California Regional Water Quality Control Board
Santa Ana Region

Order No. R8-2003-0004
NPDES No. CA8000015

Waste Discharge Requirements
for

City of San Bernardino Municipal Water Department
Geothermal Facility
San Bernardino, San Bernardino County

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Board), finds that:

1. On March 25, 2002, the City of San Bernardino Municipal Water Department (hereinafter discharger) submitted a complete report of waste discharge and application for renewal of a permit to discharge geothermal wastewater under the National Pollutant Discharge Elimination System (NPDES). The existing waste discharge requirements, Order No. 97-72, expired December 1, 2002. Order No. 97-72 was administratively extended.

2. The discharger owns and operates two geothermal production wells. One well, known as "Meeks and Daley No. 66", is located at Central Avenue and South Arrowhead Avenue and the other is located at "D" Street and Mill Street. The wells are pumped alternately and produce about 2.2 million gallons per day of geothermal water from within the San Jacinto Fault system.

3. Geothermal water is extracted and delivered in insulated pipes to heat various municipal buildings, including the discharger's office at City Hall and other buildings in the downtown area of the City of San Bernardino. The pipeline has a total length of about 18 miles. The geothermal water is coursed through non-contact heat exchanger systems where the geothermal heat is transferred to domestic water. The domestic water temperature is raised from 65^0F to 98^0F, while the geothermal water is cooled from 121^0F to 113^0F.

4. Waste geothermal water is then discharged into either the sanitary sewer line or to 10 outfalls. Six outfalls feed into storm channels that drain to tributary creeks of the Santa Ana River. These creeks include Warm Creek, City Creek, Lytle Creek, Twin Creek, and San Timoteo Creek. Four outfalls discharge directly into creeks. These creeks are tributaries to Reaches 4 and 5 of the Santa Ana River.

5. A Water Quality Control Plan (Basin Plan) became effective on January 24, 1995. The Basin Plan contains water quality objectives and beneficial uses for waters in the Santa Ana Region.

6. The requirements contained in this Order are necessary to implement the Basin Plan.

7. The discharges are to City Creek, Warm Creek, San Timoteo Creek, Lytle Creek and Twin Creek, which are tributary to Reaches 4 and 5 of the Santa Ana River. The beneficial uses of these surface waters include:

   a. Groundwater recharge,
   b. Water contact recreation,
   c. Non-contact water recreation,
   d. Wildlife habitat, and
   e. Warm freshwater habitat,

8. The discharges overlie the Bunker Hill II Groundwater Subbasin, the beneficial uses of which are:

   a. Municipal and domestic supply,
   b. Agricultural supply,
   c. Industrial process supply, and
   d. Industrial service supply.

9. In accordance with Water Code Section 13389, the issuance of waste discharge requirements for this discharge is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (commencing with Section 21100), Division 13 of the Public Resources Code.

10. The Board has considered antidegradation pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16, and finds this discharge is consistent with those provisions.

11. The Board has notified the discharger and other interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

12. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the discharger, in order to meet the provisions contained in Divisions 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and the regulations and guidelines adopted thereunder, shall comply with the following:

A. DISCHARGE SPECIFICATIONS

1. The discharge shall be limited to extracted and cooled geothermal groundwater that complies with the requirements of this Order.

2. The discharge of the geothermal wastewater shall not create or threaten to create a nuisance or pollution, as defined in Section 13050 of the California Water Code.

3. The discharge of any substance in concentrations toxic to human, animal, plant, or aquatic life is prohibited.

B. RECEIVING WATER LIMITATIONS

1. The discharge shall not cause any of the following:

   a. The increase in the temperature of the receiving waters above 90^0F (32^0C), which normally occurs during the period of June through October, or above 78^0F (26^0C) during the rest of the year.

   b. The undesirable discoloration of the receiving waters.

   c. The presence of visible oil, grease scum, floating or suspended material or foam in the receiving waters.

   d. The increase in the amounts of suspended or settleable solids of the receiving waters, which will cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.

   e. The presence of objectionable odor in the receiving water.

   f. The presence of radioactive materials in concentrations which are deleterious to human, plant or animal life.

g. The depletion of the dissolved oxygen concentration below 5.0 mg/l in Santa Ana River, Reaches 4 and 5. In addition, the waste discharge shall not cause the median dissolved oxygen concentration to fall below 85% of saturation or the 95th percentile concentration to fall below 75% of saturation within a 30-day period.

