



United States Department of the Interior

BUREAU OF RECLAMATION
Central Valley Operations Office
3310 El Camino Avenue, Suite 300
Sacramento, California 95821

IN REPLY REFER TO:

OCT 05 2018

CVO-400
WTR-4.10

VIA ELECTRONIC MAIL

Mr. Erik Ekdahl
Deputy Director, Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812

Subject: Monitoring and Reporting Program on Water Rights Order No. 90-5 (Water Rights)

Dear Mr. Ekdahl:

For the month of September 2018, the temperature control point was set at Balls Ferry, per the May 2018, Sacramento River Temperature Plan.

During the month, the average daily water temperature compliance of 56.0°F or less was met at the Balls Ferry compliance point on the Sacramento River. During the month, the observed average monthly water temperature was 54.2°F at Balls Ferry.

Enclosed is the monitoring report for September 2018, under Order No. 90-5. Some directly measured information is not available due to the Carr Fire near Shasta and Keswick Dams. At present, Reclamation has recovered communication systems and expects uninterrupted data in the future. The report contains the following data as required:

| ID # | Station | Temperature* | Turbidity* | Dissolved Oxygen* | Flow* |
|------|------------------------------------|--------------|------------|-------------------|-------|
| 1 | Shasta Inlets | X | X | | |
| 2 | Shasta Dam | X | X | X | |
| 2a | Shasta Dam | | | | X |
| 3 | Sacramento River below Keswick Dam | X | | X | |
| 3a | Keswick Dam | | X | | X |
| 4 | Spring Creek Power Plant | X | X | | X |
| 5 | Temperature Control Point | X | X | X | |
| 6 | Sacramento River at Delta | X | X | | |
| 7 | McCloud River | X | X | | |
| 8 | Pit River | X | X | | |

| ID # | Station | Temperature* | Turbidity* | Dissolved Oxygen* | Flow* |
|------|---|--------------|------------|-------------------|-------|
| 9 | Trinity River below Lewiston Dam | X | | | |
| 9a | Lewiston Dam | | | | X |
| 10 | Trinity River at Douglas City Bridge | X | | | |
| 11 | Trinity River at confluence of North Fork | X | | | |

*Monitoring frequency, period, and units are specified in enclosures

Please contact Ms. Randi Field at 916-979-2066, should you have any questions regarding this data.

Sincerely,

Elizabeth Kiteck
Chief, Water Operations

Enclosures

cc: Ms. Alessia Siclari Melchor
Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812

