey Results (Table 3-4: 498,249 MTCO₂e/yr for Monterey Bay Unified APCD / approx 1000 active wells).”

B10-2
cont.

However, the basis for the emissions factors is not apparent in the cited ARB 2013 California Almanac of Emissions and Air Quality³ or the ARB 2007 Oil and Gas Industry Survey Results.⁴ The 2013 Almanac provides statewide estimates of criteria air pollutants coming from the general category of “oil and gas production” for 2012 in Table 2-9 on page 2-9, and has no separate category for ROG for vents and fugitive emissions, EOR, or secondary recovery. It is unclear how BLM translated statewide emissions estimates for general “oil and gas production” into emissions per well for operations and maintenance activities, including accounting for vents and fugitive emissions, EOR, secondary recovery, plugging and abandonment.

The 2007 Industry Survey provides GHG emissions estimates from the oil and gas industry, including tables of CO₂, CH₄, and (sometimes) N₂O estimates for total emissions, combustion emissions, vented emissions, and fugitive emissions by California air district and by source type. However, once again, it is unclear how BLM translated these general GHG estimates into emissions per well for operations and maintenance activities, including accounting for vents and fugitive emissions, EOR, secondary recovery, plugging and abandonment. The BLM emissions factors are simply not evident in either of cited reports for this section.

It is important to note that the Reasonably Foreseeable Development Scenario (RFDS) in Appendix B highlights that the EOR techniques of cyclic steam and steam flood and the secondary recovery technique of water flood are commonly used in the oil and gas fields in the project area.⁵ Thus, BLM must make clear how it is accounting for the air pollutants that will be generated by EOR and secondary recovery techniques. In sum, BLM must present an air pollutants inventory with transparent accounting that specifies traceable sources for all the emissions factors listed in the spreadsheet.

An additional concern is that BLM is under-reporting the emissions that will be generated by well stimulations. BLM’s spreadsheet makes the assumption that there will be a maximum of three well stimulations per year (see page 3 of the “AQ-GHG Emissions Inventory for Oil and Gas RFDS” that states “37 wells over 15 to 20 year plan, 3 well stimulations in single year.”) However, the Reasonably Foreseeable Development Scenario (RFDS) does not support this assumption. The RFDS states that well stimulation technologies may be required on any or all of these wells: “Depending on the type of formation and the current state of the wellbore, well stimulation, such as hydraulic fracturing, acid matrix stimulation or acid fracturing, may be required on any or all of the wells.... Of the 32 development wells and 3 to 5 exploratory wells that are anticipated to be drilled within the HFO area, it is assumed that well stimulation

B10-3

³ California Air Resources Board. 2013. The California Almanac of Emissions and Air Quality. 2013 Edition. Prepared by the Staff of The Air Quality Planning And Science Division, California Air Resources Board, Principal Authors: Paul Cox, Andy Delao, Anna Komorniczak.

⁴ California Air Resources Board. 2013. 2007 Oil and Gas Industry Survey, Final Report (Revised), October 2013, Principal Author: Stephanie Detwiler.

⁵ RMP/DEIS at Appendix B-25 and B-26.

Comment Set B10 – Center for Biological Diversity (cont.)

technologies could be used on any or all of these wells.”⁶ Table 3 in Appendix B provides percentages of wells hydraulically fracked in fields in the HFO planning area, which ranges from 0% to a high of 40%. Therefore, it is very plausible that more than three well stimulation events per year could occur. As indicated by the BLM spreadsheet, each well stimulation results in 1.03 tons per year of NO_x. At just five well stimulations per year, NO_x emissions would exceed the de minimus threshold and trigger a full General Conformity Determination for this RMP. Therefore, it is critical that BLM provide the source and rationale for its estimate of three well stimulations per year for this project.

On a final note, the RMP/DEIS provides no cited references for its Air Quality Section (Section 4.5).⁷ The five reports cited by the BLM air quality spreadsheet are not found in the RMP/DEIS references chapter,⁸ which reflects the overall lack of transparency of the air quality inventory. As required by internal agency policy adopted by the BLM in 2012, a full emissions inventory based on site-specific air quality modeling will be used to assess impacts to air quality if either “the proposal (1) is anticipated to cause a Substantial Increase in Emissions based on the Emissions Inventory prepared *or* (2) will materially contribute to potential adverse cumulative air quality impacts as determined under NEPA.”⁹ As detailed in our comments on the draft RMP/EIS, the San Joaquin Valley Air Basin is classified as “extreme non-attainment” for ozone. Any additional ozone pollution precursors like NO_x and ROG_s will materially contribute to potential adverse cumulative air quality impacts and will hinder the region’s ability to comply with health-protective ozone standards. BLM failed to provide the requisite basis for its air quality analysis in the spreadsheets provided or within the RMP/DEIS as required by NEPA and the CAA.

B. BLM’s GHG Analysis Underestimates Production Emissions and Fails to Provide a Basis for its Development and Production Emission Estimates.

BLM appears to underestimate the GHG emissions that will be produced by the project. In the spreadsheet entitled “GHG Indirect Emissions Calculation for Oil and Gas RFDS,” BLM calculates that GHGs emitted from production and transport will total 53,754 MT CO₂e per year. However, this estimate is not reported in the RMP/DEIS. Instead the RMP/DEIS reports a much lower estimate of 19,084 MT CO₂e per year for production phase emissions in Table 4.6-4. In addition, BLM’s spreadsheet and the RMP/DEIS fail to show how BLM calculated the estimates for development phase emissions reported in Table 4.6-1 of the DEIS or production phase emissions in Table 4.6-2 of the DEIS.

⁶ RMP/DEIS at Appendix B-21.

⁷ RMP/DEIS at 7-25.

⁸ RMP/DEIS at Chapter 7.

⁹ Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the National Environmental Policy Act Process, Section V.E.3(a) (2011), available at: <https://www.epa.gov/sites/production/files/2014-08/documents/air-quality-analyses-mou-2011.pdf>. Adopted as formal agency policy by the United States Department of the Interior, Bureau of Land Management, in Instruction Memorandum No. 2013-025, *Guidance for Conducting Air Quality General Conformity Determinations* (December 4, 2012) found at https://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-025.html.

B10-3
cont.

B10-4

Comment Set B10 – Center for Biological Diversity (cont.)

B10-4
cont.

Courts interpret BLM’s duty to provide supporting analyses, calculations and reports broadly, especially in the NEPA air quality impacts context. A recent Ninth Circuit decision provides a clear explanation of this agency duty. In *Great Basin Resource Watch v. BLM*, BLM’s use of a zero baseline value for some pollutants was found to be unreasonable. 844 F.3d 1095, 1102 (9th Cir. 2016). BLM claimed that its decision to use a zero baseline for those pollutants was reasonable because it was “based on recommendations from the [NDEP’s Bureau of Air Pollution Control], the agency with Nevada-specific expertise.” *Id.* The FEIS similarly used the expertise of the NDEP’s Bureau of Air Pollution Control (“BAPC”), preceding the table of baseline values with the note that “[t]he BAPC was contacted to obtain representative background concentrations for the modeling analysis.” *Id.* In addition, the air impacts analysis submitted to BLM, the study that underlined the FEIS’ air impacts analysis, noted that the “NDEP-BAPC recommends assuming zero background for” the remaining pollutants. *Id.* However, the only “expert recommendation” in the record was a short email from an NDEP official. *Id.* at 1103. The email was, in fact, the sole source of the zero baseline value cited in the FEIS.¹⁰

The court held that BLM’s analysis of air impacts was inadequate. *Id.* at 1104. BLM did not provide any support for its use of baseline values of zero for several air pollutants, and significantly, the email did not explain why or how the NDEP arrived at zero. *Id.* at 1103. Such a basic assertion of opinion¹¹ coming from a BLM expert, without any supporting reasoning, is insufficient in an EIS. *Id.*

Courts have also held that if an agency relies only on expert opinion without supplying the underlying data supporting that opinion, such an activity destroys the public’s ability to challenge government action. In other words, “NEPA requires that the public receive the underlying environmental data from which a [reviewing agency] expert derived her opinion.” *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150 (9th Cir. 1998); reversed on other grounds by *Lands Council v. McNair*, 537 F.3d 981, 997 (9th Cir. 2008).

An agency must also support its conclusions with studies the agency deems reliable. *Tri-Valley Cares v. U.S. Dep’t of Energy*, 671 F.3d 1113, 1124 (9th Cir. 2012). The fact that such conclusions come from an expert at a state agency is of no significance to the analysis. *Natural Resources Defense Council, Inc. v. Herrington*, 768 F.2d 1355, 1412–14 (D.C. Cir. 1985). In *Natural Resources Defense Council*, the Department of Energy (“DOE”) was required to prescribe energy efficiency improvement targets for thirteen appliances. *Id.* at 1362. The DOE expressed the overall costs of one of these appliances to a consumer as the “life-cycle cost” of the appliance. *Id.* at 1386. In determining these life-cycle costs, the DOE increased its real

¹⁰ That email read: “In an un-monitored area, BAPC uses 10.2 µg/m³ for a 24-hour average background and 9.0 µg/m³ for an annual average background for PM10. *All other pollutants are assumed to be 0.* If there is on-going quality assured monitoring representative of an area, we can rely on that data to set a different background. I’m not aware of any monitoring being performed by BAPC in the area you propose.” (Emphasis added.)

¹¹ In the absence of data, the value that must be used as a baseline concentration for a particular air pollutant is a question of expert judgment, not one of fact. *Great Basin Resource Watch*, 844 F.3d 1095 at 1102. There is no uncertainty that the baseline pollutant levels are not zero; the question is what must be used for purposes of modeling. *Id.* In fact, the email to the NDEP official requested “some guidance on what background concentration values . . . to use for a modeling analysis in [the] Mount Hope area.” (Emphasis added.) *Id.*

Comment Set B10 – Center for Biological Diversity (cont.)B10-4
cont.

annual discount rate from 5 percent to 10 percent because an Office of Management and Budget (“OMB”) Circular prescribed that figure as a government-wide discount rate. *Id.* at 1412. The court held that the OMB circular was essentially a “general instruction to government agencies and [did] not explain the reasoning behind the discount rate it recommend[ed].” *Id.* at 1413. It reasoned that “in a rulemaking which must be supported by substantial evidence, [an agency] may not rely without further explanation on an unelaborated order from another agency. Neither we as a reviewing court nor participants in the rulemaking can possibly discover the substantive basis of [the second agency’s] edict.” *Id.*

Here too, BLM failed to provide accurate, defensible or verifiable data to support its air pollution and GHG estimates in the Central Coast RMP/DEIS. Neither the DEIS nor the response to the Center’s FOIA request provides such support. These deficiencies must be corrected before the RMP/DEIS is finalized.

Respectfully submitted,

/s/

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/s/

Hollin Kretzmann

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Comment Set C1 – California Independent Petroleum Association



California Independent Petroleum Association
 1001 K Street, 6th Floor
 Sacramento, CA 95814
 Phone: (916) 447-1177
 Fax: (916) 447-1144

March 30, 2017

Bureau of Land Management, California State Office
 O&G Leasing DEIS Comments
 2800 Cottage Way Suite W-1623
 Sacramento, CA 95825

To Whom It May Concern:

The California Independent Petroleum Association (CIPA) appreciates the opportunity to comment on the Bureau of Land Management's (BLM) proposed Draft Resource Management Plan Amendment (RMP) and Draft Environmental Impact Statement (EIS). CIPA is a non-profit, non-partisan trade association representing approximately 500 independent crude oil and natural gas producers, royalty owners, and service and supply companies operating in the State of California. Our members represent approximately 70% of California's total oil production and 90% of California's natural gas production, including many with petroleum extraction leases on federal land. CIPA would like to draw specific attention to elements of the proposals being considered by the BLM as they would have immediate and negative impacts to California's oil and gas industry operating on federal lands.

CIPA continues to support the utilization of federal lands to promote domestic production. This utilization offers great economic value to federal, state and local government based on royalty revenue, industry-related jobs and the economic activity associated with production. Special consideration should be given to this point as some elements of the draft proposals stand to significantly reduce these benefits. Specifically, proposed surface restrictions on future leasing within existing oil and gas operations on split-estate lands is problematic. Denying a lessee the right to occupy the surface for its oil and gas operations could conflict with the existing legal rights of the lessee. In many cases, an oil and gas operator also holds separate surface rights and would be allowed to utilize the surface by law. The BLM should re-evaluate the proposals to ensure surface rights will not be jeopardized under any potential scenario in the future.

Additionally, it is critical the BLM consider the benefits and protections provided by existing regulations protecting the environment. The RMP Amendment and EIS ultimately adopted by the BLM should serve to enhance production, not stifle it by adding unnecessary and

C1-1

C1-2

Comment Set C1 – California Independent Petroleum Association (cont.)

C1-2
cont.

duplicative environmental protections. Existing regulations already sufficiently protect federal lands in California and our operators go to great lengths to safely produce and operate on federal lands. CIPA requests the BLM re-assess the need for new environmental regulations based on the totality of existing regulations the industry already complies with.

CIPA appreciates the opportunity to provide these comments. We look forward to working with the Bureau of Land Management as these proposals develop further. Production on federal lands benefits all involved and the RMP Amendment and EIS ultimately adopted by the BLM should ensure production is maintained. Should you have any questions or wish to discuss our comments further, please do not hesitate to contact my office directly.

Sincerely,



Rock Zierman
Chief Executive Officer
California Independent Petroleum Association

Comment Set C2 – Chevron

Carla Musser
Policy, Government & Public Affairs Manager
San Joaquin Valley Business Unit

April 4, 2017

BLM, California State Office
Attn: CCFO O&G Leasing, EIS
2800 Cottage Way, Rm. W-1623
Sacramento, CA 95825

Subject: Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement for Oil and Gas Leasing and Development
Index No. BLM/CA/PL-2017/001+1610+1675+1793

To Whom It May Concern:

Chevron U.S.A. Inc. ("Chevron") is an integrated energy enterprise involved in all aspects of the energy business: exploration, production, manufacturing, transportation, marketing, and research. Chevron is committed to conducting our operations safely and in a manner that protects the environment. Chevron operates over 1,200 wells on over 9,000 acres of federally managed land throughout California.

Chevron appreciates the opportunity to provide comments on the BLM's proposed Draft Resource Management Plan ("RMP") and Draft Environmental Impact Statement ("EIS") for oil and gas leasing and development in the BLM's Central Coast Field Office as published January 6, 2017.

Chevron's primary concern is with the draft's proposed surface restrictions on future leasing within existing oil and gas operations on split-estate lands. We believe the proposed restrictions raise certain jurisdictional and legal issues. Under three of the Alternatives, including the BLM's preferred Alternative C, the BLM owns and controls only the mineral estate for some of the associated lands within the existing oil and gas producing field. Denying a lessee the right to occupy the surface for its oil and gas operations could directly conflict with existing legal rights. In many cases, an oil and gas operator holds separate surface rights and would have rights to use and enjoy the surface and associated pore space as provided by separate instruments and by law.

Chevron agrees with the BLM's Preferred Alternative (Alternative C), which provides more balance to open and closed acreages of Federal mineral estate. However, Chevron respectfully requests that, in order to avoid interference with separate legal rights and to avoid obstruction of proper development, the BLM reevaluate each of the proposals to confirm that surface rights arising separately from any BLM lease will not be jeopardized under any Alternative scenario.

San Joaquin Valley Business Unit
Chevron North America Exploration and Production Company
(a division of Chevron U.S.A. Inc.)
9525 Camino Media, Bakersfield, CA 93311
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CarlaMusser@chevron.com

C2-1

Comment Set C2 – Chevron (cont.)

BLM, California State Office
Page 2
April 4, 2017

Chevron appreciates your attention to our comments. We would be happy to meet at your convenience to discuss further. If you have any questions, please contact me.

C2-1
cont.

Kind regards,



Carla Musser

Policy, Government & Public Affairs Manager
San Joaquin Valley Business Unit

Comment Set C3 – Western States Petroleum Association



Western States Petroleum Association
Credible Solutions • Responsive Service • Since 1907

Thomas A. Umenhofer, CCM, REPA
Vice President

April 6, 2017

Sent via email: BLM_CA_OGEIS@blm.gov

Bureau of Land Management, California State Office
Attn: CCFO O&G Leasing, EIS
2800 Cottage Way, Rm. W-1623
Sacramento, CA 95825

Re: WSPA Comments on Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement for Oil and Gas Leasing Development

Dear Sir or Madam:

The Western States Petroleum Association (WSPA) appreciates the opportunity to provide comments on the Bureau of Land Management's (BLM) draft Resource Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing Development published January 6, 2017 in the BLM's Central Coast Field Office. WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in California and four other western states.

C3-1

As a general principle, WSPA encourages the BLM to design its land management plans in a manner that maximizes opportunities for the efficient development of domestic oil and natural gas resources. It is vital that California work its way towards energy independence. Federal lands throughout the state can provide important contributions towards this goal. Policies that hinder efficiency or place lands off limits altogether should be minimized to the extent possible.

Of the alternatives outlined in the draft document, WSPA believes Alternatives C and A, in that order, are the most reasonable and aligned with the BLM's mission as a multiple use agency. Having said that, we are concerned about the document's inclusion of proposed surface restrictions on future leasing within existing oil and gas operations on split-estate lands. As written, the Resource Management Plan Amendment denies the lessee in certain instances the right to occupy the surface for its oil and gas operations and could prospectively conflict with existing legal rights. In many cases, an oil and gas operator holds separate surface rights and would have rights to use and enjoy the surface and associated pore space as provided by separate instruments and by law.

Furthermore, it should be noted for the record that no surface occupancy (NSO) restrictions often promote inefficiency and, in fact, sometimes create more impacts than the restriction avoids. Our member companies place a priority on designing projects in a way that are minimally invasive and efficient from a cost, timing, and impacts perspective. NSO restrictions typically force companies to incur longer drilling times and have to design larger than otherwise necessary pads in order to accommodate the extended reach necessary to recover the hydrocarbons.

C3-2

For these reasons, we respectfully request the BLM reevaluate each of the proposals to minimize the application of NSO restrictions, and to confirm that surface rights arising separately from any BLM lease will not be jeopardized under any Alternative scenario.

1415 L Street, Suite 600, Sacramento, California 95814
(916) 498-7752 • Fax: (916) 444-5745 • Cell: (805) 701-9142
tom@wspa.org • www.wspa.org

Comment Set C3 – Western States Petroleum Association (cont.)

Bureau of Land Management, California State Office
Attn: CCFO O&G Leasing, EIS
April 6, 2017
Page 2

Thank you for your consideration of WSPA's comments. If you have any questions, please contact me at (805) 701-9142 or email tom@wspa.org, or Jenifer Pitcher at (661) 321-0884 or email jpitcher@wspa.org.

C3-2
cont.

Sincerely,



cc: Jenifer Pitcher, WSPA

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Comment Set D1 – Virginia "Polly" Hughes



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
 Draft Resource Management Plan Amendment and
 Draft Environmental Impact Statement
 for Oil and Gas Leasing and Development

Comment Card

Date: 3/14/2017
 Name: * Virginia ("Polly") Hughes
 Affiliation (if any): * Citizens Climate Lobby
 Address: * 8040 Hihn Road
 City, State, Zip Code: * Ben Lomond, CA 95005
 Telephone Number: * PRIVATE
 Email: * phpainter@crozio.com (Please add me to your mailing list)
 Do you prefer paperless (email) notification? Yes No

Comment: 1) Given CA's high earthquake potential, combined with Oklahoma's high ~~number~~ number of earthquakes since starting fracking there, why would we take the risk here? (OK had maybe 3 earthquakes of 3.0 mag. or more before 2013. After fracking began, they had 109 ~~mag~~ in 2013 and another 119 in the first half of 2014! EPA Seismologists confirmed the link to fracking.)
 2) The central valley and many other local areas are some of the prime growing areas in the country. Fracking uses 8 million gal. of H₂O for every fracking project and contaminates it so that the water can't really be reclaimed - 50-70% of it stays in the ground to possibly contaminate groundwater.
 3) Why are we not looking for RENEWABLE energy leases on BLM lands? Essentially, I believe none of the available lands should be opened to fracking.

D1-1
 D1-2
 D1-3

*PLEASE PRINT your name, address, and comments because public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D2 – Polly Hughes



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 3/15/2017
 Name: Polly Hughes
 Affiliation (if any): Citizens' Climate Lobby, Santa Cruz County
 Address: 8040 Haha Road
 City, State, Zip Code: Ben Lomond CA 95005
 Telephone Number: Private
 Email: phpainter@cruzio.com

Do you prefer paperless (email) notification? Yes No

Comment: None of the alternatives presented prohibit enhanced extraction methods, or fracking. San Benito and Monterey Counties as well as Santa Cruz County, have enacted by popular vote a PROHIBITION on fracking. BLM should respect these local ordinances and include fracking bans in any alternative enacted.*

Any method ~~the~~ of extraction that puts greenhouse gases (methane) into the atmosphere and pollutes ground water and/or makes it useless for normal applications must not be allowed!

What effects from exploring (3-5 wells) would show that fracking is NOT A VIABLE OPTION? What would provide better evidence than Oklahoma, PA, and North Dakota have already shown?

*How can we prevent damaging "frinky" enhanced techniques from being used?

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

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D2-1

D2-2

D2-3

Comment Set D3 – Larry Rebecchi



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
 Draft Resource Management Plan Amendment and
 Draft Environmental Impact Statement
 for Oil and Gas Leasing and Development

Comment Card

Date: 3-15-17
 Name: * Larry Rebecchi
 Affiliation (if any): * San Benito Rising / Protect Monterey Co.
 Address: * 1951 Highland Drive
 City, State, Zip Code: * Hollister CA. 95023
 Telephone Number: * 831-637-9727 831-801-9061
 Email: * larryrebecchi@yahoo.com
 Do you prefer paperless (email) notification? Yes No

Comment: Please follow the wishes of local residents in San Benito Co. / Monterey Co. The residents have spoken overwhelmingly by Measure 7 in San Benito Co. 2014. And by measure 7 in Monterey Co. 2016. Please take into consideration the contents of these (2) measures when the BLM finalizes its plan - Please maintain the pristine countryside in south San Benito Co. We have a National Park (Pinnacles) and Scenic Road designation for State Highway 25. Thank you for your consideration.

D3-1

D3-2

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D3 – Larry Rebecchi (cont.)

- 1) All 3 Counties Santa Cruz Monterey, and San Benito have voted to ban extreme gas/oil extraction
- 2) Furthermore the 3 counties have chosen to use more renewable energy solar & wind ect. – The Monterey Bay ~~Power~~ Community Power has secured support transfer to renewable energy for electricity.

D3-3

Comment Set D4 – Lynn Overtree



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
 Draft Resource Management Plan Amendment and
 Draft Environmental Impact Statement
 for Oil and Gas Leasing and Development

Comment Card

Date: 3-15-17
 Name: * Lynn Overtree
 Affiliation (if any): * Resident
 Address: * 6016 San Juan Canyon Rd.
 City, State, Zip Code: * San Juan Bautista, CA 95045
 Telephone Number: * 831-224-5059
 Email: * lovertree@sbcglobal.net
 Do you prefer paperless (email) notification? Yes No

Comment: _____

Please respect + comply w/ San Benito County's ban on fracking + other extreme extraction methods.

D4-1

I am also concerned about detrimental impacts to native, especially endemic + rare, species of plants + animals. Please ~~avoid any~~ restrict oil development to areas of significant existing impact from past ~~industrial~~ development.

D4-2

Finally, considering the severe impact of climate change, we should be reducing fossil fuel extraction pushing all energy production to renewable sources + sources with minimal to no emissions.

D4-3

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Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D5 – Peter Muñoz-Cowan



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 3-15-17

Name: * Peter Muñoz-Cowan

Affiliation (if any): * San Benito Rising - organization 40 page Measure

Address: * 1947 Santa Ana Ct.

City, State, Zip Code: * Hollister, CA 95023

Telephone Number: * 831-245-7263

Email: * petroskymc@gmail.com

Do you prefer paperless (email) notification? Yes No

Comment: First, I am against any drilling for fossil fuels that will only increase the CO2 in our atmosphere and cause increased warming of the atmosphere and climate change.

D5-1

Second - the process of drilling will cause physical damage to the land and air and water pollution.

D5-2

Drilling should not and cannot be done.

D5-3

Thank you

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D6 – Sylvia Shih

16 March 2017

United States Department of the Interior
 Bureau of Land Management - Central Coast Field Office
 940 2nd Avenue
 Marina, CA 93933
 Phone: 831-582-2200 - Fax: 916-978-4419

Oppose: Oil and Gas Leases in Monterey County

To the Bureau of Land Management:

I am aware that the Bureau of Land Management (BLM) is preparing to offer oil and gas leases on thousand of acres of land in Monterey County and surrounding areas. I strongly oppose that action.

The citizens of Monterey County overwhelmingly passed Measure Z in November of 2016 to ban "fracking" and protect our water supply. Monterey is the sixth county in California to ban hydraulic fracturing and other dangerous extraction techniques such as acidizing and cyclic steam injection. When fully implemented, the measure will also prohibit land uses that enhance drilling methods. Further, it phases out toxic wastewater injection and prohibits new oil wells in the county.

Measure Z won with more than 56 percent of the vote, despite supporters being outspent 18 to 1 by major oil companies that spent \$5.4 million.

I urge the BLM to refrain from offering oil and gas leases on federal land and other lands (public or private) in our region. To do otherwise would clearly be contrary to the will of the residents and voters of Monterey County.

Under California law, counties have authority over land use and zoning. The people of Monterey County have determined with certainty and conveyed with great clarity that many oil practices are incompatible with land uses in their county.

I request that the BLM respect the local authority over land use by not granting oil and gas leases in our county.

Thank you.

Sincerely,

Signature: _____

Name: _____

City of Residence/Zip Code: _____

D6-1

Comment Set D7 – Jay Solis

16 March 2017

United States Department of the Interior
Bureau of Land Management - Central Coast Field Office
940 2nd Avenue
Marina, CA 93933
Phone: 831-582-2200 - Fax: 916-978-4419

Oppose: Oil and Gas Leases in Monterey County

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I request that the BLM respect the local authority over land use by not granting oil and gas leases in our county.

Thank you.

Sincerely,

Signature: 

Name: Jay Solis

City of Residence/Zip Code: Salinas 93906

D7-1

Comment Set D8 – Natalie U. Gray

16 March 2017

United States Department of the Interior
Bureau of Land Management - Central Coast Field Office
940 2nd Avenue
Marina, CA 93933
Phone: 831-582-2200 - Fax: 916-978-4419

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I request that the BLM respect the local authority over land use by not granting oil and gas leases in our county.

Thank you.

Sincerely,

Signature: Natalie U. Gray
Name: Natalie U. Gray
City of Residence/Zip Code: 93950

D8-1

Comment Set D9 – Rowan Tauriac

16 March 2017

United States Department of the Interior
Bureau of Land Management - Central Coast Field Office
940 2nd Avenue
Marina, CA 93933
Phone: 831-582-2200 - Fax: 916-978-4419

Oppose: Oil and Gas Leases in Monterey County

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I request that the BLM respect the local authority over land use by not granting oil and gas leases in our county.

Thank you.

Sincerely,

Signature:



Name:

Rowan Tauriac

City of Residence/Zip Code:

Aromas, 95004

D9-1

Comment Set D10 – Robert F. Sigala

16 March 2017

United States Department of the Interior
 Bureau of Land Management - Central Coast Field Office
 940 2nd Avenue
 Marina, CA 93933
 Phone: 831-582-2200 - Fax: 916-978-4419

Oppose: Oil and Gas Leases in Monterey County

To the Bureau of Land Management:

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Measure Z won with more than 56 percent of the vote, despite supporters being outspent 18 to 1 by major oil companies that spent \$5.4 million.

I urge the BLM to refrain from offering oil and gas leases on federal land and other lands (public or private) in our region. To do otherwise would clearly be contrary to the will of the residents and voters of Monterey County.

Under California law, counties have authority over land use and zoning. The people of Monterey County have determined with certainty and conveyed with great clarity that many oil practices are incompatible with land uses in their county.

I request that the BLM respect the local authority over land use by not granting oil and gas leases in our county.

Thank you.

Sincerely,

Signature: Robert F Sigala

Name: _____

City of Residence/Zip Code: 95020

D10-1

Comment Set D11 – Brett Garrett

I oppose offering oil and gas leases of federal mineral estate in Monterey County. Under California law, counties have authority over land use and zoning. The people of Monterey County have determined with certainty and conveyed with great clarity that many oil practices are incompatible with land uses in our county.

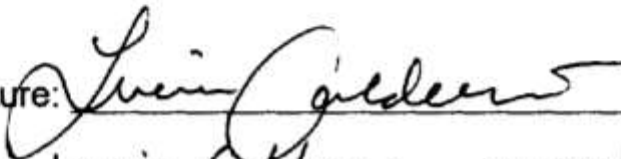
D11-1

Signature: 
Name: Brett Garrett City/Zip: Santa Cruz
95060

Comment Set D12 – Lucia Calderon

I urge the BLM to refrain from offering oil and gas leases on federal land and other lands (public or private) in Monterey County. To do otherwise would clearly be contrary to the will of the residents and voters of Monterey County. Measure Z to ban fracking and protect our water won with more than 56 percent of the vote, despite supporters being outspent 18 to 1 by major oil companies that spent \$5.4 million.


D12-1

Signature: 
Name: Lucia Calderon City/Zip: Salinas 93905

Comment Set D13 – Mike Saint

I urge the BLM to refrain from offering oil and gas leases on federal land and other lands (public or private) in Monterey County. To do otherwise would clearly be contrary to the will of the residents and voters of Monterey County. Measure Z to ban fracking and protect our water won with more than 56 percent of the vote, despite supporters being outspent 18 to 1 by major oil companies that spent \$5.4 million.

D13-1

Signature: 
Name: MIKE SAINT City/Zip: 95003

Comment Set D14 – Rhoda Holabird**Rhoda Holabird <rholabird@roadrunner.com>**

From: Rhoda Holabird <rholabird@roadrunner.com>
Sent: Fri Mar 10 2017 21:11:21 GMT-0700 (MST)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Fossil Fuels are a danger to our health

Dear BLM Officials, I am writing to request that you stop leasing public lands for fossil fuel development. As a native Californian I only support new clean, renewable energy. California's environment is at stake Your agency must adopt an alternative that closes the entire planning area to new leasing, cancels all pending leases that have yet to be drilled, and bans fracking on currently operating leases. Sincerely, Rhoda Holabird 2244 Beverly Glen Pl. Los Angeles, CA 90077 US

D14-1

Comment Set D15 – Susan Rautine

Susan Rautine <srautine@pacbell.net>

From: Susan Rautine <srautine@pacbell.net>
Sent: Fri Mar 10 2017 16:53:46 GMT-0700 (MST)
To: <BLM_CA_OGEIS@blm.gov>
Subject: STOP OIL AND GAS LEASES

Please, no leases for oil and gas companies. Federal lands should not have drilling on them. There are enough other places to drill. Susan Rautine Monterey CA

D15-1

Comment Set D16 – Diane McElroy

Diane McElroy <dinalu7240@aol.com>

From: Diane McElroy <dinalu7240@aol.com>
Sent: Mon Mar 27 2017 15:10:39 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Fracking

Sent from my iPad Atten: CCO O&G Leasing EIS My family strongly disapproves of the fracking and oil and gas extraction on public lands in this state. There is no safe alternative plan! Mrs. Diane McElroy

D16-1

Comment Set D17 – Troy Ishikawa

Troy Ishikawa <ishikawatroy@yahoo.com>

From: Troy Ishikawa <ishikawatroy@yahoo.com>
Sent: Tue Mar 28 2017 13:50:56 GMT-0600 (MDT)
To: "BLM_CA_OGEIS@blm.gov"
<BLM_CA_OGEIS@blm.gov>
Subject: Comment - CENTRAL COAST RESOURCE
MANAGEMENT PLAN AMENDMENT FOR OIL AND GAS
LEASING & DEVELOPMENT

Dear BLM_CA_OGEIS,
ATTN: Sky Murphy,

I strongly oppose the Bureau of Land Management (BLM) to lease any Federal Public Lands (FPLs) for purposes exploiting any oil, gas, and minerals.

D17-1

The BLM should not grant leases to allow for oil, gas, and mineral extraction to private corporations on FPLs. These FPLs should remain undisturbed and minimally developed to provide wildlife sanctuaries and public activities (e.g., hiking).

Climate change is the greatest threat to our national security: fossil fuels should remain in the ground, we have an alternative - renewable energies, and our environment should be revitalized.

As a reminder, Monterey County passed Measure Z in the November 2016 election. This measure bans all new oil and gas drilling.

D17-2

The preservation of FPLs should be the most important mandate of the BLM.

Sincerely,
Troy Ishikawa
26505 Mission Fields Rd.
Carmel, CA 93923

Comment Set D18 – Ken Reichman

Ken Reichman <kenreichman@gmail.com>

From: Ken Reichman <kenreichman@gmail.com>
Sent: Wed Mar 29 2017 13:10:26 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: No Fracking in California

Protect our water and our safety!!

Federal law under the Clean Water Act has charged the companies with protecting the aquifers from contamination. In 1974 Congress passed the Safe Drinking Water Act (SWDA) which is administered by the EPA.

D18-1

Fracking has initiated massive numbers of earthquakes in Oklahoma which had none in the past. Just imagine what fracking will trigger in a seismic active area like California.

D18-2

You are charged with protecting the environment, even though Trump wants to dismantle protections and trample over our rights.

Thank You,

Ken Reichman

Comment Set D19 – Anne Cassell

Anne Cassell <Anne.L.Cassell@gmail.com>

From: Anne Cassell <Anne.L.Cassell@gmail.com>
Sent: Thu Mar 30 2017 15:32:21 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: oil and gas leasing plan for the central California coast region

I am writing to comment on the Central Coast Field Office Oil and Gas Leasing and Development Rmp Amendment and EIS. Thank you for doing this important review of resource management on our central coast public lands.

I encourage your agency to pick Alternative B as the final preferred alternative, as it limits the total area that could be explored for oil and gas and has the strongest environmental protections. I feel that Alternative B adequately balances the multiple uses of BLM land by keeping open 3,800 acres for oil and gas leasing, but by limiting these acres to be in and around current oil and gas fields. Given the serious negative environmental and societal impacts of oil and gas drilling, and especially "enhanced" drilling techniques, it is reasonable to exclude land not previously developed from oil and gas drilling in our region. The negative impacts I reference are well described in your plan, including definite contributions to climate change, loss and degradation of wildlife habitat, light and noise pollution, and loss of recreational opportunities. Potential negative impacts such as contamination of groundwater, land subsidence, and increased seismic activity are serious enough possibilities that Monterey County banned hydraulic fracturing last year. Again, given these serious concerns, limiting drilling to existing areas, as described in Alternative B, is a reasonable balance of land uses.

Barring picking Alternative B, I encourage you to incorporate aspects of Alternatives B and D into Alternative C, the current "preferred" alternative. Alternative C could be improved by including the following measures:

- Closure to drilling for threatened and endangered species critical habitat, BLM developed recreation and administrative sites, and special status split estate lands. Alternative C currently would allow drilling in these areas with CSU stipulations.

- closure to drilling for the Ciervo Panoche Natural Area (both BLM surface and split estate lands), as described in Alternative D.

- I commend Alternative C's closure of core areas of Giant Kangaroo Rat habitat, and encourage the agency to expand the buffer around this habitat for better protection of the kangaroo rats.

- Finally, greatly reducing the number of acres in Alternative C would make it a much more reasonably balanced alternative. I strongly recommend reducing the acreage open in Alternative C by closing any areas with potential contamination of groundwater resources, potential disruption or destruction of threatened and endangered species habitat, or disruption of recreational resources.

Although the eastern part of this management region is lightly visited, it is a recreational and biological treasure for our region. Because of the minimal development that has taken place in the past, the areas in eastern San Benito and Monterey County are a refuge for many threatened plant and animal species unique to the interior coast range. Likewise, these areas provide unique opportunities for recreation offering a wilderness-like experience close to the metropolitan areas of the San Francisco and Monterey Bay areas. These values should be balanced strongly against the dubious short-term economic benefits of expanded oil and gas drilling in the central coast region.

Thank you,
 Anne Cassell

D19-1

Comment Set D20 – Kalen Edwards**Kalen Edwards <edwardskalen@gmail.com>**

From: Kalen Edwards <edwardskalen@gmail.com>
Sent: Thu Mar 30 2017 12:40:00 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: BLM's responsibilities

With our current administration, it falls onto the state governments to resist the horrific decisions being handed down by the federal government. Ecologically California cannot afford to risk our water supplies, which allowing greedy oil companies access to BLM lands will do. From a global perspective we need to be disincentivizing oil extraction and processing and encouraging the development of renewable source of energy. Now I address who ever is reading this, the oil companies do not have your best interest at heart, do the right thing, resist this. You are in a far better position than I will ever be in to fight this terrifying idea. I hope you take this to heart

D20-1

Rise and resist.

Comment Set D21 – Ryan Carle

3/30/2017

D21-1

Dear Bureau of Land Management,

I am writing to comment on the *Central Coast Field Office Oil and Gas Leasing and Development Rmp Amendment and EIS*. Thank you for doing this important review of resource management on our central coast public lands.

I encourage your agency to pick Alternative B as the final preferred alternative, as it limits the total area that could be explored for oil and gas and has the strongest environmental protections. I feel that Alternative B adequately balances the multiple uses of BLM land by keeping open 3,800 acres for oil and gas leasing, but by limiting these acres to be in and around current oil and gas fields. Given the serious negative environmental and societal impacts of oil and gas drilling, and especially “enhanced” drilling techniques, it is reasonable to exclude land not previously developed from oil and gas drilling in our region. The negative impacts I reference are well described in your plan, including definite contributions to climate change, loss and degradation of wildlife habitat, light and noise pollution, and loss of recreational opportunities. Potential negative impacts such as contamination of groundwater, land subsidence, and increased seismic activity are serious enough possibilities that Monterey County banned hydraulic fracturing last year. Again, given these serious concerns, limiting drilling to existing areas, as described in Alternative B, is a reasonable balance of land uses.

Barring picking Alternative B, I encourage you to incorporate aspects of Alternatives B and D into Alternative C, the current “preferred” alternative. Alternative C could be improved by including the following measures:

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- Finally, greatly reducing the number of acres in Alternative C would make it a much more reasonably balanced alternative. I strongly recommend reducing the acreage open in Alternative C by closing any areas with potential contamination of groundwater resources, potential disruption or destruction of threatened and endangered species habitat, or disruption of recreational resources.

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Comment Set D21 – Ryan Carle (cont.)

Thank you
Ryan Carle
2621 N Rodeo Gulch Rd.
Soquel CA 95073

Comment Set D22 – Sharry Jones

Dear Sir/Madam,

I am writing to you about the mineral rights you want to auction off in several thousand acres in the counties of Central California. I do not believe these oil leases should be auctioned off. I have six points that I would like to bring up that I believe are important reasons why those leases should not be auctioned Off.

When I was in high school, my history and civics teachers not only taught me about the history and government of this nation, but they also pointed out the differences between this country and totalitarian regimes. In the United States we get to choose our leaders, and by voting on ballot propositions we can also determine some policy matters. People vote in totalitarian regimes but their votes don't mean anything because they don't have a choice. There is only one candidate on the ballot, The people of San Benito County voted overwhelmingly to ban fracking. We now find that our vote apparently didn't mean any more than the vote of someone in the old Soviet Union. Many people are cynical about government and don't vote because they feel their vote doesn't really matter. Your action only reinforces their belief and makes them more cynical.

My second point, is that fracking uses thousands of gallons of water. We had a lot of rain this winter, but for the previous 5-6 years Californians suffered through one of the worst droughts we had seen in years. We have no idea how much rain we will get in the next few years. California needs its water for people and crops, not fracking.

My third point is that, California is one of the biggest producers of food in this country and even rivals the production of many countries, California produces 90% of the broccoli in the US and is 3rd in the world. California produces 100% of the artichokes grown in the US. The US is 2nd in the production of lettuce in the world, and 71% of the lettuce grown in the US is grown in California. California produces the most tomatoes of any state in the US. California produces 60% of bell peppers and 69% of chili peppers grown in the US. If California's water supply is contaminated by the chemicals used in fracking its agricultural Industry will be destroyed. The people that depend on California's food production will be very hungry.

D22-1

D22-2

D22-3

Comment Set D22 – Sharry Jones (cont.)

My fourth point is, fracking causes earthquakes. San Benito County is surrounded by three active earthquake faults. The last thing San Benito County needs is to have more earthquakes.

D22-4

My fifth point is, oil is a 20th century fuel. When cars were invented, no one understood the effects that gasoline would have on the climate. Everyone fell in love with their cars and the convenience cars brought us. Most people never considered that combustion engines could have detrimental effects on our environment. Luckily for us many scientists have been monitoring our climate and how fossil fuels have affected it. We **MUST** do something to reverse climate change, We are living in the 21st century, and we **MUST** use 21st century technology. Depending on 20th century technology in the 21st century will not solve any problems, it will only worsen them.

D22-5

My sixth point is, that what we do in the US will have a direct effect on the rest of the world. We can't do what we want and expect the rest of the world to not care, We cannot expect that the effects of our use of fossil fuels will stop at our borders and not affect the rest of the world. President Trump and Steve Bannon may not like it, but the United States is part of a global community. It is extremely wrong and arrogant of us to tell the rest of the world that we will do what we want, and we do not care what they think.

San Benito County is beautiful. Please let us keep our county beautiful.

Sincerely,
Sharry Jones

Comment Set D23 – Audrey Doocy

Audrey Doocy <adoocy@pacbell.net>

From: Audrey Doocy <adoocy@pacbell.net>
Sent: Mon Apr 03 2017 23:09:26 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: STOP OIL AND GAS LEASES

Dear BLM, I attended the King City presentation last month and was just wishing to briefly express my concerns with the proposed oil and gas leases on public lands with Federal mineral rights..This is a direct assault on Measure Z which was passed by Monterey County voters by a large margin last November. Measure Z bans all new oil and gas drilling. Water is an increasingly important resource with climate change and draughts expected to persist into the future. Current research suggests deep ground water sources maybe needed for eventual human use and maybe processed. Waste water injection should be banned . Reverse osmosis techniques are available to somewhat clean the water and at a minimum should be required. Stop letting the oil and gas industry not responsibly work on the lands. Severely polluting water with carcinogens used in oil and gas drilling is a public health and environmental serious concern. Agriculture is the lifeblood of Monterey county and the risks of pollution and abundant use of water for extreme extraction methods should be realized. It does not make economic sense for this region, one of the most productive on the planet for agriculture, to waste our water and risk the health of the population for oil and gas. We should be looking at better alternatives not plundering our resources. Then there is also the excessive methane gas that is a byproduct as well that is much more dangerous than the CO2. Please look at the big picture rather than the big oil and gas lobby. Let local control and the will of the people of Monterey prevail rather than money and power. Thank you, Audrey Doocy 508 18th st. Pacific Grove,Ca 93950 Sent from my iPad

D23-1

D23-2

D23-3

Comment Set D24 – Daian Hennington, MSW, LCSW**Daian Hennington <daian.hennington@gmail.com>**

From: Daian Hennington <daian.hennington@gmail.com>
Sent: Mon Apr 03 2017 15:27:49 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: CCFO O&G Leasing EIS Comment
Attachments: BLMcomment.docx

April 3, 2017

Bureau of Land Management

California State Office

ATTN: CCFO O&G Leasing EIS

Sacramento CA 95825

BLM_CA_OGEIS@blm.gov

RE: Comment Submission

Central Coast Field Office Oil and Gas Leasing and Development Rmp
 Amendment and EIS

I am a resident of Monterey County and submitting comment on the above matter. I have been a social worker in this County since 1992 and my expertise, if any, is in listening to people. I have participated in this conversation and listened to the hopes and worries of fellow County residents.

D24-1

By proceeding to make lease decisions without consideration for current Measure Z and clearly expressed public sentiment, BLM shows blatant disregard for local

Comment Set D24 – Daian Hennington, MSW, LCSW (cont.)

policy and land use planning in Monterey County. While the plans for BLM land leasing to the oil industry does consider environmental and social concerns of our community, BLM does not go far enough to address our clearly expressed concerns and values in regards to sustainable land use.

D24-1
cont.

Proposed plans to lease BLM land for new oil wells is in violation of Monterey County Measure Z, now in litigation. The BLM report has not taken into consideration the successful November 2016 ballot measure to prohibit the drilling of new oil wells. Pending the outcome of current litigation, BLM would be in violation of County regulations regarding land use for oil production. BLM must cease the leasing of public land for oil production in light of Measure Z.

The BLM report fails to give adequate consideration to local policy decisions for sustainable land use planning, or the values of County residents. By voting for Measure Z the citizens of Monterey County clearly decided that our values and priorities lie with sustainable land use planning, and that increasing fossil fuel production in this County does not fit those community values and public planning decisions. Recent city government decisions to move toward sustainable, non-fossil fuel, power demonstrates our community's commitment to alternative energy sources.

In the drought conditions that have marked our last decade and are predicted to continue with climate change, we cannot afford to increase overdraft of water resources or poison our water with toxic oil extraction byproduct. The BLM study notes that ground water is already over-drafted. This community cannot afford to increase overdraft of groundwater in the interest of corporate profit. In addition, oil production activities take place adjacent to groundwater basins and the Salinas River which feeds the entire Salinas Valley and empties into a National Marine Sanctuary. Migration of toxic fluids from oil production into our groundwater puts at risk water for human and agricultural use.

D24-2

Proposed oil lease areas lie in a seismically active area near the San Andreas fault zone, the San Antonio Thrust Fault and the Los Lobos Thrust Fault. Damage to casings, wells and fracture lines by earthquakes puts our groundwater at risk. The BLM report notes that seismicity induced by oil production activities is still under study, but studies from other states such as Oklahoma do suggest that oil production activities can induce seismic activity.

D24-3

In conclusion, BLM should not lease out public lands for new oil drilling in Monterey County as this is prohibited by Monterey County Measure Z. BLM should honor the sustainable land use policies and practices of Monterey County that protect water, air, public health, wildlife and other natural resources and that take responsibility to address global warming. Proposed lease scenarios do not offer the no new drilling option as is laid out in Measure Z. Alternatively the most restrictive Scenario B should be pursued.

D24-4

Comment Set D24 – Daian Hennington, MSW, LCSW (cont.)

Respectfully submitted,

Daian Hennington, MSW, LCSW

PO Box 813

Monterey CA 93940

Comment Set D25 – Jeannette Langstaff

To: BLM, California State Office
2800 Cottage Way, Room W-1623
Saramento Ca 95825

From: Jeannette Langstaff
1631 Tiburon Dr.
Hollister, California, 95023
April 4, 2017

Attn: CCFO O&G Leasing EIS

As a Native Californian, I am seriously disturbed at this BLM Central Coast Draft Plan's further destruction to our precious environment. There needs be **no more Open Federal land with Oil/Gas Leases for Exploration and Development**. These Federal managed 793,000 acres cover 12 countries; from Contra Costa and San Joaquin Counties down to Monterey, San Benito and Fresno Counties and the others in between, The big industry BLM is fostering does not help the economy locally Our Open Space must be kept Natural and Sustainable for the Health and Welfare of All Life. The mandated State goal is to curb GHG emission down to the level of the late 1990's within the next 30 years. We must strive to maintain good air quality, pure drinking water, healthy soil for growing food, grazing, native plants and wildlife habitat. San Benito County is among others that have passed a Ban on Fracking. In a Democracy, we have the rights to maintain that. California is the 3rd largest producer of oil/gas in the Nation and doesn't need more!

D25-1

About 95% of California's fracking takes place in San Joaquin Basin. Despite being the state's richest source of oil and gas, it receives less public health funding from State and Federal sources compared with similar counties in population. It has some of the State's highest level of poverty and poor health. This bad technology is desperately ruining our economy and health.

The agency, California Council of Science & Technology (CCST) has searched out data for BLM Draft Plan and is the basis for the EIS. It will also be that for any permits going before NEPA. The Plan relies just on preferred information. It does not adhere to data indicating the serious effects; insufficient evidence and monitoring; warnings of prohibiting certain activities and need of further study.

D25-2

Here are some of these statements of dangers, among many more in the CCST report.

1-- Chemicals injected into the ground tht have been disclosed are strong acids, bases, silica, biocides & quaternary ammonium. Many are carcinogens, endocrine disruptors, neurotoxins and chemicals having caused productive and neruological harm. However, a number of chemicals are undisclosed. "This lack of transparency makes it impossible to know the risks. Lack of knowledge makes potential for air and water pollution a serious problem."

2-- Fracturing and unconventional processes can release contaminants into the environment and water through chemical transport, storage, mixing, well stimulation, operation, wastewater storage treatment and disposal. For every barrel of oil produced up to 10 barrels of contaminated water is returned to the surface. This flowback water can contain heavy metals such as lead, arsenic or radioactive compounds that occur naturally in the soil. In California 60% of flowback is disposed in unlined pits or sumps that can seep in the ground and contaminate water. Recovered fluid , before production, is stored in tanks prior to reuse or disposal. 99% of these fluids are injected into wells. Often located near active faults, this gives serious concern for effects of earthquakes and pollution from faulty well construction.

D25-3

D25-4

Comment Set D25 – Jeannette Langstaff (cont.)

3-- Advertising for wastewater goes out to agriculture, but companies have only been required to test for solids and boron. The effects of this use has not been studied and the State should prohibit this irrigation on crops for human and animal consumption until further testing.

D25-5

4 – Thousands of gallons of water and large quantities of proppants and chemicals are transported by diesel trucks. These and machinery used to pump chemicals and water are great contributors of NOX and Particulate Matter 2.5 destroying air quality. This is known to increase asthma, cardiovascular disease, chronic obstructive pulmonary disease, premature death as well as cancer and infant mortality; most vulnerable are children, pregnant women and the elderly

D25-6

CCST 5.5 #17 out of 41 statements, Conclusion Comments:

In General, monitoring effects near well stimulation in U.S. haven't been extensive, and data on potential contamination in ground water not easily available.

