

Yolo Bypass Chlorophyll and Phaeophytin a Sampling Meta Data – Lynn Takata

Suggested Citation: California Department of Water Resources, Aquatic Ecology Section. Yolo Bypass Chlorophyll a and Phaeophytin a Sampling Meta Data. 2016.

Aquatic Ecology Section Yolo Bypass Chlorophyll a and Phaeophytin a Sampling Meta Data Last updated: August 2016

I. Contact Information

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II. Study Elements and Objectives

Largely supported by the Interagency Ecological Program (IEP), DWR has operated a fisheries and invertebrate monitoring program in the Yolo Bypass since 1998. The project has provided a wealth of information regarding the significance of seasonal floodplain habitat to native fishes. Basic objectives of the project are to collect baseline data on lower trophic levels (phytoplankton, zooplankton, and invertebrate drift), juvenile and adult fish, hydrology, and physical conditions. As the Yolo Bypass has been identified as a high restoration priority by the US Fish and Wildlife Service and National Marine Fisheries Service biological opinions for Delta Smelt (*Hypomesus transpacificus*) and winter and spring-run Chinook Salmon (*Oncorhynchus tshawytscha*), and by California EcoRestore, these baseline data are critical for evaluating success of future restoration projects. In addition, the data have already served to increase our understanding of the role of the Yolo Bypass in the life history of native fishes and its ecological function in the San Francisco Estuary. Key findings include: (1) Yolo Bypass is a major factor regulating year class strength of splittail, *Pogonichthys macrolepidotus* (Sommer et al., 1997; Feyrer et al., 2006; Sommer et al., 2007a); (2) Yolo Bypass is a key migration corridor for adult fish of several listed and sport fish (Harrell and Sommer 2003); (3) it is one of the most important regional rearing areas for juvenile Chinook Salmon (Sommer et al., 2001a; 2005); (4) Yolo Bypass is a source of phytoplankton to the food web of the San Francisco Estuary (Jassby and Cloern 2000; Schemel et al., 2004; Sommer et al., 2004); and (5) Inundation of the Yolo Bypass enhances the quantity and quality of phytoplankton carbon to the downstream estuary (Lehman et al. 2007).

The collection of chlorophyll data is one element of the Aquatic Ecology Section's (AES), Yolo Bypass Fish Monitoring Program conducted under the IEP umbrella. The monitoring of chlorophyll a and phaeophytin a concentration was initiated to compare seasonal and annual variations in primary production between the Sacramento River channel and the Yolo Bypass, the river's seasonal floodplain (Sommer et al. 2003). The collection of chlorophyll samples is an important element in determining the annual patterns of productivity that support the aquatic food web.

Key findings to date include: (1) Chlorophyll a levels were significantly higher in the Yolo Bypass than in the Sacramento River during the winters and springs of 2000-2001, and chlorophyll a was inversely related to flow in both systems (Sommer et al. 2004), (2) Chlorophyll a is correlated with hydrologic conditions, with highest levels during floodplain drainage, likely due to increased inundation area and water residence time (Schemel et al. 2004), (3) The floodplain enhanced the quality and quantity of phytoplankton carbon available to the aquatic food web, and 14-37% of this biomass was exported to the estuary downstream (Lehman et al. 2008).