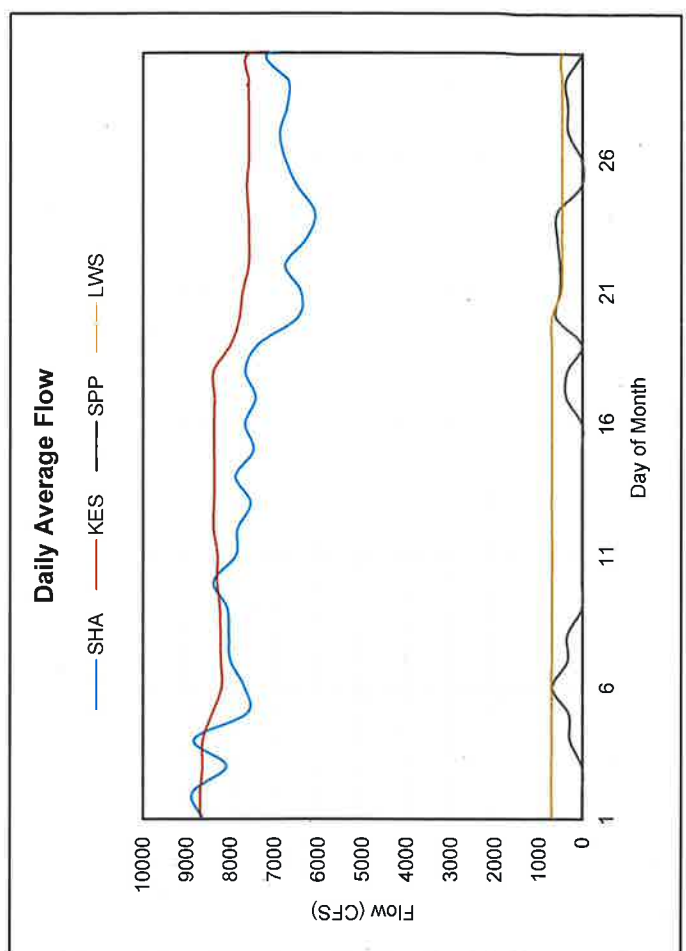
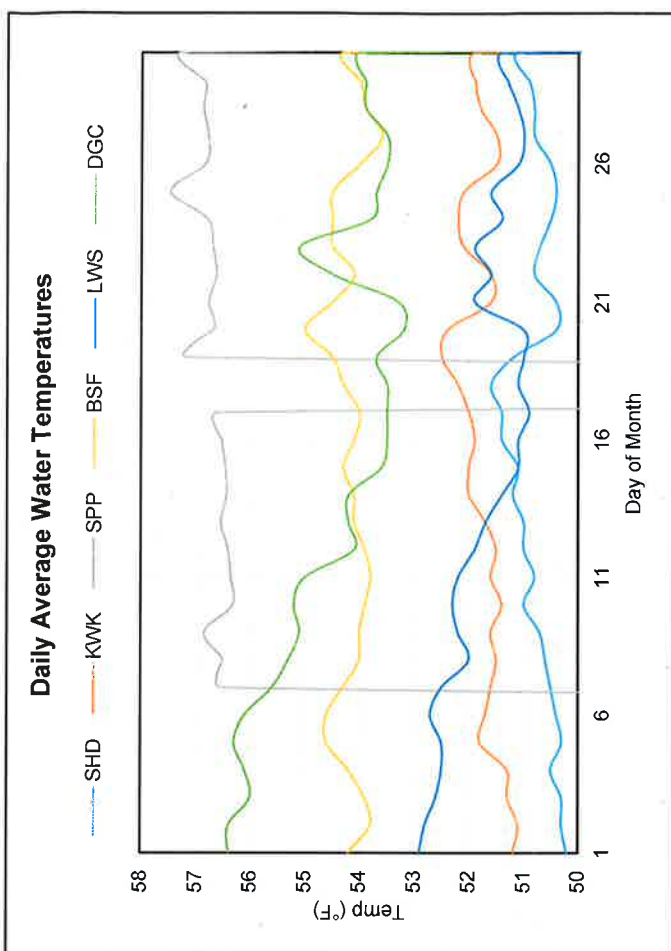
Mr. Vadim Demchuk
Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
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Ms. Diane Riddle
Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812
(w/encl)