D25-7

Lack of Baseline Data on Groundwater Quality impedes clearly assessing key water related risks of Hydraulic Fracturing and Well Stimulation Treatments (WST)

My personal comment also stresses further evaluation of noise pollution, lights on non-stop, to humans, animals and plants; destruction of Native American Artifacts, etc. from this ill fated industry.

D25-8

This information needs to be assimilated, disclosed and new leases closed..

The BLM Plan lists 5 Alternatives for us, as residents, to decide on one. Even 39,000 acres opened to new leases is unacceptable. Whereas, p 3/26, 2-20 BLM Central Coast Leases, 2017 – **shows FIVE more alternatives considered but not analyzed.**

D25-9

One is to Ban Fracking; Another one states No New Leases on These Federal Lands.

Many of us declare the above to be feasible, practical, economical, technical and legal

Among BLM's decision is to possibly allow a plan for the other California Field Offices: Bakersfield, Palm Springs – South Coast, Mother Lode and Ukiah. It is not just the 368,800 acres opened (out of CCOF's 793,000 acres) for potential oil/gas leases but possibly a million plus acres in our state.

D25-10

This needs to be noticed by the people and stopped right now with the current Central Coast Draft Plan!

San Benito County along with many others are supporting GHF reduction Goals by joining Community Choice Energy. It allows the increased use of renewable, sustainable power in our homes' electricity to 69%, eventually 100%, with Solar, Wind, Biomass. PGE remains in partnership. The people are furthering best practices and producing healthy jobs for the local towns, cities, instead of poorly paid and toxic work.. Union of Concerned Scientists has said a major transformation is taking place in the US Power Sector. It's ramping up across the country at a record pace. **Fossil Fuel Industry is fighting Clean Energy with "misinformation and counterfeit science"**. We must work hard to advance Renewable Energy and Sustainable Benefits for our Health, Economy, Environment.

D25-11

It's a grave concern some people have a mindset, occurring now, going against well documented science and healthy jobs -- pressured by bad businesses and their big money. Instead, we need to resist and work for the well-being of all. Keep it in the Ground; No New Oil/Gas Leases on our Federal Land. **Set in place to preserve Nature, Our Life Giving Natural Resources.**

Langstaff – Page Two

Comment Set D26 – Constance Rose

Connie Rose <constancerose05@gmail.com>

From: Connie Rose <constancerose05@gmail.com>
Sent: Tue Apr 04 2017 18:05:26 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: BLM Land usage

Since the BLM land is public land I strongly do not want any oil, gas, or other mineral exploration or developing on BLM lands. I strongly feel that our country needs to go toward renewable energy and that is the best and safest for all. Thank you, Constance Rose Monterey CA 93940 Sent from my iPhone

D26-1

Comment Set D27 – John and Carolyn Hernandez

John Hernandez <johnhernandez604@gmail.com>

From: John Hernandez <johnhernandez604@gmail.com>
Sent: Tue Apr 04 2017 15:04:04 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Comments on the Draft RMPA/EIS Due April 6th

We have reviewed the Central Coast Field Office (CCFO) Draft Resources Management Plan Amendment and Draft Environmental Impact Statement for Oil and Gas Leasing and Development and attended the public meeting where the draft was presented in Hollister, CA on March 15, 2017. The draft RMPA/EIS would affect approximately 800,000 acres of public land in Contra Costa, San Francisco, Alameda, San Mateo, Santa Clara, Santa Cruz, San Bento, and Monterey counties by opening them up for fracking and other types of dangerous oil and gas development. We reject the "preferred" alternative C (one of five) and request that you consider an alternative that would halt oil and gas development for the following reasons: 1. California faces frequent stresses on groundwater supplies. Fracking requires an enormous amount of water-up to 5 million gallons per well or more. It routinely employs numerous toxic chemicals, including methanol, benzene, naphthalene, and trimethylbenzene. About 25% of fracking chemicals could cause cancer, according to scientists with the Endocrine Disruption Exchange. Evidence is mounting through the country that these chemicals are making their way into aquifers and drinking water. 2. Oil and gas activity in California and elsewhere has been linked to seismic activity, including the Central Coast region. Research has linked much of the increased earthquake activity and several of the largest earthquakes in the U.S. mid-continent in recent years to fracking and the disposal of wastewater into deep injection wells. We are a region with several active earthquake fault lines which will be at risk of induced seismicity activity. 3. Many local jurisdictions have banned fracking. The CCFO EIS does not adequately address these ordinances. Of the 10 counties within the area considered, 4 have banned fracking and water injections. Opening up our land to fossil fuel leasing is an attempt to undermine the will of the voters. John & Carolyn Hernandez 9723 Blackfoot Court Gilroy, CA. 95020 Sent from my iPad

D27-1

D27-2

D27-3

D27-4

Comment Set D28 – Robert & Denyse Frischmuth #1

Denyse <denyse.f@att.net>

From: Denyse <denyse.f@att.net>
Sent: Tue Apr 04 2017 14:57:44 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Leasing of public lands

Bureau of Land Management
California State Office
ATTN: CCFO O&G Leasing EIS
Sacramento CA 95825
BLM_CA_OGEIS@blm.gov

RE: Comment Submission
Central Coast Field Office Oil and Gas Leasing and Development Rmp Amendment and EIS

We have been residents of Monterey County for the past 20 years and we are submitting our comments on the above matter.

How can BLM make lease decisions without taking into account the current Measure Z which was passed last November with 56% of the county residents voting for prohibiting drilling new oil wells in the county of Monterey. The vote of the citizens of Monterey County clearly expressed that they do not support increased fossil fuel production. Water is the other critical issue which is paramount in decisions about oil extraction. Oil operations (extraction and waste water injections) are incompatible with the priority of conserving our water for agriculture and domestic and commercial use, all uses threatened by droughts which are likely to happen more frequently and for longer periods of time with climate change.

Permitting leasing out of public lands for new oil drilling is in total disregard of the will of the people as expressed by Measure Z. Measure Z is in litigation currently, but pending its outcome it is the law and BLM would be in violation of the regulations about land use for oil production.

Respectfully submitted,

Robert and Denyse Frischmuth

D28-1

Comment Set D29 – Susan Schiavone**susan schiavone <s.schiavone@sbcglobal.net>**

From: susan schiavone <s.schiavone@sbcglobal.net>
Sent: Tue Apr 04 2017 14:10:39 GMT-0600 (MDT)
To: "BLM_CA_OGEIS@blm.gov"
<BLM_CA_OGEIS@blm.gov>
Subject: Oil/Gas leasing in Monterey County

I am voicing my serious opposition to the possibility leasing oil and gas rights in Monterey County beyond what we now have. The geology of the county is sensitive to earthquakes, and the groundwater situation is already dire and in need of reparative action. The Salinas Valley feeds the United States with vegetables and is crucial to our economy; this is not the place to expand oil production. Please make the appropriate decision and deny this action. Thank you.

D29-1

Susan L. Schiavone, Seaside, CA

Comment Set D30 – Susan DiGirolamo

<susie@digiolamo.org>

From: <susie@digiolamo.org>
Sent: Tue Apr 04 2017 13:21:09 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: fracking public lands

As a registered voter in the state of California I strongly oppose using public lands for oil and gas extraction. Regardless of any proposed safe alternative plans, any fracking could put us more at risk for earthquakes and will destroy the beauty of nature protected on public lands. Voters in California have already come out against fracking. Please respect our wishes.

D30-1

Susan DiGirolamo

Comment Set D31 – Emma Kelsey

Emma Kelsey <emmacashmankelsey@gmail.com>

From: Emma Kelsey <emmacashmankelsey@gmail.com>
Sent: Wed Apr 05 2017 21:41:09 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Alternative B for Central Coast Field Office Oil and Gas Leasing and Development Rmp Amendment

Dear Bureau of Land Management,

I am writing in regards to the Central Coast Field Office Oil and Gas Leasing and Development Rmp Amendment and EIS. Thank you for this important review of resource management on our central coast public lands.

I encourage your agency to pick Alternative B as the final preferred alternative, as it limits the total area that could be explored for oil and gas and has the strongest environmental protections. I feel that Alternative B adequately balances the multiple uses of BLM land by keeping open 3,800 acres for oil and gas leasing, but by limiting these acres to be in and around current oil and gas fields. Given the serious negative environmental and societal impacts of oil and gas drilling, and especially "enhanced" drilling techniques, it is reasonable to exclude land not previously developed from oil and gas drilling in our region. The negative impacts I reference are well described in your plan, including definite contributions to climate change, loss and degradation of wildlife habitat, light and noise pollution, and loss of recreational opportunities. Potential negative impacts such as contamination of groundwater, land subsidence, and increased seismic activity are serious enough possibilities that Monterey County banned hydraulic fracturing last year. Again, given these serious concerns, limiting drilling to existing areas, as described in Alternative B, is a reasonable balance of land uses.

Barring picking Alternative B, I encourage you to incorporate aspects of Alternatives B and D into Alternative C, the current "preferred" alternative. Alternative C could be improved by including the following measures:

- Closure to drilling for threatened and endangered species critical habitat, BLM developed recreation and administrative sites, and special status split estate lands. Alternative C currently would allow drilling in these areas with CSU stipulations.

- closure to drilling for the Ciervo Panoche Natural Area (both BLM surface and split estate lands), as described in Alternative D.

- I commend Alternative C's closure of core areas of Giant Kangaroo Rat habitat, and encourage the agency to expand the buffer around this habitat for better protection of the kangaroo rats.

- Finally, greatly reducing the number of acres in Alternative C would make it a much more reasonably balanced alternative. I strongly recommend reducing the acreage open in Alternative C by closing any areas with potential contamination of groundwater resources, potential disruption or destruction of threatened and endangered species habitat, or disruption of recreational resources.

Although the eastern part of this management region is lightly visited, it is a recreational and biological treasure for our region. Because of the minimal development that has taken place in the past, the areas in eastern San Benito and Monterey County are a refuge for many threatened plant and animal species unique to the interior coast range. Likewise, these areas provide unique opportunities for recreation offering a wilderness-like experience close to the metropolitan areas of the San Francisco and Monterey Bay areas. These values should be balanced strongly against the dubious short-term economic benefits of expanded oil and gas drilling in the central coast region.

Thank you,

Emma Kelsey

Santa Cruz, CA 95062

D31-1

Comment Set D32 – Emily Coren

Emily Coren <kivakali@gmail.com>

From: Emily Coren <kivakali@gmail.com>
Sent: Wed Apr 05 2017 21:13:40 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Comments to Bureau of Land Management, California State Office

I am a resident in Santa Cruz with a three year old son. I am opposed to drilling for oil and fracking, please do not approve more BLM oil and gas land leases. California is already suffering from drought due to climate change, fracking uses excessive use of freshwater. Water that is needed for life in CA for drinking and agriculture (which is one of our states main exports). The close proximity of wells to the Salinas River which irrigates our crops is irresponsible land use planning. Fracking causes pollution of our freshwater aquifers. This would be catastrophic for my family and our community. We absolutely need access to clean unpolluted drinking water. Furthermore, fracking increases the potential seismic activity, which due to fault lines running through the region is already problematic. The release of methane gas into the atmosphere increases the rate of climate change (please note the impacts for California in the National Climate Assessment, <http://nca2014.globalchange.gov/>). As a society in general we need to be moving away from fossil fuel use not beginning more mining for it, this is especially true of Santa Cruz and Monterey counties as coastal regions. Insufficient regulation by the DOGGR (Division of Oil, Gas, and Geothermal Resources) practically guarantees that any drilling or fracking is not done in a safe way or anywhere near the public's best interest. I'm very concerned about the implications of new oil and gas land leases for my family and my neighbors. Please do not approve any more BLM oil and gas land leases.

D32-1

D32-2

D32-3

D32-4

Sincerely,
 Emily Coren

--
 Emily Coren
 WalkaboutEm.com
 Twitter: @emilycoren
 (c) [443-472-5899](tel:443-472-5899)

Comment Set D33 – Mary Jane Prough

Jane Prough <janeprough@gmail.com>

From: Jane Prough <janeprough@gmail.com>
Sent: Wed Apr 05 2017 09:45:53 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Fracking

PLEASE do not go against the will of the California voters. We spoke loudly NO FRACKING. Our already fragile land cannot tolerate the abuse of fracking.

D33-1

Mary Jane Prough
Zip code: 95076

Comment Set D34 – Janet Stahl

Janet Stahl <jstahl@slvusd.org>

From: Janet Stahl <jstahl@slvusd.org>
Sent: Wed Apr 05 2017 09:39:00 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: public comment

Bureau of Land Management

I would like to make a public comment and receive a reply on the plan for the BLM to consider 5 alternatives for leasing land on the central coast for oil and gas drilling or fracking. I oppose all 5 alternatives for many reasons. The BLM needs to come up with an alternative that protects and preserves the central coast from degradation by oil and gas drilling. I know from the hearing that you are all well aware of the myriad of reasons that these leases would be a bad idea for our area, but let me name the top offenders on my list.

D34-1

1. **Water.** Water is precious everywhere and especially in California. Fracking uses millions of gallons of fresh water to drill and frack the land. The wastewater is then injected or stored with the very high likelihood that it will contaminate ground water and/or aquifers. (Based on the 1,000 plus contaminations and CCST study of 2016.) Of the chemicals that are listed, science tells us these are bad for plants, animals, and people. We can only guess at the toxic effects of the chemicals that are not listed. Our farmlands and the water used to irrigate must be kept clean at all costs.

2. **Air.** Fracking creates air pollution that is harmful to the health of people's nervous, cardiovascular, endocrine, and reproductive systems. The health risks are more severe for those of lower economic status with less access to health care and the ability to relocate to other areas. The gas deposits are dirty, dirty, dirty. The use of gas from these deposits would also pollute the air at a greater degree.

D34-2

3. **Seismic activity.** As is evident in Kansas and Oklahoma, fracking increases seismic activity. The San Andreas Fault, as well as other faults, travel through the areas BLM is considering leasing. This would put most Californians at risk for increased earthquakes. It is hard to assess the loss of property and life with increased seismic activity. It is playing with fire to add any stress to our "faults".

D34-3

4. **Protection and Stewardship.** We want our public and private lands protected. Fracking damages and places in peril land, water, air and public

D34-4

Comment Set D34 – Janet Stahl (cont.)

health. You have the power to stop this.

D34-4
cont.

5. The voter's have spoken. BLM is not respecting the will and the law of the people who have passed bans on fracking. Do not undermine the local land use policies and ballot boxes.

6. Climate change. We know that use of oil and gas and fracking are harming the environment. The BLM needs to move forward, not backwards in the fight against climate change. (Yes, wind and solar farms would be a much better use of this land and create health and jobs.)

D34-5

I ask that you have courage to stand up to the oil and gas companies and the current administration that looks to make a buck regardless of the long-term consequences. You know that DOGGR is not capable of safeguarding our water, air and land. People no longer run the EPA with the environment in mind. Please, please, please do the right thing. We are Californians. We believe in protecting the environment. Stop all current and future leases to oil and gas companies on public land.

D34-6

Thank you

Janet Stahl

148 Southview Terrace

Santa Cruz, CA

95060

Comment Set D35 – Elia & Peter Muñoz-Cowan

Elia Munoz-Cowan <elia.munozcowan@gmail.com>

From: Elia Munoz-Cowan <elia.munozcowan@gmail.com>
Sent: Thu Apr 06 2017 19:34:37 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: BLM Draft RMPA/EIS 2017

As concerned residents of San Benito County we wish to express our outrage regarding BLM Draft RMPA/EIS to make public land available for oil and gas development in Central California.

D35-1

BLM must consider an alternative that would HALT oil and gas development on our public lands.

San Benito County, along with three other counties have banned fracking and waste injection. BLM should respect the will of the voters.

D35-2

An additional concern is the fact that California is a very seismically active state. Many active faults run through it. Oil and gas exploration, especially fracking will contribute to the risk of increased seismic activity.

D35-3

In addition to the risk of increased seismic activity, California's groundwater would be at risk as well. Massive quantities of groundwater would be used in both exploratory drilling and hydraulic fracturing. Our groundwater would be contaminated, harming humans, animals and plants.

D35-4

We urge you to consider the alternative that would put a HALT to oil and gas development on public lands.

D35-5

Elia and Peter Munoz-Cowan
1947 Santa Ana Rd.
Hollister, Calif. 95023

Comment Set D36 – Suzie Gabri**Suzie Gabri <suzie_gabri@yahoo.com>**

From: Suzie Gabri <suzie_gabri@yahoo.com>
Sent: Thu Apr 06 2017 17:51:58 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: No Public Land for Fossil Fuel Leases

To whom it may concern, We, the Monterey County residents , have spoken when we voted to pass the Measure Z. Now we expect our officials whom we voted for to be honorable and respect our wishes. We expect you not to open up public lands to fracking and fossil fuel leases. Sincerely, Suzie Gabri Pacific Grove

D36-1

Comment Set D37 – Dani

Dani <dpaul9ypd@aol.com>

From: Dani <dpaul9ypd@aol.com>
Sent: Thu Apr 06 2017 16:08:07 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Fracking in Monterey County

Please do not allow Fracking in Monterey County. We need to explore other sources of energy than fossil fuel's. It is very important for the survival of the planet that we stop Fracking as the voters of this county requested we do. Sent from my iPhone

D37-1

Comment Set D38 – Cherylyn Smith

Cherylyn <cherylynsmith@aol.com>

From: Cherylyn <cherylynsmith@aol.com>
Sent: Thu Apr 06 2017 15:51:10 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Comments About Expanding Fracking in California
Attachments: **Paris-Howearth.html

To the Bureau of Land Management:

I strongly oppose your proposal to allow more fracking in Coalinga or any other place in California or the U.S. This e-mail emphasizes and expands upon the public comments I presented in March, 2017 at the BLM public hearing in Coalinga, CA.

D38-1

Fracking for oil or gas presents unacceptable risks and known hazards to our environment and to human health. Fracking in California elevates those risks to unacceptable levels.

Current California fracking operations pollute air, water, soil, and crops. Here are examples of that:

1. Chemicals used in the fracking process occur in dangerous amounts in the wastewater. Chemicals such as benzene, arsenic, chromium, and lead are commonly found in the wastewater to exceed legal limit. These chemicals are polluting our aquifers and our groundwater.
2. The heavy salt content of fracking wastewater is ruining the productivity of the soil on farmland that fracking operations are situated on and is ruining the land wherever the wastewater is used to water crops (See #3, below).
3. This wastewater is "dumped" in many ways: It is held in ponding pools which release toxic steam; In Kern County, for example, it has been sprayed on hills (which eventually trickle-down into gulleys that enter the drinking water supply); it has been sold to farmers for irrigating their crops, which poisons our food supply, nationwide; and it is commonly injected into the ground, below the groundwater table -- a practice that has been proven to cause increase earthquake activity, dramatically.
4. Flares are used to burn off some of the methane that leaks in fracking operation. However, flares only convert the methane to CO2 over time, which is also a GHG. Flares also emit high levels of PM 2.5, which is a significant source of harmful air pollution in the Central Valley.

D38-2

D38-3

D38-4

D38-5

D38-6

Furthermore, methane leakage from fracking operations is much higher than reported by the EPA. A 2014 study issued by the National Academy of Science in the online journal (PNS) revealed that fracking leakage of methane is up to 1,000 times higher than EPA estimates. A 2015 study by the Environmental Defense Fund indicates that the Barnett Shale Fields, in Texas, had a leakage rate 90% higher than originally stated by the EPA. A Cornell University Study (April 2011) on methane releases from fracking found that fracking operations leaked methane at at least a 30% higher rate than conventional gas extraction. The study also found that **methane is 86 times more potent as a heat-bearing agent than CO2, in the first 15 to 20 years after it's release.**

D38-7

Comment Set D38 – Cherylyn Smith (cont.)

The lead author of the Cornell Study, Professor Robert Howarth, made the following statement following the Paris Climate Agreement, in 2015, in relation to the heightened heat-trapping capacity of methane:

D38-7
cont.

If we continue with methane production at current rates, the world will run up against the 1.5 degree limit in 12 to 15 years. If we stop producing methane, which means stop doing fracking of natural gas and oil, the world wouldn't run up against that limit for about 50 years. So we could buy ourselves 25 to 35 years of time, which is critical. That would allow us to improve our political and socioeconomic responses to climate change and decarbonize our societies accordingly. But if we're serious about a 1.5 degree target, or even a 2 degree target, we can't keep on fracking. (See Attachment – scroll to last 2 pages.)

In short, if our goal is to reverse global warming, we have to end the practice of fracking immediately. Therefore, it is out of the question to add more fracking operations to our state or to our country. Recognize the importance of ending the practice of fracking. It is imperative that we convert to sustainable energy sources -- such as sun, wind, and water technology, instead. Do not assign any more land in California, or anywhere else for that matter, to this dangerous practice.

D38-8

The general public is still not well-informed that this assault on our environmental protections is taking place. This April 6th deadline for comments is inadequate because the public information is so poorly distributed by the Bureau of Land Management. Please reopen this discussion and make sure that all media sources have made this proposal to frack 700,000 acres of California public lands available to the public.

Sincerely,
Cherylyn Smith
Climate/Energy Chair of the Sierra Club, Tehipite Chapter
Fresno, CA

Comment Set D38 – Cherylyn Smith (cont.)

CLIMATE CHANGE SCIENCE AND HEALTH UNITED NATIONS

D38-9

Scientists Warn: The Paris Climate Agreement Needs Massive Improvement

The current text doesn't even mention "fossil fuels" and lacks strong language on human rights.

By
Mark Hertsgaard

DECEMBER 11, 2015



The Arc de Triomphe roundabout painted with yellow by Greenpeace activists for the United Nations Climate Change Conference, December 11, 2015. (Greenpeace via AP)

Comment Set D38 – Cherylyn Smith (cont.)

PARIS, FRANCE—The long-running clash between climate science and climate politics again took center stage at the Paris summit on Friday as the talks headed into overtime and activists prepared an unauthorized march near the Arc de Triomphe on Saturday “because climate justice won’t wait for governments—it is up to us to keep fossil fuels in the ground.”

Friday began with the French hosts, United Nations officials, rich nation governments, and US and UK media expressing confidence that an ambitious agreement will be reached, though not before Saturday, a day later than scheduled. “I’m optimistic,” the BBC quoted French Foreign Minister Laurent Fabius as saying, adding that Fabius had told reporters he was “sure” the 196 assembled governments would approve a new text that would be “a big step forward for humanity as a whole.” The New York Times reported that the draft text “skates on the edge of historical significance,” adding that the biggest missing piece is “clear language on monitoring and verifying whether and how countries will follow through on their promises to cut emissions.”

At noon, however, an all-star international panel of climate scientists delivered a far harsher judgment, warning that the current text needs massive improvement to deliver on its stated goal of limiting temperature rise to “below 2 degrees C or 1.5 C above pre-industrial levels.”

“The current text is weaker than the final agreement that came out of [the failed] Copenhagen [summit in 2009],” said Kevin Anderson, deputy director of the Tyndall Center for Climate Change Research in the UK, to a packed-to-bursting press conference at the Le Bourget convention center.

D38-9
cont.

Comment Set D38 – Cherylyn Smith (cont.)

Noting that the text does not even contain the words “fossil fuels,” Anderson added, “It is not consistent with science. It calls for peaking greenhouse gas emissions ‘as soon as possible.’ That is not consistent with a 2 degrees limit. Negotiators are praising this text as ‘practical,’ but for whom? For poor, non-white people in the southern Hemisphere, it falls somewhere between dangerous and deadly. But we still have 24 hours here to pull something more serious together.”

China and the United States, as the world’s leading climate and economic superpowers, obviously will be critical to whatever outcome emerges over the next 24 hours. Many developing nations have been unhappy with the US position, which they charge does not reduce heat-trapping emissions anywhere near fast enough to honor a 2 degrees C goal (much less a 1.5 degree C goal) and does not provide the scale of financial assistance poor and vulnerable nations need to cope with intensifying climate impacts and shift to zero-carbon economic development. The US has pledged, in what is known in Paris summit lingo as its INDC (Intended Nationally Determined Contribution) to reduce its emissions by 26 to 28 percent from 2005 levels by 2025.

The Chinese vice foreign minister, Liu Zhenmin, told a press conference late on Friday afternoon that, “The US Secretary of State said that his government would face domestic difficulties if the INDCs are included in the Paris agreement.” Liu added, “We must have the United States on board for a successful Paris agreement. We need to find a solution that is acceptable to all.”

D38-9
cont.

Comment Set D38 – Cherylyn Smith (cont.)

The Nation was told separately that Kerry specifically blamed “resistance in the Congress” for the relative weakness of the US position in Paris. A request for comment from the US delegation’s press office is pending.

“Rather than blame Secretary of State Kerry and President Obama, who I think understand the climate crisis and want to do what they can to reach a just agreement in Paris, we should blame Charles and David Koch, because it is their funding of climate deniers in Congress that has made it impossible for the US to be more ambitious at this summit,” said Victor Menotti, director of the International Forum on Globalization.

“To achieve the 1.5 C limit, we’d need complete de-carbonization of the world economy by 2050,” Hans Schellnhuber, founder of the Potsdam Institute for Climate Impact Research and former chief climate-science adviser to the German government, told *The Nation*. “That means that, once we leave Paris, every country should set up a plan to de-carbonize its economy.”

“To limit warming below 1.5 degrees C, there is no scenario available that says that we can delay action to 2020 and beyond,” said Joeri Rogelj of the International Institute for Applied Systems Analysis in Austria, who authored one of the few scientific studies to analyze a 1.5 C scenario. “We need a global peak of emissions by 2020 to limit warming to 1.5 degrees C.”

D38-9
cont.

Comment Set D38 – Cherylyn Smith (cont.)



Activists used the Eiffel Tower to call for a 1.5 degrees C target at the Paris Climate talks. *Mark Hertsguard*

Such a schedule is light-years ahead of what the current text calls for. Although the point has gotten little attention in media coverage, it is arguably among the most critical facing the negotiations: How soon and how vigorously must emissions reductions begin?

The current text is based on voluntary commitments submitted by 186 governments—Intended Nationally Determined Commitments, or INDCs. These pledges in most cases cover the period from now until 2030—and, as has been widely reported, would yield a temperature rise of roughly 3 degrees, a catastrophic amount. Many poor and vulnerable countries and civil-society groups have urged that the Paris accord call for much greater commitments, starting much sooner. But the current text only envisions convening a “dialogue” in 2019 that would “take stock” of the collective efforts of all nations to de-carbonize, but would not single out high emitters nor impose obligations for additional action.

D38-9
cont.

Comment Set D38 – Cherylyn Smith (cont.)

Another huge concern raised by civil society: The current text has gutted or outright removed language stipulating that human rights, gender equality, indigenous people’s rights and ecosystem integrity are fundamental to making a climate accord work in the real world. “The people we’re here to represent are being left out of this document, by state parties, and we’re looking for them to rise to the occasion,” said Roberto Borrero of the Indigenous People’s Caucus, a coalition of the indigenous people’s groups attending the summit. “The United Nations estimates that there are 370 million indigenous people in the world. Our lands cover 22 percent of the earth’s surface and contain 80 percent of the earth’s biodiversity. Climate change threatens the very survival of our people and we want to see language [to that effect] restored to the legally binding portion of the agreement.”

The world—and the United States in particular—has one possible trick up its sleeve to help keep the 1.5 C target in reach, but it would mean banning shale gas, said Robert Howarth, a professor at Cornell University in New York who has done some of the most cutting-edge research on fracking. Shale gas is composed largely of methane, a greenhouse gas that has escaped notice in the official proceedings at the Paris summit, where the focus is overwhelmingly on carbon dioxide. But methane is actually a much more powerful trapper of heat than is carbon dioxide over the short term—which, paradoxically, means that reducing methane emissions offers a much quicker way to reduce the total concentration of heat-trapping gases in the atmosphere.

D38-9
cont.

Comment Set D38 – Cherylyn Smith (cont.)

“If we continue methane production at current rates, the world will run up against the 1.5 degrees limit in 12 to 15 years,” Howarth told *The Nation*. “If we stop producing methane, which means stop doing fracking of natural gas and oil, the world wouldn’t run up against that limit for about 50 years. So we could buy ourselves 25 to 35 years of time, which is critical. That could allow us to improve our political and socioeconomic responses to climate change and de-carbonize our societies accordingly. But if we’re serious about a 1.5 degrees target, or even the 2 degrees target, we can’t keep on fracking.” ●

D38-9
cont.**0 COMMENTS**

MARK HERTSGAARD Mark Hertsgaard is the the environment correspondent for *The Nation* and the author, most recently, of *HOT: Li Through the Next Fifty Years on Earth*.

To submit a correction for our consideration, click *here*.
For Reprints and Permissions, click *here*.

Comment Set D39 – Marsha Moroh

Marsha Moroh <mmoroh@gmail.com>

From: Marsha Moroh <mmoroh@gmail.com>
Sent: Thu Apr 06 2017 15:33:57 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Oil and Gas leases on public lands

To Whom it may concern:

The BLM should cancel current and proposed leases that would open up public land to fracking, and to further oil and gas exploration. This land belongs to the people, and the people of our County have already voted to ban fracking. This goes against the will of the population!!!

It also compromises the precious groundwater under the region, which is already suffering from a water shortage.

Please -- NO oil and gas drilling on public lands in Monterey County!!!!

M Moroh
762 Oak Street
Monterey California

D39-1

Comment Set D40 – Dr. & Mrs. Elliott and Lucie Hazen

Lucie Hazen <ljhazen@gmail.com>

From: Lucie Hazen <ljhazen@gmail.com>
Sent: Thu Apr 06 2017 13:44:55 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Comment letter on BLM Draft Plan for Oil & Gas leasing

Dear BLM Official, The draft plan to open public BLM lands in Central California to new oil and gas leases is not acceptable. In particular, this top down move to make over 700,000 acres of California public lands available to fracking and fossil fuel leases, is in direct conflict with clear (VOTER SUPPORTED) local policies that have banned fracking (in Alameda, Monterey, San Benito and Santa Cruz counties). Actions like this are not aimed at the public good - but rather for the benefit of industry and political purposes at the expense of local populations. Further, this draft plan does not adequately account for: · Depletion of already limited water resources; · Contamination threats to groundwater; · Human health costs; and · Risks of increased seismic activity. We urge you to cancel current and halt proposed leasing of public lands for new oil and gas development. As a nation, we should be moving forward with smarter renewable energy sources, and the BLM must stand up now for the protection of our health and public lands. Sincerely, Dr. and Mrs. Elliott and Lucie Hazen Pacific Grove, CA

D40-1

D40-2

D40-3

D40-4

Comment Set D41 – Suzanne Worcester

Suzy <suzanne.worcester@gmail.com>

From: Suzy <suzanne.worcester@gmail.com>
Sent: Thu Apr 06 2017 12:34:54 GMT-0600 (MDT)
To: <BLM_CA_OGEIS@blm.gov>
Subject: No oil and gas leases on/under BLM lands in Central Coast

Dear Sky and other BLM Staff,

I write to express my concern about the proposed Amendment to the Central Coast Office Oil and Gas Leasing EIS. I am opposed to opening most BLM lands in the Central Coast to subsurface oil and gas extraction and/or well stimulation. The citizens of Monterey County passed Measure Z with a large majority even with huge counter investment by the oil and gas industry. Similar measures were also passed in San Benito and Santa Cruz Counties. It is clear that the majority of people in the tri-county Central Coast region do not want oil and gas extraction (with fracking included) on (or below) their lands. The economics of oil and gas extraction are tiny compared to the major economic drivers, tourism and agriculture, in Monterey County. And, oil and gas extraction can diminish the value of our primary economic drivers by diminishing viewsheds and changing the wild character of the region, and potentially contaminating water for agriculture (due to leaks during the drilling process, with backfilling wells with produced water or other contamination from produced water). There is also always the chance of oil spills. Small ones due happen regularly as part of normal operations (to my understanding). Finally, there are the methane leaks associated with oil and gas production (some intentional and most unintentional, but undocumented). California law requires considering such impacts to global climate change as part of CEQA. This particular action is under NEPA which I don't think has the same restrictions, but CEQA laws better reflect the will of the people of California.

Based on the maps presented on the available e-documents, https://eplanning.blm.gov/epl-front-office/projects/lup/67003/94014/113328/Appendix_A_-_Figures.pdf, there appear to be substantial areas that are available for oil and gas leases beyond the current, large foot print of oil and gas drilling south of San Ardo, CA. It also appears from the text that the BLM has little control over the current large drilling operations in the region (i.e. they are not on federal lands). Here are my comments on a very brief reading of the alternatives.

Alternative A is unacceptable because it would open up too much land to oil and gas leasing (potentially 17,000 + acres depending on Endangered Species issues). This is clearly against the will of the people based on Measure Z and other fracking ban ballot measures in the region.

Alternative B is an improvement in that it greatly restricts oil and gas leasing to areas near existing wells (to my understanding). And bans wildcat wells in new areas. It still allows

D41-1

D41-2

D41-3

D41-4

D41-5

Comment Set D41 – Suzanne Worcester (cont.)

D41-5
cont.

drilling on over 3,000 acres (but 3,000 is much better than 17,000+!)

Alternative C is unacceptable due to the large amount of acreage that would be open. It does not clearly limit drilling in all recreation areas (such as Fort Ord National Monument) - the writing is more vague. Clearly 17,000 acres of drilling is a large area and is not consistent with the bans passed by voters in the Tri-County region.

Alternative D and E further restrict drilling in certain areas. I especially prefer the consideration of maintaining the integrity of our surface and ground water supplies in Alternative E.

What is needed is Alternative F which combines the Alternative B with Alternative E.

A reason to create this new "Alternative F" is the amazing biodiversity and unique land values in these areas that is clearly outlined in the Executive Summary as quoted here: "The biodiversity is reflected by 88 federally listed or candidate species or distinct population segments that occur within the Planning Area, including 46 plants and 42 animals. Critical habitat for 14 animal species and 13 plant species occurs within the Planning Area. There are 197 additional special status species (137 plant and 60 animal species) that occur within the Planning Area, and 129 of these are designated as BLM sensitive species (100 plant and 29 animal species).

There are a number of Special Management Areas within the CCFO Planning Area including two national monuments, two national trails, two research natural areas, and three areas of critical environmental concern. There are also three wilderness areas and five wilderness study areas. The diverse land area managed by the CCFO encompasses a vast, cultural resource. . . "

The second major reason is the limited water supply in the central coast which is used for all of our drinking water needs as well as agricultural production. We can not afford to contaminate any of our water supplies given the predictions of climate models for more variable rainy seasons as well as longer, more extended droughts.

For these reasons **I strongly encourage the BLM to come up with a new, more restrictive alternative that combines Alternatives B and E and make that available for public comment.** That would be more consistent the will of the people who have passed bans on drilling through the ballot box. At a maximum I would prefer Alternative B over any others presented here. I am just surprised that a more restrictive alternative was not included on this Amended EIS.

Thank you for carefully considering this feedback.

Sincerely,
Suzanne Worcester
Monterey, CA

Comment Set D42 – Seth Capron

Seth <seth@razzolink.com>

From: Seth <seth@razzolink.com>
Sent: Thu Apr 06 2017 03:51:31 GMT-0600 (MDT)
To: "BLM_CA_OGEIS@blm.gov"
 <BLM_CA_OGEIS@blm.gov>
Subject: Seth Capron has shared a file with you using Dropbox

Dear BLM -

Here's a link where you can access "BLM EIR Comments.doc," an MS Word document with my comments on the environmental document you are preparing on opening up additional oil leases in Monterey and San Benito Counties.

<https://www.dropbox.com/s/dwvpruegdgq94i/BLM%20EIR%20Comments.doc?dl=0>

Here is the text of my comments:

I testified at the BLM hearings in Hollister at San Juan Oaks on March 15th. This is a written submission summarizing my comments. I have been a resident of San Benito County for 47 years. I have learned a great deal about oil extraction over the last ten years. I was on the steering committee for Aromas Cares for the Environment (ACE), and participated in working with the San Benito County Board of Supervisors on updating the County's petroleum extraction ordinance. I also worked on the passage of Measure J, wherein the people of San Benito County banned fracking and other enhanced methods of oil extraction. In my comments I will work from the most general to the more specific.

The science on climate change is supported almost unanimously by qualified scientists. Even ExxonMobile has come out in support of the Paris Agreements, due to there concern about the effects of carbon pollution on the future climate of the planet. Scientist who have studied the effects of the increase in carbon in the earth's atmosphere have calculated the approximate amount of additional carbon release that will lead to an unmanageable, devastating increase in global temperature. Calculations have also been made of the total amount of additional carbon that would be added to the earth's atmosphere if all of the currently identified fossil fuels in proven reserves were harvested and consumed. This additional amount of carbon is five times the quantity that scientists have calculated would do irreversible harm to the planet. These proven reserves are on the books of energy companies, and they are counting on extracting them and selling them on the market. So with the proven reserves that have been previously identified, we are already in very difficult situation. We need to figure out how we will prevent the release of all of this carbon, despite the fact that the largest corporations in the world are counting on harvesting all of their reserves. Given that global backdrop, how could a scientifically based environmental analysis! such as this EIR, possibly conclude that ANY

D42-1

Comment Set D42 – Seth Capron (cont.)

exploration of additional petroleum reserves on BLM land could be part of the "preferred alternative"?

D42-1

There is another climate science based reason that oil extraction on BLM lands in San Benito and Monterey Counties poses unacceptable climate change risks. The petroleum deposits throughout this part of Central California are heavy and tar-like. In order to be extracted and processed, typically large amounts of steam must be generated and pumped into the ground to make the petroleum more viscous so that it can be pumped to the surface. This takes a great deal of carbon based energy production to generate these large amounts of steam. The result is that for every BTU of energy that is produced, there is a much larger net amount of carbon released into the earth's atmosphere. Some of the oil in our region has a larger net carbon footprint than that of the Canadian tar sands! Any reasonable scientific analysis of the environmental effects of harvesting this oil needs to include a study of the effects of steam injection or other enhance production techniques, and how the carbon footprint of this oil compares to alternatives that can be harvested elsewhere. I believe that such an analysis would lead to the conclusion that the "no project" alternative would be the preferable choice.

D42-2

The BLM needs to respect the will of the voters in both San Benito and Monterey Counties. Large majorities of voters in both Counties have passed ballot initiatives that ban fracking, steam injection and other forms of enhanced extraction. It would be a rude slap in the face to local residents to have the federal government ignore these standards that citizens have put in place to protect the local environment. It would more appropriate for the federal government to be identifying appropriate BLM lands for the installation of solar or wind electrical generating equipment, and offering leasing opportunities on those tracts.

D42-3

If consideration is given to oil extraction in the study area in spite of all of the above, I think that BLM split estate oil rights should not be included in any preferred alternative. Given the large number of acres of BLM land being considered which do not include split estate, there is no reason to open up property for exploration and production where an owner with surface rights would be impacted by oil drilling on their property. This is often an unimaginable nightmare for surface owners, and should be avoided.

D42-4

Seth Capron
1811 Cole Road
Aromas, CA 95004
408-592-9666

Seth <seth@razzolink.com>

From: Seth <seth@razzolink.com>
Sent: Thu Apr 06 2017 03:55:54 GMT-0600 (MDT)
To: "BLM_CA_OGEIS@blm.gov"
<BLM_CA_OGEIS@blm.gov>
Subject: Re: Seth Capron has shared a file with you using Dropbox

Please use the following email address to respond to this email:

SethCapron@razzolink.com

Comment Set D43 – Nicholas Brown

Nicholas Brown
40 Chappell Cir
Hollister, CA 95023
(408) 201 4070

BLM, California State Office
Attn;CCFO O&G Leasing EIS
2800 Cottage Was, RM.W-1623
Sacramento CA 95825

My concern is that over 30,00 Agricultural jobs may be threatened if environmental damage occurs if chemicals used in oil extraction find their way into the ground water. The ground water could not be used again if this happens. Organic farms would be especially hard hit. The studies I have seen do not address the oil industry exemptions from revealing the types of chemical being used. Testing for unknown chemicals must be included in testing.

D43-1

D43-2

Nicholas Brown

Comment Set D44 – Judith Jackson



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 3/18/17

Name:* Judith Jackson

Affiliation (if any):* Democrat

Address:* 1841 Alia St

City, State, Zip Code:* Santa Cruz, CA 95062

Telephone Number:* 831-428-3789

Email:* judyjackson@alumni.cmu.edu

Do you prefer paperless (email) notification? Yes No

Comment: I do NOT want fracking on BLM land. Please do NOT allow fracking. DO NOT open any more land near me in San Benito, Monterey or Fresno counties for exploration or fracking and stop any fracking you are doing now.

D44-1

Bureau of Land Management
California State Office

MAR 29 2017

Received

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D45 – Kymm Ann Wallin



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: March 18, 2017

Name:* Kymm Ann Wallin

Affiliation (if any):* _____

Address:* 1503 Escalona Drive

City, State, Zip Code:* Santa Cruz CA 95060

Telephone Number:* 831.334.3917

Email:* Kymmman@gmail.com

Do you prefer paperless (email) notification? Yes No

Comment: I am concerned about oil and gas leasing on California public land. Much research shows that fracking leads to groundwater contamination. I urge you to not allow fracking on our public lands. This is especially concerning at this point in time because the Trump administration has stated that it is rolling back an Obama administration ruling which requires companies that drill for oil + natural gas on federal lands to disclose chemicals used in the hydraulic fracturing (fracking). Please hear the concerns of local residents.
Thank you.

Bureau of Land Management
California State Office

MAR 29 2017

D45-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to internet sites if requested.

Received

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D46 – Susan Moren



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 3/18/2017

Name: * SUSAN MOREN

Affiliation (if any):* _____

Address:* _____

City, State, Zip Code:* SANTA CRUZ, CA 95062

Telephone Number:* _____

Email:* Susanaudreym@yahoo.com

Do you prefer paperless (email) notification? Yes No

Comment: _____

Please stop fracking! It has destroyed drinking water in the past and the risk of water contamination is too great!
Please Stop Fracking!

D46-1

Bureau of Land Management
California State Office

MAR 29 2017

Received

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM CA OGEIS@blm.gov.

Comment Set D47 – Emily Coren



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Bureau of Land Management
California State Office

Date: 3/30/17

APR 10 2017

Name: * Emily Coren

Affiliation (if any): * _____

Received

Address: * 533 Broadway #3,

City, State, Zip Code: * Santa Cruz, CA 95060

Telephone Number: * 443-472-5899

Email: * emilycoren@gmail.com

Do you prefer paperless (email) notification? Yes No

Comment: I am strongly opposed to drilling for oil + fracking, please do not approve more BLM oil + gas land leases. California is already suffering from drought due to climate change, fracking uses excessive use of freshwater. Water that is needed for life in CA for drinking and agriculture (one of our states main exports). The close proximity of wells to the Salinas River which irrigates our crops is irresponsible land use planning! Fracking causes pollution of our freshwater aquifers. This would be catastrophic for my family and our community. We absolutely need access to clean drinking water. Furthermore, fracking increases the potential seismic activity, which due to fault lines running through the region is already problematic. The release of methane gas into the atmosphere increases the rate of climate change (please note the impacts for California in the National Climate Assessment)

D47-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

over...

Comment Set D47 – Emily Coren (cont.)

As a society in general we need to be moving away from fossil fuel use not beginning more mining for it. This is especially true of Santa Cruz + Monterey counties as coastal regions. Insufficient regulation by the division of Oil, Gas, and Geothermal Resources practically guarantees that any drilling or fracking done is unsafe + not in the public's best interest. I'm very concerned about the implications of new oil and gas land leases for my family and my neighbors. Please do not approve any more oil and land gas leases.

Sincerely,
Emily Coren

D47-1
cont.

Comment Set D48 – Linda Sherlock



BUREAU OF LAND MANAGEMENT – CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 3/31/17
 Name: * Linda Sherlock Linda Sherlock
 Affiliation (if any): * _____
 Address: * 40006 Rd 406
 City, State, Zip Code: * Madera, Ca 93636
 Telephone Number: * 559-868-4120
 Email: * lsherlock88@gmail.com
 Do you prefer paperless (email) notification? Yes No

Comment: I believe science is real. Our children and lives are more important than corporate profits. Our BLM is not for the oil and gas industries taking. Please do not allow fracking or any pollutants to be allowed on our beautiful American lands. No Fracking! No drilling on BLM land.

D48-1

Linda Sherlock

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D49 – Angelita Gonzalez



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 4.1.17

Name: *Angelita Gonzalez

Affiliation (if any):*

Address:*

City, State, Zip Code: *fresno, CA, 93727

Telephone Number:*

Email: ~~agonzalez~~ agonzalez@friendsofcalwa.org

Do you prefer paperless (email) notification? Yes No

Comment: im against this, because
I want clean water for our
future generations

D49-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D50 – Inga Minton



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 4-1-17

Name: * Inga Minton

Affiliation (if any): * Fresnos Against Fracking

Address: * 5192 E. Behmer Ave.

City, State, Zip Code: * Clouis CA 93619

Telephone Number: * 559-297-0458

Email: * ingaminton@gmail.com

Do you prefer paperless (email) notification? Yes No

Comment: Fracking should not be allowed on any BLM Land. The reasons are numerous! The foremost reason is that with the climate changes affecting our climate ALL fossil fuels should be left in the ground, especially now as renewables are less expensive. The methane wasted + released is monumental, and methane is 85th times stronger than CO₂ as a greenhouse gas. Fracking uses 11 million gallons of fresh water for each well, and the toxic waste water, full of toxic + carcinogenic pollutants, is then often pumped back into our scarce groundwater!

Inga Minton RM

D50-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D51 – John Mataka



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 4-1-17

Name: * John X MATAKA

Affiliation (if any): * Graysan Neighborhood Council

Address: * P.O. Box 941

City, State, Zip Code: * Westley, CA. 95387

Telephone Number: * (209) 495-4322

Email: * rmataka@yahoo.com

Do you prefer paperless (email) notification? Yes No

Comment: Do not increase Fracking - President Trump has lost his mind! We know that Fracking uses a lot of valuable water and leaves the earth polluted. We are contaminating our water quality by Fracking, the Flares from Fracking pollute our Air.

D51-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

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Comment Set D52 – Richard D. Iyall



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 4-1-2017
 Name: * Richard D. Iyall
 Affiliation (if any): * Cowlitz Indian Tribe Community Alliance
 Address: * 4787 N. Barton Ave.
 City, State, Zip Code: * Fresno, CA 93726
 Telephone Number: * _____
 Email: * richarddiyall@yahoo.com
 Do you prefer paperless (email) notification? Yes No

Comment: Extreme methods of oil extraction cause too many problems to the environment. Hydraulic fracturing for oil contaminates water & land. It also traps more methane to the atmosphere. People need to understand that this are natural ways of directing energies on this sacred planet without destroying life here so quickly, which is being done for centralized control. I.e. Centralized control of natural actions is the way to live in a sustainable way.

D52-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

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Comment Set D53 – Rosenda Mataka



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: April 1, 2017

Name: * Rosenda Mataka

Affiliation (if any):* _____

Address: * 8505 Wilson St

City, State, Zip Code: * Batherson, CA 95363

Telephone Number: * _____

Email: * _____

Do you prefer paperless (email) notification? Yes No

Comment: Fracking hurts humans and earth.
Do not permit further drillings on
land that is not fracked today.
Expanding Fracking in California
is encouraging climate warming.
Contaminated water, land and air.
result from fracking.

D53-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

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Comment Set D54 – Sara Aird



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 4/1/17

Name: * Sarah Aird

Affiliation (if any): * _____

Address: * 515 O'Farrell St. #99

City, State, Zip Code: * San Francisco, CA 94102

Telephone Number: * 415-971-4401

Email: * sarahaird@igc.org

Do you prefer paperless (email) notification? Yes No

Comment: I am opposed to any ~~expansion~~ ^{expansion} of fracking in California. It's harmful and unnecessary. A number of communities in California have already voted that they do not want fracking in their counties. Fracking is not needed for our energy, and it causes earthquakes.

D54-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

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Comment Set D55 – Alec Kimmel



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
 Draft Resource Management Plan Amendment and
 Draft Environmental Impact Statement
 for Oil and Gas Leasing and Development

Comment Card

Date: 4/2/17

Name: * ALEC KIMMEL

Affiliation (if any):* _____

Address:* 7095 N. FRUIT AVENUE, APARTMENT 206

City, State, Zip Code:* FRESNO, CA 93711

Telephone Number:* (559) 900-2809

Email:* alec.kimmel@gmail.com

Do you prefer paperless (email) notification? Yes No

Comment: PLEASE DO NOT OPEN UP OUR LAND RESOURCES
TO FRACKING HERE IN THE CALIFORNIA CENTRAL
VALLEY. FRACKING IS NOT A CLEAN, GREEN TECHNOLOGY
FOR OBTAINING FUEL & ENERGY. THIS WILL RELEASE
METHANE GAS INTO THE ATMOSPHERE IN CONCENTRATIONS
SO POWERFUL THAT NEAR THE SOURCES THEY WILL
LITERALLY MAKE THE AIR INFLAMMABLE, TO SAY NOTHING
OF NUMEROUS SCIENTIFICALLY PROVEN HEALTH DEFECTS
FROM FRACKING OPERATIONS. THERE ARE MUCH
BETTER SOLUTIONS OUT THERE AND OUR LAND
AND HEALTH DESERVES BETTER CARE. THANK YOU.

D55-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

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Comment Set D56 – Kyla Noelle Mitchell



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 4/1/2017

Name: * KYLA NOELLE MITCHELL

Affiliation (if any): * WILPF Fresno

Address: * 2975 E. Indianapolis Ave

City, State, Zip Code: * Fresno, CA 93726

Telephone Number: * (557) 346-8253

Email: * kyla.noelle@gmail.com

Do you prefer paperless (email) notification? Yes No

Comment: I believe that opening up BLM land for fracking and oil wells is going to severely affect the health of our communities. Increased fossil fuel extraction and burning will also greatly affect our ability to ~~reduce~~ ~~slow~~ ~~our~~ ~~ability~~ ~~to~~ slow climate change. We know CO₂ and methane emissions cause the temperature on our planet to increase, so let us use that knowledge to save lives and give us a chance to meet the Paris Climate Agreement standards. The people don't want fracking or more health problems. Thank you.

