

WATER NEWS

PALMDALE WATER DISTRICT'S QUARTERLY NEWSLETTER ON-LINE Spring, 2001

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Water News is a quarterly publication. Please direct any questions or comments to Newsletter Editor Dawn Hensley at 661-947-4111, ext. 103, Fax 661-947-8604, or e-mail dhensley@palmdalewater.org You can also write to Dawn at Palmdale Water District, 2029 E. Avenue Q., Palmdale, CA. 93550. We look forward to hearing from you!

ATENCION RESIDENTES QUE NO HABLAN INGLES

Atencion residentes que no hablan Ingles: Para recibir una version en Espanol sobre las noticias del agua o para cualquier pregunta o duda acerca del agua, de las reglas de la compania o de su estado de cuenta, favor de llamar a la oficina de P.W.D. al telefono 947-4111.

POWER IN PWD'S FUTURE

"Waste water – waste power; conserve water – conserve power; and you know how high the cost of power is getting to be."

P.W.D. Director Lynn Coffey

The Palmdale Water District's goal is to provide high quality water at the lowest possible cost. It takes a lot of electricity for PWD to deliver water to our customers and electricity rates are increasing substantially. To help keep operating costs at a minimum, PWD is reviewing the options for generating our own power supplies. You're probably wondering, "How can a water agency generate power?" As an irrigation district, PWD can buy, sell, and generate power.

Since the large-scale generation of power is somewhat new to the District, a consultant will be hired to help determine the best options for generating and delivering power supplies. In the meantime, data is being collected from two wind meter stations that have been placed on District property. The data will be studied to determine whether or not wind can be used as an alternate energy source.

PWD may also put its existing hydroelectric generator at Palmdale Lake back into service. This unit generates power through the velocity of water released from the California Aqueduct into Palmdale Lake. PWD has other sites in its water system where this type of power generation is a possibility.

The District will meet with representatives from the City of Palmdale and other water agencies to look at ways to coordinate energy efforts.

All energy conservation tips are provided courtesy of Southern California Edison Company.

- *Use the right light bulb. Choose bulbs that give the most light, or lumens, for the electricity or watts they use. Compact fluorescent bulbs use 75% less energy than incandescent bulbs.*
- *Use zone heating and cooling. Heating or cooling a room you're not using wastes energy. Close doors and/or vents to that room. To avoid damage to your central heating or cooling system, close off no more than 1/4 of your home.*
- *Because your washing machine uses most of its energy heating the water, cold-water washing saves a substantial amount of energy. Use the coolest water temperature appropriate for fabric and soil conditions.*
- *Clean the lint filter in your dryer after every load to increase airflow and decrease drying time.*
- *Keep your spa or pool covered when not in use. Well-fitted covers help prevent heat loss for energy savings of 50% to 70% and reduce water evaporation.*

P.W.D. KEEPING YOU INFORMED

Current construction projects for the Palmdale Water District are listed below. If you have questions about these projects or experience any problems during construction, please call PWD at (661) 947-4111, ext. 118.

- The water main replacement project in the north side of Palmdale Blvd. between Sierra Hwy. and 10th St. E. is now complete.
- Abandonment of a water main and installation of a new 8" water main at the intersections of Pearblossom Hwy. and 42nd St. E. and Avenues T-2, T-4, T-6, and T-8 at 42nd St. E. will start in March.
- 90,000 tons of sediment is expected to be removed from Littlerock Reservoir by the end of this year. The removal of the sediment is necessary to maintain water storage capacity in the Reservoir. Studies are being conducted to determine the effect of the sediment removal on the endangered arroyo toad, and sources of funding are being identified.

CELEBRATE WATER AWARENESS MONTH "MAY 2001"

From conserving water to conserving energy, this year's Water Awareness Fair will be an event you won't want to miss! Mark your calendars for May 12 and 13, 2001 to attend PWD's Water Awareness Fair. The Fair will, once again, be held in the parking lot area of the Hammack Activity Center just north of the Youth Library (Sierra Hwy. and Ave. Q-6). Hours will be 9 am to 4 pm on Saturday and 10 am to 3 pm on Sunday.

Come and help PWD and Aquadog celebrate Water Awareness Month by being a part of Aquadog's H₂O Talent Show. Come see the Backhoe Rodeo Championships and take a peek into the Millennium Tent to see what the future in water is all about and to receive information and ideas on water science experiments. Enjoy the free entertainment and the amazing Water Wizard. You won't want to miss the live, exotic animals and the native wildlife and plant life exhibits in the Environmental and Rainforest Tent. And, most important, don't miss the Kid's

Tent jammed full of free, exciting learning games to keep your kids entertained and educated about water.

For additional information on the Fair or if you would like to help spread the word on the importance of conserving water and protecting our environment by becoming a sponsor for this exciting community event, contact the District at 947-4111 and ask for Claudette or Tammy. Different sponsorship programs are available.

EARTHQUAKE TIPS FOR YOUR TAP

With all the recent "earth-shaking" activity, the Palmdale Water District recommends everyone have a family emergency preparedness plan. Regular drills are held with PWD staff to review the procedures in our Emergency Preparedness and Emergency Response Plan to ensure that District staff is ready to respond to any type of emergency.

The following tips for your tap may help in the event we experience an earthquake.

- *Store emergency drinking water rations. Allow 3 – 5 gallons per person per day. Don't forget drinking water for the family pets!*
- *Stay tuned to local radio stations for updates on the water system.*
- *Do not tie up phone lines with non-emergency calls regarding water outages. Please keep areas around fire hydrants and water meters clear to aid emergency repair crews.*
- *Consider all bodies of water such as flowing gutters, streams, ponds, and lakes to be polluted.*
- *Shut off automatic sprinkler systems, discontinue use of swamp coolers, and turn off the water heater.*
- *Turn off the water supply to your house at the main shut-off valve if any plumbing fixtures in the house are damaged and/or leaking.*
- *To prevent odors from entering the house through the sewer system, add a small amount of water to any open drain and toilet bowl if the water supply is out of service for more than two or three days.*

The District has back-up materials and supplies on hand to make repairs to the water system if damage occurs. PWD also has emergency generators so the District can transfer water during a power outage. If a water outage does occur, please be assured that District personnel are checking the system and making repairs as rapidly as possible.

For additional information on earthquake preparedness, call the American Red Cross at 661-267-0650 or stop by their office at 2715 East Avenue P, Palmdale. They have brochures available that can help you and your family "be prepared."

PWD'S ANNUAL SCHOOL CONTESTS FOCUS ON WATER SOURCES

Where does our water come from? Is it important to protect these sources from pollution? Classes entering this year's Water Awareness Contests will help answer these important questions as they illustrate the three sources of water for the Palmdale Water District.

A Coloring Contest is offered for Grades K – 2, and Grades 3 – 5 can enter a Poster Contest to illustrate how PWD gets its water. The contest for 6 – 8 Grades will allow students to express their musical side as they compose the words to Aquadog's music for an "Aquadog Theme Song." The winning class for this contest can look forward to hearing their song on local radio stations and everywhere Aquadog makes an appearance.

Materials and entry forms for these contests are now available at the District office. 1st, 2nd, and 3rd place cash prizes will be awarded for each grade level. There will be a Grand Prize for each contest. The deadline to enter these fun and exciting contests is March 16, 2001 so don't delay, call PWD at 947-4111 x120 or x109 and enter today!

GRAYWATER ESSAY CONTEST... CELEBRATES WATER AWARENESS MONTH

Are you planning to install a graywater system at your home? Enter our contest and you could get your system installed for free! The use of graywater can help reduce outdoor watering and can mean overall lower utility bills. Entry forms and guidelines for the contest are now available. The contest is open to all residents within the Palmdale Water District's boundaries who own their home. You must be 18 years of age or over. If your entry is selected as the winning essay, PWD will assist you in obtaining a permit for installation of the system from the City of Palmdale Building Department and will make arrangements for construction of the system. Entries must be received by March 23, 2001.

Call PWD Special Projects Coordinator Claudette Roberts at (661) 947-4111, ext. 120 to pick up an entry form and guidelines for this contest.

RECOMMENDED FLOWER OF THE QUARTER:

Calendula (*Kah-len-deu-lah*). Easy to grow, good in sun or semi-shade, with bright orange and yellow flowers.

As an added tip... March is the time to add a light fertilizer to pruned rose bushes. A light fertilizer in spring helps produce better flowers and roots that use less water.

AQUADOG POINTER

- *Aquadog points out that half the water used by the average family is for outdoor use. Check your sprinkler system for leaks, adjust watering times, and use water conservation plants when planning your landscape to reduce watering costs.*
- *Aquadog would like to know....Are you working on a project about water? Do you need information? Call PWD at (661) 947-4111, ext. 120. Education packets are available and we are here to help!*

COMMUNITY CORNER

The City of Palmdale has announced the following special events. Call the City at 267-5112 with questions or to verify event dates.

- Palmdale Playhouse "1776" 6th Annual Cultural, Historical, and Education Drama Series: March 16, 17, 23, 24 – 8 pm; March 18 & 25 – 2 pm; \$12/\$10/\$8 admission
- Teen Job Fair: March 31 – 11 am to 1 pm, Hammack Activity Center
- Palmdale Playhouse "Children's Festival:" April 7 & 8
- Children's Springfest and Egg Hunt: April 14 – 11 am, Pelona Vista Park, FREE
- Rim of the World Rally: May 4 and 5 – times vary, call 760-375-8704
- Palmdale Playhouse "Summer Celebration:" May 17, 18, 19, 20 – Call (661) 267-5685 for events and times.
- Memorial Day Service: May 28 – 11 am, Desert Lawn Memorial Park

ASK US!

Q. Why am I being fined \$5.00 for not paying my bill by the due date?

A. The \$5.00 is not a fine. It is a late fee. Water bills are due and payable when received. If payment is not received within 25 days, the bill becomes "late" or delinquent and a late fee is charged to the account. The late fee is 5% of the delinquent amount with a minimum late fee of \$5.00. Late fees cover the cost to produce and process the final notice including staff time, envelopes, and postage.

NOW LET US ASK YOU!

Q. Where does a family use half of its water?

The answer is somewhere in this issue of Water News. Read carefully, and you could win a prize! Call or write to PWD with your answer. Ten winners will be randomly selected from the first 25 correct responses. (Employees of the Palmdale Water District and their families are not eligible to win.)

"NO" is the correct answer to last issue's question: "Is there a Maximum Contaminant Level (MCL) set for Chromium 6?" Congratulations to all winners!

- PWD Board Meetings: PWD's Board of Directors meet the 2nd and 4th Monday of each month. Board meetings are held at the District office at 2029 E. Avenue Q, Palmdale. They begin at 7:00 p.m. and are open to the public.
- PWD Holiday Closures: To help you avoid any inconvenience, please note that District offices will be closed in observance of the following holidays: April 13th, Good Friday. We will also be closed May 28th for Memorial Day; July 4th to observe Independence Day; and September 3rd for Labor Day.
- For any questions or concerns about your water, District policies, or your water bill, please call PWD at (661) 947-4111.

Do you have any questions about PWD? We'd like to hear from you! Call us at (661) 947-4111 ext. 103, write to us at 2029 E. Ave. Q, Palmdale, CA 93550, ATTN: Dawn Hensley, or e-mail us at dhensley@palmdalewater.org. We look forward to hearing from you!

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1998 ANNUAL
WATER QUALITY
CONSUMER CONFIDENCE REPORT

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Palmdale Water District . . . Making available the highest quality water at the lowest possible cost.

WELCOME TO THE PALMDALE WATER DISTRICT'S 1998 ANNUAL WATER QUALITY CONSUMER CONFIDENCE REPORT. The purpose of this report, which is mandated by federal and state law, is to increase your understanding and confidence in the quality of drinking water delivered to you by the District.

The Water Quality Report is divided into sections listing "Primary" and "Secondary" standards. Primary and secondary standards are set forth by the California Department of Health Services (CDHS) and the U.S. Environmental Protection Agency (USEPA).

Primary standards are set to protect public health from contaminants in water that may be immediately harmful to humans or affect their health if consumed for long periods of time. Secondary standards govern aesthetic qualities of water such as taste, mineral content, odor, color, and turbidity.

The Palmdale Water District is pleased to inform you that the water delivered to you by the District meets or exceeds all Primary and Secondary standards for water quality as shown in the report.

To help you better understand the water quality data included in the report, an outlined example has been provided at the top of page 3. In addition, you will notice other subheadings in the Maximum Contaminant Level (MCL) column of the report. For example, in the MCL column for Total Trihalomethanes (TTHms) there is a subheading "System Running Annual Average." This means that the MCL is based on analysis taken from the distribution system and that the results are reported as a running annual average of all analysis within the previous four quarters.