90-5 Required Water Monitoring Data

September 2018

| Daily Averages from Hourly Automated Observations | | | | | | | | | | | | |
|---|-----------|------|------------------|------------------|------|------|--------------|------|------|-----|------------|--|
| Parameter | Temp (°F) | | | | | | | | | | Flow (CFS) | |
| | Site | 2 | 3 | 4 | 5 | 9 | 10 | 2a | 3a | 4 | 9a | |
| | SHD | KWK | SPP ² | BSF ¹ | LWS | DGC | SHA | KES | SPP | LWS | | |
| 1 | 50.2 | 51.2 | - | 54.2 | 52.9 | 56.4 | 8625 | 8684 | 14 | 709 | | |
| 2 | 50.3 | 51.1 | - | 53.8 | 52.8 | 56.4 | 8874 | 8687 | 14 | 713 | | |
| 3 | 50.3 | 51.3 | - | 53.9 | 52.6 | 56.0 | 8099 | 8634 | 14 | 715 | | |
| 4 | 50.5 | 51.3 | - | 54.2 | 52.5 | 56.1 | 8837 | 8633 | 297 | 709 | | |
| 5 | 50.3 | 51.8 | - | 54.6 | 52.5 | 56.3 | 7628 | 8412 | 318 | 709 | | |
| 6 | 50.4 | 51.7 | - | 54.6 | 52.7 | 56.1 | 7682 | 8198 | 699 | 715 | | |
| 7 | 50.5 | 51.6 | 56.5 | 54.3 | 52.5 | 55.6 | 8004 | 8218 | 345 | 704 | | |
| 8 | 50.6 | 51.5 | 56.5 | 54.0 | 52.0 | 55.3 | 8039 | 8223 | 350 | 703 | | |
| 9 | 50.7 | 51.6 | 56.8 | 54.0 | 52.2 | 55.1 | 8072 | 8234 | 14 | 703 | | |
| 10 | 51.0 | 51.4 | 56.3 | 53.9 | 52.3 | 55.2 | 8383 | 8301 | 14 | 702 | | |
| 11 | 50.8 | 51.6 | 56.4 | 53.8 | 52.2 | 55.0 | 7870 | 8286 | 14 | 697 | | |
| 12 | 51.0 | 51.5 | 56.4 | 53.9 | 51.9 | 54.1 | 7834 | 8379 | 14 | 703 | | |
| 13 | 51.0 | 51.7 | 56.5 | 54.1 | 51.7 | 54.2 | 7535 | 8371 | 14 | 706 | | |
| 14 | 51.2 | 52.0 | 56.4 | 54.1 | 51.4 | 54.2 | 7879 | 8362 | 14 | 704 | | |
| 15 | 51.1 | 52.0 | 56.5 | 54.3 | 51.1 | 53.6 | 7468 | 8367 | 14 | 699 | | |
| 16 | 51.4 | 51.9 | 56.5 | 54.1 | 51.1 | 53.5 | 7663 | 8366 | 14 | 702 | | |
| 17 | 51.4 | 52.0 | 56.6 | 54.0 | 50.9 | 53.5 | 7421 | 8356 | 372 | 703 | | |
| 18 | 51.6 | 52.2 | - | 54.3 | 51.1 | 53.5 | 7651 | 8372 | 353 | 700 | | |
| 19 | 51.2 | 52.5 | 57.2 | 54.5 | 51.0 | 53.7 | 7361 | 7980 | 14 | 703 | | |
| 20 | 50.4 | 52.4 | 56.7 | 55.0 | 51.0 | 53.2 | 6458 | 7784 | 599 | 706 | | |
| 21 | 50.4 | 51.6 | 56.8 | 54.5 | 51.9 | 53.3 | 6371 | 7714 | 514 | 490 | | |
| 22 | 50.8 | 51.6 | 56.6 | 54.1 | 51.6 | 54.5 | 6733 | 7570 | 514 | 464 | | |
| 23 | 50.7 | 52.1 | 56.7 | 54.5 | 51.9 | 55.1 | 6251 | 7563 | 574 | 465 | | |
| 24 | 50.5 | 52.2 | 56.8 | 54.5 | 51.4 | 53.8 | 6053 | 7576 | 577 | 464 | | |
| 25 | 50.4 | 52.1 | 57.5 | 54.5 | 51.6 | 53.7 | 6456 | 7616 | 30 | 464 | | |
| 26 | 50.5 | 51.5 | 56.8 | 54.0 | 51.1 | 53.5 | 6727 | 7564 | 16 | 462 | | |
| 27 | 50.8 | 51.5 | 56.8 | 53.6 | 51.0 | 53.5 | 6849 | 7567 | 325 | 459 | | |
| 28 | 50.8 | 51.8 | 56.9 | 53.9 | 51.1 | 53.9 | 6684 | 7567 | 329 | 459 | | |
| 29 | 50.9 | 51.9 | 56.8 | 54.0 | 51.3 | 53.9 | 6655 | 7569 | 383 | 461 | | |
| 30 | 51.1 | 51.9 | 57.3 | 54.3 | 51.4 | 54.0 | 7078 | 7506 | 20 | 461 | | |
| - | - | - | - | - | - | - | - | - | - | - | | |
| | | | | | | | Max | 8874 | 8687 | 699 | 715 | |
| | | | | | | | Mean | 7441 | 8089 | 226 | 625 | |
| | | | | | | | Min | 6053 | 7506 | 14 | 459 | |
| | | | | | | | Volume (TAF) | 443 | 481 | 13 | 37 | |