D56-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

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Comment Set D57 – Lynn Jacobeson



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
 Draft Resource Management Plan Amendment and
 Draft Environmental Impact Statement
 for Oil and Gas Leasing and Development

Bureau of Land Management
 California State Office

Comment Card

APR 10 2017

Date: APRIL 2, 2017

Received

Name: * LYNN JACOBESONAffiliation (if any): * FRESNIANS AGAINST FRACKING, THE SIERRA CLUB, CALIFORNIA ENVIRONMENTAL JUSTICE COALITIONAddress: * 41801 LOCUS LOMOND LN.City, State, Zip Code: * OAKHURST, CA 93644Telephone Number: * 559-658-5227Email: * lynnj@mail.fresnostate.eduDo you prefer paperless (email) notification? Yes No

Comment: I AM adamantly opposed to re-opening the 700,000 acres of federal public lands in Monterey, San Benito & Fresno counties to oil and gas drilling. Legal action four years ago by the Center for Biological Diversity which successfully argued that environmental reviews of the land it was leasing, had not been completed. I have had the opportunity to view the current oil & gas operations in Kern County at Belridge and in and around Taft and Shafter. I concluded that oil & gas drilling would be disastrous in the public lands as proposed for the following reasons: (1) the injection of waste water so near the San Andreas fault that runs through the area poses a serious possibility of disastrous earthquakes; (2) the open pits of toxic chemicals used in the drilling process are a serious threat to the aquifers; (3) the citizens in the area have voted against oil & gas drilling, e.g. Monterey County, and (4) California must focus on renewable energy sources such as solar & wind in order to avoid a climate disaster on our planet.

D57-1

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D58 – Barbara McKinder



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 3-30-17

Name: * Barbara McKinder Pgi

Affiliation (if any):* _____

Address:* 139 10th St.

City, State, Zip Code:* Pacific Grove, CA 93950

Telephone Number:* 831-224-5452

Email:* mckinder@att.net

Do you prefer paperless (email) notification? Yes No

Comment: First of all Thank you for all of your work protecting our precious lands. Your meeting in Salinas was fantastic and it was a joy to experience our democracy in action first hand! A few of my concerns regarding Measure 2 are!

D58-1

1) Monterey County is one of the most beautiful & fragile in our state. Because of the fragility we need to be extra cautious to preserve it for future generations.

2) accidents happen and are inevitable

3) droughts are also inevitable & we need to preserve the aquifer for our future.

4) fracking causes earthquakes and for goodness sake we live on a fault line = an active fault line!

5) emissions

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Comment Set D58 – Barbara McKinder (cont.)



Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Pg 2

Date: 3-30-17

Name: * Barbara McKinder

Affiliation (if any): * _____

Address: * 139 10th St.

City, State, Zip Code: * Pacific Grove, CA 93950

Telephone Number: * 831-224-5452

Email: * mcKinder@att.net

Do you prefer paperless (email) notification? Yes No

cont.

Comment:

⑥ Climate change is real & we need to prepare for the future to preserve our precious planet. What good will all the money do for the oil companies if we allow them to pollute the earth?

Please help preserve our beautiful lands. Our future is in your hands. You all have families and I am sure that you will do what is necessary for their futures and all of ours!

Thank you for your time

D58-1

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Comment Set D59 – Char Biddle



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: April 4, 2017

Name: * Char Biddle

Affiliation (if any): * Citizen

Address: * 354 Sunset Ln.

City, State, Zip Code: * Soquel, CA, 95073

Telephone Number: * 831 423-0514

Email: * charbe4@comcast.net

Do you prefer paperless (email) notification? Yes No

Comment: I am opposed to having any more oil & gas wells on the BLM lands. My preference would be to place solar or wind in those areas.

From information I have read, there have been to many infractions by the fossil fuel industry, i.e. pipeline leaks, injection of waste water into our fresh water aquifers. Additionally, the increased amount of seismic activity that would increase in this fault litter area would be devastating.
It appears that the agency DOGGER, has not met their obligations to the citizens of California. How can we trust them to regulate any new wells? I think the citizens of this region have spoken. Please consider making the choice that is best for the earth & our future generations.

D59-1

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Comment Set D60 – Ronald J. Martin Ph.D.



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
 Draft Resource Management Plan Amendment and
 Draft Environmental Impact Statement
 for Oil and Gas Leasing and Development

Comment Card

Date: April 4, 2017

Name: * Ronald J. Martin, Ph.D.

Affiliation (if any): * Fresnans against Fracking President

Address: * 4721 N. Cedar Ave, apt. 113, Fresno Square
Tehipite Chapter of the Sierra Club, Vice Chairman

City, State, Zip Code: * Fresno, California 93726-1081

Telephone Number: * (559) 222-5524

Email: * martinrj93638@yahoo.com

Do you prefer paperless (email) notification? Yes No

Comment: I object to the plan to drill and frack for oil in the BLM lands of Fresno, Monterey, and San Benito Counties since this potentially will poison these lands with toxic produced water. Oil companies have shown no willingness to pay for purification of the water. Worse yet this is the wrong time to invest in expansion of petroleum production in the wake of the Paris agreements to slow climate change as our planet warms with increasing concentration of CO₂ in our atmosphere. We need to prepare for the energy of the future, from sun and wind. This is a much better use of our BLM land. Alternatively, if petroleum is of such value, why would we want to burn all of it now? Why not leave it to our posterity, as the writers of our Constitution encourage us? Do not drill and frack for oil anywhere on BLM land. Besides, with all our earthquake faults, the risks of damage to the wells and to plans to dispose of the produced water are too great.

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D60-1

Comment Set D61 – Alan Chea



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Comment Card

Date: 4/5/2017

Name: * Alan Chea

Affiliation (if any): * _____

Address: * 41801 Loch Lomond Ln

City, State, Zip Code: * Oakhurst, CA 93644

Telephone Number: * 559-658-5227

Email: * livnez@hotmail.com

Do you prefer paperless (email) notification? Yes No

Comment: I vehemently oppose fracking and drilling. During the fracking process methane is emitted. Methane is 30 times more potent as a heat-trapping gas than CO₂. Kansas, Oklahoma, Texas and many other states are experiencing unprecedented increases in earthquakes. That's the last thing we need in California where fault lines are pervasive. The costs of dirty air, dirty water, contaminated agricultural products, ~~poor~~ health of children and adults, economic impact from climate destruction far outweigh any benefit of increased oil & gas production. Renewable energy ~~alternatives~~ ^{has} become a cheaper alternative. China is now the leader in solar production. Let's not get left behind. California has always been at the forefront. Let's keep it that way.

D61-1

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Comment Set D62 – Alette Brooks



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
 Draft Resource Management Plan Amendment and
 Draft Environmental Impact Statement
 for Oil and Gas Leasing and Development

2017 APR -6 AM 11: 37

Comment Card

Date: 4-5-2016

RECEIVED
 U.S. DEPT. OF INTERIOR
 BUREAU OF LAND MANAGEMENT
 WASHINGTON, DC 20250

Name: * Alette BrooksAffiliation (if any): * South San Jose Nextdoor networkAddress: * 6724 Landerwood LaneCity, State, Zip Code: * San Jose CA 95120-5526Telephone Number: * 408-705-6869Email: * alette.brooks@gmail.comDo you prefer paperless (email) notification? Yes No

Comment: I feel strongly that fracking, enhanced extraction, or other oil/gas exploration should be halted and/or not started in the proposed areas under consideration. Keep the oil and gas in the ground. Reduce carbon pollution by pursuing renewable energy sources. It is simply too dangerous to use enhanced extraction techniques in California. Please see my detailed statement and attached documentation. Regardless of the current administration's reckless disregard of science and the good of the environment, Californians and the local communities are steadfastly against expansion of oil/gas leases (ALL of the proposals are unacceptable) and strongly favor conservation efforts.

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D62-1

Comment Set D62 – Alette Brooks (cont.)

**BLM Public Hearing regarding oil leases for lands in central and northern Calif.
March 15, 2017; Hollister, California** and statement to BLM, April 5, 2017
(sent by US mail)

Comments by Alette Brooks, resident of San Jose, zip code 95120

I would like to provide input that I have gathered in discussions with family, neighbors, work colleagues, and businesses in my neighborhood. Not only are we extremely concerned about the detrimental effects upon water and air quality related to drilling and fracking in the proposed counties, we have an additional concern about increased seismic danger. It has been well documented that fracking is an agent in the 1000% increases in earthquake activity that has been recorded recently in Oklahoma. We are incredulous that the BLM, as a steward of the nation's public lands, would even consider opening areas of California that are at the highest risk levels for devastating earthquakes of Richter magnitudes of 7.0 and above to activities known to increase earthquake risk. See maps 1, 2, and 3.

I have gathered documentation to show the changes in earthquake risk in Oklahoma pre- and post-fracking. See maps 4, 5, and 6. Additional proof comes from data taken during the past year. Decreases were observed in seismicity in 2016 directly related to decreases in fracking activity due to regulations and a gas glut. With the state of Oklahoma as an *in vivo* experiment conducted by oil and gas companies, it has been shown that increases in fracking increase risk and decreases in fracking decrease the risk of earthquakes. It is important to note, however, that because of the action of the waste water injected in deeper and deeper levels below the surface, the earthquake risk does not reduce to pre-fracking levels. It was reported this month that the USGS lists the risk in 2017 for a strong and potentially destructive earthquake in Oklahoma to be at the same level as for California!

Several of California's faults are past due for a major earthquake, including the Hayward/Calaveras/Rodgers Creek complex which runs through several of the counties that are part of the oil leasing proposal. The notorious San Andreas fault runs through many of the other counties. As a survivor of the Tehachapi, San Fernando, Loma Prieta and Napa earthquakes, I can personally attest to the physical and emotional devastation of those events. Please do not disrupt the fragile balance of our land by allowing oil and gas companies to engage in activities that have been shown to significantly impact that balance. Thank you.

Alette Brooks, Ph.D.
6724 Landerwood Lane
San Jose, CA 95120

Alette Brooks

D62-1
cont.

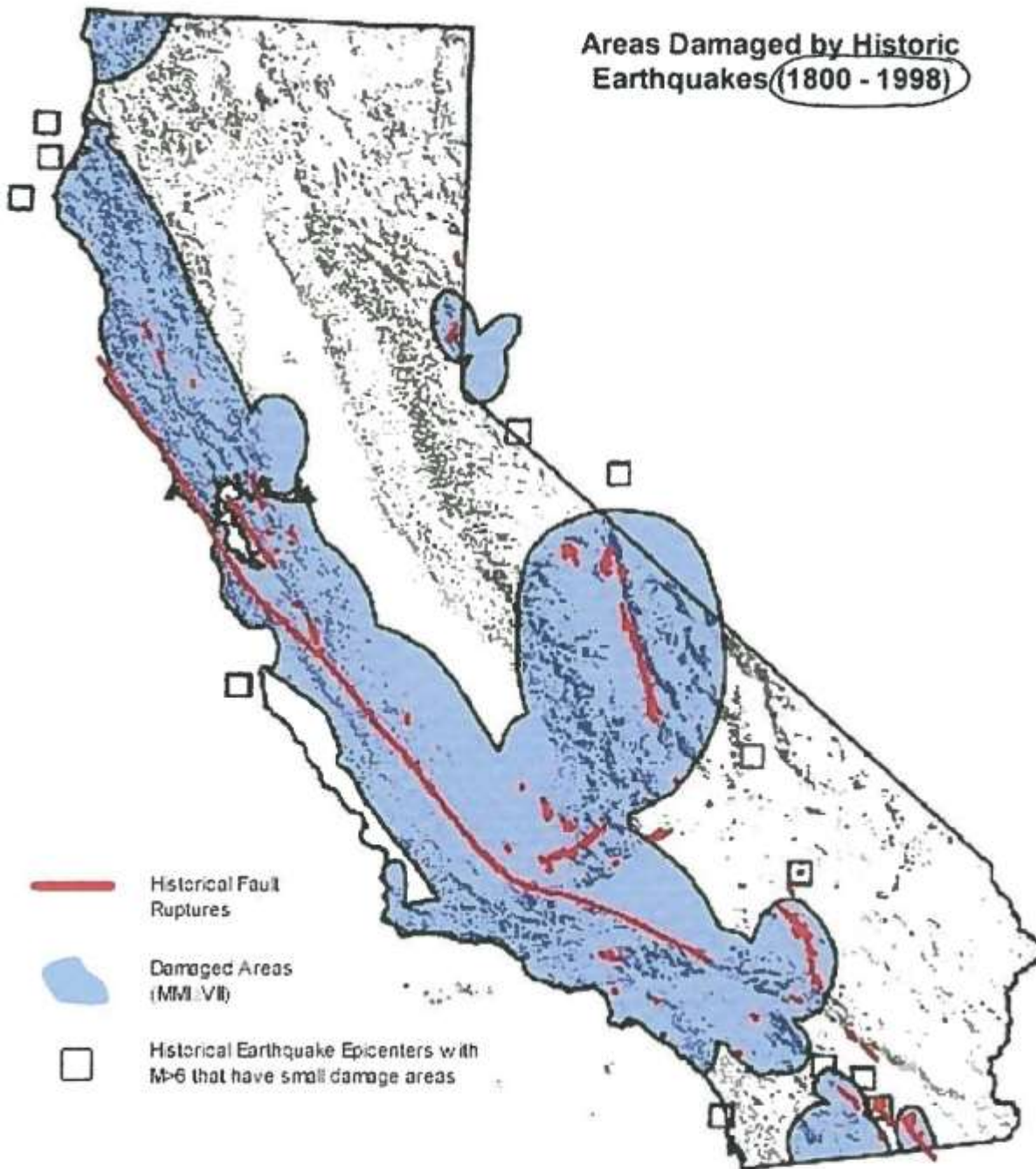
Comment Set D62 – Alette Brooks (cont.)



counties identified
BLM for oil/gas leases.
3-2017

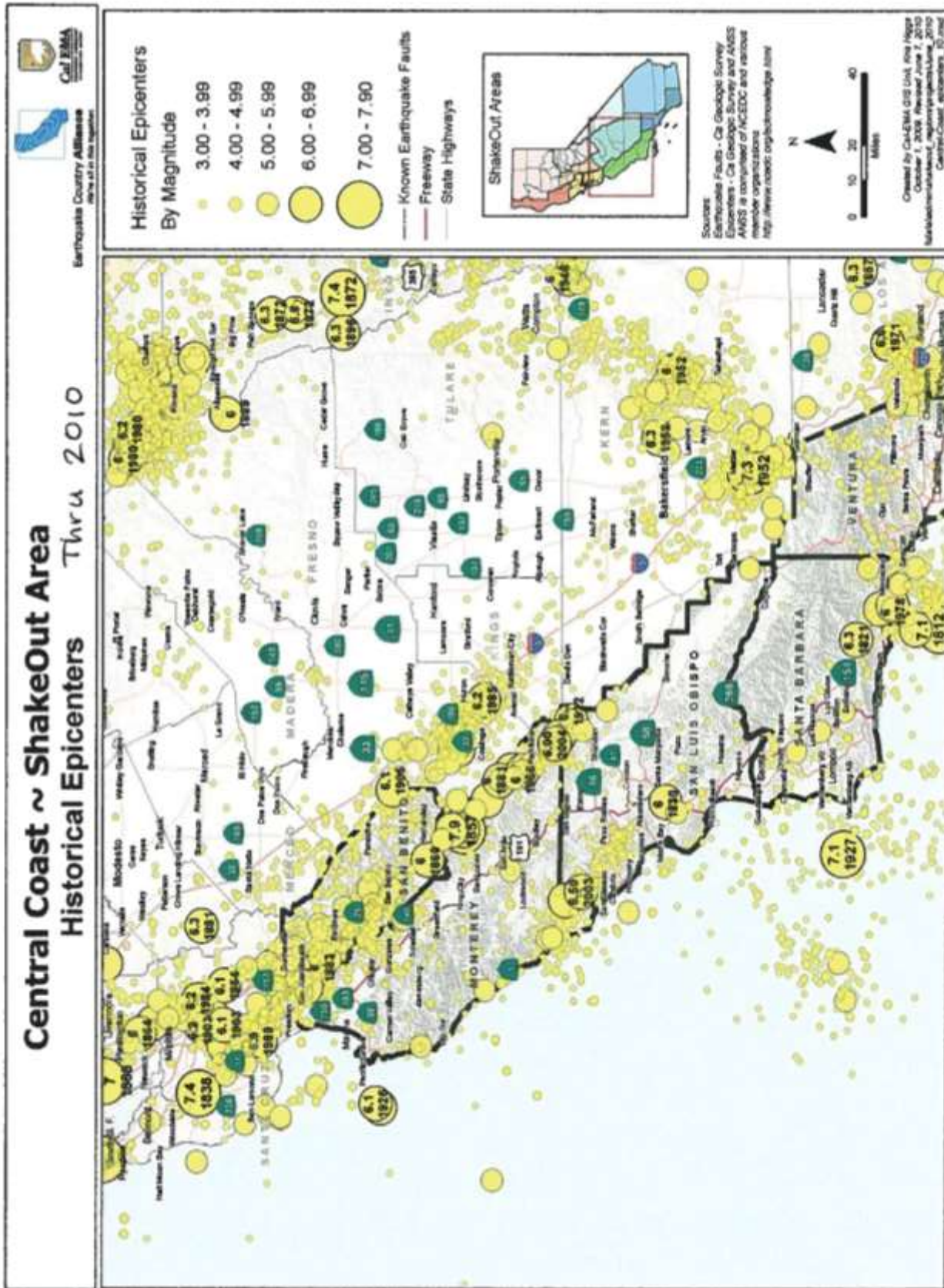
D62-1
cont.

Comment Set D62 – Alette Brooks (cont.)



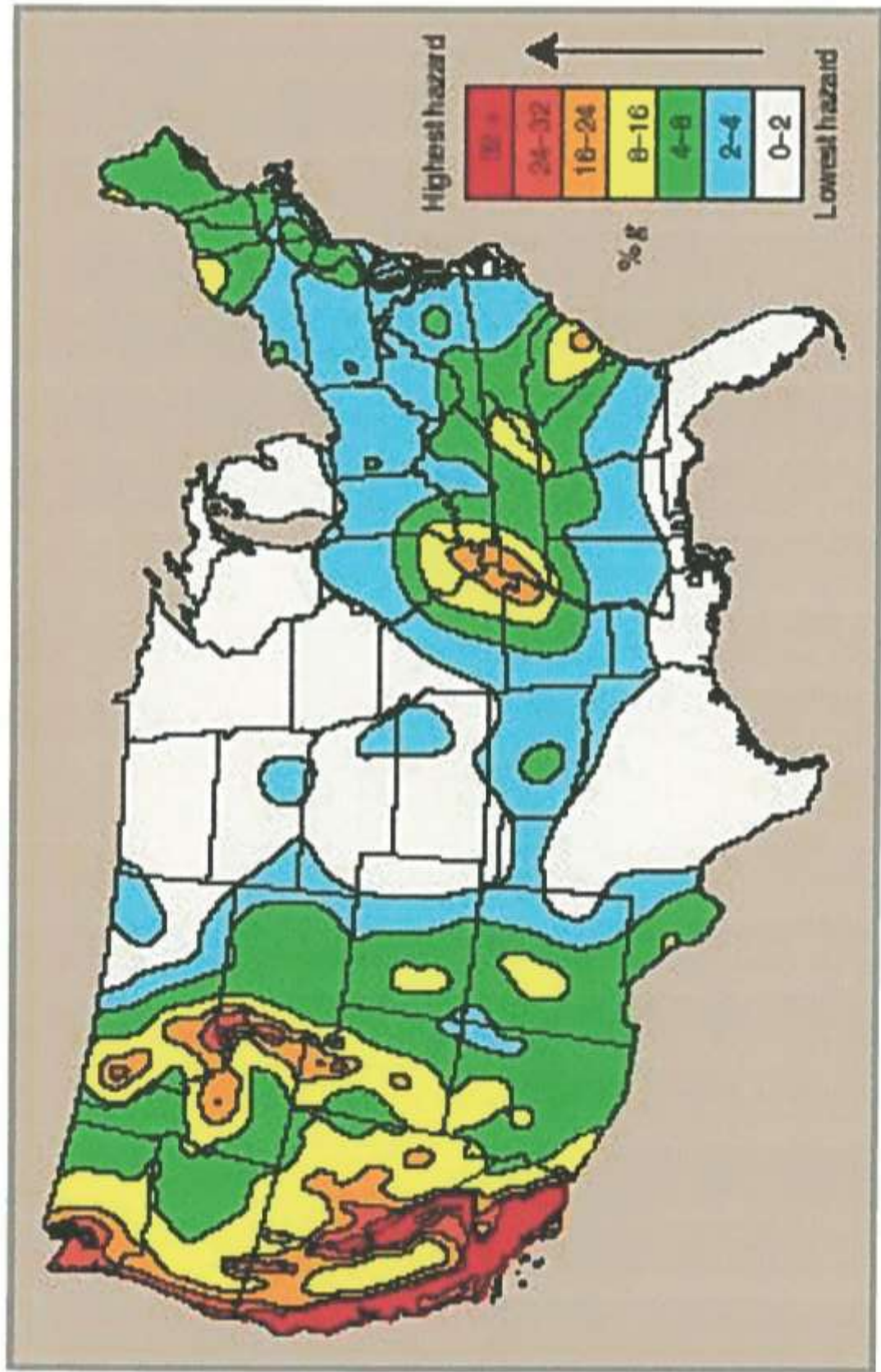
D62-1
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Comment Set D62 – Alette Brooks (cont.)



D62-1
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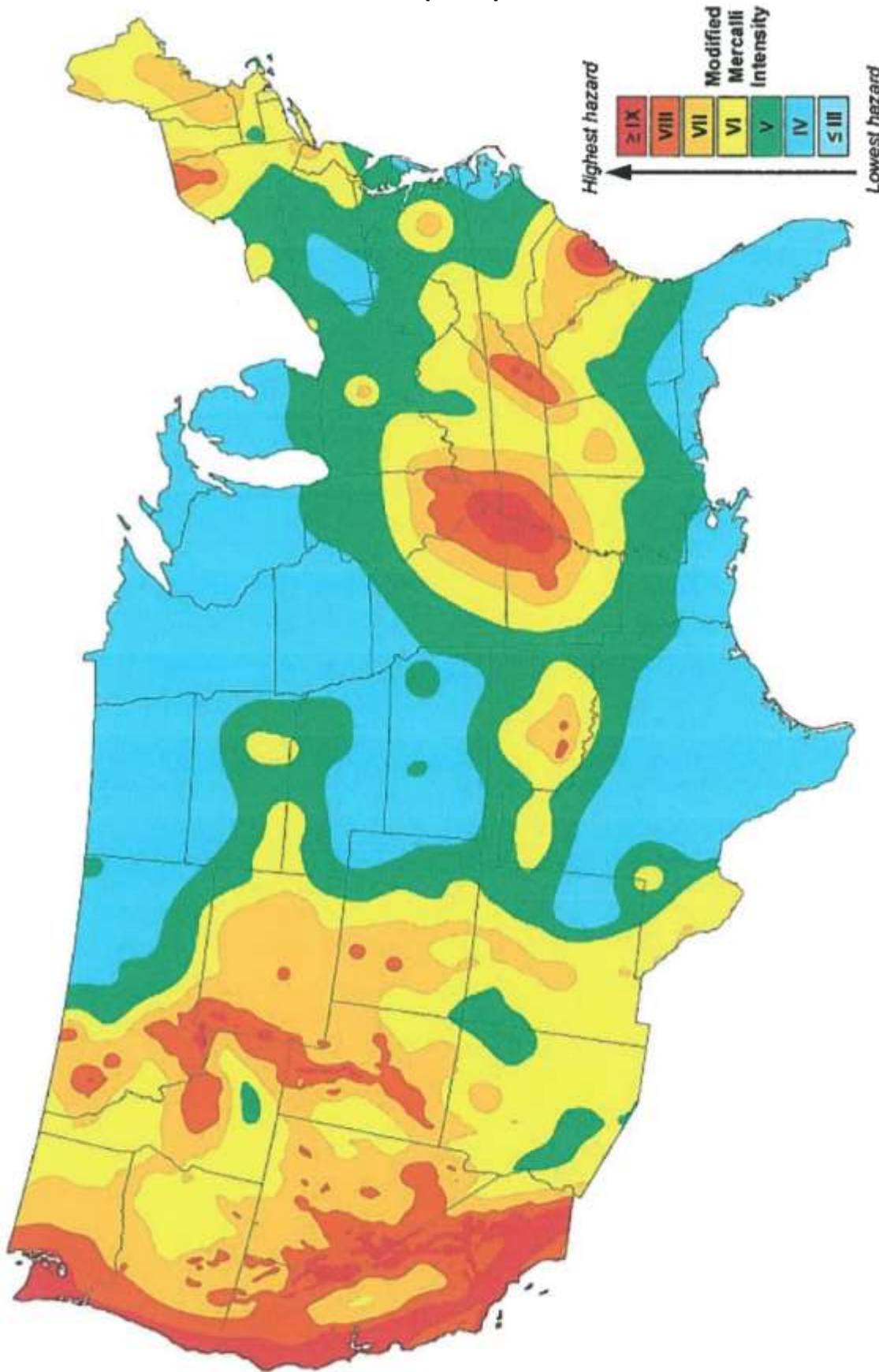
Comment Set D62 – Alette Brooks (cont.)



2000 Earthquake Hazard Risk Map

D62-1
cont.

Comment Set D62 – Alette Brooks (cont.)



2014 USGS map showing the intensity of potential earthquake ground shaking that has a 2% chance of occurring in 50 years

D62-1
cont.

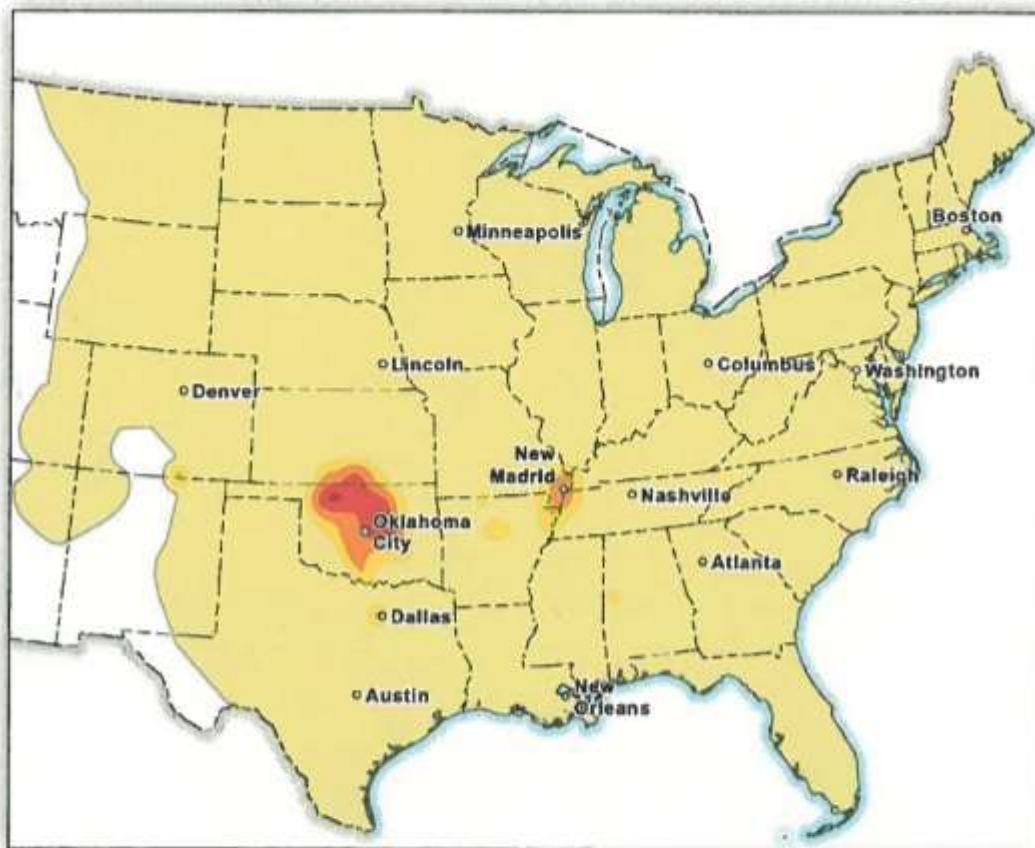
Comment Set D62 – Alette Brooks (cont.)



D62-1
cont.

2016 One-Year Seismic Hazard Forecast for the Central and Eastern United States from Induced and Natural Earthquakes

By Mark D. Petersen, Charles S. Mueller, Morgan P. Moschetti, Susan M. Hoover, Andrea L. Llenos, William L. Ellsworth, Andrew J. Michael, Justin L. Rubinstein, Arthur F. McGarr, and Kenneth S. Rukstales



Open-File Report 2016-1035
Version 1.1, June 2016

U.S. Department of the Interior
U.S. Geological Survey

Comment Set D62 – Alette Brooks (cont.)

ENVIRONMENT

Oklahoma Is Now as Much of an Earthquake Risk as California

Josh Sanburn

Mar 28, 2016



D62-1
cont.

A new federal map released Monday shows parts of Oklahoma are now as seismic as parts of California and Alaska, long the nation's leaders in earthquakes, and for the first time includes **man-made earthquakes**.

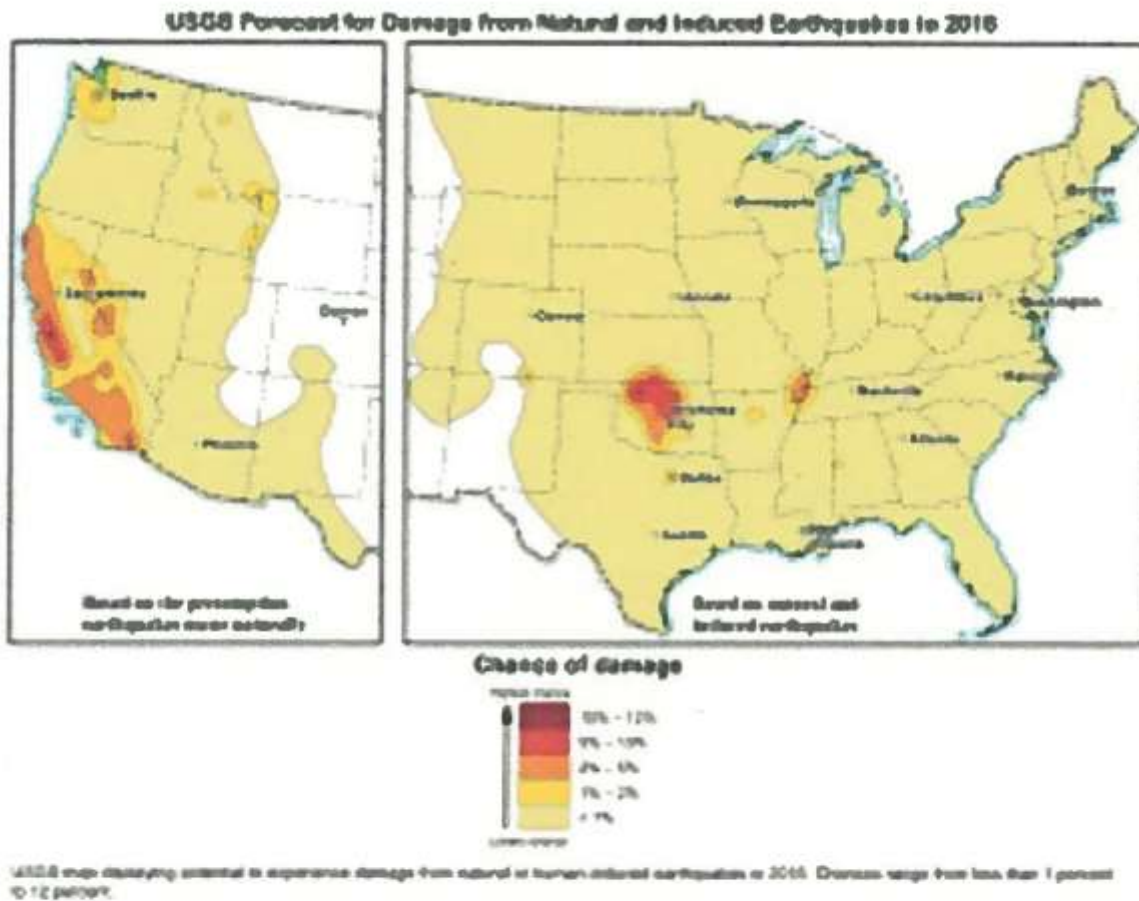
The U.S. Geological Survey's **new earthquakes hazard map**, which helps states and government officials determine insurance rates and building codes, is in part a reaction to the historic increase in seismic activity in Oklahoma. Last year the state experienced **almost 900 3-plus magnitude earthquakes**; in 2007, it recorded just one. On earlier USGS maps, Oklahoma was a seismic afterthought.

Read more: See How Oil Drilling Created an Earthquake Crisis in Oklahoma

Scientists say Oklahoma's surge in quakes is due to the injection of billions of barrels of salty wastewater that have come to the surface during oil and natural gas exploration. The water's injection back into the earth has put pressure on the state's fault lines, leading to quakes that have damaged homes, schools and other structures. Oklahoma has thousands of disposal wells, including a heavy concentration in the state's northwestern and central regions, where most of the earthquakes are occurring. Ten of the state's 12 most powerful quakes have **struck since 2011**.

Comment Set D62 – Alette Brooks (cont.)

D62-1
cont.



USGS

Read more: Greed, Politics and the Biggest Oil Boom in Decades

For years, state officials refused to acknowledge a link between the quakes and the energy industry. However in recent months, the Oklahoma Corporation Commission, the industry’s regulator, has issued a series of orders to oil and gas companies to limit wastewater volumes in the most seismic parts of the state. Several ongoing lawsuits are also seeking to stop disposal well activity.

The USGS has traditionally released an updated hazard map **every six years** based on 50-year forecasts. But USGS officials say that due in part to the spike in earthquakes in Oklahoma, they now plan to issue a new map every year based on one-year projections.

Comment Set D63 – Barbara Murray



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
Draft Environmental Impact Statement
for Oil and Gas Leasing and Development

Bureau of Land Management
California State Office

Comment Card

APR 10 2017

Date: 4/5/2017
Name: * BARBARA W. MURRAY
Affiliation (if any):* _____
Address: * 10328 EMPIRE GRADE
City, State, Zip Code: * SANTA CRUZ, CA 95060
Telephone Number: * (831) 818-7774
Email: * _____

Received

Do you prefer paperless (email) notification? Yes No

Comment: I AM VERY CONCERNED RE: POTENTIAL OIL & GAS DRILLING & FRACKING ON BLM HELD LANDS GIVEN NEW ADMINISTRATION. PLEASE PROTECT THESE LANDS FOR OUR FUTURE GENERATIONS. SO MUCH TO DO TO JUST CLEAN UP & PRESERVE THESE WILD LANDS W/O MAKING MORE DISASTERS, NEEDING CLEAN UP.

SEISMOLOGY OF CALIFORNIA ALONE SHOULD INFORM YOUR PROTECTION IN OUR UNIQUE & PRECIOUS STATE.

Barbara W. Murray

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D63-1

Comment Set D64 – Sara Drost



BUREAU OF LAND MANAGEMENT — CENTRAL COAST FIELD OFFICE
Draft Resource Management Plan Amendment and
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for Oil and Gas Leasing and Development

Comment Card

Bureau of Land Management
California State Office

Date: 4/6/17

APR 10 2017

Name: Sara Drost

Received

Affiliation (if any):

Address: 40850 Westview Lane

City, State, Zip Code: Oakhurst, CA 93644

Telephone Number: 818 - 281 - 5281

Email: Sara.drost@gmail.com

Do you prefer paperless (email) notification? Yes No

Comment: Times are a'changin'! Out with fossil fuel!
Let's think about the next generation and the world
they face. Fracking research proves that scars are
left on our Earth as a result of the ignorant
practice; lowering the water table, poisoning water,
injury to humans from pollution in the air from
pools of chemicals unguarded, earthquakes, methane
leaks, and the list continues... You know more!

Please remember that I'm just one represen-
tative writing for thousands of like-minded aware
citizens who want to stop all fracking! Stop
antique fossil fuels and turn to sustainable energy.
Then both the planet and businesses will flourish.

D64-1

*PLEASE PRINT. Your name, address, and comments become public information and may be released to interested parties if requested.

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Include additional sheets if needed. Comments must be postmarked by April 6, 2017. Comments may also be emailed to BLM_CA_OGEIS@blm.gov.

Comment Set D65 – Christie Turano #1

D65-1

I request that the BLM respect the local authority over land use by not granting oil and gas leases in Monterey County. To do otherwise would clearly be contrary to the will of the residents and voters of Monterey County. Thank you.

The BLM has worked with environmental agencies before now we need their help more than ever. Respect our voting rights, science and our children's future.

Signature: Christie Turano

Name: Christie Turano City/Zip: 93906

the vote, despite supporters being outspent 18 to 1 by major oil companies that spent \$5.4 million.

Our votes can not be bought by Russia or Big Agriculture or Oil on giants. The rule of law is on our side.

Signature: Christie Turano

Name: Christie Turano City/Zip: 93906

with great clarity that many oil practices are incompatible with land uses in our county.

The natural resources that oil practices compromise are water and food. The oil companies own scientists and study confirm this, water is life.

Signature: Christie Turano

Name: Christie Turano City/Zip: 93906

Comment Set D66 – Julie Tell

Hello BLM

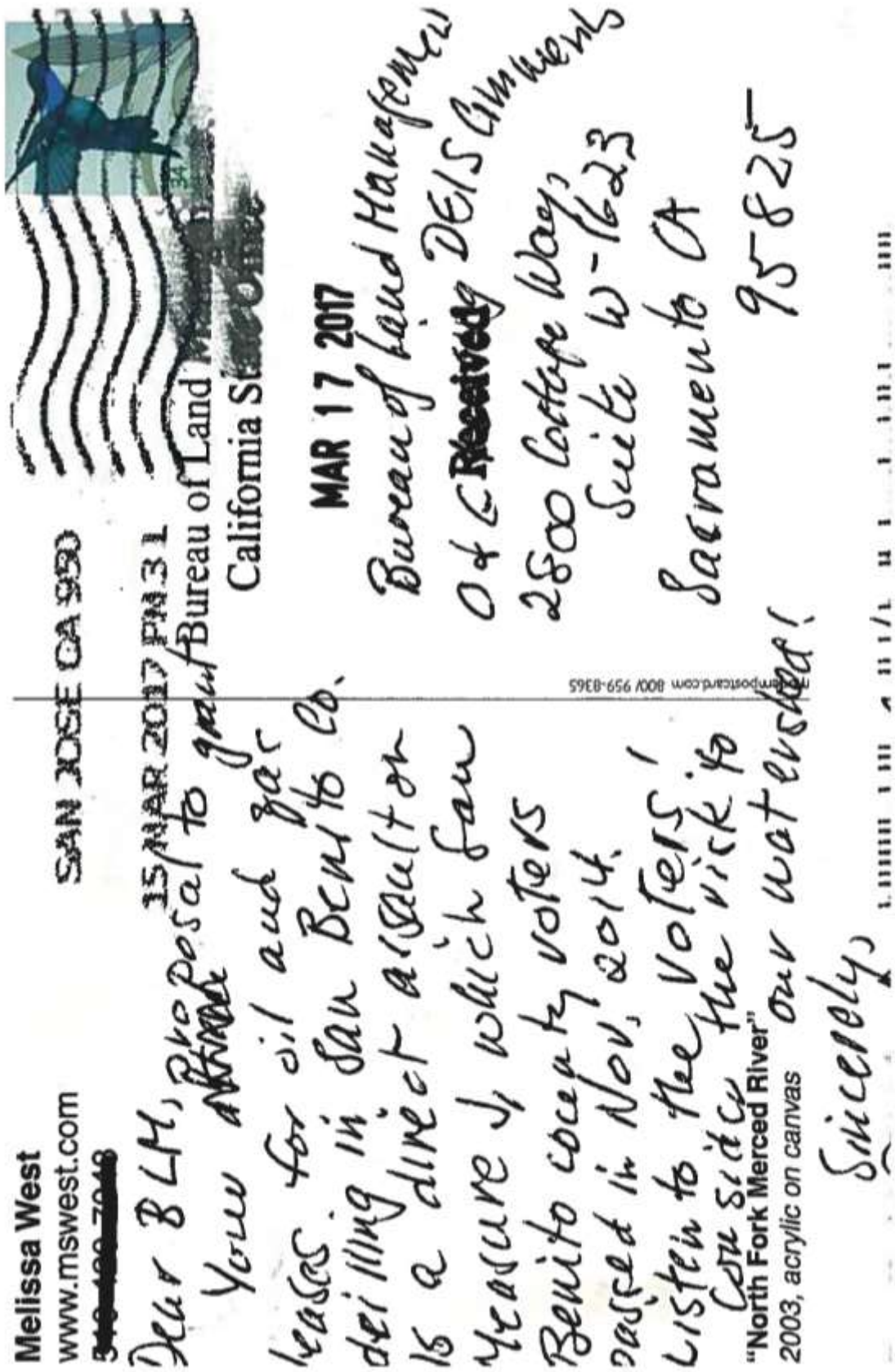
Please don't open any more public lands to fracking. Some counties have even banned fracking - respect that. We have enough groundwater and earthquake problems!

Thank you
Julie Tell
Berkeley, CA 94705

D66-1

Comment Set D67 – Melissa West #1

D67-1



Comment Set D68 – Melissa West #2



751 LITTLE AVE
 Watsonville, CA 95576
 www.mswest.com
 (530) 927-7073

Dear BLM - I am writing to you to strongly oppose oil & gas leases in Alameda, Contra Costa, Fresno, Merced, Monterey, San Benito, San Francisco or Santa Cruz counties. It is especially appalling to think you might sell such rights in San Benito, given that they have voted to oppose such activities.

modernpostcard.com 800/959-8365

Bureau of Land Management
 Oil & Gas Leasing DEIS
 comments
 2800 Cottage Way
 Suite W-1623
 Sacramento CA
 95825

D68-1

Comment Set D69 – Debbie Kirk



BLM

O+G Leasing
2800 Cottage Way

Suite 1623

95499

NO MORE
STOP LEASING
CA PUBLIC
LANDS TO
O&G IND.

STOP LEASING

CA PUBLIC

LANDS TO

O&G IND.

Debbie Kirk

95499

Comment Set D70 – Dierdre Means



I urge the BLM to refrain from offering oil and gas leases on federal land and other lands (public or private) in Monterey County. To do otherwise would clearly be contrary to the will of the residents and voters of Monterey County. Measure Z to ban fracking and protect our water won with more than 56 percent of the vote, despite supporters being outspent 18 to 1 by major oil companies that spent \$5.4 million.

Signature: Dierdre Means

Name: Dierdre Means City/Zip: 93901
Salinas, CA

D70-1

Comment Set D71 – Margaret



March 23, 2017

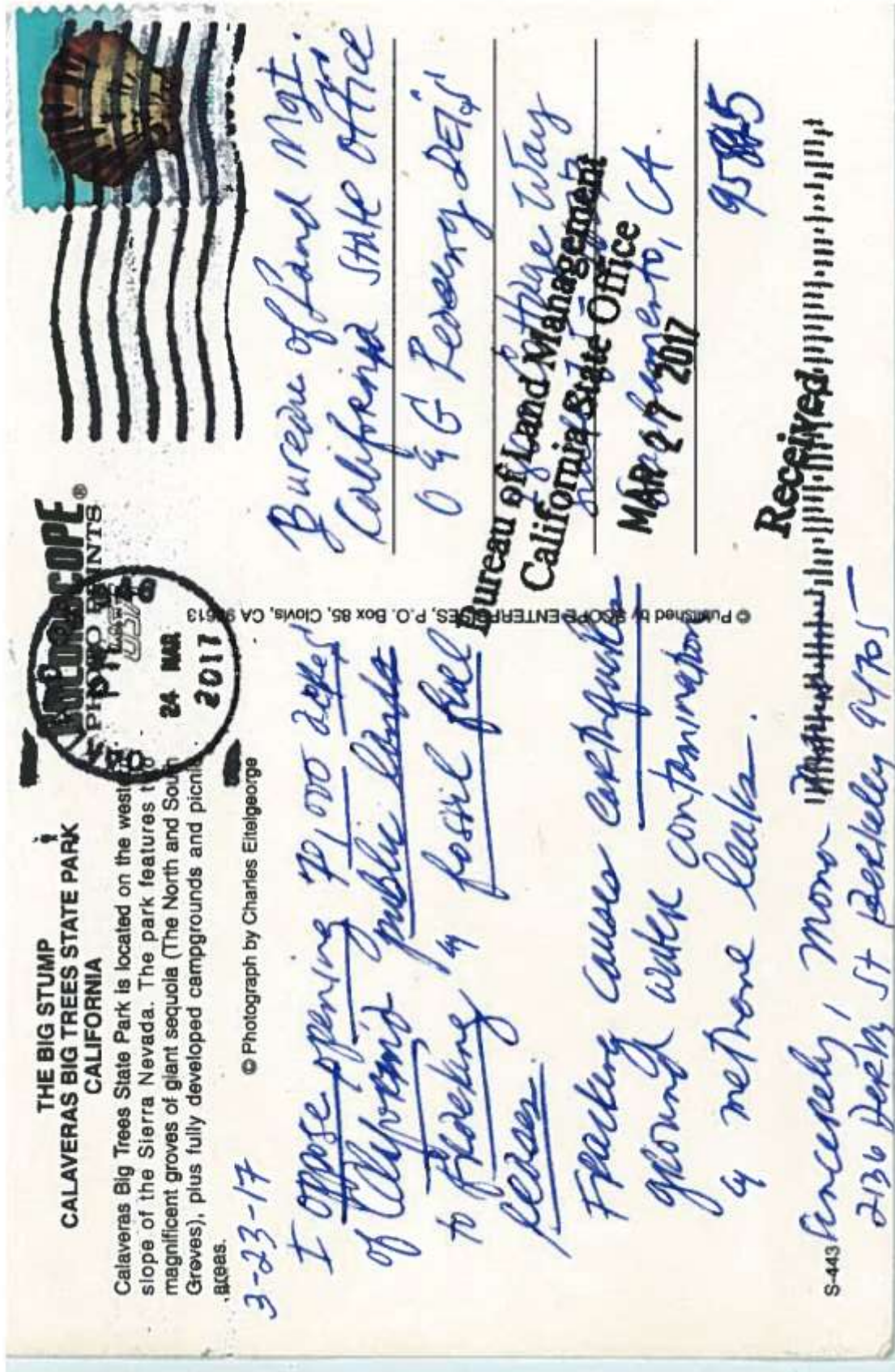
It's crazy to frack in California. We need the water & we don't need the earthquakes & methane.

Don't open 700,000 acres of public lands for fracking.

Margaret Jean

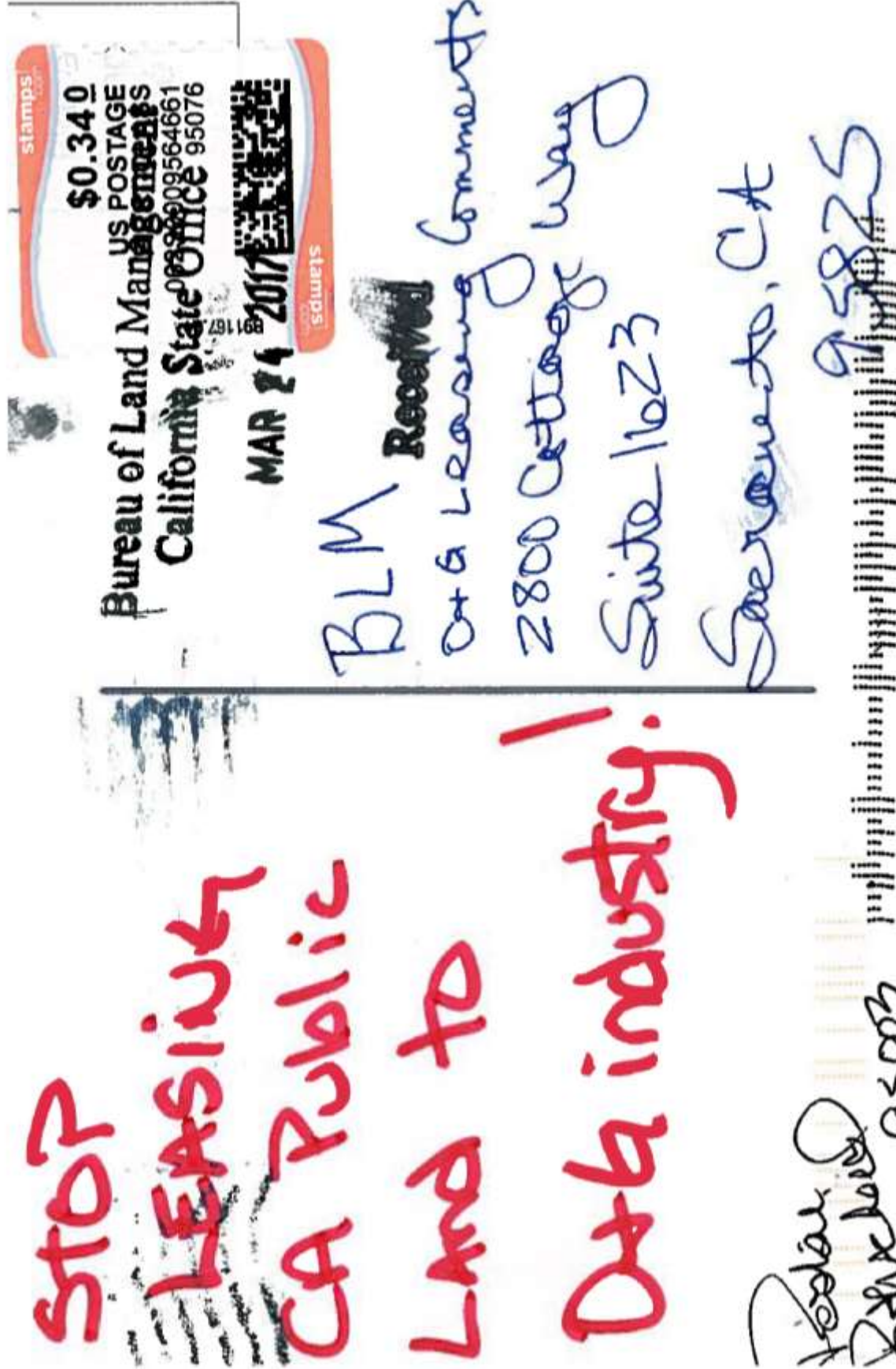
D71-1

Comment Set D72 – Mona M.



