

Water Hyacinth Control Program 2012 Annual Report

Submitted Pursuant to: Statewide General NPDES Permit (CAG990005)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate information submitted. Based on my inquiry of the persons who manage the program, Terri Ely – *Senior Environmental Scientist*, or those persons directly responsible for gathering the information, Angela Llaban – *Water Hyacinth Control Program Environmental Scientist*, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Lucia C. Becerra, Acting Director

Date

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EXECUTIVE SUMMARY

Water hyacinth (*Eichhornia crassipes*) is a non-native, free-floating, invasive aquatic plant. It grows in wetlands, marshes, shallow water bodies, slow moving waterways, lakes, reservoirs, and rivers. Water hyacinth negatively influences biodiversity, recreation, and agriculture. It de-stabilizes dissolved oxygen cycles, crowds out native plants, shades out important shallow water fish habitat, obstructs waterways and navigational channels, and blocks agricultural and municipal water intakes.

In 1982, SB 1344, Chapter 2, Article 2, Section 64 amended the statutes of the California Harbors and Navigation Code to designate the California Department of Boating and Waterways (DBW) as the lead agency for controlling water hyacinth in the Sacramento-San Joaquin Delta (Delta), its tributaries, and the Suisun Marsh.

This program operates under the regulations imposed by the National Pollutant Discharge Elimination System (NPDES) Statewide General Permit (CAG990005) issued by the State Water Resources Control Board (SWRCB) and administered by the Central Valley Regional Water Quality Control Board (CVRWQCB), the U.S. Fish and Wildlife Service (USFWS) Biological Opinion (81410-2011-F-0035), and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) Biological Opinion for the Endangered Species Act (ESA) Section 7 (2012/01731). As part of the permits and biological opinions, a monitoring program was developed to evaluate effects of the Water Hyacinth Control Program (WHCP) on water quality and federally listed threatened and endangered species.

All WHCP water quality monitoring follows the WHCP NPDES Annual Monitoring Protocol as outlined in the WHCP Aquatic Pesticide Application Plan (APAP), which was approved in 2006 by the CVRWQCB. Monitoring activities include recording WHCP impacts on beneficial waters of the United States, observations of federally listed threatened or endangered species, and associated listed species habitats. DBW documented herbicide residues in receiving waters and monitored water quality parameters such as dissolved oxygen, temperature, conductivity, salinity, pH, and turbidity at representative locations. During 2012, there were several occurrences where dissolved oxygen levels and pH exceeded basin limits. All herbicide (and Agridex) residue concentrations at receiving water locations were not detected or were below limits as specified in the WHCP NPDES permit.

In 2012, the WHCP applied 82 gallons of 2,4-D, 770 gallons of glyphosate, and 234 gallons of Agridex. Historically, the earliest water hyacinth treatment began in April. However, the start of the 2012 treatment season was delayed and herbicide treatments began on August 13 through October 15. The program was granted an extension to adjust the end of DBW's treatment period from October 15 to November 30 due to unseasonably warmer weather. WHCP treatments were terminated on November 26 due to detections of juvenile salmonids migrating into the Delta. The program successfully treated 851 acres of water hyacinth in the Delta and its surrounding tributaries.

1 INTRODUCTION

1.1 Extent of Infestation

The DBW is responsible for controlling water hyacinth (*Eichhornia crassipes*), an invasive, floating, aquatic weed that can potentially grow in 50,000 surface acres of the Sacramento-San Joaquin Delta and its tributaries. Determining the annual extent of infestation is difficult because both individual plants and large mats move with river current and diurnal tidal movement. Historically, pre- and post-season infestations have been measured through visual estimates conducted by WHCP application crews.

Crews visually survey all the sites in their application region. Herbicide applications are then prioritized such that nursery areas and areas that are critical to public, agricultural, municipal, industrial, recreational or navigational use are treated first. Logistics such as tide, travel times and daily weather conditions such as wind speed are also factored into daily site selections for treatment.

1.2 Setting

The WHCP includes portions of eleven counties that encompass the Delta and its upland tributaries. The eleven counties include Alameda, Contra Costa, Fresno, Madera, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Tuolumne, and Yolo. General boundaries for the treatment area in the Delta and its tributaries are as follows:

- West up to and including Sherman Island, at the confluence of the Sacramento and San Joaquin Rivers
- West up to the Sacramento Northern Railroad to include water bodies north of the southern confluence of the Sacramento River and Sacramento River Deep Water Ship Channel
- North to the northern confluence of the Sacramento River and Sacramento River Deep Water Ship Channel, plus waters within Lake Natoma
- South along the San Joaquin River to Mendota, just east of Fresno
- East along the San Joaquin River to Friant Dam on Millerton Lake
- East along the Tuolumne River to LaGrange Reservoir below Don Pedro Reservoir
- East along the Merced River to Merced Falls, below Lake McClure

Within the 2012 WHCP project area, there were 272 possible treatment sites averaging between one and two miles in length. See Figure C-1 in Appendix C for a map of the WHCP project area and monitoring sites sampled in 2012.

2 SB 1344

2.1 Section 64 of the Harbors and Navigation Code

Section 64 of the Harbors and Navigation Code reads as follows:

“(a) The Legislature hereby finds and declares that the growth of water hyacinth and *Egeria densa* in the Sacramento-San Joaquin Delta, its tributaries, and the Suisun Marsh has occurred at an unprecedented level and the resulting accumulations of water hyacinth and *Egeria densa* obstruct navigation, impair other recreational uses of waterways, have the potential for damaging manmade facilities, and may threaten the health and stability of fisheries and other ecosystems within the delta and marsh. Accordingly, it is necessary that the state, in cooperation with agencies of the United States, undertake an aggressive program for the effective control of water hyacinth and *Egeria densa* in the delta, its tributaries, and the marsh.”

“(b) The department is designated as the lead agency of the state for the purpose of cooperating with agencies of the United States and other public agencies in controlling water hyacinth and *Egeria densa* in the delta, its tributaries, and the marsh.”

3 COMPLIANCE

3.1 Summary of Regulatory Permits

The following constitutes a summary of the permits required to implement the WHCP. Each permit has regulations designed to ensure avoidance or minimization of significant impacts to beneficial uses of waters of the U.S. or federally threatened and endangered species protected by the Endangered Species Act (ESA).

3.1.1 Reporting Requirements

The NPDES Statewide General Permit for Aquatic Pesticide Use requires DBW to submit an Annual Report March 1 following the WHCP application season. Reporting per NPDES guidelines must include the following: 1) an executive summary discussing permit compliance or violation of permit terms and conditions to beneficial waters of the U.S., 2) the effectiveness of the WHCP Aquatic Pesticide Application Plan (APAP), 3) the discharge of pollutants associated with aquatic pesticide applications, 4) a summary of monitoring data, including changes to water quality, and violations of compliance with water quality objectives as outlined in the Central Valley Basin Plan issued by the CVRWQCB, 5) identification of Best Management Practices (BMPs) and their effectiveness in meeting permit requirements, 6) a discussion of modifications or management corrections for any violations that occurred, 7) maps showing application area, acreage and sampling locations, types and amounts of aquatic pesticides used during each application event, information on surface area, volume and rate of application, and 8) sampling results for all required monitoring.

Both the WHCP USFWS Biological Opinion (BO) and the WHCP NOAA Fisheries BO require Annual Reports to be submitted January 31, following the application season. These reports summarize compliance with the terms and conditions which include species and habitat protection, water quality monitoring, and any additional monitoring and studies that may have been conducted as part of regulatory requirements from other participating state or federal agencies. Additional reporting requirements are on a case-by-case basis in the event an incidental take should occur with any of the species discussed in these BOs. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Reporting of take begins with immediate notification to the USFWS or NOAA biologist (based on jurisdiction) in charge of administering the BOs and requires documentation of information, such as location of take, number of species, water quality conditions, chain of custody, and prescriptive action for preventing future occurrences.

3.1.2 Statewide General NPDES Permit

RECEIVING WATERS

There is a clear distinction in the NPDES Permit (No. CAG990005) regarding application area, treatment area, and receiving waters. In the NPDES Permit, an application area is defined as the area in which aquatic pesticides are directly applied. The treatment area is the area treated with an aquatic herbicide to control aquatic weeds. It is the responsibility of the Discharger to define the treatment area for each location that it discharges to. The WHCP sprays herbicide onto water hyacinth. Since DBW does not inject herbicides into the water column to treat submerged plants, the application and treatment areas are essentially the same geographic place. Receiving waters are defined in two manners: 1) waters directly down flow of the treatment area, and 2) waters within the treatment area after completion of the treatment event when herbicide residue levels fall below minimum effective

concentrations. Herbicides applied to aquatic plants are not considered a pollutant until residues reach receiving waters. This is because an herbicide designed to treat aquatic plants and approved by the US EPA cannot also be a pollutant under the Clean Water Act when the herbicide is doing what it was designed and approved to do under federal pesticide use regulations.

NUMERIC LIMITS

Dissolved Oxygen

Dissolved oxygen (DO) limits are required under the NPDES permit. Figures C-2 and C-3 in Appendix C geographically show where these basin limits occur in the WHCP project area. Within the legal boundaries of the Delta, the DO concentration shall not be reduced below:

- 7.0 mg/l in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge
- 6.0 mg/l in the San Joaquin River (between Turner Cut and Stockton, 1 September through 30 November)
- 5.0 mg/l in all other Delta waters

For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily DO concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. To protect beneficial uses of water, the dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:

- 5.0 mg/l for waters designated as warm freshwater habitat (WARM)
- 7.0 mg/l for waters designated as cold freshwater habitat (COLD)
- 7.0 mg/l for waters designated for spawning, reproduction, and development (SPWN)

In the locations listed in Table 1, dissolved oxygen concentrations shall not be reduced below the amount indicated during the stated time period.

Table 1. Specific Dissolved Oxygen Water Quality Objectives

Location	DO concentration	Time Period
Sacramento River from Keswick Dam to Hamilton City	9.0 mg/l*	1 June to 31 August
Feather River from Fish Barrier Dam at Oroville to Honcut Creek	8.0 mg/l	1 September to 31 May
Merced River from Cressy to New Exchequer Dam	8.0 mg/l	All year
Tuolumne River from Waterford to La Grange	8.0 mg/l	15 October to 15 June

* When natural conditions lower dissolved oxygen below this level, the concentration shall be maintained at or above 95 percent of saturation.

pH and Turbidity

In addition to DO limits, basin limits for pH and turbidity are also required under the NPDES permit. The discharge shall not cause the ambient pH to fall below 6.5 or exceed 8.5, and the 30-day average turbidity to increase as follows:

- More than 1 Nephelometric Turbidity Units (NTU) where natural turbidity is between 0 and 5 NTUs
- More than 20 percent where natural turbidity is between 5 and 50 NTUs
- More than 10 NTUs where natural turbidity is between 50 and 100 NTUs
- More than 10 percent where natural turbidity is over 100 NTUs

3.1.3 USFWS Biological Opinion for WHCP

The USFWS issued a biological opinion (BO) (Service file No. 81410-2011-F-0035) on the effects of DBW's WHCP on delta smelt (*Hypomesus transpacificus*) and its critical habitat, giant garter snake (*Thamnophis gigas*) and the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). The WHCP complies with the USFWS BO terms and conditions which include implementation of conservation measures identified in the WHCP project description. Below is a summary of the terms and conditions required under the biological opinion.

DELTA SMELT

The WHCP USFWS BO outlines specific mitigation measures to minimize impact to *H. transpacificus* (Delta smelt) and associated habitats. Interagency Ecological Program (IEP) fish monitoring data is used to determine the presence or absence of Delta smelt within or near herbicide application areas. The use of the herbicides 2,4-D and glyphosate with the adjuvant Agridex® is limited to the period between April 1 and November 30. Herbicide application will be suspended in the immediate treatment area in the event that delta smelt are identified, harmed or killed in the action area.

In the 2001 WHCP USFWS BO, DBW was directed to determine the level of impact that WHCP herbicides might have on the Delta smelt. These impacts were to be determined for critical life stages only. Originally, the USFWS BO required egg and larvae 96-hr. definitive toxicity tests and "live-car" exposure studies. It was later determined by the USFWS that only 96-hr. definitive studies on larvae were necessary. It was also determined that 96-hr. acute toxicity tests using application-exposed field water from treatment sites was acceptable in lieu of live car studies. Both studies for Delta smelt were completed and submitted to the USFWS in March 2004. After evaluation of these reports, in the spring of 2004, the USFWS determined that acute exposure from 2,4-D, glyphosate and Agridex® does not cause significant impacts and issued new terms and conditions for unrestricted use of these herbicides and adjuvant.

The WHCP USFWS BO that personnel involved with the WHCP receive USFWS approved worker environmental awareness training. Under this training program, personnel are informed about the presence of Delta smelt and its associated habitat. Training includes 1) species identification, 2) the life history of Delta smelt, 3) the importance of delta migratory routes, and 4) all terms and conditions of the WHCP USFWS BO for protection, avoidance and minimization of impacts to protected species under ESA.

VALLEY ELDERBERRY LONGHORN BEETLE

The WHCP USFWS BO outlines specific mitigation measures to minimize impact to *Desmocerus californicus dimorphus*, the valley elderberry longhorn beetle (VELB), and associated elderberry shrub (*Sambucus* sp.) habitat. DBW was directed to avoid impact to VELB by surveying for *Sambucus* ssp. (elderberry shrub), and maintaining a 250 foot buffer between treatment sites and shoreline elderberry shrubs. In areas where treatment cannot occur away from VELB habitat, a maximum of one-half of the area may be treated at one time. In addition, wind speed and direction are also factors as to whether or not a treatment could occur in these areas. Herbicide applications occur away from and downwind of elderberry shrubs.

The USFWS BO requires that personnel involved with the WHCP receive USFWS approved worker environmental awareness training. Under this training program, personnel are informed about the presence of VELB and its habitat. Training includes 1) species identification, 2) the life history of VELB, 3) the importance of elderberry shrubs as habitat, and 4) all terms and conditions of the WHCP USFWS BO for protection, avoidance and minimization of impacts to protected species under ESA.

GIANT GARTER SNAKE

The WHCP USFWS BO outlines specific mitigation measures to minimize impact to *Thamnophis gigas* (giant garter snake, GGS). Restrictions regarding GGS in the USFWS BO apply to any land based operations, which occur on Delta banks other than existing roads or boat ramps. Disposal of water hyacinth following handpicking occurs at least 200 feet from all aquatic GGS habitat. Mitigation measures beyond the requirements of the USFWS BO have been implemented to avoid impacts to GGS and their habitat. The entire WHCP project area has been evaluated for GGS habitat. This evaluation has been incorporated into the GIS technology utilized by application crews. The application crews have also been provided with a set of maps to minimize impact where GGS are most likely to be found.

The 2001 WHCP USFWS BO required tests to evaluate acute toxicity of a representative species of garter snakes. DBW conducted oral and dermal exposure tests using the program herbicides and adjuvant on *Thamnophis elegans* (mountain garter snake) and *Thamnophis sirtalis* (common garter snake) in the spring of 2003. A final report of this study was submitted to the USFWS in the spring of 2004. The study found there were no observable effects to these two species when oral and dermal exposure was at maximum label concentrations.

The USFWS BO requires that personnel involved with the WHCP receive USFWS approved worker environmental awareness training. Under this training program, personnel are informed about the presence of GGS (*T. gigas*) and habitat associated with the species. Training includes: 1) species identification, 2) the life history of the GGS, 3) the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas as habitat, and 4) all terms and conditions of the USFWS WHCP BO for protection, avoidance and minimization of impacts to protected species under ESA.

3.1.4 NMFS Biological Opinion for WHCP

In 2012, NOAA National Marine Fisheries Service (NMFS) issued a concurrence letter (2012/01731) in response to USDA and DBW's request for ESA Section 7 consultation. Based on the WHCP project description and supplemental material provided, and the best

available scientific and commercial data, NMFS concurs with USDA and DBW's determination that the proposed use of the herbicides 2,4-D and glyphosate is not likely to adversely affect federally listed Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook salmon (*O. tshawytscha*), Central Valley steelhead trout (*O. mykiss*), or the Southern distinct population segment (DPS) of North American green sturgeon (*Acipenser medirostris*) or any of their designated critical habitats.

The WHCP project description outlines specific mitigation measures and avoidance guidelines to minimize impact to Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley steelhead trout. Dependent upon type of water year and in-stream flows, juvenile Chinook salmon and steelhead may be present in the Delta through June. Historically, the DBW was permitted to begin herbicide applications as early as April 1 in sites not considered as salmon habitat. The remainder of the action area (i.e. the Delta) may have been treated after June 1, provided that IEP fish monitoring data indicated the pulse of Chinook salmon had migrated through the Delta and an increase in water temperatures prohibited salmonid survival. In 2012, however, herbicide application by the WHCP did not begin until August 13. To minimize potential negative effects to steelhead, NMFS permitted 2,4-D applications from June 15 to September 15 within the Delta and from July 15 to August 15 in the San Joaquin River. Glyphosate applications were to end on October 15, 2012. Due to unseasonably warmer weather that contributed to the further growth of and infestation water hyacinth, NMFS granted a 45-day extension (October 15 to November 30) for 2012 WHCP glyphosate applications. NMFS determined that glyphosate applications beyond October 15, 2012 would not increase potential effects of the action to listed species and their habitat. WHCP treatments ended on November 26, 2012 because monitoring data indicated that juvenile salmonids were migrating into the action area (The Delta).

Specific guidelines ensure fish are not impacted by WHCP applications. The following practices are incorporated into the WHCP protocols to ensure fish passage: applicators may only treat 3 acres or less per site, treat no more than one-half of a completely infested waterway, must maintain buffer zones, treat at specific dissolved oxygen levels, and never block escape routes. Each WHCP crew received a copy of the protocol and refresher training on Fish Passage Protocol prior to the 2012 treatment season.

The NMFS BO no longer contains education mitigation. However, it does require that DBW staff and assigned agents follow all federal and State laws applicable to the use of herbicides including mitigation outlined in the current WHCP project description. Thus, DBW continues to require applicators to be informed about the presence of salmon, steelhead, and green sturgeon and habitat associated with these species. Training includes: 1) species identification, 2) salmonid and sturgeon life history, 3) importance of migratory routes, and 4) the terms and conditions of the concurrence letter.

4 PERSONNEL, MATERIALS AND METHODS

4.1 WHCP Personnel

4.1.1 Application Crews

During 2012, the DBW had six full-time crews, each consisting of a specialist and a technician, for herbicide application activities. Similarly, under contract with DBW, Merced County had one crew that conducted herbicide treatment activities in 2012. Fresno County had one crew that handpicked (non-chemical control) water hyacinth in 2012. Each crew contains a minimum of one member possessing a Qualified Applicators Certificate, category "F" (aquatics), administered by the California Department of Pesticide Regulation (CDPR).

APPLICATION PERSONNEL EDUCATION AND TRAINING

Qualified Applicator Certificate

Application crews receive continuing education credits in pesticide training to keep their licenses current. Category F licenses are renewed every two years upon completion of the continued education credit requirements.

Environmental Awareness Training

Environmental awareness training was conducted in March 2012. This training included the following items:

- Species identification and impact avoidance guidelines on all threatened and endangered species associated with the WHCP
- Identification and protection of elderberry shrubs (*Sambucus* spp.) and protocol for monitoring species fitness during an application season
- Identification and protection of the giant garter snake (*T. gigas*), including life history; importance of irrigation canals, marshes, wetlands, and seasonally flooded areas as habitat; and the terms and conditions of the biological opinion
- Identification and protection of Delta smelt (*H. transpacificus*), Chinook salmon (*O. tshawytscha*), steelhead (*O. mykiss*), green sturgeon (*A. medirostris*) and associated protected habitats, fishery closure dates, and other agency requirements
- Protocol for "take," including reviewing the "Incidental Take Statement," collection and handling of dead species, completion of chains of custody, and notification to either USFWS or NOAA Fisheries

Equipment Training

Refresher training on the use and calibration of the dissolved oxygen meters, and use of the Xplore iX104C GPS system and ArcPad application took place in March 2012.

4.1.2 Monitoring Personnel

Monitoring activities are overseen by an environmental scientist and conducted by qualified personnel, which may include an environmental scientist and scientific aids. All water sampling events are carried out in accordance with the WHCP Quality Assurance Project Plan (QAPP) and the WHCP Environmental Monitoring Protocol as approved by the Central Valley Regional Water Quality Control Board, NMFS and USFWS.

Environmental scientists are responsible for understanding and adhering to the permit and biological opinion terms and conditions. They are also responsible for training other monitoring crew members concerning monitoring protocols, water sampling techniques, and the calibration and use of field equipment necessary to collect accurate data. Environmental scientists conducted monitoring training for all monitoring personnel during 2012 on environmental monitoring and field equipment protocols.

4.2 Materials and Methods

4.2.1 Herbicide Application

WHCP OPERATION MANAGEMENT PLAN

The WHCP has an Operations Management Plan (WHCP OMP). This WHCP OMP details general requirements, a pre-application planning protocol, application/monitoring coordination protocol, the application protocol and Best Management Practices (BMP) for herbicide handling, spray equipment maintenance and calibration, spill contingency plan, listed species avoidance and habitat evaluation, dissolved oxygen/temperature measurement, fish passage protocol, daily log completion, and GPS data download and use.

HERBICIDES AND ADJUVANT

Herbicides used in 2012 by the WHCP include the following:

Herbicides

- 2,4-Dichlorophenoxyacetic acid, dimethylamine salt (2,4-D) (Weedar® 64, by NuFarm), EPA Registration Number 71368-1-ZB
- Glyphosate (N-(phosphonmethyl) glycine, in the form of isopropylamine salt) (Aquamaster®, by Monsanto), EPA Registration Number 524-343-ZF

Adjuvant

- Agridex® (active ingredients: paraffin base petroleum oil and polyoxyethylate polyol fatty acid esters), California State Registration 5905-50017-AA

APPLICATION EQUIPMENT

The application of herbicides in 2012 was conducted with hand held spray wands operated from 16 to 21 foot air or outboard aluminum boats. The boats are equipped for direct metering of herbicides, adjuvant and water into the pump system of the spraying unit.

Each application crew utilized a Hach® HQ-10 Dissolved Oxygen Meter and an Xplore iX104C GPS system to record pre-spray and post-spray temperature, dissolved oxygen, beginning and ending UTM coordinates of spray area, amount of herbicide used, acreage treated, and the date and time of treatment.

EQUIPMENT MAINTENANCE

Spray equipment was calibrated on a weekly basis, after changing injection pumps and whenever problems with the equipment occur. Injection systems were cleaned daily and hoses were cleaned as needed. Pump oil was changed every 50 hours. Boat maintenance was conducted on a regular basis; boat maintenance records are available upon request.