III. Study Area and Sample Sites

A. General Information

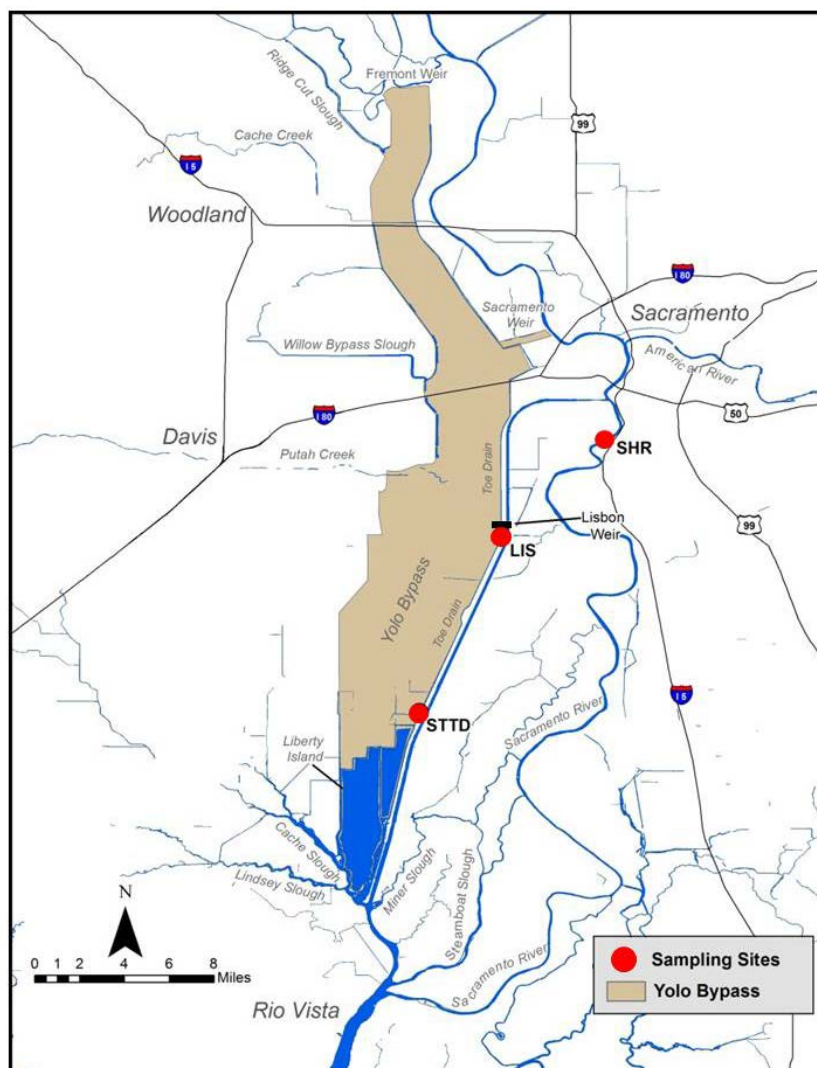
There are three fixed sampling site locations for this study: (1) Toe Drain of Yolo Bypass at our rotary screw trap (STTD), (2) Toe Drain of the Yolo Bypass at Lisbon Weir (LIS), and (3) Sacramento River at Sherwood Harbor (SHR). These sites are currently sampled at least twice monthly on an ebb tide on the same day or within one day of one another. During inundation events, sampling increases to weekly as detailed below.

B. Name and Location Information of Chlorophyll Sampling Sites

Currently Sampled Stations

| Station | Location | latitude | | | longitude | | | Start Year |
|---------|--|----------|---------|---------|-----------|---------|---------|------------|
| | | degrees | minutes | seconds | degrees | minutes | seconds | |
| STTD | Yolo Bypass – Toe Drain at Screw Trap | 38 | 21 | 12.46 | 121 | 38 | 34.71 | 2001 |
| LIS | Yolo Bypass – Toe Drain at Lisbon Weir | 38 | 28 | 29.09 | 121 | 35 | 18.94 | 2013 |
| SHR | Sacramento River at Sherwood Harbor | 38 | 31 | 56.77 | 121 | 31 | 41.1 | 2001 |

Map of Sampling Stations



IV. Period of Record

Chlorophyll monitoring began in 2001 and continues through the present.

V. Sampling Frequency

From 2001-2010, sampling was typically conducted at least once monthly from January through June at two sites: One at the rotary screw trap in the Yolo Bypass Toe Drain (STTD), and the other at Sherwood Harbor in the Sacramento River (SHR). Since 2011, sampling has been conducted at least biweekly (every other week) year-round and weekly during floodplain inundation and drainage events.

Beginning in March of 2013, a sampling site at Lisbon Weir was added to regular chlorophyll sampling. Sampling is conducted at this site at least once monthly year-round. More frequent sampling is conducted up to weekly at LIS and STTD immediately before, during, and immediately after pulsed agricultural drainage flows in the early fall, and during floodplain inundation and drainage events. This data is also collected to validate onsite continuous chlorophyll data (relative florescence units) which is measured using a Yellow Springs Instruments 6600 multi-parameter sonde.