Notes

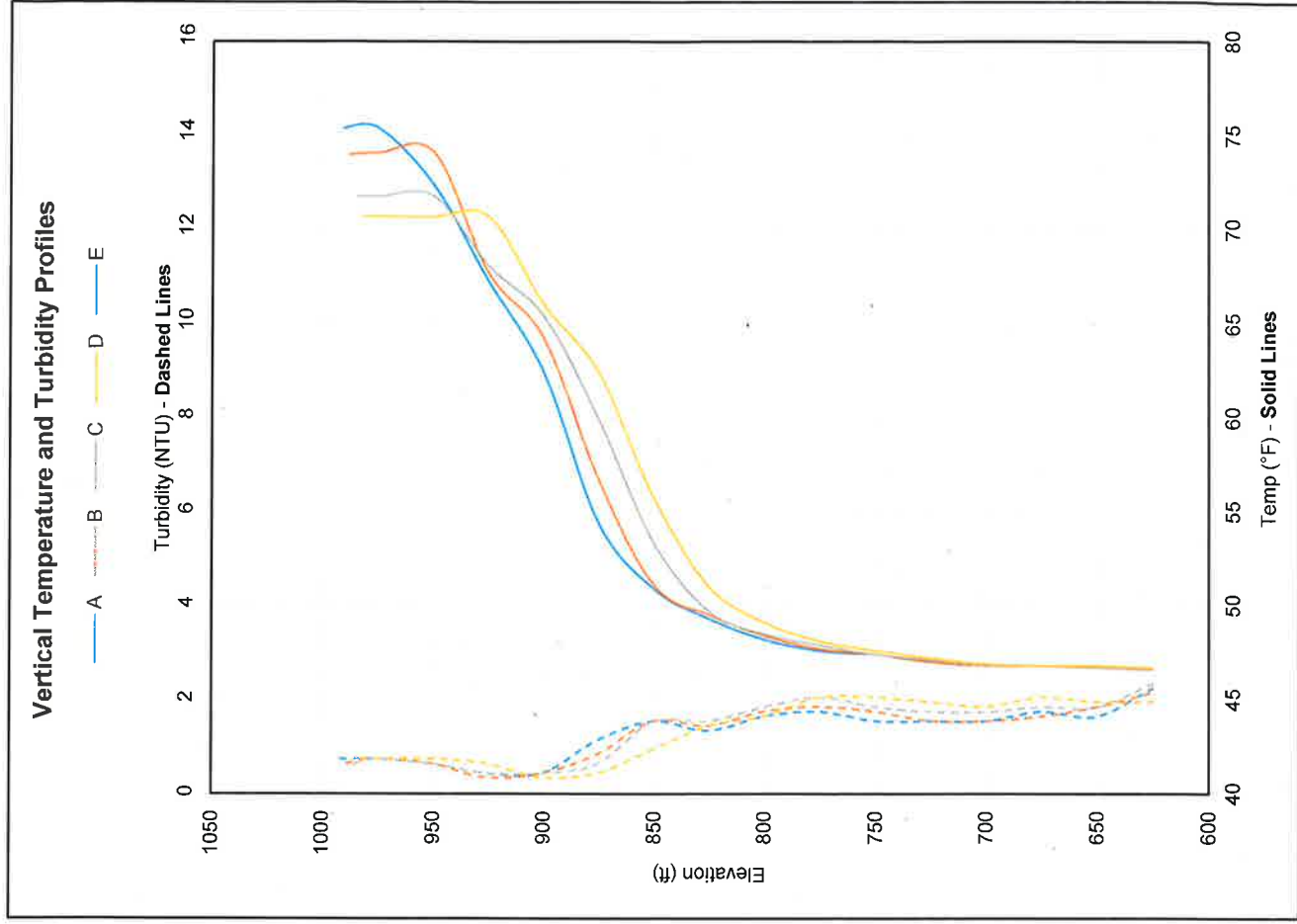
¹ Current temperature control point

² Missing data due to Carr Fire

90-5 Required Water Monitoring Data (Continued)

