VENTURA COUNTY WATERSHED PROTECTION DISTRICT

Matilija Dam
Ecosystem Restoration Project
Giant Reed Removal

Water Quality Monitoring Report
August 2007 – August 2009

Project No. 81916

October 2009

Water Quality Monitoring Report
August 2007 – August 2009

1.0 INTRODUCTION

The Matilija Dam Giant Reed Removal Project (Project) is one component of the greater Matilija Dam Ecosystem Restoration Project, which is the result of more than five years of collaboration with stakeholders and experts. The goal of the Project is to substantially reduce the abundance and distribution of invasive plants which consume large quantities of water, displace native vegetation and wildlife, disperse readily during floods, and exacerbate flooding, erosion, and fire intensity. The Project is sponsored by the Ventura County Watershed Protection District (District) and was conducted under the Proposition 40 Consolidated Grant from the California State Water Resources Control Board (SWRCB). Approximately 190 acres of invasive weed infestation were targeted within the 1,100 acre project area. The Project area includes the floodplains of the Ventura River just upstream of the Highway 150 bridge north to the confluence with Matilija Creek, and in the floodplains of Matilija Creek upstream to the waterfall. Project information is provided in the Water Quality Monitoring Plan (2007), which is available at the www.matilijadam.org website.

The herbicide Aquamaster™ was selected for the Project because it is approved by the United States Environmental Protection Agency (USEPA) and the United States Fish and Wildlife Service (USFWS) for use in aquatic environments and its active ingredient, glyphosate, is unlikely to leach into the ground water table or build up in the tissues of aquatic invertebrates and organisms. Aquamaster™ was mixed with Agri-dex™, a non-ionic surfactant used to aid absorption, and applied through foliar spray or cut and daub methods depending on wind conditions and proximity to water. Glyphosate breaks down into aminomethylphosphonic acid (AMPA). The half-life of glyphosate ranges from 1 to 174 days. Agri-dex™ breaks down within several days.

The District and the Ventura River Stream Team[1] (Stream Team) conducted regular monitoring of the surface water in the Matilija Creek and Ventura River watershed before, during, and after the active treatment periods. The maximum contaminant level (MCL) for glyphosate in drinking water has been set by the USEPA at 0.7 parts per million (ppm). Agri-dex™ and its components (non-ionic surfactants) are not listed in the National Drinking Water Regulations. The laboratories are able to detect glyphosate down to 0.02 ppm and non-ionic surfactants to 0.20 ppm. Glyphosate was not detected in any of the samples during the project period August 2007 through August 2009. No accredited laboratory in the region can test for AMPA; therefore, water samples were not tested for this constituent.

2.0 METHODS

Six routine sampling sites were established within the treatment area to allow the District to conduct comparative and representative monitoring for the duration of the Project

[1] The Stream Team is a volunteer organization affiliated with the Santa Barbara Channelkeeper and Ventura Chapter of the Surfrider Foundation that has been conducting monthly monitoring in the Ventura River Watershed since January 2001.

(Attachment 1). Three of the selected sites were already established routine monitoring sites for the Stream Team. The Stream Team collected samples for glyphosate analysis at their three sites during treatment periods as part of their monthly routine monitoring efforts. Stream Team samples were collected on the first Saturday of the month. The District conducted monthly routine monitoring during the initial treatment period and then quarterly during retreatment through August 2008. Routine sampling resumed in 2009 during months that retreatment occurred.

The District measured temperature, conductivity, pH, turbidity, and dissolved oxygen in the field using a YSI portable meter. Stream flow measurements were taken using the float method or a Marsh-McBirney meter and a stadia rod. Samples were collected and sent to EPA-accredited laboratories to be analyzed for glyphosate and non-ionic surfactants. The District's routine monitoring generally occurred during the week prior to the first Saturday of the month.

In addition to routine sampling, the District collected water samples upstream and downstream of the application area when the contractor was working near surface water. The contractor was not given advance notice of the sampling dates or locations. Samples were collected and sent to EPA-accredited laboratories to be analyzed for glyphosate and non-ionic surfactants. Samples of soil and chipped giant reed (*Arundo donax*) were collected from within and beneath the accumulated treated material in reach 7A and 7B and were also tested for the existence of glyphosate and non-ionic surfactants. Samples from three groundwater wells in the vicinity of the treatment area were analyzed for glyphosate in November 2008.