D72-1

Comment Set D74 – D. Rothchild



D74-1

Comment Set D75 – Don Hirschauer



Bureau of Land Management
California State Office

MAR 24 2017

BILL M

Received

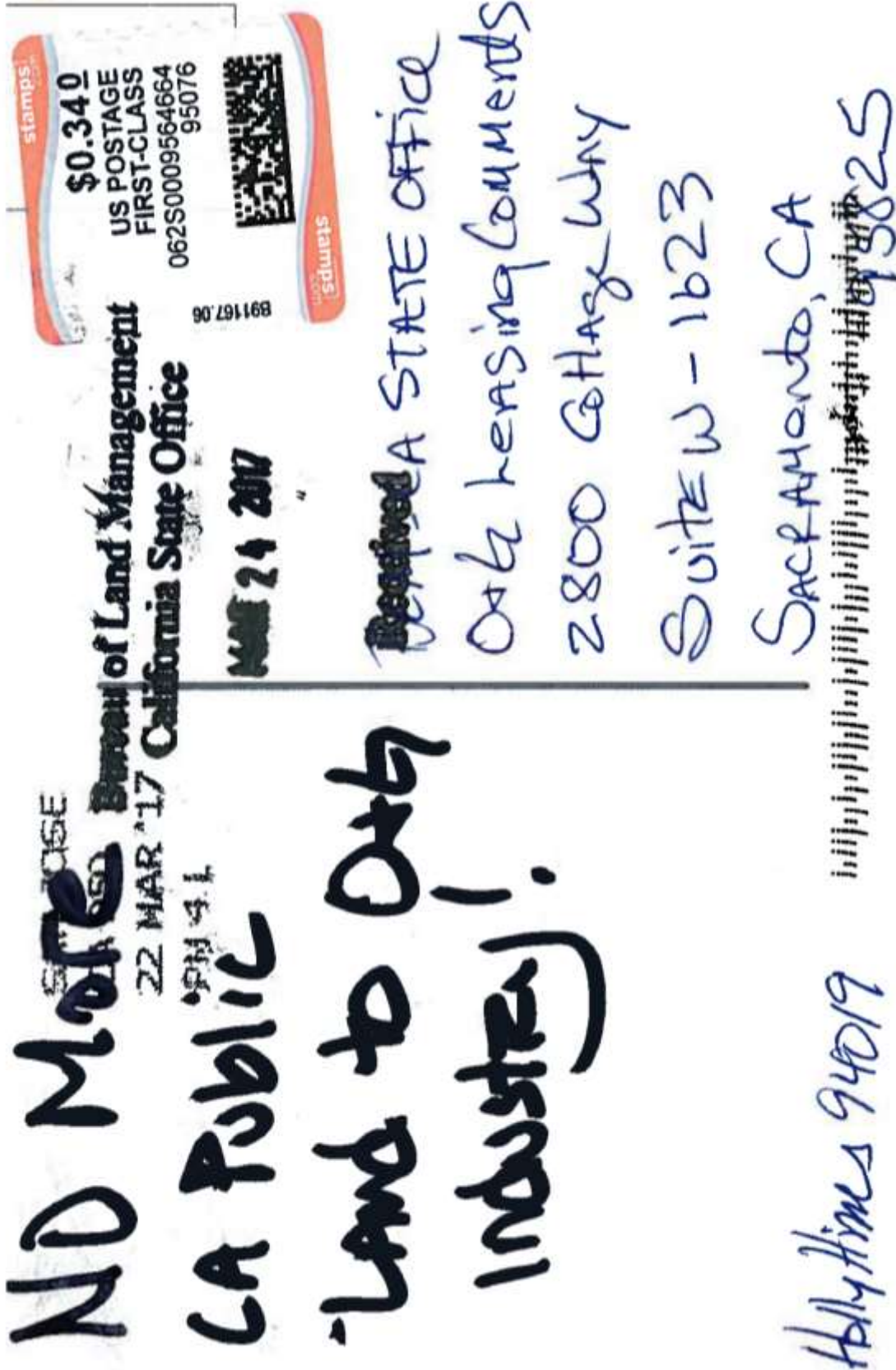
O+G Leasing Com
2800 Cottage Way
Suite 71623

Don Hirschauer
95076
BUREAU OF LAND MANAGEMENT, CA

S.T.O.P.
S.A. 9/5/17
21 MARCH 17
PM 11

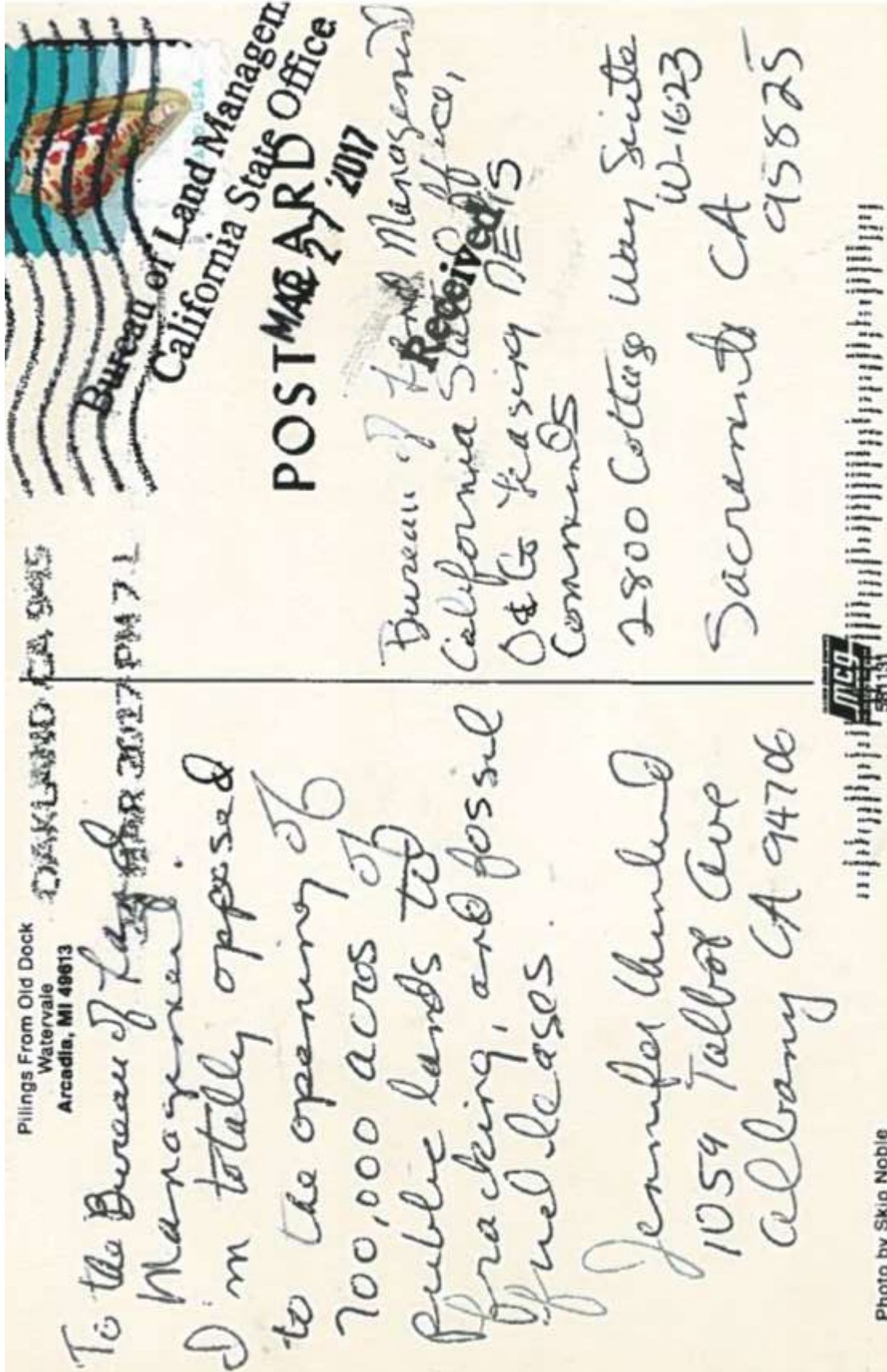
Leasing CA
Public Land
to O+G
Industry!

Comment Set D77 – Holly Hines



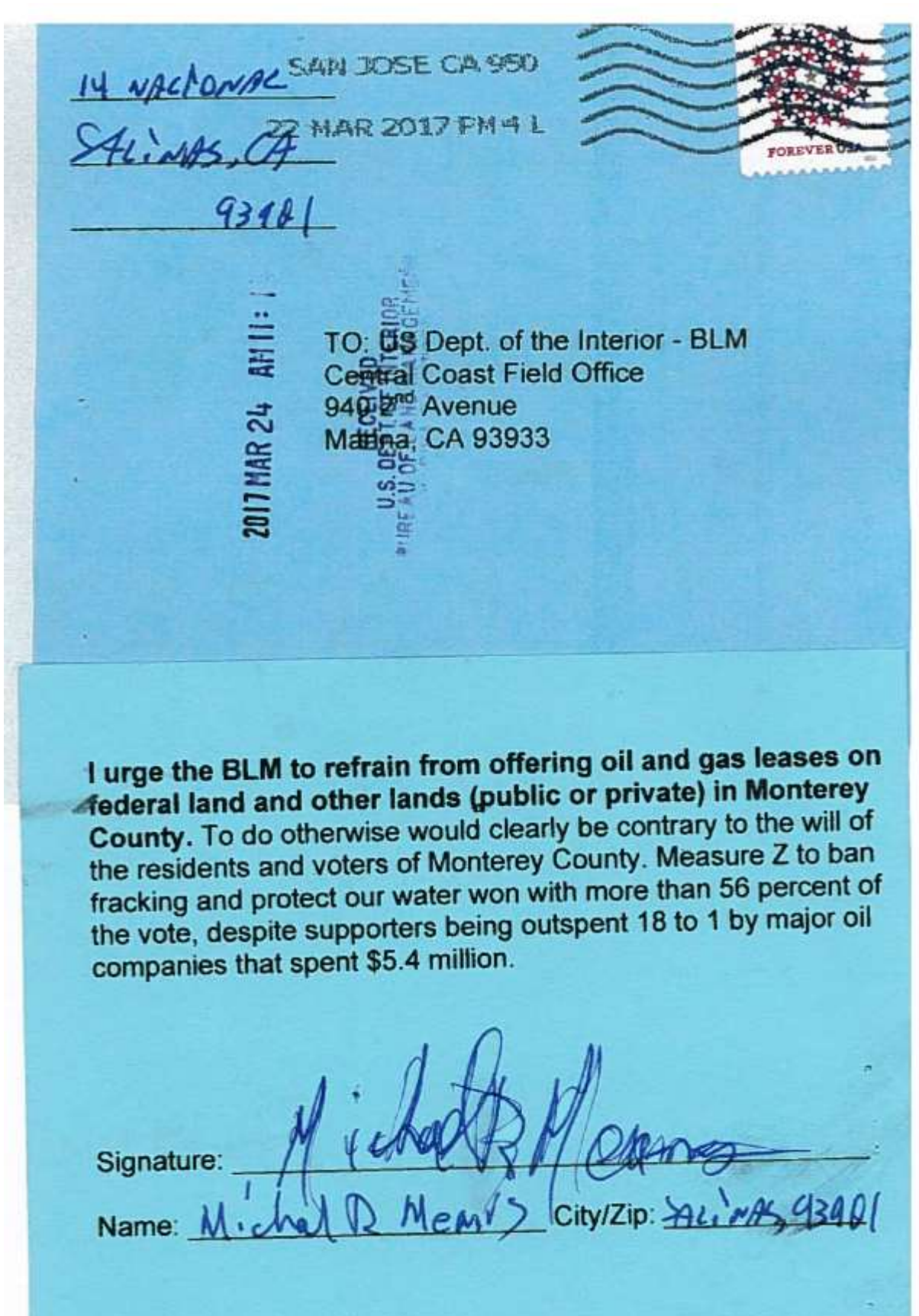
D77-1

Comment Set D78 – Jennifer



D78-1

Comment Set D79 – Michael Means



D79-1

Comment Set D80 – Michelle Hoffman



Bureau of Land Management
California State Office

MAR 24 2017

Received

BLM
Oil + Gas Leasing Comment
2800 Cottage Way
Suite W-11023
Sacramento, CA

Do the Right
Thing -
Stop leasing
Public Land
to Oil
Industry
Michelle Hoffman
11/15/16 10:58:25

D80-1

Comment Set D82 – Kathryn Hyde

To the Bureau of Land Management

I urge you not to open public or private lands for fracking or new oil exploration.

We need to protect our precious water from contamination and methane leaks (from fracking). Thank you - Kathryn Hyde re: kathrynegmail.com

D82-1

Comment Set D85 – Lynn Strandberg

March 25, 2011

BLM California:

I oppose the proposed plan for oil and gas leasing and development on the central coast counties.

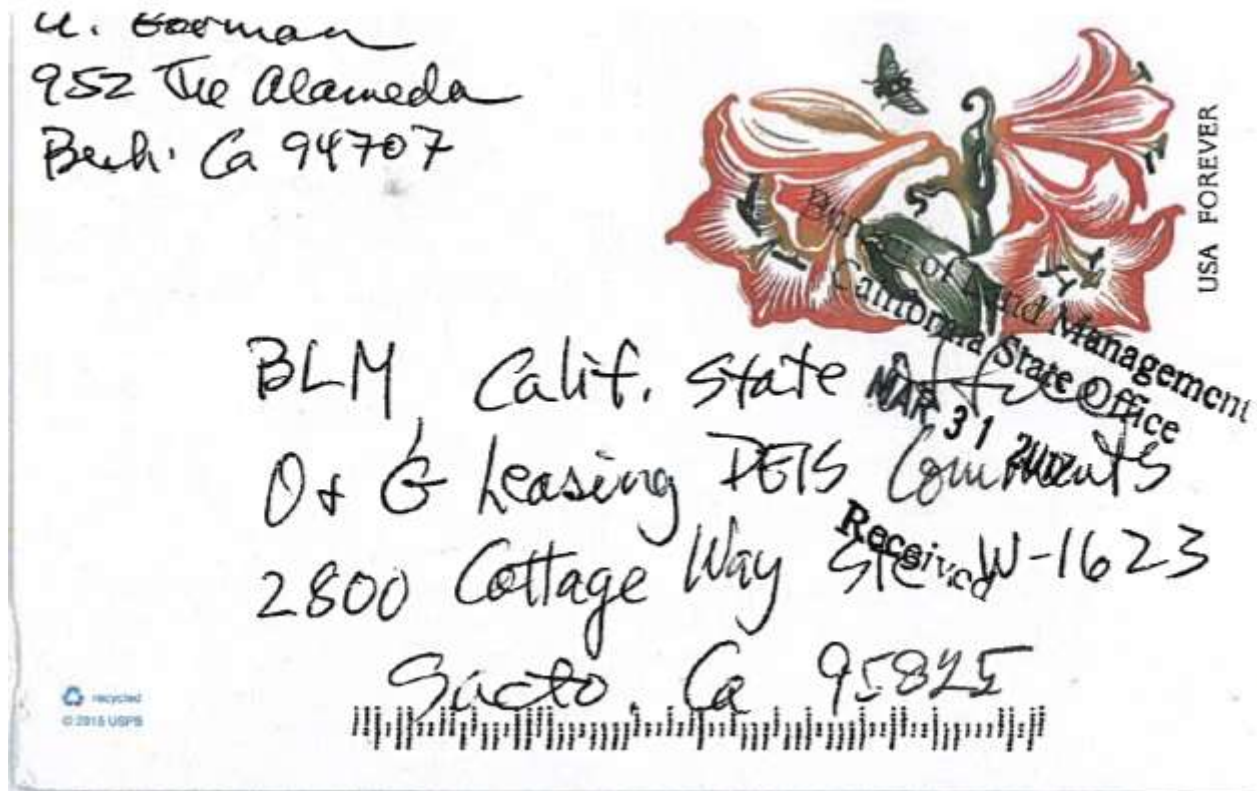
Fracking studies overwhelmingly indicate that it is linked to pollution, earthquakes and threats to public health.

Sincerely,

Lynn Strandberg

D85-1

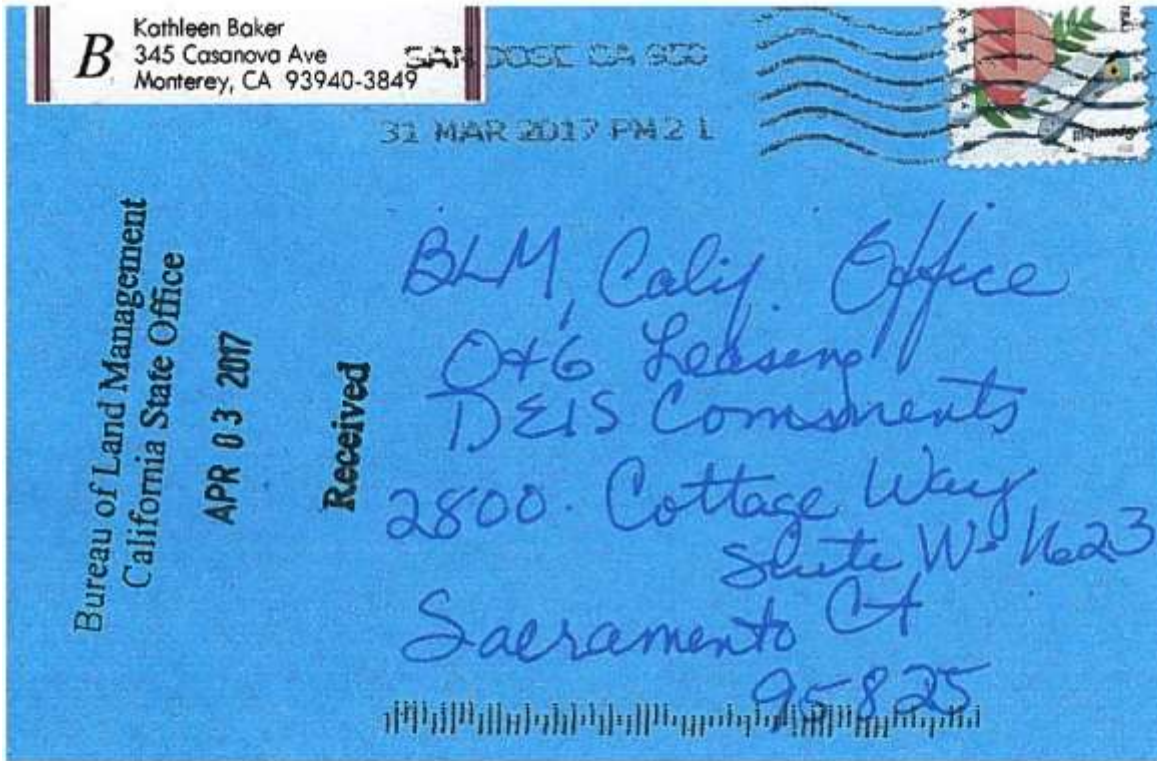
Comment Set D86 – Amy Gorman



I am opposed to fracking, as those in Alameda, Monterey, & Santa Cruz counties, courts have already banned fracking. Please do not open any other California lands to fracking. It creates methane leaks earthquakes + ground water contamination.
 Thank you, Amy Gorman

D86-1

Comment Set D87 – Kathleen Baker



Please persist & resist the Trump proposed BLM plan to allow oil & gas leases on lands with Federal mineral rights. Monterey County voters passed Measure Z to protect our local land & residents for future generations.
Kathleen Baker
Monterey resident

D87-1

Comment Set D88 – Debra Rubin



D88-1

Comment Set D89 – Laura B.



Mrs.
 Please do not support the

Bureau of Land Management
 California State Office
 APR 16 4 17 PM '19

up pushing and steam
 fracking and steam
 injecting wells. Be
 true to your
 mission statement.

No more fracking, no
 more oil & gas extraction
 on public lands in this
 state! There are no safe
 alternative plans.



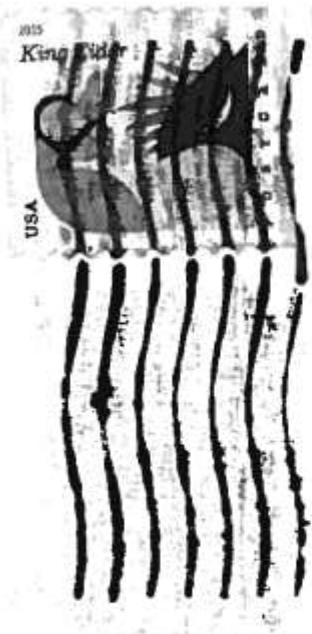
24355 Grebb St #88 Santa Cruz
 95062

Received
 BLM California State
 2800 Cottage Way
 Room W-1623
 Sacramento
 CA

95825
 LEASING EIS

D89-1

Comment Set D90 – Jan Cecil



Darryl Sapien
It's lucky when you live in America; 1986
encaustic and collage on panel
108 x 68"



Dear BLM,

Please do not open
additional Calif. public lands
to fracking & fossil fuel leases.
Fracking is toxic, poisons our
water, leaks methane, and
~~helps~~ causes climate danger.

Thank you
Jan Cecil
Berkeley, CA
94705

Bureau of Land Management,
California State Office,
Cal. Capitol Building
Leasing Department Comments
2800 ~~Leather~~ Valley Suite
W-1623
Sacramento, Ca 95825



D90-1

Comment Set D91 – Christie Turano #2

16 March 2017

2017 APR -7 PM 3: 55

United States Department of the Interior
Bureau of Land Management - Central Coast Field Office
940 2nd Avenue
Marina, CA 93933
Phone: 831-582-2200 - Fax: 916-978-4419

RECEIVED
U.S. DEPT. OF INTERIOR
BUREAU OF LAND MANAGEMENT

Oppose: Oil and Gas Leases in Monterey County

To the Bureau of Land Management:

I am aware that the Bureau of Land Management (BLM) is preparing to offer oil and gas leases on thousand of acres of land in Monterey County and surrounding areas. I strongly oppose that action.

The citizens of Monterey County overwhelmingly passed Measure Z in November of 2016 to ban "fracking" and protect our water supply. Monterey is the sixth county in California to ban hydraulic fracturing and other dangerous extraction techniques such as acidizing and cyclic steam injection. When fully implemented, the measure will also prohibit land uses that enhance drilling methods. Further, it phases out toxic wastewater injection and prohibits new oil wells in the county.

Measure Z won with more than 56 percent of the vote, despite supporters being outspent 18 to 1 by major oil companies that spent \$5.4 million.

I urge the BLM to refrain from offering oil and gas leases on federal land and other lands (public or private) in our region. To do otherwise would clearly be contrary to the will of the residents and voters of Monterey County.

Under California law, counties have authority over land use and zoning. The people of Monterey County have determined with certainty and conveyed with great clarity that many oil practices are incompatible with land uses in their county.

I request that the BLM respect the local authority over land use by not granting oil and gas leases in our county.

Thank you.

Sincerely,

Signature:



Name:

Christie Turano

City of Residence/Zip Code:

Salinas, 93906

D91-1

Comment Set D91 – Christie Turano #2 (cont.)

16 March 2017

United States Department of the Interior
Bureau of Land Management - Central Coast Field Office
940 2nd Avenue
Marina, CA 93933
Phone: 831-582-2200 - Fax: 916-978-4419

2017 APR -7 PM 3: 55

RECEIVED
U.S. DEPT. OF INTERIOR
BUREAU OF LAND MANAGEMENT

Oppose: Oil and Gas Leases in Monterey County

I have read the Impact statement for oil and gas leasing and developing lands by oil companies. I voted yes on measure Z and made phone calls, pounded the pavement and put up signs, and with all that effort putting my heart into protecting Monterey County from fracking using acidizing and cyclic steam injections to extract fossil fuels, which in the future will be more and more obsolete. Smart cars the bullet train, wind and solar are the future energy consumption modes.

I was not alone in my choice the citizens voted (a record turnout) 56% to ban fracking!

The Center for Biological Diversity has stayed present and future non-NSD leases (case no. 11-06174) in response to the failed preparation of an EIS. The BLM's management of public land and mineral rights on behalf of American citizens of Monterey CO. all 6.8 million acres is a daunting task and one done in trust of representing the people, animals and environment. The summary of alternatives A to E shows an effort by the BLM to be fair and give choices to citizens yet the choices are all negligible considering the recent vote to ban fracking in Monterey County. The preference action of the BLM to choose alternative C based on a 2007 RMP is obsolete clearly considering the will of the people and current scientific evidence. please give the people and the Grant Kangaroo rat (immigrant from Australia?)

Sincerely,

Signature

Christie Turano

Name:

Christie Turano

City of Residence/Zip Code:

Salinas 93906

a change for a healthy safe environment and democracy
Thank you for your time.

D91-1
cont.

Comment Set D92 – Christine Tucker

Christine Tucker

Subject: BLM letter

2017 MAR 31 AM 9:17

March 20, 2017

RE: BLM leases CCFO

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U.S. DEPT. OF INTERIOR
BUREAU OF LAND MANAGEMENT

Where to start... It's been said before, but it bears repeating – BLM is the public's land and should be safeguarded for us.

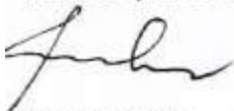
Despite this winter's rain, I think we can all agree that drought is the new normal. Fracking uses an inordinate amount of this precious resource. And then we are left with the brackish, chemical laden wastewater. The fact that this wastewater is then disposed of in other freshwater aquifers would seem to be a crime against future generations, or maybe even our own, as we don't know where the hydrostatic pressure will drive those wastewaters underground. Is it worth endangering our drinking and irrigation waters? Salinas grows a large percentage of the produce this nation consumes, and we don't know if other aquifers across the nation are endangered by the same fracking process.

Besides the use/ abuse of water, there are seismic concerns. USGS has tied increased seismic activity and the magnitude of said quakes directly to the fracking process. We are sitting atop the San Andreas Fault. What catastrophic results should we expect here in California, a state that is significantly more populated than Oklahoma or Kansas?!

The release of methane into the atmosphere at the well head is another concern since methane is a huge contributor to greenhouse gases. And then there's DOGGR's poor regulation. I understand that improvements have been made at DOGGR, but there are still the unpermitted exemptions for disposing into the aquifers. Why are those disposal wells allowed to be used in the interim? Why is it necessary to get an exemption from the Clean Water Act in the first place? And why are we opening more fields for lease when DOGGR has such a poor record for regulating in the first place?!

With a current glut of oil and gas, and fracking being an expensive process, it begs the question of why the oil companies want to pursue drilling at this time. Not to mention the moratoriums that exist in several municipalities where you are considering offering leases. My conclusion is that BLM's cheap leases, along with easy disposal of wastewater into the aquifers, makes it financially feasible. Leases should be at market rate! The true cost of this extraction process, including the social costs, must be examined. Or better yet, please don't make any new leases!

Thanks for your consideration,



Christine Tucker

Bureau of Land Management
California State Office

MAR 24 2017

Received

D92-1

Comment Set D93 – Debora Bone

March 27, 2017
Debora Bone
170 Hagemann Ave.
Santa Cruz, CA 95062

Bureau of Land Management
California State Office
O&G Leasing DEIS Comments
2800 Cottage Way
Suite W-1623
Sacramento, CA 95825

Bureau of Land Management
California State Office

APR 03 2017

Received

Dear Sir or Madam,

I am writing to ask the BLM to respect the local land use authority of voters in California cities who have voted to ban fracking and waste injection. Furthermore, I am writing to ask that the BLM disallow new leasing of public lands for fracking.

There are many reasons to stop this dangerous practice. Of greatest significance in California is the need to protect groundwater and the deeper freshwater aquifers from contamination. It is well documented that the volatile chemicals used in fracked gas wells can harm the human brain, blood, nervous and cardiovascular systems and kidneys. These chemicals are also toxic to animals and plants, endangering the rich agricultural sector of our state.

I am personally very concerned that increasing the areas where fracking is permitted will damage the Salinas River and other key irrigation areas needed for crops. In addition, fracking leads to increased seismic activity in our already earthquake prone state.

Unfortunately the California Division of Oil, Gas and Geothermal Resources (DOGGR) has not upheld the CA Code of Regulations to protect freshwater aquifers and surface waters. Nor have they provided required data and oversight of wastewater disposal. Many oil extraction projects in DOGGR's Coastal District were found to lack compliance and completion of requirements for initial drilling. Meanwhile the brine injection continues. Please use your authority to stop these dangerous and illegal practices.

Finally, in light of the weather uncertainties and damage associated with climate change, it is time to stop any further leasing of public lands for fracking. We may still have oil in the ground, but we are rapidly depleting the atmosphere by burning too many fossil fuels. We must safeguard air and water for future generations.

Sincerely,



Debora Bone

D93-1

Comment Set D94 – Natasha Wist

BLM Oil & Gas Leasing EIS

D94-1

I was astounded when I learned from a friend that the BLM was holding a series of three meetings in the tri-county area of Monterey, San Benito and Santa Cruz. How can that be I asked myself? During the 2014 campaign to ban fracking in San Benito County the BLM assured us at the Hollister Office that they had our backs and would do what they could to fulfill their mission statement which is: TO SUSTAIN THE HEALTH AND DIVERSITY AND PRODUCTIVITY OF PUBLIC LANDS ENTRUSTED TO THEM FOR THE USE AND ENJOYMENT OF THE PRESENT AND FUTURE OF ALL PEOPLE. Since 2014 two measures have been passed by the voters of San Benito, Santa Cruz and Monterey counties to ban fracking and steam injection methods of oil and gas extraction in all three counties. By the vote of the people these measures became the law of the state of California. This was due to the BLM being sued for an inadequate Environmental Impact Statement on their lands and the overwhelming majority of people in the three counties who did not want any fracking in their counties.

This seemed settled until the new administration entered the picture. It is interesting how fast the oil and gas corporations got to work to present a "revised EIR indicating new methods of fracking and extraction of oil and gas that would not harm the environment or the creatures living in the area including humans: No poisoning of the aquifers, no pollution in the drinking and irrigation wells, no polluting of the air or surface land and of course no earthquakes to damage the well casings! This is preposterous and contradicts thousands of pages of scientific investigations into fracking and injection methods over the past 20 years in this country.

I can only surmise that the power of the fossil fuel industry is once more in the driver's seat of government decisions and that there was great pressure on the BLM to spend the time and money to develop five alternative plans to permit oil and gas leases on BLM lands and private lands on which BLM has held the mineral rights for generations (sometimes unknown to the private owners of the land).

We are the public. These lands are OUR lands held in trust for the millions of us who want to preserve and protect our dwindling resources of recreation and renewal for the human spirit and for all the animal and plant spirits that dwell therein. Fracking and extraction are against everyone of us who want a sustainable and peaceful planet. This is the last gasp of the fossil fuel monopolies who will squeeze the last drop and make as many billions as then can before they are stopped by the people of this planet,

The BLM must unite with the people of this state to honor the wishes of the people they serve and tell the oil and gas monopolies: NO MORE FRACKING, NO MORE OIL AND GAS EXTRACTION ON PUBLIC LANDS IN THIS STATE!! There is no "safe" alternative plan. The only plan is stop the process NOW.

NatashaWist 5850 San Felipe Road Hollister, Ca.

2017 MAR 31 AM 9:15
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U.S. DEPT. OF INTERIOR
BUREAU OF LAND MANAGEMENT

Bureau of Land Management
California State Office

MAR 27 2017

Received

Comment Set D95 – Amy Gorman

Please do not open up 700,000 ac
of beautiful public lands to fracking +
fossil fuel leases, Vote No on fracking.
It has shown to create methane leaks
contaminate our water and cause
earthquakes (Oklahoma is an example!).
Please save our public lands, Thank you!

D95-1

Comment Set D96 – Norma Block

I am against fracking and fossil fuel leases because of the danger of methane leaks, ground water contamination, and earthquakes from waste water going back in the ground.

Besides, there are four counties that have banned fracking: Alameda, Monterey, San Benito, and Santa

D96-1

Comment Set D97 – Robert and Denyse Frischmuth #2

April 4, 2017

Bureau of Land Management
California State Office

Bureau of Land Management
California State Office
ATTN: CCFO O&G Leasing EIS
Sacramento CA 95825
BLM_CA_OGEIS@blm.gov

APR 06 2017

Received

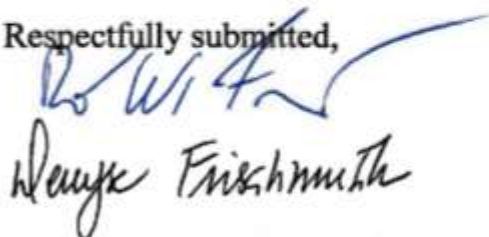
RE: Comment Submission
Central Coast Field Office Oil and Gas Leasing and Development Rmp
Amendment and EIS

We have been residents of Monterey County for the past 20 years and we are submitting our comments on the above matter.

How can BLM make lease decisions without taking into account the current Measure Z which was passed last November with 56% of the county residents voting for prohibiting drilling new oil wells in the county of Monterey. The vote of the citizens of Monterey County clearly expressed that they do not support increased fossil fuel production. Water is the other critical issue which is paramount in decisions about oil extraction. Oil operations (extraction and waste water injections) are incompatible with the priority of conserving our water for agriculture and domestic and commercial use, all uses threatened by droughts which are likely to happen more frequently and for longer periods of time with climate change.

Permitting leasing out of public lands for new oil drilling is in total disregard of the will of the people as expressed by Measure Z. Measure Z is in litigation currently, but pending its outcome it is the law and BLM would be in violation of the regulations about land use for oil production.

Respectfully submitted,



Robert and Denyse Frischmuth

D97-1

Comment Set D98 – Peter Hain

Bureau of Land Management
 California State Office
 CCFO O&G Leasing DEIS Comments
 2800 Cottage Way, Room W-123
 Sacramento, Ca. 95825

Regarding the Draft Resource Management Plan Amendment and EIS for the 2007 Resource Management Plan for the Southern Diablo Mountain Range and Central Coast of California, I am opposed to any actions by the Bureau to open lands to mineral (oil and gas) extraction in the counties of Monterey, San Benito and Santa Cruz for the following reasons.

These three counties have enacted legislation to ban oil extraction involving enhanced techniques including acidization, fracking and steam extraction. These extreme practices endanger ground water supplies both in the recovery of oil and in the disposal of waste liquids through injection. Tens of thousands of voters in these counties have rejected oil extraction by any but conventional drilling means and their wishes should be respected.

The Pinnacles National Park lies at the heart of the area under consideration. Oil and gas development in area surrounding the park could be detrimental for three reasons. The park is home for the endangered California Condor and these birds, brought back from the verge of extinction, range throughout the central coast region. They are known to drink from remote watering troughs on both private and leased BLM lands. Contamination of these water supplies by oil and gas operations would endanger the survival of the birds. Chemical contamination from industrial sites, such as spilled antifreeze, also presents a hazard.

The park lands and water resources could be exposed to contamination from oil and gas extraction activities carried out on adjacent private and BLM lands. The park is currently protected by sustainable cattle ranching activities on surrounding private and public lands. This buffer should be maintained.

Tourists come from around the world to enjoy the unique features of the Pinnacles and this provides a valuable input for local economies. Oil and gas extraction operations could ruin this remote and picturesque area not to mention the danger of adding drilling trucks to the already narrow and winding Highway 25.

Sincerely,



Peter Hain
 PO Box 245
 Tres Pinos, CA

Bureau of Land Management
 California State Office

APR 05 2017

Received

D98-1

Comment Set D99 – Sharry Jones

**Bureau of Land Management
California State Office**

APR 06 2017

Dear Sir/Madam,

Received

I am writing to you about the mineral rights you want to auction off in several thousand acres in the counties of Central California. I do not believe these oil leases should be auctioned off. I have six points that I would like to bring up that I believe are important reasons why those leases should not be auctioned Off.

When I was in high school, my history and civics teachers not only taught me about the history and government of this nation, but they also pointed out the differences between this country and totalitarian regimes. In the United States we get to choose our leaders, and by voting on ballot propositions we can also determine some policy matters. People vote in totalitarian regimes but their votes don't mean anything because they don't have a choice. There is only one candidate on the ballot, The people of San Benito County voted overwhelmingly to ban fracking. We now find that our vote apparently didn't mean any more than the vote of someone in the old Soviet Union. Many people are cynical about government and don't vote because they feel their vote doesn't really matter. Your action only reinforces their belief and makes them more cynical.

My second point, is that fracking uses thousands of gallons of water. We had a lot of rain this winter, but for the previous 5-6 years Californians suffered through one of the worst droughts we had seen in years. We have no idea how much rain we will get in the next few years. California needs its water for people and crops, not fracking.

My third point is that, California is one of the biggest producers of food in this country and even rivals the production of many countries, California produces 90% of the broccoli in the US and is 3rd in the world. California produces 100% of the artichokes grown in the US. The US is 2nd in the production of lettuce in the world, and 71% of the lettuce grown in the US is grown in California. California produces the most tomatoes of any state in the US. California produces 60% of bell peppers and 69% of chili peppers grown in the US. If California's water supply is contaminated by the chemicals used in fracking its agricultural Industry will be destroyed. The people that depend on California's food production will be very hungry.

D99-1

Comment Set D99 – Sharry Jones (cont.)

Bureau of Land Management
California State Office

APR 06 2017

My fourth point is, fracking causes earthquakes. San Benito County is surrounded by three active earthquake faults. The last thing San Benito County needs is to have more earthquakes.

My fifth point is, oil is a 20th century fuel. When cars were invented, no one understood the effects that gasoline would have on the climate. Everyone fell in love with their cars and the convenience cars brought us. Most people never considered that combustion engines could have detrimental effects on our environment. Luckily for us many scientists have been monitoring our climate and how fossil fuels have affected it. We **MUST** do something to reverse climate change, We are living in the 21st century, and we **MUST** use 21st century technology. Depending on 20th century technology in the 21st century will not solve any problems, it will only worsen them.

My sixth point is, that what we do in the US will have a direct effect on the rest of the world. We can't do what we want and expect the rest of the world to not care, We cannot expect that the effects of our use of fossil fuels will stop at our borders and not affect the rest of the world. President Trump and Steve Bannon may not like it, but the United States is part of a global community. It is extremely wrong and arrogant of us to tell the rest of the world that we will do what we want, and we do not care what they think.

San Benito County is beautiful. Please let us keep our county beautiful.

Sincerely,
Sharry Jones

D99-1
cont.

Comment Set D100 – Form Letter

From: [REDACTED]
Sent: Thu Mar 09 2017 22:45:43 GMT-0700 (MST)
To: <BLM_CA_OGEIS@blm.gov>
Subject: Stop Leasing Our Public Land to the Oil Industry

Dear BLM Officials, I am writing in response to your Central Coast Field Office's "Oil and Gas Leasing and Development RMP Amendment and EIS." In an era of dangerous climate change, it makes no sense to continue to lease any additional public lands for fossil fuel development – and so, simply put, I'm asking you to stop. Your agency must analyze and adopt an alternative that closes the entire planning area to new leasing, cancels all pending leases that have yet to be drilled, and bans fracking on currently operating leases. Doing so is the only way to protect our air, water, wildlife, climate and communities – and it's the only path forward that I will support. Sincerely, [REDACTED]

D100-1

I.4 Responses to All Comments

Responses to Comment Set A1 – California Coastal Commission

A1-1 The commenter describes the California Coastal Commission’s regulatory authority. The commenter further states that the RMPA is unlikely to result in effects to coastal resources and a federal consistency review of the RMPA is not required at this time. BLM acknowledges the commenters statement that if future changes to the RMP result in new leasing or development with the potential to affect the coastal zone, a consistency determination may need to be submitted to the California Coastal Commission.

Responses to Comment Set A2 – Division of Oil, Gas & Geothermal Resources

A2-1 The commenter states that BLM needs to continue to manage well stimulation technologies (WST) operations on BLM leases to be at least consistent with or exceed California’s requirements for WST operations.

BLM agrees with the commenter, as is stated in Section 2.4.4 (BLM Final Rule on Hydraulic Fracturing) of the Draft RMPA/EIS which says, “[o]n public lands, including those covered by the RMPA, oil and gas operators must comply with both Federal and State statutes and regulations to the extent that State regulations do not contradict Federal law or interfere with Federal lease rights. In California, the relevant State law includes hydraulic fracturing regulations promulgated under California’s Senate Bill 4 (SB 4).”

Note that in the Proposed RMPA/Final EIS, reference to the BLM Hydraulic Fracturing Final Rule has been removed, because the 2015 Rule has been rescinded. On December 29, 2017, the Federal Register (Vol. 82, No. 249, p. 61924) issued a Final Rule announcing that BLM officially rescinds the 2015 Rule, because BLM believes that it imposes administrative burdens and compliance costs that are not justified. Affected sections of the Code for Federal Regulations (CFR) were returned to the language that existed immediately before the published effective date of the 2015 Rule (June 24, 2015), except for changes to those regulations that were made by other rules published between the date of publication of the 2015 Rule and now and that the phrase “perform nonroutine fracturing jobs,” was not restored to the list of subsequent operations requiring prior approval.¹ Therefore, Section 2.4.4 in the Proposed RMPA/Final EIS is now titled “DOGGR Senate Bill 4 Regulations.”

A2-2 The commenter states that the Draft RMPA/EIS mischaracterizes the 0.5-mile buffer used in DOGGR’s 2015 EIR. BLM incorporated DOGGR’s 0.5-mile buffer into the Draft RMPA/EIS to allow for a consistent buffer area that may potentially be subject

¹ This is because the phrase “perform nonroutine fracturing jobs” had not been previously defined and in the last 20 years, hydraulic fracturing practices that would have been considered “nonroutine” when the BLM originally issued the regulations requiring prior approval for “nonroutine fracturing jobs” are now commonly utilized and considered “routine.” The combination of advances in oil and gas development technology and the BLM’s existing authority to mitigate the potential risks of hydraulic fracturing operations through site-specific protective measures that are applied as a part of the environmental review and approval process at the APD stage has made post-APD approvals for “nonroutine fracturing jobs” at most a very rare occurrence. See the Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands; Rescission of a 2015 Rule for more details.

to future oil and gas development. To address the commenter's concerns, the footnote under Alternative B in Section 2.7 of the Proposed RMPA/Final EIS has been clarified to explain that DOGGR's buffer was developed to factor in potential development or new finds that could be brought into production for DOGGR's EIR impact analysis based on industry production estimates, and that it is not used for DOGGR's oilfield management.

Please refer to Responses to Comments A2-3 through A2-42 for responses to the commenter's detailed comments.

A2-3 The commenter's request for one copy of the Final EIS is noted.

Section 1 (Introduction) has been revised as suggested in the comment to state that unconventional wells require the use of technology to increase hydrocarbon flow rates, rather than that well stimulation is required.

A2-4 Section 1.2 (Planning Area Description) describes the lands under BLM's jurisdiction within the Planning Area and does not explain approvals required for oil and gas development. Therefore, the commenter's suggested text has instead been added under the Development discussion in Section 1.2.2 (Planning Approach) of the Proposed RMPA/Final EIS to state that depending on the activity, applications to conduct oil and gas activities on BLM leases in the CCFO Planning Area would also likely require approval from DOGGR in accordance with Title 14 California Code of Regulations (14 CCR) Sections 1712 and 1714, among others.

BLM has a Memorandum of Understanding (MOU) with DOGGR, in which the two agencies lay out their respective roles for regulating oilfield operations on BLM lands. The stated purposes of the MOU "are to delineate procedures for regulating oilfield operations where both the BLM and the Division have jurisdictional authority, to streamline operations, and to minimize duplication." (See October 16, 2012, MOU between BLM and DOGGR.) As the MOU recounts, the BLM has statutory authority for regulation of all oilfield operations on BLM-administered land, including down-hole operations. The MOU provides that, on BLM-administered lands, DOGGR is responsible for regulating well operations and for appropriate surface facilities, including protection of hydrocarbon reservoirs, groundwater, and health and safety.

A2-5 The commenter requests that the RMPA/EIS state that DOGGR regulations and policies apply to oil and gas well developments in California. Text has been added to Section 1.2.2 (Planning Approach) in the Proposed RMPA/Final EIS to describe that oil and gas operators must comply with both Federal and State statutes and regulations. See also Response to Comment A2-4.

A2-6 The commenter suggested adding text describing the California Environmental Quality Act (CEQA). BLM would coordinate with DOGGR and State agencies on environmental review, but BLM is not subject to CEQA, so no text revisions are necessary. Note that the Regulatory Framework discussion has been moved from Section 1.6 (Related Federal, State, and Local Laws and Plans) to Appendix J of the Proposed RMPA/Final EIS.

- A2-7 The commenter requests that the RMPA/EIS state that the Draft RMPA/EIS alternatives should be consistent with current California laws and regulations. The text in Section 2.1 (Introduction) of the Proposed RMPA/Final EIS has been clarified to add “Federal and State” to the description of the current laws and regulations.
- A2-8 As requested, the last sentence in the description of Covered Operations under the California SB 4 Regulations in Table 2-1 of the Proposed RMPA/Final EIS has been revised to state that data collected regarding all uses of acid and bottomhole pressures are applied to the formation above pore pressure.
- As also requested, the description of Permit Grouping has been revised to change “permits” to “applications” in Table 2-1 of the Proposed RMPA/Final EIS.
- Please refer to Response to Comment A2-1 regarding the rescission of the BLM 2015 Final Rule. Therefore, Table 2-1 is no longer a comparison of BLM’s Hydraulic Fracturing Rule and Senate Bill 4, and it is now titled “Summary of Senate Bill 4 Regulations” in the Proposed RMPA/Final EIS.
- A2-9 As requested, the description of the pressure change under the row “Monitoring during treatment” in Table 2-1 of the Proposed RMPA/Final EIS has been revised as suggested.
- As requested, “five times” has been added to the description of the area of treatment under the row “Monitoring for seismic activity” in Table 2-1 of the Proposed RMPA/Final EIS.
- The text under the row “Management of recovered fluids” has been revised as suggested to describe recovered and produced fluids in Table 2-1 of the Proposed RMPA/Final EIS.
- The text in Table 2-1 of the Proposed RMPA/Final EIS under the row “Public disclosure” has been revised as suggested to describe the concentration information that the operator must disclose to the public on each and every constituent in the fluid after treatment.
- Please refer to Response to Comment A2-1 regarding the rescission of the BLM 2015 Final Rule. Therefore, Table 2-1 is no longer a comparison of BLM’s Hydraulic Fracturing Rule and Senate Bill 4, and it is now titled “Summary of Senate Bill 4 Regulations” in the Proposed RMPA/Final EIS.
- A2-10 The commenter requests that the RMPA/EIS clarify DOGGR’s regulatory authority. The text under “State Regulations” in Section 3.2.2 (Regulatory Framework) of the Proposed RMPA/Final EIS has been revised to “DOGGR’s regulatory authority is not limited to private lands. DOGGR regulates all onshore and offshore oil, gas, and geothermal resources within the State of California on federal, state, and private lands.”
- A2-11 As requested, the text in Section 3.2.2 (Regulatory Framework) of the Proposed RMPA/Final EIS has been revised to clarify that the DOGGR regulations discussed under “State Regulations” are the DOGGR “well” regulations.

- The commenter requests that the RMPA/EIS use the definition of idle wells consistent with the new DOGGR regulation, which would change the definition of an “idle well” according to AB 2729 as of January 1, 2018. The text under “State Regulations” in Section 3.2.2 (Regulatory Framework) of the Proposed RMPA/Final EIS has been revised to clarify references to “abandoned wells” as “idle wells” and the suggested text defining idle wells has been added.
- A2-12 The commenter states that the Draft RMPA/EIS text in Section 3.3.1 (Introduction) suggests DOGGR’s requirements to reduce the potential seismic hazard impacts of well stimulation activities or fluid disposal in injection wells are less stringent than the BLM Final Rule. To address the commenter’s concerns, the text in Section 3.3.1 (Introduction) of the Proposed RMPA/Final EIS has been revised to explain that DOGGR “requires operators to disclose geologic features, including known faults, in applications for evaluation.”
- Please refer to Response to Comment A2-1 regarding the rescission of the BLM 2015 Final Rule. As a result, discussion of the BLM Final Rule has been removed from the Proposed RMPA/Final EIS. In June 2015, the California Department of Conservation (DOC) completed the Final Environmental Impact Report for the Analysis of Oil and Gas Well Stimulation Treatments in California (Final EIR) (DOC, 2015). Although the BLM 2015 Final Rule provided protective measures, the DOGGR regulations and the mitigation measures provided in the DOGGR Final EIR (DOC, 2015) under SB 4 and this RMPA/EIS mitigate potential impacts to seismic hazards from well stimulation treatments.
- A2-13 As requested, the acronym for “Underground Injection Program” has been revised from “URIC” to “UIC” in Section 3.3.1 (Introduction) of the Proposed RMPA/Final EIS.
- A2-14 As requested, the description of Senate Bill 4 as related to well stimulation, stimulation fluid constituents, and anticipated recovered fluid disposal has been revised under “California Division of Oil, Gas, and Geothermal Resources” in Section 3.3.2 (Regulatory Framework) of the Proposed RMPA/Final EIS. The text in this section of the Proposed RMPA/Final EIS has also been revised to clarify that DOGGR is currently not “regulating chemicals used in stimulation fluids.”
- The commenter states that seismic monitoring is based on the area of five times the maximum axial dimension stimulation area and not at “each point of fracture” as stated in the Draft RMPA/EIS. The text under “California Division of Oil, Gas, and Geothermal Resources” in Section 3.3.2 (Regulatory Framework) of the Proposed RMPA/Final EIS has been revised as suggested.
- A2-15 The commenter states that Material Safety Sheets (MSDS) are now referred to as “Safety Data Sheets (SDS)” per OSHA’s 2012 revised HazCom Standard. The text under “Overview of State Regulations” in Section 3.4.2 (Regulatory Framework) of the Proposed RMPA/Final EIS has been revised as suggested.
- A2-16 As requested, text has been added under “California Regulations for Well Stimulation Treatments (Senate Bill 4)” in Section 3.3.2 (Regulatory Framework) of the Proposed

RMPA/Final EIS to clarify that DOGGR also regulates geothermal resources in California.

