

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0052

NPDES NO. CA0081850

WASTE DISCHARGE REQUIREMENTS  
FOR  
UNITED STATES DEPARTMENT OF THE AIR FORCE  
FORMER McCLELLAN AIR FORCE BASE  
GROUND WATER EXTRACTION AND TREATMENT SYSTEM (GWTS)  
SACRAMENTO COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board), finds that:

1. The United States Department of the Air Force, Air Force Real Property Agency, (hereafter Discharger) owns and operates a ground water extraction and treatment system (GWTS) to extract ground water contaminated with volatile organic compounds (VOC's), remove the contaminants, and discharge the treated water. The GWTS includes an ultraviolet/peroxide (UVOX) system, an air stripper, and granular activated carbon vessels.
2. The ultraviolet/peroxide (UVOX) system was designed to reduce the concentration of volatile organics from a select group of extraction wells. In January 2002, the UVOX system was bypassed and shut down because lower concentrations of contaminants entering the system make UVOX treatment unnecessary. The UVOX system was designed to reduce contaminant loading from specific wells, particularly contaminants that use a significant amount of carbon during treatment (such as vinyl chloride and chlorinated ethanes). The UVOX system will remain in place at the GWTP in case it is needed in the future.
3. The air-stripper is designed to treat up to 2000 gallons per minute (gpm) and remove approximately 99% of the volatile organics in the groundwater entering the stripper. The off-gas from the stripper is treated by concentrating the contaminants and then using a thermal oxidation unit to destroy the contaminants.
4. Granular activated carbon (GAC) trains are utilized for effluent polishing. Each GAC train consists of two vessels, operated in either parallel or series. Each GAC contact vessel is 10 feet in diameter and 10 feet in length, providing 10.5 minutes of contact. One train operates at 500 gpm, while the other three trains operate at 350 gpm. The GWTS configuration will change to accommodate the Ion Exchange (IX) Hexavalent Chromium Full Scale Treatment system. Two vessels will be used in series (lead/lag) to accommodate the new IX system operating at flows of up to 750 gpm. The other six vessels will be operated in parallel for VOC polishing. Once the Phase III wells are added the total flow will become about 2000 gpm.

5. The GWTS is currently designed to treat a maximum of 2.16 million gallons per day (mgd) of extracted groundwater. When Phase III extraction wells become operational, the treatment capacity will likely increase to approximately 3.6 mgd. Treated groundwater is subsequently discharged to Magpie Creek, tributary to the Magpie Creek Diversion, tributary to Robla (Rio Linda) Creek, tributary to the Natomas East Main Drainage Canal, tributary to the Sacramento River. A small portion of the flow, up to 0.144 mgd, is also discharged to a wetland which drains to adjacent Don Julio Creek, which is tributary to Magpie Creek. All of these are waters of the United States, in Section 24, T19N, R5E, MDB&M as shown in Attachment A, incorporated herein and made a part of this Order.

6. The discharge is described as follows:

Average flow:	2.12 mgd
Design flow:	2.16 mgd
Average temperature:	72 °F summer; 60 °F winter

<u>Constituent</u>	<u>Units</u>
Suspended Matter	< 5 mg/L (ppm)*
pH	6.5 - 8.5

\* milligrams/Liter (parts per million)

7. The discharge was previously regulated by Order No. 99-067 adopted by the Regional Board on 11 June 1999. This Order expired on 1 July 2001.

8. The Discharger did not submit a Report of Waste Discharge to revise Order No. 99-067, but did submit information necessary for permit renewal in several other documents. The Discharger has stated that they are not required to obtain a permit as CERCLA allows for an exemption from the necessity of obtaining a permit for onsite remedial response activities. However, one of the requirements that allows the exemption is that all substantive requirements that would be contained in the permit must be in the CERCLA decision document that governs the activity that would be permitted. An Interim Record of Decision (IROD) was signed in the summer of 1995 which does not contain all the substantive requirements contained in the NPDES permit. The substantive requirements are also known as Applicable, Relevant, and Appropriate Requirements (ARARs). Since the appropriate decision document, the IROD, does not contain all of the necessary ARARs, the NPDES permit is necessary to regulate the discharge.

9. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge as a minor discharge.

10. The Regional Board adopted the *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates

beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

11. As shown in Attachment A, a part of this Order, up to 2.16 mgd of treated groundwater may be discharged from the GWTS via Outfall 001 to **Magpie Creek**. When the Phase III wells become operational, the projected maximum discharge is expected to increase to 3.6 mgd. This Order may be reopened prior to expiration to consider this increase in flow. A portion of the 2.16 mgd currently discharged by the GWTS, up to 0.144 mgd, may be discharged via Outfall 002 to a wetlands area (Beaver Pond) which drains to adjacent **Don Julio Creek**, which is tributary to Magpie Creek east of the former McClellan AFB (Base) boundary and east of Raley Boulevard. According to documents provided by the Discharger (IRP Creeks and Floodplains Conceptual Site Model, 4 June 2002), Magpie Creek originates to the east of the McClellan Base boundary, in the Foothill Farms area, flowing in general from east to west through the Base. The tributary land area of Magpie Creek is approximately 4 square miles. Magpie Creek carries flows onto the Base through a set of culverts under Roseville Road. Magpie Creek conveys water across the developed portions of the Base through a series of channels and underground pipes. Portions of the Magpie Creek channel have been modified, at various times since 1945, from their original course. Within much of the Base, Magpie Creek is lined with concrete, gunite, or corrugated steel half-pipe. Downstream of Outfall 001 at Lang Avenue, the modified creek channel connects with the old alignment of Magpie Creek. From this point west to Raley Boulevard, Magpie Creek follows its original course and has not been re-routed or channelized.

Don Julio Creek originates east of the Base, in the North Highlands area. Don Julio Creek also flows, in general, from east to west, entering the Base near James Way via two 60 inch diameter culverts. After entering the Base, flow in Don Julio Creek is conveyed underground, resurfacing on the west side of the Base. In addition, a pair of creeks or drainage ditches originating from the Building 772 and 774 areas also feed into Don Julio Creek. Don Julio Creek then exits the Base, flows through a residential area, and re-enters the Base near the northwest corner. From the northwest corner of the Base, Don Julio Creek continues as a gunite lined ditch and flows south along Patrol Road, turning west near the center of the Base and exiting the Base near Raley Boulevard. Absent the discharge of treated groundwater from the GWTS, there are periods of limited or no flow in Magpie Creek and Don Julio Creek.

Off the Base and west of Raley Boulevard, Magpie Creek and Don Julio Creek flow into the Magpie Creek Diversion which empties into Robla (Rio Linda) Creek. This diversion was constructed in the 1950s to alleviate flooding along the lower reaches of Magpie Creek by diverting water to Robla Creek. Robla Creek, in turn, empties into the Natomas East Main Drainage Canal (NEMDC). From this point the NEMDC flows south to the north side of the American River, then turns west, paralleling the American River before emptying into the Sacramento River just north of Discovery Park and upstream from the confluence with the American River.

12. The Basin Plan at page II-2.00 states that: “Existing and potential beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams.” The Basin Plan does not specifically identify beneficial uses for Magpie Creek, Don Julio Creek, Robla Creek, or the NEMDC, but the Basin Plan does identify existing beneficial uses for the Sacramento River to which they are tributary.

In Table II-1 the Basin Plan identifies the following existing **beneficial uses** of the Sacramento River, from the Colusa Basin Drain to the I Street Bridge, downstream of the discharge: municipal and domestic supply, agricultural irrigation, body contact water recreation, other non-body contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, wildlife habitat, and navigation.

The Basin Plan on page II-1.00 states: “Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...” and with respect to disposal of wastewaters states that “... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.”

In reviewing what existing beneficial uses that may apply to Magpie Creek and Don Julio Creek, the Regional Board has considered the following facts:

1) *Domestic, Municipal, and Agricultural Irrigation Supply*

The Regional Board is required to apply the beneficial uses of municipal and domestic supply to Magpie Creek and Don Julio Creek based on SWRCB Resolution No. 88-63 which was incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056. In addition, the SWRCB has issued water rights to existing water users along the Sacramento River downstream of the discharge for domestic and irrigation uses. As noted in reports provided by the Discharger, Magpie Creek and Don Julio Creek are losing streams, losing some of their surface flow to the subsurface vadose zone and groundwater zones via surface water infiltration. Groundwater is a source of domestic, municipal and irrigation supply water. In addition to the existing water uses, growth in the area, downstream of the discharge, is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in Magpie Creek and Don Julio Creek. As noted previously, municipal and domestic supply are identified as existing beneficial uses of the Sacramento River.

2) *Water Contact and Non-Contact Recreation and Esthetic Enjoyment*

The Regional Board finds that the discharge flows through residential areas, and there is ready public access to Magpie Creek and Don Julio Creek. Exclusion of the public is unrealistic and contact recreational activities currently exist along the creeks. These uses are likely to increase as the population in the area grows.

3) *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

From the point of effluent discharge, Magpie Creek flows into the Magpie Creek Diversion which empties into Robla (Rio Linda) Creek. Robla Creek, in turn, empties into the Natomas East Main Drainage Canal (NEMDC). From this point the NEMDC flows south to the north side of the American River, then turns west, paralleling the American River before emptying into the Sacramento River just north of Discovery Park and upstream from the confluence with the American River. While the beneficial uses of Magpie Creek, are not identified in the Basin Plan, Table II-1 of the Basin Plan designates cold freshwater habitat (COLD) as an existing beneficial use of the Sacramento River, from the Colusa Basin Drain to the I Street Bridge, downstream of the discharge (#30, Hydro Unit Number 520.00). There is limited information on the specific types of habitats provided by Magpie Creek. However, Magpie Creek has been observed to retain pools of water several feet deep throughout the summer due to the GWTS effluent discharge. Magpie Creek, via Magpie Creek Diversion and Robla Creek, is tributary to, and in hydraulic continuity with the NEMDC during periods of the year. Information is available on the NEMDC which suggests it has served in the past as an important migration pathway for cold water aquatic fish species like salmon and steelhead. There are no known permanent barriers to flow between Magpie Creek and the Natomas East Main Drainage Canal which would prevent the migration or movement of cold water species between the water bodies at times of the year. Use of the tributary language in the Basin Plan results in the designation of the COLD beneficial use to Magpie Creek. Evidence in the record suggests that the COLD beneficial use is an appropriate designation for Magpie Creek. Designation of the COLD beneficial use to Magpie Creek necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/L (ppm). This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/L (ppm), the Discharger is not required to improve the naturally occurring level.

Upon review of the flow conditions, habitat values, existing and potential beneficial uses of the Sacramento River, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Sacramento River, from the Colusa Basin Drain to the I Street Bridge, are applicable to Magpie Creek and Don Julio Creek.

13. The Regional Board also finds that based on available information that Magpie Creek and Don Julio Creek, absent the discharges, are at times seasonal and/or ephemeral waterbodies. The seasonal and/or ephemeral nature of Magpie Creek and Don Julio Creek means that the

beneficial uses must be protected, but that no year-round credit for receiving water dilution is available. Although the discharges, at times, maintain the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, flows within Magpie Creek and/or Don Julio Creek help support aquatic life. Both conditions may exist within a short time span, where the creeks would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the NEMDC and the Sacramento River. The lack of dilution results in more stringent effluent limitations to protect recreational uses and aquatic life. Significant dilution may occur during the irrigation season, and immediately following high rainfall events.

The Discharger may conduct flow monitoring of Magpie Creek and Don Julio Creek to determine the actual flow regime. To the extent seasonal assimilative capacity is available in the receiving water to accommodate constituents in the effluent which exceed reasonable potential criteria, this permit contains a re-opener to consider final effluent limitations based upon demonstrated assimilative capacity. However, effluent limitations contained in this permit do not account for the receiving waters having assimilative capacity. The Discharger may submit additional receiving water characterization to demonstrate the flow regime and pollutant assimilative capacity and ask the Regional Board to re-open the permit to consider this new information.

14. USEPA adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board (SWRCB) adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP), which establishes requirements for implementation of the NTR and the CTR.
15. Areas of the Sacramento River, from Red Bluff to the Delta, have been identified as **Water Quality Limited Segments** under Section 303(d) of the CWA. The list of pollutants for which portions of this stretch of the Sacramento River is impaired appears on a list (the "California 303(d) List"), which was most recently updated in 1998. Pollutants and/or conditions identified on the California 303(d) List as impairing the Sacramento River, from Red Bluff to the Delta, to which Magpie Creek and Don Julio Creek are tributary, include mercury, diazinon, and unknown toxicity.
16. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream

excursion above a narrative or numeric water quality standard. The absence of a limitation for a constituent indicates either a lack of information is available for evaluation, or the constituent does not have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard. As a means of collecting additional information

necessary to conduct a complete reasonable potential analysis, this Order contains provisions that:

- a. Require the Discharger to provide information as to whether the levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives and NTR and CTR pollutants;
- b. If pollutants in the discharge have a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard, requires the Discharger to submit information to calculate effluent limitations for those pollutants; and
- c. Allow the Regional Board to reopen this Order and include effluent limitations for those pollutants.

