CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

FACT SHEET
APPLICATION FOR
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
AND
WASTE DISCHARGE REQUIREMENTS
TO DISCHARGE TO STATE WATERS

Permittee Name:	PG&E Groundwater Remediation Facility	Public Notice No.: 7-04-31
NPDES Permit Number:	CA7000016	Board Order No.: R7-2004-0100
Mailing Address:	Pacific Gas & Electric Company 77 Beale Street San Francisco, CA 94105	
Location:	I-40 and Park Moabi Road 15 miles east of Needles, Ca	
Contact Person:	Yvonne Meeks	
Telephone:	(805) 546-5243	

I. Status of Permit

Pacific Gas and Electric Company (PG&E) owner/operator (hereinafter referred to as PG&E or the discharger), of the Topock Compressor Station submitted an application for Waste Discharge Requirements (WDRs) and permit to discharge wastewater under the National Pollutant Discharge Elimination System (NPDES).

From 1951 to 1964, PG&E discharged about 6 million gallons per year of untreated wastewater containing hexavalent chromium to Bat Cave Wash, an ephemeral streambed draining into the Colorado River, causing contamination of the groundwater in the region between the Compressor Station and the Colorado River.

The application is for a groundwater remediation facility to be located on San Bernardino County Assessor's parcel No. 650-151-06. PG&E is currently in the process of purchasing the land from the Metropolitan Water District. The discharger proposes to discharge treated reverse osmosis permeate to the Colorado River.

II. Facility Description

The discharger proposes operation of a groundwater remediation facility. The facility is designed to extract and treat 150 gallons per minute (gpm) of contaminated groundwater for implementation Interim Measures No. 3. The proposed project addresses hydraulic control of the contaminated groundwater plume boundaries to prevent contaminated groundwater from entering the Colorado River.

The extracted groundwater will be treated with chemical reduction, precipitation, and solids removal by gravity or clarifier. Ferrous chloride will be used to reduce Cr (VI) to Cr (III). The precipitated solids containing Cr (III) and Fe (III) will be removed by gravity settling and microfiltration. Reverse Osmosis will be used as a polishing step for the treated water to reduce Total Dissolved Solids (TDS).

III. Description of Discharge

The discharger will be composed of treated RO permeate. The final effluent will be discharged to Colorado River.

IV. Receiving Water

The receiving water for Outfall OO1 is the Colorado River.

1. The designated beneficial uses of waters in the Colorado River are:

    a. Municipal supply (MUN)
    b. Agricultural supply (AGR)
    c. Aquaculture (AQUA)
    d. Industrial supply (IND)
    e. Groundwater recharge (GWR)
    f. Water contact recreation (REC I)
    g. Non contact water recreation (REC II)
    h. Warm freshwater habitat (WARM)
    i. Cold freshwater habitat (COLD)
    j. Wildlife habitat (WILD)
    k. Hydropower generation (POW)
    l. Preservation of rare and endangered species (RARE)

V. Reasonable Potential Analysis

Reasonable Potential Analysis for constituents to exceed water quality criteria is based on historical disposal practices and on data from previous and ongoing groundwater investigations. Primary Constituents of Concern (COCs) at the Topock site are hexavalent chromium and total chromium. The Corrective Action Consent Agreement (CACA) identified copper, nickel, zinc, pH, and electrical conductivity as site COCs. Groundwater samples have been sampled for general chemistry parameters including total dissolved solids, total organic carbon, oxygen 18, deuterium, chloride, sulfate, nitrate, fluoride, barium, calcium, iron, magnesium, manganese, potassium, sodium, alkalinity, orthophosphate, ammonia, and sulfide. Additional analytical parameters were requested for selected wells sampled in the Sampling and Analysis Plan Groundwater and Surface Water Monitoring. These additional parameters include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), perchlorate, polychlorinated biphenyls (PCBs) and California Code of Regulations, Title 26 metals. Effluent Limitation Calculations for the Priority Pollutants as required by the California Toxics Rule (CTR) and the State Implementation Plan (SIP) are provided in attachment "A".

