Appendix B – Water Quality Monitoring Plan

Water Quality Monitoring Plan
For the Volta Wells – 5 Year Incremental Level 4 Groundwater Pumping/ Level 2 Diversification Project (Project)

WATER QUALITY MONITORING

In an effort to minimize ambient surface water quality degradation associated with the Project, water quality monitoring will consist of both surface and groundwater quality monitoring. This Project will provide refuge Incremental Level 4 water supplies to south-of-Delta (SOD) refuges and will provide exchanged Level 2 refuge water supplies for use in water districts with Central Valley Project water service contracts. Del Puerto Water District (DPWD) and San Luis Water District (SLWD) in collaboration with Grassland Water District (GWD), will be responsible for implementing this Monitoring and Mitigation Plan (Plan).

Water quality monitoring will consist of instantaneous sampling (grab samples) from upstream locations to determine the background constituent concentrations, at each wellhead, and a downstream location. Additionally, flow meters at each of the well outlets will characterize the amount of water being released in cubic-feet per second and total flow in acre-feet. Data will be recorded and included in monthly reports to the Bureau of Reclamation (Reclamation). The upstream and downstream electoconductivity (EC) in the Volta Wasteway will be monitored on a continuous basis by GWD. Continuous monitoring is achieved through telemetered stations using real time water quality sondes hosted to a website (YSIEconet). The two wells will be sampled weekly for EC by GWD personnel during the well operational period and recorded in a weekly log.

Grab samples will be collected and analyzed biannually (generally when the pumps are first turned on and then just before they are turned off for the season) upstream and downstream of the discharge of the two wells (where the input of the delivered well water is mixed with the receiving water) for Total Dissolved Solids (TDS), selenium, boron, and arsenic concentrations. **Map 1** shows the sample collection locations. **Table 1** shows the monitoring frequency for the various constituents. A Reclamation-approved laboratory will provide a method reporting limit (RL) of 0.4 micrograms per liter (µg/L) for selenium, a maximum RL of 100 µg/L for boron, a maximum RL of 0.5 µg/L for arsenic, and a maximum RL of 10 milligrams per liter (mg/L) for TDS. Instantaneous measurements of EC will be completed in the field using calibrated field instruments. In some years, pumping could occur during all 12 months. In this case, monitoring samples need to be collected at least every six months during the 5-year period.

Table 1. Water Quality Monitoring and Sampling Schedule

Electroconductivity (EC)	Frequency
Site	
Upstream	continuous
Well 1	weekly - when pumping
Well 2	weekly - when pumping
Downstream	continuous
Boron, Arsenic, Selenium, TDS	
Upstream, Well 1, Well 2, Downstream,	biannual*

*Monitoring samples need to be collected at least twice a year (e.g. once in the spring & once in the fall). If pumping occurs during all 12 months, then monitoring samples will be collected at least every six months during the five year period

If the water quality data thresholds shown in **Table 2** are exceeded, the mitigation measures described later in this Plan (and incorporated into the Proposed Action) will be implemented. The mitigation measures below will ensure that the groundwater supply developed during this Proposed Action will not significantly adversely impact surface water quality. If the monitoring indicates that threshold values are exceeded, mitigation measures will be implemented within 24 hours of identifying an exceedance.

Table 2. Water Quality Threshold and Reporting Limits – Laboratory Analysis

Analyte	Water Quality Goal (Threshold Value)	Maximum RL (mg/L)
Boron (mg/L)	Not to exceed 4 mg/L in conveyance.	.01
TDS (mg/L)	20% above the highest sample taken at annual "startup".	10 mg/L
Selenium (µg/L)	Not to exceed 2 µg/L in conveyance.[1]	0.4
Arsenic (µg/L)	Not applicable. A goal has not been established.	0.5

[1]Basin Plan, Table III-1, pgs. 28-29 of 160, footnote (b) *available at*: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf

Water Quality Mitigation Measures

DPWD, SLWD and GWD will monitor and collect water quality samples in accordance with the frequency shown in **Table 1**. For boron, arsenic, selenium, and TDS, a minimum of two samples will be collected each year at the upstream, downstream, and wellhead locations (e.g., once in

spring and once in fall). Operations under this Proposed Action will be modified or ceased until flow conditions improve if the following water quality threshold is exceeded:

- For TDS[2], biannual samples will be taken at well startup (initial) and shutdown each year at each wellhead to determine the TDS concentration. Each year, DPWD and SLWD will provide the startup and shutdown results to Reclamation within 15-days of collection. In the event that TDS levels at either wellhead increases by 20% or more above the highest initial concentration level collected, Reclamation shall be notified immediately via email of the exceedance. Corrective measures may be needed, including shutting down the wells or modifying operations until water quality conditions improve.

Reclamation will modify or cease operations under this Proposed Action until flow conditions improve if any of the following downstream water quality thresholds are exceeded:

- Maximum of 2.0 µg/L for selenium downstream of discharge points in the Volta Wasteway
- Maximum of 4.0 mg/L[3] for boron downstream of discharge points in the Volta Wasteway

Flow will be measured by a flow meter capable of recording instantaneous flow in cubic-feet per second and total flow in acre-feet. Monitoring of downstream locations will determine the combined flow and chemistry of the blended water. The downstream site allows for adequate blending of source water with discharge water by; distance from discharges, and mechanical mixing through a bend in the canal and a constriction of the canal. As soon as practical (generally within 7 days of receipt of information from the water quality testing laboratory), DPWD and SLWD will ensure that Reclamation receives electronic copies of the complete data reports submitted by the laboratory. DPWD and SLWD will also provide a monthly water quality summary report, including volumetric data on wellhead production, within 60 days of sample collection. DPWD and SLWD will provide an annual summary report to Reclamation no later than June 1 of each year.

[2]EC will also be used as a surrogate for TDS throughout the year (TDS ~59% of EC). The startup/shut down TDS sampling is to confirm the relationship and that there has been no significant change in water quality from the wells.

[3]There is an EC-TDS boron relationship. If boron is over 3 parts per million (ppm) the EC will likely be over 3,000 and the TDS would be ~1,200. The TDS (EC) trigger would be tripped long before boron approached 4 ppm.

APPENDIX B

Map 1 - Sample Collection Locations