Another subheading you will notice in the MCL column for Lead is "90th Percentile Action Level." This means that the USEPA has established an Action Level rather than an MCL for lead in drinking water. If the lead level is exceeded in the 90th percentile of all sample results, specific actions must be taken.

There is also a column labeled "EPA Maximum Contaminant Level Goal - MCLG or Public Health Goal - (PHG)." These are non-enforceable health-based goals.

As shown in the Water Quality Report, the Palmdale Water District continues to provide a safe, high quality, and carefully monitored water supply.

The following definitions are provided to help you understand the water quality report:

Public Health Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. The California Environmental Protection Agency sets PHGs.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Treatment Technique: A required process intended to reduce the level of a contaminant in drinking

water.

Action Level: The concentration of a contaminant that, if exceeded, triggers a treatment or other requirement, which a water system must follow.

Primary Drinking Water Standard: Primary MCLs, specific treatment techniques adopted in lieu of primary MCLs, and monitoring and reporting requirements for MCLs that are specified in regulation.

Iron and Manganese:

Early in 1998, one of the District's 26 wells exceeded the secondary standard for iron and another exceeded the secondary standard for manganese. Secondary standards are set for aesthetic reasons, and there are no health affects related to these standards. Aesthetics associated with iron are red staining on plumbing fixtures, and manganese is associated with black staining on plumbing fixtures. Both of these wells were flushed to atmosphere and re-sampled until secondary MCL was met.

PWD sources of water supply:

PWD obtains its water from one of three sources or a combination of these sources. *Ground water* is pumped from the earth's natural underground aquifer. *Surface water* comes from Littlerock Reservoir and is transferred to Palmdale Lake and treated at the water treatment plant. The *State Water Project*, or California Aqueduct, provides the third source of water for the District. This water is taken into Palmdale Lake and treated at the water treatment plant. PWD is currently negotiating to increase the amount of water that can be taken from the State Water Project. All three of these sources are constantly tested and treated in compliance with all applicable regulations to insure high water quality and dependability of the water system.

Required Health Information:

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Additional Testing and Updates:

To maintain the highest standard in water quality, the Palmdale Water District samples and tests its water beyond Federal and State requirements. One example is the District's testing for *Cryptosporidium*, a parasitic organism. *Cryptosporidium* can be spread through contaminated food or water or by direct contact with the stool of an infected person or animal. It can cause a gastrointestinal illness called *Cryptosporidiosis*, which may cause diarrhea, headache, abdominal cramps, nausea, vomiting, and low-grade fever. The District has been testing for *Cryptosporidium* for several years now and all results have been negative.

PWD also tests for Methyl Tertiary-Butyl Ether (MTBE), which is a gasoline additive, and for Perchlorate, which is an organic chemical derived from ammonium Perchlorate. It is used in the manufacture of solid rocket propellants and explosives. Again, the District has been testing for MTBE and Perchlorate for several years and all results have been "None Detected."

In March 1998, the California Department of Health Services (CDHS) published results on a preliminary study, which indicated a possible weak link between total Trihalomethanes (TThms) and increased miscarriage rates. To date, the Palmdale Water District has received no new information regarding further research to verify or confirm the accuracy of the original study. If you are pregnant and in your first trimester, you may wish to consult with your personal physician for advice.

Palmdale Water District Source Assessment and Wellhead Protection Program.

To further protect our ground water sources, the Palmdale Water District has been working towards the establishment of a Drinking Water Source Assessment and Wellhead Protection Program.

It is necessary to establish protection zones for both surface and ground water sources for this assessment. In order to establish protection zones, applicable information, such as water flow, soil type, and well construction data, are required for each of the District's well sites.

After each protection zone has been defined and established, identification of Possible Contaminating Activities (PCAs) is necessary. Identification of PCAs may include, but are not limited to, gas stations, septic tanks, underground storage tanks, military installations, or golf courses.

Once PCAs have been identified and a protection zone defined around each well, a vulnerability assessment is created to describe the likelihood, or risk level, that a PCA contaminant may migrate and enter the drinking water source.

PWD is the first agency in the State of California to prepare and submit a Groundwater Assessment and Protection Program and has involved local, state, and federal agencies, as well as other interested parties, as stakeholders to act as an Advisory Committee to the District in developing and implementing a Wellhead Protection Plan.

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Parameter	Maximum Contaminant Level		Surface Water		Ground Water	EPA Max Contaminant Level Goal (MCLG) or Public Health Goal (PHG)
	Surface	Ground	Influent	Effluent	Range/Average	
Turbidity (Water Clarity)	0.5	5.0	4.9	0.08	0.1-0.9 / 0.16	N/A
Microbiological "Total Coliform Bacteria, Fecal & E. coli"	<5.0%		N/A		N/A	N/A
Most Probable Number (MPN)	0		<2-≥ 1600		N/A	Zero
Present / Absent (PA)	Absent		Absent		Absent Absent	Zero
Organic Chemicals						
Total Trihalomethanes (TThms)	100 ppb		46			Zero
Parameter	Maximum Contaminant Level	Surface Water		Ground Water		EPA Max Contaminant Level Goal (MCLG) or Public Health

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						Goal (PHG)
Endrin	0.2 ppb	N/D	N/D	N/D	N/D	(1.8)
Lindane	0.2 ppb	N/D	N/D	N/D	N/D	(.032)
Methoxychlor	40 ppb	N/D	N/D	N/D	N/D	(30)
Toxaphene	3.0 ppb	N/D	N/D	N/D	N/D	Zero
2,4-D	70 ppb	N/D	N/D	N/D	N/D	70
2,4,5-TP Silvex	50 ppb	N/D	N/D	N/D	N/D	50
Atrazine	3.0 ppb	N/D	N/D	N/D	N/D	(.15)
Bentazon	18 ppb	N/D	N/D	N/D	N/D	(18)
Benzene	1.0	N/D	N/D	N/D	N/D	Zero
Carbon Tetrachloride	0.5	N/D	N/D	N/D	N/D	Zero
1,2-Dibromo-3-chloropropane	0.2	N/D	N/D	N/D	N/D	Zero
1,4-Dichlorobenzene	5.0	N/D	N/D	N/D	N/D	5
1,2-Dichloroethane	0.5	N/D	N/D	N/D	N/D	Zero
1,1-Dichloroethylene (DCE)	6.0	N/D	N/D	N/D	N/D	(6)
1,3-Dichloropropene	0.5	N/D	N/D	N/D	N/D	(.2)
Ethylbenzene	700	N/D	N/D	N/D	N/D	700
Ethylene Dibromide (EDB)	0.05	N/D	N/D	N/D	N/D	Zero
Molinate	20	N/D	N/D	N/D	N/D	20
Monochlorobenzene	70	N/D	N/D	N/D	N/D	10
Simazine	4.0	N/D	N/D	N/D	N/D	4
1,1,2,2-Tetrachloroethane	1.0	N/D	N/D	N/D	N/D	1
Toluene	150	N/D	N/D	N/D	N/D	(150)
Tetrachloroethylene	5.0	N/D	N/D	N/D	N/D	Zero
Thiobencarb	70	N/D	N/D	N/D	N/D	N/A
1,1,1-Trichloroethane (TCA)	200	N/D	N/D	N/D	N/D	200
1,1,2-Trichloroethane	5.0	N/D	N/D	N/D	N/D	3
Trichloroethylene (TCE)	5.0	N/D	N/D	N/D	N/D	(Zero)
Vinyl Chloride	0.5	N/D	N/D	N/D	N/D	Zero
Xylenes	1750	N/D	N/D	N/D	N/D	10
Cis-1,2-Dichloroethylene	6.0	N/D	N/D	N/D	N/D	6
Trans-1,2-Dichloroethylene	10	N/D	N/D	N/D	N/D	10
1,1-Dichloroethane	5.0	N/D	N/D	N/D	N/D	Zero
1,2-Dichloropropane	5	N/D	N/D	N/D	N/D	(.5)
Trichlorofluoromethane (Freon	150	N/D	N/D	N/D	N/D	150

11)						
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	1200	N/D	N/D	N/D	N/D	1.2
Carbofuran	18	N/D	N/D	N/D	N/D	18
Glyphosate	700	N/D	N/D	N/D	N/D	1
Chlorodane	0.1	N/D	N/D	N/D	N/D	(Zero)
Heptachlor	0.01	N/D	N/D	N/D	N/D	(Zero)
Heptachlor Epoxide	0.01	N/D	N/D	N/D	N/D	Zero
Di(2-ethylhexyl)phthalate	4.0	N/D	N/D	N/D	N/D	Zero

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Parameter	Maximum Contaminant Level		Surface Water		Ground Water	EPA M Contaminant Goal (MCL) Public Health (PHG)
	Surface	Ground	Influent	Effluent	Range / Average	
Inorganic Chemicals						
Arsenic	0.05 ppm		.002 ppm	.002 ppm	<.002 <.002	50
Barium	1.0 ppm		N/D	<.1	<.01 <.01	1
Cadmium	.005 ppm		N/D	<.001	<.001 <.001	(5)
Chromium	0.05 ppm		N/D	<.01	<.01 <.01	(2.5)
Fluoride	2 ppm		.14	.310	<.1-0.533 0.23	2
	(90 th %-tile Action Level)					
Lead	1.3 ppm		N/D	<.005	<.005 <.005	Zero
Mercury	.002 ppm		N/D	<.001	<.001 <.001	(1.2)
Nitrate (as NO3)	10 ppm		N/D	<2	2.0-14.7 7.13	Zero
Selenium	0.05 ppm		N/D	<.005	<.005 <.005	50

Silver	0.1 ppm	N/D	<.01	<.01 <.01	100
Nitrate & Nitrite (as N)	45 ppm	<40	<.4	<.400-6.14 1.03	Zero
Radioactivity					
Gross Alpha Activity	15 pCi/l	1.2	1.1	1.0-2.0 1.2	Zero
Gross Beta Activity	50 pCi/l	N/A	N/A	N/A N/A	Zero
Uranium	20 pCi/l	N/A	N/A	N/A N/A	Zero
Combined Radium 226 & 228	5 pCi/l	N/A	N/A	N/A N/A	Zero
Tritium	20,000 pCi/l	N/A	N/A	N/A N/A	Zero
Strontium-90	8 pCi/l	N/A	N/A	N/A N/A	Zero
Inorganic Chemicals					
Aluminum	1.0 ppm	.123	<.05	<.05-.0917 0.06	2
Color	15 units	15	<3	<3 <3	N/A
Odor-Threshold	3 units	2.0	2.0	1.0 1.0	Zero
++Chloride	250-500 ppm	49	63.2	4.0-81.0 14.83	250
Copper	1 ppm	N/D	<.05	<.05 <.05	1 pp
Foaming Agents (MBAS)	.05 ppm	.02	<.02	<0.02 <0.02	0.5 pp
Iron	0.3 ppm	620	<.1	<1-0.575 <.1	.3 pp
Manganese	0.05 ppm	47	<.03	<.03-.059 0.03	0.05 p

++Sulfate	250-500 ppm	33	55.6	16.2-58.7 29.49	250 pp
Zinc	5.0 ppm	N/D	.973	<0.05 <0.05	5 pp
++Total Dissolved Solids	500-1600 ppm	275	278	113-445 188.4	500 pp
Specific Conductance	900-1600umho/cm+	425	527	225-770 332.5	900 umho
Additional Constituents Analyzed					
pH	No Standard (units)	8	6.84	7.53-8.5 7.96	N/A
Hardness (as CaCO3)	No Standard	123	140	40-263 106.01	N/A
Sodium	No Standard	39	46.8	8.3-67.2 32.33	N/A
Calcium	No Standard	31	35.7	7.05-87.5 29.65	N/A
Potassium	No Standard	3.1	3.6	<1.0-2.4 1.7	N/A
Magnesium	No Standard	11	12.4	2-11.6 6.87	N/A

Special Testing						
Giardia (cyst.)	N/A	N/D	N/D	N/D	N/D	Zero
Cryptosporidium (oocyst.)	N/A	N/D	N/D	N/D	N/D	N/A
Dioxin	30 ppm	N/D	N/D	N/D	N/D	Zero
Methyl Tertiary Butyl Ether	0.035 ppm	N/D	N/D	N/D	N/D	Not Reg
Asbestos	7 MFL	N/D	N/D	N/D	N/D	Zero
Perchlorate	0.018 ppm		---	N/D	N/D	Not Reg

Definitions of Abbreviations	
PAL or AL = Provisional Action Levels or Action Level	umho/cm = Microhms per centimeter
MCL = Maximum Contaminant Level	+++ Recommended Upper Short Term
MFL = Million fibers per liter. Mcl is for fibers exceeding 10um in length	TT = Treatment Technique
Mg/l = Milligrams per liter = parts per million	Influent = Raw Surface Water
NTU = Nephelometric Turbidity Units	Effluent = Treated Surface Water
pCi/l = Pico Curies per liter	MCLG = Maximum Contaminant Level Goal (non-enforceable)
PHG = Public Health Goal (non-enforceable)	N/D = None Detected
ppb = Parts Per Billion	N/A = Not Applicable
ppm = Parts Per Million	

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UA suing Moly over leaks

An official for the mining company says there is no evidence the firm's plant caused health problems.