4.2.2 Environmental Monitoring

WHCP NPDES ANNUAL MONITORING PROTOCOL

All WHCP water quality monitoring follows the WHCP NPDES Annual Monitoring Protocol as outlined in the WHCP Aquatic Pesticide Application Plan (APAP), which was approved in 2006 by the Central Valley Regional Water Quality Control Board. Quality control and quality analysis measures are outlined in the WHCP Quality Assurance Project Plan (QAPP). Monitoring activities include recording WHCP impacts on beneficial waters of the United States, federally listed threatened and endangered species, and associated threatened or endangered species habitats. DBW is required to document residues in receiving waters and monitor water quality parameters such as dissolved oxygen, temperature, conductivity, pH, and turbidity at representative locations.

MONITORING EQUIPMENT

A 19-21 foot aluminum air boat or a 22 foot fiberglass C-Dory outboard motorboat was used for monitoring activities. Boats used for sampling have never been used for herbicide applications. Water samples were collected using the MasterFlex® E/S® Portable Sampler fitted with 7-10 feet of tubing. Water samples were stored on ice in 1000 mL amber glass bottles.

Water quality parameters were measured with a Hydrolab® Model MS5 mini datasonde. Water quality parameters included water temperature, electrical conductivity, salinity, dissolved oxygen, pH and turbidity. Parameters measured by the Hydrolab® were geographically referenced with GPS coordinates with an Xplore iX104C PC tablet and ArcPad application. Data were captured electronically using Hydroplus® software specifically modified for the WHCP. In the event of datasonde malfunction, a Hach® HQ-10 Dissolved Oxygen Meter was used as a backup to measure temperature and dissolved oxygen within monitoring sites. In addition, all data were hand written on datasheets as a backup copy. These datasheets were subsequently used for data quality control purposes. A digital camera, the Panasonic® DMC-TS3, was used to provide visual records of sampling locations and other notable factors that may affect water quality, species of concern, or the condition of the surrounding environment. Several monitoring sites were marked with flagging tape for quick identification for follow-up visits.

EQUIPMENT MAINTENANCE

To avoid water sample contamination, boats used for environmental monitoring are never used for spray treatments. Monitoring boats were also periodically washed. To ensure that water quality data is reliable, Hydrolabs® and Hach® DO meters were calibrated on a regular basis based on the manufacturer's requirements.

SITE SELECTION

Following terms and conditions specified in the NPDES permit and past biological opinions, several sites were historically available for treatment starting April 1, with the majority of sites open for treatment after June 1. During the April to June time period when winter-run, spring-run, and/or steelhead juveniles are entering and/or present in the Delta, site selection depended on the Interagency Ecological Program (IEP) monitoring data showing the absence of special status fish species in treatment sites. Figures C-4 and C-5 in Appendix C are maps showing the

sites and their historical corresponding start dates. The treatment start date was delayed in 2012 and all sites became open for herbicide treatment on August 13. Sites selected for treatment were based on the level of impacts to navigation, threats to agricultural water pumping facilities, and high degrees of hyacinth infestation. During the 2012 WHCP site selection process, criteria also included information and concerns received from area residents and business owners.

Environmental monitoring sites were selected based on requirements listed under the NPDES permit and biological opinions. The SWRCB Statewide General NPDES Permit requires that dischargers monitor a certain proportion of sites based on the total number of treated sites. Areas treated under the WHCP shall be classified by DBW as falling into one of two water body types: 1) Tidal and 2) Riverine. DBW monitors 10 percent of the sites it treats, for each aquatic pesticide used and per water body type. In 2012, a total of 20 sites within the Delta and along the San Joaquin River were designated as WHCP monitoring sites (Table 2). Locations of the sites monitored in 2012 are mapped in Appendix C, Figure C-1.

Representative monitoring occurred in two sites per species with favorable habitat for the following species (Table 3): giant garter snake (*T. gigas*), Delta smelt (*H. transpacificus*), and valley elderberry longhorn beetle (VELB) (*D. californicus dimorphus*). Giant garter snake habitat has been rated as low, medium or high, while VELB and smelt habitat is classified as being absent or present based on the known distribution of smelt and the known locations of valley elderberry shrubs in the project area.

RESIDUE SAMPLING

All WHCP water quality monitoring followed the WHCP NPDES Annual Monitoring Protocol as outlined in the WHCP Aquatic Pesticide Application Plan, which was approved in 2008 by the Central Valley Regional Water Quality Control Board. Quality control and quality analysis measures are outlined in the WHCP Quality Assurance Project Plan (QAPP). Monitoring activities included recording WHCP impacts on beneficial waters of the United States, documenting observations of federally listed threatened or endangered species, and associated threatened or endangered species habitats. DBW is required to document herbicide and adjuvant residues in receiving waters and monitor water quality parameters such as dissolved oxygen, temperature, conductivity, pH and turbidity at representative monitoring locations.

Table 2. 2012 WHCP Monitoring Sites

Site #	Location	Water Body Type	Chemicals
6	French Camp Slough	Tidal	2,4D/AgriDex
16	Venice Cut	Tidal	Glyphosate/AgriDex
28*	Fourteen Mile Slough	Tidal	2,4D/AgriDex and Glyphosate/AgriDex
40	Little Potato Slough	Tidal	2,4D/AgriDex
41	Little Potato Slough	Tidal	Glyphosate/AgriDex
44	Potato Slough	Tidal	2,4D/AgriDex
52	Middle River	Tidal	Glyphosate/AgriDex
56	Middle River	Tidal	Glyphosate/AgriDex
65	Latham Slough	Tidal	Glyphosate/AgriDex
78	Old River	Tidal	2,4D/AgriDex
83	Old River	Tidal	2,4D/AgriDex
95	Warner Dredge Cut	Tidal	Glyphosate/AgriDex
97	Rock Slough	Tidal	Glyphosate/AgriDex
100	Connection Slough	Tidal	Glyphosate/AgriDex
107	Piper Slough	Tidal	Glyphosate/AgriDex
109	Sand Mound Slough	Tidal	Glyphosate/AgriDex
203	Sycamore Slough	Tidal	Glyphosate/AgriDex
301	Welthall Slough	Riverine	2,4D/AgriDex
319	San Joaquin River	Riverine	Glyphosate/AgriDex
320	San Joaquin River	Riverine	Glyphosate/AgriDex

*Site 28 was sampled twice, once for each chemical.

Table 3. 2012 WHCP Monitoring Sites and Habitat Quality

Site #	Location	GGs Habitat Quality	Smelt Habitat	VELB Habitat
6	French Camp Slough	Moderate-High	Present	Present
16	Venice Cut	Moderate	Present	Absent
28	Fourteen Mile Slough	High	Present	Present
40	Little Potato Slough	Moderate-High	Present	Absent
41	Little Potato Slough	Moderate-High	Present	Absent
44	Potato Slough	Moderate	Present	Absent
52	Middle River	Low	Present	Absent
56	Middle River	Low-Moderate	Present	Absent
65	Latham Slough	Low-Moderate	Present	Absent
78	Old River	Low	Present	Absent
83	Old River	Low-Moderate	Present	Absent
95	Warner Dredge Cut	Low-Moderate	Present	Absent
97	Rock Slough	Moderate	Present	Present
100	Connection Slough	Moderate-High	Present	Absent
107	Piper Slough	Moderate-High	Present	Absent
109	Sand Mound Slough	Low-Moderate	Present	Absent
203	Sycamore Slough	Low	Present	Absent
301	Welthall Slough	Moderate	Present	Absent
319	San Joaquin River	Low-Moderate	Absent	Absent
320	San Joaquin River	Low-Moderate	Absent	Absent

Water sampling occurs on the same day of herbicide application, in addition to follow-up sampling at the same locations within a week after treatment. All sampling stations at representative locations are identified as "A", "B", and "C". Sampling station "A" represents the treatment area where water hyacinth was treated. Sampling station "B" represents receiving water that is downstream from the treatment area. Sampling station "C" represents a control site that is sampled before herbicide treatment, typically upstream of the treatment area. Sampling times are identified as "1", "2", and "3". Sampling time "1" indicates pre-treatment. Sampling time "2" indicates immediately post-treatment. Sampling time "3" indicates within seven days after treatment. Thus, sample 1A is taken before a treatment, within the treatment area. Likewise, sample 3C is taken within one week after treatment, upstream of the treatment area (i.e. control site).

4.2.3 Contract Laboratory Standard Operating Procedures

The analytical methods used by contract laboratories are published in the U.S. EPA Test Methods for Evaluating Solid Waste Physical/Chemical SW 846 or U.S. EPA Method for Chemical Analysis of Water and Waste. The primary method used for the WHCP is Method 8270/625 (or equivalent) by gas chromatography/mass spectrometry (GC/MS).

For the 2,4-D GC/MS analysis, a linear calibration with options of using an average response factor or a linear regression is specified. An initial five-point calibration curve is completed, where the low-level standard concentration is less than or equal to the analyte quantization limits. Glyphosate and Agridex undergo liquid chromatographic analysis with the same 5 point calibration curve. The 2,4-D results are also compared to percent recovery of the surrogate chemical 3,4-D to ensure accuracy of results. There are no comparable surrogates for glyphosate and Agridex at this time.

ANALYTICAL TESTING VALIDATION

DBW used several methods to validate results found by contracting laboratories. These methods include collecting split (duplicate) water samples, field spikes, field blanks and equipment blanks. An equipment blank sample (de-ionized water collected using the sampling device) was collected at every sampling event to detect potential contamination from sampling equipment.

5 MONITORING RESULTS AND DISCUSSION

5.1 Threatened and Endangered Species

The USFWS and NMFS have established incidental take limits for listed species and outlined terms and conditions necessary to minimize the impact of incidental take on threatened and endangered species. No incidental take of listed species occurred in the 2012 season.

5.2 Herbicide Application

Each crew completed a daily log to record herbicide treatment activities. The 2012 WHCP daily log information can be found in Appendix A, Tables A-1 to A-6. Herbicide applications were made only when DO levels are either above the Basin Plan limit adopted by the Central Valley Regional Water Quality Control Board or above 3.0 mg/L. No applications were made if DO concentrations were below 3.0 mg/L. Basin plan DO limits for the entire WHCP project area are shown in Appendix C, Figures C-2 and C-3.

The WHCP protocol was to treat a site up to a maximum of 4 times in the 2012 season. The numbers of herbicide applications per treatment site in 2012 are depicted in Figures C-6 and C-7 in Appendix C. Eight treatment sites within the Delta were treated more than 4 times, which exceeded the maximum number of permitted herbicide applications. These treatment sites were 8, 17, 19, 26, 31, 32, 47, and 76.

5.2.1 Summary of Herbicide Use

In 2012, all WHCP sites became available for herbicide application on August 13, 2012. For comparison, Figures C-4 and C-5 in Appendix C document when WHCP sites were historically available for treatment. To minimize potential negative effects to steelhead, NMFS permitted 2,4-D application from June 15 to September 15 within the Delta and from July 15 to August 15 in the San Joaquin River. Glyphosate applications were to end on October 15, 2012. Due to unseasonably warmer weather that contributed to the further growth and infestation of water hyacinth, NMFS granted a 45-day extension (October 15 to November 30) for 2012 WHCP glyphosate applications. NMFS determined that glyphosate applications beyond October 15, 2012 would not increase potential effects of the action to listed species and their habitat. WHCP treatments were terminated on November 26, 2012 because monitoring data indicated that juvenile salmonids were migrating into the action area.

In 2012, the WHCP used 81.75 gallons of 2,4-D, 769.50 gallons of glyphosate, and 233.56 gallons of Agridex to effectively treat a total of 851 acres of water hyacinth in the Delta and its tributaries (Table 4). The total acreage of water hyacinth each year between 1992 and 2012 varies (Figure 1) and ranged from 421 and 2791 acres. Water hyacinth was not treated in 2000 as the program was the subject of legal and regulatory changes, which prevented treatment during that year. The number of acres treated in a given year can reflect the magnitude of infestation; however other factors can also affect the amount of treatment that occurs (regulatory limits, local conditions, weather, and staff levels). These variables make it difficult to show efficacy throughout the years. In 2012, the WHCP did not begin herbicide treatments until August 13. However, despite the delay, the program was successful in treating 851 acres of water hyacinth in the Delta and its surrounding tributaries, which is an increase from the 788 acres treated in 2011.

Table 4. Summary of 2012 Herbicide Use and Acreage Treated by Month

Month	2,4-D		Glyphosate		Agridex
	Gallons	Acres	Gallons	Acres	Gallons
JUNE	0	0	0	0	0
JULY	0	0	0	0	0
AUGUST	51.00	51.00	41.50	55.33	39.00
SEPTEMBER	30.75	30.75	53.75	71.67	31.90
OCTOBER	0	0	309.50	412.67	108.63
NOVEMBER	0	0	172.38	229.83	54.04
Total	81.75	81.75	577.13	769.50	233.56

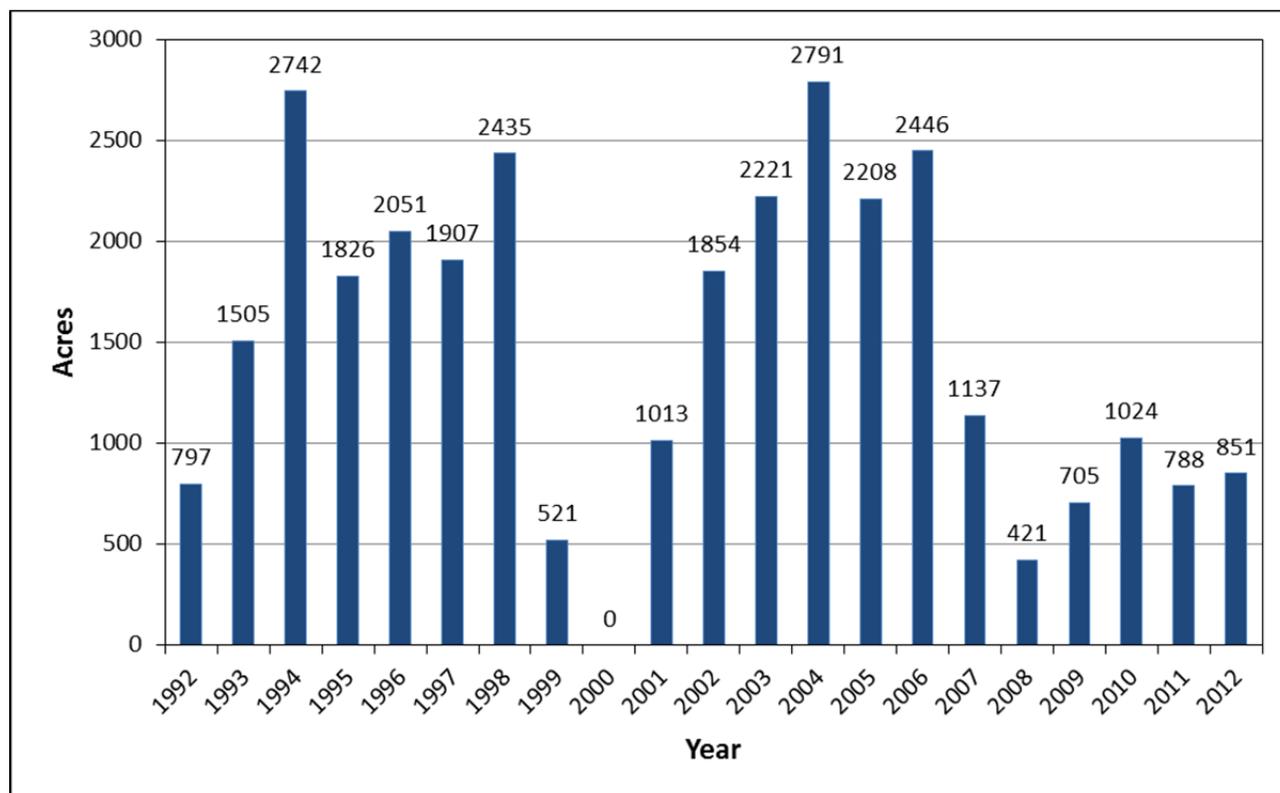


Figure 1. Total water hyacinth acres treated by year, 1992-2012

5.3 Monitoring Data and Laboratory Results

The SWRCB Statewide General NPDES Permit requires dischargers monitor a certain proportion of sites based upon the total number of treated sites. Areas treated under the Water Hyacinth Control Program (WHCP) shall be classified by DBW as falling into one of two water body types: 1) Tidal and 2) Riverine. DBW monitors 10 percent of the sites it treats, for each aquatic pesticide used and per water body type. In 2012, DBW monitored 21% of tidal sites and 33% of riverine sites treated with 2,4-D. For sites treated with glyphosate, DBW monitored 10% each of tidal and riverine sites (Table 5). A total of 20 sites within the Delta and along the San

Joaquin River were designated as WHCP monitoring sites (Table 2 and Figure C-1, Appendix C). Field monitoring data and lab results collected in compliance with the NPDES permit and BO's are summarized in Appendix B. Figures and tables found within Appendix B document the sample locations, chemical residues and water quality data for these 20 monitoring sites.

Table 5. Number of treated and sampled sites per herbicide and water body type

Herbicide	Water Body Type	# Sites Treated	# Sites Sampled	% Sampled
2,4-D	Tidal	28	6	21.4
	Riverine	3	1	33.3
Glyphosate	Tidal	125	12	9.6
	Riverine	20	2	10.0

5.3.1 Dissolved Oxygen, Turbidity and pH

At several sites during pre- and post-treatment sampling events, water quality parameters including pH, conductivity, salinity and turbidity were not recorded due to equipment failure. Turbidity data was also unreliable due to an unstable probe which intermittently malfunctioned. DBW has had the Hydrolab® datasonde fully serviced and calibrated by the manufacturer to ensure all probes provide accurate monitoring data for the 2013 season.

Basin Plan limits for receiving water DO levels are shown in Figures C-2 and C-3, Appendix C. There were two monitoring sites with DO concentrations in the treatment area below the basin plan limit of 5.0 mg/L: sites 78 and 301. The DO exceeded the basin limit on September 13 and 20 in site 78. DO levels within this treatment area (locations 1A and 3A) on these dates were 3.67 mg/L and 4.70 mg/L, respectively. The control sites (1C and 3C) also had low DO levels of 3.25 mg/L and 4.09 mg/L on September 13 and 20. At the time of treatment and monitoring in site 78, the Old River near Tracy temporary rock barrier was installed which may have reduced water flow, thus further contributing to reduced DO levels resulting from water hyacinth infestation and/or plant decomposition. In site 301, the measured DO was 3.46 mg/L. The DO level at the control site, location 3C, was also below basin limits with a concentration of 2.27 mg/L. Site 301 is a dead-end slough and low or stagnant water flow in addition to water hyacinth infestation may have resulted in low DO levels within this site. Although limits were exceeded on these dates, application crew DO measurements taken after these dates indicated that DO levels returned above basin limits. Since the majority of DO concentrations were above the 3.0 mg/L required for fish survival, the reduced DO was shown to be temporary and all fish passage protocols were followed, it is believed in this case that there were not any serious impacts to water quality or species of concern. All other DO levels in the 2012 treatment season were between 5.02 mg/L and 12.15 mg/L.

Discharge shall not cause the 30-day average turbidity in the receiving water to increase as follows, as per Basin Plan standards for turbidity are that the:

- More than 1 Nephelometric Turbidity Units (NTU) where natural turbidity is between 0 and 5 NTUs.
- More than 20 percent where natural turbidity is between 5 and 50 NTUs.
- More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.
- More than 10 percent where natural turbidity is over 100 NTUs

Since sites are not monitored for 30 days, the average of the turbidity measurements taken at “A” and “C” locations on the sampling day in question will constitute the 30-day average against which the receiving water (“B” location) measurements will be compared. Turbidity was unreliable due to an unstable probe that intermittently malfunctioned. Though the units measured were within acceptable limits, the probability that the probe had been faulty makes the data inconclusive. For monitoring sites within the Delta, turbidity readings were between 0 and 29.5 NTUs. Turbidity in monitoring sites on the upper San Joaquin River (Stanislaus County) ranged from 19.5 to 34.2 NTUs.

The Basin Plan Limit for pH is discharge shall not cause the ambient pH in the receiving water to fall below 6.5 or exceed 8.5. During the 2012 monitoring season, there were eight sites where measured pH levels were below 6.5. These sites included sites 16, 41, 52, 56, 65, 95, 97, and 100. Readings less than 6.5 ranged between 4.29 and 5.67. Only one treatment site had pH levels which exceeded the basin plan limit of 8.5. This was site 109 with pH levels of 8.73 and 8.84. The pH levels that deviated from the basin limits were measured within the treatment area, downstream of the treatment area, within the control site, and were also measured pre-treatment, immediately post-treatment, and 1 week post-treatment. Seven exceedances were from station 1A, 6 from station 2B, 7 from station 1C, and 5 each for stations 3A, 3B, and 3C. There were 5 sites (16, 65, 95, 97, and 100) that had pH levels less than 6.5 across all monitoring stations (pre-treatment, immediately post-treatment, and 1 week post-treatment). Since low pH was measured in the control sampling stations within these 5 sites, this suggests that low pH levels were likely a result from other environmental factors and not necessarily a result of herbicide application activity. All other measured pH levels complied with basin plan limits.

5.3.2 Herbicide Residue Concentrations

Maximum residue limits are based on Environmental Protection Agency (EPA) municipal drinking water standards. Herbicide residue shall not exceed the following concentrations in receiving waters (Table 6).

Table 6. Receiving water limits for WHCP herbicides

Herbicide Active Ingredient	Maximum Concentration
2,4-D	70 µg/L
Glyphosate	700 µg/L

During 2012, all herbicide (and Agridex) residue concentrations at receiving water locations were not detected or were below limits as specified in the WHCP NPDES permit (Appendix B). Residue concentrations for 2,4-D water samples were either not detected or ranged between 0.1 ppb to 14.6 ppb. For all glyphosate water samples, residues concentrations were not detected.

5.4 Additional Information

5.4.1 Valley Elderberry Longhorn Beetle Habitat Monitoring

The WHCP USFWS BO terms and conditions require monitoring of the Valley elderberry longhorn beetle (*D. californicus dimorphus*) elderberry shrub (*Sambucus* sp.) habitat before and after applications to ensure there were no significant impacts from the WHCP. In 2003, the Department of Boating and Waterways (DBW) proposed an alternate three-year quantitative

study. A draft was submitted to USFWS in February of 2003. The biological opinion was amended on March 24, 2003 to accept the Elderberry Shrub Monitoring Protocol and new study. This elderberry monitoring study allowed the DBW to continue monitoring and assess the effects of the WHCP herbicide applications on elderberry shrubs adjacent to waterways being treated. The data for year three of the study was collected during 2006. This data was inconclusive. Therefore, DBW decided to return to the original protocol approved by USFWS in 2003.