2. Pollutants not specifically mentioned and limited in this Order shall not be discharged at levels that will bioaccumulate in aquatic resources to levels that are harmful to human health.

C. PROVISIONS

1. This Order shall serve as a National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Clean Water Act, or amendments thereto, that shall become effective 10 days after the date of its adoption provided the Regional Administrator of the Environmental Protection Agency has no objection. If the Regional Administrator objects to its issuance, this Order shall not serve as an NPDES permit until such objection is withdrawn.

2. This Order expires on April 1, 2008, and the discharger must file an application in accordance with Title 23, Division 3, Chapter 9 of the California Code of Regulations not later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements.

3. Order No. 97-72 is hereby rescinded.

4. The dischargers shall comply with Monitoring and Reporting Program No. R8-2003-0004 as issued by the Executive Officer. Revision of this monitoring and reporting program by the Executive Officer may be necessary to confirm that the dischargers are in compliance with the requirements and provisions contained in this Order. Revisions may be made at any time during the term of this Order, and may include an increase in the number of parameters to be monitored, the frequency of monitoring or the number and size of samples collected. Any such modifications may be reduced back to the levels specified in the original monitoring and reporting program at the discretion of the Executive Officer.

5. The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device, method, or report required by this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

6. The Board, EPA, and other authorized representatives shall be allowed:

a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;

b. Access to copy any records that are kept under the conditions of this Order;

c. To inspect any facility, equipment (including for monitoring and control), practices, or operations regulated or required under this Order; and

d. To photograph, sample, and monitor for the purpose of assuring compliance with this Order, or as otherwise authorized by the Clean Water Act.

7. This Order may be reopened to include effluent limitations for toxic constituents determined to be present and to pose a reasonable potential to cause or contribute to a violation of water quality standards. This Order may be reopened to address any changes in State or federal plans, policies, or regulations that would affect the quality requirements for the discharges. This Order may be modified, revoked and reissued, or terminated for cause.

8. In an enforcement action, it shall not be a defense for a discharger that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

9. This Order does not convey any property rights or any exclusive privilege.

10. The discharger shall take all reasonable steps to minimize or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment. The discharger shall give advance notice to the Regional Board of any planned physical changes to the geothermal water distribution system that may result in noncompliance with these waste discharge requirements.

11. In the event of any change in control or ownership of land or waste discharge facility 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 forwarded to this Board. This Order is not transferable to any person except after notice to the Regional Board. The Regional Board may require reissuance of this Order to change the name of the discharger and incorporate other requirements as may be necessary under the Clean Water Act.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on April 4, 2003.

Gerard J. Thibeault
Executive Officer

California Regional Water Quality Control Board
Santa Ana Region

Monitoring and Reporting Program No. R8-2003-0004

for
City of San Bernardino Municipal Water Department
Geothermal Facility

San Bernardino, San Bernardino County

A. MONITORING

1. All sampling, sample preservation, and analysis shall be performed in accordance with the most recent edition of 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants" promulgated by EPA, unless otherwise noted. In addition, the Executive Officer and/or EPA, at their discretion, may specify test methods that are more sensitive than those specified in 40 CFR 136.

2. The discharger shall require its testing laboratory to calibrate the analytical system down to the minimum levels (MLs)[1] specified in Attachment "B" for priority pollutants, unless an alternative minimum level is approved by the Regional Board's Executive Officer. Any internal quality control data associated with the sample must be reported when requested by the Executive Officer. The Regional Board will reject the quantified laboratory data if quality control data are unavailable or unacceptable.

B. EFFLUENT WATER MONITORING

The following shall be the monitoring program for this discharge:

1. Temperature, in degrees Fahrenheit:

    a. Monthly, for each utilized outfall, the temperature at or near the outfall must be measured by a chart recorder, manual measurement, or other procedure.

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[1] *Minimum level is the concentration at which the entire analytical system must give a recognizable signal and acceptable point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.*

b. Temperature data may be recorded manually or with automated recorders. Chart recorder locations shall be established downstream of the heat exchangers, where a representative temperature may be measured near the outfall prior to the discharge mixing with the receiving waters. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. However, a loss of functionality for automated recorders will not constitute a violation, provided that a manual temperature is recorded near the outfall location during the monitoring interval. Subsequently, all efforts shall be made to repair any dysfunctional recorder(s) so as to return all recorders to the same accurate state of calibration.