As also requested, the text under “California Regulations for Well Stimulation Treatments (Senate Bill 4)” in Section 3.3.2 (Regulatory Framework) of the Proposed RMPA/Final EIS has been revised as suggested to describe actions that the State Oil and Gas Supervisor oversees.

A2-17 The commenter repeated the comment twice verbatim. Please refer to Response to Comment A2-16.

A2-18 The commenter states that air injection is an outdated technique and is no longer used in oil and gas fields. As requested, the reference to air injection under “Well Stimulation Techniques and Enhanced Oil Recovery” in Section 3.4.3 (Regional Setting) in the Proposed RMPA/Final EIS has been deleted.

A2-19 The commenter states that there have not been any chemicals used as stimulation constituents that have been reported as proprietary. As requested, “proprietary chemicals” has been revised to “chemicals” under “Well Stimulation Techniques and Enhanced Oil Recovery” in Section 3.4.3 (Regional Setting) in the Proposed RMPA/Final EIS.

The commenter also states that the lack of carbonate rock in California is also a reason why the HCL step of hydraulic fracturing is not typically used in California. Text has been added under “Well Stimulation Techniques and Enhanced Oil Recovery” in Section 3.4.3 (Regional Setting) in the Proposed RMPA/Final EIS as suggested by the commenter.

A2-20 The discussion in Section 3.6.2 (Regulatory Framework) of the Proposed RMPA/Final EIS has been revised. The BLM will coordinate with DOGGR to meet standards to reduce wasteful venting, flaring, and leaks of natural gas.

A2-21 The commenter states that the U.S. EPA, not DOGGR, has the authority to designate exempt aquifers or change exemption status. Section 3.7.2 (Regulatory Framework) of the Draft RMPA/EIS has been revised accordingly. In addition, an update on the review of exempt aquifers by DOGGR and the State Water Resources Control Board has been provided in Section 3.7.2. As of May 2017, no aquifer exemptions have been approved by the EPA within the CCFO Planning Area. Review is underway for aquifers beneath four oil and gas fields within the CCFO Planning Area.

A2-22 As requested, Section 3.7.2 (Regulatory Framework) of the Draft RMPA/EIS has been revised to include DOGGR well construction regulations 14 CCR 1722.2 and 1723.2.

A2-23 As requested, Section 3.7.2 (Regulatory Framework) of the Draft RMPA/EIS has been revised to include DOGGR regulations for casing strings and cement plugs for the plugging and abandonment of a well: 14 CCR 1723.2 through 1723.8.

A2-24 The commenter states that 962 well stimulation treatments occurred between 1/2/2014 and 6/22/2015 instead of 903, with an average water use of 110,000 AFY. The public disclosure downloaded from the DOGGR website in August 2015 has records for 903 well stimulation treatments during this time. However, a footnote has been added to Section 3.7.4 (Current Conditions and Trends) of the RMPA/EIS indicating that

DOGGR recorded 962 well stimulation treatments during this time. A second footnote was added to the same section of the RMPA/EIS indicating that the average water use for these 962 well stimulation treatments is 110,000 AFY.

The commenter also states that hydraulic fracturing is not a common operation in the BLM RMPA/EIS project area because it has not been proven to be productive. In response, a statement was added to Section 3.7.2 (Current Conditions and Trends) of the RMPA/EIS indicating that according to DOGGR, hydraulic fracturing has not yet proven effective in oil fields within the CCFO Planning Area.

- A2-25 The commenter states that the EPA released the final *Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources* (EPA, 2016). Section 3.7.5 (Recent Well Stimulation Studies) of the RMPA/EIS has been updated to reference EPA’s final document and Section 4.7 (Groundwater Resources) has been updated to include findings of EPA’s final document.
- A2-26 The commenter states that DOGGR regulates “the wise development of oil and gas to prevent, as far as possible, damage to life, health, property and natural resources”. The commenter references page 3.7-4, Paragraph 4, of the Draft RMPA/EIS, which is the Federal subsection of Section 3.7.2 (Regulatory Framework). Because the Section highlighted by DOGGR discusses Federal regulations, specifically the Clean Water Act, not State regulations, no change was made in response to this comment.
- A2-27 The commenter states that the Pipeline and Hazardous Materials Safety Administration’s regulatory oversight of pipelines typically applies to those that contain oil and gas prior to the products being metered or sold. Text has been added under “Pipeline and Hazardous Materials Safety Administration” in Section 3.20.2 (Regulatory Framework) to clarify the regulatory oversight of the agency.
- A2-28 The commenter states that seismic monitoring is based on the area of five times the maximum axial dimension stimulation area and not at “each point of fracture” as stated in the Draft RMPA/EIS. The text in Section 4.3.2 (Impacts Common to All Alternatives) of the Proposed RMPA/Final EIS has been revised as suggested.
- A2-29 Text has been added under “Public Exposure to Hazards of Oil and Gas Operations” in Section 4.4.2 (Impacts Common to All Alternatives) of the Proposed RMPA/Final EIS as suggested by the commenter to clarify how the fluid level in a well is to be measured when a fluid survey is performed.
- A2-30 The commenter states that DOGGR uses the term “Fluid Level Tests” and not “Fluid Survey” as used in the Draft RMPA/EIS. The description of fluid levels under “Public Exposure to Hazards of Oil and Gas Operations” in Section 4.4.2 (Impacts Common to All Alternatives) of the Proposed RMPA/Final EIS has been revised to reflect the term DOGGR uses and the suggested text explaining fluid level tests has been added.
- A2-31 As requested, the description of SB 4 requirements under “Surface Water Contamination” in Section 4.4.2 (Impacts Common to All Alternatives) of the Proposed RMPA/Final EIS has been revised to reflect that the operator is required to a “include” a Spill Contingency Plan and not “prepare” this plan as stated in the Draft RMPA/EIS.

- A2-32 The commenter states that the description of regulations under SB 4 (14 CCR Section 1787) related to cemented casing is incorrect under “Subsurface Contamination” in Section 4.4.2 (Impacts Common to All Alternatives) of the Draft RMPA/EIS. The text has been corrected under “Subsurface Contamination” in Section 4.4.2 (Impacts Common to All Alternatives) of the Proposed RMPA/EIS as suggested.
- A2-33 The commenter states that the intent of the phrase “if available, the State-approved SB 4 permit” in Section 4.4.4 (Impacts of Alternative B) of the Draft RMPA/EIS is unclear. Section 4.4.4 has been revised to eliminate the use of the term “State-approved SB 4 permit” and use the term “State-approved (stimulation) permit”.
- A2-34 As requested, text in Section 4.7.2 (Impacts Common to All Alternatives) of the Draft RMPA/EIS has been revised to indicate that pre-1976 records are only available in hard copy. In addition, the text in the same section has been revised to indicate that DOGGR has the discretion to deny a well stimulation permit if there is a high risk to nearby abandoned wells.
- A2-35 Please refer to Response to Comment A2-1 regarding the rescission of the BLM 2015 Final Rule. As a result, discussion of the BLM 2015 Final Rule has been removed from the Proposed RMPA/Final EIS. In June 2015, the California Department of Conservation (DOC) completed the Final Environmental Impact Report for the Analysis of Oil and Gas Well Stimulation Treatments in California (Final EIR) (DOC, 2015). The DOGGR regulations and the mitigation measures provided in the DOGGR Final EIR (DOC, 2015) under SB 4 mitigate potential impacts to groundwater from well stimulation treatments.
- A2-36 The commenter states that there are fewer than five reported spills in the two counties (Monterey and San Benito) for 2013. The comment is correct. There are four spills. This has been corrected in the paragraph referred to in the comment (Section 4.8.2).
- A2-37 The commenter points out certain DOGGR surface water protections. The text of Section 4.8.2 in the Proposed RMPA/Final EIS has been modified to add the information requested in this comment.
- A2-38 The commenter points out that the regulation citation for definition of projects subject to well stimulation is incorrect. The citation referred to in the comment has been changed in Section 4.8.2 of the Proposed RMPA/Final EIS.
- A2-39 Please refer to Response to Comment A2-1 to discuss the status of the BLM 2015 Final Rule.
- A2-40 The commenter would like “flow back” to be changed to “recovered” in Section 4.8.2 (Impacts Common to All Alternatives). The requested word change has been made.
- A2-41 The commenter would like “flow back” to be changed to “recovered” in Section 4.8.2 (Impacts Common to All Alternatives). The requested word change has been made.
- A2-42 The commenter states that air injection is an outdated technique and is no longer used in oil and gas fields. As requested, the reference to air injection in Section 6.2 (Enhanced Oil Recovery) of Appendix B (Reasonably Foreseeable Development Scenario for Oil and Gas) in the Proposed RMPA/Final EIS has been deleted.

Responses to Comment Set A3 – U.S. Environmental Protection Agency

A3-1 The commenter expresses concerns regarding air quality and surface and groundwater use and quality, which are discussed in detail in the comment letter. Please see Responses to Comments A3-2 through A3-57 for detailed responses to each issue raised.

A3-2 The commenter asks BLM to confirm during future NEPA analyses at the Application for Permit to Drill (APD) phase that the Reasonably Foreseeable Development (RFD) Scenario assumptions still hold, including the maximum number of 37 new wells over the 20-year planning horizon, and otherwise an amendment to the RMP may be warranted.

Section 1 (Introduction) of the RMPA/EIS states that over time, decisions on how the land is managed need to be revised or amended to respond to new, intensified, or changed uses on public land, prompting an RMP revision or amendment. The planning process also allows for continuous adjustments to respond to new issues and changed circumstances. The BLM will make decisions using the best information available. These decisions may be modified as the BLM acquires new information and knowledge of new circumstances relevant to land and resource values, uses, and environmental concerns. Modifying land use plans through maintenance and amendment on a regular basis reduces the need for major revisions of land use plans.

Please refer to General Response GR-3 regarding the 2015 RFD Scenario.

A3-3 Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

A3-4 The commenter's request for one hardcopy and one CD-ROM of the Proposed RMPA/Final EIS, as well as notice of future NEPA analyses at the APD phase of development is noted.

A3-5 The Summary of EPA Rating Definitions provided by the commenter is noted.

A3-6 The BLM initiated an Air Quality Technical Working Group for this RMPA as described in the Air Quality Memorandum of Understanding (MOU) regarding air quality analyses and mitigation for federal oil and gas decisions. The MOU (2011) is presently undergoing revision. Through its collaboration on this project under the MOU, the BLM prepared a Technical Support Document (TSD) to analyze the effects to air quality of the alternative management approaches. The Air Quality TSD appears as Appendix K of this Proposed RMPA/Final EIS. The Air Quality TSD reflects the interagency review and comments received from the Air Quality Technical Working Group (BLM, 2019).² As recommended in MOU Section V.D.1, the EIS (Section 4.5.2) includes a description of the air quality issues and a commitment to complete the air quality impacts and air quality related values (AQRVs) analyses, if necessary. The TSD indicates that BLM will notify agencies whose lands may be affected by future

² BLM (Bureau of Land Management). 2019. Bureau of Land Management Central Coast Field Office Resource Management Plan Amendment, Technical Support Document, Air Quality. Prepared by: National Operations Center, California State Office, Bakersfield Field Office and Central Coast Field Office. January.

oil and gas activities on federal mineral estate to address potential adverse impacts to air quality related values.

- A3-7 Paragraph V.E.3 of the MOU states that “the Lead Agency will conduct modeling to assess impacts to air quality and/or AQRVs” if a proposed action would meet certain criteria. The EIS includes a generalized emissions inventory for the RFD Scenario to consider whether air quality impact modeling would be required. Emissions would be below levels that would contribute substantially to an existing or projected violation, or materially contribute to adverse cumulative air quality impacts. If necessary, BLM would require near-field dispersion modeling at the leasing or Application for Permit to Drill (APD) phase for oil and gas development activities that may adversely affect Class I areas and AQRVs.
- A3-8 Emissions would be below levels that would contribute substantially to an existing or projected violation, or materially contribute to adverse cumulative air quality impacts.
- A3-9 The Air Quality TSD concludes that air dispersion modeling is not required for this planning effort, and the EIS (Section 4.5.1) indicates that projects would be reviewed for potential impacts including impacts to Class I Areas and AQRVs at the leasing or APD phase.
- A3-10 The Air Quality TSD indicates that BLM will notify agencies whose lands may be affected by future oil and gas activities on federal mineral estate in order to address potential adverse impacts to air quality related values, and if necessary, BLM would require near-field dispersion modeling at the leasing or APD phase for oil and gas development activities that may adversely affect Class I areas and AQRVs. See Response to Comment A3-6.
- A3-11 The basis for the emissions estimates in EIS Tables 4.5-1 and 4.5-2 in Section 4.5.2 (Impacts Common to All Alternatives) appears in the Air Quality TSD and in the administrative record, which shows examples of off-road equipment use factors and on-road transportation activity levels, along with the emission factors, for the generalized emissions inventory.
- A3-12 The emissions factors used in the estimates in Tables 4.5-1 and 4.5-2 in Section 4.5.2 (Impacts Common to All Alternatives) are drawn from typical equipment and vehicle fleetwide averages within the “OFFROAD” model of 2011 and the “EMFAC2014” model, respectively, as published by the California Air Resources Board.
- A3-13 The level of activities for well stimulation are representative to the extent that such activities are foreseeable in the Planning Area. However, as with other assumptions in the generalized emissions inventory, these activities could warrant further analysis at the leasing or APD phase.
- A3-14 The RFD Scenario forms the basis for the generalized emissions inventory, which shows that general conformity does not apply to the proposed action. Development proposals at the leasing or APD phase could require quantitative analysis of air quality impacts and impacts to air quality related values, and such analyses would allow the opportunity to place a limit on the number of wells to be developed, if necessary to address potential adverse impacts.

- A3-15 The RFD Scenario forms the basis for the generalized emissions inventory, and the inventory shows that general conformity does not apply to the proposed action. Site-specific development proposals could require a demonstration of conformity, if activities could generate emissions exceeding the applicable *de minimis* levels.
- A3-16 The emissions inventory shows that general conformity does not apply to the proposed action and demonstrates that development and operation consistent with the RFD Scenario would not be likely to exceed the *de minimis* levels. The BLM would confirm general conformity requirements for site-specific project development proposals at the leasing or APD phase.
- A3-17 Quantitative analysis of near-field air quality impacts, including dispersion modeling, would be required by BLM at the leasing or APD phase for activities that may adversely affect Class I areas and AQRVs. As provided in the Air Quality TSD, BLM would confer with federal land managers to determine the appropriate level of analysis (BLM, 2019).
- A3-18 Quantitative analysis of cumulative impacts and long-range transport modeling for air quality impacts and impacts to AQRVs, including potentially photochemical grid modeling, could be required by BLM at the leasing or APD phase, if necessary. For any project that is anticipated to result in emissions that materially contribute to potential adverse cumulative air quality impacts BLM would confer with federal land managers to determine the appropriate level of analysis (BLM, 2019).
- A3-19 The comment recommends that BLM consider adopting the most protective mitigation measures from AQ-1 and AQ-2 as Conditions of Approval at the APD phase. This would be accomplished by BLM managers during review of project proposals.
- A3-20 The comment recommends updating AQ-2 to require use of Tier 4 diesel engines and where appropriate use of drilling rigs powered by the electric grid. These features are identified within the types of measures that could be implemented depending on site-specific proposals.
- A3-21 The comment recommends making updates to the Best Management Practices/Standard Operating Procedures for Air Quality (Appendix D) to reflect the availability of lower-emitting diesel engines. BMPs include use of Tier 4 diesel engines, which are the most-stringent standards for new engines on the market. Reference to 2011-2014 (phase-in period) has been removed in Appendix D of the Proposed RMPA/Final EIS.
- A3-22 The comment suggests incorporating additional practicable measures to reduce GHG emissions, such as using energy efficient machinery and implementing cost-effective measures. The EIS (Section 3.6.2) identifies the U.S. EPA Natural Gas STAR Methane Challenge Program and the types of controls available to operators. Additionally, the EIS includes revisions (in Section 3.6.2 and Section 4.6.1) to clarify that, in April 2017, the ARB approved new GHG emission standards that will make methane controls enforceable.
- A3-23 The comment requests an estimate of weekly or monthly water use if multiple stimulation jobs were to occur at the same time from the same or connected groundwater

basins. As described in the 2015 RFD Scenario, up to 37 oil and gas wells are projected to be drilled within the next 15 to 20 years, 32 of which are expected to be within existing oil and gas fields and 3 to 5 outside of existing oil and gas fields. As shown on Table 4.7-3 in the Draft RMPA/EIS, there are between 6 (Alternative B) and 20 (Alternative A and Alternative F) groundwater basins that contain open Federal mineral estate and could therefore potentially be used for as a water source for well drilling and well stimulation treatments. Alternative E excludes Federal mineral estate within certain groundwater basins. Well stimulation treatments could be conducted on wells in any of these oil and gas fields in the future, so analysis of water use from any specific groundwater basin as part of this Draft RMPA/EIS would be highly speculative. Best estimates of water use for drilling and well stimulation treatments are provided on Tables 4.7-1 and 4.7-2 of the Draft RMPA/EIS.

As described in Section 1.2.2 (Planning Approach) in the Draft RMPA/EIS, oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. Environmental review under NEPA is required at each phase. Section 2 (Alternatives) of the RMPA/EIS describes the range of management options to address the scoping issues that are distinguished by the type and degree of constraints described as allowable uses under each alternative in this RMPA/EIS. Appendix C of the Draft RMPA/EIS lists the Controlled Surface Use (CSU) Oil and Gas Stipulations that would apply as well.

Once this RMPA dictates which areas would be open to leasing and sets general stipulations, the environmental review for leasing parcels identifies which parcels should be offered for leasing and the conditions under which leasing and eventual development should occur. The environmental review for the development of leased parcels (including well stimulation techniques) is a site-specific analysis of potential impacts from the proposed project and includes specific conditions of approval to avoid, minimize, or mitigate impacts to sensitive resources. Therefore, in addition to specifying stipulations for areas identified as open in this planning stage, site-specific mitigation developed at the leasing and development stages will also ensure the protection of natural resources on BLM-administered public lands.

- A3-24 The comment requests an analysis of specific groundwater basins and subbasins to ensure groundwater resources are not stressed. All 20 of the groundwater basins overlain by Federal mineral estate in the CCFO Planning Area are summarized in Section 3.7.4 of the Draft RMPA/EIS. The DOGGR Final EIR (DOC, 2015) prepared in compliance with Senate Bill (SB) 4 contains mitigation measures to prevent well stimulation treatments from causing or contributing to overdraft conditions (DOGGR Mitigation Measures GW-1a and GW-1b). Mitigation Measure GW-1a (Use Alternative Water Sources to the Extent Feasible) requires an applicant to determine the quantity of water to be used and to conduct a feasibility study to determine if recycled water or alternative water sources (including produced water, flowback water, or saline groundwater) may be used for well stimulation. Mitigation Measure GW-1b (Minimize Groundwater Impacts) states that if groundwater is used for well stimulation treatments, then DOGGR shall ensure that the use of groundwater does not contribute to an “undesirable result,” including significant and unreasonable chronic lowering of water

levels and depletion of groundwater in storage. These mitigation measures are described in detail in the DOGGR Final EIR.³

See Responses to Comments A2-4 and A2-5, which discuss the roles of BLM and DOGGR and specify that that oil and gas operators must comply with both Federal and State statutes and regulations.

As described in Response to Comment A3-23, oil and gas leasing on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. The environmental review for the development of leased parcels is a site-specific analysis that will be required in subsequent phases.

A3-25 The comment requests closing acreages overlying critically overdrafted basins for well stimulation and prohibiting groundwater withdrawal from critically overdrafted basins. As noted in the Draft RMPA/EIS, any increase in groundwater use in a basin/subbasin in overdraft would contribute to overdraft conditions, a process considered to be a substantial impact if not mitigated. However, as described in Response to Comment A3-24, the DOGGR Final EIR contains mitigation measures to prevent well stimulation treatments from causing or contributing to overdraft conditions (Mitigation Measures GW-1a and GW-1b). These mitigation measures are described further in Response to Comment A3-24 and in the DOGGR Final EIR.

A3-26 The commenter suggests that wells within the radius of influence of a proposed well stimulation treatment should be reviewed before well stimulation treatment begins, to ensure that the wells do not provide a pathway for potential contamination from well stimulation. DOGGR regulations in 14 CCR, Chapter 4, Section 1784 (Well Stimulation Treatment Area and Design) require, as part of an application for a permit to conduct well stimulation, a “well stimulation treatment area analysis to ensure the geologic and hydrologic isolation of the oil and gas formation during and following well stimulation treatment.” As described in Section 10.14.5 of the DOGGR Final EIR, and referred to in Section 4.7.2 (Impacts Common to All Alternatives) of the RMPA/EIS, Section 1784 requires the following:

- Conduct an axial dimensional stimulation area (ADSA) analysis to ensure the geologic and hydrologic isolation of the oil and gas formation during and following well stimulation treatment.
- Provide detailed well construction information for all wellbores within an area equal to twice the ADSA including casing diagrams, cement plugs, perforated intervals, type and weight of fluid between plugs, cementing information including yield, volume, and density of the cement slurry and other requirements.
- Conduct a geologic evaluation to identify potential migration pathways for well stimulation or formation fluids.

³ The DOGGR Final EIR (2015) regarding Analysis of Oil and Gas Well Stimulation Treatments in California is available at: http://www.conservation.ca.gov/dog/Pages/SB4_Final_EIR_TOC.aspx.

In addition to the DOGGR regulations, there are two mitigation measures in the DOGGR Final EIR which focus on wells within the radius of influence of a well stimulation treatment:

- Mitigation Measure GW-4a: Demonstrate that Wells within the ADSA Have Effective Cement Well Seals and Monitor Wells During Well Stimulation Treatment
- Mitigation Measure GW-5a: Conduct Geophysical Surveys or Apply Other Field Methods to Locate Improperly Abandoned Wells and Mitigate.

See General Response GR-4 for additional information.

- A3-27 The commenter suggests sealing wells no longer in use to reduce the potential for fluid movement between the production zone(s) and aquifer(s). As noted in Section 3.7.2 of the RMPA/EIS, DOGGR regulations in 14 CCR, Chapter 4, Sections 1723.2 through 1723.8 provide requirements for casing strings and cement plugs for well plugging and abandonment. These requirements as well as mitigation measures in the DOGGR Final EIR (in particular Mitigation Measure GW-4a) protect groundwater from the transport of well stimulation fluids through abandoned wells. Please also see Response to Comment A3-26.
- A3-28 The commenter requests an update on current research regarding well stimulation fluids in flowback and produced water in California. However, BLM was unable to identify any significant new information during the preparation of the preparation of the Proposed RMPA and Final EIS.
- A3-29 The commenter requests providing and discussing results of sampling of produced water initially following well stimulation and then again after 30 days of production that has been required since July 2015. As noted in Mitigation Measure GW-7a from the DOGGR Final EIR, operators are required to either add a tracer to well stimulation fluids or develop a reasonable method to distinguish these fluids in the environment. This measure, associated with groundwater monitoring, provides a more direct means to track any well stimulation fluids directly that may be released to the environment. Produced water is typically produced in large volumes and may not adequately track well stimulation fluids. Implementation of the State program to collect data on flowback and produced water in California is ongoing and results will be considered for any Project-level evaluation. Analytical data for recovered fluids are available on DOGGR's Well Stimulation Treatment Disclosure database.
- A3-30 Section 4.7 (Groundwater Resources) of the RMPA/EIS provides an assessment of potential impacts to groundwater from activities allowed under the RMPA alternatives. The analysis presented in Section 4.7 is based primarily on the impacts identified in CCST's 2014 report on well stimulation technologies, prepared to provide BLM with information to be used for "future planning, leasing, development decisions regarding oil and gas issues on the Federal mineral estate in California."

Section 4.7 and Appendix D of the RMPA/EIS contain proposed mitigation and SOPs/BMPs pertaining to reducing potential impacts to groundwater resources. Additionally, Section 4.7 discusses numerous recent regulations regarding well stimulation

and hydraulic fracturing that address these potential impacts and, at least in part, serve to mitigate the impacts discussed within this comment on groundwater quality.

Regulations under SB 4 have requirements for well seals to prevent the migration of gas and fluids from the produced zone to usable groundwater. The SB 4 regulations require cement placement in surface casing from the base of the casing to the surface and preferably through the freshwater zone (3,000 mg/L). DOGGR's SB 4 Final EIR includes a mitigation measure (Mitigation Measure GW-4b) requiring a 500-foot well seal across the base of usable water if the hydraulic fracturing zone is below the base of the usable water. If the hydraulic fracturing zone is within usable water, then this mitigation measure requires a well seal along the entire casing string, from the bottom of the well to the surface. Therefore, the potential for groundwater impacts from the migration of gas or fluids from producing zone to usable water would be mitigated.

A3-31 The commenter suggests considering several additional mitigation measures in the Proposed RMPA/Final EIS. The suggested mitigation measures and the responses are below:

Closed loop drilling. It is understood that closed loop drilling allows an operator to drill a well without using a reserve pit. As discussed in Section 3.7.2 (Regulatory Framework), the development, regulation, and conservation of oil and gas resources in the State are addressed under 14 CCR, Chapter 4. As discussed in Section 4.7.2 (Impacts Common to All Alternatives) of the Draft RMPA/EIS, Section 1786 of the DOGGR regulations prohibits the disposal of flowback water to sumps or pits in California and requires that flowback water be stored in containers.

Water quality and water level monitoring. DOGGR regulations require groundwater quality monitoring. Details of both regional and area-specific groundwater quality monitoring requirements are provided in the State Water Resources Control Board Model Criteria for Groundwater Monitoring in Areas of Oil and Gas Well Stimulation, adopted July 7, 2015 (Model Criteria), as discussed in Section 3.7.2 (Regulatory Framework) of the RMPA/EIS. Mitigation Measure GW-1b (Minimize Groundwater Impacts) in the DOGGR Final EIR states that if groundwater is used for well stimulation treatments, then DOGGR shall ensure that the use of groundwater does not contribute to an "undesirable result." One of the undesirable results is the chronic lowering of groundwater levels. Therefore, groundwater level monitoring is required if groundwater is used for well stimulation treatments.

Reserve pit closure and monitoring. Please see response above for closed loop drilling.

Evaporation pond lining and monitoring. Please see response above for closed loop drilling.

Setback stipulations, minimum 500 feet for private wells. There are no setback requirements for private wells, but DOGGR regulations and DOGGR Final EIR mitigation measures protect private wells from groundwater quality impacts. DOGGR regulations require groundwater monitoring based on the State Water Board's Model Criteria. The Model Criteria require area-specific groundwater monitoring plans to identify water supply wells (public, private, domestic, irrigation, and industrial). For any drinking

water supply well located within one mile downgradient of the zone of stimulation, a sentry monitoring well is required between the stimulated well and the drinking water supply well. In addition, as described in Response to Comment A3-26, DOGGR regulations require detailed well construction information for all wellbores within twice the ADSA. Mitigation measure GW-4a from the DOGGR Final EIR requires that wells within the ADSA have effect cement seals and requires monitoring of these wells during well stimulation treatment.

Remediation mitigation plan. The Model Criteria requires the operator to submit a groundwater monitoring report to the State Water Board. The report must include an identification of impacts. If impacts are identified, actions necessary to protect water quality must be provided in the monitoring report. The State Water Board will determine whether corrective actions are necessary.

Therefore, no additional mitigation measures are necessary in the Proposed RMPA/Final EIS in response to this comment.

- A3-32 The comment requests a general oil and gas production well schematic and discussion of how the well design would protect groundwater quality. The RMPA/EIS is a planning level document, information on well and casing design would be included during subsequent NEPA reviews.

In addition, the DOGGR Final EIR contains a Conceptual Diagram of Wells Used for Well Stimulation as Figure 10.14-5 (DOC, 2015). Discussion of this figure and how the well design would protect groundwater quality is presented in the Conceptual Well Diagram subsection of Section 10.14.4 (Impact Methodology and Significance Criteria) of the DOGGR Final EIR. See Response to Comment A2-4 regarding DOGGR's authority.

- A3-33 The comment states that the Draft RMPA/EIS does not discuss whether any specific groundwater monitoring measures will be needed before the full implementation of the State Water Board's program or the Sustainable Groundwater Management Act (SGMA). The State Water Board's Model Criteria requires both area-specific and regional groundwater monitoring. As stated in the Draft RMPA/EIS, and in the comment, the regional groundwater monitoring program will be implemented in phases, with the first phase taking approximately five years to implement. According to the Model Criteria, this is due to the large scale of the regional monitoring program. Since there is a lack of groundwater data related to oil and gas fields, it will take time for the data to be collected and a regional well network to be established. In the interim, the State Water Board has been working with the USGS to analyze water quality data and develop baseline water quality information. Area-specific groundwater monitoring has been required since adoption of the Model Criteria in July 2015. As described in Section 3.7.2 (Regulatory Framework) of the Draft RMPA/EIS, area-specific groundwater monitoring is required for each well stimulation treatment where protected water (less than 10,000 mg/L TDS) is present and outside an exempt aquifer.

- A3-34 The comment requests clarification of BLM's authority for investigating drinking water well contamination. The BLM has several overlapping authorities for protecting

groundwater from contamination, including the FLPMA, the Code of Federal Regulations (CFR), Onshore Orders, and Lease Terms. The FLMPA states that “public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values.” CFR Chapter 43, Section 3162.5 states that “[t]he operator shall exercise due diligence in taking necessary measures, subject to approval by the authorized officer, to control and remove pollutants and to extinguish fires.” The Onshore Orders require proper casing and cementing programs to protect and isolate usable water zones and to protect usable water during abandonment. Lease stipulations requires the Lessee to “conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users.”

The BLM must also adhere to the State Water Board’s Model Criteria, which requires area-specific groundwater monitoring plans and a groundwater monitoring report that includes results of water quality sampling. If water quality impacts are identified, actions necessary to protect water quality must be provided in the monitoring report. The State Water Board will determine whether actions are necessary.

A3-35 The comment recommends considering requirements to monitor private wells within a mile from the oil and gas activities in the Proposed RMPA/Final EIS. DOGGR regulations include a notice of availability for water testing services and sampling of private wells. Section 1783.2 and 1783.3 of the DOGGR regulations require the operator to notify surface property owners within a 1,500-foot radius of the well head, or within 500 feet of the horizontal projection of the subsurface well, that private property owners can have their drinking water wells and irrigation water wells tested at operator’s expense. Groundwater testing is to be conducted by an independent third-party person or entity designated by the State Water Board. Requirements for designated contractor sampling and testing are provided in the Model Criteria, which was developed to monitor well stimulation treatments and adopted by the State Water Board. As provided in the Model Criteria, sampling procedures shall be consistent with US EPA Science and Ecosystem Support Division Operating Procedure for Groundwater Sampling.

A3-36 The commenter states that fracture monitoring should be considered. Existing DOGGR regulations provide for fracture analysis and monitoring during treatment as described for surface water in Section 3.8.2 (Surface Water, Regulatory Framework) of the RMPA/EIS. As stated in Section 4.7.2 (Impacts Common to All Alternatives) of the RMPA/EIS, Section 1784 of the DOGGR regulations requires an analysis of suspected faults prior to well stimulation to identify and analyze any potential for hydraulic fracturing fluid to migrate outside of the zone being fractured. DOGGR regulations require a review of all geologic features, including known faults that are active or inactive, within five times the ADSA. The operator can use modeling, or other analysis approved by DOGGR, to estimate the ADSA. During well stimulation treatment, Section 1785 of the DOGGR regulations require the operator to continually monitor the injection pressure. If a pressure change occurs and the operator suspects a potential breach in the geologic or hydrologic isolation of the formation, then the well stimulation treatment will be terminated. In addition, it is in the best financial interest of the operator to keep the well stimulation fluids in the reservoir.

A3-37 The commenter states that EPA’s Underground Injection Control permitting guidance specific to oil and gas hydraulic fracturing activities using diesel fuels should be used including well permitting guidance. Section 1783 of the DOGGR regulations contain detailed well stimulation treatment permitting requirements. The DOGGR regulations are designed to ensure that integrity of wells used for hydraulic fracturing. Collectively, the DOGGR regulations and the mitigation measures in the DOGGR Final EIR are sufficiently protective of groundwater quality and quantity to reduce the impacts. See Response to Comment A2-4 regarding DOGGR’s authority.

A3-38 The commenter recommends that a preliminary assessment of the reach and extent of Waters of the U.S. be made. An assessment of the reach and extent of Waters of the U.S. for the entire Planning Area is beyond the scope of this analysis and would not necessarily provide useful information for the impact analysis under NEPA, because specific well locations under the RFD Scenario are not known at this time. Waters of the U.S. will be determined at the project level.

As stated in Section 2.4.4 of the RMPA/EIS, the effect of any particular well or field development would depend on the impact posed by site-specific engineering and operations within specific geology and upon the area’s other characteristics (such as nearby wellbores). The BLM will analyze these site-specific impacts during the NEPA review for a lease or an individual well.

A3-39 The comment recommends consulting with the U.S. Army Corps of Engineers regarding jurisdictional status of waters within the project area, and requiring delineations during NEPA review of future APDs, as well as marking jurisdictional features on maps and on the ground to facilitate avoidance.

Section 4.10.2 of the RMPA/EIS describes potential impacts to jurisdictional waters, and identifies existing state and federal permitting requirements for activities affecting jurisdictional waters. Consistent with the comment above, general mitigation identified in that section specifies that “site-specific evaluations of proposed ground disturbing activities will include delineations of State or federally jurisdictional hydrologic features, including wetlands, to determine whether State or Federal permitting may be required.” Consistent with the recommendation, the jurisdictional areas would be mapped in the delineation report and any such areas to be avoided would be outside the work area boundaries to be flagged in the field (see Appendix D, Section 1.4.4, General Guidelines for Conserving Habitat and Minimizing Project Impacts). Thus, both mapping and on-site marking of these features are incorporated into the Best Management Practices and Standard Operating Procedures (BMPs and SOPs) identified for the RMPA/EIS.

The commenter also asks that the RMPA/EIS include a COA in Section 4.8 (Surface Water Resources) of the Proposed RMPA/Final EIS, that jurisdiction will be determined in future NEPA analyses at the APD phase. Section 404 of the CWA requires delineation of Waters of the U.S. and such a determination would have to be made as required by law at the APD stage. Section 4.8 (Surface Water Resources) and 4.10 (Biological Resources – Vegetation) in the Draft RMPA/EIS both refer to this regulation. As this is a matter of law, an additional COA is not needed. See also Response to Comment A3-38.

A3-40 The commenter asks that the RMPA/EIS include an estimate, for each alternative of the extent to which waters such as wetlands, riparian areas and floodplains could be impacted by potential activities. An estimate of the extent to which waters could be affected would require an inventory and mapping of these waters, in addition to specific information on development plans, which is beyond the scope of this analysis under NEPA. See Responses to Comments A3-38 and A3-39.

In addition, the commenter recommends quantification of potential impacts to surface waters, including impacts to a series of stream, substrate, and habitat values. In addition, it recommends quantification of cumulative effects of increased erosion and sedimentation.

The RMPA is a planning document and cannot anticipate specific locations of future APDs. However, the RMPA/EIS anticipates reasonably foreseeable total surface development to be 22.4 to 205.7 acres. Quantitative measures of site specific impacts, including cumulative impacts to surface waters, cannot be estimated, but very little of this total surface disturbance acreage is likely to directly or indirectly affect surface waters. Due to the limited extent of surface waters on the landscape, and the facility siting requirements identified in the RMPA, most impacts to surface waters would be minimized or avoided. Where direct impacts cannot be avoided (e.g., where access routes cross linear surface water features), implementation of the BMPs and SOPs identified in the RMPA/EIS (see Appendix D) would minimize these impacts for each future APD, and compliance with existing state and federal permitting requirements would mitigate impacts of each future APD in accordance with “no net loss” policies. In addition, BMPs and SOPs include multiple measures to prevent or minimize indirect impacts, such as erosion and sedimentation. Thus, the RMPA/EIS adequately minimizes and mitigates potential impacts to surface waters.

A3-41 The commenter asks that the EIS Include clarification on the BLM 2015 Final Rule. Please refer to Response to Comment A2-1 regarding the rescission of the BLM 2015 Final Rule. In the Proposed RMPA/Final EIS, reference to the BLM Hydraulic Fracturing Final Rule has been removed. Accordingly, the regulations discussed in Section 3.8.2 (Regulatory Framework) in the Proposed RMPA/Final EIS consist of BLM’s existing applicable regulations.

A3-42 The commenter asks that the RMPA/EIS clarify whether the requirements highlighted in Section 3.8 (Surface Water Resources) of the Draft RMPA/EIS stem from BLM’s Final Rule for well completions or from existing regulations, and to identify State requirements that may be more stringent. The commenter also expresses concern about the 300-foot and 500-foot setbacks and protection of surface waters.

Please refer to Response to Comment A2-1 regarding the rescission of the BLM 2015 Final Rule. Although the BLM 2015 Final Rule has been rescinded and its discussion removed from the Proposed RMPA/Final EIS, with implementation of DOGGR SB 4 regulations, surface water would still be protected from a surface release of flowback.

Specifically, SB 4 regulations require that recovered fluids be stored in containers but does not specifically require that the containers be enclosed. SB 4 does not allow the

fluids to be stored in sumps or pits. SB 4 requires secondary containment for any production facilities in place for 30 days or more, as well as a Spill Contingency Plan to be implemented immediately in the event of an unauthorized release. See also Response to Comment A2-39.

As described in Section 4.8.2 of the Proposed RMPA/Final EIS, under the CSU stipulations, BLM may require the operator to move the proposed well more than 200 meters, modify, or delay the well completion activity to minimize the potential for adverse impacts to water resources. Mitigation in the DOGGR Final EIR (Mitigation Measure SWR-1b) may also require a setback to outside of the 100-year or 200-year floodplain if necessary as determined by the BLM. See Response to Comments A3-49 and A3-51.

Regarding avoidance of riparian areas, compliance with Section 404 of the Clean Water Act is a matter of existing law and would require avoidance of waters of the U.S. as the primary method of avoiding impacts, followed by minimization and mitigation. Any plan of operation for a project encroaching in a riparian area would necessarily comply with Section 404 guidelines.

A3-43 The commenter asks that an NSO stipulation for new pits in the floodplain be considered. Pits are not allowed in the floodplain as described in Section 4.8.3 of the RMPA/EIS, and in the 2007 HFO RMP stipulations, therefore, this stipulation is not necessary.

A3-44 The commenter asks that a hydrologic assessment be considered. A discussion of Mitigation Measure SWR-1b from the DOGGR Final EIR has been added to Section 4.8 (Surface Water Resources) of the Proposed RMPA/Final EIS. Mitigation Measure SWR-1b from the DOGGR Final EIR would require a hydrologic analysis and is applicable to Federal mineral estate within the Planning Area.

A3-45 The commenter suggests incorporating the five NSO stipulations proposed under Alternative E into the selected alternative. The commenter's request has been noted. The BLM may incorporate NSO stipulations analyzed under any of the alternatives in the RMPA/EIS into the alternative selected in the Record of Decision.

As described in Section 4.8.2, under the CSU stipulations, the BLM may require the operator to move the proposed well more than 200 meters, modify, or delay the well completion activity to minimize the potential for adverse impacts to water resources. In addition, mitigation measures that would apply from the DOGGR Final EIR (Mitigation Measures SWR-1b and SWR-2a) may also require a setback if necessary as determined by the BLM. See Response to Comments A3-49 and A3-51.

Section 1.2.2 (Planning Approach) of the RMPA/EIS explains that oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. When the BLM receives applications to conduct activities on leases (e.g., applications for permits to drill or sundry notices of intent), additional NEPA analysis will be required. During this site-specific, implementation-level analysis, the BLM may consider additional mitigation measures to address any anticipated impacts, including those to protect surface water quality.

- A3-46 The commenter asks for setbacks from water bodies. See Response to Comment A3-45.
- A3-47 The commenter asks for avoidance of surface water resources. Avoidance of surface water resources is achieved through compliance with Section 404 of the Clean Water Act, CSU stipulations as described in the Response to Comment A3-45, and mitigation measures that would apply from the DOGGR Final EIR (Mitigation Measures SWR-1b and SWR-2a). These rules would apply during exploration, drilling, completion and production.
- A3-48 The commenter asks for restoration of damaged water resources. The issue of restoration of wetlands and riparian areas is addressed more fully under General Mitigation in Section 4.10.2 (Biological Resources – Vegetation, Impacts Common to All Alternatives) of the RMPA/EIS. Compliance with Section 404 of the Clean Water Act would also require avoidance first, then restoration of any damaged wetland or riparian area regardless of whether they would help to abate polluted runoff.
- A3-49 The commenter asks for a development buffer around water resources, compensatory mitigation to offset the loss of damaged water resources, and protection of high-value wetlands. As described in Section 4.8.2 of the RMPA/EIS, under the CSU stipulations, BLM may require the operator to move the proposed well more than 200 meters to minimize the potential for adverse impacts to water resources. These decisions would be made on a project level basis. In addition, mitigation measures that would apply from the DOGGR Final EIR (Mitigation Measures SWR-1b and SWR-2a) may also require a setback if necessary as determined by the BLM. Compensation for damage to riparian areas and wetlands would be required under the conditions of a CWA Section 404 permit and existing BLM regulations.
- A3-50 The commenter asks for identification and description of impaired waters in the EIS. Table 3.8.2 has been added to Section 3.8 in the Proposed RMPA/Final EIS to list the 119 water bodies currently listed as impaired within the Planning Area. However, identification of the nature of the impairment of all water bodies on the Section 303(d) list, and any load allocations in effect that may apply to projects would take a table with more than 1,000 entries and is not practical nor necessary within the document under NEPA. Further, these designations and Total Maximum Daily Loads could be changed at any time in the future. To clarify this, the text in Section 3.8 has been modified to state that there are now 144 Total Maximum Daily Loads and that these would be considered in any Section 401 water quality certification that would be necessary. Further, WAT-COM6 in the in the 2007 RMP, described in Section 4.8.1 of the Draft RMPA/EIS, requires the BLM to establish monitoring programs to prevent water bodies from reaching impairment levels.
- A3-51 As described in Section 4.8.1 of the Draft RMPA/EIS, DOGGR rules require a setback of 100 feet for storage or application of chemicals adjacent to perennial streams or channels with beneficial use(s) recognized by the State. Section 4.8.2 describes that the BLM may impose a 200-meter setback. In addition, DOGGR Final EIR (DOC, 2015) Mitigation Measure SWR-1b requires a minimum of 100-year flood protection which could also include a setback if deemed appropriate by the BLM.

- A3-52 The comment recommends including an analysis of surface-water/groundwater connections at the APD stage. As discussed in General Response GR-4, the DOGGR Final EIR (DOC, 2015) includes a mitigation measure (Mitigation Measure GW-1b), which requires an evaluation to ensure that groundwater use will not cause or substantially contribute to an undesirable result which would include depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water. In the event of an undesirable result, DOGGR can require as a condition of approval that the applicant use recycled water, saline water, produced water, or other water sources that would not result in a net increase in groundwater extraction, as described in Section 2.4.4 of the Draft RMPA/EIS.
- A3-53 The comment recommends providing a description of how water quality monitoring will occur. WAT-COM6 in the 2007 RMP, described in Section 4.8.1 of the Draft RMPA/EIS, requires the BLM to establish monitoring programs to prevent water bodies from reaching impairment levels.
- A3-54 The comment recommends that the use of recycled water be encouraged. See Response to Comment A3-52.
- A3-55 The comment notes that the BLM is currently operating under a Biological Opinion issued by the US Fish and Wildlife Service in 2007, and that further consultation for the RMPA is ongoing. The comment recommends providing an update to the consultation process, and including in the RMPA any new mitigation or monitoring measures for sensitive biological resources that may result from the consultation. The BLM sent a memorandum to request consultation with the US Fish and Wildlife Service on the Proposed RMPA on May 31, 2018. The request included a copy of the BLM's Draft Programmatic Biological Assessment of Oil & Gas Leasing, Exploration, and Development Activities on BLM-Administered Lands in the Central Coast Field Office.
- A3-56 The commenter noted that the BLM initiated consultation with the 28 tribal individuals, organizations, and federally recognized tribes identified as having interests in the Planning Area. Of the tribes contacted, the Ohlone/Costanoan-Esselen Nation responded with a letter indicating a desire for consultation on any future proposed projects. No other written comments were received from tribal entities during the scoping period.

Section 6.2.5.2 (Native American Tribes) in the Proposed RMPA/Final EIS has been updated to describe BLM's Native American tribal consultation that has occurred since scoping.

The agency has made a commitment to engage in further consultation throughout the RMP amendment process to ensure that the concerns of tribal groups are considered in development of the RMPA and at the time any specific projects are proposed. This commitment is captured in the Preferred Alternative through the relevant best management practices (BMPs), as summarized in Section 4.15.3 of the RMPA/EIS, which states "BLM will continue open dialogue and share information through government-to-government consultation with federally recognized tribes and with other Native Americans and ethnic groups that have cultural ties to lands proposed for development." Further, the BMPs for cultural resources listed in Section 1.7 of Appendix D (Best Management Practices/Standard Operating Procedures) state "[t]he presence or

absence of cultural properties will be determined prior to the approval of any surface-disturbing activity through such means as cultural resource field inventories, archival research, oral history, or other data gathering means deemed appropriated and identified resources shall be evaluated and appropriate treatment measures identified for all project areas subject to surface disturbance or visual intrusions.”

See also Response to Comment A3-57.

- A3-57 Sections 3.15 and 4.15 of the Proposed RMPA/Final EIS have been revised to further highlight the distinction between Section 106 of the National Historic Preservation Act and Executive Order 13007 (Sacred Sites) and the related protective measures.

Responses to Comment Set A4 – County of Santa Cruz

- A4-1 The commenter requests that the BLM refrains from offering oil and gas leases on federal land and other lands (public or private) with federal mineral rights within the County of Santa Cruz and to respect the local land use authority, which voted to ban oil and gas development in the County. Please refer to General Response GR-1 regarding local bans on oil and gas development and well stimulation treatments and General Response GR-2 regarding alternatives that would halt oil and gas leasing and development on BLM-administered federal mineral estate.

Responses to Comment Set A5 – National Park Service

- A5-1 The BLM initiated an Air Quality Technical Working Group for this RMPA as described in the Memorandum of Understanding regarding air quality analyses and mitigation for federal oil and gas decisions. The Air Quality Technical Support Document (TSD) reflects the interagency review and comments received from the Air Quality Technical Working Group (BLM, 2019).⁴ The Air Quality TSD appears as Appendix K of this Proposed RMPA/Final EIS. The TSD indicates that BLM agrees to notify agencies whose lands may be affected by future oil and gas activities on federal mineral estate to address potential adverse impacts to air quality related values.
- A5-2 The commenter addresses potential effect to wildlife resources at Pinnacles National Park (NP), including air quality effects that could impact California condors, tiger salamanders and California red legged frogs. The remainder of the comment focuses largely on California condor, stating that the National Park Service is concerned about potential impacts within the Central California flock's range. The comment summarizes background and status of the California condor, including the central California flock at Pinnacles NP and along the Big Sur coast and potential impacts the proposed activity as stated in the RMPA/EIS. The comment states that ranching and hunting traditions have supported California condor recovery efforts. The comment does not recommend additional mitigation measures or other revisions to the EIS.

Air quality impacts are addressed in Section 4.5 of the RMPA/EIS. This section analyzes impacts to air quality in terms of applicable standards, although it does not

⁴ BLM (Bureau of Land Management). 2019. Bureau of Land Management Central Coast Field Office Resource Management Plan Amendment, Technical Support Document, Air Quality. Prepared by: National Operations Center, California State Office, Bakersfield Field Office and Central Coast Field Office. January.

address project-related air quality impacts to endangered species. Instead, the applicable standards are based on potential human health effects. No air quality standards are available for endangered species; thus, the standards identified in the air quality analysis serve as the best available means to evaluate air quality impacts to all resources. Section 4.5.3 identifies mitigation measures to minimize or offset air quality effects of the RMPA. Regarding California condor, the comment is correct that potential impacts to California condor are described in the EIS (Section 4.12.2). Later in the same section, the RMPA/EIS identifies a series of mitigation measure designed to prevent or minimize these impacts. In addition, please refer to Responses to Comments B5-52 and B5-53.

Impacts to the environmental issue areas listed in the comment are addressed in the following sections of the RMPA/EIS: water quality (Sections 4.7 and 4.8), air quality (Section 4.5), night skies (Section 4.13), vegetation (Section 4.10 and 4.12), wildlife (Section 4.11 and 4.12), visibility and viewsheds (Section 4.13), and archaeological resources (Section 4.15). Impacts to wildlife due to noise associated with project activities are described in Section 4.11.2 (Wildlife Habitat) and 4.12 (Special Status Species).

Section 3.1.1 (Resources Not Considered) of the RMPA/EIS concludes that there would be no additional effects to Recreation as a result of the Oil and Gas Management not already addressed in the 2007 HFO RMP, and therefore, it is not discussed in detail in the RMPA/EIS. See Response to Comment A5-7 regarding the commenter's scoping comments on the Juan Bautista de Anza National Historic Trail.

A5-3 The commenter states that well stimulation treatments may impact water quality and quantity and that San Benito and Monterey counties have fracking bans. As discussed in Section 4.7.2 (Impacts Common to All Alternatives) of the RMPA/EIS, the maximum amount of groundwater use for the 37 wells would be 1,110 AF. This is a small amount of groundwater compared to the resources that occur in the groundwater basins. However, as stated, the impacts to groundwater quantity would depend on site-specific conditions that cannot be quantified at this time. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR (2015) mitigate the potential impacts to quantity of protected groundwater in the CCFO Planning Area. Please see General Response GR-4 for more details.