On 10 September 2001, the Executive Officer issued a letter, in conformance with Section 13267 of the California Water Code, requiring the Discharger to prepare a technical report assessing effluent and receiving water quality. A copy of that letter, including its Attachments I through IV, are incorporated into this Order as Attachment D. This Order includes a Provision that is intended to be consistent with the requirements of Attachment D in requiring sampling and reporting of NTR, CTR, and additional constituents to determine if the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard. The Discharger has fulfilled the above requirement by submitting the monitoring data on 26 February 2003.

17. Technology-based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in a permit issued under section 402 of the CWA. Regulations promulgated at 40 CFR 122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on national effluent limitations guidelines and standards, best professional judgment (BPJ), or a combination of the two.
18. Volatile organic compounds (VOCs) have been detected in influent groundwater, prior to treatment. Trichloroethene (TCE), tetrachloroethene (PCE), 1,2-dichloroethane (1,2 DCA), cis-1,2-dichloroethene (cis-1,2 DCE), 1,1-dichloroethane (1,1 DCA), 1,1-dichloroethene (1,1 DCE), vinyl chloride, and 1,1,1 trichloroethane (1,1,1 TCA) have been detected in the GWTS influent during the past year (January 2001 through December 2001). Hereafter, these detected VOC's shall be referred to as VOC constituents of concern (VOC CoC's). PCE and TCE are the most common VOC CoC's detected in McClellan's influent. This GWTS is designed and operated in part to remove VOC's from groundwater. The air stripping with GAC polishing technology utilized by this GWTS is capable of dependably removing VOC CoC's to concentrations that are less than current analytical technology Minimum Levels (ML's) specified by the SIP (ML is defined in Appendix 1 to the SIP). Therefore, technology based effluent limitations still apply to

the discharge. This Order includes a daily maximum effluent limitation for the detected VOC CoC's of 1.0 µg/L (ppb), and includes a new monthly median limitation for the VOC CoC's of less than the analytical technique ML's specified by Appendix 4, Table 2a, of the SIP (or later amendment if new ML's are adopted by the SWRCB).

19. Previous Order No. 99-067 included a daily maximum effluent limitation of 'non-detectable' for **pesticides** associated with Method 8081. These pesticides are identified in Appendix 4, Table 2d of the SIP. Influent and effluent samples from the GWTS, and receiving water samples have been analyzed for pesticides twice each year. Pesticides have not been detected in the influent or effluent during the past year (January 2001 through December 2001). However, data for some of the pesticides was not of sufficient quality for comparison with CTR water quality criteria and water quality objectives for pesticides in the Basin Plan considering laboratory ML's specified by the SIP. The air stripping with GAC polishing technology utilized by this GWTS is capable of dependably removing pesticides to concentrations that are less than current analytical technology ML's specified by the SIP. Therefore, technology based effluent limitations still apply to the discharge. This Order retains a daily maximum effluent limitation for pesticides (those identified in Table 2d of Appendix 4 to the SIP) of less than the analytical technique ML's specified by Appendix 4, Table 2d, of the SIP (or later amendment if new ML's are adopted by the SWRCB).
20. Where technology-based effluent limitations are inadequate to ensure compliance with water quality standards applicable to the receiving water, more stringent effluent limits based upon applicable water quality standards are imposed.
21. Federal regulations, 40 CFR Part 122.44 (d)(1)(i), require that NPDES permit effluent limitations must control all pollutants which are or may be discharged at a level which will cause or have the reasonable potential to cause or contribute to an in-stream excursion above any State water quality standard, including any narrative criteria for water quality. Beneficial uses, together with their corresponding water quality objectives, constitute the state water quality standards for purposes of compliance with the Clean Water Act.

In determining whether a discharge has the reasonable potential to contribute to an in-stream excursion (reasonable potential analysis), the dilution of the effluent in the receiving water may be considered where areas of dilution are defined. The available dilution may also be used to calculate protective effluent limitations by applying water quality criteria at the edge of the defined mixing zone. These calculations include receiving water pollutant concentrations that are typically based on worst-case conditions for flow and concentration.

If limited or no dilution is available, effluent limitations are set equal to the applicable water quality criteria which are applied at the point of discharge so the discharge will not cause the receiving stream to exceed water quality objectives established to protect the beneficial uses. In situations where receiving water flows are substantially greater than effluent flows, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired



by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality criteria that are applied at the point of discharge such that the discharge will not cause or contribute to the receiving stream excursion above water quality objectives established to protect the beneficial uses.

22. Previous Order No. 99-067 included daily maximum, and monthly average effluent limitations of 1.0 mg/L (ppm) for **acetone**, **methyl ethyl ketone**, and **methyl isobutyl ketone** based upon the most stringent taste and odor criteria. Results of weekly influent and effluent monitoring conducted by the Discharger since January 2001 indicate influent and effluent concentrations of acetone, methyl ethyl ketone, and methyl isobutyl ketone have been less than detectable levels. Reporting limits utilized for these constituents were below applicable water quality criteria, and were as low as 8.2 ug/L (ppb) for acetone, 20 ug/L (ppb) for methyl ethyl ketone, and 1 ug/L (ppb) for methyl isobutyl ketone. Considering; this new information regarding influent and effluent quality, the use of air stripping for VOC removal and the use of GAC units for effluent polishing, and, the existing effluent limitation for VOC CoC's, the limitations for acetone, methyl ethyl ketone, and methyl isobutyl ketone have been removed from this Order. This Order will continue to include monitoring requirements for these constituents.
23. Previous Order No. 99-067 included a daily maximum and a monthly average limitation for **antimony** of 40 ug/L (ppb). The basis for these limitations was not described in the previous Order. The CTR provides a human health criterion for antimony of 14 ug/L (ppb). Consideration of this criterion in the reasonable potential analysis is appropriate as the beneficial uses of Magpie Creek and Don Julio Creek include municipal and domestic water supply. Results of effluent and receiving water monitoring since January 2001 indicate antimony has not been detected at or above laboratory reporting levels, to less than 5 ug/L (ppb), during that time period. Effluent and receiving water data collected since January 2001 represents new information which was not available at the time of adoption of the previous Order. Considering these facts, the effluent limitations for antimony from previous Order No. 99-067 have been removed from this Order (new information). This Order does require continued effluent and receiving water monitoring for antimony, and may be re-opened if antimony is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.
24. Previous Order No. 99-067 included daily maximum and monthly average effluent limitations for **hexavalent chromium** based upon USEPA aquatic life ambient water quality criteria, and a factor of safety. Order No. 99-067 included a daily maximum limitation for hexavalent chromium of 15ug/L (ppb), and a monthly average limitation for hexavalent chromium of 10 ug/L (ppb). Subsequent to the adoption of Order No. 99-067, USEPA published the CTR, and the SWRCB adopted the SIP. New limits for hexavalent chromium have been established in this Order based upon the reasonable potential to exceed the chronic freshwater aquatic life criterion

in the CTR, and in accordance with procedures specified by the SIP (new information). Results of effluent monitoring conducted by the Discharger indicate maximum effluent concentrations (MECs) of hexavalent chromium have been reported as high as 15 ug/L (ppb) (4/01). Without regard to dilution, this MEC exceeds the CTR freshwater chronic aquatic life Continuous Criterion Concentration (CCC) for hexavalent chromium of 11 ug/L (ppb).

Section 1.3 of the SIP requires a water quality based effluent limitation when the MEC exceeds appropriate pollutant criterion. New water quality based effluent limitations have been calculated based upon methodologies in the SIP. When required, Section 1.4 of the SIP provides four methods that may be used to develop effluent limitations. These four methods include: (1) assigning a loading allocation based upon a completed TMDL; (2) use of a steady state model; (3) use of a dynamic model; or, (4) establishing effluent limitations that consider intake water pollutants.

Considering that Magpie Creek and Don Julio Creek may, at times, have little or no flow and provide little or no assimilative capacity for hexavalent chromium, final water quality based effluent limitations have been developed using the steady state model in the SIP, with no credit provided for dilution. Development and calculation of the final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for hexavalent chromium is shown in the Information Sheet, a part of this Order. The final average monthly (10.0 µg/L (ppb)) and maximum daily (14.1 µg/L (ppb)) effluent limitations for hexavalent chromium have been established in this Order in accordance with Sections 1.3 and 1.4 of the SIP.

The Discharger may be unable to meet these new effluent limitations for hexavalent chromium. The GWTS has no processes specific to the removal of hexavalent chromium. The Discharger is currently investigating sources of hexavalent chromium in individual groundwater extraction wells and investigating ways to reduce hexavalent chromium concentrations in the final effluent. Section 2.1 of the SIP provides that: *“Based on an existing discharger’s request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.”* As the average monthly and maximum daily effluent limitations for hexavalent chromium are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP. This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for hexavalent chromium become effective on **25 June 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Regional Board. Otherwise, final water quality based effluent limitations for hexavalent chromium become effective **1 March 2008**.

In accordance with the SIP Section 2.2.1, numeric interim limitations for hexavalent chromium are required in this Order. Numeric interim limitations have been established based upon treatment facility performance. These interim limitations consist of projected maximum daily

and monthly average effluent concentrations derived using daily sample data collected during periods of discharge since January 2001 (39 data points, as summarized in Table A-1 of the July 2002 GWTS Monthly Operations Report), and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA's Technical Support Document for Water Quality-based Toxics Control (TSD). Where concentrations were reported as less than detectable, one half of the detection limit was used in the calculation. Derivation of these interim limitations is summarized in the Information Sheet.

These interim performance-based average monthly (16.5 µg/L (ppb)) and maximum daily (19.5 µg/L (ppb)) effluent limitations for hexavalent chromium shall be enforceable limitations until the final maximum daily and monthly average effluent limitations become effective on 1 March 2008, or 25 June 2003 if a compliance schedule justification is not submitted.

25. Previous Order No. 99-067 included daily maximum and monthly average effluent limitations for **total chromium** (80 µg/L (ppb), and 50 µg/L (ppb) respectively). These limitations were based upon the California primary MCL of 50 µg/L (ppb). The CTR does not include criteria for total chromium. Results of monitoring conducted by the Discharger indicate that the MEC for total chromium since the GWTS began operation has been less than 20 µg/L (ppb). Comparison of result for total chromium to hexavalent chromium suggest that the hexavalent chromium component may compose most if not all of the total chromium concentration. Final effluent limitations protective for hexavalent chromium, and significantly less than 50 µg/L (ppb), have been established in this Order. Considering these facts, the effluent from the GWTS has not demonstrated the reasonable potential to cause or contribute to an in-stream excursion above applicable water quality criteria for total chromium. The effluent limitations for total chromium from previous Order No. 99-067 have been removed from this Order (new information). This Order does require continued effluent and receiving water monitoring for total chromium, and may be re-opened if total chromium is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above appropriate water quality criteria.
26. Results of effluent monitoring of the GWTS indicates the MEC's of total **selenium** in the final effluent are typically less than the analytical reporting limit of 5 µg/L (ppb). However, selenium was detected in the final effluent above the laboratory reporting limit of 5 µg/L (ppb) on two occasions (7 µg/L (ppb) (June 2001) and 11 µg/L (ppb) (October 2001). The CTR, at 40 CFR 131.38, includes a Continuous Criterion Concentration (CCC) for selenium expressed in the total recoverable form. While other criteria for selenium were promulgated for specific waters in California in the NTR, it is the 5 µg/L (ppb) chronic criterion which applies to additional waters of the United States in the State of California pursuant to 40 CFR 131.38(c). Since the preservation and enhancement of fish, wildlife, and other aquatic resources and habitats is an existing beneficial use of Magpie Creek and Don Julio Creek, this criterion applies to these waters. Without regard to dilution, these MEC's exceed the CTR freshwater chronic aquatic life Continuous Criterion Concentration for selenium of 5 µg/L (ppb).

Section 1.3 of the SIP requires a water quality based effluent limitation when the MEC exceeds appropriate pollutant criterion. New water quality based effluent limitations for selenium have been calculated based upon methodologies in the SIP. Considering that Magpie Creek and Don Julio Creek may, at times, have little or no flow and provide little or no assimilative capacity for selenium, final water quality based effluent limitations have been developed using the steady state model in the SIP, with no credit provided for dilution.

Development and calculation of the final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for total selenium is shown in the Information Sheet, a part of this Order. The final average monthly (4.1 µg/L (ppb)) and maximum daily (8.2 µg/L (ppb)) effluent limitations for selenium have been established in this Order in accordance with Sections 1.3 and 1.4 of the SIP.