2. Flow, in millions of gallons per day (mgd). Daily, the volume discharged at each outfall shall be recorded.

3. Annually, a representative grab sample of the discharge shall be analyzed for the following constituents:

Total Dissolved Solids (TDS)	Chloride
Sodium	Boron
Selenium	Mercury
Arsenic	Fluoride
EPA[2] Priority Pollutants (See Attachment "A" and paragraph B.4., below)	

4. Sampling and testing for EPA Priority Pollutants shall be done only for the first year of this Order.

2 *Analysis for Acrylonitrile and Acrolein is not required.*

C. AMBIENT RECEIVING WATER MONITORING

1. Quarterly, for each utilized outfall directly discharging into receiving water, such as Santa Ana River or its tributaries, the temperature must be measured near the outfall after the discharge has mixed with the receiving waters using a chart recorder or by manual measurement.

2. Any discerned pattern of unusual rise or fall in temperature, aside from routine compliance reporting, must be reported to the Regional Board in the subsequent monitoring report.

D. REPORTING

1. Monitoring reports shall be submitted by the 30th day of the month following the sampling period and shall include the results of all the measurements required under sections B and C, above.

2. For every item of monitoring data where the requirements are not met, the discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time, and shall submit such information in writing within five days of becoming aware of the noncompliance.

3. The discharger shall retain for a period of at least five years from the date of generation the records of all monitoring information, including all calibration and maintenance records, temperature recorder strip charts, and data used to complete the NPDES application.

4. The results of any analysis of samples taken more frequently than required at the outfall locations shall be reported to the Board.

5. The discharger shall mail a copy of each monitoring report to:

   California Regional Water Quality Control Board
   Santa Ana Region
   3737 Main Street, Suite 500
   Riverside, CA 92501-3348

6. All reports shall be signed by either a principal executive officer or ranking elected or appointed official or a duly authorized representative of a principal executive officer or ranking elected or appointed official. A duly authorized representative of a principal executive officer or ranking elected or appointed official may sign the reports only if;

   a. The authorization is made in writing by a principal executive officer or ranking elected or appointed official,

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position), and

c. The written authorization is submitted to the Regional Board.

Each person signing a report required by this Order or other information requested by the Regional Board shall make the following certification:

" I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate[3], and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Gerard J. Thibeault
Executive Officer

April 4, 2003

[3] *For the purposes of this certification the term "accurate" refers to the veracity of the information submittal and not to the performance characteristics of the measurement system.*