In response to the portion of the comment regarding well stimulation treatment bans, please see General Response GR-1.

A5-4 Please refer to General Response GR-3 regarding the 2015 RFD Scenario. BLM developed a new RFD Scenario in 2015 paying greater attention to the current and future use of well stimulation technologies, including hydraulic fracturing, acid matrix stimulation, and acid fracturing, as well as future uses of enhanced oil recovery. General Response GR-3 also discusses oil and gas development exceeding what is predicted in the RFD Scenario.

A5-5 The 14 management practices identified in Table 2-5 of the RMPA/EIS and suggested by the commenter for incorporation into the selected alternative are noted. As discussed in Section 1.6 (Related Federal, State, and Local Laws and Plans) of the

- RMPA/EIS, the Federal Land Policy and Management Act (FLPMA) of 1976 establishes the authority and provides guidance for how public lands are to be managed by the BLM. It defines BLM's mission to manage public lands on the basis of multiple use and sustained yield. BLM has a responsibility under the FLPMA to act as a steward for the development, conservation, and protection of Federal lands, by implementing multiple use principles and recognizing, among other values, the Nation's need for domestic sources of minerals from the public lands. Refer to Response to Comment A3-45 regarding the incorporation of stipulations into the selected alternative.
- A5-6 The commenter addresses California condor, water resources, and rural lifestyle. Regarding California condor, the National Park Service is concerned about potential impacts within the Central California flock's range. The comment summarizes background and status of the California condor, including the central California flock at Pinnacles NP and along the Big Sur coast and potential impacts the proposed activity as stated in the DEIS. Please refer to Responses to Comments A5-2, B5-52, and B5-53.
- A5-7 The RMPA recognizes the Juan Bautista de Anza National Historic Trail corridor in Section 3.15.3 (Regional Setting). Language describing BLM's commitment to proper management of this property has been added to Section 4.15. Mitigation measures in the RMPA/EIS would require further evaluation when specific exploration or development projects are proposed in order to discern potential effects on the Juan Bautista de Anza Trail. As suggested by the commenter, these measures would be consistent with NPS planning goals and the protections and plans for the trail as well as BLM guidance in the National Scenic and Historic Trails Manual (6250 and 6280).
- A5-8 As noted in Response to Comment A5-1. BLM would confer with federal land managers to determine the appropriate level of analysis at the leasing or APD phase for activities that may adversely affect Class I areas and AQRVs (BLM, 2019).

Responses to Comment Set B1 – Center for Biological Diversity

- B1-1 The commenter states that the Draft RMPA/EIS and Federal Register notice did not provide information on public meetings, and requests that the BLM hold Draft EIS/RMPA public meetings in Monterey, Salinas, and San Francisco.
- Following submittal of this commenter letter on January 17, 2017 and in accordance with NEPA, BLM issued an online press release on February 21, 2017 announcing the date, time, and location of the three public meetings held on the Draft RMPA/EIS. As described in a new Section 6.2.4.3 (Draft EIS/RMPA Public Meetings) in the Proposed RMPA/Final EIS, BLM held the three public meetings near Coalinga, Hollister and Salinas in March 2017. These locations were identified based on the areas of potential future oil and gas development, as described in the Reasonably Foreseeable Development Scenario for Oil and Gas (see Draft RMPA/EIS Appendix B) and areas of high community concern.

Responses to Comment Set B2 – Californians Against Fracking and Dangerous Drilling

- B2-1 The commenter's opposition to current and new oil and gas leases on BLM-administered public lands is noted. Please refer to General Response GR-2 regarding the

- reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the Draft RMPA/EIS.
- B2-2 The commenter expresses concern about the impact of well stimulation treatments on groundwater supplies. Please see General Response GR-4, which addresses groundwater quantity. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater quantity.
- B2-3 The comment notes that water depletion could affect habitat for steelhead trout or California condor, and that critical habitat for these species is located within areas identified as high oil and gas potential.
- Potential impacts of groundwater withdrawals may include decreases in river flows, described under “groundwater quantity” in Section 4.7.2. As discussed in Section 4.7.2 (Impacts Common to All Alternatives) of the RMPA/EIS, the maximum amount of groundwater use for the 37 wells would be 1,110 AF. This is a small amount of groundwater compared to the resources that occur in the groundwater basins and would not likely result in any discernable surface water impact, and thus no discernible impact to steelhead trout or California condor habitat.
- B2-4 The commenter states that “we don’t know what will happen if we allow waste injection into our aquifers.” The DOGGR regulations do not allow waste disposal into aquifers. As stated in the Potential Release Pathways subsection of Section 4.7.2 (Impacts Common to All Alternatives), “most of the disposal of flowback fluids occurs in Class II injection wells that inject fluids back into the hydrocarbon zones for enhanced oil recovery (EOR).” The Class II wells are regulated through US EPA’s UIC program and DOGGR has primary authority in California. The UIC program regulations were developed for the safe injection of Class II fluids in a manner that is protective of groundwater resources. In addition, Mitigation Measure GW-6a (Require Wastewater Disposal Wells to Inject Only into Exempted Aquifers to Protect Groundwater) in the DOGGR Final EIR prohibits the disposal of well stimulation fluids through the use of a Class II injection well into an aquifer.
- B2-5 The comment notes that oil and gas development would generate GHG emissions that contribute to global climate change. The impact assessment for GHG emissions (Section 4.6) serves as a proxy for impacts to climate change and includes quantification of GHG emissions and a discussion cumulative effects.
- B2-6 The commenter’s request for BLM to cancel current and proposed leases for oil and gas extraction is noted. Please refer to General Response GR-1 regarding the status of local measures prohibiting well stimulation treatments within the Planning Area and General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands.

Responses to Comment Set B3 – San Benito Rising

- B3-1 Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area. Text has been added to Section 1.2.2 (Planning Approach) in the Proposed RMPA/Final EIS that clarifies that oil and gas

operators must comply with both Federal and State statutes and regulations to the extent that State regulations are consistent with Federal law and with Federal lease rights.

B3-2 BLM received public comments identifying concerns about impacts to cultural resources from the local grassroots organization known as San Benito Rising. In their letter, San Benito Rising expressed concerns about the effects of oil and gas leasing and development on recorded and unrecorded archeological sites.

To assess the types and distribution of previously known archaeological and historical sites within the CCFO Planning Area, letters were transmitted to a broad range of potentially interested parties. Native American Tribes, local government agencies, and local historical societies were contacted for information regarding known resources. A records search was conducted at the CCFO to examine their archaeological site records and base maps as well as reports of recent cultural investigation on BLM surface lands, and interviews were conducted with key BLM staff at the CCFO. The California Office of Historic Preservation was contacted in regard to any existing historic properties listed on the National Register of Historic Places. Section 6.2.5.2 (Native American Tribes) in the Proposed RMPA/Final EIS has been updated to describe BLM's Native American tribal consultation that has occurred since scoping.

Given the limited number of formal surveys conducted, very few sites have been recorded. Therefore, Applied EarthWorks, Inc. obtained an additional records search from the California Historical Resources Information System (CHRIS) for ten randomly selected and broadly distributed split-estate parcels in Fresno, Contra Costa, San Benito, Monterey, San Mateo, and Santa Clara counties. The Northwest Information Center (Sonoma State University) and the Southern San Joaquin Valley Information Center (CSU Bakersfield) provided the data on these parcels encompassing a total of 12,790 acres within the Planning Area. As described in Section 3.15.4 (Current Conditions and Trends), the search results did not provide sufficient data to develop projections of potential archaeological and built environment site types including their densities and locations in the CCFO Planning Area. Specific sites and cultural locations will be addressed when specific exploration or development projects are proposed, as prescribed in Section 1.7 of Appendix D (Best Management Practices/Standard Operating Procedures).

The Draft EIS and Final EIS both identify assumptions for cultural resources in Section 4.15.1, including the basic premise that BLM does not approve any ground disturbing activities that may adversely affect any historic properties, sacred landscapes, and/or resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties or may not approve any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

The BLM will continue to implement government-to-government consultation with federally and non-federally recognized tribes on a case-by-case basis for site-specific

proposals which would help determine other issues of concern, including but not limited to access rights, disruptions of cultural practices, impacts on visual resources important to the tribes, and impacts on subsistence resources.

B3-3 The commenter expresses concerns about seismic activity linked to oil and gas activity, including the Central Coast region, and is opposed to waste water injection in the San Benito County vicinity. Additional text has been added to Section 3.3.4 (Geology, Current Conditions and Trends) in the Proposed RMPA/Final EIS that discusses a 1983 earthquake near Coalinga that was not associated with any previously known or suspected active fault. Please also see General Response GR-5 (Induced Seismicity).

B3-4 The commenter states that there is risk of groundwater contamination from well stimulation treatments on BLM land. This comment is acknowledged. The DOGGR regulations and the DOGGR Final EIR mitigation measures serve to mitigate potential impacts to groundwater quality from well stimulation treatments. A summary of the key protective measures in the regulations was provided in the DOGGR Final EIR (DOC, 2015, see Section 10.14.5 Impact Analysis and Mitigation Measures for Groundwater Resources). There are seven mitigation measures in the DOGGR Final EIR which mitigate potential impacts to groundwater quality. These impacts and mitigation measures are summarized in Table 10.14-20 of the DOGGR Final EIR. Please see General Response GR-4 for more details.

B3-5 The commenter states that the lack of baseline groundwater quality data impedes risk evaluation of well stimulation treatments. The commenter is correct. However, data collection and analysis for baseline data are required in order to obtain a permit for each well stimulation treatment project. DOGGR regulations require a groundwater monitoring plan that follows the requirements of the Model Criteria as part of the application process. In addition, well construction, cementing, and ADSA requirements in the DOGGR regulations serve to reduce potential impacts to quality of protected water. As discussed in Response to Comment B3-4 and General Response GR-4, there are mitigation measures in the DOGGR Final EIR which mitigate potential impacts to groundwater quality.

The commenter also expresses concern about the quantity of water required for well stimulation treatments. Please see Response to Comment A5-3 and General Response GR-4 (Water Supply and Contamination).

B3-6 The commenter states that many chemicals used during well stimulation treatments remain undisclosed and the risks, therefore, are impossible to understand. As stated in Section 3.4.2 (Regulatory Framework) of the RMPA/EIS, Section 1788 of the DOGGR regulations require public disclosures of chemical constituents of well stimulation fluids.

The commenter also states that chemicals used for well stimulation treatments are getting into aquifers and drinking water and notes that some oil wells have integrity failure. DOGGR regulations require demonstration of well integrity prior to approving a well stimulation; further well integrity is monitored throughout the process. The DOGGR regulations and mitigation measures in the DOGGR Final EIR protect

groundwater quality. Please see General Response GR-4 (Water Supply and Contamination) for more information on mitigation measures to protect groundwater quality.

- B3-7 The commenter states that agriculture is San Benito County’s number one employer and the County cannot afford the risk of contamination from well stimulation. The DOGGR regulations and mitigation measures in the DOGGR Final EIR protect groundwater quality. Please see General Response GR-4 regarding groundwater contamination.

Section 4.17 (Social and Economic Conditions), under Impacts Common to All Alternatives (Section 4.17.2) acknowledges that “...[i]ndividuals derive passive or non-use benefits from the existence of abundant wildlife, waterways, scenic resources, and extensive agricultural lands with little development and other amenities in many areas within the CCFO Planning Area.” However, the section goes on to note that all areas currently closed to oil and gas leasing under the 2007 Hollister Field Office RMP would remain closed under all alternatives. Additionally, all areas designated as No Surface Occupancy (NSO) would further maintain and perhaps enhance non-market values associated with natural amenities protected on these lands.

- B3-8 Please see Responses to Comments A5-2, B3-7, and D3-2.

- B3-9 The comment promotes open space as a management strategy that mitigates GHG emissions. The discussion of Alternatives Considered but Not Analyzed in Detail (Section 2.12) addresses the various management approaches, and the impact assessment for GHG emissions (Section 4.6) discusses the effects of the alternative resource management strategies analyzed for this RMPA.

- B3-10 The commenter expresses concern about allowing this RMP to be used for other BLM Field Offices in the State. As described in Section 1 (Introduction) of the Draft RMPA/EIS, in the Federal Register notice initiating this planning process, the BLM indicated it may also use this process to consider amending RMPs for four other field offices in California with oil and gas leasing and development (Bakersfield, Palm Springs–South Coast, Mother Lode, and Ukiah Field Offices). The BLM considered public comments from scoping, the results of the CCST reports, and an internal evaluation of the RMPs for these five field offices to determine the proper geographic scope of this RMPA. The Mother Lode and Ukiah field offices were not included in this RMPA because their resources are primarily natural gas with an affected environment and environmental effects that vary substantially from the Central Coast Field Office. At the time the court remanded the 2007 Hollister Field Office RMP, the Bakersfield and South Coast RMPs were already under revision. The BLM determined that it was more appropriate to continue with the revised RMPs rather than initiate a new amendment for these plans during the active revision process. Because the Central Coast does have oil development potential and was not in the midst of a plan revision, the BLM determined that the Central Coast Field Office would be the appropriate geographic scope for this particular RMPA.

The commenter’s opposition to the five alternatives considered in the Draft RMPA/EIS and support for the Ban Well Stimulation Technologies alternative are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation

Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set B4 – Sierra Club Loma Prieta Chapter

- B4-1 The commenter is concerned about the risk of earthquakes induced from oil and gas activity. Please see General Response GR-5 (Induced Seismicity).
- B4-2 The commenter states that California cannot afford to use 5 to 10 million gallons of water for well stimulation treatments. The DOGGR Final EIR contains mitigation measures to prevent well stimulation treatments from causing or contributing to over-draft conditions (GW-1a and GW-1b). These mitigation measures are described in detail in the DOGGR Final EIR and are summarized in Responses to Comments B4-2, B5-35, B8-14, and B8-15. These mitigation measures along with the DOGGR regulations mitigate potential impacts to groundwater quantity from well stimulation treatments. Please also see General Response GR-4 (Water Supply and Contamination).
- B4-3 The comment notes that global warming occurs with methane (CH₄) emissions, including those GHG that occur with oil and gas development. The impact assessment for GHG emissions serves as a proxy for impacts to climate change (Section 4.6) and includes quantification of GHG emissions, which include CH₄.
- B4-4 The comment points to a report of health problems and cancer risks near wells. The impact assessment for air quality (Section 4.5) indicates that adverse health effects could occur as a result of increased concentrations of air pollutants including hazardous air pollutants from construction activities and oil and gas production, and these activities could warrant further analysis at the leasing or APD phase.
- B4-5 The commenter asserts that tourism is an important industry in California and adding oil derricks to the skyline will not enhance the view from the affected BLM lands in the Planning Area, which the commenter asserts should be kept pristine for future generations. The Federal Land Policy and Management Act (FLPMA) of 1976 established the sometimes-competing guiding principles for management of public lands, which includes multiple use as well as sustained yield and environmental protection. Thus, BLM's management of public lands must balance various demands such as recreation use and tourism, scenic preservation, wildlife habitat needs, and resource extraction.

As noted in the RMPA/EIS, the overarching objective of BLM's Visual Resource Management (VRM) program is to manage public lands in a manner that will protect the quality of their scenic (visual) values. Section 4.13 (Visual Resources Management) of the RMPA/EIS addresses the BLM's Oil and Gas VRM Best Management Practices (BMPs), which include utilizing the BLM's VRM system to reduce or avoid adverse visual impacts from constructing oil and gas facilities that promote the types of visible landscape contrasts associated with that industry. The application of mitigation measures (see VR-1 through VR-10 and AQ-1 in Section 4.13.3) are intended to lessen the degree of potential adverse visual impacts from oil and gas leases associated with the various development alternatives in order to meet the applicable VRM class objectives (VRM Class I through Class IV) as defined in Section 3.13.2 of the RMPA/EIS.

As discussed in Section 4.17 (Social and Economic Conditions) of the RMPA/EIS, the southern portion of the CCFO Planning Area has a number of well-established oil and gas fields and development areas that have shaped the social and economic landscape of communities located proximate to them. The development of new wells and stimulation treatments under the 2015 RFD Scenario are expected to occur within or proximate to these existing fields within the CCFO Planning Area. Therefore, the oil and gas activities and well development identified under the 2015 RFD Scenario would not introduce activities or result in substantial visual impacts at a level that could adversely affect or change the local economies (including tourism levels) of local communities or areas.

B4-6 Please refer to General Response GR-1 regarding the status of local measures prohibiting well stimulation treatments within the Planning Area, how these measures were considered in the development of alternatives and whether they have been found to warrant any modifications to the preferred alternative.

B4-7 The commenter's opposition to current and new oil and gas leases on BLM-administered public lands is noted.

Responses to Comment Set B5 – Center for Biological Diversity & Sierra Club

B5-1 This comment contains several issues but culminates in four (4) specific items requested by the commenter. The responses to all comments provided in Comment Set B5 further address many of the topics raised within this comment. However, the following responds to each of the four requests specifically identified within this comment:

1. Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.
2. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.
3. Sections 3.6 and 4.6 (Climate Change/Greenhouse Gas Emissions) of the RMPA/EIS provide the regulatory framework, baseline conditions, and provides an assessment of impacts to GHG emissions (a proxy for impacts to climate change) from activities allowed under the RMPA alternatives. The primary GHG impacts that can be reasonably expected to occur are emissions from the combustion of fossil fuels and from releases of CO₂ and methane due to oil and gas development and production. Discussions of impacts to other resources affected by climate change appear in the respective sections in Chapter 4 of the Draft RMPA/EIS. As discussed in the assumptions presented in Section 4.6, all activities must comply with applicable laws and regulations and may be subject to review for certain types of GHG emissions by the local air permitting authority. Therefore, utilizing this as a foundation for the analysis presented in Section 4.6, the RMPA/EIS considers current information regarding climate change.
4. Section 1.2.2 (Planning Approach) of the RMPA/EIS explains that oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM

environmental analysis and authorization. Environmental review under NEPA is required at each phase. Therefore, future projects would also conduct specific project-level assessments of potential impacts to air, water, induced seismicity and human health; and may conduct Health Impact Assessments. Sections 4.4 (Hazardous Materials and Public Safety), 4.3 (Geology), 4.5 (Air Quality and Atmospheric Conditions), 4.7 (Groundwater Resources), and 4.8 (Surface Water Resources) of the RMPA/EIS provide a detailed analysis of the potential impacts to these resources under the RMPA alternatives.

- B5-2 The comment states that the RFD Scenario should be revised under the premise that a greater level new well development and land disturbance, a greater level of oil and gas activity, and “possible future production growth” should be reflected in the RFD Scenario. Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.
- B5-3 Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.
- B5-4 Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.
- B5-5 Please refer to General Response GR-1 regarding the status of local measures prohibiting well stimulation treatments within the Planning Area, how these measures were considered in the development of alternatives and whether they have been found to warrant any modifications to the preferred alternative.
- B5-6 Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.
- B5-7 Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.
- B5-8 The comment suggests that the proposed action may not conform to the applicable implementation plans for air quality attainment because a “full and complete” conformity analysis could be required. As noted by the comment, the requirement to make a conformity determination is triggered if the action’s direct and indirect emissions exceed certain *de minimis* threshold levels. These levels as promulgated in 40 CFR 93.153 are shown in EIS Table 3.5-4. The emissions inventory in Tables 4.5-1 and 4.5-2 shows that general conformity does not apply to the proposed action and demonstrates that development and operation consistent with the RFD Scenario would not be likely to exceed *de minimis* levels.
- B5-9 The comment focuses on the 8-hour ozone national ambient air quality standard (NAAQS) that was approved by U.S. EPA in 2015. The attainment designations for the air basins potentially affected by the proposed action are shown in EIS Tables 3.5-1, 3.5-2, and 3.5-3. Attainment designations have yet to be made for the EPA’s 2015 ozone NAAQS, which as noted by the comment, may occur in 2017. Until the U.S. EPA makes a final ruling to change the attainment status, the information in the EIS remains accurate as it reflects the most-recently effective attainment designations.

- B5-10 The comment points to the interagency Memorandum of Understanding (MOU) regarding air quality analyses and mitigation for federal oil and gas decisions. Consistent with the MOU, the EIS includes a generalized emissions inventory for the RFD Scenario for the purpose of considering whether air quality impact modeling would be required. The emissions inventory in Tables 4.5-1 and 4.5-2 shows that general conformity does not apply to the proposed action. Emissions would be below levels that would contribute substantially to an existing or projected violation, or materially contribute to adverse cumulative air quality impacts, as described in MOU Section V.E.3.
- B5-11 The basis for the emissions estimates in EIS Tables 4.5-1 and 4.5-2 appears in the Air Quality TSD and in the administrative record, which shows examples of off-road equipment use factors and on-road transportation activity levels, along with the emission factors. The Air Quality TSD appears as Appendix K of this Proposed RMPA/Final EIS. Site-specific development proposals could require a demonstration of conformity, if site-specific emissions exceed applicable *de minimis* levels.
- B5-12 The comment identifies four attributes making up the definition of indirect emissions. The basis of the quantified direct and indirect emissions with citations appears in the administrative record and has been made available to parties requesting details.
- B5-13 The basis for the emissions estimates in EIS Tables 4.5-1 and 4.5-2 appears in the administrative record. The emissions inventory provides a quantitative basis for BLM consideration of the potential air quality effects at this stage of NEPA.
- B5-14 Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.
- B5-15 The commenter's opposition to the five alternatives considered in the Draft RMPA/EIS and support for the Ban Well Stimulation Technologies alternative are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the Draft RMPA/EIS.
- B5-16 The commenter's opposition to the five alternatives considered in the Draft RMPA/EIS and support for the Ban Well Stimulation Technologies alternative are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the Draft RMPA/EIS.
- B5-17 The commenter's opposition to the five alternatives considered in the Draft RMPA/EIS and support for the Ban Well Stimulation Technologies alternative are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the Draft RMPA/EIS.
- B5-18 Chapter 5 (Cumulative Impacts) of the Draft RMPA/EIS provides a detailed cumulative analysis of each issue area considering the appropriate geographic scope due to the different nature and extent of the impacted resource area. Section 5.2 (Past, Present,

and Reasonably Foreseeable Future Actions) identifies past, present, and probable projects the 12 counties within the boundary of the CCFO Planning Area used within the cumulative analysis. As identified, these projects include many oil and gas developments and other energy/mineral projects. The Council on Environmental Quality (CEQ) suggests cumulative impact analyses should focus on meaningful impacts and not exhaustively analyze all possible cumulative impacts. Therefore, the cumulative impact analysis in the Draft RMPA/EIS focuses on past, present, and future actions that are anticipated to have environmental impacts impacting the same resources as the direct and indirect impacts identified for each of the RMPA alternatives. Cumulative projects include those actions that result in meaningful impacts to historically important resources, those with a potential for violating legal standards or laws, or other identified projects or actions in the geographic scope that relate to the identified issues.

The comment also indicates a concern towards the environmental harms that may be attributable to other types of land use authorized by BLM leasing, including grazing. Grazing is a baseline activity that is part of the affected environment. The EIS addresses the impacts of the proposed action, in the context of these baseline activities, which the proposed action would not change.

B5-19 The comment indicates a concern about the wide range of the air pollutants and greenhouse gas emissions occur during oil and gas operations. The range of contaminants of concern includes hazardous air pollutants (HAPs), hydrocarbons including VOCs and other compounds that are not regulated as VOCs (methane and ethane), hydrogen sulfide, and particulate matter in airborne dust and diesel exhaust.

Information on methane appears in the analysis of EIS Section 4.5, Climate Change/Greenhouse Gas Emissions. Methane and ethane are not included within the federal definition of volatile organic compounds (VOC) because these “have been determined to have negligible photochemical reactivity” as stated in 40 CFR 51.100(s).

Information on H₂S appears in the analyses of Section 4.4, Hazardous Materials and Public Safety and Section 4.5, Air Quality and Atmospheric Conditions. Although H₂S is dangerous, this contaminant is not designated as a HAP in Section 112 (b) of the federal Clean Air Act (42 USC Section 7412(b), and H₂S is not a toxic air contaminant (TAC) as defined in California regulations (17 CCR Sections 93000-93001).

Dust and diesel exhaust would be emitted in the forms of PM₁₀ and PM_{2.5}, and these are quantified within the emissions inventory of Section 4.5, Air Quality and Atmospheric Conditions.

The comment notes the difficulties in precisely quantifying emissions from oil and gas operations and provides citations to supporting literature focusing on similar operations around the nation including areas where oil and gas production may dominate the inventory. The EIS describes the regulatory framework for controls of these emissions and includes an emissions inventory that provides a quantitative basis for BLM consideration of the potential air quality and public health effects at this stage of NEPA. Although difficult to precisely quantify the emissions related to the proposed action, the impacts common to all alternatives reveal a level of potential emissions that would be a very small fraction of the overall regional inventory.

- The comment speaks to the air quality and health risk effects on environmental justice communities. Public exposure to hazards of oil and gas operations is addressed in Section 4.4.2 (Hazardous Materials and Public Safety: Impacts Common to All Alternatives) which includes airborne hazards and silica sand, mentioned in the comment. The impacts on environmental justice communities are addressed in Oil and Gas Development Environmental Justice Effects (Section 4.17.2).
- B5-20 The comment identifies studies of the emissions from oil and gas operations and points to data gaps in the terms of specific chemicals being used and the potential exposures experienced by receptors near the sources. When site-specific project development proposals allow quantitative analysis of air quality impacts near the site of the proposal, such analysis could be necessary at the leasing or APD phase.
- B5-21 The comment identifies the types of air pollution sources related to oil and gas operations and the likelihood of pollutants contributing to adverse region-wide effects. The comment suggests additional analysis should occur in advance of site-specific project development proposals. However, because the need for additional quantitative analysis of air quality impacts would depend on the nature of each site-specific project development proposal, which includes identification of site-specific locations, types of sources (such as drill rig engines, pump engines, flares, and component contributing to fugitives), and surrounding land uses, such analysis could be necessary at the leasing or APD phase.
- B5-22 The comment identifies the types of health and environmental effects attributable to air pollution sources of all types including the sources related to oil and gas operations. Information on the adverse health effects of air pollutants appears in EIS Section 3.5, Air Quality and Atmospheric Conditions, and the impacts common to all alternatives appear in Section 4.5, Air Quality and Atmospheric Conditions.
- B5-23 The comment identifies the types of health effects found in studies focusing on proximity of the public or workers to oil and natural gas operations. The comment suggests additional analysis should occur to consider and quantify the near-field health effects of chemicals that may be used, depending on site-specific proposals. However, because the need for additional quantitative analysis of air quality impacts would depend on the nature and quantities of the sources, and materials used, and on the surrounding land uses, such analysis would be completed at the leasing or APD phase.
- B5-24 The comment requests additional detail on the inventory of GHG emissions presented in EIS Section 4.6, Climate Change/Greenhouse Gas Emissions. The EIS includes a generalized emissions inventory for the RFD Scenario for the purpose of GHG quantification. The basis for the emissions estimates in EIS Tables 4.6-1 and 4.6-2 and the estimated volume of crude oil anticipated to be produced annually appears in the administrative record and has been made available to parties requesting details.
- B5-25 Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.

- B5-26 The comment asserts that the energy intensity and life-cycle carbon intensity for the production of crude oil under the RFD Scenario would be relatively high when compared with statewide average carbon intensity for oil production. Given the wide range of potential activities that could occur within the leasing, and the difficulties in precisely quantifying emissions from oil and gas operations, the EIS presents its emissions inventory as “estimated” to reflect the embedded uncertainties. The amount of crude oil and gas produced, the actual amount of energy consumed in order to produce and treat the given barrels of oil, and the resulting carbon intensities will vary widely depending on the nature of each site-specific proposal. Additionally, the EIS notes the regulatory framework that includes California’s program specifically aimed at reducing the life-cycle carbon intensity of transportation fuels.
- B5-27 The global warming potential of methane reported in the EIS matches the factor contained in the current version of U.S. EPA regulations in 40 CFR 98, Mandatory Greenhouse Gas Reporting (specifically, in Table A-1 to Subpart A of Part 98—Global Warming Potentials). Methane is included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in EIS Table 4.6-2. The analysis does not quantify the effects of methane controls previously contemplated by BLM or the State regulations for methane that were approved in April 2017.
- B5-28 The comment states that investments in fossil-fuel related infrastructure or development should not be pursued, and that BLM should limit GHG emissions by “keeping fossil fuels in the ground.” The comment reviews and describes a body of studies that promote conservation of oil and gas resources as a means of limiting GHG emissions. Closing Federal mineral estate to oil and gas leasing and development was considered as an alternative, but this was not analyzed in detail for the reasons outlined in EIS Section 2.12 and in General Response GR-2.
- B5-29 The comment asserts that the EIS is arbitrary in the discussion of consistency with California’s climate change programs that apply to oil and gas development activities and asserts that new leasing would be inconsistent with “a carbon budget” that seeks to avoid catastrophic climate change. The EIS identifies California’s far-reaching climate change programs and identifies many of the primary regulations, policies, and programs that are being implemented across California’s entire economy to bring about GHG reductions. Oil and gas activities in California, including those within federal jurisdiction, are subject to GHG reporting, direct controls, and the Cap-and-Trade Program. The regulatory framework of these programs allows the ongoing production of fossil fuel resources, and plans for the eventual decline of these activities, in a manner that is designed to achieve California’s targets.
- B5-30 The comment asserts that more-protective mitigation measures should be considered for reducing GHG emissions. This would occur during review of project proposals at the leasing or APD phase.
- B5-31 The comment identifies a range of adverse human health effects such as carcinogenic, developmental, reproductive, and endocrine disruption effects that are correlated with exposure to air pollutants common to oil and gas development. The impact assessment for air quality (Section 4.5) indicates that adverse health effects could occur as a result of increased concentrations of air pollutants including hazardous air pollutants from

construction activities and oil and gas production, and these activities could warrant further analysis at the leasing or APD phase.

B5-32 The comment points to a study of traffic accident rates in portions of Pennsylvania with relatively recent growth in oil and gas activity. The affected environment described in the EIS Section 3.18, Transportation and Access, as well as other discussion for aesthetics, noise, and visual resources, includes a baseline of oil and gas development in the study area. This baseline of traffic related to oil and gas activity includes a certain likelihood of accidents.

B5-33 The comment notes that the EIS does not include a quantitative health impact assessment. Because the need for additional quantitative health impact assessment would depend on the nature and quantities of contaminants release and on the surrounding land uses, such analysis could be warranted at the leasing or APD phase.

B5-34 The commenter states that the EIS must account for impacts from Enhanced Oil Recovery (EOR) operations and the development of additional conventional and unconventional resources. The commenter notes the large quantities of water used are used for EOR operations at four fields in the CCFO Planning Area. The large volumes of water used for EOR and referenced in the comment are typically providing pressure for the entire field rather than just one well. Although hydraulic fracturing may increase production for one well, there may not be a need to increase EOR water use. Increased production from hydraulic fracturing may increase water injection overall because of a commensurate increase in produced water. Water-intensive operations have been assessed in Section 4.7.2, assuming a single well could use up to about 10 million gallons and that 37 wells could use up to 362 million gallons. DOGGR regulations and DOGGR Final EIR mitigation measures minimize the amount of groundwater that can be used reducing this effect, particularly in overdrafted basins (See DOGGR Mitigation Measures GW-1a and GW-1b).

Section 4.8.2 (Water Use and Supply) includes an evaluation of the water expected to be used by the project and the likely effects on water availability for the region. It was found that total project water use would be approximately 0.0003% to 0.01% of the annual water use by other users in the Salinas Valley alone. DOGGR Final EIR (Mitigation Measure SWR-3a) (Ensure Adequate Water Availability) would provide added protection to water supply.

B5-35 The commenter states that the RFD Scenario underestimates the number of conventional and unconventional wells to be drilled. The 2015 RFD Scenario assumes a maximum of 37 wells over the 20-year planning horizon and an increase in this number of wells is not expected. Please see General Response GR-3.

The commenter also states that site-specific conditions should be considered for water quantity impacts. Please see General Response GR-4.

In addition, as described in Section 1.2.2 (Planning Approach), oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. This is just the planning stage; environmental review under

NEPA is required at each phase and additional mitigation measures may be necessary in the future. Please see Response to Comment A3-23.

B5-36 The commenter provides several potential release pathways by which water quality may be impacted which are identified in Section 4.7.2 (Impacts Common to All Alternatives). This section describes, in general terms, how the DOGGR regulations and the mitigation measures in the DOGGR Final EIR address these potential impacts. The comment also suggests that the mitigation measures are inadequate but fails to recognize that many of the additional measures suggested in the comment are adequately covered in the permanent DOGGR regulations. A summary of the key protective measures in the DOGGR regulations is provided in the DOGGR Final EIR (DOC, 2015, see Section 10.14.5 Impact Analysis and Mitigation Measures for Groundwater Resources).

As the commenter has documented, there have been prior environmental incidents believed to be a result of subsurface geological and hydrological communication to groundwater sources and outreach wells, driven by well stimulation (e.g., hydraulic fracturing). These issues are generally attributed to poor well completion and cementing practices, and inadequate attention to stimulation project design. In 2013, the California State Legislature passed SB 4, which is aimed at providing environment protection from many of the underlying causes of environmental incidents associated with Well Stimulation Technology (WST).

The bill directs the Department of Conservation to implement regulations providing for environmental protection during and after WST operations. These regulations are administered through the Division of Oil, Gas, and Geothermal Resources (DOGGR), and are contained in Title 14 Division 2 Chapter 4 Subchapter 2 Environmental Protection, Article 4 Well Stimulation Treatment of the California Statutes and Regulations. Several of the regulations contained in this article address the concerns raised by the commenter, which will be discussed below.

Applicability of Regulations Promulgated under SB 4:

As the EIS stated, on public lands, including those covered by the RMPA, oil and gas operators must comply with both Federal and State statutes and regulations, to the extent that State regulations do not contradict Federal law or interfere with Federal lease rights. In California, the relevant State law includes hydraulic fracturing regulations promulgated under California's Senate Bill 4 (SB 4) as noted above.^[1] There are various applicable federal laws and regulations related to potential impact on clean air and water, and handling of waste generation due to WST, as discussed in the EIS.

The regulations resulting from SB 4 are aimed specifically at the mitigation of the causal factors that contribute to environmental impacts, and the mandatory preventative practices and corrections in the State regulations would be in addition to the requirements set forth by the applicable federal regulations. The State regulations contain

^[1] The final regulations promulgated under SB 4 amend sections of California Code of Regulations Title 14, Division 2, Chapter 4, Subchapter 2.

water testing and monitoring components for surface and groundwater near the fracturing treatment site, as well as area analysis of the treatment area to ensure the geological and hydrological isolation of the formation during and after WST. Integrity of the well is verified with pressure testing, a cement evaluation, and subsequent monitoring after WST. These State regulations improve the likelihood that WST activities occur as planned.

The commenter also provides additional comments about the impacts to groundwater quality and quantity based on the US EPA's hydraulic fracturing study and suggests three conceptual pathways for injection fluids to migrate that require analysis (see Responses to Comments B5-37 through B5-39). DOGGR regulations require a detailed geologic assessment that analyzes these potential pathways prior to injection.

The commenter states the opinion that water quality impacts have not been properly evaluated in the EIS and requests additional mitigation measures. See General Response GR-4 regarding water quality impacts.

Discharge of inadequately-treated hydraulic fracturing wastewater and produced water from the same wells to surface water and agriculture is prohibited by the Clean Water Act as administered by the State Water Resources Control Board. The SWRCB does not allow produced water from well stimulation to be used on food crops.

B5-37 The commenter states that well stimulation fluids are injected directly into relatively shallow formations that may contain high quality water. The well casing requirements of the DOGGR regulations and the mitigation measures in the DOGGR Final EIR do not allow for injection of well stimulation fluids into protected groundwater. As stated in Section 4.7.2 (Impacts Common to All Alternatives), "The SB 4 regulations require cement placement in surface casing from the base of the casing to the surface and preferably through the freshwater zone (3,000 mg/L). The DOGGR Final EIR (DOC, 2015) includes a mitigation measure (Mitigation Measure GW-4b) requiring a 500-foot well seal across the base of protected water if the hydraulic fracturing zone is below the base of the protected water. If the hydraulic fracturing zone is within protected water, then this mitigation measure requires a well seal along the entire casing string, from the bottom of the well to the surface." In addition, Mitigation Measure GW-6a in the DOGGR Final EIR requires wastewater disposal wells to inject only into exempted aquifers. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater quality from well stimulation treatments. Please also see General Response GR-4.

B5-38 The commenter states that the Draft RMPA/EIS fails to include mitigation measures requiring well stimulation to occur where there is a confining layer present. Well stimulation occurs in oil or gas bearing rock formations, or reservoirs, and reservoir rocks in California consist primarily of sandstones. Natural subsurface pathways within reservoir rocks, such as geologic faults or existing fractures, could serve as conduits for upwards or lateral migration of well stimulation fluids. As stated in Section 4.7.2 (Impacts Common to All Alternatives), the DOGGR regulations "require an analysis of suspected faults prior to well stimulation to identify and analyze any potential for hydraulic fracturing fluid to migrate outside of the zone being fractured." Consequently, the DOGGR regulations and the mitigation measures in the DOGGR Final

EIR mitigate potential impacts to groundwater quality from well stimulation treatments.

- B5-39 The commenter states that well stimulation fluids may migrate laterally into portions of the aquifer that contain usable water. As described in Response to Comment B5-38, operators are required to analyze the potential for hydraulic fluid to migrate outside of the zone being fractured.

As stated in Section 4.7.2 (Impacts Common to All Alternatives), DOGGR requires groundwater monitoring to track the performance of the regulations and mitigation in protecting groundwater resources. The State Water Resources Control Board developed the Model Criteria, which includes three main components: 1) Area specific groundwater monitoring near stimulation wells by operators, 2) Requirements for designated contractor sampling and testing, and 3) Regional scale groundwater monitoring implemented by the State Water Board. As of July 2015, a groundwater monitoring plan must be submitted to the State Water Board that follows the requirements of the Model Criteria.

- B5-40 The comment introduces multiple comments on biological resources. It summarizes the Draft RMPA/EIS's review of special-status species potentially occurring in the Planning Area and states that the Draft RMPA/EIS does not adequately address potential impacts to those species. The comment states that sufficient information is available to identify areas that should be set aside for conservation purposes, and that BLM should consider limiting oil and gas activities in those areas. It states that the Draft RMPA/EIS does not present an alternative to prevent oil and gas projects in essential and critical habitat areas. It states that requirements for "protocol" sensitive species surveys are not specified in the Draft RMPA/EIS. The comment recommends thorough field surveys for biological resources within potential lease areas, as well as public disclosure of the survey results.

The RMPA/EIS analyzes a reasonable range of alternatives, including Alternatives B and D that would close large habitat areas from oil and gas development. Potential future activities within sensitive habitat areas or other high-value conservation areas would undergo additional analysis for site-specific impacts during the NEPA review for a lease or an individual well and would be subject to BMPs, SOAs, and Statewide Stipulations identified and described throughout the remainder of Responses to Comment Set B5. These measures would adequately avoid or mitigate potential effects to sensitive biological resources.

Regarding the recommendation for protocol field surveys for listed and sensitive species, the EIS includes the requirement for these surveys. Appendix D specifies that "[s]urveys will comply with current BLM, USFWS, NMFS and CDFW protocols, to the extent consistent with federal law" (Section 1.4.1) and "[t]he USFWS, NMFS and CDFW protocols will be employed to conduct special status species surveys" (Section 1.4.4). Any field survey data collected by BLM or submitted to the BLM will be publicly available.

- B5-41 The comment addresses San Joaquin kit fox. It reviews conservation challenges, including adequate habitat acquisition, and states that the Draft RMPA/EIS does not

acknowledge the Planning Area's importance for the species, or describe potential effects of oil and gas exploration would affect recovery, including core areas, "satellite" areas, and linkages. The comment states that the EIS does not indicate how much habitat (core, satellite, linkage) would be affected under each alternative, and that appropriate mitigation cannot be identified without this information.

The specific locations of potential biological resources effects of exploration and other oil and gas activities cannot be identified at this time because this is a planning document and not a review of a specific lease, thus the potential impacts to San Joaquin kit fox core, satellite, and linkage habitats cannot be quantified. Nonetheless, the SOPs and BMPs identified for avoidance and minimization of San Joaquin kit fox impacts identified in Appendix D (Sections 1.4 and 1.8.4) serve to avoid or mitigate the potential impacts, regardless of the location. The RMPA will be consistent with San Joaquin kit fox recovery. Statewide Stipulations (Appendix C) specifies that "Surface disturbance will also be prohibited if the [USFWS Section 7] consultation concludes that the proposed action is inconsistent with the recovery needs of the listed species as identified in an approved USFWS Recovery Plan. Although Recovery Plans are not requirements, BLM has voluntarily chosen to apply their recommendations through the land use plan, and these recommendations are reflected in this stipulation." Thus, BLM state policy necessitates that activities authorized under the RMPA would conform to USFWS recovery requirements. This stipulation applies under any of the alternatives analyzed in the EIS. This stipulation has been added under "assumptions" in EIS Section 4.12.1.

B5-42 The comment addresses measures identified in Appendix D of the Draft RMPS/EIS, stating that these measures are inadequate for San Joaquin kit fox, as follows: (1) Surveys for San Joaquin kit fox should not be limited to their dens, but also the animals themselves, because absence of dens does not indicate absence of foraging or other activities; (2) Protection of dens should extend beyond the breeding/pupping season, and passive relocation activities should be conducted pursuant to an incidental take permit; (3) blasting, seismic surveys, and other non-fatal disturbance activities may affect San Joaquin kit fox activities year around (not limited to only the breeding season) and would require an incidental take permit.

Appendix D specifies that "Surveys will comply with current BLM, USFWS, NMFS and CDFW protocols, to the extent consistent with federal law" (Section 1.4.1) and "The USFWS, NMFS and CDFW protocols will be employed to conduct special status species surveys" (Section 1.4.4). These requirements are applicable for San Joaquin kit fox, as well as other species. Thus, as recommended in Comment B45-40, surveys for San Joaquin kit fox will conform to agency protocols. Nothing in Appendix D limits protection of San Joaquin kit fox dens to the breeding/pupping season (see Appendix D, first item under Methods for Minimizing Take: San Joaquin Kit Fox). Incidental take permits are required for activities that would constitute take as defined by the state or federal Endangered Species Act and subsequent clarifications. To the extent that activities cited in the comment could result in take, the comment is correct, that incidental take permits would be required. However, many activities, potentially including the activities named above, could cause minimal effects to the listed species,

not rising to the “take” threshold, and therefore would not necessitate take authorization.

B5-43 The comment reviews the state and federal protection status of blunt-nosed leopard lizard, noting the “fully protected” state designation, and conservation objectives identified by the USFWS for potential down-listing from endangered to threatened. The comment notes that existing Areas of Critical Environmental Concern (ACECs) in the Ciervo-Panoche recovery area do not provide for 5,997 acres of contiguous habitat, which was identified by USFWS among the down-listing criteria for the species. Further, the comment states that all alternatives would allow for oil & gas development between the two ACECs and therefore would preclude down-listing.

The Draft RMPA/EIS accurately indicates the Fully Protected status of blunt-nosed leopard lizard in Section 3.12 (see Table L-1 in Appendix L). The definition “fully protected” at the end of the table has been revised as recommended in the comment.

The comment presumes that any new development in the area between the two ACECs would preclude establishment of a contiguous 5,997-acre conservation area. This is incorrect. A future 5,997-acre conservation area need not be established by protecting the entire area between the two existing ACECs. Instead, if future development were to affect portions of the intervening area, other portions (either within the intervening area, or elsewhere in the Ciervo-Panoche recovery area) could contribute to the 5,997-acre contiguous area down-listing criterion identified by USFWS. Future oil and gas development as contemplated in the RMPA would not prevent accomplishment of the down-listing criterion.

The Recovery Plan for Upland Species of the San Joaquin Valley (FWS 1998) identifies a system of reserves referred to as “core recovery areas” within which certain tasks need to be accomplished in order for down- or delisting to occur. One such recovery area, the Ciervo-Panoche Natural Area (CPNA), is within the Planning Area (Fig. 2-1 to Fig. 2-6). The Proposed RMPA would contribute to the recovery of upland species of the San Joaquin Valley because federal minerals would require NSO for fluid mineral leasing in ACECs in the CPNA under the BLM’s preferred alternative.

Development and analysis of new alternatives is not necessary for RMPA compatibility with blunt-nosed leopard lizard down-listing criteria. In addition, Statewide Stipulations (Appendix C) specifies that “Surface disturbance will also be prohibited if the [USFWS Section 7] consultation concludes that the proposed action is inconsistent with the recovery needs of the listed species as identified in an approved USFWS Recovery Plan. Although Recovery Plans are not requirements, BLM has voluntarily chosen to apply their recommendations through the land use plan, and these recommendations are reflected in this stipulation.” Thus, BLM state policy necessitates that activities authorized under the RMPA would conform to USFWS recovery requirements. This stipulation applies under any of the alternatives analyzed in the EIS. This stipulation has been added under “assumptions” in EIS Section 4.12.1.

The specific locations of potential biological resources effects of exploration and other oil and gas activities cannot be identified at this time, thus the potential impacts to blunt-nosed leopard lizard habitat cannot be quantified. Nonetheless, the management

- actions, SOPs and BMPs for avoidance and minimization of impacts identified in Appendix C and Appendix D (Sections 1.4 and 1.8) serve to avoid or mitigate the potential impacts, regardless of the location.
- B5-44 The comment reviews the SOPs and BMPs for blunt-nosed leopard lizard, stating that these measures are inadequate, and recommends several revisions, as follows: Field surveys should not be limited to burrows; avoidance and protection measures should not be limited to burrows; in addition to BLM, the state and federal wildlife agencies should be informed if blunt-nosed leopard lizards are observed and should be provided monitoring reports or other documents such as operating plans. Nighttime activity scheduling could conflict with avoidance measures for nocturnal species; and specific vehicle speed limits, vehicle escorts, and road surveys are needed to prevent road mortality of blunt-nosed leopard lizards.
- Regarding field surveys, Appendix D specifies that “Surveys will comply with current BLM, USFWS, NMFS and CDFW protocols, to the extent consistent with federal law” (Section 1.4.1) and “The USFWS, NMFS and CDFW protocols will be employed to conduct special status species surveys” (Section 1.4.4). These requirements are applicable for blunt-nosed leopard lizard, as well as other species.
- Regarding avoidance of habitat surrounding burrows, Appendix D requires additional measures for avoidance of take. In particular, a biological monitor may allow certain activities in burrow areas which will be documented. Thus, the monitor may not allow incompatible activities in the burrow areas.
- All reports submitted to BLM will be available to the public, including state and federal wildlife agencies.
- The comment is correct, that nighttime activities could conflict with other resource protection measures, including measures for other special-status species. The full text of the cited BMP provides sufficient flexibility beyond the nighttime activity scheduling, including “during blunt-nosed leopard lizard inactivity periods (generally when temperatures are below 77 degrees F and above 99 degrees F)” so that nighttime activities is not a requirement but is only one among several scheduling options. The conclusion whether nighttime activity scheduling is prudent can readily be made on a site-specific basis.
- Regarding road mortality, the comment is correct that vehicle strikes caused numerous Mojave fringe-toed lizard mortalities at another site. Mitigation Measure AQ-1 includes limiting the speeds of construction vehicles on unpaved surfaces to 15 miles per hour which would reduce the road mortality.
- B5-45 The comment addresses south-central coast steelhead. The comment reviews the locations of occupied habitat, its legal status, and historical population declines. The comment states that the DEIS fails to adequately address direct, indirect and cumulative impacts to the steelhead, including impacts of surface runoff and hydrocarbon pollution of streams. Additionally, the comment states that BMPs and SOPs for the steelhead are inadequate, because they will not prevent potential spills or stop the proliferation roads, which cause excessive sediment to enter streams and damage steelhead habitat.

Regarding potential impacts to steelhead, Section 4.12, addressing this and other special-status species, notes that “other potential impacts to special status species would be similar to those discussed in Sections 4.10 and 4.11.” Section 4.11 (Wildlife Habitat), in turn, describes the potential adverse effects of surface water or groundwater contamination on plants, fish, and wildlife, as well as mitigation for those effects, in some detail (see 4.11.2). This analysis and mitigation is applicable to potential contamination to steelhead habitat and no further analysis has been added. Section 4.11.2 of the EIS properly discloses potential impacts of the RMPA to these species insofar as those impacts can be anticipated at this time, although the site-specific impacts must, by necessity, be addressed on a case by case basis for each future APD. In addition, Section 4.8 of the RMPA/EIS addresses surface water impacts, including an analysis of potential spills and sedimentation. That section cites numerous protective measures that would be applicable to steelhead habitat. Additional BLM requirements for hydraulic fracturing and well stimulation activities are described in Section 3.8.2, including measures for surface water protection, and setbacks from intermittent and perennial streams. The RMPA includes extensive protective measures for surface waters, including measures that prevent or mitigate for spills or sedimentation. These measures are applicable for steelhead habitat and provide adequate protection for the species.

- B5-46 The comment addresses giant kangaroo rat (GKR). The comment notes the current distribution and historic decline of GKR, notes that San Joaquin kit fox prey on GKR, and states that “the plan area is excellent habitat” for both species. The comment reviews the USFWS 5-year review for GKR and the Recovery Plan for Upland Species of the San Joaquin Valley, noting conservation goals such as 100% of occupied habitat in the Ciervo-Panoche Recovery Unit. The comment states that “none of these recommendations are acknowledged the DEIS.” The comment identifies movement corridors and linkages as important considerations that are not identified in the EIS. The comment cites development of the Panoche Solar as an important cumulative impact to GKR, such that other parts of its range are increasingly important.