5.4.2 Non-Chemical Control

Due to time restrictions and treatment limitations for the chemical application of water hyacinth, the Handpicking Program has been implemented as part of the WHCP's Integrated Pest Management Plan. Goals of the Handpicking Program are to control of water hyacinth by clearing areas that are 1) not accessible to chemical treatment, 2) subject to high infestation, 3) considered small and confined such as around docks or boat launching facilities, and 4) within emergent vegetation where reduction of chemical application impacts are needed. Specific protocols were established and implemented to protect water quality and endangered species. In 2012, handpicking of water hyacinth was limited to winter months. After the herbicide applications ended on November 26, crews hand-picked water hyacinth from sites which included Discovery Bay, Islander Park and Snodgrass Slough.

In 2012, DBW assisted with mechanical removal efforts of water hyacinth. DBW assisted the U.S. Bureau of Reclamation in removing a buildup of water hyacinth at the Tracy Fish Collection Facility Fish Screen. About 17,000 truckloads of water hyacinth were mechanically removed at this location. DBW also assisted the Golden State Construction Company with removal of water hyacinth in Islander Park (Site 301) and Whiskey Slough (Site 62). Approximately 8 acres and 13 acres were mechanically removed in Islander Park and Whiskey Slough, respectively. DBW considers alternatives to current non-chemical control practices (such as biological control), and hopes to implement them in future seasons.

APPENDIX A

2012 WHCP Herbicide Application Daily Logs

Table A- 1. August 2012 2,4-D/AgriDex Use

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	2,4-D (gal)	AgriDex (gal)	Chem Rate	2,4-D Acres	Wind Speed
8/13/2012	3548	300	San Joaquin	26.60	27.20	1200	1400	6.99	6.50	0.50	0.25	32	0.50	0-2
8/13/2012	3548	301	San Joaquin	24.50	25.00	900	1100	6.65	6.00	0.50	0.25	32	0.50	0-2
8/13/2012	9607	301	San Joaquin	25.30	25.90	900	1500	7.30	8.20	2.00	0.50	32	2.00	0-2
8/15/2012	9371	6	San Joaquin	24.60	25.80	1000	1100	5.80	5.00	0.25	0.25	32	0.25	0-2
8/20/2012	3548	32	San Joaquin	23.10	24.40	1300	1500	8.50	7.90	2.50	1.25	32	2.50	0-2
8/22/2012	8789	109	Contra Costa	21.90	22.20	900	1500	8.60	8.20	2.50	1.25	32	2.50	4-6
8/22/2012	3548	302	San Joaquin	23.40	23.60	1300	1500	8.70	7.90	2.50	1.25	32	2.50	2-4
8/23/2012	8789	107	Contra Costa	21.70	22.00	900	1100	8.90	8.80	2.50	1.25	32	2.50	4-6
8/23/2012	3548	47	San Joaquin	22.10	22.40	1200	1500	6.00	5.90	2.00	1.00	32	2.00	2-4
8/23/2012	3548	49	San Joaquin	21.60	21.80	900	1100	5.70	6.20	3.00	1.25	32	3.00	2-4
8/23/2012	8816	57	San Joaquin	23.60	24.20	900	1400	8.10	8.40	3.00	1.50	32	3.00	4-6
8/23/2012	9371	26	San Joaquin	23.40	27.30	900	1300	6.20	6.50	3.00	1.50	32	3.00	2-4
8/29/2012	8789	126	Sacramento	20.70	20.90	900	1100	8.30	8.50	2.00	1.00	32	2.00	4-6
8/29/2012	8789	128	Sacramento	21.00	21.20	1200	1500	8.70	8.30	2.00	1.00	32	2.00	4-6
8/29/2012	3548	32	San Joaquin	23.20	23.10	1400	1600	9.10	9.40	2.75	1.25	32	2.75	0-2
8/29/2012	8816	76	San Joaquin	24.10	24.40	900	1300	7.50	7.10	3.00	1.50	32	3.00	0-2
8/29/2012	9122	58	San Joaquin	24.30	25.20	900	1500	8.60	7.60	3.00	0.75	32	3.00	2-4
8/30/2012	8789	118	Contra Costa	20.60	20.90	900	1100	8.30	8.60	2.50	1.25	32	2.50	2-4
8/30/2012	9122	84	Contra Costa	23.90	24.40	800	1200	7.10	7.60	3.00	0.75	32	3.00	0-2
8/30/2012	8816	200	San Joaquin	23.50	23.80	800	1200	8.60	8.10	2.00	1.00	32	2.00	0-2
8/30/2012	8816	201	San Joaquin	23.80	24.20	1200	1500	8.20	7.80	2.00	1.00	32	2.00	0-2
8/30/2012	9371	29	San Joaquin	22.90	24.60	800	1100	5.80	6.30	1.75	0.75	32	1.75	2-4
8/30/2012	9371	31	San Joaquin	26.00	25.50	1100	1500	6.60	7.30	2.75	1.00	32	2.75	2-4
										Total	51.00	22.75		51.00

Table A- 2. August 2012 Glyphosate/Agridex Use

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed	
8/15/2012	8789	129	Sacramento	22.10	22.60	1200	1500	10.00	10.10	1.00	0.50	48	1.33	4-6	
8/15/2012	8816	215	Sacramento	24.50	24.70	1200	1500	7.80	8.00	2.00	1.00	48	2.67	2-4	
8/15/2012	8816	203	San Joaquin	23.20	23.80	1000	1100	8.10	8.20	1.25	0.50	48	1.67	2-4	
8/15/2012	9371	8	San Joaquin	27.50	28.30	1200	1500	7.40	9.10	2.00	1.00	48	2.67	2-4	
8/16/2012	8789	116	Contra Costa	23.00	22.90	1200	1500	8.00	7.90	0.50	0.25	48	0.67	4-6	
8/16/2012	8789	117	Contra Costa	22.80	22.90	900	1100	7.30	7.70	1.00	0.50	48	1.33	4-6	
8/16/2012	8816	38	San Joaquin	24.70	24.80	1300	1500	8.60	8.20	2.00	1.00	48	2.67	0-2	
8/16/2012	9123	26	San Joaquin	27.20	28.20	1500	1600	6.80	7.20	0.75	0.25	48	1.00	2-4	
8/16/2012	9123	32	San Joaquin	24.20	24.60	900	1100	6.30	6.30	2.00	0.75	48	2.67	2-4	
8/16/2012	9123	37	San Joaquin	24.90	25.80	1100	1400	7.30	9.30	1.75	0.75	48	2.33	2-4	
8/16/2012	9607	75	San Joaquin	25.10	25.50	1200	1500	8.70	7.30	2.00	0.50	48	2.67	2-4	
8/16/2012	9607	76	San Joaquin	24.80	25.10	900	1200	7.30	8.70	2.00	0.50	48	2.67	2-4	
8/20/2012	8816	37	San Joaquin	26.50	29.20	1400	1600	8.60	9.10	1.25	0.25	48	1.67	2-4	
8/21/2012	8816	206	San Joaquin	24.30	23.50	1300	1500	11.70	8.30	1.25	0.50	48	1.67	2-4	
8/21/2012	9123	38	San Joaquin	24.10	24.20	1300	1500	8.20	7.80	1.50	0.75	48	2.00	2-4	
8/22/2012	8816	217	Sacramento	23.90	24.20	1300	1500	8.60	8.80	2.00	1.00	48	2.67	2-4	
8/22/2012	8816	219	Sacramento	23.60	23.90	1000	1200	8.10	8.60	2.00	1.00	48	2.67	2-4	
8/22/2012	3548	300	San Joaquin	23.20	23.00	1100	1300	9.70	9.00	2.00	1.25	48	2.67	2-4	
8/22/2012	9122	75	San Joaquin	24.90	24.80	1200	1200	7.30	8.10	2.00	0.50	48	2.67	2-4	
8/22/2012	9122	76	San Joaquin	25.20	25.50	900	1500	10.30	7.60	2.00	0.50	48	2.67	2-4	
8/22/2012	9371	8	San Joaquin	27.60	27.50	900	1300	8.10	8.40	2.00	0.75	48	2.67	2-4	
8/22/2012	9371	26	San Joaquin	26.40	27.50	1300	1500	5.70	6.10	1.50	0.25	48	2.00	2-4	
8/23/2012	9371	37	San Joaquin	25.70	25.80	1300	1500	7.00	10.00	0.50	0.25	48	0.67	2-4	
8/27/2012	9371	31	San Joaquin	22.00	25.00	1500	1600	8.50	8.60	1.00	0.25	48	1.33	2-4	
8/30/2012	9122	79	Alameda	24.20	25.10	1200	1500	8.30	8.90	2.00	0.50	48	2.67	2-4	
8/30/2012	none	408	Merced	27.00	27.40	1300	1500	7.00	7.20	2.25	1.00	48	3.00	0-2	
										Total	41.50	16.25		55.33	

Table A- 3. September 2012 2,4-D/Agridex Use

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	2,4-D (gal)	Agridex (gal)	Chem Rate	2,4-D Acres	Wind Speed
9/4/2012	9371	28	San Joaquin	24.20	25.50	1200	1300	5.70	5.70	1.00	0.25	32	1.00	2-4
9/4/2012	9371	40	San Joaquin	21.60	22.20	900	1000	7.20	7.60	1.00	0.25	32	1.00	2-4
9/4/2012	9371	44	San Joaquin	22.40	23.10	1000	1100	8.10	8.60	1.00	0.25	32	1.00	2-4
9/12/2012	8816	20	Sacramento	23.10	23.50	900	1500	8.20	8.70	3.00	1.50	32	3.00	2-4
9/12/2012	3548	300	San Joaquin	22.00	22.80	900	1100	11.00	10.70	2.75	1.25	32	2.75	0-2
9/12/2012	3548	301	San Joaquin	23.40	23.30	1400	1500	10.80	10.60	1.00	0.25	32	1.00	0-2
9/12/2012	3548	302	San Joaquin	23.10	23.20	1200	1300	10.30	10.40	2.00	1.00	32	2.00	0-2
9/12/2012	9122	75	San Joaquin	23.30	24.50	900	1400	7.20	9.40	3.00	0.75	32	3.00	0-2
9/13/2012	8789	112	Contra Costa	20.90	21.30	800	1100	8.10	8.30	2.50	1.25	32	2.50	2-4
9/13/2012	3548	57	San Joaquin	22.00	22.50	1000	1400	8.06	8.20	3.00	1.50	32	3.00	2-4
9/13/2012	8816	61	San Joaquin	23.50	23.70	900	1200	8.40	8.60	2.75	1.25	32	2.75	2-4
9/13/2012	8816	62	San Joaquin	23.70	23.90	1300	1500	8.60	8.80	1.25	0.75	32	1.25	2-4
9/13/2012	9122	78	San Joaquin	23.40	23.10	900	1100	9.30	7.20	2.00	0.50	32	2.00	2-4
9/13/2012	9122	83	San Joaquin	22.90	23.20	1100	1500	8.50	7.90	1.75	0.50	32	1.75	2-4
9/13/2012	9371	39	San Joaquin	21.20	22.20	900	1500	8.50	9.60	2.75	1.75	32	2.75	2-4
										Total	30.75	13.00		30.75

Table A- 4. September 2012 Glyphosate/Agridex Use

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
9/6/2012	8789	107	Contra Costa	20.60	20.90	800	1000	8.40	8.60	1.00	0.50	48	1.33	4-6
9/6/2012	8789	109	Contra Costa	22.30	22.40	1100	1200	8.10	7.70	0.50	0.25	48	0.67	4-6
9/6/2012	8789	112	Contra Costa	22.40	22.60	1200	1500	8.00	8.30	1.50	0.75	48	2.00	4-6
9/6/2012	3548	408	Merced	22.70	23.30	1000	1200	6.30	6.50	2.00	1.00	48	2.67	0-2
9/6/2012	3548	409	Merced	23.40	23.30	1300	1400	6.10	5.90	1.00	0.50	48	1.33	0-2
9/6/2012	8816	200	San Joaquin	24.50	24.70	900	1500	8.80	8.60	2.00	1.00	48	2.67	2-4
9/6/2012	9122	75	San Joaquin	24.70	25.20	900	1500	7.90	8.30	2.00	0.50	48	2.67	2-4
9/13/2012	9371	37	San Joaquin	22.50	22.30	1500	1600	7.90	8.20	1.00	0.50	48	1.33	2-4
9/19/2012	8789	120	Contra Costa	19.90	20.30	900	1200	9.00	9.30	2.00	1.00	48	2.67	4-6
9/19/2012	8789	127	Sacramento	20.10	20.70	1200	1500	8.70	9.40	2.00	1.00	48	2.67	6-8
9/19/2012	8816	217	Sacramento	23.40	23.50	1200	1500	8.40	8.20	2.00	1.00	48	2.67	2-4
9/19/2012	8816	219	Sacramento	23.10	23.40	900	1200	8.20	8.50	2.00	1.00	48	2.67	2-4
9/19/2012	3548	319	Stanislaus	20.30	20.70	1000	1100	8.69	9.40	0.50	0.25	48	0.67	4-6
9/19/2012	3548	320	Stanislaus	21.80	22.10	1200	1400	9.90	9.70	0.75	0.25	48	1.00	4-6
9/20/2012	3548	404	Merced	19.30	20.50	900	1100	8.00	8.97	1.50	0.40	48	2.00	4-6
9/20/2012	3548	408	Merced	22.30	23.40	1200	1450	5.50	5.20	2.00	0.50	48	2.67	4-6
9/20/2012	8816	217	Sacramento	23.50	24.30	900	1400	8.30	8.60	2.00	0.50	48	2.67	2-4
9/20/2012	9371	8	San Joaquin	22.90	24.20	800	1200	6.60	6.60	1.75	0.25	48	2.33	4-6
9/20/2012	9371	42	San Joaquin	21.30	21.90	1300	1500	9.10	9.10	2.25	0.50	48	3.00	4-6
9/20/2012	9607	47	San Joaquin	22.70	23.40	1200	1500	9.30	8.30	2.00	0.50	48	2.67	2-4
9/20/2012	9607	48	San Joaquin	22.80	22.70	1000	1200	8.50	9.30	2.00	0.50	48	2.67	2-4
9/20/2012	9607	49	San Joaquin	22.30	22.80	800	900	7.30	8.10	2.00	0.50	48	2.67	0-2
9/26/2012	3738	107	Contra Costa	20.70	21.10	1000	1500	9.90	9.60	2.00	0.75	48	2.67	4-6
9/26/2012	8816	201	San Joaquin	22.30	22.50	900	1200	8.20	7.80	2.00	0.75	48	2.67	0-2
9/26/2012	8816	202	San Joaquin	22.70	23.10	1200	1500	8.20	8.60	2.00	0.75	48	2.67	0-2
9/26/2012	9122	77	San Joaquin	22.60	23.70	1100	1500	9.10	9.70	2.00	0.50	48	2.67	0-2
9/26/2012	9122	78	San Joaquin	21.80	22.90	800	1100	7.50	8.60	2.00	0.50	48	2.67	2-4

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
9/27/2012	9607	404	Merced	21.30	21.40	900	1200	8.60	9.60	2.00	0.50	48	2.67	0-2
9/27/2012	9607	405	Merced	21.90	22.40	1100	1500	8.80	8.10	2.00	0.50	48	2.67	0-2
9/27/2012	8789	122	Sacramento	20.90	21.50	900	1300	9.70	9.90	2.00	0.75	48	2.67	2-4
9/27/2012	8789	123	Sacramento	21.30	21.70	1300	1600	9.50	9.90	2.00	0.75	48	2.67	2-4
										Total	53.75	18.90		71.67

Table A- 5. October 2012 Glyphosate/AgriDex Use

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	AgriDex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
10/1/2012	8789	112	Contra Costa	21.00	21.70	900	1200	9.60	9.90	2.00	0.75	48	2.67	2-4
10/1/2012	8816	215	Sacramento	24.30	24.80	1200	1500	8.50	8.20	2.00	0.75	48	2.67	0-2
10/1/2012	8816	216	Sacramento	23.50	23.80	1000	1200	8.70	8.80	2.00	0.75	48	2.67	0-2
10/1/2012	3548	300	San Joaquin	22.40	22.90	900	1100	11.30	10.90	2.00	0.50	48	2.67	0-2
10/1/2012	3548	302	San Joaquin	23.20	23.40	1200	1500	10.10	9.90	2.00	0.50	48	2.67	0-2
10/1/2012	9371	30	San Joaquin	24.20	23.70	1300	1500	7.70	7.90	2.00	1.25	48	2.67	0-2
10/1/2012	9371	31	San Joaquin	22.30	23.60	900	1300	8.40	7.60	2.00	1.50	48	2.67	0-2
10/1/2012	9607	76	San Joaquin	21.20	21.60	900	1100	7.50	9.30	2.00	0.50	48	2.67	0-2
10/1/2012	9607	77	San Joaquin	22.10	22.80	1200	1500	7.90	8.70	2.00	0.50	48	2.67	2-4
10/2/2012	3738	214	Sacramento	23.60	24.80	1300	1600	8.60	8.10	2.00	0.50	48	2.67	0-2
10/2/2012	3738	215	Sacramento	22.90	23.50	900	1200	8.70	8.50	2.00	0.50	48	2.67	0-2
10/2/2012	8789	131	Sacramento	19.60	20.00	900	1100	8.90	9.20	2.00	0.75	48	2.67	0-2
10/2/2012	8789	132	Sacramento	20.70	21.30	1200	1500	8.90	9.00	2.00	0.75	48	2.67	0-2
10/2/2012	9122	56	San Joaquin	21.80	22.30	900	1100	9.60	7.80	2.00	0.50	48	2.67	0-2
10/2/2012	9122	58	San Joaquin	21.90	22.50	1100	1400	9.30	8.60	2.00	0.50	48	2.67	2-4
10/2/2012	9122	91	San Joaquin	22.60	22.70	1400	1500	9.60	7.40	1.00	0.25	48	1.33	2-4
10/2/2012	9371	8	San Joaquin	23.40	26.30	900	1500	6.40	7.70	2.25	1.00	48	3.00	0-2
10/3/2012	8816	10	San Joaquin	23.40	23.70	900	1200	8.60	8.80	2.00	0.50	48	2.67	0-2
10/3/2012	8816	11	San Joaquin	23.80	24.40	1300	1500	8.50	8.70	2.00	0.50	48	2.67	0-2
10/3/2012	9371	16	San Joaquin	22.30	22.70	1100	1200	7.90	7.90	1.25	0.25	48	1.67	0-2
10/3/2012	9371	28	San Joaquin	25.70	26.20	1300	1600	6.90	6.20	2.25	1.25	48	3.00	0-2
10/3/2012	9371	41	San Joaquin	20.60	21.90	900	1000	8.30	7.60	1.75	0.50	48	2.33	0-2
10/3/2012	964121	76	San Joaquin	20.80	21.00	900	1400	6.80	6.70	2.25	0.75	48	3.00	2-4
10/3/2012	3548	714	Stanislaus	15.40	15.90	1300	1400	10.60	10.10	0.25	0.13	48	0.33	0-2
10/3/2012	3548	715	Stanislaus	15.10	15.20	900	1200	10.07	11.30	0.25	0.13	48	0.33	0-2
10/4/2012	9122	93	Contra Costa	21.30	22.50	900	1500	9.70	7.30	2.00	0.75	48	2.67	2-4
10/4/2012	8816	10	San Joaquin	23.20	23.40	1000	1200	8.60	8.80	2.00	0.50	48	2.67	2-4
10/4/2012	8816	11	San Joaquin	23.70	24.20	1300	1500	8.50	8.30	2.00	0.50	48	2.67	2-4
10/5/2012	8789	110	Contra Costa	20.40	20.70	1200	1600	8.60	8.20	2.50	1.00	48	3.33	4-6
10/5/2012	8789	111	Contra Costa	19.80	20.00	800	1100	8.40	8.70	2.50	1.00	48	3.33	4-6
10/5/2012	3548	26	San Joaquin	21.00	22.20	900	1200	7.59	8.25	2.25	0.75	48	3.00	2-4

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
10/5/2012	3548	31	San Joaquin	22.30	23.10	1300	1500	8.30	7.90	2.25	0.75	48	3.00	4-6
10/5/2012	9371	13	San Joaquin	22.90	22.20	1400	1600	8.90	8.20	1.50	0.50	48	2.00	6-8
10/5/2012	9371	34	San Joaquin	20.90	21.80	800	1100	7.50	7.60	2.25	1.00	48	3.00	6-8
10/5/2012	9371	42	San Joaquin	21.10	20.70	1100	1400	8.70	8.70	2.25	1.00	48	3.00	6-8
10/6/2012	8789	110	Contra Costa	19.40	19.90	800	1000	8.60	8.80	2.50	1.00	48	3.33	4-6
10/6/2012	8789	112	Contra Costa	20.30	20.70	1100	1600	8.80	9.00	2.50	1.00	48	3.33	4-6
10/6/2012	3548	18	San Joaquin	19.00	19.40	900	1100	8.64	9.40	2.00	0.75	48	2.67	4-6
10/6/2012	3548	44	San Joaquin	19.50	19.90	1200	1400	9.10	8.90	2.00	0.75	48	2.67	4-6
10/6/2012	8816	12	San Joaquin	23.20	23.50	1300	1500	8.50	8.30	2.00	0.75	48	2.67	4-6
10/6/2012	8816	68	San Joaquin	22.70	22.90	1100	1300	8.40	8.60	2.00	0.75	48	2.67	4-6
10/6/2012	8816	69	San Joaquin	22.20	22.60	900	1100	8.00	8.20	2.00	0.75	48	2.67	2-4
10/6/2012	9371	13	San Joaquin	21.60	22.30	1400	1600	9.00	9.90	2.00	1.00	48	2.67	4-6
10/6/2012	9371	14	San Joaquin	22.00	22.20	1200	1300	8.70	9.20	2.00	1.00	48	2.67	4-6
10/6/2012	9371	33	San Joaquin	19.80	20.50	800	1100	8.00	8.00	2.00	1.00	48	2.67	4-6
10/7/2012	3548	51	San Joaquin	19.90	19.80	900	800	8.90	8.80	0.00	0.75	48	0.00	0-2
10/7/2012	9122	89	Contra Costa	19.90	20.20	900	1100	7.70	8.20	2.00	0.75	48	2.67	2-4
10/7/2012	9122	91	Contra Costa	20.10	19.80	1100	1300	9.00	8.70	2.00	0.75	48	2.67	2-4
10/7/2012	3548	50	San Joaquin	19.90	20.70	900	1500	8.80	9.00	2.00	0.75	48	2.67	0-2
10/7/2012	9122	59	San Joaquin	20.20	19.90	1300	1500	7.20	6.80	2.00	0.75	48	2.67	8-10
10/8/2012	8789	173	Contra Costa	20.60	20.90	1200	1600	11.00	10.80	2.50	1.00	48	3.33	4-6
10/8/2012	3548	25	San Joaquin	19.50	20.10	1200	1400	8.00	8.30	2.25	1.00	48	3.00	4-6
10/8/2012	3548	29	San Joaquin	19.40	19.30	900	1100	7.85	8.20	2.25	0.75	48	3.00	4-6
10/8/2012	8816	36	San Joaquin	23.20	23.40	1300	1600	8.60	8.50	2.00	0.75	48	2.67	2-4
10/8/2012	8816	38	San Joaquin	22.30	22.50	800	1000	8.10	8.20	2.00	0.75	48	2.67	2-4
10/8/2012	8816	39	San Joaquin	22.80	22.90	1100	1300	8.40	8.60	2.00	0.75	48	2.67	2-4
10/8/2012	9122	83	San Joaquin	22.30	22.40	900	1400	7.60	7.50	2.00	0.50	48	2.67	2-4
10/8/2012	9122	84	San Joaquin	21.10	21.60	1200	1200	9.30	8.50	2.00	0.50	48	2.67	2-4
10/8/2012	9371	33	San Joaquin	19.20	20.80	900	1600	7.60	8.60	1.75	0.50	48	2.33	6-8
10/9/2012	8789	124	Sacramento	19.50	19.60	1200	1500	9.00	9.30	2.00	0.75	48	2.67	4-6
10/9/2012	8789	125	Sacramento	19.10	19.70	800	1100	9.50	9.10	2.00	0.75	48	2.67	2-4
10/9/2012	8816	17	San Joaquin	19.50	19.70	1200	1400	8.60	8.40	2.00	0.75	48	2.67	2-4