EPA PRIORITY POLLUTANT LIST

Metals		Acid Extractibles		Base/Neutral Extractibles (continuation)	
1.	Antimony	45.	2-Chlorophenol	91.	Hexachloroethane
2.	Arsenic	46.	2,4-Dichlorophenol	92.	Indeno (1,2,3-cd) Pyrene
3.	Beryllium	47.	2,4-Dimethylphenol	93.	Isophorone
4.	Cadmium	48.	2-Methyl-4,6-Dinitrophenol	94.	Naphthalene
5a.	Chromium (III)	49.	2,4-Dinitrophenol	95.	Nitrobenzene
5b.	Chromium (VI)	50.	2-Nitrophenol	96.	N-Nitrosodimethylamine
6.	Copper	51.	4-Nitrophenol	97.	N-Nitrosodi-N-Propylamine
7.	Lead	52.	3-Methyl-4-Chlorophenol	98.	N-Nitrosodiphenylamine
8.	Mercury	53.	Pentachlorophenol	99.	Phenanthrene
9.	Nickel	54.	Phenol	100.	Pyrene
10.	Selenium	55.	2, 4, 6 – Trichlorophenol	101.	1,2,4-Trichlorobenzene
11.	Silver	**Base/Neutral Extractibles**		**Pesticides**	
12.	Thallium	56.	Acenaphthene	102.	Aldrin
13.	Zinc	57.	Acenaphthylene	103.	Alpha BHC
Miscellaneous		58.	Anthracene	104.	Beta BHC
14.	Cyanide	59.	Benzidine	105.	Delta BHC
15.	Asbestos (not required unless requested)	60.	Benzo (a) Anthracene	106.	Gamma BHC
16.	2,3,7,8-Tetrachlorodibenzo-P-Dioxin (TCDD)	61.	Benzo (a) Pyrene	107.	Chlordane
Volatile Organics		62.	Benzo (b) Fluoranthene	108.	4, 4' - DDT
17.	Acrolein	63.	Benzo (g,h,i) Perylene	109.	4, 4' - DDE
18.	Acrylonitrile	64.	Benzo (k) Fluoranthene	110.	4, 4' - DDD
	Benzene	65.	Bis (2-Chloroethoxy) Methane	111.	Dieldrin
20.	Bromoform	66.	Bis (2-Chloroethyl) Ether	112.	Alpha Endosulfan
21.	Carbon Tetrachloride	67.	Bis (2-Chloroisopropyl) Ether	113.	Beta Endosulfan
22.	Chlorobenzene	68.	Bis (2-Ethylhexyl) Phthalate	114.	Endosulfan Sulfate
23.	Chlorodibromomethane	69.	4-Bromophenyl Phenyl Ether	115.	Endrin
24.	Chloroethane	70.	Butylbenzyl Phthalate	116.	Endrin Aldehyde
25.	2-Chloroethyl Vinyl Ether	71.	2-Chloronaphthalene	117.	Heptachlor
26.	Chloroform	72.	4-Chlorophenyl Phenyl Ether	118.	Heptachlor Epoxide
27.	Dichlorobromomethane	73.	Chrysene	119.	PCB 1016
28.	1,1-Dichloroethane	74.	Dibenzo (a,h) Anthracene	120.	PCB 1221
29.	1,2-Dichloroethane	75.	1,2-Dichlorobenzene	121.	PCB 1232
30.	1,1-Dichloroethylene	76.	1,3-Dichlorobenzene	122.	PCB 1242
31.	1,2-Dichloropropane	77.	1,4-Dichlorobenzene	123.	PCB 1248
32.	1,3-Dichloropropylene	78.	3,3'-Dichlorobenzidine	124.	PCB 1254
33.	Ethylbenzene	79.	Diethyl Phthalate	125.	PCB 1260
34.	Methyl Bromide	80.	Dimethyl Phthalate	126.	Toxaphene
35.	Methyl Chloride	81.	Di-n-Butyl Phthalate		
36.	Methylene Chloride	82.	2,4-Dinitrotoluene		
37.	1,1,2,2-Tetrachloroethane	83.	2-6-Dinitrotoluene		
38.	Tetrachloroethylene	84.	Di-n-Octyl Phthalate		
39.	Toluene	85.	1,2-Dipenylhydrazine		
40.	1,2-Trans-Dichloroethylene	86.	Fluoranthene		
41.	1,1,1-Trichloroethane	87.	Fluorene		
42.	1,1,2-Trichloroethane	88.	Hexachlorobenzene		
43.	Trichloroethylene	89.	Hexachlorobutadiene		
44.	Vinyl Chloride	90.	Hexachlorocyclopentadiene		

Revised: 7/7/2000

MINIMUM LEVELS IN PPB (µg/l)

Table 1- VOLATILE SUBSTANCES[1]	GC	GCMS
Acrolein	2.0	5
Acrylonitrile	2.0	2
Benzene	0.5	2
Bromoform	0.5	2
Carbon Tetrachloride	0.5	2
Chlorobenzene	0.5	2
Chlorodibromomethane	0.5	2
Chloroethane	0.5	2
Chloroform	0.5	2
Dichlorobromomethane	0.5	2
1,1 Dichloroethane	0.5	1
1,2 Dichloroethane	0.5	2
1,1 Dichloroethylene	0.5	2
1,2 Dichloropropane	0.5	1
1,3 Dichloropropylene (volatile)	0.5	2
Ethylbenzene	0.5	2
Methyl Bromide (*Bromomethane*)	1.0	2
Methyl Chloride (*Chloromethane*)	0.5	2
Methylene Chloride (*Dichloromethane*)	0.5	2
1,1,2,2 Tetrachloroethane	0.5	1
Tetrachloroethylene	0.5	2
Toluene	0.5	2
trans-1,2 Dichloroethylene	0.5	1
1,1,1 Trichloroethane	0.5	2
1,1,2 Trichloroethane	0.5	2
Trichloroethylene	0.5	2
Vinyl Chloride	0.5	2
1,2 Dichlorobenzene (volatile)	0.5	2
1,3 Dichlorobenzene (volatile)	0.5	2
1,4 Dichlorobenzene (volatile)	0.5	2