The comment is correct, that San Joaquin kit fox prey on GKR and portions of the plan area are suitable habitat for both species. Regarding compatibility with USFWS recovery goals for GKR, the Statewide Stipulations (Appendix C) specifies that “Surface disturbance will also be prohibited if the [USFWS Section 7] consultation concludes that the proposed action is inconsistent with the recovery needs of the listed species as identified in an approved USFWS Recovery Plan.

The Recovery Plan for Upland Species of the San Joaquin Valley (FWS 1998) identifies a system of reserves referred to as “core recovery areas” within which certain tasks need to be accomplished in order for down- or delisting to occur. One such recovery area, the Ciervo-Panoche Natural Area (CPNA), is within the Planning Area (Fig. 2-1 to Fig. 2-6). The Proposed RMPA would contribute to the recovery of upland species of the San Joaquin Valley because federal minerals would require NSO for fluid mineral leasing in ACECs in the CPNA under the BLM’s preferred alternative.

Although Recovery Plans are not requirements, BLM has voluntarily chosen to apply their recommendations through the land use plan, and these recommendations are

reflected in this stipulation.” Thus, BLM state policy necessitates that activities authorized under the RMPA would conform to USFWS recovery requirements. This stipulation applies under any of the alternatives analyzed in the EIS. This stipulation has been added under “assumptions” in EIS Section 4.12.1.

- B5-47 The comment addresses California tiger salamander (CTS). The comment notes that upland habitat, as well as breeding habitat, is important for CTS conservation, and that loss of upland habitat may adversely affect CTS. The comment recommends conserving 300-350 acres of contiguous upland habitat around CTS breeding sites for foraging, estivation, and over-wintering. The comment also notes that habitat linkage is important to CTS conservation. The comment states that the DEIS fails to discuss any strategy to prioritize areas for conservation to protect CTS habitat.

Section 4.12.1 of the EIS identifies four management actions adopted in the BLM’s 2007 Record of Decision that will conserve CTS and its habitat: monitor and maintain upland habitat for the California tiger salamander (SSS-COM2); limit proposed new surface-disturbing activities within occupied or potential habitat for special status species (SSS-C2); mitigate or relocate activities that disturb, alter, or interrupt hydrologic or ecological processes that support special status species (SSS-C3); and protect ponds, wetlands, or riparian areas known to support or that could potentially support California tiger salamander, red-legged frog, or California linderiella to maintain natural corridors between pools/wetlands and upland habitat so that continuous native plant coverage allows adequate movement of these species (SSS-COM3). In combination, these management actions would serve to conserve occupied and suitable habitat for CTS breeding and upland activities, including hydrologic and ecological processes (e.g., habitat linkage). With inclusion of these existing management actions, the comment’s recommendation for conserving 300-350 acres of upland habitat around CTS breeding sites, although often suitable, is not necessary to adequately mitigate the RMPA’s potential impacts to CTS.

- B5-48 The comment addresses California red-legged frog. The comment states that the development or impacts to crucial habitat will decrease recoverability for the California red-legged frog, because such development would not protect known populations (citing the USFWS Recovery Plan for the species). The comment again cites the Recovery Plan, noting that oil and gas development, including potential spills or leakage, may threaten the California red-legged frog. The comment notes an ongoing decline in amphibian species worldwide and states that potential impacts of the RMPA to California red-legged frog are inadequately analyzed in the EIS, and that inadequate analysis can lead to “extinction by a thousand cuts.”

The comment is correct, that development in crucial habitat, or development that does not protect known populations, could inhibit recovery of California red-legged frog. Section 4.12.1 of the EIS identifies management actions adopted in the BLM’s 2007 Record of Decision that will conserve California red-legged frog and its habitat: limit proposed new surface-disturbing activities within occupied or potential habitat for special status species (SSS-C2); mitigate or relocate activities that disturb, alter, or interrupt hydrologic or ecological processes that support special status species (SSS-C3); and protect ponds, wetlands, or riparian areas known to support or that could potentially

support California tiger salamander, red-legged frog, or California linderiella to maintain natural corridors between pools/wetlands and upland habitat so that continuous native plant coverage allows adequate movement of these species (SSS-COM3). In combination, these management actions would serve to conserve occupied and suitable habitat for California red-legged frog breeding and upland activities, including hydrologic and ecological processes (e.g., habitat linkage).

Regarding potential impacts to California red-legged frog, the comment is correct, that numerous amphibian species worldwide are in decline and that, as an amphibian, California red-legged frog is among these species in decline, though this does not affect the impacts analysis or mitigation in the EIS. Potential impacts to wildlife, including California red-legged frog, are described in Sections 4.11 and 4.12 of the EIS, including potential water quality impacts. Section 4.11 (Wildlife Habitat), describes the potential adverse effects of surface water or groundwater contamination on plants, fish, and wildlife, as well as mitigation for those effects, in some detail (see Section 4.11.2). This analysis and mitigation is applicable to potential contamination to California red-legged frog habitat and no further analysis has been added. Section 4.11.2 of the EIS properly discloses potential impacts of the RMPA to these species insofar as those impacts can be anticipated at this time, although the site-specific impacts must, by necessity, be addressed on a case by case basis for each future APD. In addition, Section 4.8 of the RMPA/EIS addresses surface water impacts, including an analysis of potential spills and sedimentation. That section cites numerous protective measures that would be applicable to California red-legged frog habitat. Additional BLM requirements for hydraulic fracturing and well stimulation activities are described in Section 3.8.2, including measures for surface water protection, and setbacks from intermittent and perennial streams. The RMPA includes extensive protective measures for surface waters, including measures that prevent or mitigate for spills or sedimentation. These measures are applicable for California red-legged frog habitat and provide adequate protection for the species.

Regarding compatibility with USFWS recovery goals for California red-legged frog, the Statewide Stipulations (Appendix C) specifies that “Surface disturbance will also be prohibited if the [USFWS Section 7] consultation concludes that the proposed action is inconsistent with the recovery needs of the listed species as identified in an approved USFWS Recovery Plan. Although Recovery Plans are not requirements, BLM has voluntarily chosen to apply their recommendations through the land use plan, and these recommendations are reflected in this stipulation.” Thus, BLM state policy necessitates that activities authorized under the RMPA would conform to USFWS recovery requirements. This stipulation applies under any of the alternatives analyzed in the EIS. This stipulation has been added under “assumptions” in EIS Section 4.12.1.

- B5-49 The comment addresses vernal pool fairy shrimp. The comment cites a recovery goal of “80 percent of occurrences” for the species identified in the USFWS Recovery Plan for Vernal Pool Ecosystems of Northern California and southern Oregon, and states that conservation measures for specialized habitats are inadequate to ensure avoidance of impacts. The comment indicates that the mitigation ratio of 5:1 would result in net loss of habitat and recommends more specific avoidance requirements and a 5 percent

“hard limit” for disturbance to occupied vernal pool habitat disturbance in the Planning Area.

The comment is correct, that avoidance of specialized habitat such as vernal pools is not entirely prohibited, except where practical and feasible alternatives exist. However, the BMPs and SOPs require biological surveys, including protocol surveys (see Response to Comment B5-40) where appropriate. These surveys would identify any occupied vernal pool fairy shrimp that may be present. In cases where no practical or feasible alternatives exist, the BMPs and SOPs require 5:1 compensation, as noted in the comment.

The recommended 5 percent “hard limit” for habitat disturbance would exceed the 80 percent habitat conservation goal identified in the recovery plan, whereas the 5:1 compensation ratio is consistent with the goal. The 5:1 ratio, in combination with the requirement for consistency with recovery needs (below), provides for suitable avoidance and mitigation of potential vernal pool fairy shrimp impacts.

Regarding compatibility with USFWS recovery goals for vernal pool fairy shrimp, the Statewide Stipulations (Appendix C) specifies that “Surface disturbance will also be prohibited if the [USFWS Section 7] consultation concludes that the proposed action is inconsistent with the recovery needs of the listed species as identified in an approved USFWS Recovery Plan. Although Recovery Plans are not requirements, BLM has voluntarily chosen to apply their recommendations through the land use plan, and these recommendations are reflected in this stipulation.” Thus, BLM state policy necessitates that activities authorized under the RMPA would conform to USFWS recovery requirements. This stipulation applies under any of the alternatives analyzed in the EIS. This stipulation has been added under “assumptions” in EIS Section 4.12.1.

B5-50 The comment addresses Santa Lucia purple amole. The comment notes that Santa Lucia purple amole is a listed species, with designated critical habitat, but no recovery plan. It has been observed on undisturbed soils, including soils with cryptogamic crusts, and that soil disturbance may damage its habitat. The comment states that the DEIS does not analyze potential impacts to Santa Lucia purple amole, and that it is unclear whether BLM has surveyed for the plant in the vicinity of the San Ardo Oil and Gas Field. The comment requests field survey results for any such surveys. The comment notes the two places in EIS Section 3.12 where Santa Lucia purple amole is mentioned, and that field surveys would be required where it may be present. The comment concludes that the EIS should include surveys for this plant, to “ensure that occupied habitat is precluded from being included in the lease or development areas.”

The recommendation to include new (or prior) field surveys for Santa Lucia purple amole in the EIS is not adopted. The EIS provides a suitable description of the plant’s geographic range and habitat characteristics for future evaluation on a case by case basis of its potential occurrence at any given site, and notes that surveys would be required where it could occur. The BMPs and SOPs require biological surveys, including protocol surveys (see Response to Comment B5-40) where appropriate. These surveys would identify any occupied Santa Lucia purple amole that may be present.

B5-51 The comment addresses Santa Lucia purple amole and other special-status plants. The comment states that the EIS Environmental Consequences section provides no safeguards for rare plant populations, and that “listed plant populations usually would be avoided by development.” The comment states that “This language is totally inadequate when coupled with the lack of surveys in the Planning Area,” and notes species characteristics of Santa Lucia purple amole that serve to define field survey scheduling. The comment recommends protocol field surveys for rare plants, according to CDFW and California Native Plant Society (CNPS) guidelines.

The EIS includes the recommended requirement for surveys. Appendix D specifies that “Surveys will comply with current BLM, USFWS, NMFS and CDFW protocols, to the extent consistent with federal law” (Section 1.4.1) and “The USFWS, NMFS and CDFW protocols will be employed to conduct special status species surveys” (Section 1.4.4) (note that the CDFW and CNPS protocols are substantially similar). Any field survey data collected by BLM or submitted to the BLM will be publicly available.

B5-52 The comment addresses California condor. The comment reviews the California condor’s conservation status, the threat caused by lead ammunition, and efforts to prevent that threat. The comment notes that oil and gas development could reduce foraging habitat availability and states that it could cause “a range contraction.” The comment cites a variety of oil and gas related effects that may impact California condor, and recommends evaluation and mitigation of them. The comment notes that California condors have been “oiled” in oil fields.

The comment is correct, that oil and gas development could reduce foraging habitat and could adversely affect California condors, including (but not limited to) the effect of oil adhering to them when they are active in oil fields. The comment’s assertion that oil and gas development as analyzed in this EIS could cause “a range contraction” is overstated. Condors currently coexist with oil and gas development in numerous areas in California (see comment B5-64) and there is no evidence that “range contraction” has occurred. The maximum 206-acre surface disturbance contemplated in this RMPA (see Appendix B, Table 8) would not cause a “range contraction” and can be effectively mitigated through the compensation requirements identified in Section 4-12 and Appendix D.

B5-53 The comment states that BMPs and SOPs identified for California condors are inadequate, citing several specific concerns: The comment asks what timing restrictions (seasonal or time of day) may apply for activities, and what impacts such restrictions would reduce; the comment recommends that a designated “representative” for compliance should be a BLM employee rather than a private contractor; it notes that contact with a California condor can only be authorized through an incidental take permit; it recommends stricter requirements regarding spills; requests a definition of “walking beam”; recommends landing deterrents on all pumping unit surfaces; states that federal ESA incidental take permit and CDFW approval would be required for active deterrence (i.e., “hazing”); and recommends locating power lines underground or encasing them in insulated tree wire for visibility.

By necessity, site-specific timing restrictions would be made on a case by case basis, dependent on the potential for California condor seasonal or diurnal activity in the

vicinity of any given site. Activity restrictions, where appropriate, may reduce the likelihood of human/condor encounters, or the likelihood of a condor landing on working equipment. Section 4.12 has been revised to include this clarification. Further detail may be found in Appendix D (BMPs and SOPs).

Regarding the compliance representative, the BMPs and SOPs specify that the representative will be designated by the operator, and will be responsible for overseeing compliance with the California Condor Protection Measures. This requirement provides adequate protection for BLM's compliance verification.

Regarding contact with condors, the comment is correct, that contact with a California condor can only be authorized through consultation with the USFWS, and that close coordination with CDFW would also be important if any contact were anticipated.

Regarding spills of hazardous materials, including oil, Section 4.8 of the RMPA/EIS includes an analysis of potential spills. That section cites numerous applicable protective measures. Additional BLM requirements for hydraulic fracturing and well stimulation activities are described in Section 3.8.2. These measures provide adequate protection for California condor.

Regarding landing deterrents, a "walking beam" (or "working beam") is an oscillating lever that pivots to produce reciprocating motion (e.g., the oscillating beam of an oil pump). Landing deterrents on walking beams would minimize potential injury from landing on moving equipment. Deterrents would be unnecessary for any stationary portions of the structures that would not pose a threat to condors. To the extent that deterrence activities cited in the comment could result in take, the comment is correct, that incidental take permits would be required. However, many activities, potentially including deterrence activities, could cause minimal effects to the listed species, not rising to the "take" threshold, and therefore would not necessitate take authorization.

Regarding power lines; in cases where USFWS consultation for potential take may be required, the USFWS may recommend additional measures beyond those stated in the BMPs and SOPs. In the event that USFWS recommends locating power lines underground or encasing them in insulated tree wire for visibility. The BLM will consult as needed with USFWS and implement recommendations in accordance with the consultation (see Appendix C, Statewide Stipulations).

B5-59 The commenter's opposition to mitigation proposed in Section 4.3 (Geology) within the Draft RMPA/EIS is noted. It should be noted that proposed Mitigation Measures GEO-1 through GEO-3 require a project applicant to submit documentation and perform mitigation requirements to BLM's satisfaction, which ensures BLM involvement throughout the monitoring process and life of any potential future lease.

Furthermore, BLM has a Memorandum of Understanding (MOU) with DOGGR, in which the two agencies lay out their respective roles for regulating oilfield operations on BLM lands. Please refer to Response to Comment A2-4 regarding the MOU, General Response GR-4 regarding water supply and contamination, and GR-5 regarding induced seismicity.

- B5-60 Please refer to Response to Comment B5-1 regarding topics contained within this comment and the four specific items requested by the commenter.
- B5-61 The comment provides an image of ozone nonattainment areas within the area of CCFO. This information is described and summarized in Table 3.5 1, Table 3.5 2, and Table 3.5 3 in Section 3.5 (Air Quality and Atmospheric Conditions) of the RMPA/EIS.
- B5-62 The comment includes several maps overlaying biological resources including designated critical habitat, species occurrences, San Joaquin kit fox recovery areas over “high potential” and “moderate, low, or no potential” oil and gas potential lands.
- The maps illustrate potential areas where future oil and gas activities could conflict with biological resource conservation. Potential impacts to the resources identified on the maps are addressed in Sections 4.10 (Biological Resources – Vegetation), 4.11 (Biological Resources – Wildlife Habitat), and 4.12 (Biological Resources – Special Status Species) of the RMPA/EIS. The BMPs and SOPs identified in those sections would serve to avoid or mitigate potential impacts that may result from implementing the RMPA.
- B5-63 The map provided by the commenter, which shows lakes, rivers and streams within the Central Coast Field Office Planning Area, has been considered in Response to Comment B5-34.
- B5-64 The comment includes photographs of California condors; in one photo, a condor appears to have oil on its number tag (and presumably on its feathers); the other photo documents several condors on an oil pump.
- The RMPA’s potential impacts to California condor, as well as measures to avoid or mitigate impacts, are addressed in the EIS, as described in more detail in Response to Comments B5-52 and B5-53 (above).
- B5-65 The comment provides a “Review of Impacts of Fracking and Other Unconventional Oil and Gas Extraction on Wildlife.” The review includes numerous individual items with supporting references. The commenter notes that unconventional oil and gas development can impact wildlife and ecosystems through habitat loss, fragmentation, and degradation; harm from wastewater; mortality, lower reproductive success, and negative health effects; and declines in density and abundance.
- Comment B5-65 includes individual items listed below. Each item has one or more supporting references, as cited in the original comment letter. Unless stated otherwise, the information in each reference cited in the comment has been considered. The references include information from studies and reports in areas other than California, including Pennsylvania, Wyoming, Colorado, Montana, New Mexico, West Virginia, Louisiana, New York, Ohio, Arkansas, Texas, and Alberta, Canada. Some references involve certain species or types of wildlife (e.g., songbirds) and specific habitat types. Although conditions and well stimulation activities may differ in other areas and the same species or habitats may not be found in California, the underlying concepts (e.g., habitat fragmentation, surface water contamination, noise impacts, etc.) are applicable to wildlife and habitats in California and have been considered. Many of the individual comments refer to the same themes; explanations for each theme are provided below

(themes are underlined for identification) and cited under each individual item. The individual comments included in Comment B5-65 are organized using the Roman numerals and bullets in the original comment.

Habitat fragmentation and edge effects. Habitat fragmentation, edge effects, and potential shifts in wildlife species composition resulting from fragmentation are addressed in Section 4.11.2 of the EIS. BMPs and SOPs identified in Appendix D include minimization of impacts to native vegetation and habitat compensation for temporary and permanent habitat impacts. In addition, BMPs and SOPs require facility design to impact and fragment the least acreage practicable (see 1.8.1 and 1.6.2).

Wildlife avoidance of otherwise suitable habitat. Wildlife avoidance of otherwise suitable habitat due to noise and disturbance associated with project activities is described in Section 4.11.2.

Wildlife physiological stress and disruption of behavior. Physiological stress associated with project activities is described in Section 4.11.2.

Wildlife abundance. Potential shift in biological diversity and local declines in some fish and wildlife populations are identified as potential impacts in Section 4.11.2.

Toxicity. Potential toxicity impacts to plants and animals are addressed in Section 4.11.2.

Wildlife access to fluids. Spill prevention and hazardous materials handling are addressed in Section 4.8.

Spill Contingency Plan. Potential spills and spill contingency planning is addressed in Section 4.8.

Storage and management of fluids. Spill prevention and hazardous materials handling are addressed in Section 4.8.

Surface water contamination. Surface water, including prevention of potential siltation or contamination, is addressed in Section 4.8.

Water availability. Groundwater and surface water availability are addressed in EIS Section 4.7 (Groundwater) and 4.8 (Surface Water).

Air quality. Air quality impacts are addressed in Section 4.5. Section 4.11 states that air quality impacts affect plants and wildlife.

- B5-66 The commenter provides a “Review of Impacts of Oil and Gas Exploration and Development on Wildlife in California.” The review includes a number of individual items with supporting references. The commenter notes that oil and gas development can impact wildlife and ecosystems through habitat loss, fragmentation, and degradation; harm from oil and wastewater spills and releases, chemical runoff, and microtrash; and increased vehicle traffic resulting in mortality, lower reproductive success, and population declines. Affected species include the federally listed San Joaquin kit fox, California condor, and giant kangaroo rat.

Comment B5-66 includes a number of individual items, listed below. Each item has one or more supporting references, as cited in the original comment letter. Unless stated otherwise, the information in each reference cited in the comment has been considered. The references include information from studies and reports in California, and address certain species (San Joaquin kit fox, California condor, and kangaroo rat), types of wildlife (fish and mussels), or habitats (vernal pools and saltbush scrub). Although conditions and well stimulation activities may differ from place to place within California and the same species or habitats may not be found in different parts of California, the underlying concepts (e.g., habitat fragmentation, surface water contamination, noise impacts, etc.) are applicable to wildlife and habitats in California and have therefore been considered.

Many of the individual items refer to the same components; explanations for each of these are provided in Response to Comment B5-65 (underlined for identification) and cited under each individual item. The individual items included in Response to Comment B5-66 are organized according to the numbered list in the original comment.

Species

1. **San Joaquin Kit Fox.** Please refer to habitat fragmentation and edge effects; wildlife avoidance of otherwise suitable habitat; wildlife physiological stress and disruption of behavior; wildlife abundance; wildlife access to fluids; storage and management of fluids; surface water contamination; and air quality in Response to Comment B5-65.
2. **California Condor.** Please refer to wildlife physiological stress and disruption of behavior; wildlife access to fluids; storage and management of fluids; Spill Contingency Plan, and surface water contamination in Response to Comment B5-65.
3. **Kangaroo Rat.** Please refer to storage and management of fluids; Spill Contingency Plan, and surface water contamination in Response to Comment B5-65.
4. **Fish and Mussels.** Please refer to toxicity and surface water contamination in Response to Comment B5-65.

Ecosystems

1. **Vernal Pools.** Please refer to habitat fragmentation and edge effects; storage and management of fluids; Spill Contingency Plan; and surface water contamination in Response to Comment B5-65.
2. **Saltbrush Scrub Habitat.** Please refer to habitat fragmentation and edge effects; wildlife avoidance of otherwise suitable habitat; wildlife physiological stress and disruption of behavior; and wildlife abundance in Response to Comment B5-65.

Responses to Comment Set B6 – Natural Resources Defense Council

- B6-1 Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS. Please refer to General Response GR-2 regarding a Close All Lands to Oil and Gas Leasing alternative within the RMPA/EIS. Please note the Final EIS for the RMPA is available for public review and comment.

- B6-2 The commenter's opposition to the five alternatives considered in the Draft RMPA/EIS and support for the Ban Well Stimulation Technologies alternative are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.
- B6-3 Please refer to General Response GR-1 regarding the status of local measures prohibiting well stimulation treatments within the Planning Area, how these measures were considered in the development of alternatives and whether they have been found to warrant any modifications to the preferred alternative.
- Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.
- B6-4 Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS, which included thorough consideration of the CCST's 2014 report on well stimulation technologies, which was prepared for BLM to provide information to be used for "future planning, leasing, development decisions regarding oil and gas issues on the Federal mineral estate in California."

Responses to Comment Set B7 – North Coast Rivers Alliance

- B7-1 The commenter's opposition to the five alternatives considered in the Draft RMPA/EIS and support for the Ban Well Stimulation Technologies alternative are noted.
- B7-2 Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.
- B7-3 Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.
- B7-4 The comment states that level of development activity considered in the EIS may be understated by the RFD Scenario and that nothing would prevent BLM from issuing leases that allow additional wells or ground disturbance above the level described in the RFD Scenario. Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.
- B7-5 The comment states that National Marine Fisheries Service (NMFS) was not mentioned (along with U.S. Fish and Wildlife Service) regarding Endangered Species Act (ESA) consultation, although the NMFS is responsible for ESA consultations for coho salmon and steelhead trout. Further, the comment states that potential impacts of surface water contamination to steelhead critical habitat are not addressed in the Environmental Consequences section. The comment concludes that, by deferring any analysis of the potential impacts of oil and gas leasing on coho and steelhead to each individual leasing

decision, the DEIS fails to fairly disclose the impacts of the RMP Amendment itself, including its cumulative effects.

The comment is correct, that NMFS is responsible for administering the ESA for the fish species mentioned. Appendix D of the EIS states that “NMFS will be consulted on all projects occurring in or near steelhead critical habitat...”. There is no coho salmon critical habitat within the RMP area. Regarding potential effects of contamination to steelhead trout critical habitat, Section 4.12, addressing this and other special-status species, notes that “other potential impacts to special status species would be similar to those discussed in Sections 4.10 and 4.11.” Section 4.11 (Wildlife Habitat), in turn, describes the potential adverse effects of surface water or groundwater contamination on plants, fish, and wildlife, as well as mitigation for those effects, in some detail (see 4.11.2). This analysis and mitigation is applicable to potential contamination to steelhead habitat and no further analysis has been added. Section 4.11.2 of the EIS properly discloses potential impacts of the RMPA to these species insofar as those impacts can be anticipated at this time, although the site-specific impacts must, by necessity, be addressed on a case by case basis for each future APD.

- B7-6 Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set B8 – The Nature Conservancy

- B8-1 The commenter’s opposition to the proposed open lease areas within Alternative C (which include one-half of the Panoche/Coalinga ACEC) and Alternative D (which include the Ciervo-Panoche Natural Area) considered in the Draft RMPA/EIS are noted. Please refer to Responses to Comments B8-2 through B8-19, which address the commenter’s detailed comments on the Draft RMPA/EIS, including those related to compensatory mitigation, landscape-scale planning, leasing and production projections, groundwater, and compliance with SB 4.
- B8-2 The commenter explains the importance of landscape-scale planning and lays out its mitigation hierarchy that should be employed for the Central Coast Field Office (CCFO) Planning Area. Section 1.2.2 (Planning Approach) of the RMPA/EIS explains that oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. Environmental review under NEPA is required at each phase. Therefore, future projects would conduct specific project-level assessments under NEPA analyzing potential impacts to habitat and species, as well as providing any mitigation to reduce or eliminate adverse effects to these resources. As all future NEPA analyses would occur with the CCFO acting as NEPA lead agency, all future lease applications can be viewed by the CCFO for connectivity at a regional (landscape) level to balance development and conservation.
- B8-3 The commenter’s support of Draft RMPA/EIS Alternative B and request to include additional closure areas within Alternatives C are noted.

As discussed in Section 1.6 (Related Federal) of the RMPA/EIS, the Federal Land Policy and Management Act (FLPMA) of 1976 establishes the authority and provides

guidance for how public lands are to be managed by the BLM. It defines BLM's mission to manage public lands on the basis of multiple use and sustained yield. BLM has a responsibility under the FLPMA to act as a steward for the development, conservation, and protection of Federal lands, by implementing multiple use principles and recognizing, among other values, the Nation's need for domestic sources of minerals from the public lands.

Therefore, Section 2 (Alternatives) of the RMPA/EIS describes the range of development and management use, and resource protections to address the scoping issues that are distinguished by the type and degree of constraints described as allowable uses. See Responses to Comments B5-40 and D4-2, as well as B8-4 and B8-5.

B8-4 The commenter's recommendation to close the Ciervo-Panoche Natural Area under all alternatives is noted. As mentioned, the Ciervo-Panoche Natural Area would be closed under Alternative D.

Please see Responses to Comments B8-2 and B8-3.

B8-5 The commenter's recommendation to close threatened and endangered (T&E) species critical habitat is noted. Likewise the commenter is opposed to opening T&E critical habitation subject to NSO stipulations, which is proposed under Alternative C, and recommends complete closure. Please see Responses to Comments B8-2 and B8-3.

B8-6 Please refer to Response to Comment B8-2 regarding the relationship between BLM's regional and project-specific planning and lease approvals.

B8-7 The commenter opposes the proposed open lease areas of the Panoche/Coalinga ACEC under Alternative C. The commenter's request for closure or at a minimum NSO stipulations on the open half of the Panoche/Coalinga ACEC is noted. Please see Response to Comment and B8-3.

B8-8 The comment addresses compensation as a means of mitigating habitat impacts. The comment states that requirements for compensatory mitigation are unclear for the Central Coast portions of the Planning Area. The comment recommends specifying similar criteria to the CCFO region. The comment recognizes the value of mitigation through avoidance and minimization as identified in the RMPA, but states that two aspects of compensatory mitigation are not addressed: (1) to facilitate investment in key priority areas for conservation, and (2) ensure transparency and consistency in compensation requirements. The comment includes a footnote quoting compensation language from the document, noting that it apparently originated from the Hollister RMP. The comment closes by recommending: (1) standards for compensation including ratios, locations of offset habitat, and in-lieu conditions; (2) developing compensation mitigation requirements throughout the Planning Area comparable to those adopted in the San Joaquin Valley; and (3) a requirement to develop a regional mitigation planning process for the Central Coast Planning Area.

Compensation requirements specified for the San Joaquin Valley are based on the Record of Decision and Approved Resource Management Plan for the Bakersfield

- Field Office (BLM, 2014).⁵ This clarification has been added in Section 4.12.1 of the Final EIS. The comment is correct, that the remainder of the compensation requirements are consistent with the Hollister RMP. The recommendations identified in the comment would serve to facilitate and implement regional habitat conservation planning in the CCFO Planning Area. However, the biological resources effects that may result from the maximum 206-acre surface disturbance contemplated in the RFD Scenario of this RMPA (see Appendix B, Table 8) can be effectively mitigated through the compensation requirements identified in Section 4-12 and Appendix D.
- B8-9 The comment requests a wider range of development activity for consideration in the RMPA/EIS. Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.
- B8-10 The commenter expresses concerns about the quantity of groundwater required for well stimulation. As stated by the commenter and described in Section 4.7.2 of the Draft RMPA/EIS, groundwater use for the RFD scenario would range from 29 to 1,110 AFY over a time period of 15 to 20 years. As stated in the text, “[w]hether any impacts to groundwater quantity could occur would depend on site-specific conditions that cannot be quantified at this time.” In addition, mitigation measures were specifically designed to mitigate any groundwater use in critically overdrafted groundwater basins. Please see General Response GR-4 for additional information on the groundwater quantity mitigation measures. The DOGGR regulations and the mitigation measures provided in the DOGGR Final EIR (DOC, 2015) mitigate potential impacts to groundwater quantity from well stimulation treatments.
- B8-11 The commenter questions the reasonableness of assuming a maximum of 37 wells over the 20-year planning horizon. Please see General Response GR-3 (Development of the Reasonably Foreseeable Development Scenario). Additionally, DOGGR Final EIR mitigation measures limit the ability for over-use of groundwater resources, particularly in critically overdrafted basins. Please see General Response GR-4 (Water Supply and Contamination) for additional information on the groundwater quantity mitigation measures.
- B8-12 Potential impacts of groundwater withdrawals are described in Section 4.7.2. Compared to the resources present in any of the groundwater basins within the CCFO Planning Area, the anticipated volume of groundwater usage is small and would not likely result in any discernable surface water impact, and thus no discernible impact to ecological resources.
- B8-13 The commenter states that transfer of interests in federal land that will use groundwater should be similar to the requirements of BLM’s Desert Renewable Conservation Plan (DRECP). Please see Response to Comment B8-16. In addition, as described in Section 1.2.2 (Planning Approach) and in Response to Comment B8-2, oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. This is just the planning stage; environmental

⁵ BLM (U.S. Bureau of Land Management). 2014. Bakersfield Field Office. Record of Decision. December. BLM/CA/PL-2015/005+1220+1617. [online]: https://eplanning.blm.gov/epl-front-office/projects/lup/70273/92254/111143/Bakersfield_ROD-ARMP.pdf.

review under NEPA is required at each phase and additional mitigation measures may be necessary in the future. Please see General Response GR-4 for additional information on the groundwater quantity mitigation measures.

B8-14 The commenter states that the RMPA/EIS and ROD should require best management practices to minimize groundwater use. Any well stimulation treatment conducted within the CCFO Planning Area must adhere to the DOGGR regulations and the mitigation measures provided in the DOGGR Final EIR. Mitigation measure GW-1a (Use Alternative Water Sources) in the DOGGR Final EIR requires that the “applicant use recycled, saline, produced water, or other water sources that do not (a) result in a net increase in groundwater withdrawal from a critically impacted basin or subbasin or (b) in other groundwater subbasins, sources that do not cause or materially contribute to overdraft conditions.” The mitigation measures in the DOGGR Final EIR along with the DOGGR regulations mitigate potential impacts to groundwater quantity from well stimulation treatments. Please also see General Response GR-4.

B8-15 The commenter states that the RMPA/EIS must provide site-by-site groundwater withdrawal requirements and sources other than groundwater. Please see Response to Comment B5-35 describing Mitigation Measures GW-1a and GW-1b from the DOGGR Final EIR. Mitigation Measure GW-1a requires the use of alternative water sources. Mitigation Measure GW-1b requires an independent review by a Certified Hydrogeologist that evaluates the potential for any proposed use of groundwater to cause or substantially contribute to an “undesirable result.” These mitigation measures along with the DOGGR regulations mitigate potential impacts to groundwater quantity from well stimulation treatments.

In addition, as described in Section 1.2.2 (Planning Approach) and in Response to Comment A3-23, oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. This is just the planning stage; environmental review under NEPA is required at each phase and additional mitigation measures may be necessary in the future.

B8-16 The commenter states that BLM must require oil and gas development to meet the modeling, monitoring, and compensatory mitigation requirements detailed in the DRECP’s Conservation Management Actions for groundwater withdrawal.

The purpose of this RMPA/EIS is to establish lands open or closed to leasing and to specify stipulations necessary to protect resources. General Response GR-4 provides information on mitigation measures related to groundwater quantity that would limit groundwater use, particularly in critically overdrafted basins.

B8-17 The commenter’s support of Draft RMPA/EIS incorporating requirements of SB 4 for well stimulation practices is noted. See Responses to Comments A2-4 and A2-5, which discuss the roles of BLM and DOGGR and specify that that oil and gas operators must comply with both Federal and State statutes and regulations.

B8-18 Appendix E provides a copy of the Scoping Report for the RMPA/EIS. All comments received during the scoping period were carefully considered during preparation of the RMPA/EIS.

B8-19 The commenter includes text from the DRECP's Conservation Management Actions. Please see Response to Comment B8-16.

Responses to Comment Set B9 – Women's International League for Peace and Freedom

B9-1 The commenter's description of the oil and gas industry and opposition to Alternatives A, B, C, D and E are noted. Refer to General Response GR-2 regarding halting oil and gas leasing and development on BLM-administered lands.

B9-2 The commenter expresses concerns on several topics. These topics and the responses are provided below. Also see General Response GR-4 for a summary of mitigation measures to minimize impacts on groundwater resources.

Groundwater Basins. The commenter states that the areas BLM is offering for lease are in medium or high priority groundwater basins, adding to the groundwater burdens caused by the recent drought. As discussed in Section 3.7.3 (Regional Setting) and summarized on Table 3.7-2, there are 20 groundwater basins and subbasins that contain Federal mineral estate within the CCFO Planning Area. Based on the Statewide Groundwater Elevation Monitoring (CASGEM) program, 10 of these groundwater basins and subbasins are medium or high priority and ten are low and very low priority. The DOGGR Final EIR (DOC, 2015) contains Mitigation Measure GW-1b: Minimize Groundwater Impacts. This mitigation measure requires DOGGR to ensure that groundwater use for well stimulation treatments not contribute to "undesirable results," including lowering water levels, reducing groundwater storage, degrading water quality, causing inelastic land subsidence, and depletion of interconnected surface water. The mitigation measures in the DOGGR Final EIR and the DOGGR regulations mitigate potential impacts to groundwater quantity from well stimulation treatments. See Responses to Comments A2-4 and A2-5, which discuss the roles of BLM and DOGGR and specify that that oil and gas operators must comply with both Federal and State statutes and regulations.

Water Misuse, Contamination and Waste. The commenter states that BLM has no way of regulating well stimulation or enhanced oil recovery methods, oil drilling is depleting groundwater resources, and hydraulic fracturing wastes and contaminates water. Well stimulation treatments in the State of California are regulated by DOGGR. The mitigation measures in the DOGGR Final EIR and the DOGGR regulations mitigate potential impacts to groundwater quantity and quality from well stimulation treatments. Please see General Response GR-4.

Water Reclamation. The commenter states that the oil and gas industry does not reclaim water and indicates that wastewater is disposed of in deep wells and sumps that allow leaching into soil and groundwater. DOGGR regulations protect against groundwater quality impacts from the disposal of fluids from well stimulation treatments. As discussed in Section 4.7.2 (Impacts Common to All Alternatives), in California, most of the disposal of flowback fluids occurs in Class II injection wells that inject fluids back into the hydrocarbon zone for enhanced oil recovery. As discussed in Section 3.7.2 (Regulatory Framework), injection into an aquifer may only occur if the aquifer is deemed "exempt" by the US EPA. Aquifer exemption must meet the criteria set forth in 40 CFR 146.4, discussed in Section 3.7.2 (Regulatory Framework) of the

- RMPA/EIS. In addition, Mitigation Measure GW-6a of the DOGGR Final EIR requires wastewater disposal wells to inject only into exempted aquifers. Section 1786 of the DOGGR regulations prohibits the disposal of flowback water to sumps or pits in California.
- B9-3 The commenter expresses concern about the potential impacts of the oil and gas industry disposal methods on groundwater quality. Please see the “Water Reclamation” heading of Response to Comment B9-2. DOGGR regulations and mitigation measures in the DOGGR Final EIR protect against groundwater quality impacts from the disposal of fluids from well stimulation treatments.
- B9-4 The commenter expresses concern about land subsidence due to groundwater overuse in the oil and gas industry. The DOGGR Final EIR contains Mitigation Measure GW-1b: Minimize Groundwater Impacts. This mitigation measure requires DOGGR to ensure that groundwater use for well stimulation treatments does not contribute to “undesirable results,” including causing inelastic land subsidence that interferes with surface land uses. The mitigation measures in the DOGGR Final EIR and the DOGGR regulations mitigate potential impacts to groundwater quantity from well stimulation treatments.
- B9-5 The commenter expresses concerns about drilling-triggered earthquakes attributed to injections of wastewater. Please see General Response GR-5 (Induced Seismicity).
- B9-6 The comment notes the likelihood of oil and gas development causing increased methane emissions, and methane has a higher global warming potential than carbon dioxide. Methane is included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in RMPA/EIS Table 4.6-2 in Section 4.6 (Climate Change/Greenhouse Gas Emissions).
- B9-7 The commenters opposition to oil and gas leases on public lands is noted. Please refer to General Response GR-1 regarding the status of local measures prohibiting well stimulation treatments within the Planning Area and GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands.
- The commenter’s support for the development of renewable energy projects on BLM-administered land is noted. Refer to General Response GR-6 regarding the development of renewable energy facilities on BLM-administered lands.

Responses to Comment Set B10 – Center for Biological Diversity

- B10-1 The commenter focuses on the emissions estimates for the air quality and GHG analyses in the EIS, which appear on spreadsheets in the Air Quality Technical Support Document (TSD) and in the administrative record. The Air Quality TSD appears as Appendix K of this Proposed RMPA/Final EIS. The comment introduces a request for additional information to verify the estimates and asserts that additional GHG emissions would be generated during production. The following responses in this Comment Set B10 address each concern separately.
- B10-2 The commenter addresses spreadsheets for criteria air pollutants and GHG emissions estimates provided in the Air Quality TSD and in the administrative record. The EIS

includes a generalized emissions inventory for the RFD Scenario for the purpose of considering whether potential adverse impacts would occur. The production phase criteria air pollutant emissions factors are from the ARB Almanac Emission Projection Data (Published in 2013) for these oil and gas related source categories in the Monterey Bay air district, as they appear in the statewide inventory, divided by 1,030 wells that were estimated to be active across the jurisdiction of the air district. This ensures that combustion from enhanced oil recovery is considered, as it occurs in the inventory.

Because the ARB almanac and statewide criteria pollutant inventory do not include GHG, the development phase GHG emissions are based on the typical equipment and fleetwide averages, within the California Air Resources Board “OFFROAD” model of 2011 and the “EMFAC2014” model. The production phase GHG emissions are estimated as 500 MT per well per year, as substantiated by the typical per well emission rate across the Monterey Bay air district jurisdiction, from the ARB survey results. The comment indicates that the emissions inventory should make clear what specific equipment and devices would be used as necessary to derive each emissions calculation. This would require forecasting various activities that are not defined within this planning effort, such as fugitive emissions from specific components and vents, combustion emissions from unknown enhanced oil recovery devices, or other site-specific well drilling or treatment activities. The equipment and devices in use, and thus emissions, will vary widely depending on the nature of each site-specific proposal. For this reason, the BLM would confirm emissions and the potential for adverse effects for site-specific project development proposals at the leasing or APD phase.

B10-3 The comment is concerned with well stimulation activities and indicates that using well stimulation technologies on any or all of the wells in the RFD Scenario could result in greater levels of emissions than shown in the generalized emissions inventory. The level of activities for well stimulation are representative to the extent that such activities are foreseeable in the Planning Area. However, as with other assumptions in the generalized emissions inventory, these activities could warrant further analysis at the leasing or APD phase. The commenter’s opposition to the 2015 RFD Scenario is noted. Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS. Please refer to Responses to Comments A3-6 to A3-18 regarding the implementation of the MOU identified by this comment, and BLM’s level of air quality analysis for this planning effort. The cited references are shown and listed in the Air Quality Technical Support Document (BLM, 2019).⁶ The BLM would confirm general conformity requirements for site-specific project development proposals at the leasing or APD phase.

B10-4 The comment points to the different methods of quantifying GHG from the various stages of development and production, which are treated as directly emitted GHG, and shown in EIS Tables 4.6-1 and 4.6-2. The comment notes that the spreadsheet in the administrative record also includes an estimate of production plus transport GHG emissions, which adds the step of carrying the produced volume of crude to an existing

⁶ BLM (Bureau of Land Management). 2019. Bureau of Land Management Central Coast Field Office Resource Management Plan Amendment, Technical Support Document, Air Quality. Prepared by: National Operations Center, California State Office, Bakersfield Field Office and Central Coast Field Office. January.

transmission pipeline network for transportation to refineries. The basis for all GHG emissions estimates in the EIS, and an estimate of production plus transport GHG emissions, appear in the Air Quality TSD and in the administrative record. The estimate of GHG from transport to refiners (34,670 MT) can be found by subtracting the production phase (19,084 MT) from the value for production plus transport (53,754 MT). Although the data sources are from different agencies and authorities, they provide a verifiable basis for the quantities estimated throughout the GHG analysis.

Responses to Comment Set C1 – California Independent Petroleum Association

C1-1 The commenter is opposed to proposed surface restrictions on oil and gas operations on split-estate land and would like BLM to ensure surface rights are not jeopardized.

As discussed in Section 1.6 (Related Federal) of the RMPA/EIS, the Federal Land Policy and Management Act (FLPMA) of 1976 establishes the authority and provides guidance for how public lands are to be managed by the BLM. It defines BLM's mission to manage public lands on the basis of multiple use and sustained yield. BLM has a responsibility under the FLPMA to act as a steward for the development, conservation, and protection of Federal lands, by implementing multiple use principles and recognizing, among other values, the Nation's need for domestic sources of minerals from the public lands.

Therefore, Section 2 (Alternatives) of the RMPA/EIS describes the range of development and management use, and resource protections to address the scoping issues that are distinguished by the type and degree of constraints described as allowable uses. Of the six alternatives under consideration, only Alternative D, which is described in Section 2.9 (Alternative D) of the RMPA/EIS, would close all split estate public lands to mineral leasing. Therefore, the commenter's opposition to Alternative D is noted.

Additionally, Alternative C would require NSO stipulations for special status split estate lands (e.g., state parks, county parks, conservation easements, land trusts, and scenic designations). Note that BLM selected Alternative C as the Preferred Alternative in the Draft RMPA/EIS (40 CFR Part 1502.14 (e)). The BLM considered current BLM policy and all substantive comments received in preparation of this Proposed RMPA and Final EIS, in which BLM has selected Alternative F as the Preferred Alternative.

As described in Section 2.1 (Introduction) of the RMPA/EIS, this is not a final agency decision, but instead an indication of the agency's preliminary preference. BLM will consider and resolve protests submitted on the Proposed RMPA/Final EIS and will prepare the Approved RMPA and Record of Decision (ROD). The ROD will contain the decisions that will guide future management of energy and minerals administered by the Central Coast Field Office. See Response to Comment C3-2 regarding concerns about NSO stipulations.

C1-2 The commenter believes that existing regulations are sufficient to protect federal lands in California and new regulations are not necessary. The purpose of the RMPA is not to develop new environmental regulations. Section 1.6 (Related Federal, State, and Local Laws and Plans) and Section 1.5.1 (Relationship to BLM Policies, Plans, and

Programs) of the RMPA/EIS describe the broad range of existing Federal (including BLM), State and local laws that guide development of the RMPA. RMPA planning effort is to provide a collaborative community based planning approach to update the existing management decisions and resource allocations for oil and gas leases by addressing new data, changing resource conditions, and changes in the use of public land that have occurred since the 2007 Hollister Field Office RMP was completed (see Draft RMPA/EIS Section 1.7, Overall Vision).

The RMPA under consideration herein identifies areas as open or closed to fluid mineral leasing and specify appropriate stipulations for those areas identified as open. At a later time, the environmental review for leasing parcels will identify which parcels should be offered for leasing and the conditions under which leasing and eventual development should occur. Finally, the environmental review for the development of leased parcels (including well stimulation techniques) is a site-specific analysis of potential impacts from the proposed project and includes specific conditions of approval to avoid, minimize, or mitigate impacts to sensitive resources.

Responses to Comment Set C2 – Chevron

- C2-1 The commenter’s support for Alternative C and concerns about proposed surface restrictions are noted. See Response to Comments C1-1 and C3-2 regarding concerns about closure of split estate lands, NSO stipulations, and the range of alternatives considered, including a new Alternative F.

Responses to Comment Set C3 – Western States Petroleum Association

- C3-1 The commenter’s support for Alternative C and Alternative A, in that order, as well as concerns about proposed surface restrictions, are noted. See Response to Comment C1-1 regarding concerns about closure of split estate lands and the range of alternatives considered, including a new Alternative F.
- C3-2 The commenter’s opposition to NSO stipulations, due in part to greater inefficiencies and impacts, and request that the BLM reevaluate each alternative to minimize application of NSO restrictions are noted. Furthermore, the commenter states that surface rights arising separately from any BLM lease should not be jeopardized.

The alternatives described in the RMPA/EIS represent a range of management options, including the consideration of NSO stipulations to protect identified resource values, to address the scoping issues and to achieve resource management goals in light of the updated oil and gas RFD Scenario in the CCFO Planning Area. Exceptions, modifications, and waivers apply to all types of stipulations, including NSO stipulations, and the authorized officer may only approve an exception, modification, or waiver “if the record shows that circumstances or relative resource values have changed or that the lessee can demonstrate that operations can be conducted without causing unacceptable impacts, and that less restrictive stipulations will protect the public interest” [see Section 2.5.1 (Allowable Uses) of the RMPA/EIS].

Responses to Comment Set D1 – Virginia 'Polly' Hughes

- D1-3 The commenter expresses concerns about earthquakes attributed to hydraulic fracturing, citing Oklahoma as an example. Please see General Response GR-5 (Induced Seismicity).
- D1-2 The commenter states that each well stimulation treatment uses 8 million gallons of water and that this water has the potential for contaminating groundwater. As stated in Section 4.7.2 (Impacts Common to All Alternatives) of the Draft RMPA/EIS, water quantity impacts depend on local conditions, and therefore, require a site-specific analysis. Any increase in groundwater use in a basin/subbasin in overdraft would contribute to overdraft conditions. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate the impacts to groundwater.⁷ Please also see General Response GR-4 (Water Supply and Contamination).
- D1-3 The commenter's support for renewable energy development and opposition to hydraulic fracturing on BLM-administered public lands are noted. Please refer to General Response GR-6 regarding development of renewable energy on BLM-administered public lands, and General Response GR-2 regarding consideration of an alternative that would ban well stimulation technologies.

Responses to Comment Set D2 – Polly Hughes

- D2-1 Please refer to General Response GR-2 regarding banning well stimulation technologies and enhanced oil recovery techniques on BLM-administered public lands, and General Response GR-1 regarding local county ordinances prohibiting hydraulic fracturing.
- D2-2 The commenter's opposition to hydraulic fracturing is noted. Please refer to Response to Comment B5-1 regarding a discussion of greenhouse gases and General Response GR-4 (Water Supply and Contamination) regarding groundwater impacts.
- D2-3 The commenter's opposition to hydraulic fracturing and enhanced oil recovery techniques is noted. Please refer to General Response GR-3 regarding the development and use of the 2015 RFD Scenario within the RMPA/EIS.

Responses to Comment Set D3 – Larry Rebecchi

- D3-1 The commenter's opposition to well stimulation technologies is noted. Please refer to General Response GR-1 regarding local county ordinances prohibiting oil and gas facilities and/or well stimulation technologies.
- D3-2 The commenter requests that the scenic resources in South San Benito County (e.g., Pinnacles National Park and State Route [SR] 25 – an Eligible State Scenic Highway) be protected. Section 4.13 (Visual Resources Management) of the RMPA/EIS addresses the BLM's Oil and Gas Visual Resource Management (VRM) Best Management Practices (BMPs), which include utilizing the BLM's VRM system to reduce or

⁷ The DOGGR Final EIR (2015) regarding Analysis of Oil and Gas Well Stimulation Treatments in California is available at: http://www.conservation.ca.gov/dog/Pages/SB4_Final_EIR_TOC.aspx.

avoid adverse visual impacts from constructing oil and gas facilities that promote the types of visible landscape contrasts associated with that industry. Pinnacles National Park is a non-discretionary closure that is not open to oil and gas leasing under any alternative. While not managed by the BLM, Pinnacles National Park would typically be afforded maximum visual resource protections comparable to BLM's VRM Class I management objective (*preserve the existing character of the landscape*). Protection of South San Benito County's other scenic resources (such as SR 25) would typically be accomplished through the effective implementation of Mitigation Measures VR-1 through VR-10 and AQ-1 as described in Section 4.13.3.

- D3-3 The commenter's support for renewable energy development and opposition to hydraulic fracturing on BLM-administered public lands are noted. Please refer to General Response GR-6 regarding development of renewable energy on BLM-administered public lands and General Response GR-2 regarding consideration of an alternative that would ban well stimulation technologies. Please also refer to General Response GR-1 regarding local county ordinances prohibiting oil and gas facilities and/or well stimulation technologies.

Responses to Comment Set D4 – Lynn Overtree

- D4-1 The commenter's opposition to well stimulation technologies is noted. Please refer to General Response GR-1 regarding local county ordinances prohibiting oil and gas facilities and/or well stimulation technologies.
- D4-2 Please refer to Response to Comment B5-65 regarding a discussion of potential impacts to biological resources discussed in the RMPA/EIS. As described in Section 1.2.2 (Planning Approach), oil and gas leasing and development on Federal mineral estate requires multiple stages of BLM environmental analysis and authorization. Environmental review under NEPA is required at each phase. Section 2 (Alternatives) of the RMPA/EIS describes the range of management options to address the scoping issues, including concerns about biological resources, that are distinguished by the type and degree of constraints described as allowable uses under each alternative in this RMPA/EIS. Once this RMPA dictates which areas would be open to leasing and sets general stipulations, the environmental review for leasing parcels identifies which parcels should be offered for leasing and the conditions under which leasing and eventual development should occur. The environmental review for the development of leased parcels (including well stimulation techniques) is a site-specific analysis of potential impacts from the proposed project and includes specific conditions of approval to avoid, minimize, or mitigate impacts to sensitive resources. Therefore, in addition to specifying stipulations for areas identified as open in this planning stage, site-specific mitigation developed at the leasing and development stages will also ensure the protection of natural resources on BLM-administered public lands.
- D4-3 The commenter's support for renewable energy development and concerns about climate change are noted. Please refer to General Response GR-6 regarding development of renewable energy on BLM-administered public lands.

