

Appendix D Soil Sampling

Appendix

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TECHNICAL MEMORANDUM

DATE May 4, 2022

TO City of Irvine

ADDRESS One Civic Center Plaza
Irvine, California 92623

CONTACT Kathleen Haton, Senior Planner

FROM Denise Clendening, Ph.D.

SUBJECT Oak Creek Community Park Expansion Soil Sampling

PROJECT NUMBER COI-56.0

BACKGROUND

This limited soil sampling report is prepared for the City of Irvine Community Services Department as part of the effort to expand the existing facilities at the Oak Creek Community Park in Oakcreek Village (Planning Area 12) at 15616 Valley Oak Drive in the City of Irvine, California (Figure 1). The project site is bounded by Sand Canyon Avenue to the southeast, Valley Oak Drive to the northwest, Barranca Parkway to the southwest, and corporate offices to the northeast. The existing park facilities that include a baseball field, two soccer fields, a children's playground area, a flat grassy play area, a restroom building, a picnic shelter, BBQ grills, picnic tables and a paved parking lot are all located at the northerly portion of the site. The southerly portion of the site is owned by Southern California Edison (SCE) for a utility easement and is currently undeveloped. The proposed expansion of park facilities would include improvements within SCE's property. Figure 2, *Aerial Photograph* shows the park site and the SCE easement area.

The purpose of this investigation was to evaluate the surface soils in the expansion area for residual organochlorine pesticides due to historical agricultural use including an orchard followed by row crops from approximately 1938 to about 1990. The plans for the 8-acre SCE expansion parcel include a new unlighted flex field, a general park parking area, and a dog park parking area

Site Description

The 8-acre project site is currently an SCE easement that is roughly level bare soil with overhead powerline structures with the Oak Creek Community Park bordering the SCE parcel on the north northeast. There is a northwest to southeast rending berm that separates the SCE easement from the existing Oak Creek Community Park. The SCE Santiago Substation is located to the east across Sand Canyon Avenue.

The project site and its immediate vicinity are within the Oak Creek Planning Area (PA12), which is generally bounded by the I-5 freeway to the north, Sand Canyon Avenue to the east, agriculture uses and the San Diego Freeway (I-405) to the south, and Jeffrey Road to the west. The zoning designation of the project site is 1.5

Recreation. This zoning district identifies lands suitable for active recreational opportunities and activities for public use and enjoyment. The General Plan land use designation of the site is Recreation. This designation contains uses primarily for active public recreational activities that are enjoyed by the immediate and surrounding communities. City-owned parks, regional parks, golf courses, and other similar uses are allowed in this category.

SITE HISTORY

Historically, the project site was developed for agricultural purposes, orchards from at least 1938 to 1967, followed by intermittent row crops from the 1970s to about 2002. No structures were identified as being on the easement and overhead powerline have been present since the early 1970s when the substation is first seen to the east of the site. No Phase I Environmental Site Assessment or other environmental summary reports of historic land uses were available for review.

Objective of the Soil Sampling

The overall objective of the soil sampling is to evaluate if there are residual concentrations of organochlorine pesticides and arsenic in soil at the site from historic agricultural land use that could be of a concern for the planned future land uses.

Field Sampling

Soil samples were collected from four locations within the project area from two sample depths; 0 to 0.5 feet below ground surface (bgs) and from 2 to 2.5 feet bgs. Soil samples were collected using a hand auger on the site on March 10, 2022. Two sample locations were placed within the planned turf field, one sample location in the parking lot and one sample location in the dog park parking location. Select soil samples were analyzed by an analytical laboratory accredited by the California Department of Public Health (CDPH) Environmental Laboratory Accreditation Program (ELAP) for organochlorine pesticides (OCPs) by EPA Method 8081A and arsenic by EPA Method 6010B. All surface samples were analyzed for arsenic and the four surface samples were composited for one composite sample and the four deeper soil samples were composited for OCP analysis. Department of Toxic Substances Control (DTSC) agricultural guidance assumes a relatively even distribution of chemicals across an agricultural field, compositing of discrete samples allows for increased sampling coverage for a site¹. DTSC guidance indicates that composite samples may be made up of a maximum of four discrete surface samples from adjacent sampling locations.