The Discharger may be unable to meet these new effluent limitations for selenium, and the GWTS has no processes specific to the removal of selenium. Section 2.1 of the SIP provides that: *“Based on an existing discharger’s request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.”* As the average monthly and maximum daily effluent limitations for selenium are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP. This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for selenium become effective on **25 June 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Regional Board. Otherwise, final water quality based effluent limitations for selenium become effective **1 March 2008**.

In accordance with the SIP Section 2.2.1, numeric interim limitations for selenium are required in this Order. Previous Order No. 99-067 included a daily maximum and monthly average effluent limitations for selenium of 10 µg/L (ppb). The daily maximum effluent limitation of the previous Order No. 99-067 has been retained in this Order as a numeric interim limitation. This interim limitation shall be an enforceable limitation until the final maximum daily and monthly average effluent limitations become effective on 1 March 2008, or 25 June 2003 if a compliance schedule justification is not submitted.

27. Results of effluent monitoring of the GWTS indicates concentrations of total **cadmium** in the final effluent have been less than the analytical reporting limit of 0.5 µg/L (ppb). More recent monitoring results indicate concentrations of total cadmium in the final effluent are less than the analytical reporting limit of 0.25 µg/L (ppb). As shown in Attachment C, these data indicate that the MEC’s of total cadmium in the final effluent do not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total cadmium. Receiving water monitoring of Magpie Creek has not been completed. This Order requires continued effluent and

receiving water monitoring for cadmium, and may be re-opened if it is found that cadmium is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

28. Results of effluent monitoring of the GWTS indicates the MEC of total **copper** in the final effluent was reported as an estimated 0.16 µg/L (ppb) (estimated as it was detected but not quantified, between the method detection limit (0.007 µg/L (ppb)) and the reporting limit (0.5 µg/L (ppb))). As shown in Attachment C, these data indicate that the MEC of total copper in the final effluent does not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total copper. Receiving water monitoring of Magpie Creek has not been completed. This Order requires continued effluent and receiving water monitoring for copper, and may be re-opened if it is found that copper is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.
29. Results of effluent monitoring of the GWTS indicates the MEC of total **lead** in the final effluent was reported as an estimated 0.02 µg/L (ppb) (estimated as it was detected but not quantified, between the method detection limit (0.01 µg/L (ppb)) and the reporting limit (0.5 µg/L (ppb))). As shown in Attachment C, these data indicate that the MEC of total lead in the final effluent does not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total lead. Receiving water monitoring of Magpie Creek has not been completed. This Order requires continued effluent and receiving water monitoring for lead, and may be re-opened if it is found that lead is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.
30. Results of effluent monitoring of the GWTS indicates the MEC of total **nickel** in the final effluent was reported as an estimated 0.8 µg/L (ppb) (estimated as it was detected but not quantified, between the method detection limit (0.2 µg/L (ppb)) and the reporting limit (1.0 µg/L (ppb))). As shown in Attachment C, these data indicate that the MEC of total nickel in the final effluent does not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total nickel. Receiving water monitoring of Magpie Creek has not been completed. This Order requires continued effluent and receiving water monitoring for nickel, and may be re-opened if it is found that nickel is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.
31. Results of effluent monitoring of the GWTS indicates the MEC of total **zinc** in the final effluent was reported as 30 µg/L (ppb) (04/01). As shown in Attachment C, the data indicate that concentrations of total zinc in the final effluent do not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total zinc. Receiving water monitoring of Magpie Creek has not been completed. This Order requires continued effluent and receiving

water monitoring for zinc, and may be re-opened if it is found that zinc is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

32. Previous Order No. 99-067 included a daily maximum and a monthly average effluent concentration limitation for **mercury** (1.0 µg/L (ppb) and 0.012 µg/L (ppb), respectively). The Basin Plan does not provide a numeric water quality objective for mercury. The current USEPA water quality criteria for mercury, for protection of human health for consumption of both water and organisms, is 0.050 µg/L (ppb). The USEPA is currently reviewing the ambient water quality criteria for mercury and may recommend more stringent criteria, based in part on organism uptake and bioaccumulation. The Sacramento River, from Red Bluff to the Delta, has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act for mercury, based on fish tissue concentration and not water column toxicity. The California DHS has issued health warnings regarding the consumption of fish from Delta waterways. While Magpie Creek and Don Julio Creek are not identified as impaired for mercury on the California 303(d) list, additional loading resulting from the discharge from the Discharger's GWTS has the potential to cause or contribute to the impairment resulting from mercury bioaccumulation in the Sacramento River and Delta. A TMDL for mercury is currently scheduled to be completed by December 2005.

At Section 2.1.1 the SIP states: "For bioaccumulative priority pollutants for which the receiving water has been included on the CWA Section 303(d) list, the RWQCB should consider whether the mass loading of the bioaccumulative pollutant(s) should be limited to representative, current levels pending TMDL development in order to implement the applicable water quality standard". Since mercury is a bioaccumulative pollutant included on the CWA 303(d) list for the Sacramento River and Delta, the intent of this Order is to include an interim performance based effluent limitation for mercury.

Results of limited 'ultra-clean' sampling and analysis conducted by the Discharger using EPA Method SW 1631 indicate GWTP effluent mercury concentrations ranged from < 0.0039 µg/L (ppb) to 0.017 µg/L (ppb). These concentrations do not exceed the CTR human health criteria. Current mercury data are not sufficient for establishment of an interim performance based limitation. This Order requires the Discharger to collect data necessary to establish an interim performance based effluent mass limitation.

Performance-based effluent limits for mercury are typically established as follows: 1) The average monthly effluent mercury concentration is calculated by adding all detected concentrations and one-half of the reported detection levels of all non-detectable mercury concentration results; 2) From the average monthly mercury concentration and average monthly flow, a monthly mercury mass discharge is calculated; and 3) A total mass for all months is then totaled, and an average annual mass discharge is calculated.

Following the establishment of the interim limit, the mass of mercury discharged shall not exceed the interim mercury mass limit twelve months on a running average. In calculating for compliance, the Discharger shall count all non-detect measures at one-half of the detection level and apply the monthly average flow from the sampled discharge. If compliance with the effluent limit is not attained due to the non-detect contribution, the Discharger will be directed to improve and implement available analytical capabilities and compliance will be evaluated with consideration of the detection limits. For each calendar month, the Discharger shall calculate twelve-month mass loadings. For monthly measures, monthly loadings shall be calculated using the average monthly flow and the average of all mercury analyses conducted that month. The Discharger shall submit a cumulative total of mass loadings for the previous twelve months with each self-monitoring report. Compliance will be determined based on the previous 12-month moving averages over the previous twelve months of monitoring.

Until sufficient data are collected to establish a performance based interim effluent mass limitation, this Order shall include a preliminary monthly average mercury concentration limitation using the concentration limitation of the previous Order (0.000012 mg/L (ppm)). Upon completion of the Interim Mercury Mass Limitation Study required by this Order, this Order shall be reopened and an interim performance based mercury mass effluent limitation established. Final effluent limitations may include: a waste load allocation derived from the TMDL, or a site specific water quality objective.

The economic effect of the provisions of this permit on the discharger is nominal. When established, the interim mercury effluent limits require the discharger to simply maintain current plant performance.

33. Specific **trace element** water quality objectives which apply to surface waters in the Sacramento and San Joaquin River Basins, including the Sacramento River, from Keswick Dam to the I Street Bridge, are provided in Table III-1 of Chapter III of the Basin Plan. This Order requires the collection of additional effluent and receiving water data necessary to assess the impact of the discharge on these dissolved trace metal water quality objectives of the Sacramento River.
34. Pollutants and/or conditions identified on the California 303(d) List as impairing the Sacramento River, from Red Bluff to the Delta, to which Magpie Creek and Don Julio Creek are tributary, include unknown **toxicity**. This Order requires acute toxicity monitoring of the effluent and chronic toxicity monitoring of the effluent and receiving water (Whole Effluent Toxicity (WET) testing) to ensure the discharge is not contributing additional toxicity to the receiving waters, and includes notification and follow-up procedures in the event toxic endpoints are observed. If it is determined that the discharge causes or contributes to chronic toxicity in Magpie Creek and/or Don Julio Creek, the Discharger is required to conduct a toxicity identification evaluation (TIE) and/or toxicity reduction evaluation (TRE). The TRE includes all reasonable steps to identify and eliminate the source(s) of toxicity. Based upon the results of the TRE, this Order

may be reopened to include a chronic toxicity limitation and/or a limitation for the specific toxicant identified in the TRE.

35. Previous Order No. 99-067 included receiving water limitations for **dissolved oxygen**. Receiving Water Limitation B.1 of previous Order No. 99-067 stated “The discharge shall not cause the dissolved oxygen concentration in Magpie Creek to fall below 5.0 mg/l.” As noted previously (Beneficial Uses Section), the Basin Plan (Table II-1) designates the Sacramento River as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan, the COLD, or cold water habitat designation, applies to Magpie Creek and Don Julio Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/L (ppm). This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/L (ppm), the Discharger is not required to improve the naturally occurring levels. This Order contains receiving water limitations for Magpie Creek and Don Julio Creek which specify that the in-stream dissolved oxygen concentration of these waters be maintained at, or above, 7.0 mg/L (ppm). This Order also requires collection of effluent dissolved oxygen data.
36. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge.
37. The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply.
38. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.
39. The action to renew a NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Relations Code, Section 21000, et. Seq.) in accordance with Section 13389 of the California Water Code.
40. The Regional Board has considered the information in the attached Information Sheet in developing the Findings of this Order. The attached Information Sheet is part of this Order. Attachments A, B, C, and D are also a part of this Order.
41. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.



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42. The Regional Board, in a public meeting, heard and considered all comments pertaining to this discharge.
43. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect 50 days following permit adoption (effective 15 June 2003), provided EPA has no objections.
44. Any person adversely affected by this action of the Regional Board may petition the SWRCB to review the action. The petition must be received by the State Board Office of the Chief Counsel, P.O. Box 100, Sacramento, CA 95812-0100, within 30 days of the date the action was taken. Copies of the law and regulations applicable to filing petitions will be provided upon request.

IT IS HEREBY ORDERED that Order No. 99-067 is rescinded, and that the Department of the Air Force, Air Force Real Property Agency, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

**A. Discharge Prohibitions:**

1. Discharge of wastewater to surface water at a location or in a manner different from that described in the Findings 1 - 6 is prohibited. This prohibition includes flows of partially treated or untreated ground water from the ground water collection and treatment system, and from any monitoring or extraction wells.
2. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.
3. The bypass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)].

**B. Effluent Limitations, Discharge from Outfall 001 to Magpie Creek, and Discharge from Outfall 002 to Beaver Pond/Don Julio Creek:**

1. The discharge shall not have a pH less than 6.5 nor greater than 8.5.
2. The daily average discharge flow from Outfall 001 shall not exceed 2.16 million gallons per day (mgd). The total combined daily average discharge flow from Outfall 001 and Outfall 002 shall not exceed 2.16 mgd. The daily average discharge flow from Outfall 002 shall not exceed 0.144 mgd.

3. An interim mass effluent limit for mercury shall be established, if necessary, based on the report required by Provision E.4. The preliminary mass limitation (Effluent Limitation B.5.) shall apply after collection of twelve months of data and will be applied per twelve months on a running average for the discharge to surface waters, subject to the conditions stated below:
  - a. In calculating for compliance, the Discharger shall count all non-detect measures at one-half of the detection level and apply the monthly average flow from the sampled discharge. If compliance with the effluent limit is not attained due to the non-detect contribution, the Discharger will improve and implement available analytical capabilities and compliance will be evaluated with consideration of the detection limits.
  - b. After collecting the initial twelve months of data, twelve month mass loadings should be calculated for each calendar month. For monthly measures, calculate monthly loadings using average monthly flow and the average of all mercury analyses conducted that month. After collecting the initial twelve months of data, the Discharger shall submit a cumulative total of mass loadings for the previous twelve months with each self-monitoring report. Compliance will be determined based on the previous 12-month moving averages over the previous twelve months of monitoring.
  
4. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay - - - - - 70%

Median for any three or more consecutive bioassays - - - - 90%

5. Effluent from Outfall 001 or Outfall 002 shall not exceed the following limits:

<u>Constituents</u>	<u>Units</u>	<u>Daily Maximum</u>	<u>Monthly Average</u>	<u>Monthly Median</u>
Volatile Organic Compound CoC's <sup>1</sup>	µg/L (ppb)	1.0 <sup>3</sup>	---	<sup>4</sup>
	lbs/day	0.018 <sup>6</sup>	---	---
	lbs/day	0.0012 <sup>7</sup>	---	---
Pesticides <sup>2</sup>	µg/L (ppb)	<sup>5</sup>	---	---
Hexavalent Chromium	µg/L (ppb)	14.1 <sup>9</sup>	10 <sup>9</sup>	---
	lbs/day	0.25 <sup>6,9</sup>	0.18 <sup>6,9</sup>	---
	lbs/day	0.017 <sup>7,9</sup>	0.012 <sup>7,9</sup>	---
	µg/L (ppb)	19.5 <sup>10</sup>	16.5 <sup>10</sup>	---
	lbs/day	0.35 <sup>6,10</sup>	50 <sup>6,10</sup>	---
	lbs/day	0.023 <sup>7,10</sup>	0.8 <sup>7,10</sup>	---
Selenium (Total)	µg/L (ppb)	8.2 <sup>9</sup>	4.1 <sup>9</sup>	---
	lbs/day	0.15 <sup>6,9</sup>	0.074 <sup>6,9</sup>	---
	lbs/day	0.01 <sup>7,9</sup>	0.005 <sup>7,9</sup>	---
	µg/L (ppb)	10 <sup>10</sup>	---	---
	lbs/day	0.18 <sup>6,10</sup>	---	---
	lbs/day	0.012 <sup>7,10</sup>	---	---
Mercury	µg/L (ppb)	---	0.012 <sup>8</sup>	---

<sup>1</sup> Those VOC constituents identified in Finding 18 of this Order (Eight compounds; 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, PCE, 1,1,1-TCA, TCE, and Vinyl Chloride).

<sup>2</sup> Those constituents identified in Table 2d of Appendix 4 to the SIP.

<sup>3</sup> Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment.

<sup>4</sup> Less than ML's identified in Table 2a of Appendix 4 to the SIP. For compliance determination purposes, use a USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment.

<sup>5</sup> Less than ML's for those pesticides identified in Table 2d of Appendix 4 to the SIP. For compliance determination purposes, use a USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment.

<sup>6</sup> Limit for Outfall 001, based upon maximum daily discharge limit of 2.16 mgd.

<sup>7</sup> Limit for Outfall 002, based upon maximum daily discharge limit of 0.144 mgd.

<sup>8</sup> Preliminary limitation until completion of Interim Mercury Mass Limitation Report of Provision E.4.

<sup>9</sup> Final limits effective 25 June 2003, unless compliance schedule justification is submitted. Otherwise, these final limits become effective 1 March 2008.

<sup>10</sup> Interim limits effective until 25 June 2003 unless compliance schedule justification is submitted. Otherwise, these interim limitations are effective until 1 March 2008.

**C. Sludge Disposal:**

1. Sludge is not produced by this treatment process. Spent carbon shall be sent for regeneration at an approved facility. Spent carbon and any collected screenings or other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.
2. Any proposed change in disposal practice from a previously approved practice shall be reported to the Executive Officer and EPA Regional Administrator at least **90 days** in advance of the change.

**D. Receiving Water Limitations:**

Receiving water limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit. A receiving water condition not in conformance with the limitation is not necessarily a violation of this Order. The Regional Board may require an investigation to determine cause and culpability prior to asserting a violation has occurred.

The discharge shall not cause the following in **Magpie Creek** or **Don Julio Creek**:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/L (ppm). The monthly median of the mean daily dissolved oxygen concentration at this location shall not fall below 85 percent of saturation in the main water mass, and the 95<sup>th</sup> percentile concentration shall not fall below 75 percent of saturation.
2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.
3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.
4. Esthetically undesirable discoloration.
5. Fungi, slimes, or other objectionable growths.
6. The turbidity to increase as follows:
  - a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.
  - b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

- c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.
  - d. More than 10 percent where natural turbidity is greater than 100 NTUs.
7. The normal ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 pH units.
  8. The normal ambient temperature to increase more than 5°F (3°C), or exceed 90°F (32.2°C).
  9. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
  10. Deposition of material that causes nuisance or adversely affects beneficial uses.
  11. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.
  12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
  13. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder.
  14. Taste or odor-producing substances to impart undesirable tastes or odors to water supplies, or to fish flesh or other edible products of aquatic origin; or to cause nuisance or adversely affect beneficial uses.

**E. Provisions:**

1. The treatment facility shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency. The discharge point shall be firmly anchored and repaired promptly if damaged due to flooding or other causes.
2. The discharge may contain constituents that have reasonable potential to cause or contribute to an exceedance of NTR, CTR water quality criteria, or other constituents that could exceed narrative or numeric water quality objectives in the Basin Plan. The specific constituents of concern are listed in the *Requirement to Submit Monitoring Data* letter

issued by the Executive Officer on 10 September 2001. A copy of that letter, including its Attachments I through IV, are incorporated into this Order as Attachment D. The Discharger fulfilled the above requirement by submitting the monitoring data on 26 February 2003. If after review of this information it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective this Order will be reopened and effluent limitations added for the subject constituents.

3. **Hexavalent Chromium, Selenium Compliance Schedule:** Within **sixty (60) days** of adoption of this Order the Discharger shall complete and submit a compliance schedule justification for hexavalent chromium and selenium. The compliance schedule justification shall include all applicable items specified by the SIP Section 2.1, Paragraph 3 (items (a) through (d)). Implementation of the new water quality based effluent limitations for hexavalent chromium and selenium become effective on **25 June 2003** if a compliance schedule justification meeting the requirements of Section 2.1 of the SIP is not completed and submitted by the Discharger. Otherwise the new final water quality based effluent limitations for hexavalent chromium and selenium required by this Order shall become effective on **1 March 2008**. As this schedule is greater than one year, the Discharger shall submit semi-annual progress reports on **15 January** and **15 July** each year until the Discharger achieves compliance with the final water quality based effluent limitations for hexavalent chromium and selenium.
4. **Interim Mercury Mass Limitation Report:** The Discharger shall submit within eighteen (18) months of adoption of this Order an *Interim Mercury Mass Limitation Report* which summarizes flow and effluent mercury data collected pursuant to MRP No. R5-2002-0052. As necessary, this Order may be reopened and an interim mass limit included for mercury.
5. **Mercury TMDL Reopener:** This Order shall be reopened, as necessary, and final effluent limitations established for mercury based upon a waste load allocation derived from the Sacramento River and/or Delta waterways TMDL or a site-specific water quality objective.
6. **Chronic Toxicity Testing:** The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the SWRCB, this Order may be reopened and a limitation based on that objective included.

7. **Reopeners:** This Order may be reopened and effluent and/or receiving water limitations modified based on information supplied as required above.
8. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."
9. The Discharger shall comply with Monitoring and Reporting Program No. R5-2003-0052, which is part of this Order, and any revisions thereto as ordered by the Executive Officer. When requested by USEPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.
10. This Order expires on **1 March 2008** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.
11. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of or clearance from the SWRCB (Division of Water Rights).
12. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.
13. To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.
14. The Discharger may be required to submit technical or monitoring reports as directed by the Executive Officer.
15. Additional influents to the GWTS, other than those specified in this Order shall be

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approved by the Executive Officer prior to being added. The additional influents shall be sufficiently characterized to allow a determination to be made as to the adequacy of the GWTS to treat the influent, adequacy of the permit effluent limits to protect water quality, and the formulation of any pretreatment measures that will be necessary. This Order may be reopened and modified as necessary to allow the new discharges.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 24 April 2003.

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THOMAS R. PINKOS, Executive Officer

*JDT/JME*



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2003-0052  
NPDES NO. CA0081850

FOR

UNITED STATES DEPARTMENT OF THE AIR FORCE  
FORMER McCLELLAN AIR FORCE BASE  
GROUND WATER EXTRACTION AND TREATMENT SYSTEM (GWTS)  
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For purposes of evaluating compliance with the limitations of Order No. R5-2003-0052, the Discharger shall conduct monitoring and submit reports as specified below. To evaluate compliance with the limitations of this Order, monitoring should occur within a brief enough period to be able to evaluate the effect of the effluent on the ambient water quality. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program.

### INFLUENT MONITORING

Representative influent groundwater samples shall be collected from the GWTS prior to treatment. When feasible, the influent shall be collected at approximately the same time as effluent samples.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Volatile Organic Compound CoC's <sup>1</sup>	µg/L <sup>3</sup> , ppb <sup>4</sup>	Grab	Annually
Pesticides <sup>2</sup>	µg/L <sup>3</sup> , ppb <sup>4</sup>	Grab	Annually
Acetone	µg/L <sup>3</sup> , ppb <sup>4</sup>	Grab	Annually
Methyl Ethyl Ketone	µg/L <sup>3</sup> , ppb <sup>4</sup>	Grab	Annually
Methyl Isobutyl Ketone	µg/L <sup>3</sup> , ppb <sup>4</sup>	Grab	Annually

<sup>1</sup> VOC CoC's from Finding 18 of the Order, using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment.

<sup>2</sup> Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment.

<sup>3</sup> micrograms per Liter.

<sup>4</sup> parts per billion.

### EFFLUENT MONITORING

#### (Outfall 001 to Magpie Creek and Outfall 002 to Don Julio Creek)

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples shall be representative of the volume and quality of the discharge, including batch releases from the GWTS. A sampling point may be selected which is representative of both Outfall 001 and Outfall 002. Time of collection of samples shall be recorded. The effluent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Flow	mgd	Meter	Continuous
pH <sup>1</sup>	pH units	Grab	Weekly

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<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Electrical Conductivity @ 25°C <sup>1</sup>	µmhos/cm	Grab	Weekly
Temperature <sup>1</sup>	°F	Grab	Weekly
Dissolved Oxygen <sup>1</sup>	mg/L (ppm)	Grab	Weekly
Volatile Organic Compound CoC's <sup>2</sup>	µg/L, (ppb) lbs/day	Grab	Monthly
Hexavalent Chromium <sup>4</sup>	µg/L, (ppb) lbs/day	Grab or 24-hour composite	Monthly
Selenium (Total) <sup>4, 7</sup>	µg/L, (ppb) lbs/day	Grab or 24-hour composite	Monthly
Hardness (as CaCO <sub>3</sub> ) <sup>5</sup>	mg/L, (ppm)	Grab	Quarterly
Total Dissolved Solids	mg/L, (ppm)	Grab	Quarterly
Total Suspended Solids	mg/L, (ppm)	Grab	Quarterly
Turbidity	NTU	Grab or 24-hour composite	Quarterly
Mercury (Total) <sup>6</sup>	µg/L, (ppb) lbs/day	Grab or 24-hour composite	Monthly
Cadmium (Total) <sup>4</sup>	µg/L, (ppb)	Grab or 24-hour composite	Annually
Total Chromium <sup>4</sup>	µg/L, (ppb)	Grab or 24-hour composite	Annually
Copper (Total) <sup>4</sup>	µg/L, (ppb)	Grab or 24-hour composite	Annually
Lead (Total) <sup>4</sup>	µg/L, (ppb)	Grab or 24-hour composite	Annually
Zinc (Total) <sup>4</sup>	µg/L, (ppb)	Grab or 24-hour composite	Annually
Basin Plan Metals (Dissolved) <sup>8</sup>	µg/L, (ppb)	Grab or 24-hour composite	Annually
Nitrate <sup>9</sup>	mg/L, (ppm)	Grab or 24-hour composite	Annually
Pesticides <sup>3</sup>	µg/L, (ppb)	Grab	Annually
Acetone	µg/L, (ppb)	Grab	Annually
Methyl Ethyl Ketone	µg/L, (ppb)	Grab	Annually
Methyl Isobutyl Ketone	µg/L, (ppb)	Grab	Annually
1,4 Dioxane	µg/L, (ppb)	Grab	Monthly
<u>Acute Toxicity</u> <sup>10</sup>	% Survival	Grab or 24-hour composite	Semi-Annually

- <sup>1</sup> Field Measurements.
- <sup>2</sup> VOC CoC's from Finding 18 of the Order (eight compounds; 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, PCE, 1,1,1-TCA, TCE, and Vinyl Chloride). Use USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment. Report all detectable concentrations between the Method Detection Limit and Minimum Level.
- <sup>3</sup> Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment. Report all detectable concentrations between the Method Detection Limit and Minimum Level.
- <sup>4</sup> At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the SIP. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a ML below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP, the Discharger is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the USEPA test methods.
- <sup>5</sup> Concurrent with metals monitoring.
- <sup>6</sup> Use clean sample collection techniques and USEPA Test Method 1669 or 1631, or later amendment for Mercury.
- <sup>7</sup> Use USEPA Test Method 7742/6020, or later amendment for Selenium.
- <sup>8</sup> Dissolved Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, Zinc.
- <sup>9</sup> Total Nitrate (as N).
- <sup>10</sup> The acute bioassays samples shall be analyzed using USEPA-821-R-02-012, Fifth Edition, or later amendment with Regional Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (*Pimephales promelas*). Applicable acute toxicity data derived from the three species chronic toxicity testing will be considered if appropriate.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