Responses to Comment Set D5 – Peter Muñoz-Cowan

- D5-1 The commenter's opposition to oil and gas drilling is noted. See General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands.
- D5-2 Please refer to Response to Comment D34-2 regarding a discussion of air quality (pollution) impacts, and General Response GR-4 regarding groundwater impacts.
- D5-3 The commenter's opposition to oil and gas drilling is noted. See General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands.

Responses to Comment Set D6 – Sylvia Shih

- D6-1 The commenter's opposition to current and new oil and gas leases on BLM-administered public lands and request that BLM respect local land use authority are noted. See General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands, and General Response GR-1 regarding local county ordinances prohibiting oil and gas facilities and/or well stimulation technologies.

Responses to Comment Set D7 – Jay Solis

- D7-1 Please see Response to Comment D6-1.

Responses to Comment Set D8 – Natalie U. Gray

- D8-1 Please see Response to Comment D6-1.

Responses to Comment Set D9 – Rowan Tauriac

- D9-1 Please see Response to Comment D6-1.

Responses to Comment Set D10 – Robert F. Sigala

- D10-1 Please see Response to Comment D6-1.

Responses to Comment Set D11 – Brett Garrett

- D11-1 Please see Response to Comment D6-1.

Responses to Comment Set D12 – Lucia Calderon

- D12-1 Please see Response to Comment D6-1.

Responses to Comment Set D13 – Mike Saint

- D13-1 Please see Response to Comment D6-1.

Responses to Comment Set D14 – Rhoda Holabird

D14-1 The commenter’s support for renewable energy development is noted. Please refer to General Response GR-6 regarding development of renewable energy on BLM-administered public lands.

The commenter’s support for an alternative that closes the entire Planning Area to new leasing, cancels all pending leases yet to be drilled and bans hydraulic fracturing on currently operating leases is noted. See General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands and General Response GR-1 regarding banning well stimulation technologies.

Responses to Comment Set D15 – Susan Rautine

D15-1 The commenter’s support for closing Federal lands to new oil and gas leasing and drilling is noted. See General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands.

Responses to Comment Set D16 – Diane McElroy

D16-1 The commenter’s opposition to hydraulic fracturing and oil and gas extraction on public lands in the State is noted. See General Response GR-2 for a discussion about consideration of alternatives that would halt oil and gas leasing or ban well stimulation technologies on BLM-administered lands.

Responses to Comment Set D17 – Troy Ishikawa

D17-1 The commenter’s opposition to oil and gas leasing of Federal public lands is noted. See General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing or ban well stimulation technologies on BLM-administered lands.

The commenter’s support for renewable energy development is noted. Please refer to General Response GR-6 regarding development of renewable energy on BLM-administered public lands.

D17-2 Please refer to General Response GR-1 regarding a discussion of local hydraulic fracturing bans, including Measure Z in Monterey County.

Responses to Comment Set D18 – Ken Reichman

D18-1 The commenter states that the Clean Water Act requires companies to protect aquifer from contamination and the Safe Drinking Water Act was passed in 1974. This comment is acknowledged. A discussion of these Acts is provided in Section 3.7.2 (Regulatory Framework) of the RMPA/EIS.

D18-2 The commenter expresses concerns about earthquakes attributed to hydraulic fracturing, citing Oklahoma as an example. Please see General Response GR-5 (Induced Seismicity).

Responses to Comment Set D19 – Anne Cassell

D19-1 The commenter's support for Alternative B is noted. Baring picking Alternative B, the comment suggests incorporating aspects of Alternatives B and D into Alternative C, which was the Preferred Alternative in the Draft RMPA/EIS. It is assumed that the commenter may also support incorporation of similar measures into the new Alternative F, which has been identified as BLM's Preferred Alternative in the Proposed RMPA/Final EIS. Refer to Response to Comment A3-45 regarding the incorporation of stipulations into the selected alternative and Response to Comment D4-2 regarding the protection of natural resources from oil and gas development on BLM-administered public lands.

Responses to Comment Set D20 – Kalen Edwards

D20-1 Please refer to General Response GR-4 regarding a discussion of water supply concerns. The commenter's support for renewable energy development is noted. See General Response GR-6 regarding development of renewable energy on BLM-administered public lands.

Responses to Comment Set D21 – Ryan Carle

D21-1 See Response to Comment Letter D19.

Responses to Comment Set D22 – Sharry Jones

D22-1 The commenter's opposition to future oil and gas leasing on BLM-administered lands is noted. Please refer to General Response GR-1 regarding a discussion of local hydraulic fracturing bans, including Measure J in San Benito County.

D22-2 The commenter states that well stimulation uses a lot of water and, with the backdrop of the recent drought, California should preserve its water for people and crops. Please see General Response GR-4. Water quantity impacts depend on local conditions, and therefore, require a site-specific analysis. Any increase in groundwater use in a basin/subbasin in overdraft would contribute to overdraft conditions. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate the impacts to groundwater quantity.⁸

D22-3 The commenter's statement about chemical contamination of the water supply as result of hydraulic fracturing is acknowledged. The commenter states that California is one of the biggest producers of food in the country and if the water supply is contaminated by chemicals used in well stimulation, then the agricultural industry will be destroyed. Section 4.7.2 (Impacts Common to All Alternatives) of the RMPA/EIS identifies both surface and subsurface potential release pathways. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate the impacts to groundwater quality. Please also see General Response GR-4.

⁸ The DOGGR Final EIR (2015) regarding Analysis of Oil and Gas Well Stimulation Treatments in California is available at: http://www.conservation.ca.gov/dog/Pages/SB4_Final_EIR_TOC.aspx.

- D22-4 The commenter states that hydraulic fracturing causes earthquakes and San Benito County is surrounded by three active faults. Please see General Response GR-5 (Induced Seismicity).
- D22-5 The comment states that fossil-fuel production and use contributes to the adverse effects of global climate change, and that BLM should not engage in leasing for oil and gas development. Closing Federal mineral estate to oil and gas leasing and development was considered as an alternative, but this was not analyzed in detail for the reasons outlined in Section 2.12 of the RMPA/EIS and in General Response GR-2.

Responses to Comment Set D23 – Audrey Doocy

- D23-1 Please refer to General Response GR-1 regarding a discussion of local hydraulic fracturing bans, including Measure Z in Monterey County.
- D23-2 The commenter states that wastewater injection should be banned and cites concerns about both the impact to groundwater quality and quantity caused by well stimulation. DOGGR regulations protect against groundwater quality impacts from the disposal of fluids from well stimulation treatments. Please see Response to Comment B5-37 and the “Water Reclamation” section of Response to Comment B9-2 for more details. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater quality and quantity from well stimulation treatments. Please also see General Response GR-4.
- D23-3 The comment notes the likelihood of oil and gas development causing increased methane emissions, and methane has a higher global warming potential than carbon dioxide. Methane is included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in EIS Table 4.6-2. Please refer to General Response GR-1 regarding a discussion of local hydraulic fracturing bans.

Responses to Comment Set D24 – Daian Hennington, MSW, LCSW

- D24-1 Please refer to General Response GR-1 regarding a discussion of local hydraulic fracturing bans, including Measure Z in Monterey County. See also General Response GR-6 regarding development of renewable energy on BLM-administered public lands.
- D24-2 The commenter expresses concern about well stimulation causing groundwater overdraft and groundwater contamination. Please see General Response GR-4, which addresses both groundwater quantity and quality. In particular, Mitigation Measure GW-1b avoids impacts to critically overdrafted groundwater basins. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater from well stimulation treatments.⁹
- D24-3 The commenter states that the oil lease areas lie near the San Andreas fault zone, the San Antonio Thrust fault and the Los Lobos Thrust fault, and expresses concerns about seismicity induced by oil production activities, citing Oklahoma as an example.

⁹ The DOGGR Final EIR (2015) regarding Analysis of Oil and Gas Well Stimulation Treatments in California is available at: http://www.conservation.ca.gov/dog/Pages/SB4_Final_EIR_TOC.aspx.

Please see General Response GR-4 regarding the commenter's concerns about groundwater risk and General Response GR-5 regarding seismicity.

- D24-4 The commenter's foremost support for no new drilling and otherwise Alternative B are noted. Please refer to General Response GR-1 for a discussion of local hydraulic fracturing bans, including Measure Z in Monterey County. See also General Response GR-2 for a discussion about consideration of alternatives that would halt oil and gas leasing on BLM-administered lands.

Responses to Comment Set D25 – Jeannette Langstaff

- D25-1 The commenter's request for no more open Federal mineral estate for oil and gas leasing and development is noted. Please refer to General Response GR-1 regarding a discussion of local hydraulic fracturing bans, including Measure J in San Benito County. See General Response GR-6 regarding development of renewable energy on BLM-administered public lands and General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing on BLM-administered lands.
- D25-2 The commenter states that chemicals used for well stimulation are not fully disclosed and therefore, it is not possible to understand the risks of these chemicals. As stated in Section 3.4.2 (Regulatory Framework), Section 1788 of the DOGGR regulations requires public disclosure of chemical constituents of well stimulation fluids within 60 days after well stimulation treatment is completed.
- D25-3 The commenter expresses concern about water quality impacts and refers specifically to the risk of unlined pits. See Response to Comment A3-41 regarding removal of discussion of BLM's Final Rule from the Proposed RMPA/Final EIS. Although the BLM Final Rule has been rescinded, with implementation of DOGGR SB 4 regulations, water quality would still be protected. See Response to Comment A3-42.
- D25-4 The commenter is concerned about earthquakes affecting the storage of recovered fluids and pollution from faulty well construction. Please see General Responses GR-4 (Water Supply and Contamination) and GR-5 (Induced Seismicity).
- D25-5 Section 4.7 (Groundwater Resources), under Impacts Common to All Alternatives (Section 4.7.2), under the discussion of "Potential Release Pathways," does acknowledge that a potential surface release mechanism is the reuse of produced water for irrigated agriculture. Although this has not been conducted within the CCFO Planning Area, there is growing interest in this practice. Produced water from five oil and gas fields in the San Joaquin Valley (Deer Creek, Jasmin, Kern River, Kern Front, and Mount Poso), two of which have undergone hydraulic fracturing (Kern River and Mount Poso), have been used to irrigate crops. The potential reuse of produced water from well stimulation is problematic because of the chemicals in well stimulation fluid that are known to be toxic in addition to those chemicals whose toxicity is unknown. Please also see Response to Comment D38-3.
- D25-6 The comment notes the adverse health effects of NO_x and PM_{2.5} from heavy-duty vehicles and equipment, especially for hauling water and other materials to and from well sites. The emissions estimates in Tables 4.5-1 and 4.5-2 in Section 4.5 of the RMPA/EIS include these mobile sources and equipment.

- D25-7 The commenter states that groundwater monitoring near well stimulation has not been extensive and the lack of baseline groundwater quality data impedes the assessment of risk from well stimulation treatments. Historically, this is true. However, DOGGR regulations now require groundwater quality monitoring including baseline groundwater quality data. Details of both regional and area-specific groundwater quality monitoring requirements are provided in the Model Criteria, adopted July 2015, as discussed in Section 3.7.2 (Regulatory Framework) of the RMPA/EIS. Please see Responses to Comments A3-33 and B5-39 for further information about the Model Criteria and groundwater monitoring requirements.
- D28-8 The commenter stresses the need for further evaluation of the impact of “.....lights on non-stop.” As noted in the RMPA/EIS (Section 4.13.1 Introduction – Types of Impacts), production facilities could be illuminated at night resulting in nighttime color contrasts over the long term and a reduction in night-sky visibility and naturalness. The magnitude of these contrasts would depend on several factors including time of day, season, density, and extent of the oil and gas production facilities and would need to be assessed on a case-by-case basis. However, Mitigation Measure VR-8, Night Lighting (see Section 4.13.3, Impacts of Alternative A), has been developed to specifically address night lighting concerns such as that expressed in this comment. The potential effects of noise and lighting on native plants and animals are described in Section 4.11.2 (Wildlife Habitat) and 4.12.2 (Special Status Species) of the RMPA/EIS.
- The request for “further evaluation” of archaeological resources is addressed in the mitigation measures in Section 4.15 of the RMPA/EIS that stipulate additional tribal consultation and potential effects assessment when specific exploration or development projects are proposed. Best Management Practices/Standard Operating Procedures are provided in Appendix D including those for Cultural Resources.
- The commenter’s request for closure of new leases is noted. Please refer to General Response GR-2 regarding the reasons why an alternative that would close all lands to oil and gas leasing was eliminated from further consideration within the RMPA/EIS.
- D25-9 The commenter’s opposition to new oil and gas leasing and well stimulation technologies is noted. Section 2.12 (Alternatives Considered but Not Analyzed in Detail) of the RMPA/EIS describes five alternatives that were considered but not analyzed in the Draft RMPA/EIS. BLM determined that they either did not meet the purpose and need for the RMPA/EIS (see Section 1.1 of the Draft RMPA/EIS), were covered under alternatives analyzed in the RMPA/EIS, or were not practical or feasible alternatives due to technical, economic, and legal and policy considerations. The specific rationale for dismissing each alternative from further consideration is described under each alternative in Section 2.12 of the RMPA/EIS. See General Response GR-2.
- D25-10 Please see Response to Comment B3-10 regarding incorporation of the RMPA for other BLM California Field Offices.
- D25-11 See General Response GR-6 regarding development of renewable energy on BLM-administered public lands. The commenter’s support for no new oil and gas leases on Federal land is noted (see Response to Comment D25-1).

Responses to Comment Set D26 – Connie Rose

D26-1 See General Response GR-6 regarding development of renewable energy on BLM-administered public lands. The commenter's support for no new oil and gas exploration and development on Federal land is noted. Please also refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D27 – John & Carolyn Hernandez

D27-1 The commenter's opposition to Alternative C and support for halting oil and gas development are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

D27-2 The commenter's statement about overdraft of groundwater and chemical contamination of groundwater due to hydraulic fracturing is acknowledged. The commenter states that hydraulic fracturing uses a lot of water and contains chemicals that are making their way into aquifers and drinking water. Please see General Response GR-4, which addresses both groundwater quantity and quality. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater from well stimulation treatments.

D27-3 The commenter is concerned about increased earthquake activity linked to hydraulic fracturing and disposal of wastewater into deep injection wells. Please see General Response GR-5 (Induced Seismicity).

D27-4 Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

Responses to Comment Set D28 – Robert & Denyse Frischmuth #1

D28-1 Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

The commenter also states that oil operations are incompatible with conserving water for agricultural, domestic, and commercial use. Please see General Response GR-4, which addresses both groundwater quantity and quality. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater from well stimulation treatments.

Responses to Comment Set D29 – Susan Schiavone

D29-1 The commenter's opposition to future oil and gas leasing in Monterey County is noted. Please refer to General Response GR-2 regarding the reasons why an alternative that would halt oil and gas leasing on BLM-administered lands was eliminated from further consideration within the RMPA/EIS. General Response GR-5 discusses seismicity impacts and General Response GR-4 discusses where the RMPA/EIS addresses potential groundwater impacts.

Responses to Comment Set D30 – Susan DiGirolamo

D30-1 The commenter’s opposition to oil and gas development on public lands is noted. Please refer to General Response GR-2 for a discussion about alternatives that would halt oil and gas leasing or ban well stimulation technologies, including hydraulic fracturing, on BLM-administered lands. Please see General Response GR-5 for a discussion regarding induced seismicity. Finally, please also see General Response GR-1 regarding a discussion of local hydraulic fracturing bans.

Responses to Comment Set D31 – Emma Kelsey

D31-1 See Response to Comment Letter D19.

Responses to Comment Set D32 – Emily Coren

D32-1 The commenter’s statement about the effects of hydraulic fracturing on fresh water is acknowledged, and the BLM will consider this issue when selecting an alternative during its decision-making process. Please see General Response GR-4, which addresses both groundwater quantity and quality. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR would mitigate potential impacts to groundwater from well stimulation treatments.

D32-2 The commenter is concerned about increased earthquake activity linked to hydraulic fracturing, which is already problematic due to fault lines in the region. Please see General Response GR-5 (Induced Seismicity).

D32-3 The comment notes the likelihood of oil and gas development causing increased methane emissions. Methane is included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in EIS Table 4.6-2.

D32-4 The commenter’s opposition to oil and gas development on public lands and concerns about DOGGR regulation over drilling and well stimulation technologies are noted.

Responses to Comment Set D33 – Jane Prough

D33-1 The commenter’s opposition to well stimulation practices is noted. Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

Responses to Comment Set D34 - Janet Stahl

D34-1 The commenter’s opposition to all 5 alternatives in the Draft RMPA/EIS is noted. Please refer to Response to Comment D4-2 regarding the protection of natural resources from oil and gas development on BLM-administered public lands.

The commenter states concerns about the quantity of water used for hydraulic fracturing, the chemicals used for hydraulic fracturing, and the potential for injected wastewater to contaminate groundwater. Please see General Response GR-4, which addresses both groundwater quantity and quality. DOGGR regulations protect against groundwater quality impacts from the disposal of fluids from well stimulation treatments. In addition, Mitigation Measure GW-6 in the DOGGR Final EIR (DOC, 2015)

- requires wastewater disposal wells to inject only into exempted aquifers to protect groundwater. Please see Response to Comment B5-37 and the “Water Reclamation” section of Response to Comment B9-2 for more details.
- D34-2 The comment notes the adverse health effects of air pollutants related to oil and gas development and the vulnerability of populations at risk. The impact assessment for air quality (Section 4.5) indicates that adverse health effects could occur as a result of increased concentrations of air pollutants including hazardous air pollutants from construction activities and oil and gas production, and these activities could warrant further analysis at the leasing or APD phase.
- D34-3 The commenter is concerned about increased earthquake activity on the San Andreas and other faults in the Planning Area linked to hydraulic fracturing, citing Oklahoma and Kansas as examples. Please see General Response GR-5 (Induced Seismicity).
- D34-4 The commenter’s opposition to well stimulation practices is noted. Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.
- D34-5 The comment states that fossil-fuel use contributes to the adverse effects of global climate change, and that BLM should not engage in leasing for oil and gas development. Closing Federal mineral estate to oil and gas leasing and development was considered as an alternative, but this was not analyzed in detail for the reasons outlined in Section 2.12 and in General Response GR-2.
- D34-6 The commenter’s opposition to oil and gas development on public lands, recent DOGGR regulations (SB 4) pertaining to well stimulation practices, and the EPA are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D35 – Elia & Peter Munoz-Cowan

- D35-1 The commenter’s opposition to oil and gas development on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.
- D35-2 Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.
- D35-3 The commenter expresses concerns about earthquakes attributed to hydraulic fracturing, citing Oklahoma as an example. Please see General Response GR-5 (Induced Seismicity).
- D35-4 The commenter states that massive quantities of water would be used for exploratory drilling and hydraulic fracturing and groundwater would be contaminated. Please see General Response GR-4, which addresses both groundwater quantity and quality. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater quantity and quality from well stimulation treatments.

D35-5 Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D36 – Suzie Gabri

D36-1 The commenter’s opposition to oil and gas development on public lands is noted. Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D37 – Dani

D37-1 The commenter’s opposition to well stimulation practices is noted. See General Response GR-6 regarding development of renewable energy on BLM-administered public lands.

Responses to Comment Set D38 – Cherylyn Smith

D38-1 The commenter’s opposition to well stimulation practices is noted.

D38-2 The commenter states that there are chemicals in hydraulic fracturing wastewater that pollute our groundwater and aquifers. DOGGR regulations protect against groundwater quality impacts from the disposal of fluids from well stimulation treatments. Please see Response to Comment B5-37 and the “Water Reclamation” section of Response to Comment B9-2 for more details. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater from well stimulation treatments.

D38-3 The commenter states that the heavy salt content of fracking wastewater is ruining the farmland at the well site and the land where wastewater is used to water crops. DOGGR regulations prohibit wastewater disposal on the ground surface at the well site. As discussed in Section 4.7.2 (Impacts Common to All Alternatives), in California, most of the disposal of flowback fluids occurs in Class II injection wells that inject fluids back into the hydrocarbon zone. Please see Response to Comment B5-37 and the “Water Reclamation” section of Response to Comment B9-2 for more details. Section 1786 of the DOGGR regulations prohibits the disposal of flowback water to sumps or pits in California. Mitigation Measure HAZ-1a in the DOGGR Final EIR (DOC, 2015) ensures that the spill contingency plan provides adequate protection against leaks or discharges of dangerous fluids or other potentially dangerous materials.

Wastewater that is used to irrigate crops is either treated before reuse or blended with fresh water to lower the concentrations of salt and other constituents to an acceptable range (CCST, 2015b, pg. 114). According to CCST (CCST, 2015b, pg. 114), and as stated in Section 4.7.2 (Impacts Common to All Alternatives) of the Draft RMPA/EIS, wastewater has not been used for irrigation within the CCFO Planning Area. Please also see Response to Comment D25-5.

- D38-4 The commenter states that wastewater is “dumped” in ponding pools, sprayed on hills, used to irrigate crops, and injected into the ground which can cause earthquakes. Please see the “Water Reclamation” section of Response to Comment B9-2 for information about wastewater disposal. Please see Response to Comment D25-5 and General Response GR-5 regarding seismicity.
- D38-5 The commenter states that wastewater is injected into the ground, which is proven to cause increased earthquake activity. Please see General Response GR-5 (Induced Seismicity).
- D38-6 The comment notes that flares are a source of carbon dioxide and PM2.5. These combustion devices are included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in RMPA/EIS Table 4.6-2.
- D38-7 The comment notes the likelihood of oil and gas development and well stimulation treatments causing increased methane emissions, and methane has a higher global warming potential than carbon dioxide. The global warming potential of methane reported in the EIS matches the factor contained in the current version of U.S. EPA regulations in 40 CFR 98, Mandatory Greenhouse Gas Reporting (specifically, in Table A-1 to Subpart A of Part 98—Global Warming Potentials). Methane is included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in Table 4.6-2. The analysis does not quantify the effects of methane controls previously contemplated by BLM or the State regulations for methane that were approved in April 2017.
- D38-8 The commenter’s opposition to well stimulation practices is noted. The formal public scoping period as required by NEPA began on August 5, 2013, with the publication of a Notice of Intent (NOI) in the Federal Register, and ended on February 28, 2014. Public outreach for the EIS since publication of the NOI has included the following:
- An EIS planning update mailed to federal, state, and local agencies; tribal individuals and organizations and federally recognized tribes; interest groups; and members of the general public after publication of the NOI and at least two weeks prior to the first scoping meeting
 - Four legal notices published in the following local newspapers:
 - San Benito County Today
 - Monterey Herald
 - The Fresno Bee
 - The Sacramento Bee
 - Four scoping public meetings held in January and February 2014 in Hollister, Sacramento, Salinas, and Coalinga, California
 - A public website that provides access to materials distributed at scoping meetings as well as information on the public involvement process
 - Letters to 35 federal, state, and local agencies inviting them to be cooperating agencies for the project

- Letters to 28 tribal individuals and organizations, including the Tachi Yokut Tribe of Santa Rosa Rancheria to initiate consultation under Section 106 of the National Historic Preservation Act

The public scoping process provides a variety of opportunities for federal, state, and local agencies, interested organizations and industries, and members of the general public to express their comments and to provide meaningful input to the process. The BLM received 132 unique written submissions, including a letter from the non-governmental organization CREDO that included 10,577 electronic signatories, and another form letter from three individuals. In total, 734 unique comments were received during the public scoping period.

In accordance with NEPA, BLM issued an online press release on February 21, 2017 announcing the date, time, and location of the three public meetings held on the Draft RMPA/EIS. As described in a new Section 6.2.4.3 (Draft EIS/RMPA Public Meetings) in the Proposed RMPA/Final EIS, BLM held the three public meetings in Coalinga, Hollister and Salinas in March 2017. These locations were identified based on the areas of potential future oil and gas development, as described in the Reasonably Foreseeable Development Scenario for Oil and Gas (see Draft RMPA/EIS Appendix B) and areas of high community concern.

- D38-9 The comment is an attachment to provide information about fossil-fuel related development contributing to the adverse effects of global climate change, to support the comment that promotes conservation of oil and gas resources as a means of limiting GHG emissions. Please refer to Response to Comment B5-1, which discusses climate change. Closing Federal mineral estate to oil and gas leasing and development was considered as an alternative, but this was not analyzed in detail for the reasons outlined in Section 2.12 and in General Response GR-2.

Responses to Comment Set D39 – Marsha Moroh

- D39-1 The commenter’s opposition to oil and gas development on public lands is noted. Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area, including Monterey County. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D40 – Dr. & Mrs. Elliott and Lucie Hazen

- D40-1 The commenter’s opposition to oil and gas development on public lands and well stimulation practices are noted. Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.
- D40-2 The commenter states that the Draft RMPA/EIS does not adequately account for depletion of water resources and contamination threats to groundwater. Please see

- General Response GR-4, which addresses both groundwater quantity and quality. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater quantity and quality from well stimulation treatments.
- D40-3 Please see General Response GR-5 (Induced Seismicity) in response to the commenter's concerns about increased seismic activity.
- The commenter's suggestion to cancel current leasing and halt proposed leasing for oil and gas development on public lands is noted. In addition, refer to General Response GR-2, which discusses consideration of an alternative that would close all lands to oil and gas leasing in the RMPA/EIS.
- D40-4 The commenter's support of renewable energy sources is noted. See General Response GR-6 regarding development of renewable energy on BLM-administered public lands.

Responses to Comment Set D41 – Suzanne Worcester

- D41-1 The commenter's opposition to oil and gas development on public lands and well stimulation practices are noted. Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.
- D41-2 The commenter stresses that adverse effects on viewsheds and landscape character can diminish the value of the region's major economic drivers such as tourism. Mitigation Measures VR-1 through VR-10 and AQ-1 (see Section 4.13.3) have been developed to address the potential visual impacts from oil and gas leasing on the region's scenic resources. These measures incorporate the fundamental principles in the VRM system upon which the VRM Best Management Practices are based and include proper site selection, minimizing visual contrast, reducing unnecessary surface disturbance, exercising proper color selection, and restoration of impacted landscapes. Please also see Response to Comment B4-5.
- D41-3 The commenter states that well stimulation can potentially contaminate water used for agriculture, from leaks during drilling or from produced water, and from oil spills. The environmental consequences are discussed in Section 4.8 (Surface Water Resources) and Section 4.7 (Groundwater Resources) of the RMPA/EIS. Please also see General Response GR-4, which addresses groundwater quality.
- DOGGR regulations protect against groundwater quality impacts from the disposal of fluids from well stimulation treatments. Please see Response to Comment B5-37 and the "Water Reclamation" section of Response to Comment B9-2 for more details. Mitigation measure GW-6a of the DOGGR Final EIR requires wastewater disposal wells to inject only into exempted aquifers. Mitigation measure HAZ-1a of the DOGGR Final EIR ensures that the spill contingency plan provides adequate protection against leaks or discharges of dangerous fluids or other potentially dangerous materials. The DOGGR regulations and the mitigation measures in the DOGGR Final EIR mitigate potential impacts to groundwater from well stimulation treatments.
- D41-4 The comment notes the likelihood of oil and gas development causing increased methane emissions. Methane is included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in Table 4.6-2.

D41-5 The commenter's opposition to the five alternatives considered in the Draft RMPA/EIS and support for a new alternative combining Alternatives B and E are noted. Section 4.7 (Groundwater Resources) provides an assessment of potential impacts to groundwater and water supplies from activities allowed under the RMPA alternatives.

Responses to Comment Set D42 – Seth Capron

D42-1 The commenter's opposition to oil and gas development on public lands and well stimulation practices are noted. Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

D42-2 The comment asserts that the energy intensity and life-cycle carbon intensity for the production of crude oil under the RFD Scenario would be relatively high when compared with other possible energy supplies. The combustion-related emissions from steam generators are included in the overall total carbon dioxide-equivalent emissions estimate for each typical active well, as summarized in Table 4.6-2. Additionally, the EIS notes the regulatory framework that includes California's program specifically aimed at reducing the life-cycle carbon intensity of transportation fuels.

D42-3 Please refer to General Response GR-1 local measures prohibiting well stimulation treatments within the Planning Area.

D42-4 The commenter's opposition to including split estate lands within any preferred alternative is noted. Please also refer to Response to Comment C1-1 regarding split estate lands within the Proposed RMPA.

Responses to Comment Set D43 – Nicholas Brown

D43-1 The commenter's statement about the loss of agricultural jobs due to contamination of groundwater is acknowledged. Please see Response to Comment B3-7.

D43-2 The commenter states that the oil industry does not reveal the chemicals used for well stimulation and that testing for unknown chemicals must be conducted. As stated in Section 3.4.2 (Regulatory Framework), Section 1788 of the DOGGR regulations requires public disclosure of chemical constituents of well stimulation fluids.

DOGGR regulations require groundwater quality monitoring. Details of both regional and area-specific groundwater quality monitoring requirements are provided in the Model Criteria, adopted July 2015, as discussed in Section 3.7.2 (Regulatory Framework) of the RMPA/EIS. A list of required analytes for area-specific designated contractor water sampling is in Table B1 of the Model Criteria. Based on the analytical results, the State Water Board may modify the list of required analytes. As specified in the Model Criteria, testing is to be in accordance with EPA-approved analytical methods using drinking water detection limits.

Responses to Comment Set D44 – Judith Jackson

D44-1 The commenter's opposition to oil and gas development on public lands and well stimulation practices are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands

to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D45 – Kymm Ann Wallin

D45-1 The commenter’s concerns about oil and gas leasing on California public land are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter also expresses concerns about groundwater contamination. Please see General Response GR-4 (Water Supply and Contamination), which addresses groundwater quality. As discussed in Section 4.7 (Groundwater Resources) of the RMPA/EIS, the DOGGR regulations and the mitigation measures in the DOGGR Final EIR (DOC, 2015) under SB 4 would mitigate potential impacts to groundwater from well stimulation treatments. See also Response to Comment D25-7 for a discussion about groundwater monitoring.

Responses to Comment Set D46 – Susan Moren

D46-1 The commenter’s opposition to hydraulic fracturing and concerns about resulting water contamination are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative was eliminated from further consideration within the RMPA/EIS. In addition, General Response GR-4 (Water Supply and Contamination) addresses groundwater quality related to potential contamination concerns.

Responses to Comment Set D47 – Emily Coren

D47-1 The commenter’s opposition to oil and gas development on public lands and well stimulation practices, including hydraulic fracturing, is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter also expresses concerns about climate change, methane, as well as surface and groundwater supply and quality. Please refer to Response to Comment B5-1 regarding a discussion of greenhouse gases related to climate change concerns, and General Response GR-4 (Water Supply and Contamination) regarding groundwater impacts and associated DOGGR regulations. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19). See also Responses to Comment Set D32.

The commenter expresses concerns about the close proximity of wells to the Salinas River. As stated in Section 2.4.4, the location and potential site-specific impacts of any particular well or field development would be analyzed during the NEPA review for a lease or an individual well. Please see Response to Comment A3-45.

The commenter is concerned about increased earthquake activity linked to hydraulic fracturing, which is already problematic due to fault lines in the region. Please see General Response GR-5 (Induced Seismicity).

The commenter's support for moving away from fossil fuels is noted. Refer to General Response GR-6 regarding the development of renewable energy facilities on BLM-administered lands.

Responses to Comment Set D48 – Linda Sherlock

D48-1 The commenter's opposition to oil and gas development on public lands and well stimulation practices, including hydraulic fracturing, is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. In addition, General Response GR-4 addresses groundwater quality related to potential contamination concerns.

Responses to Comment Set D49 – Angelita Gonzalez

D49-1 The commenter's opposition to oil and gas development on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. In addition, General Response GR-4 (Water Supply and Contamination) addresses water quality concerns.

Responses to Comment Set D50 – Inga Minton

D50-1 The commenter's opposition to well stimulation practices, including hydraulic fracturing, and concerns about climate change, methane, and water supply and contamination are noted. Please see Response to Comment D47-1.

Responses to Comment Set D51 – John Mataka

D51-1 The commenter's opposition to hydraulic fracturing and concerns about water contamination and supply and air pollution are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative was eliminated from further consideration within the RMPA/EIS. In addition, General Response GR-4 (Water Supply and Contamination) addresses groundwater quality related to potential contamination concerns. Please refer to Response to Comment D34-2 regarding a discussion of air quality (pollution) impacts.

Responses to Comment Set D52 – Richard D. Iyall

D52-1 The commenter's support for natural ways of directing energies and concerns about potential water and land contamination and methane from extreme methods of oil extraction, such as hydraulic fracturing, are noted. Please see Responses to Comments A3-26, B5-19 and D47-1.

Responses to Comment Set D53 – Rosenda Mataka

D53-1 The commenter's opposition to hydraulic fracturing and concerns about climate change, water contamination and air pollution are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative was eliminated from further consideration within the RMPA/EIS. Please see Responses to Comments A3-26, B5-19, D34-2, and D47-1.

Responses to Comment Set D54 – Sara Aird

D54-1 The commenter's opposition to hydraulic fracturing is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative was eliminated from further consideration within the RMPA/EIS. General Response GR-5 (Induced Seismicity) addresses the commenter's concerns about earthquakes and General Response GR-1 discusses local measures prohibiting well stimulation treatments within the Planning Area.

Responses to Comment Set D55 – Alec Kimmel

D55-1 The commenter's opposition to hydraulic fracturing and concerns about methane, air pollution and health effects are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative was eliminated from further consideration within the RMPA/EIS. Please also see Responses to Comments A3-26, B5-19, D34-2, and D47-1, as well as Responses to Comment Letter B5 (Center for Biological Diversity and Sierra Club), which addresses health concerns related to oil and gas development.

Responses to Comment Set D56 – Kyla Noelle Mitchell

D56-1 The commenter's opposition to oil and gas development and hydraulic fracturing are noted, as well as her concerns about methane, climate change and health effects. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. Please also see Responses to Comments A3-26, B5-19, D34-2, and D47-1, as well as Responses to Comment Letter B5 (Center for Biological Diversity and Sierra Club), which addresses health concerns related to oil and gas development.

Responses to Comment Set D57 – Lynn Jacobeson

D57-1 The commenter's opposition to oil and gas development on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

To address the commenter's listed concerns, please see General Response GR-5 (Induced Seismicity) regarding concerns about the injection of wastewater near the San Andreas Fault. General Response GR-4 addresses groundwater quality related to potential contamination concerns to aquifers. General Response GR-1 discusses local

measures prohibiting well stimulation treatments and other oil and gas development within the Planning Area.

Finally, please refer to General Response GR-6 regarding the development of renewable energy facilities on BLM-administered lands. The commenter's support for renewable energy sources is noted.

Responses to Comment Set D58 – Barbara McKinder

D58-1 The commenter's desire to protect beautiful and fragile lands, namely Monterey County, for future generations is noted. Please refer to General Response GR-1 for discussion on local measures, such as Measure Z, that would well stimulation treatments and other oil and gas development within the Planning Area.

The commenter's concerns about droughts and preservation of aquifers are addressed in GR-4 (Water Supply and Contamination) and in Response to Comment B9-2.

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection with active faults in the Planning Area.

Air emissions and climate change are addressed in Responses to Comments A3-26, B5-19, D34-2, and D47-1.

Responses to Comment Set D59 – Char Biddle

D59-1 The commenter's opposition to oil and gas development on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

The commenter's concerns about contamination of aquifers are addressed in GR-4 (Water Supply and Contamination). See Response to Comment A3-37 regarding DOGGR's authority over regulation of well stimulation treatments.

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection with active faults in the Planning Area.

General Response GR-1 discusses local measures prohibiting well stimulation treatments and other oil and gas development within the Planning Area. Finally, please refer to General Response GR-6 regarding the development of renewable energy facilities on BLM-administered lands. The commenter's preference for renewable energy sources is noted.

Responses to Comment Set D60 – Ronald J. Martin Ph.D.

D60-1 The commenter's opposition to oil and gas development and hydraulic fracturing in Fresno, Monterey and San Benito Counties are noted, as well as concerns about produced water, water contamination, climate change and earthquakes. Please refer to

General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter's concerns about water contamination are addressed in GR-4 (Water Supply and Contamination). Please refer to Response to Comment B5-1, which discusses climate change.

Discharge of inadequately-treated hydraulic fracturing wastewater and produced water from the same wells to surface water and agriculture is prohibited by the Clean Water Act as administered by the State Water Resources Control Board. Please also see Response to Comment A3-29 regarding produced water.

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection with active faults in the Planning Area.

Responses to Comment Set D61 – Alan Chea

D61-1 The commenter's opposition to oil and gas development and hydraulic fracturing are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Air emissions and climate change are addressed in Responses to Comments A3-26, B5-19, D34-2, and D47-1. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection with faults pervasive in the Planning Area.

Finally, please refer to General Response GR-6 regarding the development of renewable energy facilities on BLM-administered lands. The commenter's support for renewable energy sources is noted.

Responses to Comment Set D62 – Alette Brooks

D62-1 The commenter's opposition to oil and gas exploration, enhanced extraction and hydraulic fracturing and support for conservation efforts are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. Please refer to General Response GR-6 regarding the development of renewable energy facilities on BLM-administered lands.

The commenter expresses concerns about induced seismicity from wastewater injection associated with oil and gas exploration, citing Oklahoma as an example. The commenter also provides an article and maps showing the location and magnitudes of past earthquakes as well as a 2016 U.S. Geological Survey seismic hazard forecast of

induced and natural earthquakes, which incorporates “man-made earthquakes” and indicates a surge of earthquakes in Oklahoma. Please refer to General Response GR-5 (Induced Seismicity), which addresses concerns related to induced seismicity from oil and gas development.

Responses to Comment Set D63 – Barbara Murray

D63-1 The commenter’s opposition to oil and gas development and hydraulic fracturing and support for preservation are noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection with faults pervasive in the Planning Area.

Please see Response to Comment A3-45 regarding the analysis of site-specific impacts and potential additional future mitigation that may be required as a part of future NEPA reviews for a lease or an individual well.

Responses to Comment Set D64 – Sara Drost

D64-1 The commenter’s opposition to hydraulic fracturing and fossil fuels is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. Please refer to General Response GR-6 regarding the development of renewable energy facilities on BLM-administered lands.

The commenter’s concerns about water contamination and supply are addressed in GR-4 (Water Supply and Contamination).

Air emissions and climate change are addressed in Responses to Comments A3-26, B5-19, D34-2, and D47-1, as well as Responses to Comment Letter B5 (Center for Biological Diversity and Sierra Club), which addresses health concerns related to oil and gas development. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection with faults pervasive in the Planning Area.

Please see Response to Comment A3-45 regarding the analysis of site-specific impacts and potential additional future mitigation that may be developed as a part of future NEPA reviews for a lease or an individual well.

Responses to Comment Set D65 – Christie Turano #1

D65-1 The commenter states that oil practices compromise water and food and requests that BLM work with environmental groups and respect voting rights, sciences and future generations. See Response to Comment D41-3 regarding potential impacts to agriculture and General Response GR-4 regarding potential impacts to water resources.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

Responses to Comment Set D66 – Julie Tell

D66-1 The commenter's opposition to hydraulic fracturing is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative was eliminated from further consideration within the RMPA/EIS.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

The commenter's concerns about groundwater impacts are addressed in GR-4 (Water Supply and Contamination). General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection.

Responses to Comment Set D67 – Melissa West #1

D67-1 The commenter states that the BLM proposal to grant oil and gas leases in San Benito County is a direct assault on Measure J.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

Responses to Comment Set D68 – Melissa West #2

D68-1 The commenter's opposition to oil and gas leases is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS. Please see Response to Comment D67-1 regarding Measure J in San Benito County.

Responses to Comment Set D69 – Debbie Kirk

D69-1 The commenter's opposition to oil and gas leasing on California public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D70 – Dierdre Means

D70-1 The commenter's opposition to oil and gas leases in Monterey County is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS. Please see Response to Comment D67-1 regarding Measure Z in Monterey County.

Responses to Comment Set D71 – Margaret P

D71-1 The commenter’s opposition to hydraulic fracturing on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter’s concerns about water supply are addressed in GR-4 (Water Supply and Contamination). General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

Responses to Comment Set D72 – Mona M.

D72-1 The commenter’s opposition to hydraulic fracturing and fossil fuel leases on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter’s concerns about water contamination are addressed in GR-4 (Water Supply and Contamination). General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

Responses to Comment Set D73 – Courtney Connelly

D73-1 The commenter’s opposition to oil and gas leasing on California public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D74 – D. Rothchild

D74-1 The commenter’s opposition to oil and gas leasing on California public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D75 – Don Hirschaur

D75-1 The commenter’s opposition to oil and gas leasing on California public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D76 – Hilary Johnson

D76-1 The commenter’s opposition to oil and gas leasing on California public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands

to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D77 – Holly Hines

D77-1 The commenter's opposition to oil and gas leasing on California public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D78 – Jennifer

D78-1 The commenter's opposition to hydraulic fracturing and fossil fuel leases on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D79 – Michael Means

D79-1 The commenter's opposition to oil and gas leases in Monterey County is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS. Please see Response to Comment D67-1 regarding Measure Z in Monterey County.

Responses to Comment Set D80 – Michelle Hoffman

D80-1 The commenter's opposition to oil and gas leasing on California public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Responses to Comment Set D81 – Anonymous

D81-1 The commenter's opposition to hydraulic fracturing on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter's concerns about water contamination are addressed in GR-4 (Water Supply and Contamination). See Response to Comment D41-3 regarding potential impacts to agriculture.

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

Responses to Comment Set D82 – Kathryn Hyde

D82-1 The commenter’s opposition to hydraulic fracturing and new oil exploration on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter’s concerns about water contamination are addressed in GR-4 (Water Supply and Contamination). Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

Responses to Comment Set D83 – Lori Hines #1

D83-1 The commenter’s opposition to hydraulic fracturing and fossil fuel leases on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter’s concerns about water contamination are addressed in GR-4 (Water Supply and Contamination). General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

Responses to Comment Set D84 – Lori Hines #2

D84-1 The commenter’s opposition to hydraulic fracturing and fossil fuel leases on public lands is noted. Please refer to Response to Comment D83-1.

Responses to Comment Set D85 – Lynn Strandberg

D85-1 The commenter’s opposition to hydraulic fracturing and oil and gas leasing and development on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter’s concerns about contamination are addressed in GR-4 (Water Supply and Contamination). General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection.

Please refer to Response to Comment D34-2 regarding a discussion of air quality (pollution) impacts. Responses to Comment Letter B5 (Center for Biological Diversity and Sierra Club) and Response to Comment D34-2 address health concerns related to oil and gas development.

Responses to Comment Set D86 – Amy Gorman

D86-1 The commenter’s opposition to hydraulic fracturing in Alameda, Monterey, San Benito and Santa Cruz Counties and on public lands is noted. Please refer to General Response

GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

The commenter's concerns about water contamination are addressed in GR-4 (Water Supply and Contamination). General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

Responses to Comment Set D87 – Kathleen Baker

D87-1 The commenter's opposition to oil and gas leases in Monterey County is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS. Please see Response to Comment D67-1 regarding Measure Z in Monterey County.

Responses to Comment Set D88 – Debra Rubin

D88-1 The commenter's opposition to oil and gas leases in Monterey County is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS. Please see Response to Comment D67-1 regarding Measure Z in Monterey County.

Responses to Comment Set D89 – Laura B.

D89-1 The commenter's opposition to hydraulic fracturing and oil and gas extraction on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. In addition, Response to Comment A5-5 discusses BLM's multiple use mandate.

Responses to Comment Set D90 – Jan Cecil

D90-1 The commenter's opposition to hydraulic fracturing and fossil fuel leases on additional public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

The commenter's concerns about contamination are addressed in GR-4 (Water Supply and Contamination). Air emissions and climate change are addressed in Responses to Comments A3-26, B5-19, D34-2, and D47-1, as well as Responses to Comment Letter B5 (Center for Biological Diversity and Sierra Club), which addresses health concerns related to oil and gas development. Information on methane appears in the analysis of

Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Response to Comment B5-19).

Responses to Comment Set D91 – Christie Turano #2

D91-1 The commenter’s opposition to oil and gas leases in Monterey County is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

Responses to Comment Set D92 – Christine Tucker

D92-1 The commenter expresses concerns about several environmental impacts addressed below, and requests that oil and gas leases be at market rate, or better yet, not at all.

The commenter’s concerns about droughts and preservation of aquifers are addressed in GR-4 (Water Supply and Contamination) and in Response to Comment B9-2. See Response to Comment D41-3 regarding potential impacts to agriculture.

Air emissions and climate change are addressed in Responses to Comments A3-26, B5-19, D34-2, and D47-1, as well as Responses to Comment Letter B5 (Center for Biological Diversity and Sierra Club), which addresses health concerns related to oil and gas development. Information on methane appears in the analysis of Section 4.5, Climate Change/Greenhouse Gas Emissions of the RMPA/EIS (see also Responses to Comments B5-19 and A2-20).

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection.

Please refer to General Response GR-1 regarding the status of local measures prohibiting well stimulation treatments within the Planning Area. The market rate of leases and DOGGR’s record of regulation are beyond the scope of NEPA and the jurisdiction of BLM, respectively.

Responses to Comment Set D93 – Debora Bone

D93-1 The commenter’s opposition to hydraulic fracturing and fossil fuel leases on additional public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. The commenter’s other concerns about groundwater quality and quantity, health effects, agriculture, increased seismic activity, climate change, and DOGGR’s oversight are addressed in Response to Comment D92-1.

Responses to Comment Set D94 – Natasha Wist

D94-1 The commenter’s opposition to hydraulic fracturing and oil and gas extraction on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a

Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. In addition, Response to Comment A5-5 discusses BLM's multiple use mandate.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

The commenter's other concerns about groundwater quality and quantity, air and land pollution, and increased seismic activity are addressed in Response to Comment D92-1.

Responses to Comment Set D95 – Amy Gorman

D95-1 The commenter's opposition to hydraulic fracturing and fossil fuel leases on additional public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS. The commenter's concerns about groundwater quality, increased seismic activity, and methane leaks are addressed in Response to Comment D92-1.

Responses to Comment Set D96 – Norma Block

D96-1 The commenter's opposition to hydraulic fracturing and fossil fuel leases on additional public lands is noted. Please refer to Response to Comment D94-1 addressing concerns about methane leaks, groundwater contamination, induced earthquakes and local bans in Alameda, Monterey, San Benito, and Santa Cruz Counties.

Responses to Comment Set D97 – Robert and Denyse Frischmuth #2

D97-1 The commenter's opposition to oil and gas leases in Monterey County is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

The commenter's concerns about droughts and preservation of water are addressed in GR-4 (Water Supply and Contamination) and in Response to Comment B9-2. See Response to Comment D41-3 regarding potential impacts to agriculture.

Responses to Comment Set D98 – Peter Hain

D98-1 The commenter's opposition to oil and gas leases in Monterey, San Benito, and Santa Cruz Counties is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

Responses to Comments A5-2 and D3-2 address potential impacts on Pinnacles National Park. Please see Response to Comment A3-45 regarding the analysis of site-

specific impacts, such as transportation impacts along Highway 25, and potential additional future mitigation that may be developed as a part of future NEPA reviews for a lease or an individual well.

Responses to Comment Set D99 – Sharry Jones

D99-1 The commenter’s opposition to auctioning fossil fuel leases on public lands is noted. Please refer to General Response GR-2 regarding the reasons why a Close All Lands to Oil and Gas Leasing Alternative was eliminated from further consideration within the RMPA/EIS.

Please refer to General Response GR-1 regarding local measures prohibiting well stimulation treatments within the Planning Area.

The commenter’s concerns about droughts and preservation of water are addressed in GR-4 (Water Supply and Contamination) and in Response to Comment B9-2. See Response to Comment D41-3 regarding potential impacts to agriculture.

General Response GR-5 (Induced Seismicity) addresses concerns about earthquakes related to hydraulic fracturing and wastewater injection.

Air emissions and climate change are addressed in Responses to Comments A3-26, B5-19, D34-2, and D47-1.

Responses to Comment Set D100 – FORM LETTER

D100-1 The commenter’s support for an alternative that closes the entire Planning Area to new leasing, cancels all pending leases yet to be drilled and bans hydraulic fracturing on currently operating leases is noted. Chapter 2 in the RMPA/EIS describes the range of alternatives analyzed in the document and eliminated from further consideration under NEPA. See General Response GR-2 regarding the reasons why a Ban Well Stimulation Technologies Alternative and a Close All Lands to Oil and Gas Leasing Alternative were eliminated from further consideration within the RMPA/EIS.

In addition, please see the following General Responses, which address the following concerns raised by commenters:

- GR-1: Local Bans on Well Stimulation Treatments and Oil and Gas Development
- GR-3: Development of the Reasonably Foreseeable Development Scenario
- GR-4: Water Supply and Contamination
- GR-5: Seismicity
- GR-6: Renewable Energy Development on Federal Lands

In addition, Response to Comment A5-5 discusses BLM’s multiple use mandate. Response to Comment B5-1 discusses climate change, and Responses to Comments D22-3 and D25-5 address concerns about potential impacts to farming and water for irrigation. Responses to Comment Letter B5 (Center for Biological Diversity and Sierra Club) and Response to Comment D34-2 address health concerns related to oil

and gas development. Finally, please see Response to Comment B5-65 regarding biological resources concerns.

The commenters' general opposition to hydraulic fracturing and mineral/fossil fuel extraction, concern about climate change, and request for clean energy alternatives are noted.