All field measurements and samples collected by District staff and the Stream Team were handled in accordance with the sampling methodologies described in the Water Quality Monitoring Plan (Plan), Section 6.0, pages 9-14. Clean sample handling protocols based on EPA Method 1669 were followed and are summarized in the Plan[2]. All samples were collected in bottles provided by the laboratory and kept on ice from the time of collection until delivery to the laboratory as described in the Plan[3]. The holding time for glyphosate is 7 days. The holding time for the non-ionic surfactants is 48 hours. All samples were analyzed at EPA-accredited laboratories. Glyphosate analysis was conducted using EPA Method 547 and non-ionic surfactants analysis followed SM 5540-D.

3.0 RESULTS

The total amount of Aquamaster™ and Agri-dex™ applied between August 2007 and August 2009 for initial and subsequent re-treatments was 3,139 gallons and 429 gallons, respectively (Table 1). District staff and Stream Team members collected a combined total of 120 samples within the Project area between August 2, 2007 and August 5, 2009. The samples included 70 routine samples collected by the District during 14 routine sampling days (Table 2), 20 random samples when treatment occurred near surface water (Table 3), four samples of soil and chipped giant reed (Table 3), and three

[2] For complete reference see Ventura Countywide Stormwater Quality Management Program Mass Emission Stations Water Quality Monitoring Standard Operating Procedures 2000-2005, Section 7.2, pages 18-22.

[3] For complete reference see Ventura Countywide Stormwater Quality Management Program Mass Emission Stations Water Quality Monitoring Standard Operating Procedures 2000-2005, Section 10.6, pages 32-33.

samples of groundwater (Table 4). In addition, 23 routine samples were collected by the Stream Team over 10 sampling days (Table 5).

Of all the samples collected by both entities, 117 were analyzed for glyphosate and 84 were analyzed for non-ionic surfactants. Glyphosate was not detected in any of the samples. Non-ionic surfactants were present in 2 of the 84 samples analyzed for the constituent (see Tables 2 and 3). Laboratory results and field measurements for temperature, conductivity, pH, turbidity, dissolved oxygen, and stream flow are shown in Attachment 2.

Table 1. Summary of Treatments

Treatment/Re-treatment Number	Start Date	End Date	Aquamaster™ Volume (gal)	Agri-dex™ Volume (gal)
Initial + 1	9/10/2007	7/7/2008	2372	323
2	7/8/2008	8/19/2008	420	58
3	9/23/2008	10/21/2008	197	27
4	4/15/2009	5/14/2009	73	10
5	7/13/2009	7/28/2009	78	11
Total	**9/10/2007**	**7/28/2009**	**3139**	**429**

Table 2. Summary of Routine Sampling by the District

Routine Site Dates	Number of Samples	Glyphosate Detections	Non-Ionic Surfactant Detections
August 2, 2007	5	0	0
September 6, 2007	4	0	0
October 4, 2007	4	0	0
November 1, 2007	4	0	0
December 5, 2007	5	0	0
January 3, 2008	5	0	0
April 3, 2008	6	0	0
May 1, 2008	6	0	0
June 5, 2008	5	0	0.91 mg/L
July 10, 2008	5	0	0
August 7, 2008	5	0	0
April 2, 2009	6	0	0
May 1, 2009	5	0	Missed Hold Time
August 5, 2009	5	0	0
Total through August 2009	**70**	**70 samples = 0 mg/L**	**64 samples = 0 mg/L; 1 sample = 0.91 mg/L**

Table 3. Summary of Additional Random Sampling by the District

Random Site Dates	Number of Samples	Glyphosate Detections	Non-Ionic Surfactant Detections
October 11, 2007	2	0	0
October 30, 2007	1	0	0
December 10, 2007	3	0	0
January 7, 2008	3	0	Not sampled
May 15, 2008	3	0	0
May 29, 2008	1	0	0.31 mg/L
June 19, 2008	2	0	Not sampled
July 10-11, 2008	2	0	0
April 2, 2009	2 (reed chips)	0	0
April 2, 2009	2 (soil)	0	0
April 15, 2009	1	0	0
May 13, 2009	2	0	0
TOTAL	**24**	**24 samples = 0 mg/L**	**18 samples = 0 mg/L; 1 sample = 0.31 mg/L**