### RECEIVING WATER MONITORING (Magpie Creek and Beaver Pond)

All receiving water samples shall be grab samples. Receiving water monitoring in Magpie Creek and Beaver Pond is required only during periods of effluent discharge and shall include at least the following:

<u>Station</u>	<u>Description</u>
R-1	100 feet upstream from the point of discharge to Outfall 001
R-2	100 feet downstream from the point of discharge to Outfall 001
R-3	Within 100 feet from the point of discharge to Outfall 002

<u>Constituents</u>	<u>Units</u>	<u>Station</u>	<u>Sampling Frequency</u>
Flow <sup>1</sup>	Cfs	R-1	Daily
pH <sup>2</sup>	pH Units	R-1, R-2, R-3	Weekly
Electrical Conductivity @ 25°C <sup>2</sup>	µmhos/cm	R-1, R-2, R-3	Weekly

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<u>Constituents</u>	<u>Units</u>	<u>Station</u>	<u>Sampling Frequency</u>
Dissolved Oxygen <sup>2</sup>	mg/L, (ppm)	R-1, R-2, R-3	Weekly
Temperature <sup>2</sup>	°F	R-1, R-2, R-3	Weekly
Hardness (as CaCO <sub>3</sub> ) <sup>4</sup>	mg/L, (ppm)	R-1, R-2, R-3	Quarterly
Total Suspended Solids	mg/L, (ppm)	R-1, R-2, R-3	Quarterly
Total Organic Carbon	mg/L, (ppm)	R-1, R-2, R-3	Quarterly
Total Dissolved Solids	mg/L, (ppm)	R-1, R-2, R-3	Quarterly
Cadmium <sup>3</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Hexavalent Chromium <sup>3</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Total Chromium <sup>3</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Copper (Total) <sup>3</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Lead (Total) <sup>3</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Mercury (Total) <sup>5</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Selenium (Total) <sup>3,7</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Zinc (Total) <sup>3</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Basin Plan Metals (Dissolved) <sup>8</sup>	µg/L, (ppb)	R-1, R-2, R-3	Annually
Nitrate <sup>9</sup>	mg/L, (ppm)	R-1, R-2, R-3	Annually
Turbidity	NTU	R-1, R-2, R-3	Quarterly
Volatile Organic Compound CoC's <sup>10</sup>	µg/L, (ppb)	R-1, R-2, R-3	Quarterly
<u>Pesticides<sup>11</sup></u>	µg/L, (ppb)	R-1, R-2, R-3	Annually

<sup>1</sup> Estimate of receiving water flow, recorded for each day of sample collection.

<sup>2</sup> Field measurements.

<sup>3</sup> At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the SIP. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a ML below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP, the Discharger is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the USEPA test methods.

<sup>4</sup> Concurrent with metals monitoring.

<sup>5</sup> Use clean sample collection techniques and USEPA Test Method 1669 or 1631, or later amendment for Mercury.

<sup>6</sup> Field measurements.

<sup>7</sup> Use USEPA Test Method 7742/6020, or later amendment for Selenium.

<sup>8</sup> Dissolved Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, Zinc.

<sup>9</sup> Total Nitrate (as N).

- <sup>10</sup> Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment. Report all detectable concentrations between the Method Detection Limit and Minimum Level.
- <sup>11</sup> Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment. Report all detectable concentrations between the Method Detection Limit and Minimum Level.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2 on Magpie Creek, and R-3 in Beaver Pond. Attention shall be given to the presence of:

- |                                 |  |
|---------------------------------|--|
| a. Floating or suspended matter | e. Visible films, sheens or coatings       |
| b. Discoloration                | f. Fungi, slimes, or objectionable growths |
| c. Bottom deposits              | g. Potential nuisance conditions           |
| d. Aquatic life                 |  |

Notes on receiving water conditions shall be summarized in the monitoring reports.

### THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring for both Magpie Creek and Don Julio Creek shall be conducted to determine whether the effluent is contributing toxicity to Magpie Creek or Don Julio Creek. The testing shall be conducted as specified in EPA-821-R-02-013, Fourth Edition, or later amendment. Chronic toxicity samples shall be collected from the final GWTS effluent discharge prior to its entering Magpie Creek and Don Julio Creek. Grab samples shall be representative of the volume and quality of the discharge. Time of collection samples shall be recorded. The effluent tests must be conducted with concurrent reference toxicant tests. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 21 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas*, *Ceriodaphnia dubia*, and *Selenastrum capricornutum*  
 Frequency: **Once within twelve (12) months of Order Adoption**

For Magpie Creek and Don Julio Creek, the Discharger shall conduct the chronic toxicity testing using 100% effluent and 2 controls. If toxicity is found in any of the effluent tests, the Discharger must immediately retest using the full sampling protocol of 5 dilutions listed below.

Dilution Series:	<u>Dilutions (%)</u>					<u>Controls</u>	
						<b>Magpie Creek/Don Julio Creek</b>	Lab
	<u>100</u>	<u>50</u>	<u>25</u>	<u>12.5</u>	<u>6.25</u>	<u>Water</u>	<u>Water</u>
% GWTS Effluent	100	50	25	12.5	6.25	0	0
% Dilution Water*	0	50	75	87.5	93.75	100	0
% Lab Water	0	0	0	0	0	0	100

\* Dilution water shall be receiving water from Magpie Creek and Don Julio Creek taken upstream from the discharge point. If dilution water is not available in Don Julio Creek upstream from Outfall 002, use synthetic laboratory water.

## REPORTING

Monitoring reports shall be submitted to the Regional Board by the **first day** of the second month following sample collection. Semi-annual and annual monitoring results shall be submitted by the **first day of the second month following each calendar semi-annual period, and year**, respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and should be determined and recorded.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

- a. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.
- b. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).
- c. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the groundwater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for accuracy.

The Discharger may also be requested to submit an annual report to the Regional Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

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The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered By: \_\_\_\_\_ THOMAS R. PINKOS, Executive Officer

\_\_\_\_\_ 24 April 2003

(Date)

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## INFORMATION SHEET

INFORMATION SHEET - ORDER NO. R5-2003-0052  
UNITED STATES DEPARTMENT OF THE AIR FORCE  
FORMER Mc CLELLAN AIR FORCE BASE  
GROUND WATER EXTRACTION AND TREATMENT SYSTEM  
SACRAMENTO COUNTY

### **Site Description and Background**

The former McClellan Air Force Base (Base) is approximately eight miles northeast of downtown Sacramento in North Highlands. As part of the Base Realignment and Closure (BRAC) Program, the Base was officially closed on 13 July 2001. Clean-up of the former Base is currently supervised by the Department of Defense (DOD) Installation and Restoration Program (IRP). The IRP is designed to manage the overall DOD activities with respect to past waste disposal practices and site remediation. This program has identified 318 sites on the former Base. The cleanup of IRP sites, and reuse and transfer of the former base property, is being directed by the Air Force Real Property Agency (hereafter Discharger). To date, seven Operable Units (OUs) have been identified for evaluation under the McClellan Federal Facilities Agreement (FFA). Many contamination source areas have been identified and found to have soil and ground water contamination due to buried and burned wastes, spills, unregulated disposal practices, leaking underground storage tanks, and industrial activities on the former Base. Contamination is found to extend from the surface to 150 to 200 feet in depth and includes many volatile organic compounds, semi-volatile compounds, and heavy metals.

### **Groundwater Extraction and Treatment System**

One of the first sites to be addressed was Site S in OU D, located in the northwest portion of the former Base. The plan for controlling and remediating the contamination in OU D included: removing 20,000 cubic yards of soils and sludges; installing a plastic membrane and soil cap to stop rainfall infiltration into the contaminated area, and; operation of a groundwater extraction and treatment system. The latter element was designed to create a cone of depression beneath the OU D contamination and prevent further migration of pollutants. It was deemed impractical to remove the contamination to a depth of 150 feet.

The Discharger owns and operates this ground water extraction and treatment system (GWTS) to extract ground water contaminated with volatile organic compounds (VOC's), remove the contaminants, and discharge the treated water. Currently, the GWTS receives approximately 80 gallons per minute (gpm) from six extraction wells in OU D. Since 1988, an additional 250 gpm has been derived from a three well extraction system in Operable Unit C. A third extraction system was completed in Operable Unit B in 1992 that produces 200-300 gpm. Additional extraction wells have been completed in Operable Units B and C and were connected to the treatment system in late 1995 bringing the extraction total to approximately 800 gpm. Contribution from another round of groundwater extraction well construction in Operable Units A, B, and C in 1998 and early 1999 brought the influent flow to the plant to approximately 1500 gpm.

The GWTS includes an ultraviolet/peroxide (UVOX) system, an air stripper, and granular activated carbon vessels. The UVOX system was designed to reduce the concentration of volatile organics from a select group of extraction wells. In January 2002, the UVOX system was bypassed and shut down because lower concentrations of contaminants entering the system make UVOX treatment unnecessary.



The UVOX system was designed to reduce contaminant loading from specific wells, particularly contaminants that use a significant amount of carbon during treatment (such as vinyl chloride and chlorinated ethanes). The UVOX system will remain in place at the GWTP in case it is needed in the future.

The air-stripper is designed to treat up to 2000 gpm and remove approximately 99% of the volatile organics in the groundwater entering the stripper. The off-gas from the stripper is treated by concentrating the contaminants and then using a thermal oxidation unit to destroy the contaminants. A scrubber is utilized to remove acid generated during the thermal destruction process.

Granular activated carbon (GAC) trains are utilized for effluent polishing. Each GAC train consists of two vessels, operated in either parallel or series. Each GAC contact vessel is 10 feet in diameter and 10 feet in length, providing 10.5 minutes of contact. One train operates at 500 gpm, while the other three trains operate at 350 gpm. The GWTS configuration will change to accommodate the Ion Exchange (IX) Hexavalent Chromium Full Scale Treatment system. Two vessels will be used in series (lead/lag) to accommodate the new IX system operating at flows of up to 750 gpm. The other six vessels will be operated in parallel for VOC polishing. Once the Phase III wells are added the total flow will become about 2000 gpm.

The GWTS is currently designed to treat a maximum of 2.16 million gallons per day (mgd) of extracted groundwater. When Phase III extraction wells become operational, the treatment capacity will likely increase to approximately 3.6 mgd. Phase III is anticipated to be completed in 2006. Treated groundwater is subsequently discharged to Magpie Creek, tributary to the Magpie Creek Diversion, tributary to Robla (Rio Linda) Creek, tributary to the Natomas East Main Drainage Canal, tributary to the Sacramento River. A small portion of the flow, up to 0.144 mgd, is also discharged to a wetland which drains to adjacent Don Julio Creek, which is tributary to Magpie Creek. All of these are waters of the United States, in Section 24, T19N, R5E, MDB&M as shown in Attachment A, incorporated herein and made a part of this Order.

The discharge is described as follows:

Average flow:	2.12 mgd
Design flow:	2.16 mgd
Average temperature:	72 °F summer; 60 °F winter

<u>Constituent</u>	<u>Units</u>
Suspended Matter	< 5 mg/L (ppm)*
pH	6.5 - 8.5

\* milligrams/Liter (parts per million)

The discharge was previously regulated by Order No. 99-067 adopted by the Regional Board on 11 June 1999. This Order expired on 1 July 2001. The Discharger did not submit a Report of Waste Discharge

to revise Order No. 99-067, but did submit information necessary for permit renewal in several other documents. The Discharger has stated that they are not required to obtain a permit as CERCLA allows for an exemption from the necessity of obtaining a permit for onsite remedial response activities. However, one of the requirements that allows the exemption is that all substantive requirements that would be contained in the permit must be in the CERCLA decision document that governs the activity that would be permitted. An Interim Record of Decision (IROD) was signed in the summer of 1995 which does not contain all the substantive requirements contained in the NPDES permit. The substantive requirements are also known as Applicable, Relevant, and Appropriate Requirements (ARARs). Since the appropriate decision document, the IROD, does not contain all of the necessary ARARs, the NPDES permit is necessary to regulate the discharge.

### **Receiving Waters**

As shown in Attachment A, a part of this Order, up to 2.16 mgd of treated groundwater may be discharged from the GWTS via Outfall 001 to **Magpie Creek**. When the Phase III wells become operational, the projected maximum discharge is expected to increase to 3.6 mgd. This Order may be reopened prior to expiration to consider this increase in flow. A portion of the 2.16 mgd currently discharged by the GWTS, up to 0.144 mgd, may be discharged via Outfall 002 to a wetlands area (Beaver Pond) which drains to adjacent **Don Julio Creek**, which is tributary to Magpie Creek east of the Base boundary and east of Raley Boulevard. According to documents provided by the Discharger (IRP Creeks and Floodplains Conceptual Site Model, 4 June 2002), Magpie Creek originates to the east of the Base boundary, in the Foothill Farms area, flowing in general from east to west through the Base. The tributary land area of Magpie Creek is approximately 4 square miles. Magpie Creek carries flows onto the Base through a set of culverts under Roseville Road. Magpie Creek conveys water across the developed portions of the Base through a series of channels and underground pipes. Portions of the Magpie Creek channel have been modified, at various times since 1945, from their original course. Within much of the Base, Magpie Creek is lined with concrete, gunite, or corrugated steel half-pipe. Downstream of Outfall 001 at Lang Avenue, the modified creek channel connects with the old alignment of Magpie Creek. From this point west to Raley Boulevard, Magpie Creek follows its original course and has not been re-routed or channelized.