All equipment that came into contact with the soil was decontaminated consistently to assure the quality of samples collected. Decontamination was conducted prior to and after each use of a piece of equipment. All sampling devices used were decontaminated using the following procedures:

- Non-phosphate detergent and distilled water wash, using a brush.
- Initial deionized/distilled water rinse; and
- Final deionized/distilled water rinse.

¹ Department of Toxic Substances Control 2008. Interim Guidance for Sampling Agricultural Properties (Third Revision) August 7.

Soil cuttings were immediately backfilled into the original boring and decontamination water was disposed of in accordance with the Office of Emergency and Remedial Response (OERR) Directive 9345.3-02 (1991). Used personal protection equipment (PPE) were double bagged and placed in a municipal refuse dumpster.

Results

Organochlorine pesticide concentrations and arsenic from soil are summarized in the tables below. All laboratory results are included as an attachment.

Pesticides

The surface and deeper composite samples were collected from across the site to assess for potential residual pesticides from historic agricultural usage of the site. One OCP, dieldrin was detected in the surface composite at a concentration of 0.17 milligrams per kilogram (mg/kg) and was not detected in the deeper composite sample. The concentration of dieldrin was compared to the Department of Toxic Substances Control (DTSC) modified screening levels (SLs) for commercial land use which assumes that an individual will be at the site for 25 years, 250 days per year for 8 hours per day which is health protective for recreational land use.²

Table 1 OCP Concentrations

Sample ID	Dieldrin (mg/kg)	SL Commercial Exposure	Ratio Con to SL
Composite B-1, B-2, B-3, B-4@0.5'	0.17	0.093	1.8
Composite B-1, B-2, B-3, B-4@2.5'	<0.005	0.093	

Since agricultural properties are assumed to have uniform application of pesticides, DTSC has allowed compositing of samples for OCP analyses. The concentration from the composited sample can be used directly in the screening level risk assessment without adjusting the screening level (DTSC 2008). The composite sample slightly exceeds the screening level resulting in an estimated risk of 1.8×10^{-6} which is within the EPA's risk management range of 1×10^{-4} to 1×10^{-6} . Because the site will be paved with either asphalt parking surfaces or a turf field, direct exposure to the soil is not expected to occur and the estimated risk is low indicating OCPs are not a concern for the site.

Arsenic

Arsenic was analyzed for discretely in four surface soil samples by EPA Method 6010B. Arsenic may be elevated at sites due to agricultural usage. Sample results show that arsenic was not elevated and was nondetect in all samples analyzed.

Table 2 Arsenic Concentrations

Sample ID	Arsenic Concentration mg/kg
B-1@0.5'	<1.0
B-2@0.5'	<1.0
B-3@0.5'	<1.0
B-4@0.5'	<1.0

² DTSC 2020. Human Health Risk Assessment (HHRA) Note Number 3, DTSC-modified Screening Levels (DTSC-SLs) June 2020.

The DTSC's screening level for arsenic in southern California soils is 12 mg/kg and arsenic was not detected above the 1.0 mg/kg detection limit indicating that arsenic is not an issue for the site.

Conclusion


Based on the field sampling and analysis at the project site, the analytical results show that historic agricultural usage of the site is not a concern based on planned future land use. There have been no releases at the site of concern.

Based on our understanding of the site PlaceWorks concludes that further assessment of the site is not necessary. The site has found to be not significantly impacted and risks to human health and the environment are found to be within acceptable levels based on the conservative screening-level risk screening.

If you have any questions please do not hesitate to contact the undersigned.