VI. Proposed Technology-Based Effluent Limitations

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for facilities other than publicly owned treatment works [defined in Section 304(b)]. Section 301(b)(1)(A) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on best practicable control technology currently available as defined by the Environmental Protection Agency (EPA) administrator.

Regulations promulgated in 40 CFR §125.3(a)(2) require technology-based effluent limits for industrial dischargers to be placed in NPDES permits based on Best Practicable Control Technology (BPT).

VII. Proposed Water Quality-Based Effluent Limitations (WQBEL's)

Effluent discharged from this facility could contain pollutants in sufficient quantities to affect receiving water quality. Pursuant to Section 13263, Article 4, Chapter 4 of the Porter Cologne Water Quality

Control Act, the Regional Boards are required to issue Waste Discharge Requirements for discharges that could affect the quality of the State's waters. Furthermore, Federal Regulation 40 CFR 122.1 requires the issuance of NPDES permits for pollutants discharged from a point source to the waters of the United States. The draft discharge requirements contain specific discharge limitations for selected pollutants.

Constituents	Basis for Limitations
Aluminum	Aluminum is known to cause toxicity in aquatic life.
Ammonia as N	Elevated levels of Ammonia may adversely affect odor in water supplied to the public. The limit is based on the Odor threshold (Amoore and Hautala).
Antimony	Elevated levels of Antimony may cause adverse effects to human health.
Arsenic	Arsenic is a known carcinogen to human health
Barium	Elevated levels of Barium may cause toxicity to human health.
Boron	Elevated levels of Boron may cause toxicity to human health.
Chromium (VI)	Chromium VI is a known carcinogen to human health and may adversely affect aquatic life.
Chromium (Total)	Chromium is a known to cause toxicity to aquatic life and human health. The limit is based on the discharger's facility design criteria as the Best Practicable Control Technology.
Color	Excedence of Color criteria in water supplied to the public may adversely affect appearance.
Flow	The maximum design capacity of the treatment facility is 150 gallons per minute.
Copper	Copper is known to cause toxicity in aquatic life.
Fluoride	Elevated levels of Fluoride may cause toxicity to human health.
Lead	Elevated levels of lead may cause toxicity to human health. The limit is based on the California Public Health Goal for Drinking Water.
Manganese	Elevated levels of Manganese in water supplied to the public may adversely affect taste.

Molybdenum	Elevated levels of Molybdenum may adversely affect suitability of use for agriculture.
Nickel	Elevated levels of nickel may cause toxicity to human health.
Nitrate + Nitrite (as N)	Elevated levels of Nitrate / Nitrite may cause toxicity to human health.
Hydrogen Ion (pH)	Hydrogen Ion (pH) is a measure of Hydrogen Ion concentration in the water. A range specified between 6.5 to 8.5 ensures suitability in water supplied to the public.
Sulfate	Elevated levels of Sulfate in water supplied to the public may adversely affect taste and odor.
Total Dissolved Solids	High levels of TDS in water supplied to the public can adversely affect taste.
Total Iron	Elevated levels of Iron in water supplied to the public may adversely affect taste and appearance.
Turbidity	Excedence of turbidity criteria in water supplied to the public may adversely affect appearance.
Zinc	Zinc is known to cause toxicity in aquatic life.
Toxicity	Toxicity testing ensures that the effluent does not contain metals, chemicals, pesticides or other constituents in concentrations toxic to aquatic life.

VIII. Proposed Effluent Limitations

Table 1, contained later in this Fact Sheet, summarizes the proposed effluent limitations for Outfall 001. Proposed effluent limitations are based on effluent limit guidelines, WQBL's and Colorado River Basin Plan Water Quality Standards.

VIII. Monitoring Requirements

Monitoring for those pollutants expected to be present in the Outfall OO1 will be required as shown on the proposed monitoring and reporting program and as required in the "*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*" adopted March 2, 2000.