Sampling Frequency by Month and Year

Yolo Bypass Screw Trap at Toe Drain (STTD)

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 2001 | 0 | 4 | 5 | 3 | 4 | 2 | 0 | 0 | 0 | 0 | 1 | 6 | 25 |
| 2002 | 7* | 2 | 2 | 2 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0* | 18 |
| 2003 | 6* | 5 | 3 | 2 | 8* | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 2004 | 2* | 2* | 3* | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 2005 | 5 | 3 | 4 | 4 | 2* | 2 | 0 | 0 | 0 | 0 | 0 | 0* | 20 |
| 2006 | 4* | 3* | 4* | 4* | 3* | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 2007 | 0 | 1 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 2008 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0* | 12 |
| 2009 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 2010 | 4* | 4 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0* | 15 |
| 2011 | 2* | 2 | 2* | 2* | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 27 |
| 2012 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2* | 27 |
| 2013 | 5 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 31 |
| 2014 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 4 | 5 | 2 | 3 | 32 |
| 2015 | 4 | 4 | 7 | 5 | 3 | 6 | 5 | 4 | 2 | 3 | 2 | 2 | 47 |
| Total | 47 | 42 | 46 | 40 | 42 | 35 | 12 | 14 | 13 | 16 | 10 | 17 | 335 |

*Months with overtopping at Fremont Weir.

Sacramento River at Sherwood Harbor (SHR)

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 2001 | 0 | 5 | 4 | 3 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 2002 | 6* | 2 | 2 | 2 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0* | 17 |
| 2003 | 6* | 5 | 3 | 2 | 8* | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 2004 | 1* | 2* | 3* | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 2005 | 5 | 3 | 4 | 4 | 2* | 1 | 0 | 0 | 0 | 0 | 0 | 0* | 19 |
| 2006 | 3* | 3* | 4* | 4* | 3* | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| 2007 | 0 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 2008 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0* | 12 |
| 2009 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 2010 | 4* | 4 | 3 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0* | 16 |
| 2011 | 2* | 2 | 2* | 3* | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 27 |
| 2012 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2* | 26 |
| 2013 | 5 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 1 | 2 | 31 |
| 2014 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 27 |
| 2015 | 4 | 4 | 6 | 5 | 4 | 4 | 5 | 5 | 2 | 2 | 2 | 2 | 45 |
| Total | 44 | 44 | 44 | 40 | 43 | 33 | 13 | 14 | 10 | 12 | 10 | 11 | 318 |

*Months with overtopping at Fremont Weir

Yolo Bypass at Lisbon Weir (LIS)

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 2013 | - | - | 4 | 3 | 2 | 2 | 2 | 3 | 5 | 6 | 3 | 2 | 32 |
| 2014 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 5 | 1 | 3 | 33 |
| 2015 | 6 | 4 | 6 | 5 | 3 | 7 | 5 | 2 | 0 | 0 | 1 | 2 | 41 |
| Total | 10 | 6 | 12 | 10 | 7 | 11 | 9 | 9 | 9 | 11 | 5 | 7 | 106 |

Number of Sampling Events by Station and by Year

| Station | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Total |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| STTD | 26 | 18 | 29 | 15 | 20 | 21 | 9 | 12 | 12 | 16 | 27 | 27 | 31 | 26 | 47 | 289 |
| SHR | 18 | 17 | 29 | 13 | 19 | 20 | 10 | 12 | 12 | 16 | 27 | 26 | 31 | 27 | 45 | 277 |
| LIS | - | - | - | - | - | - | - | - | - | - | - | - | 32 | 33 | 41 | 65 |
| Total | 44 | 35 | 58 | 28 | 39 | 41 | 19 | 24 | 24 | 32 | 54 | 53 | 94 | 86 | 133 | 631 |

VI. Field Collection Methods

A. Grab Samples

Chlorophyll/phaeophytin a surface grab samples are collected in 1 liter HDPE containers, rinsed with site water prior to water collection. The container is filled to the top, leaving as little air space as possible. When there is sufficient flow (typically from January – June), samples are collected during the ebb tide from the rotary screw trap anchored in the middle of the channel and Sacramento River/Sherwood Harbor samples are taken dockside. In the absence of sufficient downstream flow, typically from July-Nov., Sacramento River and rotary screw trap samples are taken from a boat moving approximately 2-3 mph near the screw trap or dock. Lisbon Weir samples, regardless of flow, are taken from the flow station walkway nearshore during ebb tide. All samples are immediately placed on wet ice in a cooler until return to the DWR office.