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
10/9/2012	8816	18	San Joaquin	19.70	20.60	1400	1600	8.70	8.60	2.00	0.75	48	2.67	2-4
10/9/2012	8816	44	San Joaquin	19.20	19.50	900	1100	8.30	8.50	2.00	0.75	48	2.67	0-2
10/9/2012	9371	14	San Joaquin	21.00	21.50	1100	1300	8.10	8.50	2.00	0.75	48	2.67	2-4
10/9/2012	9371	15	San Joaquin	21.50	23.90	1300	1600	9.00	8.80	2.00	0.50	48	2.67	2-4
10/9/2012	9371	33	San Joaquin	18.90	21.10	800	1100	8.00	8.50	2.00	1.00	48	2.67	2-4
10/9/2012	9607	77	San Joaquin	22.60	22.70	1100	1500	7.90	8.40	2.00	0.50	48	2.67	2-4
10/9/2012	9607	78	San Joaquin	21.30	21.90	900	1100	7.60	9.40	2.00	0.50	48	2.67	2-4
10/10/2012	8789	117	Contra Costa	19.10	19.50	1100	1500	9.90	9.60	2.50	1.00	48	3.33	4-6
10/10/2012	8816	57	San Joaquin	18.50	18.70	1300	1500	8.50	8.70	2.00	0.75	48	2.67	0-2
10/10/2012	8816	59	San Joaquin	18.10	18.30	900	1200	8.20	8.40	2.00	0.75	48	2.67	0-2
10/10/2012	9122	52	San Joaquin	20.40	20.80	1100	1500	8.30	10.30	2.00	0.50	48	2.67	2-4
10/10/2012	9122	56	San Joaquin	19.90	20.30	900	1100	8.40	7.90	1.50	0.25	48	2.00	0-2
10/10/2012	9371	16	San Joaquin	21.70	21.60	1500	1600	10.20	10.80	2.25	0.50	48	3.00	2-4
10/10/2012	9371	40	San Joaquin	19.20	19.80	1200	1400	8.80	9.40	2.25	0.50	48	3.00	2-4
10/10/2012	9371	42	San Joaquin	18.40	19.10	900	1100	8.40	8.70	2.25	0.50	48	3.00	2-4
10/10/2012	3548	712	Stanislaus	15.30	15.00	900	1100	10.80	11.00	2.00	0.75	48	2.67	0-2
10/10/2012	3548	713	Stanislaus	15.40	15.60	1100	1400	10.90	11.20	2.00	0.75	48	2.67	0-2
10/11/2012	3548	402	Merced	17.70	17.90	1200	1400	8.07	8.18	2.00	0.75	48	2.67	0-2
10/11/2012	3548	404	Merced	17.30	17.50	900	1100	8.14	8.02	2.00	0.75	48	2.67	0-2
10/11/2012	9371	8	San Joaquin	21.10	21.60	900	1300	6.70	8.30	2.00	0.75	48	2.67	2-4
10/11/2012	9371	14	San Joaquin	19.10	19.60	1400	1600	9.30	10.50	2.00	0.50	48	2.67	2-4
10/12/2012	3548	90	Contra Costa	17.20	17.60	1200	1400	8.10	8.70	2.00	0.75	48	2.67	2-4
10/12/2012	3548	89	San Joaquin	17.50	17.30	900	1100	8.00	8.10	2.00	0.75	48	2.67	2-4
10/12/2012	8789	91	San Joaquin	20.70	20.90	900	1100	7.30	8.50	2.00	0.75	48	2.67	4-6
10/12/2012	8789	92	San Joaquin	20.80	21.00	1200	1500	8.30	7.90	2.00	0.75	48	2.67	4-6
10/12/2012	9371	13	San Joaquin	19.40	19.30	1400	1600	8.00	8.90	2.00	0.75	48	2.67	0-2
10/12/2012	9371	26	San Joaquin	18.10	19.60	800	1100	6.30	6.70	2.00	0.75	48	2.67	0-2
10/12/2012	9371	28	San Joaquin	19.00	20.50	1100	1400	7.50	7.60	2.00	0.75	48	2.67	0-2
10/13/2012	3548	54	San Joaquin	20.60	20.50	900	1200	7.80	8.00	2.25	0.75	48	3.00	4-6
10/13/2012	3548	90	San Joaquin	20.70	20.90	1200	1500	8.10	8.50	2.25	0.75	48	3.00	4-6
10/13/2012	8789	92	San Joaquin	20.70	21.00	900	1100	7.30	7.90	2.00	0.75	48	2.67	4-6

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
10/13/2012	8789	98	San Joaquin	20.90	21.10	1200	1500	8.10	8.30	2.00	0.75	48	2.67	4-6
10/13/2012	8816	59	San Joaquin	18.20	18.70	900	1100	8.05	7.94	2.00	0.50	48	2.67	0-2
10/13/2012	8816	66	San Joaquin	18.90	20.90	1100	1300	7.95	10.03	2.00	0.50	48	2.67	2-4
10/13/2012	8816	67	San Joaquin	20.90	19.60	1300	1500	10.03	7.83	2.00	0.50	48	2.67	2-4
10/13/2012	9371	32	San Joaquin	19.00	18.90	1500	1600	8.00	8.30	2.00	0.75	48	2.67	2-4
10/13/2012	9371	40	San Joaquin	18.10	18.50	1200	1400	8.90	9.50	2.00	0.75	48	2.67	2-4
10/13/2012	9371	41	San Joaquin	17.20	18.00	900	1200	8.80	8.70	2.00	0.75	48	2.67	4-6
10/14/2012	8816	85	Contra Costa	18.70	18.90	900	1300	7.90	8.10	2.25	1.00	48	3.00	0-2
10/14/2012	3548	49	San Joaquin	20.70	20.90	900	1200	7.90	8.10	2.00	0.75	48	2.67	0-2
10/14/2012	3548	50	San Joaquin	21.20	21.50	1200	1500	8.30	8.50	2.00	0.75	48	2.67	0-2
10/14/2012	8816	55	San Joaquin	19.20	19.50	1300	1500	8.30	8.40	2.25	1.00	48	3.00	0-2
10/15/2012	8789	108	Contra Costa	18.20	18.90	800	1100	9.70	9.30	2.00	0.75	48	2.67	2-4
10/15/2012	8789	109	Contra Costa	19.10	19.30	1200	1500	9.50	9.30	2.00	0.75	48	2.67	2-4
10/15/2012	3548	402	Merced	17.60	17.50	900	1100	8.14	8.10	1.00	0.25	48	1.33	0-2
10/15/2012	3548	404	Merced	17.90	17.70	1200	1500	8.40	7.90	1.50	0.50	48	2.00	0-2
10/15/2012	9122	53	San Joaquin	20.00	21.00	1200	1500	9.10	7.40	2.00	0.75	48	2.67	6-8
10/15/2012	9122	56	San Joaquin	19.90	20.20	900	1200	7.20	8.20	2.00	0.75	48	2.67	4-6
10/15/2012	9371	11	San Joaquin	20.10	20.70	90	1100	7.20	7.30	1.25	0.25	48	1.67	2-4
10/15/2012	9371	12	San Joaquin	20.40	20.20	1500	1600	7.90	8.20	1.25	0.75	48	1.67	2-4
10/15/2012	9371	44	San Joaquin	20.70	19.30	1200	1400	8.90	10.30	2.00	0.75	48	2.67	2-4
10/23/2012	8816	106	Contra Costa	16.70	16.80	1200	1600	8.50	8.70	2.25	0.75	48	3.00	0-2
10/23/2012	8816	18	Sacramento	16.40	16.60	900	1200	8.30	8.60	2.25	0.75	48	3.00	0-2
10/23/2012	3548	304	San Joaquin	21.40	21.00	900	1100	9.70	9.00	2.00	0.75	48	2.67	0-2
10/23/2012	3548	305	San Joaquin	21.00	21.30	1100	1400	9.10	9.40	2.00	0.75	48	2.67	0-2
10/23/2012	9122	56	San Joaquin	15.70	16.00	900	1200	8.30	7.90	2.25	1.00	48	3.00	4-6
10/23/2012	9122	90	San Joaquin	14.90	15.30	1200	1500	7.20	7.30	2.25	0.75	48	3.00	4-6
10/23/2012	9371	14	San Joaquin	17.70	18.50	1000	1300	8.60	8.70	2.00	0.75	48	2.67	0-2
10/23/2012	9371	15	San Joaquin	18.70	19.00	1300	1600	8.90	9.30	2.00	0.75	48	2.67	0-2
10/24/2012	9122	60	San Joaquin	14.70	15.00	1200	1500	8.80	9.10	2.25	0.75	48	3.00	6-8
10/25/2012	3548	1	San Joaquin	20.70	20.90	900	1200	8.90	8.10	2.25	0.75	48	3.00	0-2
10/25/2012	3548	2	San Joaquin	20.70	21.00	1200	1500	8.40	9.10	2.25	0.75	48	3.00	0-2

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
10/25/2012	8816	50	San Joaquin	16.60	16.80	1200	1500	8.60	8.60	2.00	0.50	48	2.67	2-4
10/25/2012	8816	52	San Joaquin	16.30	16.50	900	1200	8.20	8.40	2.00	0.50	48	2.67	2-4
10/25/2012	9123	10	San Joaquin	17.90	17.90	1000	1200	7.10	2.75	2.00	0.63	48	2.67	6-8
10/25/2012	9371	32	San Joaquin	18.30	19.30	800	1000	7.50	8.00	2.25	1.00	48	3.00	2-4
10/25/2012	9371	36	San Joaquin	18.20	18.10	1100	1500	9.10	8.10	2.25	0.75	48	3.00	2-4
10/29/2012	8789	113	Contra Costa	17.50	17.90	900	1200	7.80	7.60	2.00	0.75	48	2.67	0-2
10/29/2012	8789	114	Contra Costa	18.10	18.40	1200	1600	7.90	8.30	2.00	0.75	48	2.67	0-2
10/29/2012	8816	102	Contra Costa	18.60	18.90	1200	1500	8.60	8.80	2.00	0.50	48	2.67	2-4
10/29/2012	964121	97	Contra Costa	16.10	16.20	0	0	6.20	7.20	2.25	0.75	48	3.00	4-6
10/29/2012	3548	4	San Joaquin	20.60	20.90	1200	1500	7.90	8.10	2.25	0.75	48	3.00	0-2
10/29/2012	3548	7	San Joaquin	20.10	20.40	900	1100	8.10	8.40	2.25	0.75	48	3.00	0-2
10/29/2012	8816	99	San Joaquin	18.10	18.30	900	1200	8.10	8.50	2.00	0.50	48	2.67	2-4
10/29/2012	9371	16	San Joaquin	18.40	18.20	1200	1400	9.10	8.70	2.00	0.50	48	2.67	0-2
10/29/2012	9371	41	San Joaquin	16.50	16.80	900	1200	8.60	7.40	2.25	0.75	48	3.00	0-2
10/29/2012	9371	69	San Joaquin	18.50	18.20	1400	1600	8.90	8.90	2.00	0.50	48	2.67	0-2
10/30/2012	9122	79	Alameda	19.20	19.30	900	1100	8.30	9.70	2.00	0.50	48	2.67	0-2
10/30/2012	8789	117	Contra Costa	16.90	17.30	900	1200	17.30	8.00	2.50	1.00	48	3.33	2-4
10/30/2012	3548	5	San Joaquin	19.70	19.90	1200	1400	6.40	7.10	2.00	0.75	48	2.67	0-2
10/30/2012	3548	6	San Joaquin	19.20	19.60	900	1100	6.70	6.10	2.00	0.75	48	2.67	0-2
10/30/2012	8816	52	San Joaquin	18.40	18.70	900	1200	9.10	8.80	2.25	0.75	48	3.00	0-2
10/30/2012	8816	90	San Joaquin	18.90	19.30	1200	1500	8.60	8.30	2.25	0.75	48	3.00	0-2
10/30/2012	9122	78	San Joaquin	19.90	20.10	1100	1500	9.30	7.20	2.00	0.50	48	2.67	2-4
10/30/2012	9371	31	San Joaquin	16.80	18.80	800	1200	7.80	7.60	2.00	0.75	48	2.67	0-2
10/30/2012	9371	34	San Joaquin	18.60	19.00	1200	1600	9.30	9.90	2.00	0.75	48	2.67	0-2
10/30/2012	none	301	San Joaquin	21.20	21.00	1200	1500	6.56	5.67	2.25	0.75	48	3.00	0-2
10/31/2012	9122	79	Alameda	18.90	19.20	900	1100	9.60	9.20	2.00	0.50	48	2.67	2-4
10/31/2012	9122	83	Contra Costa	19.70	20.20	1100	1400	7.60	7.90	2.00	0.75	48	2.67	2-4
10/31/2012	8816	19	Sacramento	16.70	16.80	1200	1500	8.70	8.50	2.00	0.50	48	2.67	2-4
10/31/2012	8816	20	Sacramento	16.30	16.70	900	1200	9.20	8.80	2.00	0.50	48	2.67	2-4
10/31/2012	3548	5	San Joaquin	17.80	18.40	1200	1400	8.10	7.90	1.50	0.50	48	2.00	0-2
10/31/2012	3548	25	San Joaquin	17.60	17.90	900	1100	7.30	7.00	2.25	0.75	48	3.00	0-2
										Total	309.50	108.63		412.67

Table A- 6. November 2012 Glyphosate/AgriDex Use

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	AgriDex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
11/3/2012	8816	98	Contra Costa	16.80	17.40	1200	1500	9.20	9.00	2.25	0.75	48	3.00	0-2
11/7/2012	9371	17	Contra Costa	18.40	20.20	1200	1600	9.60	9.20	2.00	0.75	48	2.67	2-4
11/7/2012	9371	104	Contra Costa	17.30	18.40	1000	1200	8.90	9.40	2.00	0.75	48	2.67	2-4
11/9/2012	9123	17	Contra Costa	16.10	16.40	1200	1300	8.74	8.57	0.75	0.25	48	1.00	4-6
11/9/2012	9371	21	Contra Costa	16.40	16.70	900	1200	8.50	8.70	2.00	0.50	48	2.67	2-4
11/13/2012	8789	109	Contra Costa	16.40	16.90	1400	1600	6.90	6.70	2.00	0.75	48	2.67	2-4
11/14/2012	9122	93	Contra Costa	17.50	16.90	900	1100	9.50	7.60	2.00	0.50	48	2.67	0-2
11/14/2012	9122	94	Contra Costa	17.30	18.30	1100	1400	10.80	8.50	2.00	0.50	48	2.67	2-4
11/15/2012	8789	121	Contra Costa	14.60	14.80	900	1200	9.70	9.90	2.25	0.75	48	3.00	2-4
11/15/2012	9123	95	Contra Costa	14.50	15.20	1100	1200	10.60	10.83	1.00	0.38	48	1.33	0-2
11/15/2012	9123	97	Contra Costa	14.10	15.20	1000	1100	9.36	10.60	1.75	0.50	48	2.33	0-2
11/20/2012	8789	115	Contra Costa	14.90	14.70	900	1200	8.60	8.80	2.00	0.75	48	2.67	6-8
11/20/2012	8789	119	Contra Costa	14.70	15.00	1200	1500	8.90	8.60	2.00	0.75	48	2.67	6-8
11/8/2012	3548	409	Merced	17.70	18.00	1000	1300	7.60	7.00	2.25	0.75	48	3.00	8-10
11/9/2012	9371	19	Sacramento	16.70	16.80	1200	1500	8.60	8.80	2.00	0.50	48	2.67	2-4
11/10/2012	9371	19	Sacramento	15.70	15.80	1200	1500	8.60	8.50	2.00	0.50	48	2.67	2-4
11/10/2012	9371	21	Sacramento	15.30	15.50	900	1200	8.60	8.70	2.00	0.50	48	2.67	2-4
11/13/2012	3738	19	Sacramento	15.40	15.60	900	1200	8.10	8.30	2.00	0.50	48	2.67	0-2
11/13/2012	3738	20	Sacramento	15.60	15.80	1200	1500	8.30	8.50	2.00	0.50	48	2.67	0-2
11/14/2012	3738	19	Sacramento	15.30	15.40	1300	1500	8.10	8.50	2.00	0.50	48	2.67	0-2
11/14/2012	3738	21	Sacramento	15.10	15.20	900	1200	8.00	8.20	2.00	0.50	48	2.67	0-2
11/14/2012	8789	23	Sacramento	14.10	14.60	1200	1600	10.30	10.50	2.00	0.75	48	2.67	2-4
11/14/2012	8789	24	Sacramento	13.90	14.30	900	1200	10.00	10.60	2.00	0.75	48	2.67	2-4
11/15/2012	3738	214	Sacramento	15.80	15.90	1000	1300	8.00	7.80	2.00	0.50	48	2.67	0-2
11/15/2012	3738	216	Sacramento	15.90	16.00	1300	1600	7.70	7.60	2.00	0.50	48	2.67	0-2
11/15/2012	8789	130	Sacramento	14.80	15.00	1200	1600	10.20	10.00	2.25	0.75	48	3.00	2-4
11/19/2012	8789	22	Sacramento	16.10	16.30	1200	1500	8.90	8.40	2.00	0.75	48	2.67	2-4
11/2/2012	8816	25	San Joaquin	16.10	16.30	900	1200	8.60	8.90	2.25	0.75	48	3.00	2-4
11/2/2012	8816	35	San Joaquin	16.70	17.20	1300	1600	9.10	8.50	2.25	0.75	48	3.00	2-4
11/3/2012	8816	57	San Joaquin	16.50	16.70	900	1200	9.20	9.30	2.25	0.75	48	3.00	0-2
11/3/2012	9123	11	San Joaquin	17.60	18.30	1000	1200	7.94	7.89	2.13	0.63	48	2.83	0-2

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
11/3/2012	9123	13	San Joaquin	18.20	20.10	1300	1500	7.52	7.65	2.13	0.63	48	2.83	0-2
11/5/2012	3548	308	San Joaquin	17.00	17.10	900	1100	10.10	9.80	1.00	0.25	48	1.33	0-2
11/5/2012	3738	36	San Joaquin	17.10	17.40	900	1200	8.30	8.60	2.25	0.75	48	3.00	0-2
11/5/2012	9122	72	San Joaquin	18.60	19.60	1300	1500	9.80	9.20	2.00	0.75	48	2.67	2-4
11/5/2012	9122	73	San Joaquin	19.10	19.50	1100	1300	7.90	7.10	2.00	0.75	48	2.67	0-2
11/5/2012	9122	74	San Joaquin	18.70	19.30	900	1100	7.40	8.40	2.00	0.75	48	2.67	0-2
11/5/2012	9123	12	San Joaquin	18.60	20.50	1000	1200	8.00	7.90	2.25	0.63	48	3.00	0-2
11/5/2012	9123	59	San Joaquin	19.10	19.50	1300	1500	7.68	7.88	2.25	0.63	48	3.00	0-2
11/5/2012	9371	17	San Joaquin	17.60	18.40	1400	1600	8.90	8.40	2.25	0.75	48	3.00	0-2
11/5/2012	9371	39	San Joaquin	16.80	17.80	900	1200	8.90	11.00	2.00	0.75	48	2.67	0-2
11/5/2012	9371	43	San Joaquin	17.70	17.80	1200	1400	8.50	8.80	2.25	0.75	48	3.00	0-2
11/6/2012	3548	7	San Joaquin	17.30	18.60	900	1200	8.34	7.98	2.25	0.75	48	3.00	0-2
11/6/2012	3548	10	San Joaquin	17.60	19.40	1200	1500	2.95	8.87	2.25	0.75	48	3.00	0-2
11/6/2012	3738	81	San Joaquin	17.30	17.50	1200	1500	7.60	7.80	2.00	0.50	48	2.67	0-2
11/6/2012	3738	82	San Joaquin	17.10	17.30	900	1200	7.30	7.60	2.00	0.50	48	2.67	0-2
11/6/2012	9122	45	San Joaquin	17.80	18.50	1100	1500	8.60	7.10	2.00	0.50	48	2.67	2-4
11/6/2012	9122	77	San Joaquin	18.20	17.90	900	1100	7.50	9.10	2.00	0.50	48	2.67	0-2
11/6/2012	9123	65	San Joaquin	18.70	19.00	1100	1200	7.83	7.90	1.25	0.38	48	1.67	0-2
11/6/2012	9123	67	San Joaquin	19.20	18.40	1300	1500	8.22	7.95	2.13	0.63	48	2.83	0-2
11/6/2012	9123	100	San Joaquin	17.30	16.40	900	1100	8.27	8.04	1.13	0.38	48	1.50	0-2
11/7/2012	3738	73	San Joaquin	17.60	17.60	1200	1500	8.40	8.70	2.00	0.50	48	2.67	0-2
11/7/2012	3738	74	San Joaquin	17.40	17.60	900	1200	8.10	8.40	2.00	0.50	48	2.67	0-2
11/7/2012	9123	9	San Joaquin	17.90	21.00	1000	1200	8.50	7.91	2.25	0.75	48	3.00	0-2
11/7/2012	9123	62	San Joaquin	19.50	19.10	1400	1600	7.46	7.34	2.25	0.75	48	3.00	0-2
11/7/2012	9607	83	San Joaquin	17.40	18.40	1100	1500	9.10	10.80	2.00	0.50	48	2.67	2-4
11/7/2012	9607	84	San Joaquin	18.10	18.50	900	1100	7.80	8.60	2.00	0.50	48	2.67	0-2
11/8/2012	3738	82	San Joaquin	16.20	16.50	900	1200	8.20	8.50	2.25	0.75	48	3.00	4-6
11/8/2012	9371	30	San Joaquin	16.20	16.20	900	1300	8.20	8.20	2.25	0.50	48	3.00	6-8
11/8/2012	9607	47	San Joaquin	17.20	17.70	1000	1400	7.60	8.20	2.25	0.75	48	3.00	2-4
11/9/2012	3548	42	San Joaquin	15.00	15.20	900	1100	8.50	8.10	2.15	0.75	48	2.87	4-6
11/9/2012	3548	43	San Joaquin	15.40	15.60	1200	1400	8.00	7.90	2.00	0.75	48	2.67	4-6