Selection and Use of Appropriate ML Value:

ML Selection: When there is more than one ML value for a given substance, the discharger may select any one of those ML values, and their associated analytical methods, listed in this Attachment that are below the calculated effluent limitation for compliance determination. If no ML value is below the effluent limitation, then the discharger shall select the lowest ML value, and its associated analytical method, listed in this Attachment.

ML Usage: The ML value in this Attachment represents the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences. Assuming that all method-specific analytical steps are followed, the ML value will also represent, after the appropriate application of method-specific factors, the lowest standard in the calibration curve for that specific analytical technique. Common analytical practices sometimes require different treatment of the sample relative to calibration standards.

Note: chemical names in parenthesis and italicized is another name for the constituent.

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1 *The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.*

MINIMUM LEVELS IN PPB (µg/l)

Table 2 – Semi-Volatile Substances[2]	GC	GCMS	LC
2-Chloroethyl vinyl ether	1	1	
2 Chlorophenol	2	5	
2,4 Dichlorophenol	1	5	
2,4 Dimethylphenol	1	2	
4,6 Dinitro-2-methylphenol	10	5	
2,4 Dinitrophenol	5	5	
2- Nitrophenol		10	
4- Nitrophenol	5	10	
4 Chloro-3-methylphenol	5	1	
2,4,6 Trichlorophenol	10	10	
Acenaphthene	1	1	0.5
Acenaphthylene		10	0.2
Anthracene		10	2
Benzidine		5	
Benzo (a) Anthracene (*1,2 Benzanthracene*)	10	5	
Benzo(a) pyrene (*3,4 Benzopyrene*)		10	2
Benzo (b) Flouranthene (*3,4 Benzofluoranthene*)		10	10
Benzo(g,h,i)perylene		5	0.1
Benzo(k)fluoranthene		10	2
bis 2-(1-Chloroethoxyl) methane		5	
bis(2-chloroethyl) ether	10	1	
bis(2-Chloroisopropyl) ether	10	2	
bis(2-Ethylhexyl) phthalate	10	5	
4-Bromophenyl phenyl ether	10	5	
Butyl benzyl phthalate	10	10	
2-Chloronaphthalene		10	
4-Chlorophenyl phenyl ether		5	
Chrysene		10	5
Dibenzo(a,h)-anthracene		10	0.1
1,2 Dichlorobenzene (semivolatile)	2	2	
1,3 Dichlorobenzene (semivolatile)	2	1	
1,4 Dichlorobenzene (semivolatile)	2	1	
3,3' Dichlorobenzidine		5	
Diethyl phthalate	10	2	
Dimethyl phthalate	10	2	
di-n-Butyl phthalate		10	
2,4 Dinitrotoluene	10	5	
2,6 Dinitrotoluene		5	
di-n-Octyl phthalate		10	
1,2 Diphenylhydrazine		1	
Fluoranthene	10	1	0.05
Fluorene		10	0.1
Hexachloro-cyclopentadiene	5	5	
1,2,4 Trichlorobenzene	1	5	

MINIMUM LEVELS IN PPB (µg/l)

Table 2 - SEMI-VOLATILE SUBSTANCES[2]	GC	GCMS	LC	COLOR
Pentachlorophenol	1	5		
Phenol [3]	1	1		50
Hexachlorobenzene	5	1		
Hexachlorobutadiene	5	1		
Hexachloroethane	5	1		
Indeno(1,2,3,cd)-pyrene		10	0.05	
Isophorone	10	1		
Naphthalene	10	1	0.2	
Nitrobenzene	10	1		
N-Nitroso-dimethyl amine	10	5		
N-Nitroso -di n-propyl amine	10	5		
N-Nitroso diphenyl amine	10	1		
Phenanthrene		5	0.05	
Pyrene		10	0.05	