Water quality parameters are recorded when the sample is collected. Temperature (C), electrical conductivity ($\mu\text{S}/\text{cm}$), dissolved oxygen (mg/L), and pH are measured using a YSI 556 Multiprobe System. Turbidity is measured from a water sample collected in a glass vial and later analyzed at the office using a Hach 2100Q Portable Turbidimeter. Secchi depth (cm) is also measured. Other factors including tide stage, weather, and trap condition code are also recorded.

VII. Lab Processing Methods

A. Chlorophyll/Phaeophytin a Sample Filtration and Preparation for Lab Analysis

Within 30 minutes of returning to the office, approximately 500ml of each sample is filtered (250 ml is filtered if sample exceeds 30 NTU).

1. Two 47-mm diameter glass-fiber filters with a $1.0\ \mu\text{m}$ pore size are placed on top of each other on the filtration manifold using forceps. There is no up/down orientation to the filter. The filter funnel(s) are attached and checked to see that they are seated correctly. Valves are left in the closed (horizontal) position.
2. The sample water is mixed completely by gently agitating sample bottles. The water to be filtered is measured in a volumetric flask (500 ml) for samples under 30 NTU. If sample turbidity exceeds 30 NTUs, water to be filtered is reduced to 250 ml. Volume is recorded.
3. 1 - 2 ml MgCO_3 solution (super-saturated in deionized (DI) water) is added to the sample prior to filtration. This buffers the sample against low pH, which can cause degradation of chlorophyll into pheophytin.
4. The content of the volumetric flask is poured into the filter funnel. The volumetric flask is then rinsed twice with deionized water and contents also poured into the filter funnel.
5. Vacuum pump is turned on. Pressure is set between 7-10 psi (do not exceed 10 psi).
6. The valve is opened and the sample water is filtered through the glass fiber filter, using vacuum suction. Sample is filtered until the rate of flow through the glass fiber filter decreases markedly and most of the sample water has passed through the filter.
7. The inside of the filter funnel(s) is rinsed with DI water.
8. The vacuum pump is run until the filters are mostly dry and then the filter funnels are removed.
9. With the vacuum pump running, the top filter is removed and folded in half with the chlorophyll-side inside, using forceps to avoid loss of sample. Take care to not touch the pigments with the forceps and avoid touching the filter paper with your fingers. If there is any observed discoloration to the bottom filter, both filters are discarded a new water sample is filtered.
10. The chlorophyll sample (filter) is placed into the pre-labeled envelope. The volume of water filtered and the sample time is recorded on the envelope.
11. The envelope and chlorophyll sample are then placed in the freezer or on dry ice immediately.

B. Sample Analysis (DWR's Bryte Laboratory – STD method 10200H)

This method is used to determine the level of chlorophyll *a* and the degradation product phaeophytin *a* by UV-Vis spectrometry for the purpose of estimating phytoplankton biomass.

1. Sample Preparation

Once submitted to the lab, the glass fiber filters are cut into small pieces and placed into a round bottom grinding tube. Approximately five to seven ml of 90% aqueous acetone (90% acetone and 10% saturated magnesium carbonate solution) is added to the tube. The sample is ground using a TFE pestle. Care should be taken while grinding so the sample does not become hot due to friction between the pestle and the grinding tube. Once the sample is sufficiently ground, as fine as possible, the sample is transferred to a 15ml glass centrifuge tube with rinses. A final volume of 10ml is desired. Yet with two filters often used to filter a representative 1000ml sample, more than 10ml is sometimes needed to rinse the contents of the grinding tube into the centrifuge tube. Once the sample has been transferred to the centrifuge tube, the sample volume is noted. (The extract volume will be used for final calculation.) Once all of the samples have been ground, they must steep for a minimum of two hours. Place them in a dark cool place.

2. Sample Analysis

Spectrometer is turned on and allowed to warm up for at least a half-hour.

While the instrument is warming up, samples are centrifuged for five minutes at approximately 500G.

Spectrometer is autozeroed. Extraction solution is added to both the reference and sample cells. Cell windows are wiped with a chem-wipe. Reference cell is placed in the rear cell holder in the instrument and the sample cell in the front cell holder. Note: Reference cell is left in the instrument throughout the run except for adding more solution if necessary.

When ready, start button is clicked on at the top left of the main window. Chlorophyll *a* scan is completed between the wavelengths 750nm and 590nm. When the Start button turns green after the chlorophyll *a* has been scanned, the instrument is ready for the next scan.