IX. Information Sources

While developing effluent limitations and receiving water limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

(1) EPA NPDES Application Forms 1 and 2D dated July 28, 2004.
(2) Code of Federal Regulations – Title 40
(3) Water Quality Control Plan (Colorado River Basin – Region 7) as amended to date.
(4) Regional Board files related to Pacific Gas and Electric Company, Topock Compressor Station.
(5) Porter-Cologne Water Quality Control Act with additions and amendments effective January 1, 2000.
(6) Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California adopted March 2, 2000.
(7) California Toxics Rule, published May 18, 2000 by U.S. EPA.
(8) National Toxics Rule (NTR), adopted by U.S. EPA on February 5, 1993.

X. Written Comments

Interested parties and agencies are invited to submit written comments on the proposed Waste Discharge Requirements and the Regional Board's Executive Officer's proposed determinations. Comments should be submitted in writing not later than September 14, 2004 to:

Executive Officer
California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

The application number shall appear on the first page of any submitted comments. All comments received by the above date will be considered in the formulation of the final determinations.

XI. Public Hearing

The Waste Discharge Requirements will be considered by the Regional Board at a public hearing to be held at the City of La Quinta City Council Chambers, 78495 Calle Tampico, La Quinta on September 15, 2004.

XII. Waste Discharge Requirements Appeals

Any person may petition the State Board to review the decision of the Regional Board regarding Waste Discharge Requirements. A petition must be made within 30 days of the Regional Board's hearing.

XIII. Additional Information

Persons wishing further information may write to the following address:

California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

or call the Regional Board at (760) 346-7491.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION

TABLE 1
PROPOSED EFFLUENT AND RECEIVING WATER LIMITATIONS
NPDES PERMIT NO. CA7000016
BOARD ORDER NO. R7-2004-0100
PACIFIC GAS AND ELECTRIC COMPANY, OWNER/OPERATOR
GROUNDWATER REMEDIATION FACILITY

Effluent Limitations

1. Representative samples of wastewater discharged to The Colorado River from the treatment systems shall not contain constituents in excess of the limits indicated below. The discharge to the Colorado River shall be monitored at a location which is acceptable by the Regional Board's Executive Officer or his designee:

Constituent	Unit	Average Monthly Effluent Limit	Maximum Daily Effluent Limit
Aluminum	µg/L	50	100
Ammonia as N	mg/L	1.5	3
Antimony	µg/L	6	6
Arsenic	µg/L	10	10
Barium	µg/L	300	600
Boron	mg/L	1.0	2.0
Boron (Mixing Zone)[a]	mg/L	0.70	1.40
Chromium (VI)	µg/L	8	16
Chromium (Total)	µg/L	25	50
Color	units	15	30
Copper	µg/L	18	36
Fluoride	mg/L	0.30	0.60
Lead	µg/L	2	4
Manganese	µg/L	50	50
Molybdenum	µg/L	10	20
Nickel	µg/L	12	24
Nitrate + Nitrite (as N)	mg/L	10	10
Sulfate	mg/L	250	250
Selenium	µg/L	4	8
TDS	mg/L	500	723
Total Iron	µg/L	300	300
Turbidity	NTU	5.0	10.0
Zinc	µg/L	80	160

2. The maximum daily flow shall not exceed 150 gpm.

3. The hydrogen ion (pH) of the effluent shall be maintained within the limits of 6.5 to 8.5.

4. The effluent shall not contain heavy metals, chemicals, pesticides or other constituents in concentrations toxic to aquatic life.

[a] In the event that the discharger chooses not to submit a mixing zone study, compliance with the discharge requirements will be at end of pipe.

5. Stormwater discharges from the facility shall not cause or threaten to cause pollution, contamination, or nuisance.

6. Stormwater discharges from the facility shall not contain hazardous substances equal to or in excess of a reportable quantity listed in 40 CFR, Part 302.

7. There shall be no acute or chronic toxicity in the treatment plant effluent nor shall the treatment plant effluent cause any acute or chronic toxicity in the receiving water. All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or bioassays of appropriate duration or other appropriate methods specified by the Regional Board.