Don Julio Creek originates east of the Base, in the North Highlands area. Don Julio Creek also flows, in general, from east to west, entering the Base at near James Way via two 60-inch diameter culverts. After entering the Base, flow in Don Julio Creek is conveyed underground, resurfacing on the west side of the Base. In addition, a pair of creeks or drainage ditches originating from the Building 772 and 774 areas also feed into Don Julio Creek. Don Julio Creek then exits the Base, flows through a residential area, and re-enters the Base near the northwest corner. From there the creek continues as a gunite lined ditch and flows south along Patrol Road, turning west near the center of the Base and exiting the Base near Raley Boulevard. Absent the discharge of treated groundwater from the GWTS, there are periods of limited or no flow in Magpie Creek and Don Julio Creek.

Off the Base and west of Raley Boulevard, Magpie Creek and Don Julio Creek flow into the Magpie Creek Diversion which empties into Robla (Rio Linda) Creek. This diversion was constructed in the 1950s to alleviate flooding along the lower reaches of Magpie Creek by diverting water to Robla Creek.

Robla Creek, in turn, empties into the Natomas East Main Drainage Canal (NEMDC). From this point the NEMDC flows south to the north side of the American River, then turns west, paralleling the American River before emptying into the Sacramento River just north of Discovery Park, upstream from the confluence with the American River.

### **Beneficial Uses**

The Basin Plan at page II-2.00 states that: “Existing and potential beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams.” The Basin Plan does not specifically identify beneficial uses for Magpie Creek, Don Julio Creek, Robla Creek, or the NEMDC, but the Basin Plan does identify existing beneficial uses for the Sacramento River to which they are tributary.

In Table II-1 the Basin Plan identifies the following existing **beneficial uses** of the Sacramento River, from the Colusa Basin Drain to the I Street Bridge, downstream of the discharge: municipal and domestic supply, agricultural irrigation, body contact water recreation, other non-body contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, wildlife habitat, and navigation.

The Basin Plan on page II-1.00 states: “Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...” and with respect to disposal of wastewaters states that “... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.”

In reviewing what existing beneficial uses that may apply to Magpie Creek and Don Julio Creek, the Regional Board has considered the following facts:

#### *1) Domestic, Municipal, and Agricultural Irrigation Supply*

The Regional Board is required to apply the beneficial uses of municipal and domestic supply to Magpie Creek and Don Julio Creek based on SWRCB Resolution No. 88-63 which was incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056. In addition, the SWRCB has issued water rights to existing water users along the Sacramento River downstream of the discharge for domestic and irrigation uses. As noted in reports provided by the Discharger, Magpie Creek and Don Julio Creek are losing streams, losing some of their surface flow to the subsurface vadose zone and groundwater zones via surface water infiltration. Groundwater is a source of domestic, municipal and irrigation supply water. In addition to the existing water uses, growth in the area, downstream of the discharge, is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in Magpie Creek and Don Julio Creek. As noted previously, municipal and domestic supply are identified as existing beneficial uses of the Sacramento River.

2) *Water Contact and Non-Contact Recreation and Esthetic Enjoyment*

The Regional Board finds that the discharge flows through residential areas, and there is ready public access to Magpie Creek and Don Julio Creek. Exclusion of the public is unrealistic and contact recreational activities currently exist along the creeks. These uses are likely to increase as the population in the area grows.

3) *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

From the point of effluent discharge, Magpie Creek flows into the Magpie Creek Diversion which empties into Robla (Rio Linda) Creek. Robla Creek, in turn, empties into the Natomas East Main Drainage Canal (NEMDC). From this point the NEMDC flows south to the north side of the American River, then turns west, paralleling the American River before emptying into the Sacramento River just north of Discovery Park and upstream from the confluence with the American River. While the beneficial uses of Magpie Creek, are not identified in the Basin Plan, Table II-1 of the Basin Plan designates cold freshwater habitat (COLD) as an existing beneficial use of the Sacramento River, from the Colusa Basin Drain to the I Street Bridge, downstream of the discharge (#30, Hydro Unit Number 520.00). There is limited information on the specific types of habitats provided by Magpie Creek. However, Magpie Creek has been observed to retain pools of water several feet deep throughout the summer due to the GWTS effluent discharge. Magpie Creek, via Magpie Creek Diversion and Robla Creek, is tributary to, and in hydraulic continuity with the NEMDC during periods of the year. Information is available on the NEMDC which suggests it has served in the past as an important migration pathway for cold water aquatic fish species like salmon and steelhead. There are no known permanent barriers to flow between Magpie Creek and the Natomas East Main Drainage Canal which would prevent the migration or movement of cold water species between the water bodies at times of the year. Use of the tributary language in the Basin Plan results in the designation of the COLD beneficial use to Magpie Creek. Evidence in the record suggests that the COLD beneficial use is an appropriate designation for Magpie Creek. Designation of the COLD beneficial use to Magpie Creek necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/L (ppm). This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/L (ppm), the Discharger is not required to improve the naturally occurring level.

Upon review of the flow conditions, habitat values, existing and potential beneficial uses of the Sacramento River, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Sacramento River, from the Colusa Basin Drain to the I Street Bridge, are applicable to Magpie Creek and Don Julio Creek.

The Regional Board also finds that based on available information that Magpie Creek and Don Julio Creek, absent the discharges, are at times seasonal and/or ephemeral waterbodies. This seasonal and/or

ephemeral nature of Magpie Creek and Don Julio Creek means that the beneficial uses must be protected, but that no year-round credit for receiving water dilution is available. Although the discharges, at times, maintain the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, flows within Magpie Creek and/or Don Julio Creek help support aquatic life. Both conditions may exist within a short time span, where the creeks would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the NEMDC and the Sacramento River. The lack of dilution results in more stringent effluent limitations to protect recreational uses and aquatic life. Significant dilution may occur during the irrigation season, and immediately following high rainfall events.

The Discharger may conduct flow monitoring of Magpie Creek and Don Julio Creek to determine the actual flow regime. To the extent seasonal assimilative capacity is available in the receiving water to accommodate constituents in the effluent which exceed reasonable potential criteria, this permit contains a re-opener to consider final effluent limitations based upon demonstrated assimilative capacity. However, effluent limitations contained in this permit do not account for the receiving waters having assimilative capacity. The Discharger may submit additional receiving water characterization to demonstrate the flow regime and pollutant assimilative capacity and ask the Regional Board to re-open the permit to consider this new information.

### **CTR, NTR, and SIP**

USEPA adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board (SWRCB) adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP), which establishes requirements for implementation of the NTR and the CTR

Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard. The absence of a limitation for a constituent indicates either a lack of information is available for evaluation, or the constituent does not have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard. As a means of collecting additional information necessary to conduct a complete reasonable potential analysis, this Order contains provisions that:

- 1) Require the Discharger to provide information as to whether the levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives and NTR and CTR pollutants;
- 2) If pollutants in the discharge have a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard, requires the Discharger to submit information to calculate effluent limitations for those pollutants; and

- 3) Allow the Regional Board to reopen this Order and include effluent limitations for those pollutants.

On 10 September 2001, the Executive Officer issued a letter, in conformance with Section 13267 of the California Water Code, requiring the Discharger to prepare a technical report assessing effluent and receiving water quality. A copy of that letter, including its Attachments I through IV, are incorporated into this Order as Attachment D. This Order includes a Provision that is intended to be consistent with the requirements of Attachment D in requiring sampling and reporting of NTR, CTR, and additional constituents to determine if the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard. The Discharger has fulfilled the above requirement by submitting the monitoring data on 26 February 2003.

### **303d Listed Constituents**

Areas of the Sacramento River, from Red Bluff to the Delta, have been identified as Water Quality Limited Segments under section 303(d) of the CWA. The list of pollutants for which portions of this stretch of the Sacramento River is impaired appears on a list (the "California 303(d) List"), which was most recently updated in 1998. Pollutants and/or conditions identified on the California 303(d) List as impairing the Sacramento River, from Red Bluff to the Delta, to which Magpie Creek and Don Julio Creek are tributary, include mercury, diazinon, and unknown toxicity.

### **Consideration of Effluent Limitations**

#### **Technology Based Effluent Limitations**

Technology-based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in a permit issued under section 402 of the CWA. Regulations promulgated at 40 CFR 122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on national effluent limitations guidelines and standards, best professional judgment (BPJ), or a combination of the two.

#### **Volatile Organic Compounds (VOCs)**

Volatile organic compounds (VOCs) have been detected in influent groundwater, prior to treatment. Trichloroethene (TCE), tetrachloroethene (PCE), 1,2-dichloroethane (1,2 DCA), cis-1,2-dichloroethene (cis-1,2 DCE), 1,1-dichloroethane (1,1 DCA), 1,1-dichloroethene (1,1 DCE), vinyl chloride, and 1,1,1 trichloroethane (1,1,1 TCA) have been detected in the GWTS influent during the past year (January 2001 through December 2001). Hereafter, these detected VOC's shall be referred to as VOC constituents of concern (VOC CoC's). PCE and TCE are the most common VOC CoC's detected in McClellan's influent. This GWTS is designed and operated in part to remove VOC's from groundwater.

The air stripping with GAC polishing technology utilized by this GWTS is capable of dependably removing VOC CoC's to concentrations that are less than current analytical technology Minimum Levels (ML's) specified by the SIP (ML is defined in Appendix 1 to the SIP). Therefore, technology based effluent limitations still apply to the discharge. This Order includes a daily maximum effluent

limitation for the detected VOC CoC's of 1.0 µg/L (ppb), and includes a new monthly median limitation for the VOC Coc's of less than the analytical technique ML's specified by Appendix 4, Table 2a, of the SIP (or later amendment if new ML's are adopted by the SWRCB).

### **Pesticides**

Previous Order No. 99-067 included a daily maximum effluent limitation of 'non-detectable' for **pesticides** associated with Method 8081. These pesticides are identified in Appendix 4, Table 2d of the SIP. Influent and effluent samples from the GWTS, and receiving water samples have been analyzed for pesticides twice each year. Pesticides have not been detected in the influent or effluent during the past year (January 2001 through December 2001). However, data for some of the pesticides was not of sufficient quality for comparison with CTR water quality criteria and water quality objectives for pesticides in the Basin Plan considering laboratory ML's specified by the SIP. The air stripping with GAC polishing technology utilized by this GWTS is capable of dependably removing pesticides to concentrations that are less than current analytical technology ML's specified by the SIP. Therefore, technology based effluent limitations still apply to the discharge. This Order retains a daily maximum effluent limitation for pesticides (those identified in Table 2d of Appendix 4 to the SIP) of less than the analytical technique ML's specified by Appendix 4, Table 2d, of the SIP (or later amendment if new ML's are adopted by the SWRCB).

### **Reasonable Potential Analyses**

Where technology-based effluent limitations are inadequate to ensure compliance with water quality standards applicable to the receiving water, more stringent effluent limits based upon applicable water quality standards are imposed.

### **Water Quality Based Effluent Limitations**

Federal regulations, 40 CFR Part 122.44 (d)(1)(i), require that NPDES permit effluent limitations must control all pollutants which are or may be discharged at a level which will cause or have the reasonable potential to cause or contribute to an in-stream excursion above any State water quality standard, including any narrative criteria for water quality. Beneficial uses, together with their corresponding water quality objectives, constitute the state water quality standards for purposes of compliance with the Clean Water Act.

The Porter Cologne Water Quality Control Act defines water quality objectives as "...*the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area*". Water quality objectives designed to protect beneficial uses and prevent nuisances are found in the Basin Plan, and may be stated in either numerical or narrative form.

In determining whether a discharge has the reasonable potential to contribute to an in-stream excursion (reasonable potential analysis), the dilution of the effluent in the receiving water may be considered where areas of dilution are defined. The available dilution may also be used to calculate protective effluent limitations by applying water quality criteria at the edge of the defined mixing zone. These

calculations include receiving water pollutant concentrations that are typically based on worst-case conditions for flow and concentration.

If limited or no dilution is available, effluent limitations are set equal to the applicable water quality criteria which are applied at the point of discharge so the discharge will not cause the receiving stream to exceed water quality objectives established to protect the beneficial uses. In situations where receiving water flows are documented, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality criteria that are applied at the point of discharge such that the discharge will not cause or contribute to the receiving stream excursion above water quality objectives established to protect the beneficial uses.