Sincerely,

PLACEWORKS



Denise Clendening, Ph.D.
Associate Principal



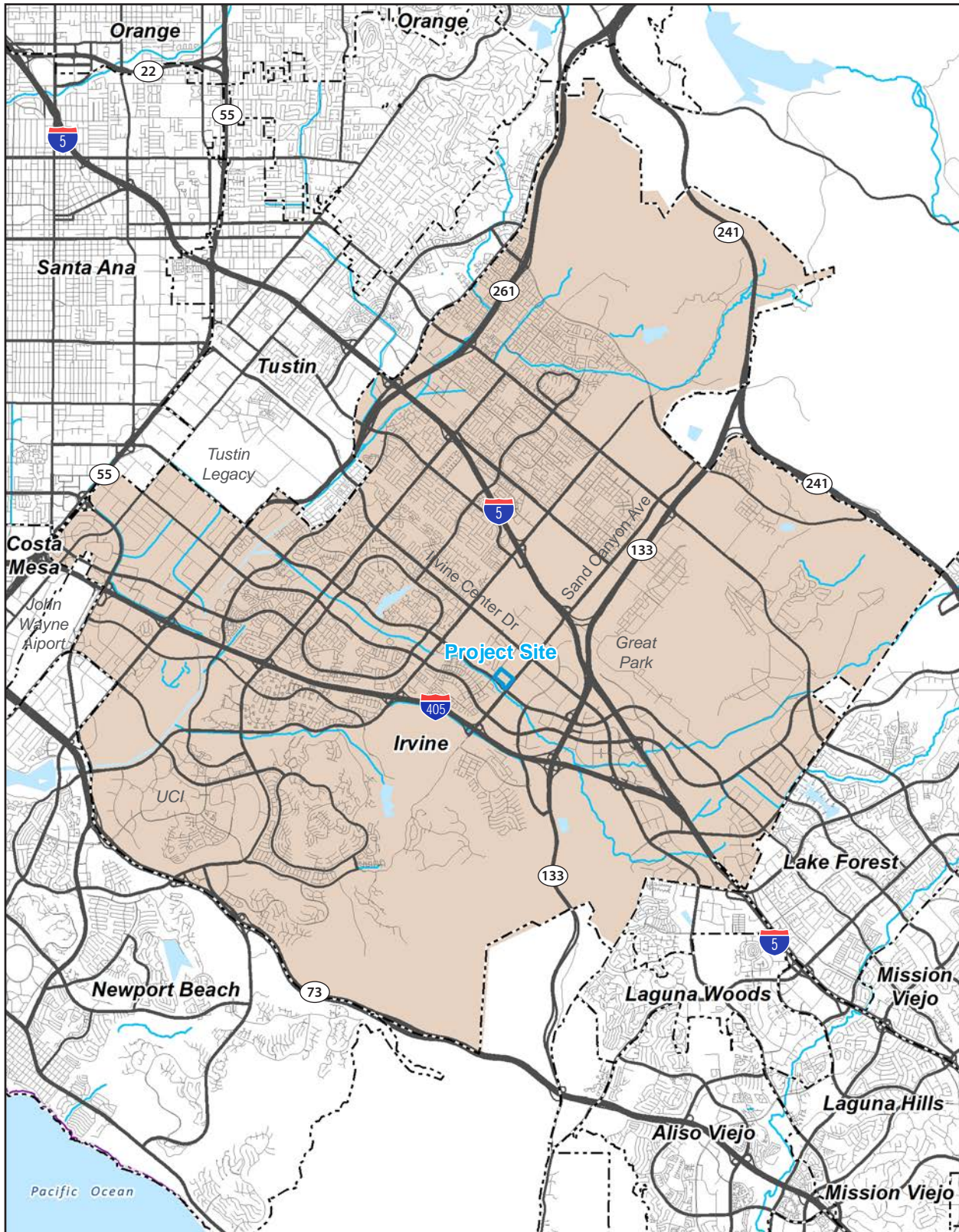
Michael Watson, PG 8177
Senior Geologist

Enclosures

Attachments:

Figure 1 – Local Vicinity
Figure 2 – Aerial Photograph
Figure 3 – Sample Locations
Laboratory Data

Figure 1 - Local Vicinity



- Project Boundary
- - - - City Boundary

Source: ESRI, 2021

0 1
Scale (Mile)