Date	Vessel ID	Site ID	County	Before Temp (°C)	After Temp (°C)	Time Arrived	Time Departed	Before DO (mg/L)	After DO (mg/L)	Glyphosate (gal)	Agridex (gal)	Chem Rate	Glyphosate Acres	Wind Speed
11/9/2012	9123	17	San Joaquin	16.10	16.30	1300	1500	8.87	8.42	1.50	0.50	48	2.00	4-6
11/9/2012	9123	18	San Joaquin	14.80	15.10	900	1100	8.09	8.38	2.13	0.63	48	2.83	4-6
11/10/2012	3548	15	San Joaquin	15.50	15.90	900	1100	8.70	8.60	2.00	0.75	48	2.67	0-2
11/10/2012	3548	16	San Joaquin	16.20	16.70	1200	1400	9.10	8.70	2.00	0.75	48	2.67	0-2
11/13/2012	9123	6	San Joaquin	12.60	13.80	1200	1500	11.30	11.30	2.25	0.75	48	3.00	0-2
11/13/2012	9123	9	San Joaquin	15.30	14.50	900	1200	7.85	10.90	2.25	0.75	48	3.00	0-2
11/13/2012	9371	29	San Joaquin	14.90	14.70	1300	1600	9.00	9.10	2.00	0.75	48	2.67	2-4
11/13/2012	9371	30	San Joaquin	13.30	14.10	1000	1300	9.60	10.10	2.00	0.75	48	2.67	2-4
11/13/2012	9607	45	San Joaquin	18.10	17.60	1300	1500	7.90	9.30	1.00	0.25	48	1.33	2-4
11/13/2012	9607	46	San Joaquin	17.30	18.10	1100	1300	9.40	7.50	2.00	0.50	48	2.67	0-2
11/13/2012	9607	47	San Joaquin	17.30	17.90	900	1100	7.80	8.40	2.00	0.50	48	2.67	0-2
11/14/2012	9123	12	San Joaquin	16.80	17.10	1200	1400	10.40	9.07	2.25	0.75	48	3.00	0-2
11/14/2012	9123	62	San Joaquin	14.00	14.80	900	1100	9.20	7.90	2.25	0.75	48	3.00	0-2
11/19/2012	3738	45	San Joaquin	15.20	15.40	1200	1300	7.30	7.50	0.25	0.08	48	0.33	0-2
11/19/2012	3738	46	San Joaquin	14.90	15.10	900	1200	7.00	7.20	2.00	0.50	48	2.67	0-2
11/19/2012	3738	72	San Joaquin	15.40	15.50	1400	1500	7.40	7.60	0.25	0.08	48	0.33	0-2
11/19/2012	9123	49	San Joaquin	16.70	17.00	1200	1400	8.00	8.40	2.15	0.75	48	2.87	0-2
11/19/2012	9123	52	San Joaquin	16.70	16.90	900	1100	9.80	9.70	2.15	0.75	48	2.87	0-2
11/20/2012	9123	47	San Joaquin	16.40	16.90	1200	1500	6.70	7.30	2.15	0.75	48	2.87	4-6
11/20/2012	9123	48	San Joaquin	16.90	16.70	1000	1200	7.20	7.00	2.15	0.75	48	2.87	6-8
11/20/2012	9371	73	San Joaquin	15.40	15.60	1300	1500	7.40	7.70	2.00	0.50	48	2.67	6-8
11/20/2012	9371	74	San Joaquin	15.10	15.40	900	1200	7.10	7.30	2.00	0.50	48	2.67	6-8
11/19/2012	8789	176	Solano	15.40	15.70	900	1200	8.70	8.90	2.00	0.75	48	2.67	2-4
11/5/2012	3548	310	Stanislaus	17.00	17.20	1200	1400	9.70	9.80	1.50	0.50	48	2.00	0-2
11/7/2012	3548	708	Stanislaus	16.20	16.30	1200	1400	10.10	10.40	2.00	0.75	48	2.67	0-2
11/7/2012	3548	709	Stanislaus	16.20	16.10	1000	1200	10.36	10.50	2.00	0.75	48	2.67	0-2
									Total	172.38	54.04		229.83	

APPENDIX B

Site Maps and Monitoring and Laboratory Data

Site 6 Sampling Results

2,4-D Residue

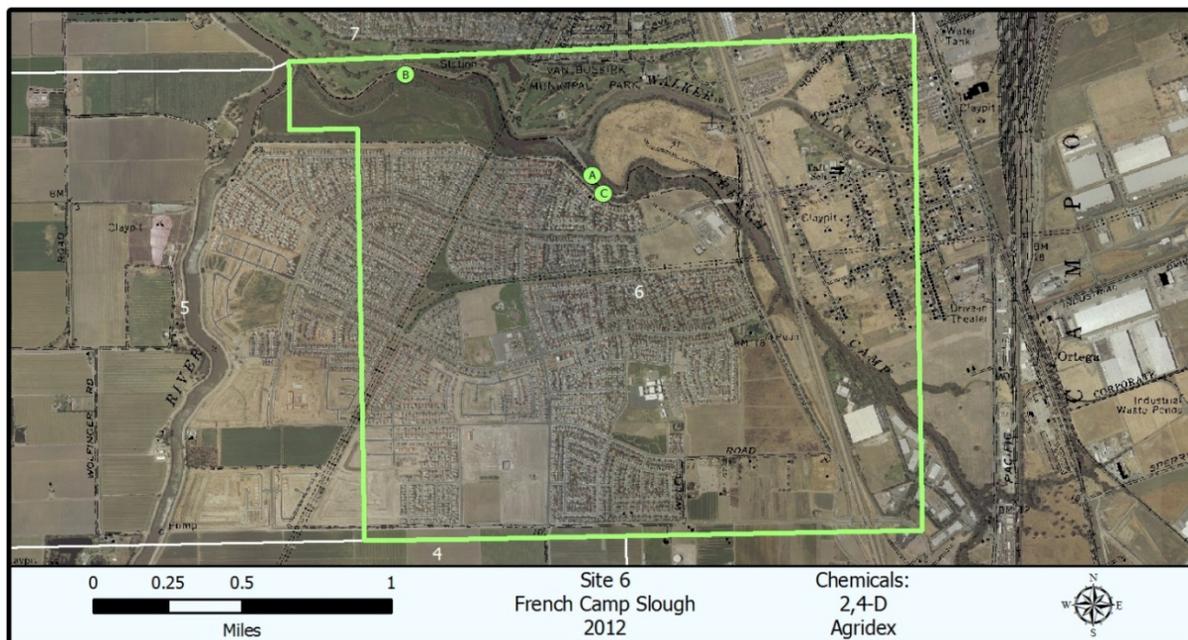
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	2,4-D (ppb)
1A	2012-0587	H06-081512-3	8/15/2012	8/16/2012	8/21/2012	8/23/2012	0.2
1C	2012-0586	H06-081512-2	8/15/2012	8/16/2012	8/21/2012	8/23/2012	0.1
2B	2012-0589	H06-081512-5	8/15/2012	8/16/2012	8/21/2012	8/23/2012	14.6
3A	2012-0664	H06-082112-3	8/21/2012	8/21/2012	8/24/2012	8/25/2012	0.2
3B	2012-0666	H06-082112-5	8/21/2012	8/21/2012	8/24/2012	8/25/2012	0.2
3C	2012-0663	H06-082112-2	8/21/2012	8/21/2012	8/24/2012	8/25/2012	0.1

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-0587	H06-081512-3	8/15/2012	8/16/2012	9/6/2012	9/10/2012	ND
1C	2012-0586	H06-081512-2	8/15/2012	8/16/2012	9/6/2012	9/10/2012	ND
2B	2012-0589	H06-081512-5	8/15/2012	8/16/2012	9/6/2012	9/10/2012	ND
3A	2012-0664	H06-082112-3	8/21/2012	8/21/2012	9/12/2012	9/19/2012	ND
3B	2012-0666	H06-082112-5	8/21/2012	8/21/2012	9/12/2012	9/19/2012	ND
3C	2012-0663	H06-082112-2	8/21/2012	8/21/2012	9/12/2012	9/19/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H06-081512-3	08/15/12	649422	4197653	09:21	24.50			5.06		
1C	H06-081512-2	08/15/12	649470	4197583	09:08	24.30			5.02		
2B	H06-081512-5	08/15/12	648408	4198188	11:09	25.10			5.33		
3A	H06-082112-3	08/21/12	649454	4197581	12:00	24.90			5.78		
3B	H06-082112-5	08/21/12	648427	4198182	12:18	26.20			5.32		
3C	H06-082112-2	08/21/12	649249	4197694	11:48	24.60			5.43		



Site 16 Sampling Results

Glyphosate Residue

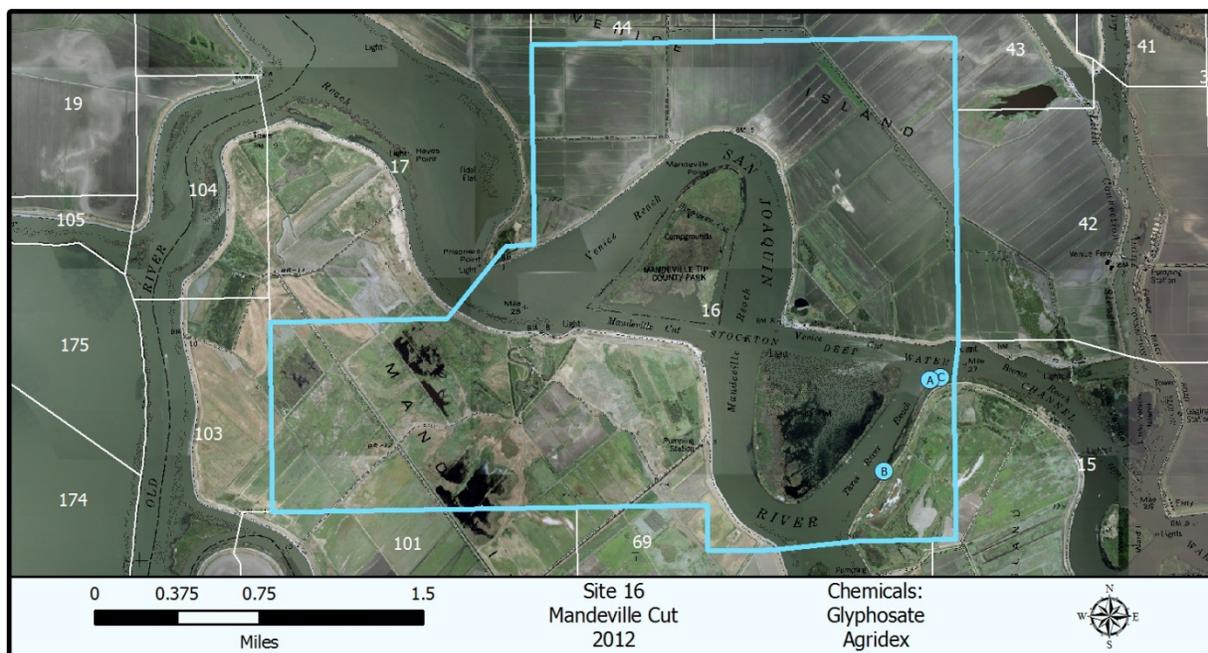
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1396	H16-100312-3	10/03/2012	10/03/2012	10/04/2012	10/04/2012	ND
1C	2012-1395	H16-100312-2	10/03/2012	10/03/2012	10/04/2012	10/04/2012	ND
2B	2012-1398	H16-100312-5	10/03/2012	10/03/2012	10/04/2012	10/04/2012	ND
3A	2012-1547	H16-101012-3	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
3B	2012-1549	H16-101012-5	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
3C	2012-1546	H16-101012-2	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1396	H16-100312-3	10/03/2012	10/03/2012	10/10/2012	10/17/2012	ND
1C	2012-1395	H16-100312-2	10/03/2012	10/03/2012	10/10/2012	10/17/2012	ND
2B	2012-1398	H16-100312-5	10/03/2012	10/03/2012	10/10/2012	10/17/2012	ND
3A	2012-1547	H16-101012-3	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
3B	2012-1549	H16-101012-5	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
3C	2012-1546	H16-101012-2	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H16-100312-3	10/03/12	630042	4212703	09:51	21.46	0.307	0.14	8.14	4.92	14.8
1C	H16-100312-2	10/03/12	630117	4212722	09:43	21.46	0.275	0.13	8.93	4.84	9.3
2B	H16-100312-5	10/03/12	629700	4212029	12:12	22.39	0.220	0.13	7.83	4.29	19.5
3A	H16-101012-3	10/10/12	630053	4212694	12:56	19.83	0.230	0.14	9.28	4.46	9.8
3B	H16-101012-5	10/10/12	629705	4212032	13:12	19.79	0.264	0.04	8.87	5.67	15.8
3C	H16-101012-2	10/10/12	630127	4212719	12:51	19.82	0.281	0.10	8.81	5.60	10.3



Site 28 Sampling Results

2,4-D Residue

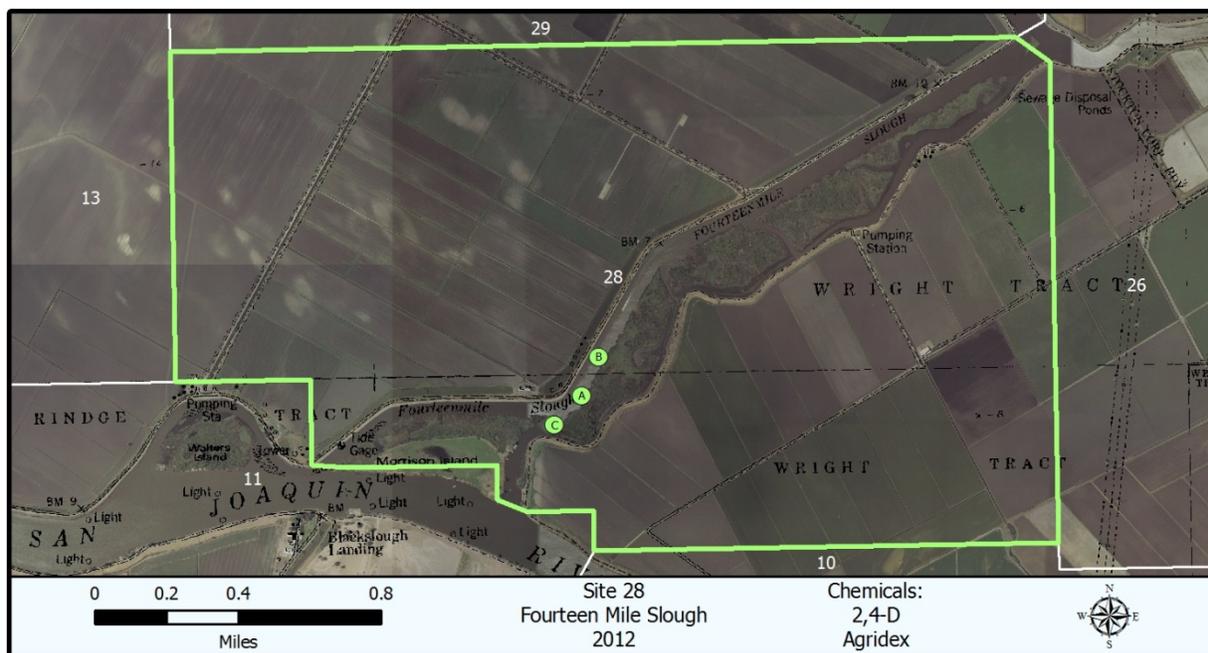
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	2,4-D (ppb)
1A	2012-0914	H28-090412-3	9/4/2012	9/4/2012	9/19/2012	9/26/2012	0.3
1C	2012-0913	H28-090412-2	9/4/2012	9/4/2012	9/19/2012	9/26/2012	0.3
2B	2012-0916	H28-090412-5	9/4/2012	9/4/2012	9/19/2012	9/26/2012	2.3
3A	2012-1073	H28-091112-3	9/11/2012	9/11/2012	9/21/2012	10/9/2012	0.3
3B	2012-1075	H28-091112-5	9/11/2012	9/11/2012	9/21/2012	10/9/2012	0.3
3C	2012-1072	H28-091112-2	9/11/2012	9/11/2012	9/21/2012	10/9/2012	0.3

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-0914	H28-090412-3	9/4/2012	9/4/2012	9/26/2012	10/2/2012	ND
1C	2012-0913	H28-090412-2	9/4/2012	9/4/2012	9/26/2012	10/2/2012	ND
2B	2012-0916	H28-090412-5	9/4/2012	9/4/2012	9/26/2012	10/2/2012	ND
3A	2012-1073	H28-091112-3	9/11/2012	9/12/2012	9/28/2012	10/9/2012	ND
3B	2012-1075	H28-091112-5	9/11/2012	9/12/2012	9/28/2012	10/9/2012	ND
3C	2012-1072	H28-091112-2	9/11/2012	9/12/2012	9/28/2012	10/9/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H28-090412-3	09/04/12	639900	4206983	11:02	24.00			5.85		
1C	H28-090412-2	09/04/12	639928	4207083	10:55	24.10			5.82		
2B	H28-090412-5	09/04/12	639729	4206771	12:55	24.60			5.68		
3A	H28-091112-3	09/12/12	639852	4206906	11:49	23.17	0.416	0.21	6.19	7.60	3.5
3B	H28-091112-5	09/12/12	639730	4207042	12:05	23.24	0.426	0.21	6.06	7.57	4.9
3C	H28-091112-2	09/12/12	639929	4206774	11:45	23.22	0.410	0.20	6.18	8.10	8.5



Site 28 Sampling Results

Glyphosate Residue

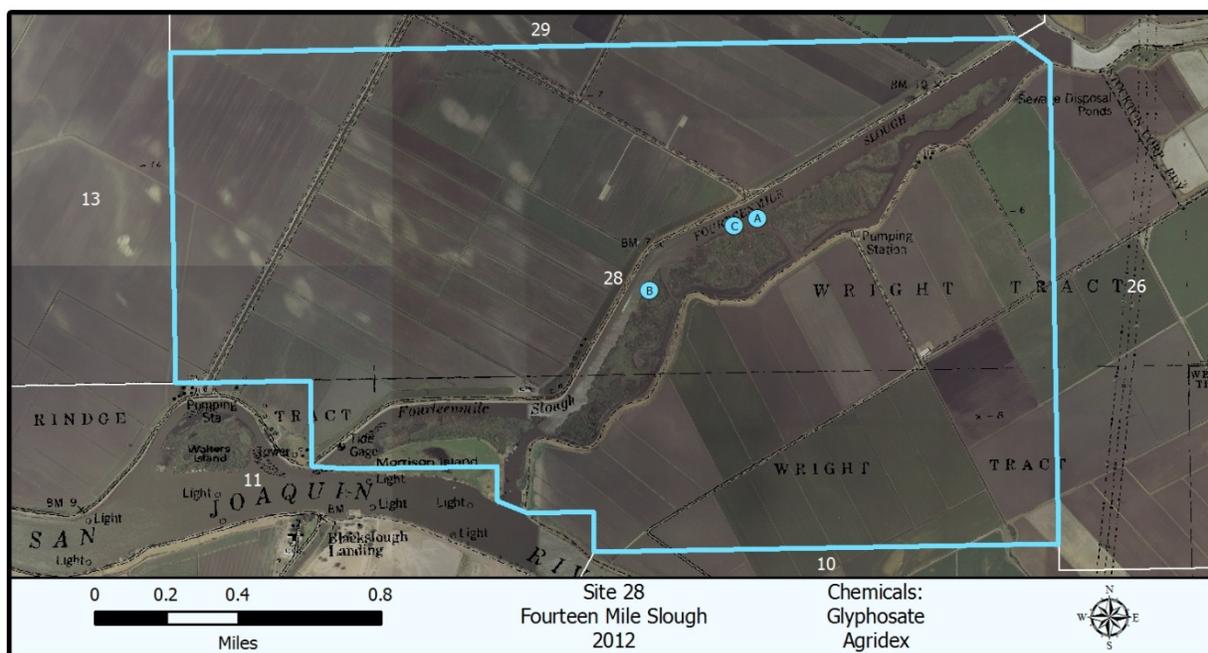
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-0593	H28-081512-3	8/15/2012	8/16/2012	8/28/2012	8/28/2012	ND
1C	2012-0592	H28-081512-2	8/15/2012	8/16/2012	8/28/2012	8/28/2012	ND
2B	2012-0598	H28-081512-5	8/15/2012	8/16/2012	8/28/2012	8/28/2012	ND
3A	2012-0679	H28-082212-3	8/22/2012	8/23/2012	8/29/2012	8/29/2012	ND
3B	2012-0681	H28-082212-5	8/22/2012	8/23/2012	8/29/2012	8/29/2012	ND
3C	2012-0678	H28-082212-2	8/22/2012	8/23/2012	8/29/2012	8/29/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-0593	H28-081512-3	8/15/2012	8/16/2012	9/10/2012	9/28/2012	ND
1C	2012-0592	H28-081512-2	8/15/2012	8/16/2012	9/10/2012	9/28/2012	ND
2B	2012-0598	H28-081512-5	8/15/2012	8/16/2012	9/10/2012	9/28/2012	ND
3A	2012-0679	H28-082212-3	8/22/2012	8/22/2012	9/21/2012	10/1/2012	ND
3B	2012-0681	H28-082212-5	8/22/2012	8/22/2012	9/21/2012	10/1/2012	ND
3C	2012-0678	H28-082212-2	8/22/2012	8/22/2012	9/21/2012	10/1/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H28-081512-3	08/15/12	640542	4207671	12:15	26.80			5.08		
1C	H28-081512-2	08/15/12	640664	4207704	12:10	26.10			5.55		
2B	H28-081512-5	08/15/12	640157	4207387	14:45	28.00			6.24		
3A	H28-082212-3	08/22/12	640333	4207578	12:48	25.50			5.63		
3B	H28-082212-5	08/22/12	639911	4207012	13:00	26.10			5.61		
3C	H28-082212-2	08/22/12	640629	4207712	12:43	26.70			5.67		