### **Data Adjustments**

In most situations, EPA's NPDES regulations require that limits for metals in permit's be stated as total recoverable. Since most water quality criteria are expressed in the dissolved form, it is necessary to translate between dissolved metal in ambient waters and total recoverable metal in effluent. EPA guidance on the use of translators provides three options including, (1) assuming the translator equivalent to the criteria guidance conversion factor, (2) developing a translator directly as the ratio of dissolved to total recoverable metal, and/or, (3) developing a translator through the use of a partitioning coefficient. Reasonable potential analysis for this permit was conducted using the first option, applying criteria guidance conversion factors. To assure that metals criteria are appropriate for the chemical conditions under which they are applied, EPA also provides for adjustment of the criteria through application of the water-effect ratio (WER). The WER approach compares bioavailability and toxicity of a specific pollutant in receiving waters and in laboratory waters. For this permit, reasonable potential analysis was conducted using a WER default value of 1. As described in the CTR, freshwater aquatic life criteria for certain metals are expressed as a function of hardness, since hardness, and/or water quality characteristics that are usually correlated with hardness can reduce or increase the toxicities of some metals.

Hardness is used as a surrogate for a number of water quality characteristics which affect the toxicity of metals in a variety of ways. To ensure the level of protection intended by the EPA's 1985 Guidelines for hardness is maintained or exceeded, the minimum observed hardness of the upstream water that does not contain effluent should be used to adjust the applicable criterion. Limited receiving water and effluent hardness data has been collected by the Discharger, as it was not required to be collected by previous Order monitoring programs. For purposes of the reasonable potential analysis, hardness dependent criteria have been adjusted where appropriate using the limited amount of hardness data that has been collected. The minimum observed hardness of Magpie Creek, upstream of the point of effluent discharge, was reported as 33 mg/L (ppm) as CaCO<sub>3</sub> (on 4/15/02). The hardness of Magpie Creek downstream of the point of effluent discharge has not been assessed. For purposes of the reasonable potential analysis, hardness dependent criterion were adjusted using these lowest observed hardness



levels of Magpie Creek, upstream of the point of effluent discharge. The reasonable potential analysis for hardness dependent criteria may be reconsidered upon collection of additional constituent and hardness data as required by the 10 September 2001 *Requirement to Submit Monitoring Data* Letter. This Order may be reopened at that time.

### **Evaluation of Priority Pollutants Requiring Water Quality Based Effluent Limitations**

Section 1.3 of the SIP requires that the Regional Board to conduct an analysis for each priority pollutant with an applicable criterion or objective to determine if a water quality based effluent limitation is required. Attachment C summarizes final effluent inorganic priority pollutant data collected from the GWTS during the most recent periods of discharge to Magpie Creek. Attachment C also includes a summary of aquatic life and human health criteria for each inorganic priority pollutant. The Criteria Maximum Concentration (CMC) is defined by USEPA as the water quality criteria to protect against acute effects in aquatic life and is the highest in stream concentration of a priority toxic pollutant consisting of a short-term average not to be exceeded more than once every three years on the average. The Continuous Criteria Concentration (CCC) is the water quality criteria to protect against chronic effects in aquatic life and is the highest in stream concentration of a priority toxic pollutant consisting of a 4-day average not to be exceeded more than once every three years on the average. The CTR also includes human health criteria for many priority pollutants.

### **Calculation of Effluent Limitations**

At Section 1.4, the SIP provides four methods for developing SIP water quality based effluent limitations necessary to control a priority pollutant. These methods include:

1. Use of a Waste Load Allocation based upon the results of a TMDL
2. Use of Steady State Model(s)
3. Use of Dynamic Model(s)
4. Established effluent limitations which consider intake water pollutants

### **Data Quality/Discussion of RPA for Specific Pollutants**

Based upon effluent and receiving water data provided by the Discharger, and the methods prescribed by the SIP, priority pollutants for which a water quality based effluent limitation is required based upon available data are described in greater detail below. Where pollutant information was not sufficient, this Order requires the collection of additional effluent and background water quality data of sufficient quality for comparison with appropriate criteria, and may be reopened if collected data indicate concentrations of pollutants are or may be discharged at a level which will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the appropriate criteria.

### **Antimony**

Previous Order No. 99-067 included a daily maximum and a monthly average limitation for antimony of 40 µg/L (ppb). The basis for these limitations was not described in the previous Order. The CTR provides a human health criterion for antimony of 14 µg/L (ppb). Consideration of this criterion in the reasonable potential analysis is appropriate as the beneficial uses of Magpie Creek and Don Julio Creek include municipal and domestic water supply. Results of effluent and receiving water monitoring since

January 2001 indicate antimony has not been detected at or above laboratory reporting levels, to less than 5 µg/L (ppb), during that time period. Effluent and receiving water data collected since January 2001 represents new information which was not available at the time of adoption of the previous Order. Considering these facts, the effluent limitations for antimony from previous Order No. 99-067 have been removed from this Order (new information). This Order does require continued effluent and receiving water monitoring for antimony, and may be re-opened if antimony is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

### **Hexavalent Chromium**

Previous Order No. 99-067 included daily maximum and monthly average effluent limitations for hexavalent chromium based upon USEPA aquatic life ambient water quality criteria, and a factor of safety. Order No. 99-067 included a daily maximum limitation for hexavalent chromium of 15µg/L (ppb), and a monthly average limitation for hexavalent chromium of 10 µg/L (ppb). Subsequent to the adoption of Order No. 99-067, USEPA published the CTR, and the SWRCB adopted the SIP. New limits for hexavalent chromium have been established in this Order based upon the reasonable potential to exceed the chronic freshwater aquatic life criterion in the CTR, and in accordance with procedures specified by the SIP (new information). Results of effluent monitoring conducted by the Discharger indicate maximum effluent concentrations (MECs) of hexavalent chromium have been reported as high as 15 ug/L (ppb) (4/01). Without regard to dilution, this MEC exceeds the CTR freshwater chronic aquatic life Continuous Criterion Concentration for hexavalent chromium of 11 ug/L (ppb).

Section 1.3 of the SIP requires a water quality based effluent limitation when the MEC exceeds appropriate pollutant criterion. New water quality based effluent limitations have been calculated based upon methodologies in the SIP.

When required, Section 1.4 of the SIP provides four methods that may be used to develop effluent limitations. These four methods include: (1) assigning a loading allocation based upon a completed TMDL; (2) use of a steady state model; (3) use of a dynamic model; or, (4) establishing effluent limitations that consider intake water pollutants.

Considering that Magpie Creek and Don Julio Creek may, at times, have little or no flow and provide little or no assimilative capacity for hexavalent chromium, final water quality based effluent limitations have been developed using the steady state model in the SIP, with no credit provided for dilution. The chronic effluent concentration allowance (ECA) was set equal to the chronic aquatic life criterion for hexavalent chromium, and the long-term average (LTA) discharge condition was determined using Table 1 of the SIP, using a coefficient of variation (CV) calculated using the results of the 39 hexavalent chromium sampling events conducted since December 2000 (CV=2.3) (39 data points, as summarized in Table A-1 of the July 2002 GWTS Monthly Operations Report). The average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) were then calculated using multipliers in Table 2 of the SIP as shown below:

<b>WATER QUALITY BASED EFFLUENT LIMITATIONS</b>	
<u>Hexavalent Chromium</u>	
Number of Observations	39
Effluent Maximum	15
Dilution Credit	0
ECA chronic	11 µg/L
Percent of Observations Below Detection	<90%
Coefficient of Variation (Calculated)	0.23
Limiting LTA (chronic) = (ECA chronic*Table 1 Chronic Multiplier)	8.5
Sampling Frequency (n)	≤ 4/mo
AMEL (LTA*Table 2 AMEL Multiplier)	<b>10.0 µg/L (ppb)</b>
MDEL (LTA*Table 2 MDEL Multiplier)	<b>14.1 µg/L (ppb)</b>

Final average monthly (10.0 µg/L (ppb)) and maximum daily (14.1 µg/L (ppb)) effluent limitations for hexavalent chromium have been established in this Order in accordance with Sections 1.3 and 1.4 of the SIP. The Discharger may be unable to meet these new effluent limitations for hexavalent chromium. The GWTS has no processes specific to the removal of hexavalent chromium. The Discharger is currently investigating sources of hexavalent chromium in individual groundwater extraction wells and investigating ways to reduce hexavalent chromium concentrations in the final effluent. Section 2.1 of the SIP provides that: *“Based on an existing discharger’s request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.”* As the average monthly and maximum daily effluent limitations for hexavalent chromium are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP. This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for hexavalent chromium become effective on **25 June 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Regional Board. Otherwise, final water quality based effluent limitations for hexavalent chromium become effective **1 March 2008**.

In accordance with the SIP Section 2.2.1, numeric interim limitations for hexavalent chromium are required in this Order. Numeric interim limitations have been established based upon treatment facility performance. These interim limitations consist of projected maximum daily and monthly average effluent concentrations derived using daily sample data collected during periods of discharge since December 2000 (39 data points, as summarized in Table A-1 of the July 2002 GWTS Monthly Operations Report), and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA’s Technical Support Document for Water Quality-based Toxics Control (TSD). Where concentrations were reported as less than detectable, one half of the detection limit was used in the calculation. Derivation of these interim limitations is summarized below:

<b>INTERIM EFFLUENT LIMITATIONS</b>	
<u>Hexavalent Chromium</u>	
Number of Observations	39

Minimum (µg/l)	0.5
Observed Maximum (µg/l)	<b>15.0</b>
Mean	9.5
Standard Deviation	2.156
Coefficient of Variation	0.23
Multiplier <sup>1</sup>	1.3
Projected Daily Maximum	<b>19.5 (µg/l)</b>
Multiplier <sup>2</sup>	1.1
Projected Monthly Average	<b>16.5 (µg/l)</b>

<sup>1</sup> From TSD Table 3-1

<sup>2</sup> From TSD Table 3-2

These interim limitations shall be enforceable limitations until the final maximum daily and monthly average effluent limitations become effective on 1 March 2008 or 25 June 2003 if a compliance schedule justification is not submitted.

### **Total Chromium**

Previous Order No. 99-067 included daily maximum and monthly average effluent limitations for total chromium (80 µg/L (ppb), and 50 µg/L (ppb) respectively). These limitations were based upon the California primary MCL of 50 µg/L (ppb). The CTR does not include criteria for total chromium. Results of monitoring conducted by the Discharger indicate that the MEC for total chromium since the GWTS began operation has been less than 20 µg/L (ppb). Comparison of result for total chromium to hexavalent chromium suggest that the hexavalent chromium component may compose most if not all of the total chromium concentration. Final effluent limitations protective for hexavalent chromium, and significantly less than 50 µg/L (ppb), have been established in this Order. Considering these facts, the effluent from the GWTS has not demonstrated the reasonable potential to cause or contribute to an in-stream excursion above applicable water quality criteria for total chromium. The effluent limitations for total chromium from previous Order No. 99-067 have been removed from this Order (new information). This Order does require continued effluent and receiving water monitoring for total chromium, and may be re-opened if total chromium is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above appropriate water quality criteria.

### **Selenium**

Results of effluent monitoring of the GWTS indicates the MEC's of total selenium in the final effluent are typically less than the analytical reporting limit of 5 µg/L (ppb). However, selenium was detected in the final effluent above the laboratory reporting limit of 5 ug/L (ppb) on two occasions (7 ug/L (ppb) (June 2001) and 11 ug/L (ppb) (October 2001). The CTR, at 40 CFR 131.38, includes a CCC criterion for selenium expressed in the total recoverable form. While other criteria for selenium were promulgated for specific waters in California in the NTR, it is the 5 µg/L (ppb) chronic criterion which applies to additional waters of the United States in the State of California pursuant to 40 CFR 131.38(c). Since the preservation and enhancement of fish, wildlife, and other aquatic resources and habitats is an existing beneficial use of Magpie Creek and Don Julio Creek, this criterion applies to these waters.

Without regard to dilution, these MEC's exceed the CTR freshwater chronic aquatic life Continuous Criterion Concentration for selenium of 5 ug/L (ppb).

Section 1.3 of the SIP requires a water quality based effluent limitation when the MEC exceeds appropriate pollutant criterion. New water quality based effluent limitations for selenium have been calculated based upon methodologies in the SIP.