Table 4. Summary of Groundwater Sampling by the District

Routine Site Dates	Number of Samples	Glyphosate Detections
October 31, 2008	2	0
November 5, 2008	1	0
TOTAL	**3**	**3 samples = 0 mg/L**

Table 5. Summary of Routine Sampling by the Stream Team

Routine Site Dates	Number of Samples	Glyphosate Detections
August 4, 2007	2	0
September 8, 2007	2	0
October 6, 2007	2	0
November 3, 2007	2	0
December 1, 2007	2	0
January 5, 2008	3	0
April 5, 2008	2	0
October 4, 2008	2	0
April 4, 2009	3	0
May 2, 2009	3	Missed Hold Time
TOTAL	**23**	**20 samples = 0 mg/L**

4.0 DISCUSSION

The District collected three samples on January 7, 2008 following a major storm event that measured 7.17 inches at the Matilija Dam gauge (see Table 3). The project had been fully underway for four months by this date. The samples were collected within and downstream of the reach in which treatment had most recently occurred to determine if glyphosate entered the stream through storm water runoff. Glyphosate was not detected in these samples.

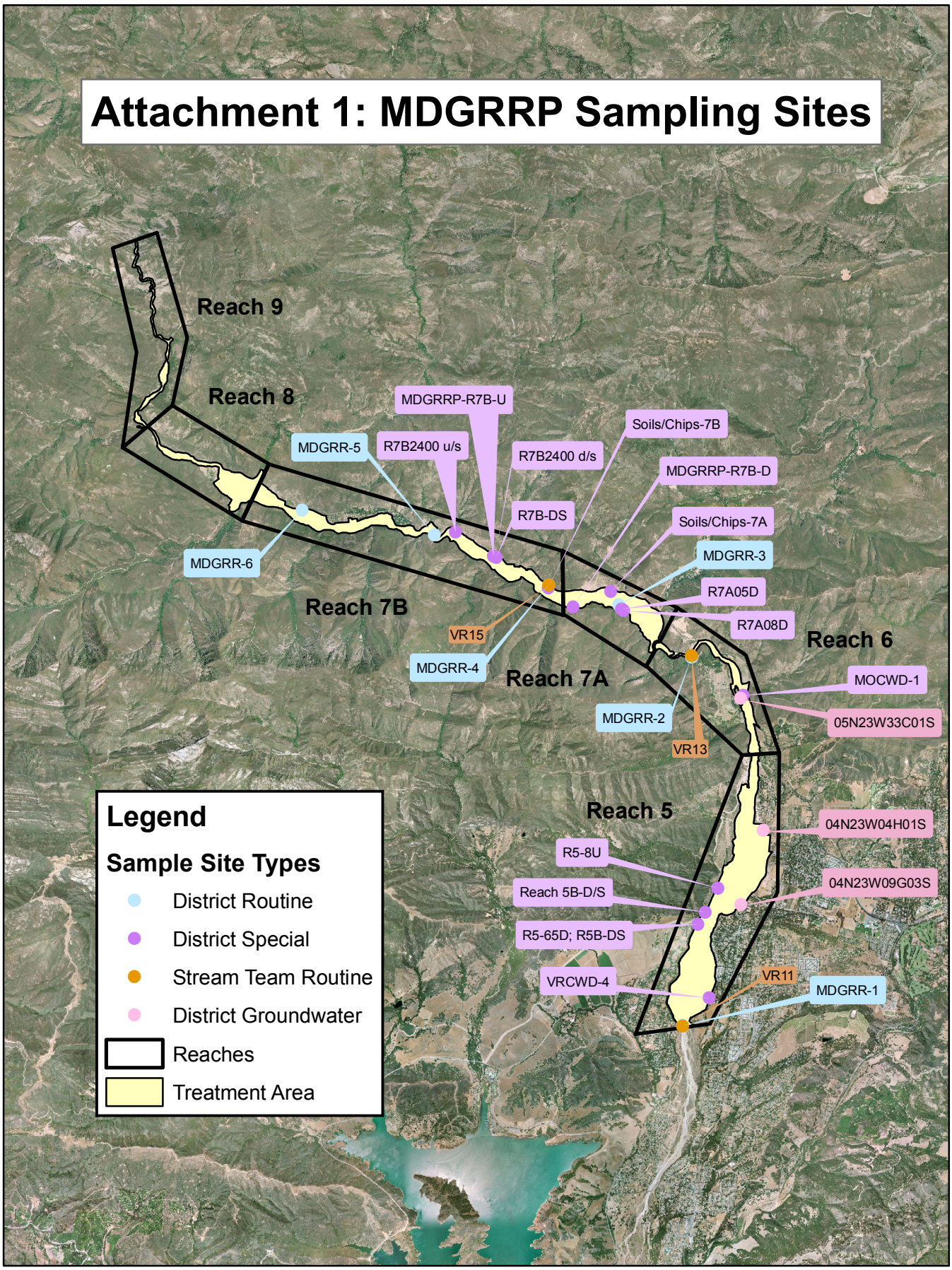
The District collected a sample downstream of the Reach 5B work zone on May 29, 2008 after receiving a report from the District Inspector that the contractor failed to meet all the application protocol standards that morning. The sample was analyzed for glyphosate and non-ionic surfactants. Non-ionic surfactant was detected at a concentration of 0.31 ppm (see Table 3). The District Inspector issued a Warning of Non-compliance to the Contractor and the Biologist spoke with the field crew to correct the issue on site.