Without removing the sample cell, 170ul of 0.1N hydrochloric acid is added directly to it. After 90 seconds, the start button is activated. While the 90 seconds is counting down, the sample is gently stirred in the cell with a TFE stirring rod. Start button is activated after 90 seconds. This begins the phaeophytin *a* scan between the wavelengths 750nm and 590nm.

When the scan is complete, the sample cell is removed and rinsed three times with acetone. With a 10ml glass syringe with a five-inch stainless steel needle, the needle is inserted into the centrifuge tube and the supernate is pulled up. The needle is removed and a 0.2um solvent resistant nylon filter is placed on the syringe. 5ml is filtered directly into the sample cell. Cell windows are wiped and the cell is replaced in the instrument. Following the steps in running a blank, the samples are run.

3. QA/QC

A blank is run at the beginning of each run; at every five samples and then at the end of the run. There are no standards run with this method. Only blanks and field duplicates.

4. Calculation

The formula included in Standard Methods, Method 10200H, is used calculate the chlorophyll *a* and phaeophytin *a* concentrations.

VIII. Data Management and Quality Assurance/Quality Control

A. Field Data

Field data are collected and recorded onto datasheets by DWR personnel. These data are then entered monthly by DWR personnel into an Access database. Field data are subsequently reviewed by a second staff member for accuracy and completeness. Annually, after all samples are processed for the year, lab data are reviewed for accuracy and completeness.

B. Field Datasheet

Paper datasheets are archived in binders, and stored at the West Sacramento, Industrial Blvd. DWR office. Scans are made of datasheets are made annually and stored on a server.

C. Laboratory Data

Laboratory results are received via email from the DWR Bryte Chemical Laboratory, and entered into the AES Access database. Electronic copies of results for laboratory analyses are archived on DWR/AES Network drives. Hard copies are printed and stored in binders at the West Sacramento, Industrial Blvd. DWR office. Data is also archived electronically in the DWR Water Data Library, accessible at: <http://www.water.ca.gov/waterdatalibrary/>.

Field Datasheet

| LOWER TROPHIC SAMPLING – YOLO BYPASS STUDY 2015/2016 | | | | | | | | | |
|---|-------|--|----|---|--------------|--|-------------|--------------|----------------|
| Location: _____ | | Date: _____ | | Time: _____ | | pH: _____ | | DO: _____ | |
| Crew: _____ | | Vial #: _____ | | Weather: _____ | | Turb: _____ | | NTU: _____ | |
| Secchi | Water | Temp: _____ | °C | Secchi | Depth: _____ | Water | Temp: _____ | °C | Weather: _____ |
| Light Attenuation: | | Surface Irradiance (in air avg): _____ μmol | | Subsurface Irradiance (in water avg) (~75%, ~50%, ~25%, ~1%): | | Depth: _____ | | Depth: _____ | |
| LLCCOR Calibration -143.27 (in air) -232.10 (in water) | | 0.75 = _____ μmol 0.50 = _____ μmol 0.25 = _____ μmol 0.01 = _____ μmol | | ① _____ μmol ② _____ μmol | | ③ _____ μmol ④ _____ μmol | | | |
| Drift Sample : Start Time: _____ Stop Time: _____ Set Time: _____ min Condition Code: <input type="checkbox"/> | | | | | | | | | |
| Flow Meter: Regular or Low Speed Flow : Start Meter: _____ End Meter: _____ *For low speed, record initial meter reading in "end meter" box | | | | | | | | | |
| Egg & Larval Fish Sample : 1 st Start Time: _____ 1 st Stop Time: _____ 2 nd Start Time: _____ 2 nd Stop Time: _____ Set Time: _____ min Condition Code: <input type="checkbox"/> | | | | | | | | | |
| Flow Meter: Regular or Low Speed Flow : (Mid-West) Start Meter: _____ End Meter: _____ *For low speed, record initial meter reading in "end meter" box (Near-West) Start Meter: _____ End Meter: _____ (Mid-East) Start Meter: _____ End Meter: _____ (Near-East) Start Meter: _____ End Meter: _____ | | | | | | | | | |
| Zooplankton Sample : Start Time: _____ 150 Stop Time: _____ 50 Stop Time: _____ 150 Set Time: _____ min 50 Set Time: _____ min Condition Code: <input type="checkbox"/> | | | | | | | | | |
| Flow Meter: Regular or Low Speed Flow : 150 μm : Start Meter: _____ End Meter: _____ *For low speed, record initial meter reading in "end meter" box 50 μm : Start Meter: _____ End Meter: _____ | | | | | | | | | |
| Chlorophyll Sample : Yes <input type="checkbox"/> No <input type="checkbox"/> Replicate <input type="checkbox"/> Time: _____ Filtered: 500mL OR 250mL | | | | | | | | | |
| Phytoplankton Sample : Yes <input type="checkbox"/> No <input type="checkbox"/> 60 mL Amber Bottle w/ Lugol Solution | | | | | | | | | |
| Entered by : _____ Date: _____ Checked by : _____ Date: _____ | | | | | | | | | |