PlaceWorks

Figure 2 - Aerial Photograph



— Project Boundary

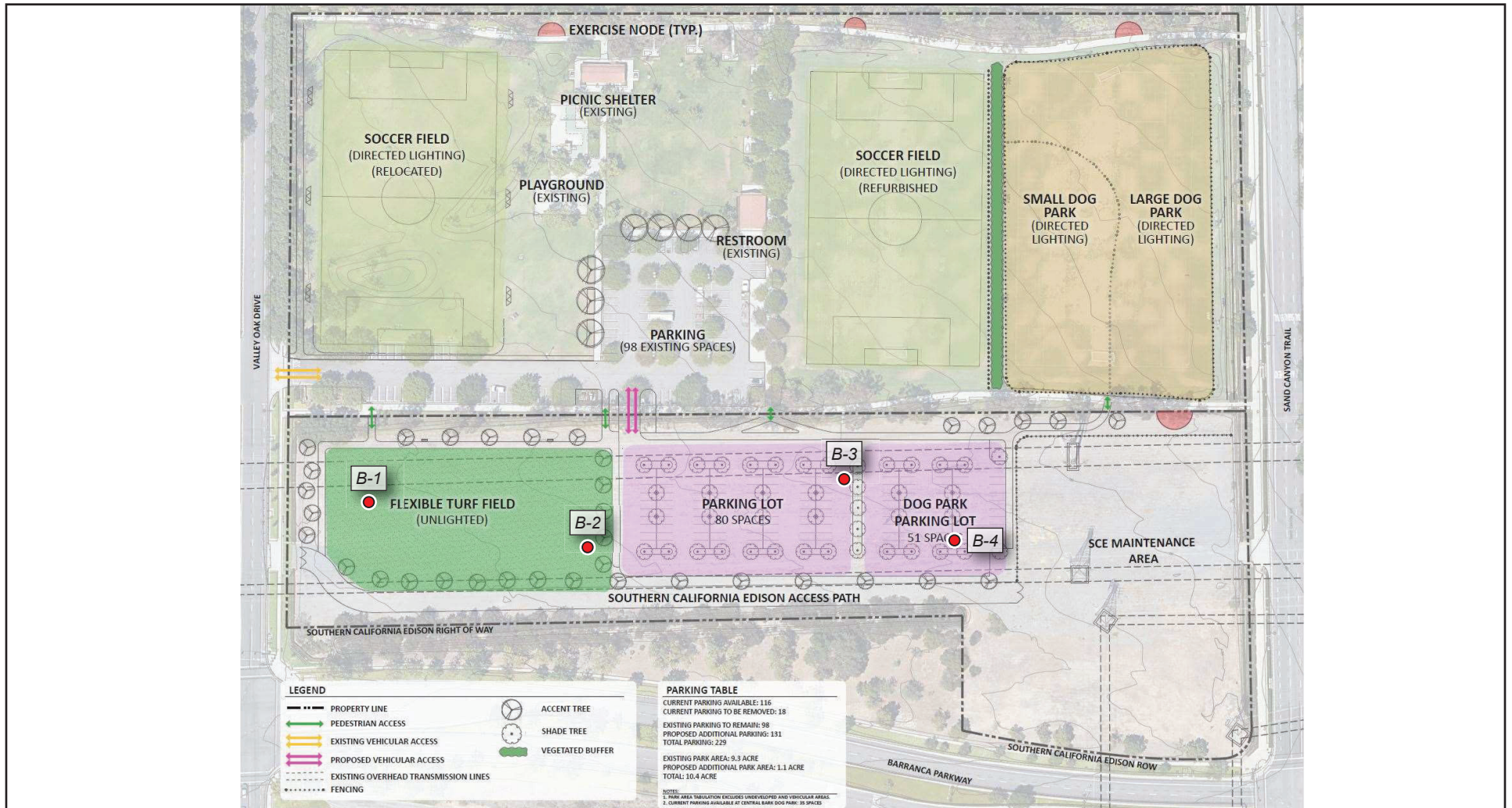
0 450
Scale (Feet)



Source: Nearmap, 2021

PlaceWorks

Figure 3 - Soil Sample Locations



● B-X Soil Sample Locations (4)

0 165
Scale (Feet)





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CASE NARRATIVE

Authorized Signature Name / Title (print)

Ken Zheng, President

Signature / Date

Ken Zheng, President
03/18/2022 15:10:54

Laboratory Job No. (Certificate of Analysis No.)

2203-00100

Project Name / No.