Receiving Water Limitations

1. Receiving water limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit. The discharge shall not cause the following in the Colorado River.

   a. Depress the concentration of dissolved oxygen to fall below 8.0 mg/L. When dissolved oxygen in the receiving water is already below 8.0 mg/L, the discharge shall not cause any further depression.

   b. The presence of oil, grease, floating material (liquids, solids, foam and scum) or suspended material in amounts that create a nuisance or adversely affect beneficial uses.

   c. Result in the deposition of pesticides or combination of pesticides to be detected in concentrations that adversely affect beneficial uses.

   d. Aesthetically undesirable discoloration or odors in the receiving water.

   e. A significant increase in fungi, slime, or other objectionable growth.

   f. Increase turbidity that results in affecting beneficial uses.

   g. The normal ambient pH to fall below 6.0 or exceed 9.0 units.

   h. Impact the receiving water temperature, resulting in adversely affecting beneficial uses.

   i. Result in the deposition of material that causes nuisance or adversely affects beneficial uses.

   j. The chemical constituents to exceed concentrations that adversely affect beneficial uses or create nuisance.

   k. Toxic pollutants to be present in the water column, sediments or biota in concentrations that adversely affect beneficial uses or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

   l. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause or otherwise adversely affect beneficial uses.

2. This discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board as required by the Federal Clean Water Act and regulations adopted thereunder. If more stringent applicable

water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act or amendments thereto, the Regional Board will revise and modify this Permit in accordance with such more stringent standards.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION (R-7)
CTR AND SIP CALCULATIONS FOR TOPOCK NPDES PERMIT

PART 1 CALCULATION OF EFFLUENT CONCENTRATION ALLOWANCES (ECA)

For each water quality criterion/objective, calculate the effluent concentration allowance (*ECA*) using the following steady-state mass balance equation:
ECA = C + D (C - B) when *C > B*, and
ECA = C when *C <=B*,
where
C = the priority pollutant criterion/objective, adjusted (as described in section 1.2), if necessary, for hardness, pH, and translators (as described in section 1.4.1);
D = the dilution credit (as determined in section 1.4.2); and
B = the ambient background concentration. The ambient background concentration shall be the observed maximum as determined in accordance with section 1.4.3.1 with the exception that an *ECA* calculated from a priority pollutant criterion/objective that is intended to protect human health from carcinogenic effects shall use the ambient background concentration as an arithmetic mean determined in accordance with section 1.4.3.2.
The concentration units for *C* and *B* must be identical. Both *C* and *B* shall be expressed as total recoverable, unless inappropriate. The dilution credit is unitless.

Table 1

Pollutant	Ambient B	C Acute	D Acute	C Chronic	D Chronic	C HH	D HH
Antimony	0	NA	0	NA	0	14	0
Arsenic	0	340	0	150	0	NA	0
Chrome VI	0	16	0	11	0	NA	0
Copper	0	37	0	22	0	1300	0
Lead	0	201	0	8	0	NA	0
Nickel	0	1153	0	128	0	610	0
Selenium	0	NA	0	5	0	NA	0
Zinc	0	289	0	291	0	NA	0

Perform the following calculations and insert values in Table 2

$ECA_{ACUTE} = C_{ACUTE} + D_{ACUTE} \times (C_{ACUTE} - \text{Ambient B})$

$ECA_{CHRONIC} = C_{CHRONIC} + D_{CHRONIC} \times (C_{CHRONIC} - \text{Ambient B})$

Table 2

Pollutant	ECA_{ACUTE} (µg/L)	$ECA_{chronic}$ (µg/L)
Antimony	NA	NA
Arsenic	340	150
Chrome VI	16	11
Copper	37	22
Lead	201	8
Nickel	1153	128
Selenium	NA	5
Zinc	289	291

STEP 2 CALCULATIONS OF LONG TERM AVERAGES (LTA)

For each *ECA* based on an aquatic life criterion/objective, determine the long-term average discharge condition (*LTA*) by multiplying the *ECA* with a factor (multiplier) that adjusts for effluent variability. The multiplier shall be calculated as described below, or shall be found in Table 1. To use Table 1, the *coefficient of variation (*CV*) for the effluent pollutant concentration data must first be calculated. If (a) the number of effluent data points is less than ten, or (b) at least 80 percent of the data are reported as not detected, the *CV* shall be set equal to 0.6. When calculating *CV* in this procedure, if an effluent data point is below the detection limit for the pollutant in that sample, one-half of the detection limit shall be used as a value in the calculations. Multipliers for acute and chronic criteria/objectives that correspond to the *CV* can then be found in Table 1.