Table 3– INORGANICS[4]	FAA	GFAA	ICP	ICPMS	SPGFAA	HYDRIDE	CVAA	COLOR	DCP
Antimony	10	5	50	0.5	5	0.5			1000
Arsenic		2	10	2	2	1		20	1000
Beryllium	20	0.5	2	0.5	1				1000
Cadmium	10	0.5	10	0.25	0.5				1000
Chromium (total)	50	2	10	0.5	1				1000
Chromium VI	5							10	
Copper	25	5	10	0.5	2				1000
Lead	20	5	5	0.5	2				10000
Mercury				0.5			0.2		
Nickel	50	5	20	1	5				1000
Selenium		5	10	2	5	1			1000
Silver	10	1	10	0.25	2				1000
Thallium	10	2	10	1	5				1000
Zinc	20		20	1	10				1000
Cyanide								5	

2 *With the exception of phenol by colorimetric technique, the normal method-specific factor for these substances is 1000, therefore, the lowest standards concentration in the calibration curve is equal to the above ML value for each substance multiplied by 1000.*

3 *Phenol by colorimetric technique has a factor of 1*

4 *The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.*

MINIMUM LEVELS IN PPB (µg/l)

Table 4- PESTICIDES – PCBs[5]	GC
Aldrin	0.005
alpha–BHC (*a-Hexachloro-cyclohexane*)	0.01
beta–BHC (*b-Hexachloro-cyclohexane*)	0.005
Gamma–BHC (*Lindane; g-Hexachloro-cyclohexane*)	0.02
Delta-BHC (*d-Hexachloro-cyclohexane*)	0.005
Chlordane	0.1
4,4'-DDT	0.01
4,4'-DDE	0.05
4,4'-DDD	0.05
Dieldrin	0.01
Alpha-Endosulfan	0.02
Beta-Endosulfan	0.01
Endosulfan Sulfate	0.05
Endrin	0.01
Endrin Aldehyde	0.01
Heptachlor	0.01
Heptachlor Epoxide	0.01
PCB 1016	0.5
PCB 1221	0.5
PCB 1232	0.5
PCB 1242	0.5
PCB 1248	0.5
PCB 1254	0.5
PCB 1260	0.5
Toxaphene	0.5

Techniques:
GC - Gas Chromatography
GCMS - Gas Chromatography/Mass Spectrometry
HRGCMS - High Resolution Gas Chromatography/Mass Spectrometry (i.e., EPA 1613, 1624, or 1625)
LC - High Pressure Liquid Chromatography
FAA - Flame Atomic Absorption
GFAA - Graphite Furnace Atomic Absorption
HYDRIDE - Gaseous Hydride Atomic Absorption
CVAA - Cold Vapor Atomic Absorption
ICP - Inductively Coupled Plasma
ICPMS - Inductively Coupled Plasma/Mass Spectrometry
SPGFAA - Stabilized Platform Graphite Furnace Atomic Absorption (i.e., EPA 200.9)
DCP - Direct Current Plasma
COLOR - Colorimetric

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[5] *The normal method-specific factor for these substances is 100, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 100.*

California Regional Water Quality Control Board
Santa Ana Region

April 4, 2003

ITEM: *5

SUBJECT: Waste Discharge Requirements for City of San Bernardino Municipal Water Department, Geothermal Facility, San Bernardino County - Order No. R8-2003-0004, NPDES Permit No. CA 8000015

DISCUSSION:

On March 25, 2002, the City of San Bernardino Municipal Water Department (SBMWD) submitted a complete report of waste discharge for the renewal of waste discharge requirements regulating the discharge of geothermal wastewater from its heat exchange system. The existing waste discharge requirements, Order No. 97-72, expired December 1, 2002. Order No. 97-72 was administratively extended.

SBMWD owns and operates two geothermal production wells within the City of San Bernardino. One well is located at "D" Street and Mill Street. Another well, known as "Meeks and Daley No. 66", is located near Central and Arrowhead streets. The wells are pumped alternately and produce about 2.2 mgd of geothermal water.

Geothermal water is extracted and delivered in insulated pipes to heat various municipal buildings, including the Department office at City Hall and other buildings in the downtown area of the City of San Bernardino. The pipeline has a total length of about 18 miles. The geothermal water is coursed through non-contact heat exchanger systems where the geothermal heat is transferred to domestic water. The domestic water temperature is raised from 65^0F to 98^0F, while the geothermal water is cooled from 121^0F to 113^0F.