Site 40 Sampling Results

2,4-D Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	2,4-D (ppb)
1A	2012-0919	H40-090412-3	9/4/2012	9/4/2012	9/19/2012	9/26/2012	ND
1C	2012-0918	H40-090412-2	9/4/2012	9/4/2012	9/19/2012	9/26/2012	ND
2B	2012-0921	H40-090412-5	9/4/2012	9/4/2012	9/19/2012	9/26/2012	ND
3A	2012-1052	H40-091112-3	9/11/2012	9/11/2012	9/21/2012	10/9/2012	ND
3B	2012-1054	H40-091112-5	9/11/2012	9/11/2012	9/21/2012	10/9/2012	ND
3C	2012-1051	H40-091112-2	9/11/2012	9/11/2012	9/21/2012	10/9/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-0919	H40-090412-3	9/4/2012	9/4/2012	9/26/2012	10/2/2012	ND
1C	2012-0918	H40-090412-2	9/4/2012	9/4/2012	9/26/2012	10/2/2012	ND
2B	2012-0921	H40-090412-5	9/4/2012	9/4/2012	9/26/2012	10/2/2012	ND
3A	2012-1052	H40-091112-3	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND
3B	2012-1054	H40-091112-5	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND
3C	2012-1051	H40-091112-2	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H40-090412-3	09/04/12	632093	4218585	08:45	21.90			7.60		
1C	H40-090412-2	09/04/12	632058	4218616	08:39	21.60			7.51		
2B	H40-090412-5	09/04/12	632372	4218360	10:11	22.10			7.94		
3A	H40-091112-3	09/11/12	632091	4218598	08:05	20.40			8.17		
3B	H40-091112-5	09/11/12	632111	4218568	08:15	20.30			6.79		
3C	H40-091112-2	09/11/12	632065	4218629	08:00	20.30			8.24		



Site 41 Sampling Results

Glyphosate Residue

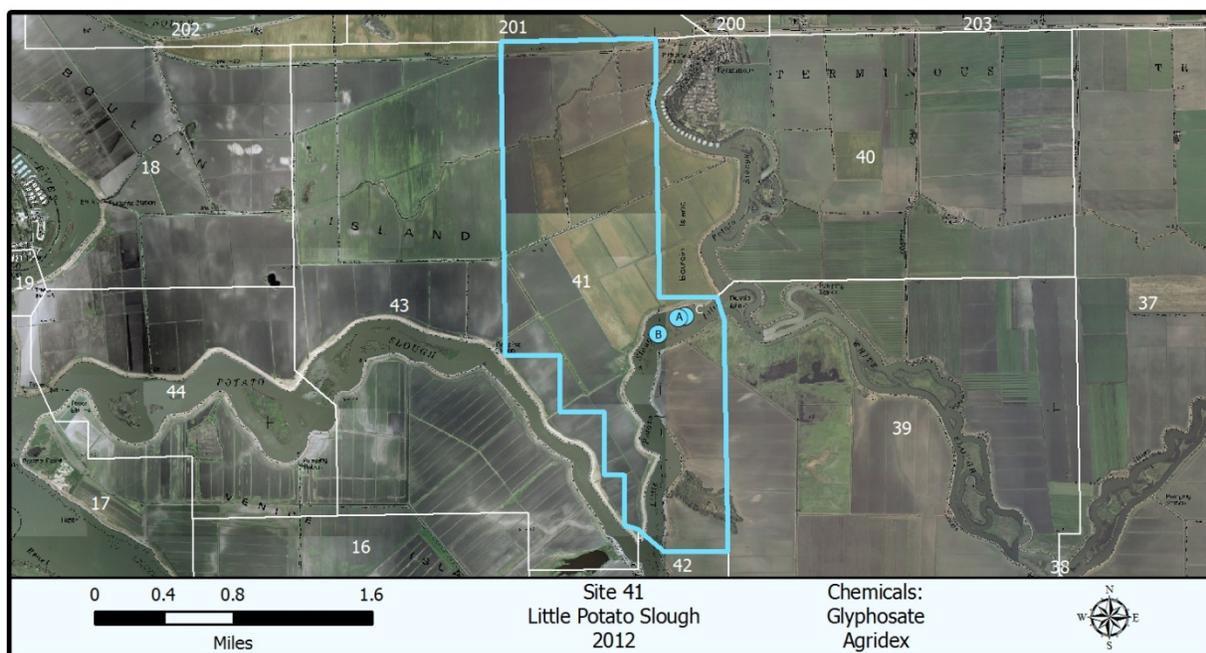
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1402	H41-100312-3	10/03/2012	10/03/2012	10/04/2012	10/04/2012	ND
1C	2012-1401	H41-100312-2	10/03/2012	10/03/2012	10/04/2012	10/04/2012	ND
2B	2012-1404	H41-100312-5	10/03/2012	10/03/2012	10/04/2012	10/04/2012	ND
3A	2012-1552	H41-101012-3	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
3B	2012-1554	H41-101012-5	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
3C	2012-1551	H41-101012-2	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1402	H41-100312-3	10/03/2012	10/03/2012	10/10/2012	10/17/2012	ND
1C	2012-1401	H41-100312-2	10/03/2012	10/03/2012	10/10/2012	10/17/2012	ND
2B	2012-1404	H41-100312-5	10/03/2012	10/03/2012	10/10/2012	10/17/2012	ND
3A	2012-1552	H41-101012-3	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
3B	2012-1554	H41-101012-5	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
3C	2012-1551	H41-101012-2	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H41-100312-3	10/03/12	631623	4217032	08:57	21.28	0.147	0.06	7.61	6.71	0
1C	H41-100312-2	10/03/12	631687	4217040	08:47	21.10	0.144	0.06	7.40	6.55	0
2B	H41-100312-5	10/03/12	631431	4216885	10:37	21.49	0.153	0.02	7.58	5.38	2.9
3A	H41-101012-3	10/10/12	631619	4217030	13:45	19.07	0.107	0.04	9.28	4.99	12.5
3B	H41-101012-5	10/10/12	631443	4216898	13:52	19.06	0.151	0.07	8.50	5.37	12.3
3C	H41-101012-2	10/10/12	631688	4217037	13:42	19.20	0.148	0.06	8.97	5.32	9.5



Site 44 Sampling Results

2,4-D Residue

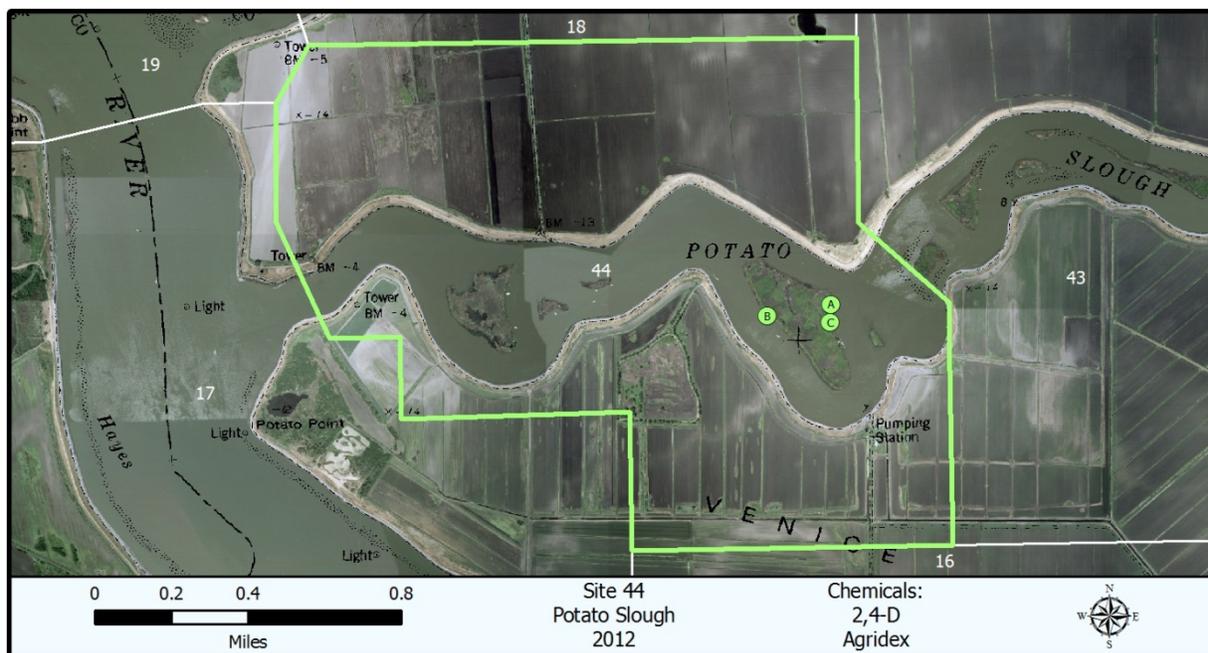
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	2,4-D (ppb)
1A	2012-0925	H44-090412-3	9/4/2012	9/4/2012	9/19/2012	9/26/2012	ND
1C	2012-0924	H44-090412-2	9/4/2012	9/4/2012	9/19/2012	9/26/2012	ND
2B	2012-0927	H44-090412-5	9/4/2012	9/4/2012	9/19/2012	9/26/2012	ND
3A	2012-1058	H44-091112-3	9/11/2012	9/11/2012	9/21/2012	10/9/2012	0.1
3B	2012-1060	H44-091112-5	9/11/2012	9/11/2012	9/21/2012	10/9/2012	ND
3C	2012-1057	H44-091112-2	9/11/2012	9/11/2012	9/21/2012	10/9/2012	0.1

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-0925	H44-090412-3	9/4/2012	9/4/2012	9/28/2012	10/3/2012	ND
1C	2012-0924	H44-090412-2	9/4/2012	9/4/2012	9/28/2012	10/3/2012	ND
2B	2012-0927	H44-090412-5	9/4/2012	9/4/2012	9/28/2012	10/3/2012	ND
3A	2012-1058	H44-091112-3	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND
3B	2012-1060	H44-091112-5	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND
3C	2012-1057	H44-091112-2	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H44-090412-3	09/04/12	627934	4216198	09:32	21.80			7.96		
1C	H44-090412-2	09/04/12	627932	4216128	09:24	21.90			7.73		
2B	H44-090412-5	09/04/12	627668	4216153	11:44	22.60			7.94		
3A	H44-091112-3	09/11/12	627939	4216204	08:45	20.80			8.16		
3B	H44-091112-5	09/11/12	627688	4216154	08:55	20.70			7.81		
3C	H44-091112-2	09/11/12	627942	4216124	08:40	20.60			8.17		



Site 52 Sampling Results

Glyphosate Residue

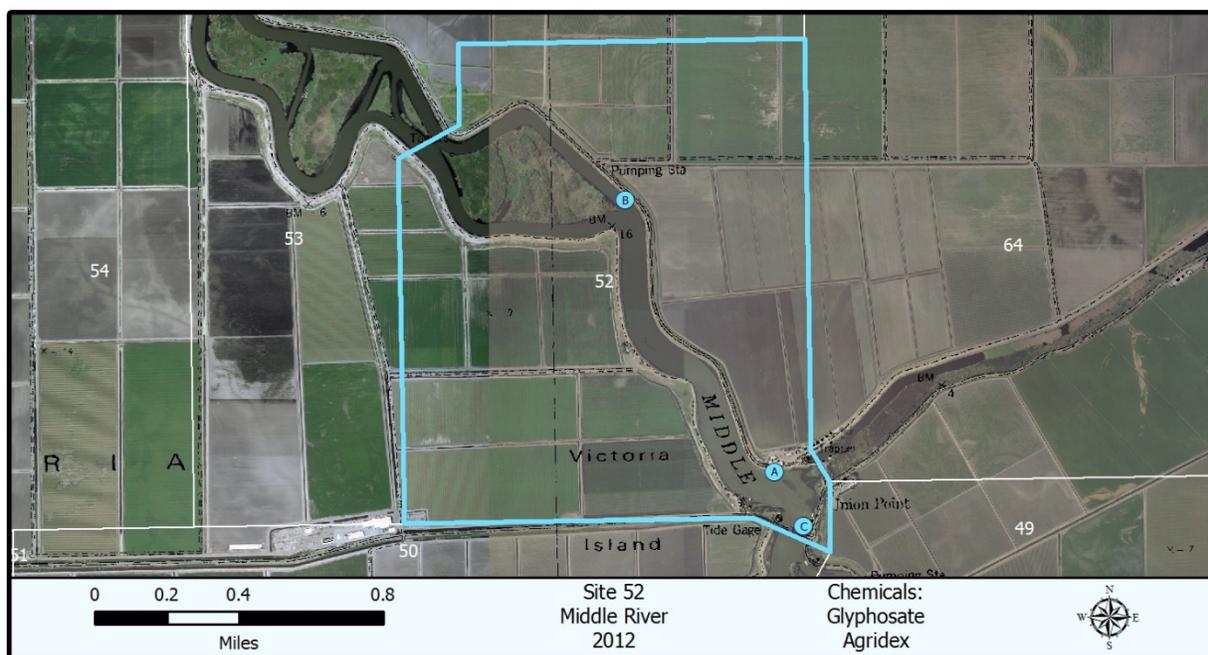
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1540	H52-101012-3	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
1C	2012-1539	H52-101012-2	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
2B	2012-1542	H52-101012-5	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
3A	2012-1676	H52-101612-3	10/16/2012	10/16/2012	10/24/2012	10/24/2012	ND
3B	2012-1678	H52-101612-5	10/16/2012	10/16/2012	10/24/2012	10/24/2012	ND
3C	2012-1675	H52-101612-2	10/16/2012	10/16/2012	10/24/2012	10/24/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1540	H52-101012-3	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
1C	2012-1539	H52-101012-2	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
2B	2012-1542	H52-101012-5	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
3A	2012-1676	H52-101612-3	10/16/2012	10/16/2012	11/2/2012	11/5/2012	ND
3B	2012-1678	H52-101612-5	10/16/2012	10/16/2012	11/2/2012	11/5/2012	ND
3C	2012-1675	H52-101612-2	10/16/2012	10/16/2012	11/2/2012	11/5/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H52-101012-3	10/10/12	632773	4195058	10:22	20.05	0.403	0.18	8.69	5.14	16.6
1C	H52-101012-2	10/10/12	632904	4194816	10:08	20.04	0.311	0.17	8.54	4.43	14.8
2B	H52-101012-5	10/10/12	632107	4196271	11:54	20.13	0.370	0.19	8.07	5.4	10
3A	H52-101612-3	10/16/12	632772	4195044	11:10	19.74	0.323	0.16	5.98	4.49	0
3B	H52-101612-5	10/16/12	632086	4196290	11:24	19.61	0.331	0.16	5.89	7.73	0
3C	H52-101612-2	10/16/12	632909	4194821	10:52	19.59	0.331	0.16	5.89	7.84	0



Site 56 Sampling Results

Glyphosate Residue

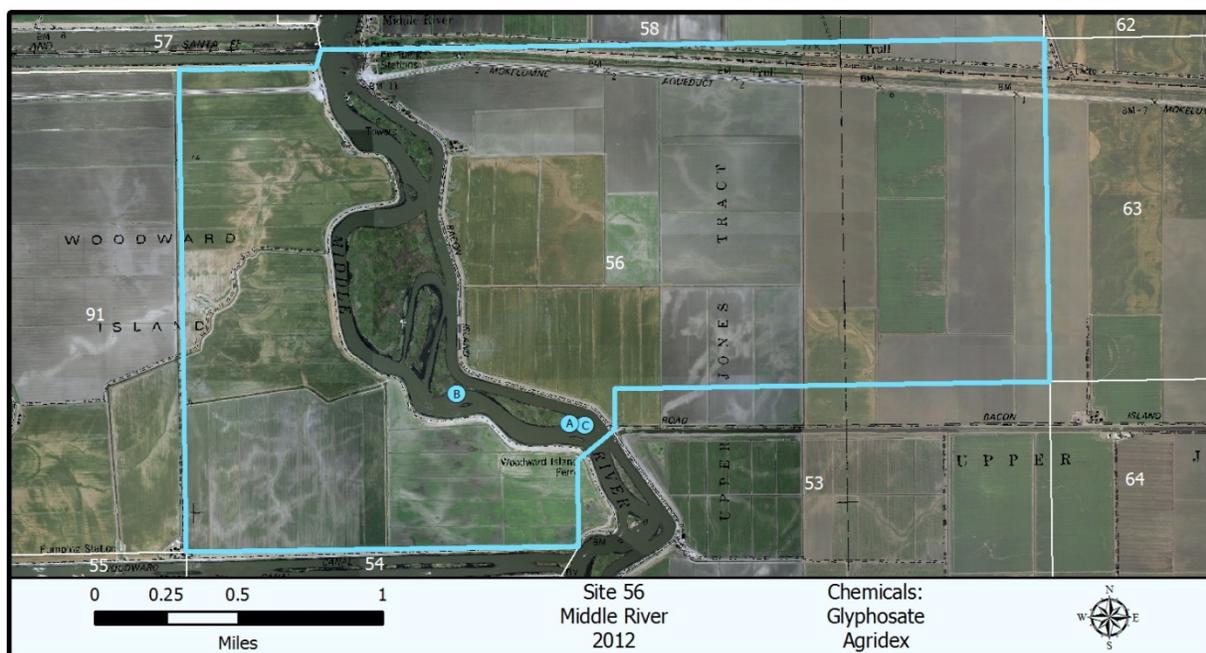
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1534	H56-101012-3	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
1C	2012-1533	H56-101012-2	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
2B	2012-1536	H56-101012-5	10/10/2012	10/10/2012	10/12/2012	10/12/2012	ND
3A	2012-1682	H56-101612-3	10/16/2012	10/16/2012	10/24/2012	10/24/2012	ND
3B	2012-1684	H56-101612-5	10/16/2012	10/16/2012	10/24/2012	10/24/2012	ND
3C	2012-1681	H56-101612-2	10/16/2012	10/16/2012	10/24/2012	10/24/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1534	H56-101012-3	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
1C	2012-1533	H56-101012-2	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
2B	2012-1536	H56-101012-5	10/10/2012	10/10/2012	10/23/2012	10/23/2012	ND
3A	2012-1682	H56-101612-3	10/16/2012	10/16/2012	11/2/2012	11/5/2012	ND
3B	2012-1684	H56-101612-5	10/16/2012	10/16/2012	11/2/2012	11/5/2012	ND
3C	2012-1681	H56-101612-2	10/16/2012	10/16/2012	11/2/2012	11/5/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H56-101012-3	10/10/12	630201	4198064	08:33	19.90	0.412	0.21	8.41	5.29	13.4
1C	H56-101012-2	10/10/12	630285	4198054	08:24	19.69	0.275	0.16	8.61	5.57	5.4
2B	H56-101012-5	10/10/12	629564	4198229	11:10	20.21	0.252	0.12	8.38	4.56	29.5
3A	H56-101612-3	10/16/12	630201	4198064	10:11	19.43	0.318	0.16	5.69	7.77	0
3B	H56-101612-5	10/16/12	629534	4198233	10:21	19.53	0.317	0.15	5.78	7.79	24.5
3C	H56-101612-2	10/16/12	630277	4198055	10:07	19.45	0.317	0.15	5.72	7.88	0



Site 65 Sampling Results

Glyphosate Residue

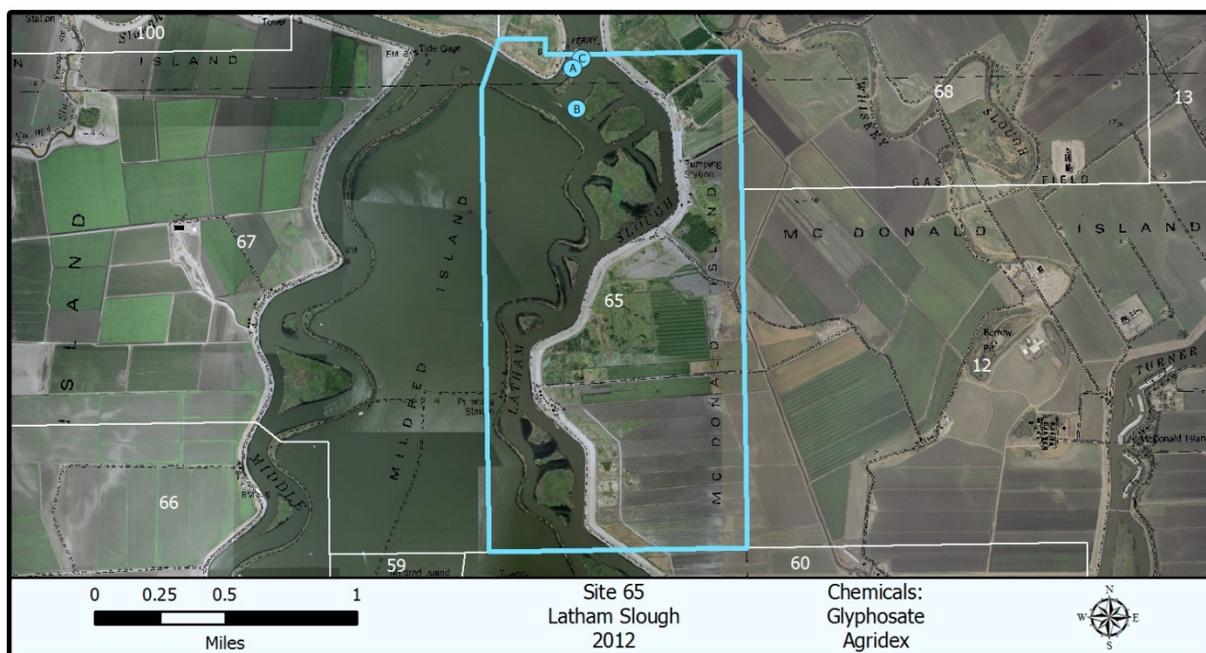
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1893	H65-110612-3	11/06/2012	11/06/2012	11/07/2012	11/07/2012	ND
1C	2012-1892	H65-110612-2	11/06/2012	11/06/2012	11/07/2012	11/07/2012	ND
2B	2012-1895	H65-110612-5	11/06/2012	11/06/2012	11/07/2012	11/07/2012	ND
3A	2012-1980	H65-111312-3	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3B	2012-1982	H65-111312-5	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3C	2012-1979	H65-111312-2	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1893	H65-110612-3	11/06/2012	11/06/2012	11/9/2012	11/13/2012	ND
1C	2012-1892	H65-110612-2	11/06/2012	11/06/2012	11/9/2012	11/13/2012	ND
2B	2012-1895	H65-110612-5	11/06/2012	11/06/2012	11/9/2012	11/13/2012	ND
3A	2012-1980	H65-111312-3	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3B	2012-1982	H65-111312-5	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3C	2012-1979	H65-111312-2	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H65-110612-3	11/06/12	630586	4206949	10:03	17.46	0.137	0.12	8.94	4.46	0
1C	H65-110612-2	11/06/12	630640	4207006	09:42	17.35	0.145	0.07	8.44	5.35	0
2B	H65-110612-5	11/06/12	630608	4206697	12:08	17.88	0.266	0.04	7.86	5.66	0
3A	H65-111312-3	11/13/12	630574	4206942	10:05	15.01	0.289	0.15	9.06	4.94	0
3B	H65-111312-5	11/13/12	630610	4206677	09:57	14.99	0.302	0.16	9.05	4.96	0
3C	H65-111312-2	11/13/12	630606	4207009	10:15	14.98	0.142	0.14	9.37	5.65	1.6