Cv	WLa Multipliers		
	95th percentile	99 percentile	
0.1	0.853	0.797	
0.2	0.736	0.643	
0.3	0.644	0.527	
0.4	0.571	0.44	**Acute**
0.5	0.514	0.373	
0.6	0.468	0.321	
0.7	0.432	0.281	
0.8	0.403	0.249	
0.9	0.379	0.224	**Table 5-1**
1	0.360	0.204	
1.1	0.344	0.187	
1.2	0.330	0.174	
1.3	0.319	0.162	
1.4	0.310	0.153	
1.5	0.302	0.144	
1.6	0.296	0.137	
1.7	0.290	0.131	
1.8	0.285	0.126	
1.9	0.281	0.121	
2	0.277	0.117	

Cv	WLa Multipliers		
	95th percentile	99 percentile	
0.1	0.922	0.891	
0.2	0.853	0.797	
0.3	0.791	0.715	
0.4	0.736	0.643	**Chronic**
0.5	0.687	0.581	
0.6	0.644	0.527	
0.7	0.606	0.481	
0.8	0.571	0.440	
0.9	0.541	0.404	**Table 5-1**
1	0.514	0.373	
1.1	0.490	0.345	
1.2	0.468	0.321	
1.3	0.449	0.300	
1.4	0.432	0.281	
1.5	0.417	0.264	
1.6	0.403	0.249	
1.7	0.390	0.236	
1.8	0.379	0.224	
1.9	0.369	0.214	
2	0.360	0.204	

LTA Equations

LTA_{Acute} = ECA_{Acute} (from Table 2)* ECA multiplier $_{Acute\ 99}$ (from Table 5-1)

$LTA_{Chronic}$ = $ECA_{Chronic}$ (from Table 2)* ECA multiplier $_{Chronic\ 99}$ (from Table 5-2)

Select the lowest (most limiting) of the *LTA*s for the pollutant derived in *Step 2*.

TABLE 3 VALUES USED IN LTA CALCULATON

Pollutant	CV Q	Sigma	Mult Acute 99th Percentile	Mult Chronic 99th Percentile	LTA Acute	LTA Chronic	LTA Min
Antimony	0.6	0.555	0.321	0.527	NA	NA	NA
Arsenic	0.6	0.555	0.321	0.527	109.1	79.1	79.1
Chrome VI	0.6	0.555	0.321	0.527	5.0	5.6	5.0
Copper	0.6	0.555	0.321	0.527	11.8	11.7	11.7
Lead	0.6	0.555	0.321	0.527	64.6	4.1	4.1
Nickel	0.6	0.555	0.321	0.527	370.0	67.5	67.5
Selenium	0.6	0.555	0.321	0.527	NA	2.6	2.6
Zinc	0.6	0.555	0.321	0.527	92.7	153.5	92.7

STEP 3 CALCULATIONS OF AVERAGE MONTHLY EFFLUENT LIMITATION (AMEL) AND MAXIMUM DAILY EFFLUENT LIMITATION (MDEL)

Calculate water quality-based effluent limitations (an *average monthly effluent limitation, AMEL, and a *maximum daily effluent limitation, MDEL) by multiplying the most limiting *LTA* (as selected in *Step 2*) with a factor (multiplier) that adjusts for the averaging periods and exceedance frequencies of the criteria/objectives and the effluent limitations, and the effluent monitoring frequency as follows:

AMEL $_{\text{aquatic life}}$ = *LTA Min (from Table 3)* * AMEL $_{\text{multiplier95}}$ (from Table 5-3b)

MDEL $_{\text{aquatic life}}$ = *LTA Min (from Table 3)* * MDEL $_{\text{multiplier99}}$ (from Table 5-3a)

The AMEL and MDEL multipliers shall be calculated as described below, or shall be found in Table 5-2 using the previously calculated *CV* and the monthly sampling frequency (*n*) of the pollutant in the effluent. If the sampling frequency is four times a month or less, *n* shall be set equal to 4. For this method only, maximum daily effluent limitations shall be used for publicly-owned treatment works (POTWs) in place of average weekly limitations.