By STEVEN CHURCH
Sun Staff Writer

County prosecutors sued Molycorp Inc. Tuesday, accusing the mining company of violating state law by leaking toxic and radioactive waste into the main drinking water supply for thousands of visitors to resorts on the California/Nevada border.

By allowing toxic and radioactive waste to seep into groundwater, Molycorp violated state law, claims the lawsuit, which was filed in superior court in Barstow.

For more than a decade waste water from Molycorp's Mountain Pass operation near Primm, Nev., has seeped into aquifers used by the sparsely populated region, regulators say.

A Molycorp official said there is no evidence the company's mining and chemical processing plant has caused any health problems in the surrounding community, which includes an elementary school a few hundred feet from the company's main gate.

The lawsuit accuses the company of exposing workers to dangerous chemicals, but stops short of saying the public drank any toxic or radioactive substances.

The San Bernardino County District Attorney's office took over the lawsuit from a San Francisco-based environmental group, which had started the case in March.

Under state law, certain kinds of environmental lawsuits can be taken over by public prosecutors. Because the environmental group's case paralleled a district attorney criminal investigation, prosecutors decided to assume responsibility for the lawsuit, said Deputy District Attorney Charles Umeda.

The group, Communities for a Better Environment, will try to work with the county to hold Molycorp responsible for the pollution.

said CBE staff attorney Scott Kuhn.

Last week, Kuhn said the environmental group was worried Molycorp would pressure county prosecutors into taking over the case, hoping for an easy settlement. CBE was looking forward to taking its case to trial, said Kuhn.

"Right now, it's a little frustrating," said Kuhn.

The group will continue to look at its legal options and may try to file a federal or different kind of state case, Kuhn said.

Umeda said Molycorp officials told him they did not like the idea of CBE suing the company, but never pressured him to take over the case.

Molycorp, owned by oil giant Unocal 76, expressed support for the district attorney's decision.

"Unocal would concur that this is the appropriate forum for this issue to move forward in, if it has to move forward," said Allen Randle, Molycorp's general manager for technical services.

The environmental group has successfully sued Unocal 76, winning judgments worth more than \$100 million, said CBE spokesman Denny Larson.

The criminal probe involves allegations Molycorp lied about several toxic and radioactive waste spills in the desert near Interstate 15 in mid-summer 1996.

The civil complaint accuses Molycorp of violating the Safe Drinking Water and Toxic Enforcement Act, passed by voters in 1986.

Under that law, a company cannot release any chemical known to cause cancer or birth defects into the environment.

A similar lawsuit was filed against four of the state's biggest grocery chains last month by the Natural Resources Defense

Council and state Attorney General's office. The group accused of failing to notify residents living near homes about the danger of diesel exhaust.

The Molycorp case goes further, however, claiming the mine is responsible for a drinking water supply charge rarely made under state law, commonly called Proposition 65, said Umeda.

Randle said his company is working to clean up all pollution problems.

"The actions we are taking will answer these kind of questions," said Randle. "We are making progress on the issues that are of concern to the residents and some of our neighbors."

Since the 1994 spill, the state and county regulators have been investigating the mine, slowly forcing the company to tighten its environmental controls.

Wells put in to monitor pollution coming off the old Mountain Pass mine and chemical plant have tested for several toxic and hazardous substances, including lead, and two radioactive elements, uranium 238 and thorium 230. Molycorp is under contract from state water quality regulators to clean up and replace leaking waste water at Mountain Pass and 14 other sites in the Ivanpah Valley.

District attorney files suit against Molycorp

► **ENVIRONMENT:** Case stems from contamination of drinking water at Mountain Pass Mine.

By GREG HARRIS
Staff Writer

5/21/98

VICTORVILLE — San Bernardino County prosecutors are suing Molycorp Inc. for violations of state law at the company's Mountain Pass Mine.

The lawsuit alleges that Molycorp has contaminated, and continues to contaminate, sources of drinking water with chemicals known by the state of California to cause cancer and/or "reproductive toxicity." Reproductive toxicants are chemicals known to cause birth defects or other reproductive harm.

Prosecutors said the drinking water supply is used by thousands of visitors to resorts on the California/Nevada border. The civil suit, filed in Superior Court in Barstow, also alleges that Molycorp failed to provide adequate warning to people who were exposed to cancer-causing chemicals.

Officials from Molycorp could not be reached for comment Wednesday.

Charles Umeda, deputy district attorney, said the alleged acts are violations of Proposition 65, also known as the Safe Drinking Water and Toxic Enforcement Act of 1986.

"We are looking at contamination of the source of drinking water in the area near the plant, specifically, plumes that formed on ponds at the mine, which are contaminating underground aquifers," Umeda said.

Umeda said the suit concerns low levels of contamination, but levels that may exceed limits mandated by Proposition 65.

Molycorp has been in hot water with government and environmental agencies for years because of its activities at the Mountain Pass Mine, 15 miles from the California/Nevada border.

Molycorp recently completed cleanup of hazardous materials spilled in a 1996 pipeline rupture. Approximately 300,000 gallons of wastewater contaminated with radioactive materials and heavy metals were released near the mining facility, which cost Molycorp about \$3.6 million.

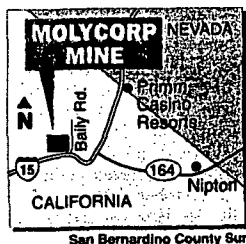
In addition, the Lahontan Regional Water Quality Control Board was set to fine the company \$550,000 for an administrative liability, but postponed that action when it appeared Molycorp would not present a defense at a March hearing.

The board instead issued three cleanup and abatement orders against Molycorp. The orders address activity at the mine's New Ivanpah Pond, the Old Ivanpah Pond, the plant site and the groundwater supply around the mining facility.

Umeda said the suit also alleges that Molycorp "failed to warn individuals that they are being exposed" to contaminants. Umeda said citizens near the plant and plant employees may have been exposed.

In late March, the mine temporarily stopped using its wastewater pipeline, which resulted in reduced production and temporary layoffs.

Molycorp, a subsidiary of Union Carbide Corp., is the world's leading producer of lanthanides, a rare earth element used in everything from catalytic converters to television screens.



Firm claims 2,620 spills

By ANDREW SILVA
San Bernardino County Sun 2-6-99

A High Desert mining operation struggling to recover from a history of serious toxic spills reported on Friday that it is responsible for 2,620 chemical releases between 1982 and 1998.

Molycorp Inc. researched the spills in response to orders from the state Lahontan Regional Water Quality Control Board.

The releases ranged from a few gallons to a spill of 1.3 million gallons in 1985. It is not clear how many of the spills were reported to the water quality agency, officials said.

Previous research by the company indicated that about 70 spills since 1985 put more than 1 million gallons of contaminated waste in the ground along the 14-mile pipeline. The pipeline carried waste water from the mine, now shut down, to ponds at Mountain Pass near Interstate 15, not far from the Nevada border.

"We are getting a handle on how much cleanup needs to be done and where cleanup needs to be done," said Harold Singer, director of the water quality agency.

Some groundwater has been contaminated, and the company and agency are working on ways to make sure those plumes of contamination don't affect drinking water.

Now that the company has identified all the spills, it must find out how serious they were and whether there is further contamination. That work is supposed to be done by the end of next month.

The 1.3-million-gallon spill in 1985 happened when a storage pond overflowed. Much of the material cascaded into lower ponds. It is not known how much of the contaminated water might have spilled onto the desert floor and caused problems, said Allen Randle, Molycorp general manager.

That spill was reported, as were all serious spills, Randle said.

Cleanup of major pipeline breaks in 1995 and 1996, which dumped 233,000 gallons, is largely complete. The

See MOLYCORP/A4

Molycorp

Continued from A1

contaminated material, including hazardous and radioactive waste, now is being shipped to dumps or appropriate storage sites, Randle said.

The latest research provides a more thorough picture of what will be needed to get the mine operating again.

Problems with the pipeline and environmental concerns caused the pipeline to be shut down last March. The operation has gone from about 300 employees a year ago to a skeleton crew of about 60 today, Randle said.

The company is working with San Bernardino County to write an environmental impact report to outline what will be necessary to reopen the mining operation safely. That should be done by the end of the year, Randle said, and company officials hope to be back in operation by the middle of 2000.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

**BOARD ORDER NO. 6-01-18
WDID NO. 6B360011004**

UPDATED WASTE DISCHARGE REQUIREMENTS

FOR

**MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL SITE
DOMESTIC WASTEWATER TREATMENT AND DISPOSAL FACILITIES**

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region, (Regional Board) finds:

1. Discharger

On November 9, 2000, Molycorp, Inc. (Molycorp) submitted a complete Revised Report of Waste Discharge for Domestic Wastewater Collection, Transport, Treatment and Disposal Facilities located at its Mountain Pass Mine and Mill Site (Mine Site). The Mine Site consists of 2,223 acres of land owned by Molycorp in the Community of Mountain Pass. For the purposes of this Regional Board Order (Order), Molycorp is referred to as the "Discharger."

2. Facilities

For the purposes of this Order, the domestic wastewater collection, transport, treatment and disposal facilities are referred to as the "Facilities." The Facilities currently collect, transport and dispose of domestic wastewater from onsite sanitary facilities and cooling water from the laboratory. Septic tanks are used to treat domestic wastewater prior to disposal. With the current employment at the Mine Site (80 people), the domestic wastewater flow is approximately 2,800 gallons per day (gpd). At full employment (350 people), the flow increases to 12,250 gpd. The cooling water generated at the laboratory is water from the domestic water supply system that has been used for once-through cooling of analytical equipment. The only change in quality of the water is a slight increase in water temperature. The cooling water flow is intermittent and averages 1,900 gpd. The flow rate reaches a maximum of 3,800 gpd.

3. Order History

a. Waste Discharge Requirements

On June 13, 1991, the Regional Board adopted Board Order No. 6-91-836, which prescribed Revised Waste Discharge Requirements (WDRs) for the: (a) Domestic Wastewater Facilities, (b) North Tailings Pond (P-16), and (c) Product Storage Ponds. Board Order No. 6-91-836 no longer regulates the Domestic Wastewater Facilities and P-16, but currently remains in effect to regulate the Product Storage Ponds. WDRs for P-16 are currently prescribed in a separate Order (Order No. 6-00-101), which was adopted on November 16, 2000.

b. Cleanup and Abatement Order No. 6-98-19

The Facilities are located within the area of the commingled ground water plumes (Commingled Plumes) at Mountain Pass (See Finding 10.c.). The Commingled Plumes include ground waters that have been either degraded or polluted by mining waste generated at the Mine Site. Investigations conducted by the Discharger indicate mine related operations have caused the presence of mining waste in surface soils at one of the disposal sites regulated by this Order.

On March 25, 1998, the Regional Board's Executive Officer issued Cleanup and Abatement Order No. 6-98-19 (CAO No. 6-98-19), which included time schedules ordering the Discharger to:

- i. Complete a Site Investigation to determine the lateral and vertical extent of mining waste constituents in soils and ground water; and
- ii. Implement an acceptable ground water Corrective Action Program.

c. Cleanup and Abatement Order No. 6-98-19A1

In November 2000, the Regional Board's Executive Officer issued Amended CAO No. 6-98-19A1, establishing revised and additional time schedules for achieving compliance to CAO No. 6-98-19. One additional schedule in the Amended CAO requires the Discharger to submit to the Regional Board:

- i. A Final Soil Investigation Report to the Regional Board describing the extent of mining waste constituents in soils; and
- ii. A workplan and schedule for determining whether mining waste constituents in soils are a threat to waters of the State.