Site 78 Sampling Results

2,4-D Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	2,4-D (ppb)
1A	2012-1196	H78-091312-3	9/13/2012	9/14/2012	9/21/2012	11/1/2012	0.2
1C	2012-1195	H78-091312-2	9/13/2012	9/14/2012	9/21/2012	11/1/2012	0.2
2B	2012-1198	H78-091312-5	9/13/2012	9/14/2012	9/21/2012	11/1/2012	ND
3A	2012-1251	H78-092012-3	9/20/2012	9/21/2012	9/24/2012	10/30/2012	0.2
3B	2012-1250	H78-092012-5	9/20/2012	9/21/2012	9/24/2012	10/30/2012	0.1
3C	2012-1253	H78-092012-2	9/20/2012	9/21/2012	9/24/2012	10/30/2012	0.2

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1196	H78-091312-3	9/13/2012	9/14/2012	10/1/2012	10/10/2012	ND
1C	2012-1195	H78-091312-2	9/13/2012	9/14/2012	10/1/2012	10/10/2012	ND
2B	2012-1198	H78-091312-5	9/13/2012	9/14/2012	10/1/2012	10/10/2012	ND
3A	2012-1251	H78-092012-3	9/20/2012	9/21/2012	10/5/2012	10/15/2012	ND
3B	2012-1250	H78-092012-5	9/20/2012	9/21/2012	10/5/2012	10/15/2012	ND
3C	2012-1253	H78-092012-2	9/20/2012	9/21/2012	10/5/2012	10/15/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H78-091312-3	09/13/12	628201	4185821	09:35	21.94	0.779	0.41	3.67	7.55	8.5
1C	H78-091312-2	09/13/12	628234	4185777	09:30	21.85	0.873	0.45	3.25	7.51	7.8
2B	H78-091312-5	09/13/12	627163	4186459	10:53	23.09	0.541	0.28	10.22	8.23	23.2
3A	H78-092012-3	09/20/12	628224	4185798	08:45	20.10				4.70	
3B	H78-092012-5	09/20/12	627164	4186456	08:40	20.40				7.59	
3C	H78-092012-2	09/20/12	628251	4185776	08:56	19.80				4.09	



Site 83 Sampling Results

2,4-D Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	2,4-D (ppb)
1A	2012-1202	H83-091312-3	9/13/2012	9/14/2012	9/21/2012	11/1/2012	ND
1C	2012-1201	H83-091312-2	9/13/2012	9/14/2012	9/21/2012	11/1/2012	ND
2B	2012-1204	H83-091312-5	9/13/2012	9/14/2012	9/21/2012	11/1/2012	0.5
3A	2012-1256	H83-092012-3	9/20/2012	9/21/2012	9/24/2012	10/30/2012	0.1
3B	2012-1258	H83-092012-5	9/20/2012	9/21/2012	9/24/2012	10/30/2012	0.1
3C	2012-1255	H83-092012-2	9/20/2012	9/21/2012	9/24/2012	10/30/2012	0.1

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1202	H83-091312-3	9/13/2012	9/14/2012	10/1/2012	10/10/2012	ND
1C	2012-1201	H83-091312-2	9/13/2012	9/14/2012	10/1/2012	10/10/2012	ND
2B	2012-1204	H83-091312-5	9/13/2012	9/14/2012	10/1/2012	10/10/2012	ND
3A	2012-1256	H83-092012-3	9/20/2012	9/21/2012	10/5/2012	10/15/2012	ND
3B	2012-1258	H83-092012-5	9/20/2012	9/21/2012	10/5/2012	10/15/2012	ND
3C	2012-1255	H83-092012-2	9/20/2012	9/21/2012	10/5/2012	10/15/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H83-091312-3	09/13/12	627492	4187624	10:36	22.53	0.380	0.19	8.76	7.78	8.5
1C	H83-091312-2	09/13/12	627461	4187682	10:24	22.38	0.377	0.19	8.10	7.88	4.1
2B	H83-091312-5	09/13/12	627471	4187138	12:27	23.25	0.602	0.31	6.39	7.82	3.4
3A	H83-092012-3	09/20/12	627193	4187613	08:15	19.90			8.21		
3B	H83-092012-5	09/20/12	627470	4187144	08:10	20.50			8.40		
3C	H83-092012-2	09/20/12	627465	4187679	08:25	20.00			8.48		



Site 95 Sampling Results

Glyphosate Residue

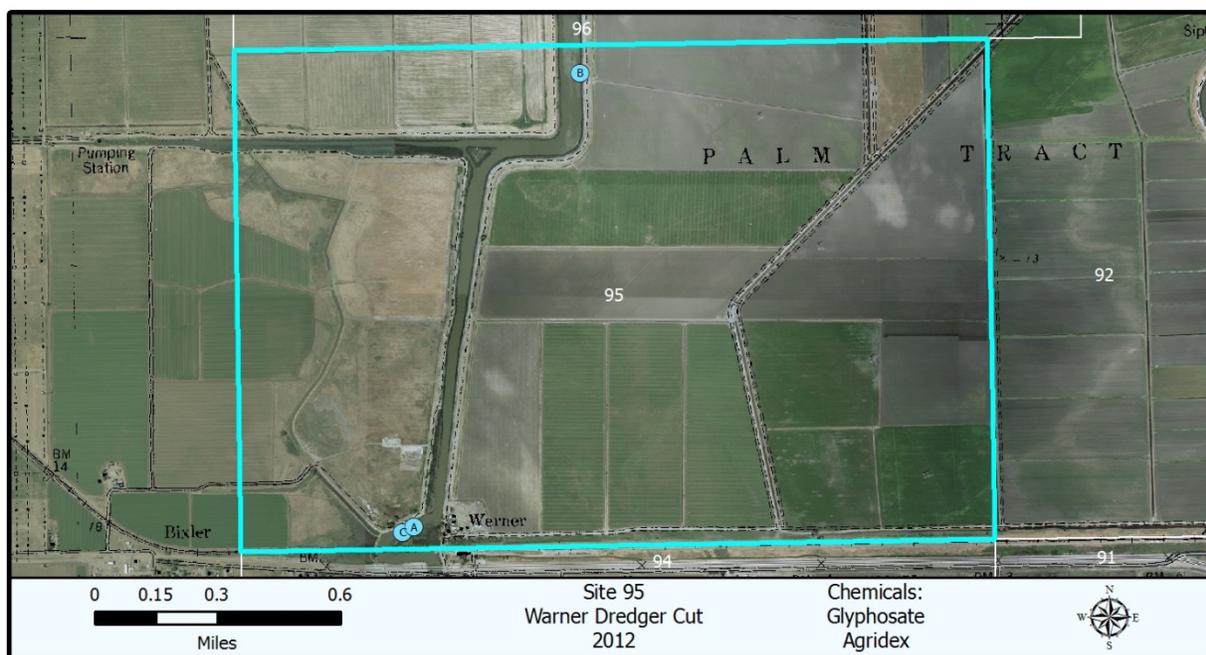
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-2027	H95-111512-3	11/15/2012	11/16/2012	11/27/2012	11/27/2012	ND
1C	2012-2026	H95-111512-2	11/15/2012	11/16/2012	11/27/2012	11/27/2012	ND
2B	2012-2029	H95-111512-5	11/15/2012	11/16/2012	11/27/2012	11/27/2012	ND
3A	2012-2049	H95-112012-3	11/20/2012	11/20/2012	11/26/2012	11/26/2012	ND
3B	2012-2051	H95-112012-5	11/20/2012	11/20/2012	11/26/2012	11/26/2012	ND
3C	2012-2048	H95-112012-2	11/20/2012	11/20/2012	11/26/2012	11/26/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-2027	H95-111512-3	11/15/2012	11/16/2012	11/21/2012	11/26/2012	ND
1C	2012-2026	H95-111512-2	11/15/2012	11/16/2012	11/21/2012	11/26/2012	ND
2B	2012-2029	H95-111512-5	11/15/2012	11/16/2012	11/21/2012	11/26/2012	ND
3A	2012-2049	H95-112012-3	11/20/2012	11/20/2012	11/21/2012	11/27/2012	ND
3B	2012-2051	H95-112012-5	11/20/2012	11/20/2012	11/21/2012	11/27/2012	ND
3C	2012-2048	H95-112012-2	11/20/2012	11/20/2012	11/21/2012	11/27/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H95-111512-3	11/15/12	622048	4200153	10:25	14.00	0.396	0.27	10.15	4.90	0
1C	H95-111512-2	11/15/12	622004	4200133	10:15	13.80	0.481	0.10	10.14	5.49	2.4
2B	H95-111512-5	11/15/12	622702	4201936	12:15	14.70	0.495	0.16	10.16	7.72	0
3A	H95-112012-3	11/20/12	622040	4200156	10:14	14.18	0.215	0.25	10.01	5.26	0
3B	H95-112012-5	11/20/12	622679	4201941	10:30	14.29	0.443	0.15	9.79	4.70	0
3C	H95-112012-2	11/20/12	621978	4200119	10:10	14.17	0.388	0.13	10.08	4.98	0



Site 97 Sampling Results

Glyphosate Residue

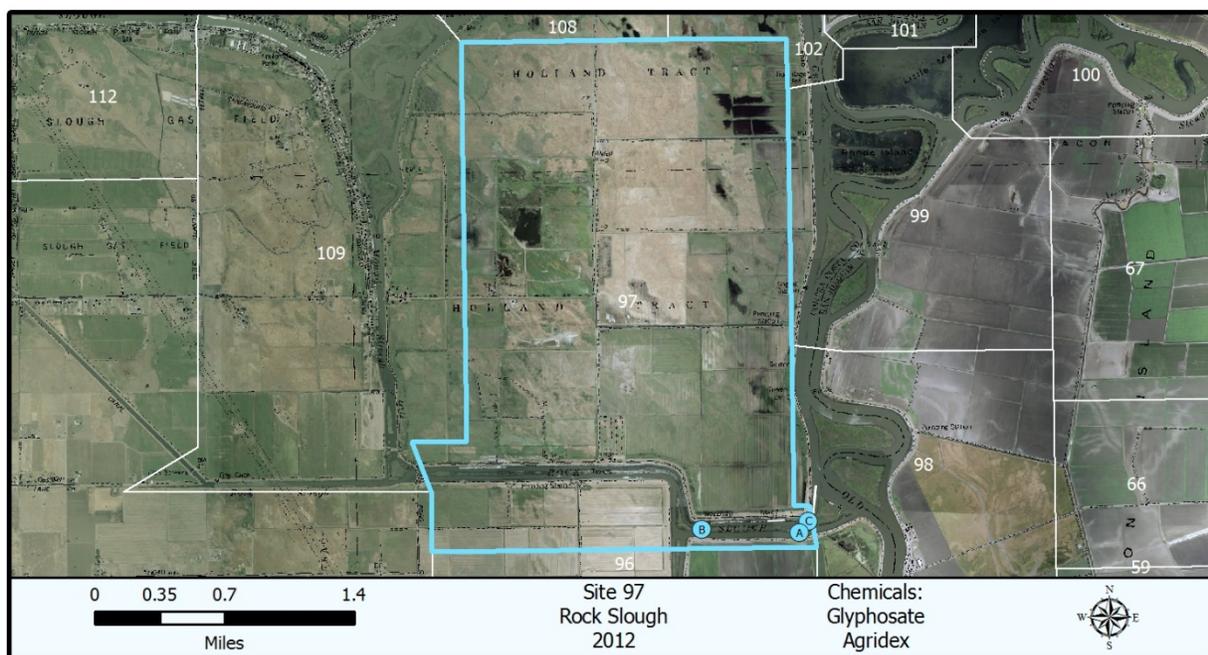
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-2033	H97-111512-3	11/15/2012	11/16/2012	11/27/2012	11/27/2012	ND
1C	2012-2032	H97-111512-2	11/15/2012	11/16/2012	11/27/2012	11/27/2012	ND
2B	2012-2035	H97-111512-5	11/15/2012	11/16/2012	11/27/2012	11/27/2012	ND
3A	2012-2054	H97-112012-3	11/20/2012	11/20/2012	11/26/2012	11/26/2012	ND
3B	2012-2056	H97-112012-5	11/20/2012	11/20/2012	11/26/2012	11/26/2012	ND
3C	2012-2053	H97-112012-2	11/20/2012	11/20/2012	11/26/2012	11/26/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-2033	H97-111512-3	11/15/2012	11/16/2012	11/21/2012	11/26/2012	ND
1C	2012-2032	H97-111512-2	11/15/2012	11/16/2012	11/21/2012	11/26/2012	ND
2B	2012-2035	H97-111512-5	11/15/2012	11/16/2012	11/21/2012	11/26/2012	ND
3A	2012-2054	H97-112012-3	11/20/2012	11/20/2012	11/21/2012	11/27/2012	ND
3B	2012-2056	H97-112012-5	11/20/2012	11/20/2012	11/21/2012	11/27/2012	ND
3C	2012-2053	H97-112012-2	11/20/2012	11/20/2012	11/21/2012	11/27/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H97-111512-3	11/15/12	624505	4203605	09:55	14.15	0.126	0.05	9.47	4.96	0
1C	H97-111512-2	11/15/12	624583	4203710	09:40	14.04	0.221	0.11	9.42	5.32	9.2
2B	H97-111512-5	11/15/12	623661	4203635	11:18	14.04	0.483	0.24	10.13	7.65	0
3A	H97-112012-3	11/20/12	624486	4203612	09:34	14.27	0.254	0.18	9.30	5.23	0
3B	H97-112012-5	11/20/12	623648	4203635	09:44	14.24	0.465	0.13	9.59	4.94	0
3C	H97-112012-2	11/20/12	624578	4203709	09:15	14.25	0.192	0.22	9.29	4.58	0



Site 100 Sampling Results

Glyphosate Residue

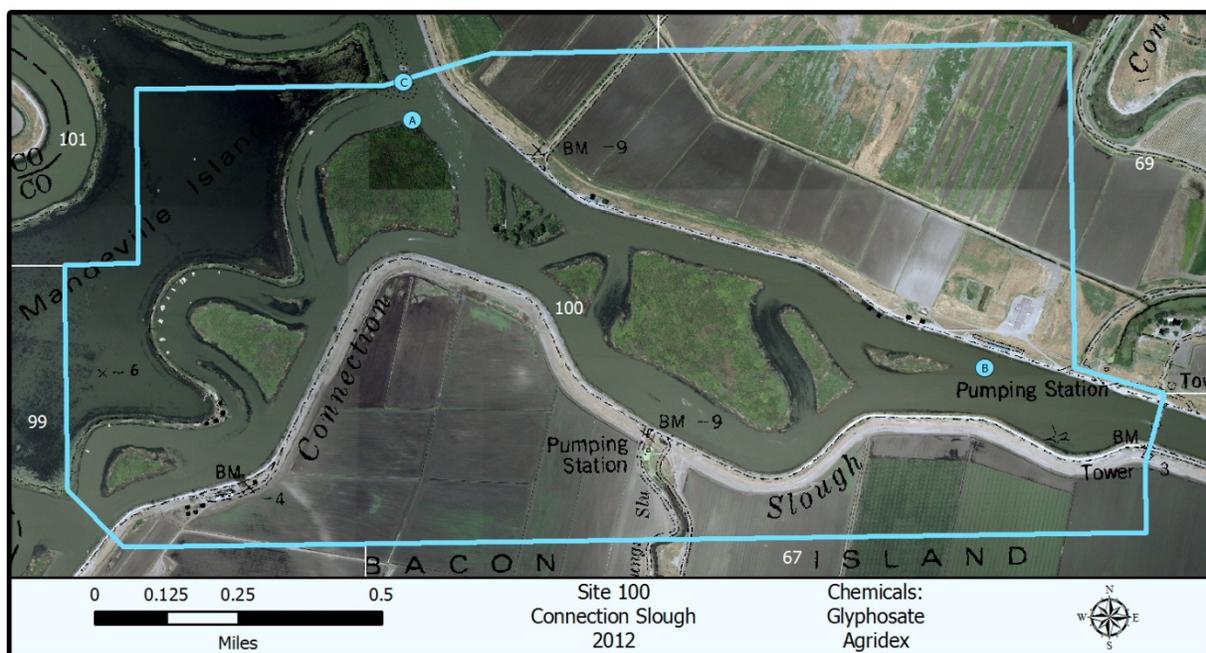
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1899	H100-110612-3	11/06/2012	11/06/2012	11/07/2012	11/07/2012	ND
1C	2012-1898	H100-110612-2	11/06/2012	11/06/2012	11/07/2012	11/07/2012	ND
2B	2012-1901	H100-110612-5	11/06/2012	11/06/2012	11/07/2012	11/07/2012	ND
3A	2012-1985	H100-111312-3	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3B	2012-1987	H100-111312-5	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3C	2012-1987	H100-111312-2	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1899	H100-110612-3	11/06/2012	11/06/2012	11/9/2012	11/13/2012	ND
1C	2012-1898	H100-110612-2	11/06/2012	11/06/2012	11/9/2012	11/13/2012	ND
2B	2012-1901	H100-110612-5	11/06/2012	11/06/2012	11/9/2012	11/13/2012	ND
3A	2012-1985	H100-111312-3	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3B	2012-1987	H100-111312-5	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND
3C	2012-1987	H100-111312-2	11/13/2012	11/13/2012	11/15/2012	11/15/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H100-110612-3	11/06/12	626801	4208213	08:33	17.38	0.409	0.18	8.34	4.88	5.3
1C	H100-110612-2	11/06/12	626778	4208320	08:25	17.35	0.135	0.15	8.50	5.47	4.6
2B	H100-110612-5	11/06/12	628406	4207521	10:45	17.62	0.445	0.17	8.60	5.45	6.3
3A	H100-111312-3	11/13/12	626799	4208213	09:18	14.61	0.240	0.16	9.08	4.93	0
3B	H100-111312-5	11/13/12	627314	4207641	09:29	14.68	0.206	0.08	9.10	5.21	0
3C	H100-111312-2	11/13/12	626778	4208320	09:10	14.42	0.284	0.14	9.02	5.15	0.1



Site 107 Sampling Results

Glyphosate Residue

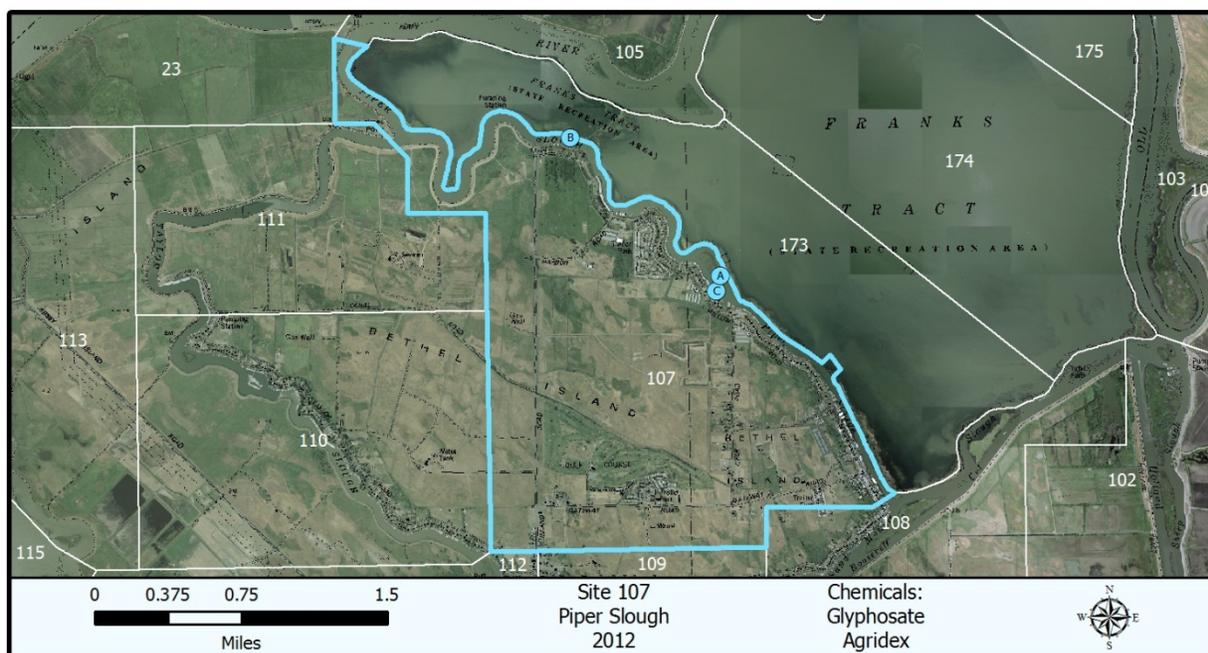
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1008	H107-090612-3	9/6/2012	9/7/2012	9/11/2012	9/11/2012	ND
1C	2012-1007	H107-090612-2	9/6/2012	9/7/2012	9/11/2012	9/11/2012	ND
2B	2012-1010	H107-090612-5	9/6/2012	9/7/2012	9/11/2012	9/11/2012	ND
3A	2012-1047	H107-091112-3	9/11/2012	9/11/2012	9/12/2012	9/12/2012	ND
3B	2012-1049	H107-091112-5	9/11/2012	9/11/2012	9/12/2012	9/12/2012	ND
3C	2012-1046	H107-091112-2	9/11/2012	9/11/2012	9/12/2012	9/12/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1008	H107-090612-3	9/6/2012	9/7/2012	9/28/2012	10/3/2012	ND
1C	2012-1007	H107-090612-2	9/6/2012	9/7/2012	9/28/2012	10/3/2012	ND
2B	2012-1010	H107-090612-5	9/6/2012	9/7/2012	9/28/2012	10/3/2012	ND
3A	2012-1047	H107-091112-3	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND
3B	2012-1049	H107-091112-5	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND
3C	2012-1046	H107-091112-2	9/11/2012	9/11/2012	9/28/2012	10/8/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H107-090612-3	09/06/12	620835	4210756	08:45	20.50			6.76		
1C	H107-090612-2	09/06/12	620805	4210635	08:30	20.80			8.01		
2B	H107-090612-5	09/06/12	619602	4211896	12:35	21.50			8.43		
3A	H107-091112-3	09/11/12	620811	4210866	09:55	21.20			8.47		
3B	H107-091112-5	09/11/12	619641	4211884	10:19	21.80			8.47		
3C	H107-091112-2	09/11/12	620812	4210475	09:45	21.40			9.01		