Non-ionic surfactant was detected at a concentration of 0.91ppm in the Reach 7B routine sample collected by the District on June 5, 2008 (see Table 2). Non-ionic surfactant was not detected in the routine samples collected downstream of Reach 7B on the same day. The results were issued by the laboratory on July 28, 2008. By the time the results were issued by the laboratory the District had conducted the July routine monitoring (July 10, 2008), including the Reach 7B site. Non-ionic surfactant was not detected in any of these samples. It is unclear how non-ionic surfactant came to be detected in Reach 7B on June 5. Records show that the crews did not work in Reach 7B between May 14, 2008 (three weeks prior to the detection) and June 18, 2008. The crews were working downstream of Reach 7B (in Reaches 5B and 7A) on June 5, as they had been since May 14, 2008. Non-ionic surfactant was not detected in any of the District's other June and July routine monitoring samples, including those collected where the crews were working (note: a sample was not collected at the Reach 5 sampling site downstream of Reach 5B on June 5 due to a lack of surface water flow).

Holding times for glyphosate were exceeded by the Stream Team for their 3 samples collected on May 2, 2009 due to a change in staff and unfamiliarity with the holding time for glyphosate (see Table 5). This brought the total number of samples analyzed for glyphosate down to 117 of the 120 collected. The holding time for non-ionic surfactant analysis was exceeded by the laboratory for the 5 samples collected by the District on May 1, 2009 (see Table 2). This was due to a lack of communication among laboratory staff resulting in the samples not being shipped to the subcontracting laboratory.

5.0 CONCLUSION

The Project successfully treated the 190 acres of target invasive species with minimal impacts to water quality during the two-year period. Glyphosate was not detected in any of the samples collected by the District or the Stream Team. Non-ionic surfactant was detected in two samples collected by the District but was absent in follow-up samples. Additional water quality sampling will occur before, during, and after future giant reed control treatments in this area.


Attachment 1: MDGRRP Sampling Sites
Reach 9
Reach 8
Reach 7B
Reach 7A
Reach 6
Reach 5
MDGRRP-R7B-U
MDGRR-5
R7B2400 u/s
R7B2400 d/s
Soils/Chips-7B
MDGRRP-R7B-D
R7B-DS
Soils/Chips-7A
MDGRR-3
MDGRR-6
R7A05D
R7A08D
VR15
MDGRR-4
MOCWD-1
05N23W33C01S
MDGRR-2
VR13
04N23W04H01S
R5-8U
04N23W09G03S
Reach 5B-D/S
R5-65D; R5B-DS
VRCWD-4
VR11
MDGRR-1
Legend
Sample Site Types
District Routine
District Special
Stream Team Routine
District Groundwater
Reaches
Treatment Area

Attachment 2
Matilija Dam Giant Reed Removal Project
Water Quality Monitoring Results: District Routine