4. Reason for Action

The Regional Board periodically reviews and updates WDRs in the region to ensure that permits remain consistent with the *Water Quality Control Plan for the Lahontan Region* and state and federal water pollution laws and regulations. The Regional Board is also updating WDRs to bring findings up-to-date, including: (a) the citing of recent investigation results showing mining waste constituents are present in soils at one of the treated sewage disposal sites, and (b) that the Regional Board Executive Officer has issued a Cleanup and Abatement Order requiring the Discharger address such waste constituents in soils. The attached Monitoring and Reporting Program has been updated to incorporate additional testing of the discharge for hexavalent chromium, lanthanides and other constituents to ensure water quality objectives for ground water will be met.

5. Location of Facilities

The Facilities are located at the Mine Site, adjacent to Interstate 15 within the Ivanpah Hydrologic Unit as shown on Attachments A, B, and C, which are made part of this Order. The Facilities are located within Sections 12 and 13, T16N, R13E and Section 31, T16N, R14E, SBB&M.

6. Description of Facilities

The sources of domestic wastewater are in employee restrooms and clothing changing rooms located at the Mine Site. Septic tanks constructed of concrete treat the domestic wastewater. There are 20 septic tanks located at the Mine Site. Eighteen (18) of the septic tanks are part of the main domestic wastewater system (Main System) that collects, transports, treats, and disposes of sewage. In the Main System, effluent from the 18 septic tanks flows by gravity sewers (for distances of 0.25 to 1.0 miles) to the Effluent Percolation Pond (P-19) for disposal. Gravity sewers also convey once-through cooling water a distance of 0.5 miles from the Analytical Laboratory to P-19 for disposal. The design capacity of the Main System is in excess of 15,000 gallons per 24-hour period. The remaining two septic tanks are part of two separate Septic-Tank/Leachfield Systems, each including one septic tank and a leachfield. One of the Systems serves (and is located adjacent to) the Carpenter Shop. The other serves (and is located adjacent to) the Sales Office. The design capacity for each of these Systems is 840 gallons per 24-hour period. Attachment C shows the location of the septic tanks, gravity sewers, onsite leachfield systems and P-19. Table 1 of Attachment D, which is made a part of this Order, provides the septic tank volumes and sources of domestic wastewater.

7. Septage Disposal

Septage from the septic tanks is pumped into and hauled by tank trucks to an authorized location in Las Vegas, Nevada where it is treated and disposed.

8. Wastewater Characteristics

Domestic wastewater receives treatment by septic tanks before being discharged to P-19. Sampling results for the wastewater discharged to P-19 indicate the quality of the wastewater is similar to a low strength domestic wastewater. During the period of October 1996 through July 2000, Biochemical Oxygen Demand (BOD) concentrations ranged from 1 to 13.7 mg/l; nitrate ranged from 0.2 to 3.8 mg/l as N; and total dissolved solids (TDS) ranged from 562 to 871 mg/l. The average TDS was 655 mg/l. The number of samples analyzed were 12, 3 and 13, respectively. These results were submitted with the Discharger's November 9, 2000 RWD.

The Basin Plan states that the Regional Board may need to establish effluent limits for discharges of domestic wastewater to land where percolation occurs. Effluent limits are to be established on a case-by-case basis to ensure that such discharges do not degrade ground water or cause a nuisance. In some cases, effluent limits for BOD, nitrate, and TDS are needed to ensure a discharge does not degrade ground water. For such discharges, typical effluent limits for BOD and nitrate require that the Discharger provide a secondary level of treatment. In the case of the discharge regulated in this Order, effluent limits are not needed. The BOD and nitrate concentrations in the discharge indicate the quality of the discharge meets (or exceeds) the quality of secondary effluent. The reason there is no need for effluent limits on TDS constituents is discussed in Finding 16, below.

During the period of October 1996 through July 2000, the Discharger collected one sample collected in October 1996 that was analyzed for fluoride. The sample contained 3.5 mg/l of fluoride, which exceeds the Maximum Contaminant Level (MCL) of 1.6 mg/l. The high analytical result of the sample is due to high concentrations of naturally occurring fluoride (1 to 6 mg/l) in the Discharger's Ivanpah Well Field. The Discharger has not used the Ivanpah Well Field since March 1998. The Shadow Valley Well Field, which is currently being used, has low fluoride concentrations (0.1 to 1.5 mg/l).

An effluent limit for fluoride is not included in this Order. Provision No. II.A of this Order, however, requires the Discharger to file a revised RWD in the event the Discharger proposes to activate the Ivanpah Well Field (See Finding No. 16 and Provision No. II.A, below). Tables 2 and 3 in Attachment D summarize analytical results for other constituents present in the discharge including radiological constituents. The concentrations of these constituents are low and similar to background levels for the area.

9. Authorized Disposal Sites

P-19 and the two leachfields are the only authorized disposal sites for septic tank effluent and the once-through cooling water from the Discharger's analytical laboratory.

10. Hydrology

a. Surface

Mountain Pass is located in a saddle between the Clark and Mescal/Ivanpah Mountain Ranges. At the pass on Interstate 15, the elevation is 4,730 feet above mean sea level (msl). Surface drainage in the area where the Facilities are located is tributary to Wheaton Wash, which is tributary to the Ivanpah Dry Lakebed. Ivanpah Dry Lakebed is located eight miles downgradient of the disposal sites. Wheaton Wash and Ivanpah Dry Lakebed appear on the U.S. Geological Survey (USGS) 15-minute quadrangle(s) for the area.

Surface waters in the area include ephemeral surface water present during and following storm events. Other surface waters include springs located in the Ivanpah Hydrologic Unit. One spring (Roseberry Spring) appears on the USGS 15-minute quadrangle published in 1912, but does not appear on more recent quadrangle maps. Roseberry Spring is an ephemeral spring located approximately 3,000 feet downgradient of P-19 in Wheaton Wash within Section 31, T16N, R14E, SBB&M on federal land administered by the Bureau of Land Management. Other springs, which may be located downgradient, are also ephemeral and do not appear on USGS quadrangle maps. Such springs are typically present for short periods during or following wet weather.

b. Subsurface

Ground water at the Mine Site generally flows toward the south and then splits into an east and west component along a north-south-trending ground water divide. Both the eastern and western ground water flow directions follow the topographic drainages down the eastern drainage (Wheaton Wash) and the Western Drainage. Depth to ground water on or downgradient of the Mine Site varies depending on the topography and other factors. Depths to ground water at the Carpenter Shop and Sales Office leachfield systems, and P-19 are estimated to be 120, 30 and 10 feet, respectively.

Wastewater percolation from P-19 has some localized effect on the direction of ground water movement in the Commingled Plumes. It does not, however, have a significant effect on the overall direction of movement. At P-19, the cross-gradient width of the Commingled Plumes is 6,000 feet. The localized effect of percolating wastewater appears to be limited to 10% of the total width. The ground water flowrate across the total width is 40 gpm (*Geomega, February 10, 2000*); whereas, the flowrate of the percolating wastewater currently averages 3.0 gpm.

A combination of percolating wastewater and hydrogeology is acting as a partial barrier to slow the downgradient movement of contaminants in the P-20A Ground Water Hot Spot. The P-20A Hot Spot is located immediately upgradient of P-19 and the Mexican Well area. The P-20A Hot Spot contains high concentrations of nitrate and other constituents (See data for Well No. 98-16MW in Table 2 and 3 of Attachment D). Monitoring results indicate that some of the nitrate from the P-20A Hot Spot is migrating in ground water past P-19. This is causing violation of the Health-Based Water Quality Objective for nitrate in the downgradient ground water of Wheaton Wash. CAO No. 6-98-19A1 includes a schedule requiring the Discharger to submit a feasibility report for interim corrective actions to shorten the cleanup time by addressing ground water hot spots. Such actions may include a ground water extraction system at the downgradient edge of the P-20A Hot Spot to stop nitrate contaminants from migrating into Wheaton Wash. Extracted ground water must be disposed to an approved disposal location.

c. Water Quality

The ground water at the Mine Site receives high-quality ground water from the eastern portion of the Clark Mountain Range. An example of the high-quality ground water is ground water in Molycorp's background monitoring well (Well No. 93-1MW), located upgradient of the Mine Site. The TDS concentrations in Well No. 93-1MW average 382 mg/l. Radiological constituents, metals, and minerals are present in the ground water at low concentrations. Mining and processing of carbonatite ore at the Mine Site began in 1950. Since then, mining waste has impacted ground water underlying and downgradient of the disposal sites. The disposal sites are located between Well No. 93-1MW and the Mexican Well area, which is located in Wheaton Wash. As discussed in Finding 3.c., above, CAO No. 6-98-19A1 requires that the Discharger address mining waste constituents in ground water.

There is limited data on the background quality for ground water underlying the disposal sites. Search for records indicate only one ground water sample analysis for the pre-1950 period (before lanthanide mining began). That result is for Mexican Well (State Well No. 16N/14E-31E2). All other data was obtained after 1950, and most of that data indicate impacts by contaminants related to the mine operation.

Naturally occurring degradation must be considered in estimating the background quality of ground water underlying the disposal sites. As ground water flows between Well No. 93-1MW and the Mexican Well, there is natural water quality degradation caused by dissolution of geologic material. These geologic materials include carbonatite rocks and fenitized metamorphics.

The nearby China Springs Watershed is important in estimating background for the disposal sites, because the same natural degradation is occurring there. China Springs Watershed is located south of the watershed where the disposal sites are located. China Springs Watershed is also important, because there is no significant development (e.g., mining activity) there. Ground water in the China Springs watershed is also tributary to Wheaton Wash, but flows in the opposite direction (from south to north). Water quality in the China Springs Watershed is believed to be very similar to the background quality for ground water underlying the disposal sites.

Tables 2 and 3, Attachment D, provide estimates of the concentrations of constituents that are representative of background. These estimates are only applicable to the Mexican Well (and P-19) area and are not applicable to upgradient and downgradient areas. The estimates are based on: (1) the one sample collected from Mexican Well in 1917, (2) post-1950 well data before the wells were impacted by the Commingled Plumes, and (3) wells not currently impacted by the Commingled Plumes, including Well No. 93-1MW and wells in the China Springs Watershed. Table 4, in Attachment D, summarizes additional details for these estimates. Estimates may change if additional information becomes available.

There are currently no active domestic water supply wells located within the Mine Site or within a distance of several miles downgradient of the Mine Site. Molycorp currently supplies domestic water to the Community of Mountain Pass from two separate well fields. One is located 10 miles to the west in the Amargosa Hydrologic Unit (Shadow Valley). The other is located 10 miles to the east in the Ivanpah Valley. The well fields are used to supply water to the Mine Site, Public School, Caltrans Maintenance Station and Caltrans/Highway Patrol residential area.

11. Geology and Soils

a. Description of Geology and Soils

Shallow soils at the disposal sites consist of artificial fill and in-situ alluvium, which extend to depths of at least 10 feet below the ground surface. The Discharger has historically used artificial fill at the Mine Site in construction of pond dikes and sub-bases for various structures. The artificial fill is typically a soil mixture that includes onsite alluvium and waste rock removed from the active mining area. The surface geology of the Mine Site includes older alluvium (debris flow) and outcropping bedrock in the topographically higher areas and recent alluvial deposits and low terrace alluvium in the wash areas. The wash deposits consist of moderately to well-sorted gravel and cobbles within a fine to medium sand matrix, and range from a few feet to about 30 feet in thickness. These deposits are the most permeable at the site. Ground water flowrates within the bedrock is fracture controlled.

Geology and mineralogy at the Mine Site influences the concentrations of analytes in soils at the disposal sites. The disposal sites are located downgradient of the ore body that Molycorp mines. Molycorp extracts ore from a Pre-Cambrian carbonatite ore body (igneous rock) surrounded by Pre-Cambrian metamorphic rock (primarily gneiss). The ore body, other nearby geologic formations and mining wastes (i.e. tailings) located at the Mine Site contain elevated concentration of various analytes, including: lanthanides, strontium, barium, gross alpha, gross beta, radium and uranium. Geologic formations with elevated concentrations include the carbonatite ore body, fenitized metamorphics, and older alluvium (Type Qog₂ and Qog₃ debris flow (GSI/Water, 1998). The Type Qog₂ and Qog₃ debris flow contains clasts of Pre-Cambrian metamorphics, Cambrian quartzite and PreCambrian Delfont volcanics. The surface soils at the bottom of P-19 are believed to be composed of the Type Qog₂ and Qog₃ debris flow.

b. Mining Waste Constituents in Soils

Results of soil investigations conducted in 1998 and 1999 indicate the presence of mining waste constituents in the soils at one of the disposal sites (P-19). Methods used during the investigations included field screening with a portable radiation survey meter and collection of soil samples for fixed laboratory analysis. Field radiation survey results for surface soils at the bottom of the P-19 indicate radiation levels of 0.030 to 0.070 mR/hour. The background radiation levels at P-19 range from 0.020 to 0.030 mR/hour (based on a soil type consisting of Type Qog₂ and Qog₃ debris flow). Results for the fixed laboratory analysis confirm that elevated concentrations are present above background. At this time, the source(s) of the mining waste constituents in soils at P-19 is not known; however, it is not believed to be the septic tank effluent discharged to P-19. Sampling results for the septic tank effluent do not indicate elevated concentrations of the above analytes. As discussed in Finding No. 3.c, above, CAO No. 6-98-19A1 requires that the Discharger address mining waste constituents in soils.