IX. Chain of Custody and Sample Handling

Following filtration, Chlorophyll/phaeophytin *a* filters containing the samples are folded and placed into an enveloped pre-labeled with the sample date, sample location, and volume of water filtered. The envelope and samples are placed in the freezer or on dry ice (especially if sample is being transported) immediately. Samples

are generally delivered to the DWR Bryte Chemical Laboratory within the week of collection, as samples must be analyzed within 28 days after collection.

A Chain of Custody form is completed for every sample and delivered with the sample to the Bryte Chemical Laboratory. Following Completion of laboratory analysis, Bryte Laboratory personnel make a notation on the Chain of Custody form, and the document is then filed with the analysis report. Copies of the files are maintained in the DWR archives.

Sample Chain of Custody Form

State of California

Department of Water Resources

The Resources Agency

Bryte Chemical Laboratory Chain of Custody

Submittal ID & Run/Submittal Name: ES0216B0012 - Yolo Bypass 2013

Container Summary

Send Report To: Jared Frantzich
3500 Industrial Blvd.

Manila Envelope, Filt 6
Bottle Check: Lab Initials: MC Field Initials: MF Total: 6 ✓

West Sacramento CA 95691
Activity Unit: 0330

Sampled By: _____

Instructions to Lab:

Notice: Please deliver samples to the lab as soon as possible. Allow time for lab handling and preparation after delivery. The lab is not responsible for missed holding times due to late delivery. SEE YOUR LAB ANALYSIS GROUPS FOR MINIMUM SAMPLE HOLD TIME. Samples must be transported in accordance with method and handling requirements, on ice and arrive below 6°C if transported overnight.

Submitted By: Signature: [Signature] Date Relinquished: 02/10/2016

Print Name: Maryjade Farnogian Phone Number: (916) 376-9834

Received By: Signature: [Signature] Print Name: Marjorie Cervell

Date and Time Received: 2/10/16 15:15 Condition When Received: 0°C Iced? Yes ☒ No ☐

Chlorophyll a - Please indicate one of the following:

Arrived Frozen ☒ Will be frozen by lab w/in required time Not frozen w/in required time Chlorophyll a was not collected

Nutrients - Please indicate one of the following:

Arrived Frozen ☐ Will be frozen by lab w/in required time Not frozen w/in required time Nutrients were not collected ☒

Submittal ID: ES0216B0012

DWR Sample Code/ID Collection Date 2/8/2016 Collection Time: 10:07 EC: 175 μ S/cm
ES0216B0070 Station No.: A0200000 Station Name: SHER Matrix: Water, Natural

Add'l Note:

Cost Code: V10041200000

Spectrometric Determination of Chlorophyll ☐ Fld Filtered

DWR Sample Code/ID Collection Date 2/9/2016 Collection Time: 10:14 EC: 781 μ S/cm
ES0216B0071 Station No.: A0D82120386 Station Name: Toe Drain at STTD Matrix: Water, Natural

Add'l Note:

Cost Code: V10041200000

Spectrometric Determination of Chlorophyll ☐ Fld Filtered

DWR Sample Code/ID Collection Date 2/9/2016 Collection Time: 13:40 EC: 779 μ S/cm
ES0216B0072 Station No.: A0D82851352 Station Name: Toe Drain at Lisbon Matrix: Water, Natural

Add'l Note:

Cost Code: V10041200000

Spectrometric Determination of Chlorophyll ☐ Fld Filtered

Submittal ID: ES0216B0012

Page 1 of 3

Submittal ID: ES0216B0012

| | | | |
|--|--------------------------|-------------------------|------------------------|
| DWR Sample Code/ID | Collection Date 2/8/2016 | Collection Time: 10:07 | EC: 175 μ S/cm |
| ES0216B0073 | Station No.: A0200000 | Station Name: SHER | Matrix: Water, Natural |
| Add'l Note: | | Cost Code: V10041200000 | |
| Spectrometric Determination of Chlorophyll | | Fld Filtered | |

| | | | |
|--|--------------------------|---------------------------------|------------------------|
| DWR Sample Code/ID | Collection Date 2/9/2016 | Collection Time: 10:14 | EC: 781 μ S/cm |
| ES0216B0074 | Station No.: A0D82120386 | Station Name: Toe Drain at STTD | Matrix: Water, Natural |
| Add'l Note: | | Cost Code: V10041200000 | |
| Spectrometric Determination of Chlorophyll | | Fld Filtered | |

| | | | |
|--|--------------------------|-----------------------------------|------------------------|
| DWR Sample Code/ID | Collection Date 2/9/2016 | Collection Time: 13:40 | EC: 779 μ S/cm |
| ES0216B0075 | Station No.: A0D82851352 | Station Name: Toe Drain at Lisbon | Matrix: Water, Natural |
| Add'l Note: | | Cost Code: V10041200000 | |
| Spectrometric Determination of Chlorophyll | | Fld Filtered | |

Submittal ID: ES0216B0012

Page 2 of 3

Checklist for Sample Submittal by Field Personnel

- ☒ Correct collection dates and times are on the COC.
- ☒ An EC result per "Normal" (sample type) collection event has been written on the COC.
- ☒ The number of containers being submitted matches the container count on the COC.
- ☐ * Please correct the count if it is not the same and initial the appropriate area to confirm.
- ☒ Container label's DWR Sample Code/ID matches what is on the COC.
- ☐ Canceled collection events on still on the COC are crossed out and clearly marked as not sampled "N.S." with your initials.
- ☐ * If the N.S. reason needs to go to the WDL, please write the reason on the COC or enter the reason in FLIMS with the "Reason Going to WDL" checkbox checked.
- ☒ Volumes for chlorophyll a samples are written on either the label or the packet.
- ☒ The "Send Report To:" contact on the COC is correct.
- ☒ The "Submitted By:" signature, printed name and phone number are on the COC.
- ☐

Checklist for Bryte Lab Sample Receiving Personnel

- ☒ The DWR Sample Code/ID on the container labels matches the COC.
- ☐ Collection dates and times are on the COC for every collection event.
- ☒ The EC for every "Normal" collection event is written on the COC.
- ☒ The Priority Code for the submittal/samples is 5. If it is >5 alert Bryte management prior to field personnel leaving.
- ☒ The volume for chlorophyll samples are written on the packet or label.
- ☒ The container count matches COC.
- ☒ The container count has been initialed on COC by both parties to confirm.
- ☒ UNFROZEN sample temperature is written on the COC. *No unfrozen samples*
- ☒ Check the appropriate box on the COC regarding NUTRIENT or CHL A samples that should be frozen OR check the box that says they were not collected.
- ☐ Sites that were not collected are crossed out and clearly marked as not sampled "N.S." with field personnel initials.
- ☐ If the "N.S." reason needs to go to the Water Data Library (WDL) the reason is written on the COC.
- ☐ -- CHECKLIST FOR SAMPLE RECEIVING IN FLIMS (LAB INTERNAL USE ONLY) --
- ☒ All applicable EC's are in FLIMS before the project is submitted. Enter parent EC for "Duplicate" or "Replicate" collection events.
- ☒ The collection date and time in FLIMS matches the COC.
- ☐ The "N.S." collection events have been canceled in FLIMS.
- ☐ If there is a "N.S." reason written on the COC it is in FLIMS and the "Reason Going to WDL" box is checked.

X. References

Program Reports, Publications, and Other Pertinent Literature

- Cranston, P.S., G.M. Benigno, and M.C. Domingeuz. 2007. [Hydrobaenus saetheri Cranston, new species, an aestivating, winter-emerging chironomid \(Diptera: Chironomidae\) from California](#). Pages 73-79 in Contributions to the Systematics and Ecology of Aquatic Diptera-A tribute to Ole A. Saether. T. Andersen, editor. The Caddis Press
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