September 2018

| Vertical Profiles Taken at Site 1 (Shasta Lake at Dam Inlets) | | | | | | | | | | | | |
|---|--------|------|--------|------|--------|------|--------|------|------|------|------|------|
| Profile | A | | B | | C | | D | | E | | | |
| Day of Month | 5 | | 11 | | 18 | | 25 | | | | | |
| Lake Elev. | 991.16 | | 988.36 | | 984.74 | | 981.89 | | | | | |
| Parameter | Temp | Turb | Temp | Turb | Temp | Turb | Temp | Turb | Temp | Turb | Temp | Turb |
| L.E. | 75.4 | 0.7 | 74.0 | 0.6 | 71.8 | 0.6 | 70.7 | 0.7 | 70.7 | 0.7 | - | - |
| 1050 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1025 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1000 | - | - | - | - | - | - | - | - | - | - | - | - |
| 975 | 75.4 | 0.7 | 74.1 | 0.7 | 71.8 | 0.7 | 70.7 | 0.7 | 70.7 | 0.7 | - | - |
| 950 | 72.4 | 0.6 | 74.1 | 0.6 | 71.8 | 0.6 | 70.7 | 0.7 | 70.7 | 0.7 | - | - |
| 925 | 67.3 | 0.4 | 67.7 | 0.3 | 68.1 | 0.4 | 70.7 | 0.6 | 70.7 | 0.6 | - | - |
| 900 | 62.4 | 0.4 | 64.2 | 0.4 | 65.4 | 0.4 | 66.0 | 0.3 | 66.0 | 0.3 | - | - |
| 875 | 54.4 | 1.1 | 56.7 | 0.8 | 59.9 | 0.6 | 62.4 | 0.4 | 62.4 | 0.4 | - | - |
| 850 | 50.9 | 1.5 | 51.1 | 1.5 | 53.3 | 1.5 | 55.7 | 0.9 | 55.7 | 0.9 | - | - |
| 825 | 49.3 | 1.3 | 49.5 | 1.4 | 49.7 | 1.5 | 51.0 | 1.4 | 51.0 | 1.4 | - | - |
| 800 | 48.2 | 1.6 | 48.4 | 1.7 | 48.5 | 1.8 | 49.1 | 1.6 | 49.1 | 1.6 | - | - |
| 775 | 47.6 | 1.7 | 47.7 | 1.8 | 47.9 | 2.0 | 48.1 | 2.0 | 48.1 | 2.0 | - | - |
| 750 | 47.4 | 1.5 | 47.4 | 1.7 | 47.4 | 1.8 | 47.6 | 2.0 | 47.6 | 2.0 | - | - |
| 725 | 47.0 | 1.5 | 47.0 | 1.5 | 47.1 | 1.7 | 47.2 | 1.9 | 47.2 | 1.9 | - | - |
| 700 | 46.8 | 1.5 | 46.8 | 1.5 | 46.8 | 1.7 | 46.9 | 1.8 | 46.9 | 1.8 | - | - |
| 675 | 46.8 | 1.7 | 46.8 | 1.6 | 46.8 | 1.8 | 46.8 | 2.0 | 46.8 | 2.0 | - | - |
| 650 | 46.7 | 1.6 | 46.7 | 1.8 | 46.7 | 1.8 | 46.8 | 1.9 | 46.8 | 1.9 | - | - |
| 625 | 46.6 | 2.2 | 46.6 | 2.1 | 46.6 | 2.3 | 46.7 | 1.9 | 46.7 | 1.9 | - | - |



| Monthly Manual Observations | | | | | | | | | | | | |
|-----------------------------|-----------|------|------|-----|-----|-----|------------|-----|-----|-----|--|--|
| Parameter | Temp (°F) | | | | | | Turb (NTU) | | | | | |
| | 6 | 7 | 8 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| Site | DLT | MSS | PMN | SHD | KWK | SPP | RDB | DLT | MSS | PMN | | |
| Value | 57.8 | 50.8 | 59.7 | 1.4 | 1.3 | 0.5 | 1.7 | 0.9 | 0.8 | 1.6 | | |
| Day of Month | 26 | 20 | 21 | 19 | 5 | 5 | 14 | 26 | 20 | 21 | | |