Waste geothermal water is then discharged into either the sanitary sewer line or to 10 outfalls. Six outfalls feed into storm channels that drain to tributary creeks of the Santa Ana River. These creeks include: Warm Creek, City Creek, Lytle Creek, Twin Creek, and San Timoteo Creek. Four outfalls discharge directly into these Creeks. These Creeks are tributaries to Reaches 4 and 5 of the Santa Ana River (See Attachment A).

Beneficial uses of Reach 4 and 5 of the Santa Ana River and the tributary Creeks include groundwater recharge, water contact recreation, non-contact water recreation, wildlife habitat, and warm freshwater habitat.

The Basin Plan specifies that the discharges shall not cause temperatures of inland surface waters to be raised above 90^0F (32^0C), which normally occurs during the period of June through October, or above 78^0F (26^0C) during the rest of the year. The proposed Order implements this requirement.

Because the minerals and metals concentrations of the discharges have generally remained consistently low during many years of monitoring, no minerals and metals effluent limits are specified in the proposed Order. However, annual monitoring of mineral and metal constituents as contained in the previous Order is required.

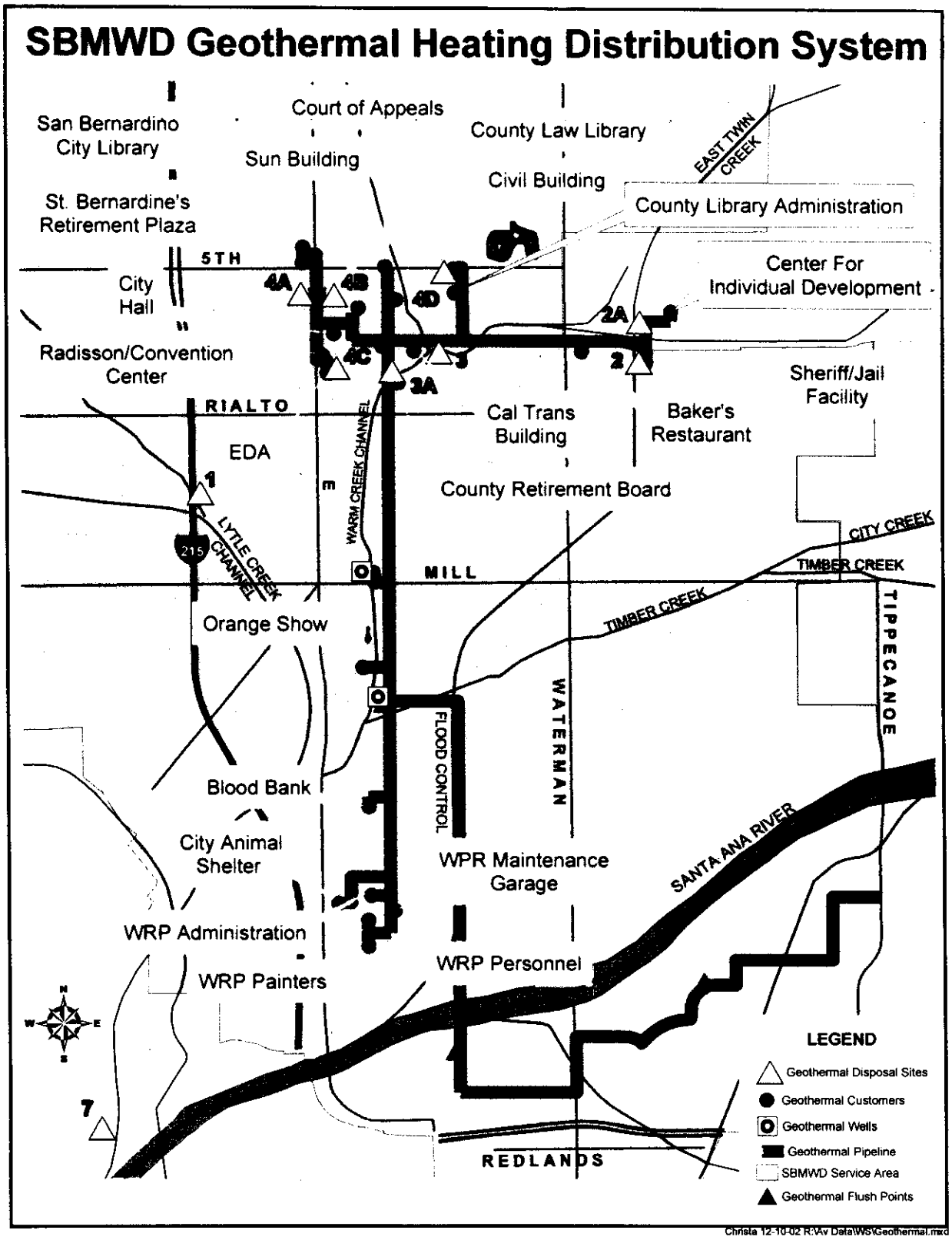
The proposed waste discharge requirements should be adequate to protect the beneficial uses of the receiving waters.