12. Receiving Waters

The receiving waters are ground and surface waters of the Ivanpah Hydrologic Unit. The surface waters include springs, and ephemeral surface water present during and following storm events.

13. South Lahontan Basin Plan

The Regional Board adopted a Water Quality Control Plan for the South Lahontan Region (Basin Plan), which became effective on March 31, 1995. This Order implements the Basin Plan, as amended.

14. Beneficial Uses

The present and potential beneficial uses of the ground waters of the Ivanpah Hydrologic Unit as set forth and defined in the Basin Plan are:

- a. Municipal and Domestic Supply (MUN);
- b. Agricultural Supply (AGR);
- c. Industrial Service Supply (IND); and
- d. Freshwater Replenishment (FRSH)

The present and potential beneficial uses of surface waters of the Ivanpah Hydrologic Unit are set forth and defined in the Basin Plan under Minor Surface Waters. Those beneficial uses include the above beneficial uses and the following beneficial uses:

- e. Water Contact Recreation (REC-1);
- f. Non-contact Water Recreation (REC-2);
- g. Commercial and Sport Fishing (COMM);
- h. Warm Freshwater Habitat (WARM);
- i. Cold Freshwater Habitat (COLD);
- j. Wildlife Habitat (WILD);
- k. Water Quality Enhancement (WQE); and
- l. Flood Peak Attenuation/Flood Water Storage (FLD).

15. California Environmental Quality Act (CEQA) Compliance

These WDRs govern an existing Facility, which the Discharger is currently operating. The project consists only of the continued operation of the Facility and is therefore exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000 et seq.) in accordance with Section 15301, Chapter 3, Title 14, of the California Code of Regulations.

16. Nondegradation

State Water Resources Control Board (SWRCB) Resolution No. 68-16 (Statement of policy with respect to maintaining high quality of waters in California) is called the nondegradation objective in the Basin Plan. This objective requires maintenance of existing high quality in surface and ground waters. Whenever the existing quality of water is better than the quality of water established in the basin plan, such existing quality shall be maintained unless appropriate findings are made pursuant to Resolution No. 68-16.

The wastewater discharge to the main disposal site (P-19), located in the Mexican Well area, is of higher quality than the quality of ground water currently underlying P-19. This is due to the presence of the Commingled Plumes, which were created by mine waste discharges. Present beneficial uses of the ground water in the Mexican Well area have been impaired by these discharges. CAO No. 6-98-19A1 has been issued to the Discharger requiring cleanup of the ground water. The cleanup level for the ground water is currently background.

The quality of the discharge is equivalent to background quality of ground water with the possible exception of TDS and fluoride. The Regional Board acknowledges the discharge to P-19 will cause some TDS degradation in the future. The degradation, however, will be localized, minor and not adversely affect restored (present or future) beneficial uses of ground water, including ground water in the Mexican Well area. The quality of the discharge to P-19 and the background quality for ground water in the Mexican Well area are summarized in Tables 2 and 3 of Attachment D.

Provision No. II.A of this Order requires the Discharger to file a revised RWD in the event the Discharger proposes to activate the Ivanpah Well Field. This provision is included to ensure the discharge does not cause fluoride degradation in ground water. The Ivanpah Well Field contains elevated concentrations of naturally occurring fluoride, which may increase fluoride concentrations in the discharge. Provision No. II.A requires that the RWD include: (a) a description of measures the Discharger will employ to ensure activation of the well field does not cause degradation of ground water; and (2) supporting technical information (i.e. mathematical modeling) to show the measures will be adequate.

17. Notification of Interested Parties

The Regional Board notified the Discharger and interested parties of its intent to update WDRs for the discharge.

18. Consideration of Comments

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

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

I. DISCHARGE SPECIFICATIONS

A. Effluent /Discharge Limitations

1. During a 24-hour period, the total volume of wastewater discharge to P-19 shall not exceed 0.015 million gallons.
2. During a 24-hour period, the aggregate volume of wastewater discharge to the two leachfields shall not exceed 1,680 gallons.
3. All wastewater discharged to the authorized disposal sites shall have a pH of not less than 6.0 pH units nor more than 9.0 pH units.
4. All wastewater discharged to the authorized disposal sites shall have a dissolved oxygen concentration not less than 1.0 mg/l.

B. Receiving Water Limitation

This discharge shall not cause a violation of any applicable water quality standards for receiving waters adopted by the Regional Board or the SWRCB. The discharge shall not cause the presence of the following substances or conditions in ground or surface waters of the Ivanpah Hydrologic Unit.

1. Ground Waters

- a. Bacteria - In ground waters, the median concentration of coliform organisms over any seven-day period shall be less than 1.1/100 milliliter.
- b. Chemical Constituents

Ground waters shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), Table 6444-A of Section 64444 (Organic Chemicals), Table 64449-A of Section 64449 (SMCLs - Consumer Acceptance Limits), and Table 64449-B of Section 64449 (SMCLs - Ranges). This incorporation-by-reference is prospective including future changes to the incorporated provisions as the changes take effect.

Waters designated as AGR shall not contain concentrations of chemical constituents in amounts that adversely affect the water for beneficial uses (i.e., agricultural purposes).

Ground waters shall not contain concentrations of chemical constituents that adversely affect the water for beneficial uses.

- c. Radioactivity - Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, or that result in the accumulation of radionuclides in the food chain to an extent that it presents a hazard to human, plant, animal, or aquatic life. Waters shall not contain concentrations of radionuclides in excess of limits specified in the California Code of Regulations, Title 22, Chapter 15, Article 5, Section 64443.
- d. Taste and Odors - Ground waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses. For ground waters designated as MUN, at a minimum, concentrations shall not exceed adopted SMCLs specified in Table 64449-A of Section 64449 (SMCLs - Ranges), and Table 64449-B of Section 64449 (SMCLs - Ranges) of Title 22 of the California Code of Regulations, including future changes as the changes take effect.

C. General Requirements and Prohibitions

- 1. There shall be no discharge, bypass, or diversion of raw or partially treated sewage, sewage sludge, grease, or oils from the collection, transport, treatment, or disposal facilities to adjacent land areas or surface waters.
- 2. Surface flow or visible discharge of sewage or sewage effluent from the authorized disposal sites to adjacent land areas or surface waters is prohibited.
- 3. The freeboard at the lowest point of a pond containing treated effluent shall not be less than two (2.0) feet.
- 4. The discharge shall not cause a pollution as defined in Section 13050 of the California Water Code, or a threatened pollution.
- 5. Neither the treatment nor the discharge shall cause a nuisance as defined in Section 13050 of the California Water Code.
- 6. The discharge of wastewater except to the authorized disposal sites is prohibited.

7. The discharge of waste, as defined in the California Water Code, which causes violation of any narrative water quality objective contained in the Basin Plan, including the Nondegradation Objective, is prohibited.
8. The discharge of waste which causes violation of any numeric water quality objective contained in the Basin Plan is prohibited.
9. Where any numeric or narrative water quality objective contained in the Basin Plan is already being violated, the discharge of waste which causes further degradation or pollution is prohibited.
10. The Discharger shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices.
11. The discharge of waste to the authorized disposal sites (other than the wastes described in Finding No. 2) is prohibited.

II. PROVISIONS

A. Change in Discharge Characteristics

Pursuant to Section 13260(c) of the California Water Code, the Discharger shall submit a revised RWD to the Regional Board office at least 120 days in advance of a plan to reactivate the Ivanpah Well Field. The Ivanpah Well Field contains elevated concentrations of naturally occurring fluoride, which may increase fluoride concentrations in the Discharge. The Discharger shall include in the RWD a description of measures that will be taken to ensure the plan does not cause degradation of ground water. The RWD shall include supporting technical information (e.g, mathematical modeling) to show there will not be significant degradation.

B. Standard Provisions

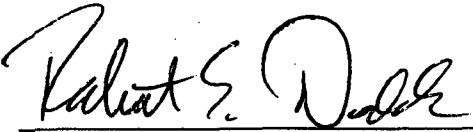
The Discharger shall comply with the "Standard Provisions for Waste Discharge Requirements", dated September 1, 1994, in Attachment "E", which is made part of this Order.

C. Monitoring and Reporting

1. Pursuant to Section 13267(b) of the California Water Code, the Discharger shall comply with the Monitoring and Reporting Program No. 01-18 as specified by the Executive Officer.

2. The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made a

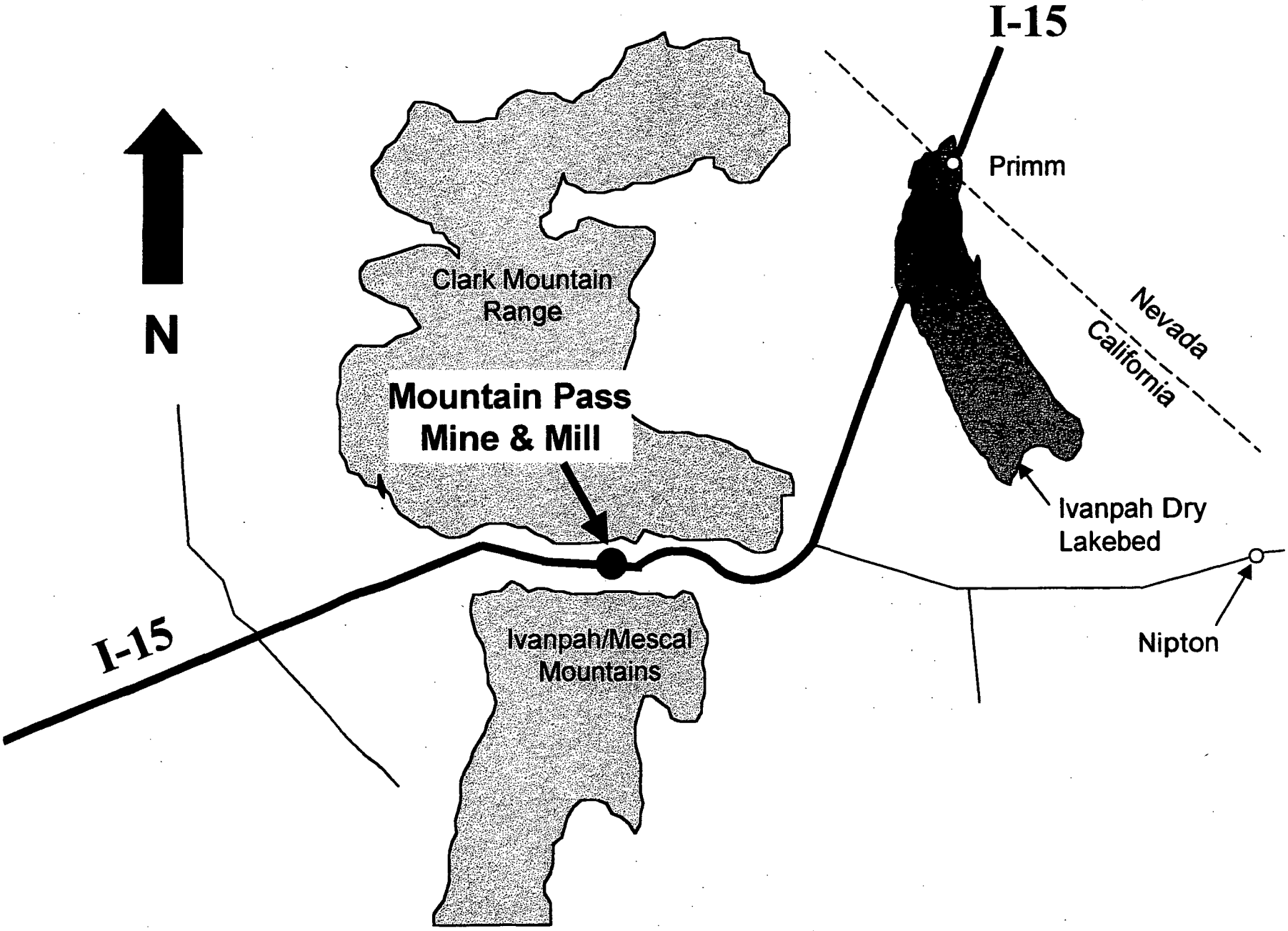
I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Lahontan Region, on April 11, 2001.