WPD Monthly Sampling

Site	*Constituent*	*Units*	*8/2/2007*	*9/6/2007*	*10/4/2007*	*11/1/2007*	*12/5/2007*
MDGRR-1	Glyphosate	ug/L	DRY	DRY	DRY	DRY	DRY
	Non-Ionic Surfactant	mg/L					
	Flow	cfs					
	Dissolved Oxygen	%					
	Dissolved Oxygen	mg/L					
	Temperature	°C					
	Conductivity	uS/mS					
	Specific Conductivity	uS/mS					
	Salinity	ppt					
	pH						
	Turbidity	NTU					
MDGRR-2	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	1.4	1.1	0.81	0.68	0.76
	Dissolved Oxygen	%	83.8	75.4	71.0	70.0	102.1
	Dissolved Oxygen	mg/L	7.37	6.61	6.96	6.9	10.94
	Temperature	°C	22.5	21.8	17.4	15.5	12.0
	Conductivity	uS/mS	780	778	728	617	666
	Specific Conductivity	uS/mS	820	828	851	751	885
	Salinity	ppt	0.4	0.4	0.4	0.4	0.4
	pH		7.6	7.7	8	7.6	7.95
	Turbidity	NTU	data missing	0.6	0.6	0.71	0.7
MDGRR-3	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	<1.0	<1.0	0.38	0.25	0.65
	Dissolved Oxygen	%	40.3	17.0	62.0	46.9	70.6
	Dissolved Oxygen	mg/L	3.66	1.55	5.64	4.59	6.67
	Temperature	°C	20.4	18.7	19.1	16.1	17.8
	Conductivity	uS/mS	883	962	954	887	995
	Specific Conductivity	uS/mS	961	1093	1075	1069	1152
	Salinity	ppt	0.5	0.5	0.5	0.5	0.6
	pH		6.8	7.2	7.5	7.4	7.45
	Turbidity	NTU	0.4	0.5	<0.2	0.29	0.29
MDGRR-4	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	1.35	>1.0	1.40	1.39	2.21
	Dissolved Oxygen	%	142.8	112.4	128.6	139.2	138.0
	Dissolved Oxygen	mg/L	11.12	9.88	10.74	13.14	12.82
	Temperature	°C	28.2	21.5	22.9	18.0	18.7
	Conductivity	uS/mS	1062	1096	1127	997	979
	Specific Conductivity	uS/mS	1001	1164	1174	1151	1113
	Salinity	ppt	0.5	0.6	0.6	0.6	0.6
	pH		8.3	8.4	8.5	8.5	8.42
	Turbidity	NTU	0.6	0.3	0.5	0.64	0.71
MDGRR-5	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	1.15	<1.0	1	1.81	-
	Dissolved Oxygen	%	131.2	128.6	120.7	112.5	104.8
	Dissolved Oxygen	mg/L	10.86	11.43	10.93	11.81	10.70
	Temperature	°C	24.8	21.1	19.8	15.9	14.3
	Conductivity	uS/mS	764	790	768	713	691
	Specific Conductivity	uS/mS	767	856	852	861	868
	Salinity	ppt	0.4	0.4	0.4	0.4	0.4
	pH		8.3	8.10	8.10	8.10	8.06
	Turbidity	NTU	0.2	1.9	<0.2	0.23	0.17
MDGRR-6	Glyphosate	ug/L	ND	DRY	DRY	DRY	ND
	Non-Ionic Surfactant	mg/L	ND				ND
	Flow	cfs	<1.0				0.30
	Dissolved Oxygen	%	169.6				111.8
	Dissolved Oxygen	mg/L	12.69				10.36
	Temperature	°C	28.5				18.9
	Conductivity	uS/mS	769				754
	Specific Conductivity	uS/mS	721				854
	Salinity	ppt	0.4				0.4
	pH		8.6				8.14
	Turbidity	NTU	0.3				0.20

ND = Non-Detect
est. - Estimated Flow

Attachment 2
Matilija Dam Giant Reed Removal Project
Water Quality Monitoring Results: District Routine

