

# Appendix 5A-4 HEC5Q and Reclamation Temperature Model Assumptions Callouts

## 1 Introduction

The assumptions for all Sites model simulations are summarized in Appendix 5A Attachment 1 Model Assumptions.

### 1.1 HEC5Q and Reclamation Temperature Modeling Assumptions Callouts

The following matrix summarizes the assumptions used for the HEC5Q and Reclamation Temperature models:

- No Action Alternative 011221
- Alternative 1A 011221
- Alternative 1B 011221
- Alternative 2 011221
- Alternative 3 020121

|                      | <b>No Action Alternative (NAA)</b> | <b>Alternative 1A (ALT 1A)</b> | <b>Alternative 1B (ALT 1B)</b> | <b>Alternative 2 (ALT 2)</b> | <b>Alternative 3 (ALT 3)</b> |
|----------------------|------------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|
| Period of simulation | 82 years (1922-2003)               | Same as NAA                    | Same as NAA                    | Same as NAA                  | Same as NAA                  |

|         | <b>No Action Alternative (NAA)</b> | <b>Alternative 1A (ALT 1A)</b> | <b>Alternative 1B (ALT 1B)</b> | <b>Alternative 2 (ALT 2)</b> | <b>Alternative 3 (ALT 3)</b> |
|---------|------------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|
| Climate | Current climate conditions         | Same as NAA                    | Same as NAA                    | Same as NAA                  | Same as NAA                  |

|                             | <b>No Action Alternative (NAA)</b>          | <b>Alternative 1A (ALT 1A)</b>              | <b>Alternative 1B (ALT 1B)</b>              | <b>Alternative 2 (ALT 2)</b>                | <b>Alternative 3 (ALT 3)</b>                |
|-----------------------------|---|---|---|---|---|
| Boundary flows and storages | Monthly timeseries (from CalSim II output). | Monthly timeseries (from CalSim II output). | Monthly timeseries (from CalSim II output). | Monthly timeseries (from CalSim II output). | Monthly timeseries (from CalSim II output). |

|              | <b>No Action Alternative (NAA)</b>   | <b>Alternative 1A (ALT 1A)</b>   | <b>Alternative 1B (ALT 1B)</b>   | <b>Alternative 2 (ALT 2)</b>   | <b>Alternative 3 (ALT 3)</b>   |
|--------------|--|--|--|--|--|
| Trinity Lake | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |

|                  | <b>No Action Alternative (NAA)</b>   | <b>Alternative 1A (ALT 1A)</b>   | <b>Alternative 1B (ALT 1B)</b>   | <b>Alternative 2 (ALT 2)</b>   | <b>Alternative 3 (ALT 3)</b>   |
|------------------|--|--|--|--|--|
| Lewistown Lake   | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |
| Whiskeytown Lake | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |
| Shasta Lake      | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |

|                               | <b>No Action Alternative (NAA)</b>   | <b>Alternative 1A (ALT 1A)</b>   | <b>Alternative 1B (ALT 1B)</b>   | <b>Alternative 2 (ALT 2)</b>   | <b>Alternative 3 (ALT 3)</b>   |
|-------------------------------|--|--|--|--|--|
| Keswick Reservoir             | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         |
| Black Butte Lake              | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir.         |
| Shasta Temperature Management | Temperature schedules developed to match Shasta Summer Cold Water Pool Management in 2019 NMFS BiOp. | Temperature schedules developed to match Shasta Summer Cold Water Pool Management in 2019 NMFS BiOp. | Temperature schedules developed to match Shasta Summer Cold Water Pool Management in 2019 NMFS BiOp. | Temperature schedules developed to match Shasta Summer Cold Water Pool Management in 2019 NMFS BiOp. | Temperature schedules developed to match Shasta Summer Cold Water Pool Management in 2019 NMFS BiOp. |

|                                | <b>No Action Alternative (NAA)</b>   | <b>Alternative 1A (ALT 1A)</b>   | <b>Alternative 1B (ALT 1B)</b>   | <b>Alternative 2 (ALT 2)</b>   | <b>Alternative 3 (ALT 3)</b>   |
|--------------------------------|--|--|--|--|--|
| Trinity Temperature Management | Releases allowed from lower, auxiliary outlet when normal outlet release are too warm.       | Releases allowed from lower, auxiliary outlet when normal outlet release are too warm.       | Releases allowed from lower, auxiliary outlet when normal outlet release are too warm.       | Releases allowed from lower, auxiliary outlet when normal outlet release are too warm.       | Releases allowed from lower, auxiliary outlet when normal outlet release are too warm.       |
| Lake Oroville                  | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |
| Thermalito Afterbay            | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |

|                               | <b>No Action Alternative (NAA)</b>   | <b>Alternative 1A (ALT 1A)</b>   | <b>Alternative 1B (ALT 1B)</b>   | <b>Alternative 2 (ALT 2)</b>   | <b>Alternative 3 (ALT 3)</b>   |
|-------------------------------|--|--|--|--|--|
| Folsom Lake                   | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |
| Lake Natoma                   | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |
| Folsom Temperature Management | Similar to 2009 NMFS BiOp Appendix B (See 2015 LTO for details).                             | Similar to 2009 NMFS BiOp Appendix B (See 2015 LTO for details).                             | Similar to 2009 NMFS BiOp Appendix B (See 2015 LTO for details).                             | Similar to 2009 NMFS BiOp Appendix B (See 2015 LTO for details).                             | Similar to 2009 NMFS BiOp Appendix B (See 2015 LTO for details).                             |
| New Melones Lake              | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |

|                   | <b>No Action Alternative (NAA)</b>   | <b>Alternative 1A (ALT 1A)</b>   | <b>Alternative 1B (ALT 1B)</b>   | <b>Alternative 2 (ALT 2)</b>   | <b>Alternative 3 (ALT 3)</b>   |
|-------------------|--|--|--|--|--|
| Lake Tulloch      | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |
| Goodwin Reservoir | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. | Monthly timeseries (from CalSim II output). Limited to physical specifications of reservoir. |