Table 5-3a

Cv	LTA multipliers	
	95th percentile	99 percentile
0.1	1.17	1.25
0.2	1.36	1.55
0.3	1.55	1.9
0.4	1.75	2.27
0.5	1.95	2.68
0.6	2.13	3.11
0.7	2.31	3.56
0.8	2.48	4.01
0.9	2.64	4.46
1	2.78	4.9
1.1	2.91	5.34
1.2	3.03	5.76
1.3	3.13	6.17
1.4	3.23	6.56
1.5	3.31	6.93
1.6	3.38	7.29
1.7	3.45	7.63
1.8	3.51	7.95
1.9	3.56	8.26
2	3.6	8.55

Maximum Daily Limit MDL

Table 5-3a

Table 5-3b

	LTA Multipliers									
	95th percentile					99 percentile				
Cv	n=1	n=2	n=4	n=10	n=30	n=1	n=2	n=4	n=10	n=30
0.1	1.17	1.12	1.08	1.06	1.03	1.25	1.18	1.121	1.08	1.04
0.2	1.36	1.25	1.17	1.12	1.06	1.55	1.37	1.25	1.16	1.09
0.3	1.55	1.38	1.26	1.18	1.09	1.9	1.59	1.4	1.24	1.13
0.4	1.75	1.52	1.36	1.25	1.12	2.27	1.83	1.55	1.33	1.18
0.5	1.95	1.66	1.45	1.31	1.16	2.68	2.09	1.72	1.42	1.23
0.6	2.13	1.8	1.55	1.38	1.19	3.11	2.37	1.9	1.52	1.28
0.7	2.31	1.94	1.65	1.45	1.22	3.56	2.66	2.08	1.62	1.33
0.8	2.48	2.07	1.75	1.52	1.26	4.01	2.96	2.27	1.73	1.39
0.9	2.64	2.2	1.85	1.59	1.29	4.46	3.28	2.48	1.84	1.44
1	2.78	2.33	1.95	1.66	1.33	4.9	3.59	2.68	1.96	1.5
1.1	2.91	2.45	2.04	1.73	1.36	5.34	3.91	2.9	2.07	1.56
1.2	3.03	2.56	2.13	1.8	1.39	5.76	4.23	3.11	2.19	1.62
1.3	3.13	2.67	2.23	1.87	1.43	6.17	4.55	3.34	2.32	1.68
1.4	3.23	2.77	2.31	1.94	1.47	6.56	4.86	3.56	2.45	1.74
1.5	3.31	2.86	2.4	2	1.5	6.93	5.17	3.78	2.58	1.8
1.6	3.38	2.95	2.48	2.07	1.54	7.29	5.47	4.01	2.71	1.87
1.7	3.45	3.03	2.56	2.14	1.57	7.63	5.77	4.23	2.84	1.93
1.8	3.51	3.1	2.64	2.2	1.61	7.95	6.06	4.46	2.98	2
1.9	3.56	3.17	2.71	2.27	1.64	8.26	6.34	4.68	3.12	2.07
2	3.6	3.23	2.78	2.33	1.68	8.55	6.61	4.9	3.26	2.14

Average Monthly Limit (AML) Table 5-2b

AMEL $_{\text{aquatic life}}$ = *LTA Min (from Table 3)* * AMEL $_{\text{multiplier95}}$ (from Table 5-3b)

MDEL $_{\text{aquatic life}}$ = *LTA Min (from Table 3)* * MDEL $_{\text{multiplier99}}$ (from Table 5-3a)

For the applicable human health criterion/objective, set the AMEL equal to the *ECA* (from *Step 1*).

AMELhuman health = ECA

To calculate the MDEL for a human health criterion/objective, multiply the ECA by the ratio of the MDEL multiplier to the AMEL multiplier.