| Monthly Manual** & Bi-Monthly Automated Observations | | | | | | | | | | | | |
|--|-----------|-------|------|--------|------|------|------|--------|------|--|--|--|
| Parameter | DO (mg/L) | | | | | | | | | | | |
| | 2 | | 3 | | | 5 | | | | | | |
| Site | SHD | | KWK | | | RDB | | | | | | |
| Value | 9.5 | 9.4** | 10.6 | 10.3** | 10.0 | 10.0 | 11.2 | 11.6** | 11.6 | | | |
| Day of Month | 9 | 19 | 29 | 5 | 15 | 25 | 4 | 14 | 24 | | | |
| Time | 9:00 | 9:30 | 9:00 | 9:00 | 9:00 | 9:00 | 9:00 | 9:16 | 9:00 | | | |

90-5 Required Water Monitoring Details

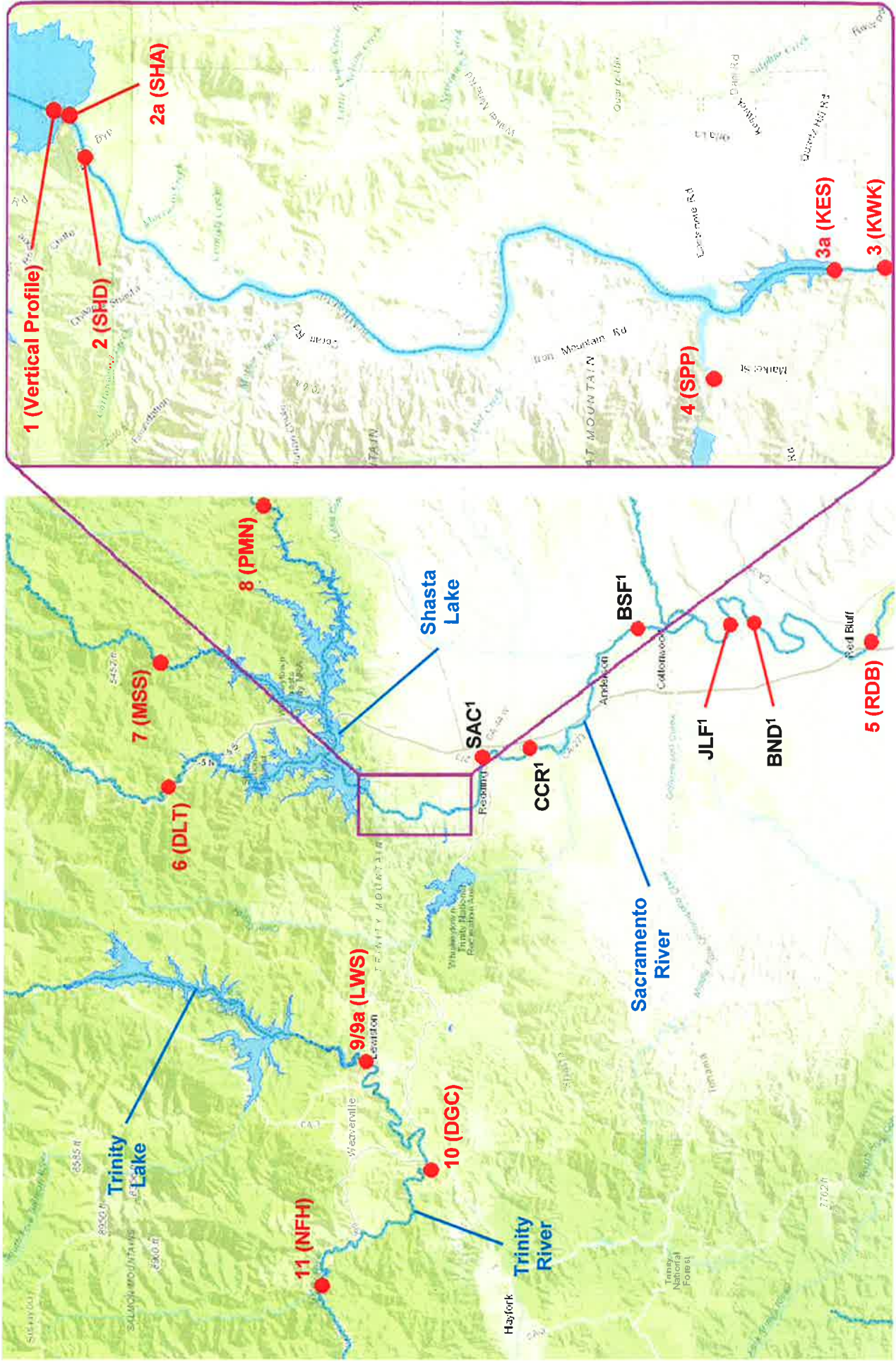
| Site | CDEC ID | Description |
|------|------------------|--|
| 1 | - | Shasta Dam inlets or lake adjacent to the dam face. ¹ |
| 2 | SHD | Shasta Dam release immediately downstream from the power plant. |
| 2a | SHA | Shasta Dam release. |
| 3 | KWK | Sacramento River immediately downstream from Keswick Dam. |
| 3a | KES | Keswick Dam release. |
| 4 | SPP | Spring Creek Power Plant release. |
| 5 | RDB | Sacramento River downstream from Red Bluff Diversion Dam. |
| 6 | DLT ² | Sacramento River (above Shasta Dam). |
| 7 | MSS | McCloud River (above Shasta Dam). |
| 8 | PMN | Pit River (above Shasta Dam). |
| 9 | LWS | Trinity River immediately downstream from Lewiston Dam. |
| 9a | LWS | Lewiston Dam release. |
| 10 | DGC | Trinity River at the Douglas City Bridge. |
| 11 | NFH | Trinity River at the confluence of the North Fork Trinity River. |