fr HAROLD J. SINGER
EXECUTIVE OFFICER

- Attachments: A. Mine Site Location Map
B. Mine Site Boundary Map
C. Facilities Location Map
D. Tables No. 1 through 4
E. Standard Provisions for Waste Discharge Requirements

4/2001#3 MOLY STP WDR
CS/rp



I-15

I-15

Clark Mountain Range
Mountain Pass Mine & Mill

Ivanpah/Mescal Mountains

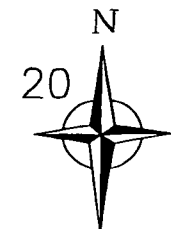
Primm

Nevada
California

Ivanpah Dry Lakebed

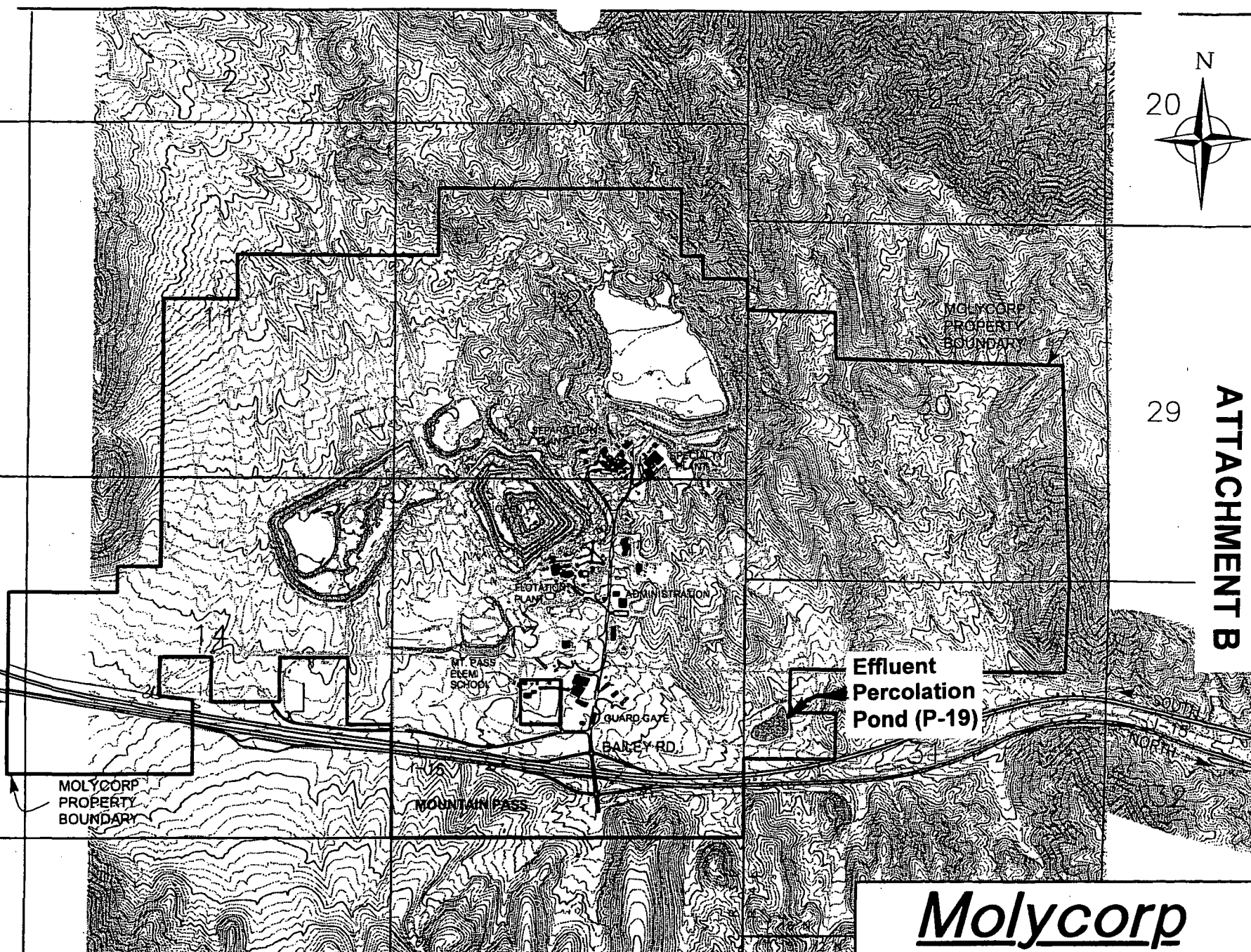
Nipton

ATTACHMENT A



ATTACHMENT B

3
10
15
22



Molycorp

LANTHAMIDE GROUP - MOUNTAIN PASS, CALIFORNIA

PROJECT TITLE Waste Discharge Update for Sewage Conveyance, Board Order No. 6-91-836

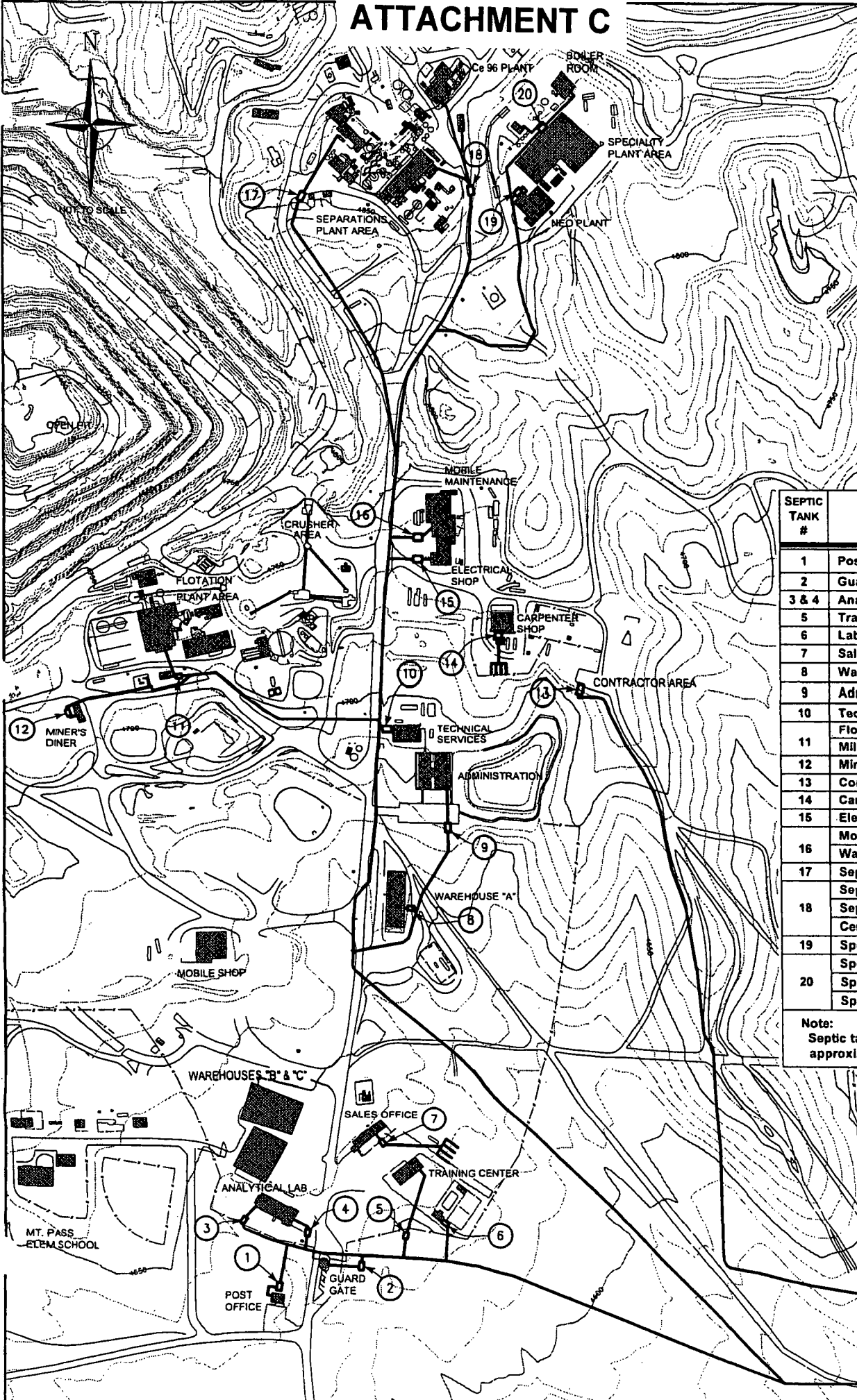
SHEET TITLE FIGURE 1

DESIGNED BY MOLYCORP	DRAWN BY CARL	DATE 11/07/00	DRAWING NO. 19-068-G-01	REVISION
SCALE 1" = 2000'	CHECKED BY J.W.P.	DATE 11/07/00	SHEET 1 of 1	SHEETS

R 14

19

ATTACHMENT C



Molycorp
 LANTHAIR GROUP · MOUNTAIN PASS, CALIFORNIA

PROJECT TITLE: Waste Discharge Update for Sewage Conveyance, Board Order No. 6-91-836
 SHEET TITLE: FIGURE 2

DESIGNED BY	DATE	DRAWING NO.	REVISION
MOLYCORP	11/07/00	19-068-G-02	0
CHECKED BY	DATE		
APPROVED BY	DATE		
SCALE: Approx. $1" = 400'$		SHEET 2 OF 2	

SEPTIC TANK #	LOCATION
1	Post Office
2	Guard Gate
3 & 4	Analytical Lab
5	Training Center
6	Lab Pool House
7	Sales Office
8	Warehouse "A"
9	Administration Building
10	Technical Services Building
11	Flotation Plant
12	Mill Maintenance Office/Diner
13	Miner's Diner
14	Contractor Area
15	Carpenter Shop
16	Electrical Shop
17	Mobile Maintenance
18	Warehouse & Receiving
19	Sep. Plant Maintenance Office
20	Separations Plant
	Separations Plant Office Trailer
	Cerium 96 Plant
	Specialty Plant - Neo Plant
	Specialty Plant
	Specialty Plant Office Trailer
	Specialty Plant Boiler Room

Notes:
 Septic tanks and lines are approximate locations.

Effluent Percolation Pond (P-19)

ATTACHMENT D
(Tables No. 1 through 4)

Table No. 1
Septic Tank Volumes, Locations and Source of Wastewater

Septic Tank No.	Volume (Gallons)	Location	Water Closet	Urinal	Sink	Shower
1	750	Post Office	1	0	2	0
2	1500	Guard Gate	1	0	2	0
3 & 4	2000 & 2800	Analytical Lab	6	2	5	2
5	Unknown ¹	Training Center	3	1	3	0
6	750	Lab Pool House	1	1	1	1
7 ²	Unknown ¹	Sales Office (<i>Separate Leach Field</i>)	2	0	5	0
8	750	Warehouse "A"	1	0	2	0
9	2500 & 1875	Administration Building	5	2	6	0
10	Unknown ¹	Technical Services	2	0	3	0
11	2250	Flotation Plant	3	2	3	3
		Mill Maintenance Office/Diner	1	0	2	1
12	1250	Miner's Diner	3	1	3	5
13	1000	Contractor Area	0	0	0	0
14 ²	Unknown ¹	Carpenter Shop (<i>Separate Leach Field</i>)	1	1	2	2
15	Unknown ¹	Electrical Shop	1	0	2	1
16	1500	Mobile Maintenance	1	1	1	1
		Warehouse & Receiving	1	0	1	0
17	Unknown ¹	Separations Plant, Maintenance Office	1	1	1	1
18	1250	Separations Plant	2	2	3	3
		Separations Plant, Office Trailer	1	0	2	0
		Cerium 96 Plant	1	0	1	0
19	Unknown ¹	Specialty Plant, Neodymium Plant	1	0	1	0
20	1250	Specialty Plant, Office Trailer	1	0	1	0
		Specialty Plant	1	2	2	0
		Specialty Plant, Boiler Room	1	1	1	0
Totals	---	---	39	16	48	18

¹ Septic tank effluent is disposed to a separate onsite leach field system. The number of water closets, urinals, sinks and showers is not included in totals at bottom of the above table.

² Septic tank size is not currently known, but is estimated to be approximately 1,250 gallons. Exact size will be determined the next time the tank is pumped.