WPD Monthly Sampling

Site	*Constituent*	*Units*	*1/3/2008*	*4/3/2008*	*5/1/2008*	*6/5/2008*	*7/10/2008*
MDGRR-1	Glyphosate	ug/L	DRY	ND	ND	DRY	DRY
	Non-Ionic Surfactant	mg/L		ND	ND		
	Flow	cfs		21.37	2.84		
	Dissolved Oxygen	%		90.0	96.1		
	Dissolved Oxygen	mg/L		9.14	9.76		
	Temperature	°C		14.7	14.6		
	Conductivity	uS/mS		636	629		
	Specific Conductivity	uS/mS		792	786		
	Salinity	ppt		0.4	0.4		
	pH			7.97	7.83		
	Turbidity	NTU		0.33	0.21		
MDGRR-2	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	1.0 est.	41.02	17.67	13.47	5.02
	Dissolved Oxygen	%	96.3	87.4	88.9	96.7	98.4
	Dissolved Oxygen	mg/L	11.06	8.88	8.67	8.84	8.41
	Temperature	°C	8.9	14.6	16.7	19.6	23.1
	Conductivity	uS/mS	682	638	481	782	787
	Specific Conductivity	uS/mS	984	796	572	872	818
	Salinity	ppt	0.5	0.4	0.3	0.4	0.4
	pH		8.14	8.15	8.12	8.03	7.96
	Turbidity	NTU	1.7	0.42	0.55	0.7	0.98
MDGRR-3	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	2.5 est.	31.4	13.4	10.45	5.72
	Dissolved Oxygen	%	54.7	82.4	83.0	82.9	61.0
	Dissolved Oxygen	mg/L	5.39	8.35	8.09	7.67	5.53
	Temperature	°C	16.2	14.5	16.5	19	20
	Conductivity	uS/mS	1025	657	682	777	837
	Specific Conductivity	uS/mS	1233	820	816	878	925
	Salinity	ppt	0.6	0.4	0.4	0.4	0.5
	pH		7.57	7.56	7.81	5.92	7.29
	Turbidity	NTU	0.21	0.46	0.41	0.37	0.55
MDGRR-4	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	0.91	ND
	Flow	cfs	3.50 est.	25.97	19.55	9.99	3.64
	Dissolved Oxygen	%	99.1	99.3	90.9	93.0	114.3
	Dissolved Oxygen	mg/L	10.31	9.92	8.67	8.13	9.54
	Temperature	°C	13.3	15.1	17.6	21.9	24.3
	Conductivity	uS/mS	858	659	720	819	905
	Specific Conductivity	uS/mS	1104	812	838	871	918
	Salinity	ppt	0.6	0.4	0.4	0.4	0.5
	pH		8.3	8.29	8.19	5.3	8.2
	Turbidity	NTU	0.46	0.49	0.54	0.43	1.03
MDGRR-5	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	3.5 est.	31.79	16.89	12.38	4.69
	Dissolved Oxygen	%	94.4	95.9	89.9	98.5	94.6
	Dissolved Oxygen	mg/L	10.09	9.62	8.66	8.95	8.24
	Temperature	°C	12.2	14.9	16.9	19.9	21.8
	Conductivity	uS/mS	681	640	670	737	790
	Specific Conductivity	uS/mS	902	793	793	816	841
	Salinity	ppt	0.4	0.4	0.4	0.4	0.4
	pH		8.18	8.24	8.09	5.24	8.07
	Turbidity	NTU	0.29	0.26	0.36	0.19	0.5
MDGRR-6	Glyphosate	ug/L	ND	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	ND	ND	ND
	Flow	cfs	1.0 est.	27	13.44	6.77	1.53
	Dissolved Oxygen	%	99.1	97.6	94.8	96.3	102.3
	Dissolved Oxygen	mg/L	10.21	9.61	9.09	8.69	8.89
	Temperature	°C	14	15.9	17.4	20.1	22.1
	Conductivity	uS/mS	697	665	674	743	795
	Specific Conductivity	uS/mS	883	804	789	820	841
	Salinity	ppt	0.4	0.4	0.4	0.4	0.4
	pH		8.28	8.21	8.1	5.58	8.12
	Turbidity	NTU	0.18	0.33	0.5	0.29	0.66

ND = Non-Detect
est. - Estimated Flow

Attachment 2
Matilija Dam Giant Reed Removal Project
Water Quality Monitoring Results: District Routine