| | Temperature | | Turbidity ³ | | Dissolved Oxygen ⁴ | | Flow | |
|----|----------------------------|---------------|------------------------|----------|-------------------------------|-------------|---------------|----------|
| | Frequency | Period | Frequency | Period | Frequency | Period | Frequency | Period |
| 1 | Every 2 weeks | 5/1 to 11/30 | Monthly | All Year | - | - | - | - |
| 2 | Average Daily | All Year | Monthly | All Year | Every 2 weeks | 5/1 to 9/30 | - | - |
| 2a | - | - | - | - | - | - | Average Daily | All Year |
| 3 | Average Daily | All Year | - | - | Every 2 weeks | 5/1 to 9/30 | - | - |
| 3a | - | - | Monthly | All Year | - | - | Average Daily | All Year |
| 4 | Average Daily | All Year | Monthly | All Year | - | - | Average Daily | All Year |
| 5 | Average Daily ⁵ | All Year | Monthly | All Year | Every 2 weeks | 5/1 to 9/30 | - | - |
| 6 | Monthly | All Year | Monthly | All Year | - | - | - | - |
| 7 | Monthly | All Year | Monthly | All Year | - | - | - | - |
| 8 | Monthly | All Year | Monthly | All Year | - | - | - | - |
| 9 | Average Daily | All Year | - | - | - | - | - | - |
| 9a | - | - | - | - | - | - | Average Daily | All Year |
| 10 | Average Daily | 9/15 to 10/1 | - | - | - | - | - | - |
| 11 | Average Daily | 10/1 to 12/31 | - | - | - | - | - | - |

Notes

- Take sufficient collection points to characterize the vertical profile for temperature and turbidity.
- Site 6 (DLT) is not accessible year round making it unsuitable for real-time Dissolved Oxygen monitoring do to calibration requirements.
- From 5/1 to 9/30 if turbidity at site 2 is greater than or equal to 10 ntu's then frequency must be weekly.
- To be taken before 10:00 am.
- If the temperature control point is moved upstream from site 5, then temperature monitoring shall continue at the new site.

90-5 Required Water Monitoring Site Map



Notes

¹ SAC, CCR, BSF, JLF and BND are alternative upstream temperature control points to RDB