Table No. 2

Constituent	Background WQOs (Upgradient of Mine Site, Well 93-1MW) ¹	N	Background WQOs (Mexican Well, Estimated) ²	Health-Based WQOs	Discharge to P-19	N	Ground Water Upgradient of P-19 (Well 98-16MW) ⁶	N	Ground Water Downgradient of P-19 (Well SRK-19) ¹	N
Strontium (mg/l)	0.3	26	2.9	4.2 ³	1.1 ⁴	11	150	1	16.79	59
Nitrate (mg/l as N)	3.31	27	3.41	10.0 ³	2.5 ⁵	3	230	1	16.8	60
Barium (mg/l)	0.116	27	0.12	1.0 ³	0.08 ⁵	3	0.24	1	18.7	58
Gross Alpha (pCi/l)	3.0	4	11	15.0 ³	5.26 ⁵	3	66	1	10	4
Gross Beta (pCi/l)	3.9	4	5	50.0 ³	8.02 ⁵	3	41	1	7.9	4
Radium ₂₂₆ + Radium ₂₂₈ (pCi/l)	---	---	---	5.0 ³	0.911 ⁵	3	5.3	1	---	---
Total Uranium (pCi/l)	2.1	4	6.7	20.0 ³	4.65 ⁵	3	109	1	6.8	4
Fluoride	1.3	2	1.3	1.6 ³	3.5 ⁴	1	---	---	---	---

Table No. 3

Constituent	Background WQOs (Well 93-1MW) ¹	N	Background WQOs (Mexican Well, Estimated) ²	Sensory-Based WQOs	Discharge to P-19	N	Ground Water Upgradient of P-19 (Well 98-16MW) ⁶	N	Ground Water Downgradient of P-19 (Well SRK-19) ¹	N
Total Dissolved Solids (mg/l)	378	27	575	500 ⁷	655 ⁴	13	19,300	1	2170	60
Chloride (mg/l)	24.4	25	90	250 ⁷	170 ⁴	1	8,700	1	831	60

¹ Average values reported in Molycorp's Third Quarterly Self Monitoring Report for 2000, with the exception of fluoride. The average value of fluoride in Well No. 93-1MW is for two samples, which Molycorp collected in February and March, 1994.

² Estimated background concentrations are for deeper ground water located below the root zone of the non-native tamarisk (*Tamarisk chinensis*). See Finding No. 9.c of WDRs and Table No. 4, below, for rationale used arrive at estimates. Values are rounded up to the nearest two significant digits.

³ Primary Maximum Contaminant Levels (MCLs) for all analytes, except strontium. Value for strontium is a US Environmental Protection Agency (USEPA) Lifetime Health Advisory [The Lifetime Health Advisory (LHA) is based on data published in the USEPA's Integrated Risk Information System (IRIS) for waters used in domestic supply systems.]

⁴ Average of results given in the Report of Waste Discharge (RWD) received November 14, 2000.

⁵ Average of results given in the following reference: Tetra Tech, Human Health and Ecological Risk Assessment Field Summary Report Volume 1

⁶ Results for second quarter of 1999. Reported in Self Monitoring Report for 4th Quarter 1999

⁷ Secondary Maximum Contaminant Level (MCL)

Table No. 4
Basis for Estimate of Background Water Quality in the Mexican Well and P-19 Area¹

	Basis (Primary)	N	Time Period	Basis (Secondary)	N	Time Period	Comment
TDS & Cl	16N/14E-31E1	2	1960 - 1961	93-1MW	27	1993 - 2000	16N/14E-31E1: Comparison of specific conductance results for the two sampling events selected for this well were used to estimate TDS for one of the events.
				SRK-18U	1	12/85	
				16N/14E-31E2 (Mex Well).	1	10/27/17	
Nitrate	93-1MW	27	1993 - 2000	16N/14E-31E1	2	1960 - 1961	
				SRK-18U	1	12/85	
				16N/14E-31E2 (Mex Well).	1	10/27/17	
Fluoride	93-1MW	2	1994	Same as above for Nitrate			
Strontium	SRK-18U	1	12/85	SRK-22	30	1985-2000	SRK-22: Ground water of the China Springs Watershed may be the entire or partial source of ground water flow into this well .
				93-1MW	27	1993-2000	
Barium	93-1MW	27	1993-2000	SRK-22	30	1985-2000	
Radionuclides	SRK-22	4	1999-2000	93-1MW	27	1993 - 2000	

¹The following wells were also used as a basis for estimating background water quality in the Mexican Well and P-19 Area: Wells No. 94-14MWL, 16N/14E-31L01&2, 16N/13E- 14J01. Wells were designated as not impacted at the time of sampling if: (1) more highly mobile wastewater indicators (i.e. chloride, nitrate & strontium) were not present above estimated background concentrations, and (2) the ratio of mineral ions (e.g., bicarbonate to chloride) were similar to the estimated background quality.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

STANDARD PROVISIONS
FOR WASTE DISCHARGE REQUIREMENTS

ATTACHMENT E

1. **Inspection and Entry**

The Discharger shall permit Regional Board staff:

- a. to enter upon premises in which an effluent source is located or in which any required records are kept;
- b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements;
- c. to inspect monitoring equipment or records; and
- d. to sample any discharge.

2. **Reporting Requirements**

- a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.
- b. Pursuant to California Water Code Section 13260(c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not limited to, all significant soil disturbances.
- c. The Owners/Discharger of property subject to Waste Discharge Requirements shall be considered to have a continuing responsibility for ensuring compliance with applicable Waste Discharge Requirements in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the Waste Discharge Requirements shall be reported to the Regional Board. Notification of applicable Waste Discharge Requirements shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.
- d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing and correct that information.
- e. Reports required by the Waste Discharge Requirements, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation.

- f. If the Discharger becomes aware that their Waste Discharge Requirements (or permit) is no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their Waste Discharge Requirements (or permit) be rescinded.

3. Right to Revise Waste Discharge Requirements

The Regional Board reserves the privilege of changing all or any portion of the Waste Discharge Requirements upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the Waste Discharge Requirements may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and reissuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the Waste Discharge Requirements which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the Waste Discharge Requirements. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the Waste Discharge Requirements.

7. Waste Discharge Requirement Actions

The Waste Discharge Requirements may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the Waste Discharge Requirements conditions.

8. Property Rights

The Waste Discharge Requirements do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the Waste Discharge Requirements including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the Waste Discharge Requirements shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the Waste Discharge Requirements are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from disposal/treatment facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operator. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

- a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.
- b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

- a. All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

UPDATED MONITORING AND REPORTING
PROGRAM NO. 01-18
WDID NO. 6B360011004

FOR

MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL SITE
DOMESTIC WASTEWATER TREATMENT AND DISPOSAL FACILITIES

San Bernardino County

I. MONITORING

The Discharger shall monitor and report the following:

A. Flow Monitoring

1. The estimated total volume, in million gallons, of wastewater flow to the Effluent Percolation Pond (P-19) calculated for each month.
2. The average flow rate, in million gallons per day (mgd), of wastewater flow to P-19 calculated for each month.
3. The freeboard (distance from the top of the lowest part of the dike to the wastewater surface in a pond) measured each month in P-19.

B. Effluent Percolation Pond (P-19)

Grab samples of treated effluent discharged into P-19 shall be collected and analyzed to determine the magnitude of the following parameters.

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
BOD ¹	mg/l	Quarterly
Dissolved Oxygen	mg/l	Quarterly
pH	pH units	Quarterly
Specific Conductance (EC)	micromhos/cm	Quarterly
Methylene Blue Active Substances	mg/l	Quarterly
Oil & Grease	mg/l	Quarterly
Nitrate	mg/l as N	Quarterly
Total Chromium ²	mg/l	Annually (More frequently when EC is high) ³

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Hexavalent Chromium ²	mg/l	Annually if Total Chromium is greater than 0.001 mg/l (More frequently when EC is high) ³
Total Dissolved Solids (TDS)	mg/l	Annually (More frequently when EC is high) ³
Chloride	mg/l	Annually (More frequently when EC is high) ³
Sodium	mg/l	Annually (More frequently when EC is high) ³
Sulfate	mg/l	Annually (More frequently when EC is high) ³
Calcium	mg/l	Annually (More frequently when EC is high) ³
Magnesium	mg/l	Annually (More frequently when EC is high) ³
Strontium	mg/l	Annually (More frequently when EC is high) ³
Boron	mg/l	Annually (More frequently when EC is high) ³
Kjeldahl Nitrogen	mg/l as N	Annually (More frequently when EC is high) ³
Ammonia Nitrogen	mg/l as N	Annually (More frequently when EC is high) ³
Fluoride	mg/l	Annually (More frequently when either the EC is high and/or the Ivanpah Well Field is operating) ^{3,4}
Barium	mg/l	When EC is High ⁵
Lanthanides	mg/l	When EC is High ⁵
Gross Alpha	pCi/l	When EC is High ⁵
Gross Beta	pCi/l	When EC is High ⁵
Radium ²²⁶ + Radium ²²⁸	pCi/l	When EC is High ⁵
Total Uranium	pCi/l	When EC is High ⁵

C. Ground Water Monitoring

Ground water monitoring for the authorized disposal sites is specified under Monitoring and Reporting Program (MRP) No. 00-101, which is separate from this MRP. The Discharger shall review sampling results from the following monitoring wells as a check to make certain the discharge is causing violations of receiving water limits and other applicable discharge specification contained in the attached waste discharge requirements: Wells No. 93-1MW, 98-16MW, SRK-27A, SRK-19, SRK-22, SRK-20U, SRK-21A and 94-15UMW. If the Ivanpah Well Field is activated, fluoride shall be added to the list of monitoring parameters specified under MRP No. 6-00-101 for the proceeding listed wells.

D. Supply Water Monitoring

For each semiannual period, a report shall be submitted to the Regional Board detailing a chemical analysis that is representative of the average supply water used within the pertaining sewerage areas. Chemical analysis shall be provided for those constituents listed above in Part I.B, with the exception of BOD, dissolved oxygen, oil and grease, Kjeldahl nitrogen and ammonia. The chemical makeup of the supply water will be determined from analysis of water collected at the well head in accordance with current guidelines stipulated by San Bernardino County Department of Environmental Health Services for community water systems.

E. Operation and Maintenance

1. The Discharger shall record the date of septic tank pumping, volume of septage pumped, legal point of disposal, and the person or company that performed the work.
2. A brief summary of any operational problems and maintenance activities shall be submitted to the Regional Board with each monitoring report. The summary shall include the information described in No. I.D.1, above, and discuss:
 - a. Any modifications or additions to the wastewater conveyance system, treatment facilities, or disposal facilities;
 - b. Any major maintenance conducted on the wastewater conveyance system, treatment facilities, or disposal facilities;
 - c. Any major problems occurring in the wastewater conveyance system, treatment facilities, or disposal facilities; and

II. REPORTING

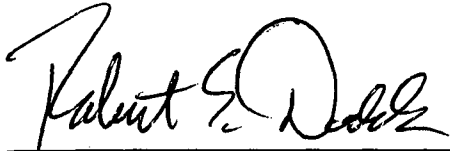
A. General Provisions

1. In accordance with Provision No. 3.a. of the General Provisions for Monitoring and Reporting, the Discharger shall make a compliance statement in each submitted monitoring report, noting each violation that occurred during the reporting period and actions taken and/or proposed to return into compliance.
2. The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of this Monitoring and Reporting Program.

B. Submittal Periods

1. Quarterly monitoring reports containing the above required information shall be submitted to the Regional Board the month following each quarter.
2. An annual monitoring report shall be submitted to the Regional Board by March 30 of each year.

Ordered by:


for HAROLD J. SINGER
EXECUTIVE OFFICER

Dated: April 11, 2001

Attachment: A. General Provisions for Monitoring and Reporting Program

-
- 1 Biochemical Oxygen Demand (5 day, 20°C) of a filtered sample using a No. 1 Whatman filter or equivalent.
 - 2 Use appropriate USEPA approved methods that will quantify concentrations down to 0.001 mg/l for hexavalent chromium and 0.0025 mg/l for total chromium.
 - 3 If the quarterly Specific Conductance (EC) measured in the field exceeds 1400 micromhos/cm, a grab sample of treated effluent discharged into P-19 shall be collected and analyzed to determine the magnitude of this parameter.
 - 4 If the Ivanpah Well Field is activated, the frequency shall be increased to quarterly.
 - 5 A grab sample of treated effluent discharged into P-19 shall be collected and analyzed to determine the magnitude of this parameter only if the quarterly Specific Conductance (EC) measured in the field exceeds 1400 micromhos/cm.