Table 4 **Values from above equations**

Pollutant	LTA Min	CV Q	N samp	AMEL Mult	AMEL Aqua	MDEL Mult	MDEL Aqua	AMEL HH	MDEL/AMEL	MDEL HH
Antimony	NA	0.6	4	1.55	NA	3.11	NA	14	2.0069	28.097
Arsenic	79.1	0.6	4	1.55	122.5	3.11	245.8	NA	2.0069	NA
Chrome VI	5.0	0.6	4	1.55	7.8	3.11	15.7	NA	2.0069	NA
Copper	11.7	0.6	4	1.55	18.2	3.11	36.5	1300	2.0069	2609
Lead	4.1	0.6	4	1.55	6.4	3.11	12.9	NA	2.0069	NA
Nickel	67.5	0.6	4	1.55	104.6	3.11	209.8	610	2.0069	1224.2
Selenium	2.6	0.6	4	1.55	4.1	3.11	8.2	NA	2.0069	NA
Zinc	92.7	0.6	4	1.55	143.7	3.11	288.3	NA	2.0069	NA

AMEL AND MDEL EFFLUENT LIMITS BASED ON SIP AND CTR

Pollutant	AMEL (µg/L)	MDEL (µg/L)
Antimony	14	28
Arsenic	123	246
Chrome VI	8	16
Copper	18	36
Lead	6	13
Nickel	105	210
Selenium	4	8
Zinc	144	288

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION (R-7)
CTR AND SIP CALCULATIONS FOR TOPOCK NPDES PERMIT

AVERAGE MONTHLY EFFLUENT LIMITS (AMEL)

Pollutant	AMEL (µg/L)	BASIS FOR EFFLUENT LIMITS
Aluminum	50	Secondary Maximum Contaminant Level (MCL)
Ammonia	1,500	Taste and Odor Threshold
Antimony	6	Primary MCL
Arsenic	10	USEPA Primary MCL
Barium	300	Best Practical Treatment Technology
Boron	1,000	Best Achievable Treatment Technology
Boron (Mixing Zone Value)	700	Best Achievable Treatment Technology
Chromium (VI)	8	California Toxic Rule
Chromium (Total)	25	Best Practical Treatment Technology
Color	15 Color Units	Secondary MCL
Copper	18	California Toxic Rule
Fluoride	300	Best Practical Treatment Technology
Lead	2	Public Health Goal
Manganese	50	Secondary MCL
Molybdenum	10	Water Quality Goal for Agriculture
Nickel	12	Public Health Goal
Nitrate + Nitrate (as Nitrogen)	10,000	Primary MCL
Sulfate	250	Secondary MCL
Selenium	4	California Toxic Rule
Total Dissolved Solids (TDS)	500	Secondary MCL
Iron	300	Secondary MCL
Turbidity	5	Secondary MCL
Zinc	80	Best Practical Treatment Technology

MAXIMUM DAILY EFFLUENT LIMITS (MDEL)

Pollutant	MDEL (µg/L)	BASIS FOR EFFLUENT LIMITS
Aluminum	100	Secondary Maximum Contaminant Level (MCL)
Ammonia	3,000	Taste and Odor Threshold
Antimony	6	Primary MCL
Arsenic	10	USEPA Primary MCL
Barium	600	Best Practical Treatment Technology
Boron	2,000	Best Achievable Treatment Technology
Boron (Mixing Zone Value)	700	Best Achievable Treatment Technology
Chromium (VI)	16	California Toxics Rule
Chromium (Total)	50	Best Practical Treatment Technology
Color	30 Color Units	Secondary MCL
Copper	36	California Toxics Rule
Fluoride	600	Best Practical Treatment Technology
Lead	4	Public Health Goal
Manganese	50	Secondary MCL
Molybdenum	20	Water Quality Goal for Agriculture
Nickel	24	Public Health Goal
Nitrate + Nitrate (as Nitrogen)	10,000	Primary MCL
Sulfate	250	Secondary MCL
Selenium	8	California Toxics Rule
Total Dissolved Solids (TDS)	723	Basin Plan Water Quality Objective
Iron	300	Secondary MCL
Turbidity	10	Secondary MCL
Zinc	160	Best Practical Treatment Technology