WPD Monthly Sampling

Site	*Constituent*	*Units*	*8/7/2008*	*4/2/2009*	*5/1/2009*	*8/5/2009*
MDGRR-1	Glyphosate	ug/L	DRY	ND	DRY	DRY
	Non-Ionic Surfactant	mg/L		ND		
	Flow	cfs		<0.10		
	Dissolved Oxygen	%		92.6		
	Dissolved Oxygen	mg/L		9.61		
	Temperature	°C		13.6		
	Conductivity	uS/mS		665		
	Specific Conductivity	uS/mS		850		
	Salinity	ppt		0.4		
	pH			8		
	Turbidity	NTU		0.7		
MDGRR-2	Glyphosate	ug/L	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	Missed hold time	ND
	Flow	cfs	4.79	10.12	5.29	1.11
	Dissolved Oxygen	%	83	85.0	88.1	54.9
	Dissolved Oxygen	mg/L	7.01	8.47	8.52	4.78
	Temperature	°C	23.3	15.3	16.9	22.1
	Conductivity	uS/mS	892	747	781	795
	Specific Conductivity	uS/mS	921	917	952	842
	Salinity	ppt	0.5	0.5	0.5	0.4
	pH		7.98	8.28	8.27	7.95
	Turbidity	NTU	0.7	0.91	1.06	0.83
MDGRR-3	Glyphosate	ug/L	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	Missed hold time	ND
	Flow	cfs	1.29	9.22	7.22	0.46
	Dissolved Oxygen	%	59.2	91.5	61.3	56.2
	Dissolved Oxygen	mg/L	5.27	9.07	6.09	5.25
	Temperature	°C	20.9	15.7	15.5	18.3
	Conductivity	uS/mS	872	756	768	884
	Specific Conductivity	uS/mS	947	919	938	1013
	Salinity	ppt	0.5	0.5	0.5	0.5
	pH		7.44	7.91	7.7	7.5
	Turbidity	NTU	0.6	0.63	0.46	0.89
MDGRR-4	Glyphosate	ug/L	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	Missed hold time	ND
	Flow	cfs	0.96	10.69	6.14	0.73
	Dissolved Oxygen	%	117.7	108.3	98.2	113.6
	Dissolved Oxygen	mg/L	9.79	10.17	9.55	9.78
	Temperature	°C	24.5	18.4	16.6	22.8
	Conductivity	uS/mS	944	787	789	1066
	Specific Conductivity	uS/mS	953	901	939	1117
	Salinity	ppt	0.5	0.4	0.5	0.6
	pH		8.19	8.43	8.39	7.7
	Turbidity	NTU	0.58	0.56	0.61	0.52
MDGRR-5	Glyphosate	ug/L	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	Missed hold time	ND
	Flow	cfs	3.92	8.7	5.62	1.28
	Dissolved Oxygen	%	107.2	95.1	90.3	109.6
	Dissolved Oxygen	mg/L	9.22	9.13	8.97	9.6
	Temperature	°C	22.6	17	15.7	21.5
	Conductivity	uS/mS	811	717	706	825
	Specific Conductivity	uS/mS	851	846	860	884
	Salinity	ppt	0.4	0.4	0.4	0.4
	pH		8.03	8.27	8.28	8.19
	Turbidity	NTU	0.25	0.29	0.27	0.23
MDGRR-6	Glyphosate	ug/L	ND	ND	ND	ND
	Non-Ionic Surfactant	mg/L	ND	ND	Missed hold time	ND
	Flow	cfs	0.42	5.02	2.27	0.08
	Dissolved Oxygen	%	110.8	100.2	100.3	136
	Dissolved Oxygen	mg/L	9.27	9.52	9.74	11.79
	Temperature	°C	23.5	17.6	16.6	22.3
	Conductivity	uS/mS	825	740	723	832
	Specific Conductivity	uS/mS	849	862	861	878
	Salinity	ppt	0.4	0.4	0.4	0.4
	pH		8.15	8.29	Probe malfunction	8.31
	Turbidity	NTU	0.56	0.82	0.48	0.36

ND = Non-Detect
est. - Estimated Flow

Attachment 2
Matilija Dam Giant Reed Removal Project
Water Quality Monitoring Results: District Routine

Glyphosate Results (ug/L)