OAK CREEK COMMUNITY PARK, IRVINE, CA / COI-56

Dates Sampled (from/to)

03/10/22 To 03/10/22

Dates Received (from/to)

03/10/22 To 03/10/22

Dates Reported (from/to)

03/18/22 To 3/18/2022

Chains of Custody Received

Yes

Comments:

Subcontracting

Organic Analyses

No analyses sub-contracted

Inorganic Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

Sample	Analyte	Result	Qual	Units	RL	Result	Qual	Units	RL
COMPOSITE: B-1, B-2, B-3, B-4@	Dieldrin	0.017		mg/Kg	0.0050				



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CERTIFICATE OF ANALYSIS

2203-00100

PLACEWORKS
DENISE CLENDENING
2850 INLAND EMPIRE BLVD.
SUITE B
ONTARIO, CA 91764

Date Reported 03/18/22
Date Received 03/10/22
Invoice No. 94412
Cust # P135
Permit Number
Customer P.O.

Project: OAK CREEK COMMUNITY PARK, IRVINE, CA / COI-56

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 B-1@0.5' Sample Matrix: Soil					Date & Time Sampled:		03/10/22 @	7:07
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		03/14/22	TLB
Arsenic	<1.0		mg/Kg	EPA 6010B	1.0	1.0	03/14/22	TLB
Sample: 002 B-2@0.5' Sample Matrix: Soil					Date & Time Sampled:		03/10/22 @	7:38
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		03/14/22	TLB
Arsenic	<1.0		mg/Kg	EPA 6010B	1.0	1.0	03/14/22	TLB
Sample: 003 B-3@0.5' Sample Matrix: Soil					Date & Time Sampled:		03/10/22 @	8:03
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		03/14/22	TLB
Arsenic	<1.0		mg/Kg	EPA 6010B	1.0	1.0	03/14/22	TLB
Sample: 004 B-4@0.5' Sample Matrix: Soil					Date & Time Sampled:		03/10/22 @	8:35
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1.0		03/14/22	TLB
Arsenic	<1.0		mg/Kg	EPA 6010B	1.0	1.0	03/14/22	TLB
Sample: 005 COMPOSITE: B-1, B-2, B-3, B-4@0.5' Sample Matrix: Soil					Date & Time Sampled:		03/10/22 @	7:07
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		03/17/22	JEN
Aldrin	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
alpha-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
beta-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
delta-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
gamma-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	03/17/22	JEN
4,4'-DDD	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN

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USDA-EPA-NIOSH Testing Food Sanitation Consulting Chemical and Microbiological Analyses and Research



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Customer P.O.

Project: OAK CREEK COMMUNITY PARK, IRVINE, CA / COI-56

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 005 COMPOSITE: B-1, B-2, B-3, B-4@0.5'							Date & Time Sampled: 03/10/22 @ 7:07	
Sample Matrix: Soil								
.....continued								
4,4'-DDE	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
4,4'-DDT	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Dieldrin	0.017		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endosulfan I	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endosulfan II	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endosulfan Sulfate	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endrin	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endrin Aldehyde	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endrin ketone	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Heptachlor	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Heptachlor Epoxide	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	03/17/22	JEN
Toxaphene	<0.050		mg/Kg	EPA 8081A	1.0	0.050	03/17/22	JEN
[Surrogates]								
Tetrachloro-m-xylene	140		%REC	EPA 8081A/8082		50-150	03/17/22	JEN
Decachlorobiphenyl	150		%REC	EPA 8081A/8082		50-150	03/17/22	JEN
Sample: 006 COMPOSITE: B-1, B-2, B-3, B-4@2.5'							Date & Time Sampled: 03/10/22 @ 7:07	
Sample Matrix: Soil								
[Pesticides]								
Ultrasonic Extraction	Complete			EPA 3550	1.0		03/17/22	JEN
Aldrin	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
alpha-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
beta-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
delta-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
gamma-BHC	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Chlordane	<0.010		mg/Kg	EPA 8081A	1.0	0.010	03/17/22	JEN
4,4'-DDD	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
4,4'-DDE	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
4,4'-DDT	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Dieldrin	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN

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Customer P.O.