Considering that Magpie Creek and Don Julio Creek may, at times, have little or no flow and provide little or no assimilative capacity for selenium, final water quality based effluent limitations have been developed using the steady state model in the SIP, with no credit provided for dilution. The chronic effluent concentration allowance (ECA) was set equal to the chronic aquatic life criterion for selenium, and the long-term average (LTA) discharge condition was determined using Table 1 of the SIP, using a default coefficient of variation (CV) of 0.6 (>80 percent of the data reported as not detected). The average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) were then calculated using multipliers in Table 2 of the SIP as shown below:

<b>WATER QUALITY BASED EFFLUENT LIMITATIONS</b>	
<u>Selenium (total)</u>	
Number of Observations	11
Effluent Maximum	11
Dilution Credit	0
ECA chronic	5 µg/L
Percent of Observations Below Detection	> 80%
Coefficient of Variation (Default)	0.6
Limiting LTA (chronic) = (ECA chronic*Table 1 Chronic Multiplier)	2.635
Sampling Frequency (n)	≤ 4/mo
AMEL (LTA*Table 2 AMEL Multiplier)	<b>4.1 µg/L (ppb)</b>
MDEL (LTA*Table 2 MDEL Multiplier)	<b>8.2 µg/L (ppb)</b>

Final average monthly (4.1 µg/L (ppb)) and maximum daily (8.2 µg/L (ppb)) effluent limitations for selenium have been established in this Order in accordance with Sections 1.3 and 1.4 of the SIP. The Discharger may be unable to meet these new effluent limitations for selenium, and the he GWTS has no processes specific to the removal of selenium. Section 2.1 of the SIP provides that: *“Based on an existing discharger’s request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.”* As the average monthly and maximum daily effluent limitations for selenium are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP. This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for selenium become effective on **25 June 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Regional Board. Otherwise, final water quality based effluent limitations for selenium become effective **1 March 2008**.

In accordance with the SIP Section 2.2.1, numeric interim limitations for selenium are required in this Order. Previous Order No. 99-067 included a daily maximum and monthly average effluent limitations for selenium of 10 µg/L (ppb). The daily maximum effluent limitation of the previous Order No. 99-067 has been retained in this Order as a numeric interim limitation. This interim limitation shall be an enforceable limitation until the final maximum daily and monthly average effluent limitations become effective on 1 March 2008.

### **Cadmium (total)**

Results of effluent monitoring of the GWTS indicates concentrations of total cadmium in the final effluent have been less than the analytical reporting limit of 0.5 µg/L (ppb). More recent monitoring results indicate concentrations of total cadmium in the final effluent are less than the analytical reporting limit of 0.25 µg/L (ppb). As shown in Attachment C, these data indicate that the MEC's of total cadmium in the final effluent do not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total cadmium. Receiving water monitoring of Magpie Creek and Don Julio Creek has not been completed. This Order requires continued effluent and receiving water monitoring for cadmium, and may be re-opened if it is found that cadmium is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

### **Copper (total)**

Results of effluent monitoring of the GWTS indicates the MEC of total copper in the final effluent was reported as an estimated 0.16 µg/L (ppb) (estimated as it was detected but not quantified, between the method detection limit (0.007 µg/L (ppb)) and the reporting limit (0.5 µg/L (ppb))). As shown in Attachment C, these data indicate that the MEC of total copper in the final effluent does not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total copper. Receiving water monitoring of Magpie Creek and Don Julio Creek has not been completed. This Order requires continued effluent and receiving water monitoring for copper, and may be re-opened if it is found that copper is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

### **Lead (total)**

Results of effluent monitoring of the GWTS indicates the MEC of total lead in the final effluent was reported as an estimated 0.02 µg/L (ppb) (estimated as it was detected but not quantified, between the method detection limit (0.01 µg/L (ppb)) and the reporting limit (0.5 µg/L (ppb))). As shown in Attachment C, these data indicate that the MEC of total lead in the final effluent does not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total lead. Receiving water monitoring of Magpie Creek and Don Julio Creek has not been completed. This Order requires continued effluent and receiving water monitoring for lead, and may be re-opened if it is found that lead is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

### **Nickel (total)**

Results of effluent monitoring of the GWTS indicates the MEC of total nickel in the final effluent was reported as an estimated 0.8 µg/L (ppb) (estimated as it was detected between the method detection limit (0.2 µg/L (ppb)) and the reporting limit (1.0 µg/L (ppb))). As shown in Attachment C, these data indicate that the MEC of total nickel in the final effluent does not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total nickel. Receiving water monitoring of Magpie Creek and Don Julio Creek has not been completed. This Order requires continued effluent and receiving water monitoring for nickel, and may be re-opened if it is found that nickel is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

### **Zinc (total)**

Results of effluent monitoring of the GWTS indicates the MEC of total zinc in the final effluent was reported as 30 µg/L (ppb) (04/01). As shown in Attachment C, the data indicate that concentrations of total zinc in the final effluent do not have the reasonable potential to exceed the lowest (most stringent) water quality criterion for total zinc. Receiving water monitoring of Magpie Creek and Don Julio Creek has not been completed. This Order requires continued effluent and receiving water monitoring for zinc, and may be re-opened if it is found that zinc is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above the CTR/NTR criteria.

### **Mercury**

Previous Order No. 99-067 included a daily maximum and a monthly average effluent concentration limitation for mercury (1.0 µg/L (ppb) and 0.012 µg/L (ppb), respectively). The Basin Plan does not provide a numeric water quality objective for mercury. The current USEPA water quality criteria for mercury, for protection of human health for consumption of both water and organisms, is 0.050 µg/L (ppb). The USEPA is currently reviewing the ambient water quality criteria for mercury and may recommend more stringent criteria, based in part on organism uptake and bioaccumulation. The Sacramento River, from Red Bluff to the Delta, has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act for mercury, based on fish tissue concentration and not water column toxicity. The California DHS has issued health warnings regarding the consumption of fish from Delta waterways. While Magpie Creek and Don Julio Creek are not identified as impaired for mercury on the California 303(d) list, additional loading resulting from the discharge from the Discharger's GWTS has the potential to cause or contribute to the impairment resulting from mercury bioaccumulation in the Sacramento River and Delta. A TMDL for mercury is currently scheduled to be completed by December 2005.

At Section 2.1.1 the SIP states: *"For bioaccumulative priority pollutants for which the receiving water has been included on the CWA Section 303(d) list, the RWQCB should consider whether the mass loading of the bioaccumulative pollutant(s) should be limited to representative, current levels pending TMDL development in order to implement the applicable water quality standard"*. Since mercury is a bioaccumulative pollutant included on the CWA 303(d) list for the Sacramento River and Delta, the

intent of this Order is to include an interim performance based effluent limitation for mercury.

Results of limited 'ultra-clean' sampling and analysis conducted by the Discharger using EPA Method SW 1631 indicate GWTP effluent mercury concentrations ranged from  $< 0.0039 \mu\text{g/L}$  (ppb) to  $0.017 \mu\text{g/L}$  (ppb). These concentrations do not exceed the CTR human health criteria. Current mercury data are not sufficient for establishment of an interim performance based limitation. This Order requires the Discharger to collect data necessary to establish an interim performance based effluent mass limitation.

Performance-based effluent limits for mercury are typically established as follows: 1) The average monthly effluent mercury concentration is calculated by adding all detected concentrations and one-half of the reported detection levels of all non-detectable mercury concentration results; 2) From the average monthly mercury concentration and average monthly flow, a monthly mercury mass discharge is calculated; and 3) A total mass for all months is then totaled, and an average annual mass discharge is calculated.

Following the establishment of the interim limit, the mass of mercury discharged shall not exceed the interim mercury mass limit twelve months on a running average. In calculating for compliance, the Discharger shall count all non-detect measures at one-half of the detection level and apply the monthly average flow from the sampled discharge. If compliance with the effluent limit is not attained due to the non-detect contribution, the Discharger will be directed to improve and implement available analytical capabilities and compliance will be evaluated with consideration of the detection limits. For each calendar month, the Discharger shall calculate twelve-month mass loadings. For monthly measures, monthly loadings shall be calculated using the average monthly flow and the average of all mercury analyses conducted that month. The Discharger shall submit a cumulative total of mass loadings for the previous twelve months with each self-monitoring report. Compliance will be determined based on the previous 12-month moving averages over the previous twelve months of monitoring.

Until sufficient data are collected to establish a performance based interim effluent mass limitation, this Order shall include a preliminary monthly average mercury concentration limitation using the concentration limitation of the previous Order ( $0.000012 \text{ mg/L}$  (ppm)). Upon completion of the Interim Mercury Mass Limitation Study required by this Order, this Order shall be reopened and an interim performance based mercury mass effluent limitation established. Final effluent limitations may include: a waste load allocation derived from the TMDL, or a site specific water quality objective.

The economic effect of the provisions of this permit on the discharger is nominal. When established, the interim mercury effluent limits require the discharger to simply maintain current plant performance.

### **Trace Element Water Quality Objectives**

Specific trace element water quality objectives which apply to surface waters in the Sacramento and San Joaquin River Basins, including the Sacramento River, from Keswick Dam to the I Street Bridge, are provided in Table III-1 of Chapter III of the Basin Plan. These objectives are summarized in the table below:



Constituent	Maximum Concentration (µg/l)
Arsenic (dissolved)	10
Barium (dissolved)	100
Copper (dissolved)	10
Cyanide (dissolved)	10
Iron (dissolved)	300
Manganese (dissolved)	50
Silver (dissolved)	10
Zinc (dissolved)	100

Trace metal objectives in this table are dissolved concentrations. This Order requires the collection of additional effluent and receiving water data necessary to assess the impact of the discharge on these dissolved trace metal water quality objectives of the Sacramento River.

### Toxicity

At p.III-9.00 the Basin Plan provides that relative to toxicity : *“All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.”* At page 1, the USEPA’s Technical Support Document for Water Quality-based Toxics Control (TSD) provides that *“Where States have not developed chemical specific numeric criteria, States may interpret their narrative standards for specific chemicals by using EPA criteria updated with current quantitative risk values.”* The TSD further states on page 1 *“The integrated approach must include the control of toxics through implementation of the “no toxics” criterion and/or numeric criteria for the parameter of toxicity, the control of individual pollutants for which specific chemical water quality criteria exist in a state’s standard, as well as the use of biological criteria. Reliance solely on the chemical specific numeric criteria or the narrative criterion or biological criteria would result in only a partially effective State toxics control program.”*

Under the CWA Section 304(a), EPA has developed methodologies and specific criteria guidance to protect aquatic life and human health. These methodologies are intended to provide protection for all surface waters on a national basis. The methodologies have been subject to public review, as have the individual criteria guidance documents. Water quality criteria developed under Section 304(a) of the CWA are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. Section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. Section 304(a) criteria provide guidance to States in adopting water quality standards that ultimately provide a basis for controlling discharges or releases of pollutants. USEPA’s ambient water quality criteria have been used as a means of supplementing the integrated approach to toxics control, and in some cases deriving numeric limitations to protect receiving waters from toxicity as required in the Basin Plan’s narrative standard prohibiting the discharge of toxic constituents in toxic amounts.

As noted previously, pollutants and/or conditions identified on the California 303(d) List as impairing the Sacramento River, from Red Bluff to the Delta, to which Magpie Creek and Don Julio Creek are

tributary, include unknown toxicity. This Order requires acute toxicity monitoring of the effluent and chronic toxicity monitoring of the effluent and receiving water (Whole Effluent Toxicity (WET) testing) to ensure the discharge is not contributing additional toxicity to the receiving waters, and includes notification and follow-up procedures in the event toxic endpoints are observed. If it is determined that the discharge causes or contributes to chronic toxicity in Magpie Creek and/or Don Julio Creek, the Discharger is required to conduct a toxicity identification evaluation (TIE) and/or toxicity reduction evaluation (TRE). The TRE includes all reasonable steps to identify and eliminate the source(s) of toxicity. Based upon the results of the TRE, this Order may be reopened to include a chronic toxicity limitation and/or a limitation for the specific toxicant identified in the TRE.

### **Dissolved Oxygen**

Previous Order No. 99-067 included receiving water limitations for dissolved oxygen. Receiving Water Limitation B.1 of previous Order No. 99-067 stated “The discharge shall not cause the dissolved oxygen concentration in Magpie Creek to fall below 5.0 mg/l.” As noted previously (Beneficial Uses Section), the Basin Plan (Table II-1) designates the Sacramento River as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan, the COLD, or cold water habitat designation, applies to Magpie Creek and Don Julio Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/L (ppm). This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/L (ppm), the Discharger is not required to improve the naturally occurring levels. This Order contains receiving water limitations for Magpie Creek and Don Julio Creek which specify that the in-stream dissolved oxygen concentration of these waters be maintained at, or above, 7.0 mg/L (ppm).

### **1,4 Dioxane**

Results of effluent monitoring of the GWTS indicates detectable concentrations of **1,4-dioxane** in the final effluent were reported between 1.6 to 2.1ug/L (ppb) (03/03). There is currently insufficient data to determine whether concentrations of 1,4-dioxane in the final effluent have reasonable potential to exceed the lowest (most stringent) water quality criterion for 1,4-dioxane. This Order adds a requirement for monthly effluent water monitoring for 1,4-dioxane, and may be re-opened if it is found that 1,4-dioxane is or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above a water quality standard.