	Stream Team Site		
Sample Date	**VR11**	**VR13**	**VR15**
8/4/2007	DRY	ND	ND
9/8/2007	DRY	ND	ND
10/6/2007	DRY	ND	ND
11/3/2007	DRY	ND	ND
12/1/2007	DRY	ND	ND
1/5/2008	DRY	ND	ND
4/5/2008	DRY	ND	ND
10/4/2008	DRY	ND	ND
4/4/2009	DRY	ND	ND
5/2/2009	DRY	Missed hold time	Missed hold time

ND = Non-Detect
est. - Estimated Flow

Attachment 2
Matilija Dam Giant Reed Removal Project
Water Quality Monitoring Results: Special Sampling Events

WPD Special Sampling Events: Glyphosate

Site	Constituent	Units	10/11/2007	10/30/2007	12/10/2007	1/7/2008	5/15/2008	5/29/2008	6/19/2008	7/10-11/08	4/2/2009	4/15/2009	5/13/2009
R7A08D	Glyphosate	ug/L	ND										
R7A05D	Glyphosate	ug/L	ND										
MDGRR-3	Glyphosate	ug/L		ND									
R7B2400 d/s	Glyphosate	ug/L			ND								
R7B2400 u/s	Glyphosate	ug/L			ND								
MDGRRP-4	Glyphosate	ug/L			ND								
MDGRR-3A	Glyphosate	ug/L				ND							
MDGGR-3	Glyphosate	ug/L				ND							
MDGRR-5	Glyphosate	ug/L				ND							
MDGRR-1	Glyphosate	ug/L					ND						
R5-65 D	Glyphosate	ug/L					ND						
R5-8 U	Glyphosate	ug/L					ND						
R5B-DS	Glyphosate	ug/L						ND					
R7B-US	Glyphosate	ug/L							ND				
R7B-DS	Glyphosate	ug/L							ND				
VRCWD-4	Glyphosate	ug/L								ND			
MOCWD-1	Glyphosate	ug/L								ND			
Soils-7A	Glyphosate	mg/kg									ND		
Chips-7A	Glyphosate	mg/kg									ND		
Soils-7B	Glyphosate	mg/kg									ND		
Chips-7B	Glyphosate	mg/kg									ND		
REACH 5B-D/S	Glyphosate	ug/L										ND	
MDGRRP-R7B-D	Glyphosate	ug/L											ND
MDGRRP-R7B-U	Glyphosate	ug/L											ND

WPD Special Sampling Events: Non-ionic surfactants

Site	Constituent	Units	10/11/2007	10/30/2007	12/10/2007	5/15/2008	5/29/2008	7/10-11/08	4/2/2009	4/15/2009	5/13/2009
R7A08D	Non-Ionic Surfactant	mg/L	ND								
R7A05D	Non-Ionic Surfactant	mg/L	ND								
MDGRR-3	Non-Ionic Surfactant	mg/L		ND							
R7B2400 d/s	Non-Ionic Surfactant	mg/L			ND						
R7B2400 u/s	Non-Ionic Surfactant	mg/L			ND						
MDGRRP-4	Non-Ionic Surfactant	mg/L			ND						
MDGRR-1	Non-Ionic Surfactant	mg/L				ND					
R5-65 D	Non-Ionic Surfactant	mg/L				ND					
R5-8 U	Non-Ionic Surfactant	mg/L				ND					
R5B-DS	Non-Ionic Surfactant	mg/L					0.31				
VRCWD-4	Non-Ionic Surfactant	mg/L						ND			
MOCWD-1	Non-Ionic Surfactant	mg/L						ND			
Soils-7A	Non-Ionic Surfactant	mg/kg							ND		
Chips-7A	Non-Ionic Surfactant	mg/kg							ND		
Soils-7B	Non-Ionic Surfactant	mg/kg							ND		
Chips-7B	Non-Ionic Surfactant	mg/kg							ND		
REACH 5B-D/S	Non-Ionic Surfactant	mg/L								ND	
MDGRRP-R7B-D	Non-Ionic Surfactant	mg/L									ND
MDGRRP-R7B-U	Non-Ionic Surfactant	mg/L									ND

WPD Groundwater Sampling Events: Glyphosate

Site	Constituent	Units	10/31/2008	11/5/2008
04N23W09G03S	Glyphosate	ug/L	ND	
04N23W04H01S	Glyphosate	ug/L	ND	
05N23W33C01S	Glyphosate	ug/L		ND

ND = Non-Detect
est. - Estimated Flow