RECOMMENDATION:

Adopt Order No. R8-2003-0004, NPDES No. CA 8000015, as presented.

Comments were solicited from the following:

U.S. Environmental Protection Agency, Permits Issuance Section (WTR-5) - Terry Oda
U.S. Army District, Los Angeles, Corps of Engineers - Regulatory Branch
U.S. Fish and Wildlife Service, Carlsbad
State Water Resources Control Board, Office of the Chief Counsel - Jorge Leon
State Water Resources Control Board, Division of Water Quality - James Maughan
State Department of Water Resources, Glendale
State Department of Fish and Game, Long Beach
State Department of Health Services, San Bernardino
San Bernardino County Flood Control – Naresh Varma
San Bernardino County Environmental Health Department - Ron Ripley
City of San Bernardino, Municipal Water Department - W. William Bryden
City of San Bernardino -- City Manager
Orange County Water District – Nara Yamachika
Orange County Coastkeeper – Garry Brown
Lawyers for Clean Water C/c San Francisco Baykeeper


SBMWD Geothermal Heating Distribution System
San Bernardino City Library
Court of Appeals
Sun Building
County Law Library
Civil Building
EAST TWIN CREEK
County Library Administration
St. Bernardine's Retirement Plaza
5TH
City Hall
4A
4B
4D
2A
Center For Individual Development
Radisson/Convention Center
4C
3
2
3A
Sheriff/Jail Facility
RIALTO
Cal Trans Building
Baker's Restaurant
EDA
WARM CREEK CHANNEL
County Retirement Board
1
LYTLE CREEK CHANNEL
215
CITY CREEK
TIMBER CREEK
MILL
TIMBER CREEK
Orange Show
TIPPECANOE
WATERMAN
FLOOD CONTROL
Blood Bank
City Animal Shelter
WPR Maintenance Garage
SANTA ANA RIVER
WRP Administration
WRP Personnel
WRP Painters
N
W
E
S
7
REDLANDS
LEGEND
Geothermal Disposal Sites
Geothermal Customers
Geothermal Wells
Geothermal Pipeline
SBMWD Service Area
Geothermal Flush Points
Christa 12-10-02 R:\Av Data\WS\Geothermal.mxd

California Regional Water Quality Control Board
Santa Ana Region

\ ,ton H. Hickox
Secretary for Environmental Protection

Internet Address: http://www.swrcb.ca.gov/rwqcb8
3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (909) 782-4130 - FAX (909) 781-6288

Gray Davis
Governor

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at www.swrcb.ca.gov/rwqcb8.

April 9, 2003

W. William Bryden, P.E.
Municipal Water Department
City of San Bernardino
300 North D Street
San Bernardino, CA 92418

TRANSMITTAL OF ADOPTED ORDER NO. R8-2003-0004, NPDES NO. CA8000015

Dear Mr. Bryden:

At the regular Board Meeting held on April 4, 2003, the Regional Board adopted Order No. R8-2003-0004 renewing waste discharge requirements for the Geothermal Facility. A certified copy is enclosed for your records.

Sincerely,

Barbara Laffoon

BARBARA LAFFOON
Executive Assistant

Enclosure: Adopted Order No.R8-2003-0004

c. State Water Resources Control Board, Division of Water Quality, James Maughan
United States Environmental Protection Agency, WTR 5, Permits Section, Terry Oda

/bjl