Project: OAK CREEK COMMUNITY PARK, IRVINE, CA / COI-56

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 006 COMPOSITE: B-1, B-2, B-3, B-4@2.5'							Date & Time Sampled: 03/10/22 @ 7:07	
Sample Matrix: Soil								
.....continued								
Endosulfan I	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endosulfan II	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endosulfan Sulfate	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endrin	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endrin Aldehyde	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Endrin ketone	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Heptachlor	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Heptachlor Epoxide	<0.0050		mg/Kg	EPA 8081A	1.0	0.0050	03/17/22	JEN
Methoxychlor	<0.010		mg/Kg	EPA 8081A	1.0	0.010	03/17/22	JEN
Toxaphene	<0.050		mg/Kg	EPA 8081A	1.0	0.050	03/17/22	JEN
[Surrogates]								
Tetrachloro-m-xylene	150		%REC	EPA 8081A/8082		50-150	03/17/22	JEN
Decachlorobiphenyl	150		%REC	EPA 8081A/8082		50-150	03/17/22	JEN

Respectfully Submitted:

Ken Zheng - Lab Director

QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications. The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician



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QUALITY CONTROL DATA REPORT

PLACEWORKS
 ONTARIO, CA 91764

2203-00100

Date Reported 03/18/2022
 Date Received 03/10/2022
 Date Sampled 03/10/2022
 Invoice No. 94412
 Customer # P135
 Customer P.O.

Project: OAK CREEK COMMUNITY PARK, IRVINE, CA /
 COI-56

Method #		EPA 6010B				
QC Reference #	101559	Date Analyzed:	3/14/2022	Technician: TLB		
Samples	001 002 003 004					
Results						
	LCS %REC	LCS %DUP	LCS %RPD	SPIKE %REC	SPIKE %DUP	SPIKE %RPD
Arsenic	102	100	1.8	79	80	0.5
				Control Ranges		
				LCS %REC	LCS %RPD	SPIKE %RPD
				75 - 125	0 - 20	0 - 20

Method #		EPA 8081A				
QC Reference #	101684	Date Analyzed:	3/17/2022	Technician: JEN		
Samples	005 006					
Results						
	LCS %REC					
4,4'-DDT	110					
Aldrin	110					
Dieldrin	120					
Endrin	120					
gamma-BHC	110					
Heptachlor	120					
				Control Ranges		
				LCS %REC		
				30 - 130		
				50 - 140		
				70 - 130		
				70 - 150		
				50 - 150		
				50 - 150		

Method # EPA 8081A/8082
 QC Reference # 101684 Date Analyzed: 3/17/2022 Technician: JEN
 Samples 005 006
No QC recoveries reported.

No method blank results were above reporting limit

Respectfully Submitted:

Ken Zheng

Ken Zheng - President



Sample Acceptance Checklist

CLIENT: PLACEWORKS

WORK ORDER NUMBER: 2203-100

Temperature: (Criteria: 0.0°C-6.0°C)
 Sample Temp. (w/CF) °C(w/CF) 4.0°c

Sample(s) outside temperature criteria: PM contacted by : _____
 Sample(s) outside temperature criteria, but received on ice/chilled on same day of sampling.
 Sample(s) received at ambient temperature; placed on ice for transport by courier.
 Ambient Temperature Air Filter

CUSTODY SEAL:
 Cooler Present and Intact Present and Not Intact Not Present
 Sample(s) Present and Intact Present and Not Intact Not Present

Sample Condition:	Yes	No	N/A
Was a COC received	✓		
Were sample IDs present?	✓		
Were sampling dates & times present?	✓		
Was a relinquished signature present?	✓		
Were the tests required clearly indicated?	✓		
Were all samples sealed in plastic bags?		✓	
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were correct containers used for the tests required?	✓		
Was a sufficient amount of samples sent for tests indicated?	✓		
Was there headspace in VOA vials?			✓
Were the containers labeled with correct preservatives?			✓

Explanations/Comments:

Notification:
 For discrepancies, how was the Project Manager notified? Verbal
 Verbal: PM Initials: _____ Data/Time: _____
 Email: Send to: _____ Data/Time: _____
 Project Manager's response:

Completed By: [Signature]

Date: 3-10-22

A R Laboratories
 1650 S. Grove Ave., Suite C, Ontario, CA 91761
 PH: 951-779-0310 Fax: 951-779-0344
 Email: office@arlaboratories.com