Site 109 Sampling Results

Glyphosate Residue

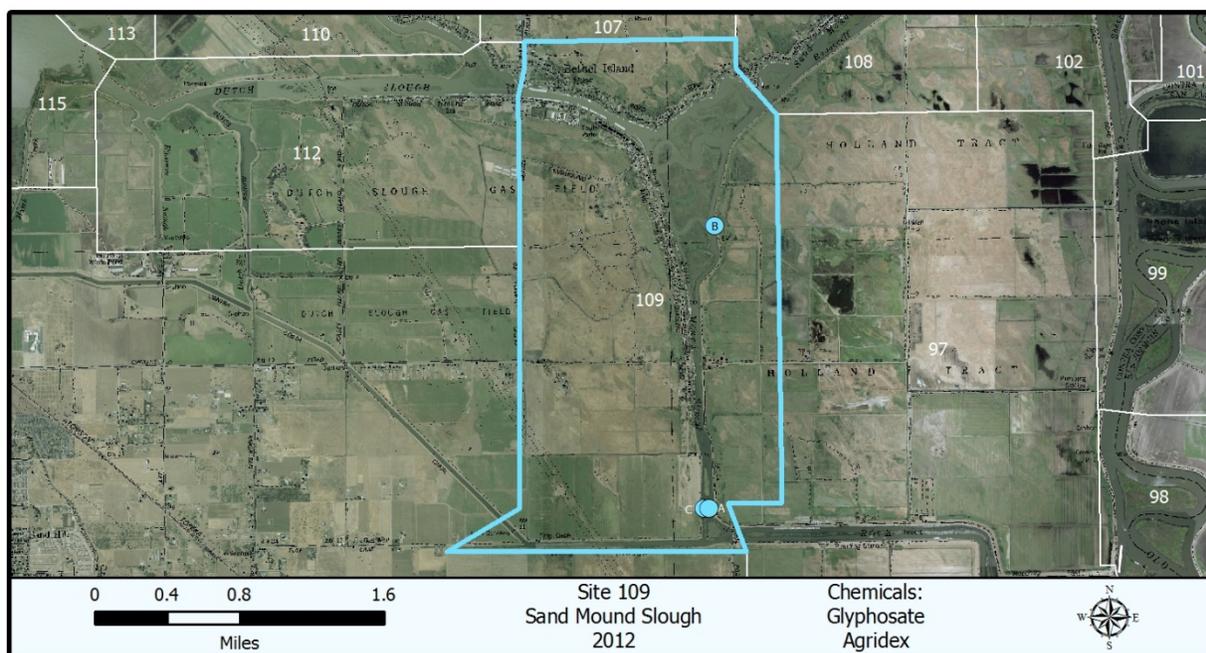
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1014	H109-090612-3	9/6/2012	9/7/2012	9/11/2012	9/11/2012	ND
1C	2012-1013	H109-090612-2	9/6/2012	9/7/2012	9/11/2012	9/11/2012	ND
2B	2012-1016	H109-090612-5	9/6/2012	9/7/2012	9/11/2012	9/11/2012	ND
3A	2012-1078	H109-091112-3	9/11/2012	9/12/2012	9/13/2012	9/13/2012	ND
3B	2012-1080	H109-091112-5	9/11/2012	9/12/2012	9/13/2012	9/13/2012	ND
3C	2012-1077	H109-091112-2	9/11/2012	9/12/2012	9/13/2012	9/13/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1014	H109-090612-3	9/6/2012	9/7/2012	9/28/2012	10/3/2012	ND
1C	2012-1013	H109-090612-2	9/6/2012	9/7/2012	9/28/2012	10/3/2012	ND
2B	2012-1016	H109-090612-5	9/6/2012	9/7/2012	9/28/2012	10/3/2012	ND
3A	2012-1078	H109-091112-3	9/11/2012	9/12/2012	9/28/2012	10/9/2012	ND
3B	2012-1080	H109-091112-5	9/11/2012	9/12/2012	9/28/2012	10/9/2012	ND
3C	2012-1077	H109-091112-2	9/11/2012	9/12/2012	9/28/2012	10/9/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H109-090612-3	09/06/12	620979	4204349	10:35	21.90			7.55		
1C	H109-090612-2	09/06/12	620938	4204344	10:30	21.80			7.39		
2B	H109-090612-5	09/06/12	621143	4206855	12:30	21.70			7.83		
3A	H109-091112-3	09/11/12	620965	4204341	09:55	21.85	0.786	0.41	7.96	7.36	6.3
3B	H109-091112-5	09/11/12	621257	4207699	10:41	21.25	1.086	0.57	9.54	8.84	0.5
3C	H109-091112-2	09/11/12	620948	4204336	09:48	21.95	0.779	0.40	9.43	8.73	8.1



Site 203 Sampling Results

Glyphosate Residue

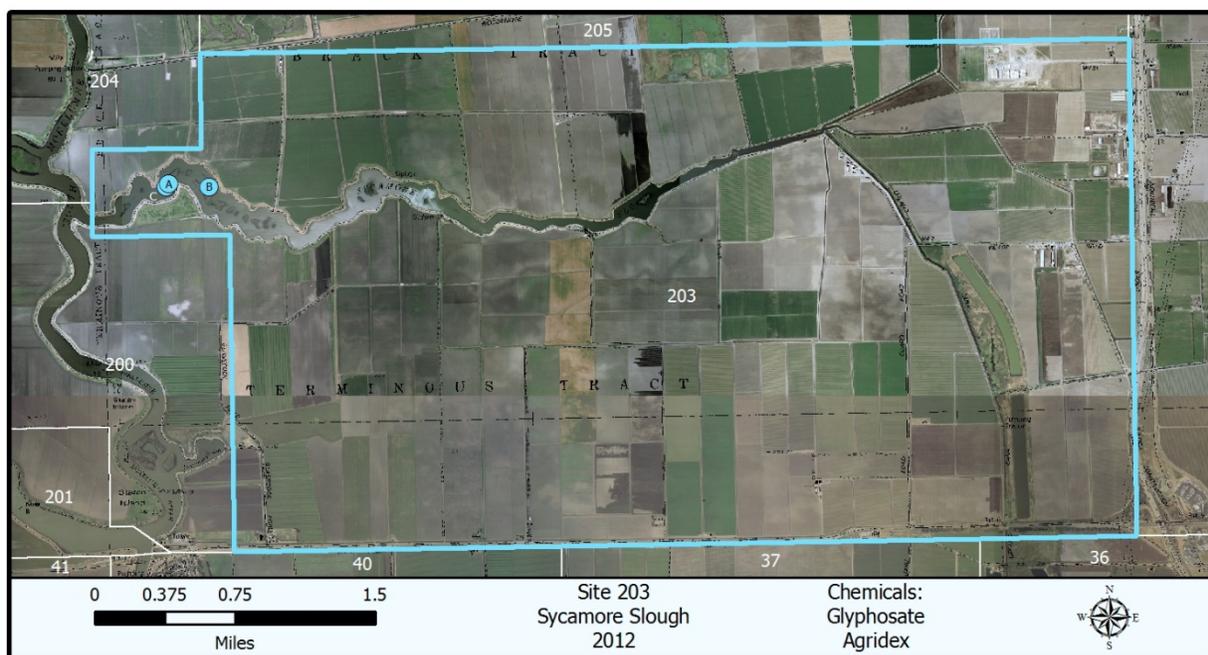
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-0596	H203-081512-3	8/15/2012	8/16/2012	8/28/2012	8/28/2012	ND
1C	2012-0595	H203-081512-2	8/15/2012	8/16/2012	8/28/2012	8/28/2012	ND
2B	2012-0601	H203-081512-5	8/15/2012	8/16/2012	8/28/2012	8/28/2012	ND
3A	2012-0685	H203-082212-3	8/22/2012	8/23/2012	8/29/2012	8/29/2012	ND
3B	2012-0687	H203-082212-5	8/22/2012	8/23/2012	8/29/2012	8/29/2012	ND
3C	2012-0684	H203-082212-2	8/22/2012	8/23/2012	8/29/2012	8/29/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-0596	H203-081512-3	8/15/2012	8/16/2012	9/10/2012	9/28/2012	ND
1C	2012-0595	H203-081512-2	8/15/2012	8/16/2012	9/10/2012	9/28/2012	ND
2B	2012-0601	H203-081512-5	8/15/2012	8/16/2012	9/10/2012	9/28/2012	ND
3A	2012-0685	H203-082212-3	8/22/2012	8/23/2012	9/21/2012	10/1/2012	ND
3B	2012-0687	H203-082212-5	8/22/2012	8/23/2012	9/21/2012	10/1/2012	ND
3C	2012-0684	H203-082212-2	8/22/2012	8/23/2012	9/21/2012	10/1/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H203-081512-3	08/15/12	631905	4222820	09:31	23.70			7.03		
1C	H203-081512-2	08/15/12	631881	4222788	09:25	23.60			7.02		
2B	H203-081512-5	08/15/12	632246	4222794	11:00	23.70			9.99		
3A	H203-082212-3	08/22/12	632070	4222891	11:38	23.40			7.94		
3B	H203-082212-5	08/22/12	632277	4222749	11:51	24.00			7.31		
3C	H203-082212-2	08/22/12	631897	4222806	11:34	23.90			7.63		



Site 301 Sampling Results

2,4-D Residue

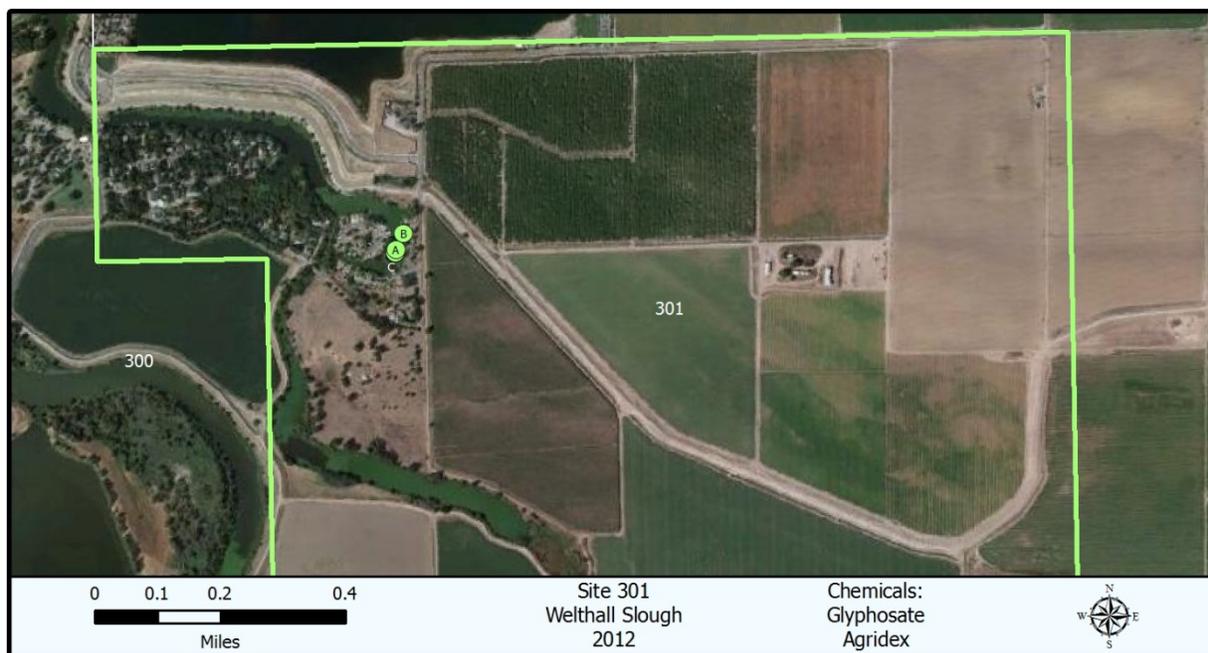
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	2,4-D (ppb)
1A	2012-0575	H301-081312-3	8/13/2012	8/14/2012	8/17/2012	8/20/2012	ND
1C	2012-0574	H301-081312-2	8/13/2012	8/14/2012	8/17/2012	8/20/2012	ND
2B	2012-0577	H301-081312-5	8/13/2012	8/14/2012	8/17/2012	8/20/2012	ND
3A	2012-0670	H301-082112-3	8/21/2012	8/21/2012	8/24/2012	8/25/2012	0.4
3B	2012-0672	H301-082112-5	8/21/2012	8/21/2012	8/24/2012	8/25/2012	ND
3C	2012-0669	H301-082112-2	8/21/2012	8/21/2012	8/24/2012	8/25/2012	0.6

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-0575	H301-081312-3	8/13/2012	8/14/2012	9/6/2012	9/10/2012	ND
1C	2012-0574	H301-081312-2	8/13/2012	8/14/2012	9/6/2012	9/10/2012	ND
2B	2012-0577	H301-081312-5	8/13/2012	8/14/2012	9/6/2012	9/10/2012	ND
3A	2012-0670	H301-082112-3	8/21/2012	8/21/2012	9/12/2012	9/19/2012	ND
3B	2012-0672	H301-082112-5	8/21/2012	8/21/2012	9/12/2012	9/19/2012	ND
3C	2012-0669	H301-082112-2	8/21/2012	8/21/2012	9/12/2012	9/19/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H301-081312-3	08/13/12	650618	418183	09:08	24.00			6.89		
1C	H301-081312-2	08/15/12	650628	4181755	09:00	24.70			5.61		
2B	H301-081312-5	08/15/12	649830	418081	10:10	26.00			12.15		
3A	H301-082112-3	08/21/12	650623	4181756	09:17	21.60			3.46		
3B	H301-082112-5	08/21/12	650640	4181800	09:40	24.40			7.82		
3C	H301-082112-2	08/21/12	650622	4181748	09:11	21.90			2.27		



Site 319 Sampling Results

Glyphosate Residue

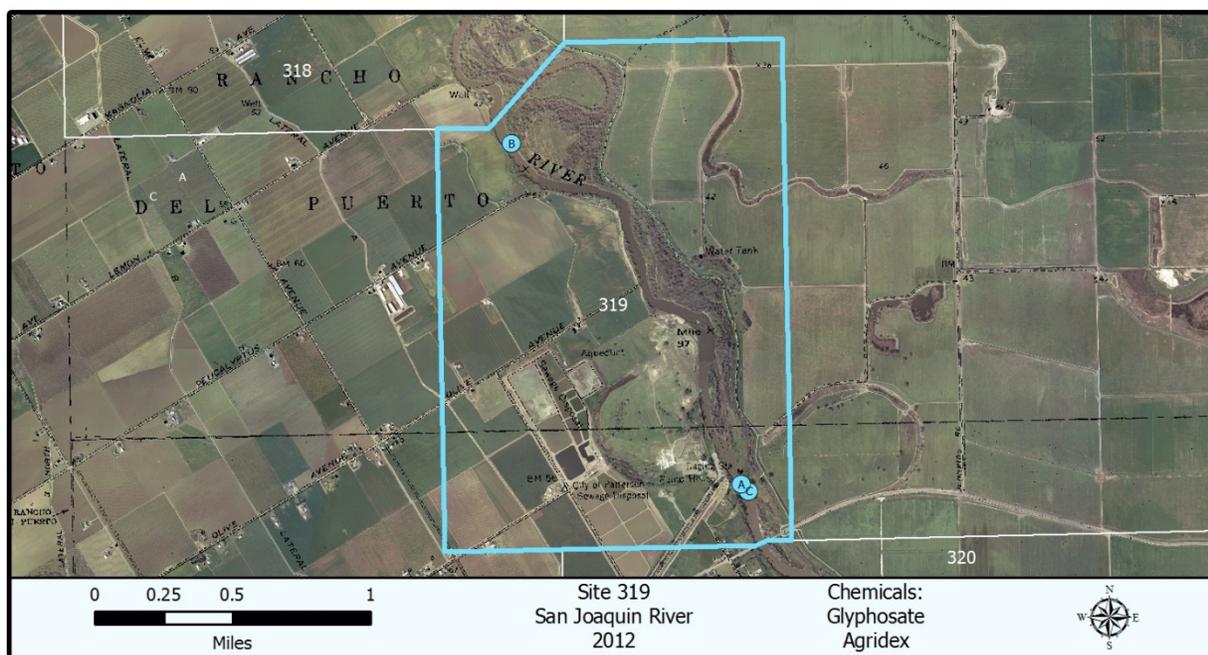
Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1224	H319-091912-3	9/19/2012	9/19/2012	9/20/2012	9/20/2012	ND
1C	2012-1223	H319-091912-2	9/19/2012	9/19/2012	9/20/2012	9/20/2012	ND
2B	2012-1226	H319-091912-5	9/19/2012	9/19/2012	9/20/2012	9/20/2012	ND
3A	2012-1282	H319-092612-3	9/26/2012	9/26/2012	9/27/2012	9/27/2012	ND
3B	2012-1284	H319-092612-5	9/26/2012	9/26/2012	9/27/2012	9/27/2012	ND
3C	2012-1281	H319-092612-2	9/26/2012	9/26/2012	9/27/2012	9/27/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1224	H319-091912-3	9/19/2012	9/19/2012	10/3/2012	10/11/2012	ND
1C	2012-1223	H319-091912-2	9/19/2012	9/19/2012	10/3/2012	10/11/2012	ND
2B	2012-1226	H319-091912-5	9/19/2012	9/19/2012	10/3/2012	10/11/2012	ND
3A	2012-1282	H319-092612-3	9/26/2012	9/26/2012	10/5/2012	10/16/2012	ND
3B	2012-1284	H319-092612-5	9/26/2012	9/26/2012	10/5/2012	10/16/2012	ND
3C	2012-1281	H319-092612-2	9/26/2012	9/26/2012	10/5/2012	10/16/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H319-091912-3	09/19/12	669522	4151728	10:36	21.00			8.69		
1C	H319-091912-2	09/19/12	669605	4151686	10:20	20.70			8.33		
2B	H319-091912-5	09/19/12	668214	4153711	12:25	22.70			9.70		
3A	H319-092612-3	09/26/12	669516	4151724	11:34	21.78	1.220	0.65	7.74	7.74	22.6
3B	H319-092612-5	09/26/12	668219	4153713	11:55	21.52	1.250	0.66	8.07	7.78	34.2
3C	H319-092612-2	09/26/12	669607	4151680	11:28	21.44	1.210	0.64	7.71	7.72	21.2



Site 320 Sampling Results

Glyphosate Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Glyphosate (ppb)
1A	2012-1230	H320-091912-3	9/19/2012	9/19/2012	9/20/2012	9/20/2012	ND
1C	2012-1229	H320-091912-2	9/19/2012	9/19/2012	9/20/2012	9/20/2012	ND
2B	2012-1232	H320-091912-5	9/19/2012	9/19/2012	9/20/2012	9/20/2012	ND
3A	2012-1288	H320-092612-3	9/26/2012	9/26/2012	9/27/2012	9/27/2012	ND
3B	2012-1290	H320-092612-5	9/26/2012	9/26/2012	9/27/2012	9/27/2012	ND
3C	2012-1287	H320-092612-2	9/26/2012	9/26/2012	9/27/2012	9/27/2012	ND

Agridex Residue

Sample Location	Lab Sample ID	DBW ID	Date Sample Taken	Date Sample Received	Date Sample Extracted	Date Sample Analyzed	Agridex (ppb)
1A	2012-1230	H320-091912-3	9/19/2012	9/19/2012	10/3/2012	10/11/2012	ND
1C	2012-1229	H320-091912-2	9/19/2012	9/19/2012	10/3/2012	10/11/2012	ND
2B	2012-1232	H320-091912-5	9/19/2012	9/19/2012	10/3/2012	10/11/2012	ND
3A	2012-1288	H320-092612-3	9/26/2012	9/26/2012	10/5/2012	10/16/2012	ND
3B	2012-1290	H320-092612-5	9/26/2012	9/26/2012	10/5/2012	10/16/2012	ND
3C	2012-1287	H320-092612-2	9/26/2012	9/26/2012	10/5/2012	10/16/2012	ND

Water Quality Data

Sample Location	Sample ID	Date	UTM Easting	UTM Northing	Time	Water Temp (°C)	Conductivity (mS/cm)	Salinity (ppt)	DO (mg/L)	pH	Turbidity (NTU)
1A	H320-091912-3	09/19/12	672096	4149736	11:02	21.40			8.44		
1C	H320-091912-2	09/19/12	672162	4149739	10:57	21.40			8.44		
2B	H320-091912-5	09/19/12	670181	4151024	13:30	23.40			9.51		
3A	H320-092612-3	09/26/12	672092	4149729	10:42	21.25	1.110	0.59	7.50	7.48	20.6
3B	H320-092612-5	09/26/12	670095	4151051	11:10	21.29	1.190	0.69	7.60	7.69	26.7
3C	H320-092612-2	09/26/12	672158	4149737	10:27	21.14	1.110	0.58	7.40	6.90	19.5



APPENDIX C

WHCP Protocol and Program Maps

Figure C- 1. 2012 WHCP Project Area and Sampling Sites

Figure C- 2. WHCP Dissolved Oxygen Limits: Northern Sites

Figure C- 3. WHCP Dissolved Oxygen Limits: Southern Sites

Figure C- 4. Historical Program Start Dates: Northern Sites

Figure C- 5. Historical Program Start Dates: Southern Sites

**Figure C- 6. Treatment Numbers Per 2012 WHCP
Site: Northern Sites**

Figure C- 7. Treatment Numbers Per 2012 WHCP Site: Southern Sites