4/2001 #2 MOLYSTP MRP
CS/rp

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

ATTACHMENT A

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

- a. All analyses shall be performed in accordance with the current edition(s) of the following documents:
 - i. Standard Methods for the Examination of Water and Wastewater
 - ii. Methods for Chemical Analysis of Water and Wastes, EPA
- b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board. Specific methods of analysis must be identified on each laboratory report.
- c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The method used shall also be reported. If methods other than USEPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.
- d. The Discharger shall establish chain-of-custody procedures to ensure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.
- e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall ensure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.
- f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.
- g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be obtained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

- ~~a. For every item 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 submit a timetable for correction.~~
- b. Pursuant to California Water Code Section 13267(b), all sampling shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Regional Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.
- d. Monitoring reports shall be signed by:
- i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;
 - ii. In the case of a partnership, by a general partner;

- iii. In the case of a sole proprietorship, by the proprietor;
- iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.
- e. Monitoring reports are to include the following:
 - i. Name and telephone number of individual who can answer questions about the report.
 - ii. The Monitoring and Reporting Program Number.
 - iii. WDID Number.
- f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation under Section 13268 of the Water Code.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. 6-00-34
WDID NO. 6B369807003

NEW WASTE DISCHARGE REQUIREMENTS
FOR

MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL
ON-SITE WASTEWATER TREATMENT, LINED EVAPORATION PONDS, AND LAND
APPLICATION OF TREATED WASTEWATER

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Regional Board) finds:

1. Discharger

Molycorp, Inc. (Molycorp) has submitted to the Regional Board the following reports and information as a Report of Waste Discharge (RWD) for a new Class II waste management facility pursuant to regulations contained in Division 2, Title 27 (hereinafter referred to as Title 27).

- a) A RWD package for the proposed facility dated July 6, 1998.
- b) A letter dated September 24, 1998, responding to a written Regional Board staff request for clarification on California Environmental Quality Act (CEQA) compliance, action leakage rates, and water quality monitoring.
- c) Water Quality Monitoring and Response Program dated December 28, 1998.
- d) A letter dated December 28, 1998, responding to a written Regional Board staff request for further information to support the RWD.

Molycorp (hereinafter referred to as the "Discharger"), a wholly-owned subsidiary of Union Oil Company of California (UNOCAL), owns the land on which the proposed Facility is located.

2. Facilities

Molycorp operates an open pit mine with milling, beneficiation, and processing facilities for the economic extraction of lanthanide elements. For the purposes of this Regional Board Order (Order), the "Facility" proposed for the collection, treatment, and disposal of wastewater includes:

- a) an above-ground water collection tank;
- b) a softening and pH adjustment circuit;
- c) a tailings reclaim water filtration system;
- d) a reverse osmosis (RO) filtration system;
- e) four lined surface impoundments for disposal of RO reject wastewater (high-TDS brine);

- f) an unlined three-acre storage pond and a 90-acre land application area for high-quality treated water; and
- g) associated piping and sprinkler systems.

The purpose of the treatment system is to treat and recycle wastewater from the ground water extraction system, water from the open pit, storm water runoff, tailings seepage water from Recovery Wells 2 and 8 (RW-2 and RW-8), and some tailings reclaim water. It is estimated that the treatment system will generate an annual average flow of 41,760 gallons per day (gpd) of RO reject wastewater and 197,280 gpd of high-quality wastewater for land application or industrial uses at the mine site. The four lined surface impoundments are hereinafter referred to as the "Evaporation Ponds" and are the only authorized disposal site for the RO reject wastewater.

3. Order History

The Regional Board previously adopted Waste Discharge Requirements (WDRs) for Molycorp under the following Board Orders:

- a) Board Order No. 6-81-73 was adopted on September 19, 1981, for the Mountain Pass (mine and mill) Operations.
- b) Board Order No. 6-90-41 was adopted on June 14, 1990, for the New Ivanpah Dry Lake Wastewater Evaporation Ponds for the disposal of wastewater from the mill and contaminated ground water extracted from the mill area.
- c) Board Order No. 6-90-56 was adopted on September 13, 1990, for the closure of the Old Ivanpah Dry Lake Wastewater Evaporation Ponds.
- d) Board Order No. 6-91-836 was adopted on Jun 13, 1991 (superceding Board Order No. 6-81-73) revising the mine and mill site's WDRs to reflect changes to Chapter 15, to include modifications to the Discharger's waste management strategy, and to incorporate provisions for a contaminated ground water corrective action plan.

Additionally, site investigations and cleanups are being conducted under the following Cleanup and Abatement Orders:

- e) 6-97-66A2, Discharges from the Outfall Pipeline
- f) 6-98-19, Mine and Mill Site
- g) 6-98-20A2, New Ivanpah Evaporation Ponds
- h) 6-98-21A1, Old Ivanpah Evaporation Ponds

4. Reason for Action

The Regional Board is issuing WDRs to establish:

- a) discharge requirements for the proposed evaporations ponds, holding pond, and land application area;
- b) Rapid and Large Leakage Rate (RLLR) requirements for the surface impoundments;
- c) a water-quality protection standard for the ground water beneath the ponds; and
- d) incorporate revisions to Discharger's wastewater management, reuse, and disposal.

5. Facility Location

The MolyCorp Mine and Mill occupy 2,100 acres immediately north of Interstate 15 at Mountain Pass. The site straddles the boundary between the Ivanpah Valley and Amargosa Hydrologic Units within Sections 11, 12, 13, and 14, T16N, R13E, SBB&M as shown on Attachment A. The Evaporation Ponds are proposed for construction in the very northwestern portion of the Mountain Pass Mine and Mill Site in Section 11.

6. Climatology

The climate at Mountain Pass is arid to semi-arid with rainfall varying from 3 to 10 inches per year. The mean annual precipitation at the mine site is 6-inches per year. Most precipitation occurs during the winter months. Daytime temperatures during the summer frequently exceed 100°F and may fall to less than 10°F at night during the winter. Estimated annual gross evaporation is 65-inches per year.

7. Site Geology

The surface geology of the mine site is characterized by older gravels and outcropping bedrock in the topographically higher areas and by recent alluvial deposits and low terrace gravels in the wash areas. The wash deposits consist of moderately to well-sorted pebbles and cobbles within a fine to medium sand matrix, and range from a few feet to about 30 feet in thickness. These deposits are the most permeable at the site, exhibiting hydraulic conductivities on the order of 1×10^{-2} cm/sec.

The older (Tertiary-age) gravels (also referred to as older alluvium and debris flows) are the predominant natural overburden of the Mountain Pass area and are comprised of poorly-sorted pebble- to boulder-sized clasts in a finer-grained matrix. These deposits extend to great depth (i.e., on the order of hundreds of feet) and probably represent debris flows that have infilled deep channels in the bedrock. These deposits are usually firmly cemented with calcareous mud and are less permeable than the shallow alluvium, exhibiting hydraulic conductivities on the order of 1×10^{-5} cm/sec (Environmental Solutions, Inc., October 1994). These older gravels are the material underlying the proposed Evaporation Ponds, Treated Water Storage Pond, and Land Application Area.

Bedrock in the area consists of Precambrian metamorphic and intrusive rocks. The older metamorphic rocks consist primarily of granitic gneiss. The main igneous body at the mine site, which has intruded the older metamorphic complex, consists of shonkinite-syenite stock and associated carbonatites. Ground water permeability within the bedrock is fracture controlled. Hydraulic conductivities in fractured zones range up to 6×10^{-3} cm/sec, while those in less fractured zones are estimated to be on the order of 1.5×10^{-5} cm/sec (GSi/Water, 1991).

8. Site Hydrogeology

Ground water at the Mine and Mill Site generally flows toward the south and then splits into an east and west component along a north-south-trending ground-water divide. Both the eastern and western flow follows the topographic drainages down Wheaton wash and the Western Drainage, respectively, starting at the southern edge of the mine site.

Based on the recent exploratory drilling performed by the Discharger, ground water is found approximately 100-feet below ground surface and flow beneath the proposed Evaporation Ponds area is toward the south-southeast. The flow direction trends more southerly beneath the Land Application Area and then towards the southwestern portion of the mine property. The flow is then directed westward into the Shadow Valley Drainage and into the Upper Kingston Valley Basin. The eastern portion of the mine site drains to Wheaton Wash and then eastwardly into the Ivanpah Valley Basin. The ground water levels and flows at the site have been significantly affected by corrective action -pumping and pit dewatering activities. These activities have created local "cones of depression" in the ground water surface due to the capture and extraction of ground water.

Ground water, from three existing monitoring wells in area of the proposed ponds, exhibited total dissolved solids concentrations ranging from 479 to 538 mg/L with low but detectable concentrations of barium, boron, selenium, strontium, and vanadium.

Ground water migration velocities are highly variable due to the varying hydraulic conductivities and localized fracturing. Typical velocities are estimated to range from four to five feet per day (ft/day) in shallow alluvium and fractured bedrock; from 0.03 to 1.0 ft/day for old alluvium and moderately fractured bedrock; and from negligible to 0.02 ft/day for slightly fractured bedrock.

9. Site Surface Hydrology and Storm Water Runoff

Surface runoff in the area is primarily by sheet flow within localized drainage courses. As the site is located on a sloping alluvial fan surface, the area is not prone to flooding and the proposed Evaporation Ponds, Treated Water Storage Pond and Land Application Area are not located in a flood plain. Review of flood insurance rate map indexes published by the Federal Emergency Management Administration (FEMA), indicates the site has not been mapped for flooding potential.

10. Faulting and Seismicity

The Mountain Pass Mine area is not within an Alquist-Priolo Earthquake Fault Zone. The Clark Mountain Fault is the most prominent fault in the area and trends northwesterly for approximately 20 miles along the western flank of the Clark Mountain Range. This fault is considered to be inactive based on its age and lack of geologic evidence of recent movement.

A search of the National Earthquake Information Center reveals that most earthquakes greater than M4.0 are more than 100 km away. The largest earthquake within a 100-km radius was an estimated M6.1 in 1916 approximately 45 km west of site. The strongest historic earthquake in the northeastern Mojave Desert was the M7.1 Hector Mine Earthquake located approximately 120-km west of Mountain Pass. An M6.2 event on the Mannix Fault occurred in 1947 about 110-km west of the mine site (Real et.al., 1964).

The Pahrump-Stateline fault located about 18 km east of the mine is the controlling fault for calculating the maximum credible earthquake (MCE) for the site. The fault is thought to have been last active in the Pleistocene (700,000 – 1,600,000 years ago) and is therefore considered potentially active. The MCE associated with this fault was calculated to be M7.5 with a peak acceleration of 0.32 gravity (g). This 0.32g figure was used to perform the design and stability analysis on the Evaporation Ponds embankments.

11. Site Topography

The site of the proposed Evaporation Ponds, Treated Water Storage Pond and Land Application Area is located in the northwest part of the Mountain Pass Mine property (Attachment B). The site consists of an alluvial fan, which slopes towards the southeast. Elevations of the ground surface range from approximately 5,025-feet above mean sea level (msl) to 4,975-feet above msl (Attachment C).

12. Land Uses

The proposed On-Site Evaporation Ponds, Treated Water Storage Pond, and Land Application Area are located entirely on the Molycorp Mountain Pass property. Uses for the immediately adjacent land are related to the mine operations.

Land in the vicinity of the mine are public lands managed by the Bureau of Land Management (BLM) and by the National Park Service. The Mojave National Preserve lands, administered by the National Park Service, are located south of the Interstate 15 and north and west of the Mountain Pass property. A public elementary school is located at the Mountain Pass, adjacent to the plant site. A California Department of Transportation (Caltrans) highway maintenance station and California Highway Patrol (CHP) residences are located near the mine at Mountain Pass. There are also several parcels of privately owned land, some with residences, located in the general area.

13. Description of the Influent Streams

The estimated chemical characteristics of the influent streams are summarized in Table 3.3 taken from the RWD. The proposed influent waste streams for treatment and disposal are:

- a) **Ground water extracted from the Mexican Wells, Farmer's Wash Well, RW-2, and RW-8.** Flow from these sources average 56 gallons per minute (gpm) or 29 million gallons per year (mgy). The pH of the water ranges from 6.4 to 8.0 and total dissolved solids (TDS) averages 6,500 mg/L.

- b) **Water extracted from the open pit mine.** The current pumping rate averages approximately 152 gpm of which 107 gpm (80 mgy) is proposed for treatment and 45 gpm (24 mgy) for on-site dust control. The pH of this water ranges from 6.6 to 8.0 and TDS averages 3,300 mg/L.
- c) **Storm water runoff from the Specialty and Separations Plant.** Storm water runoff from these plants averages 7 gpm (4 mgy) and is anticipated to exhibit a pH of 6.0 to 7.0 and TDS concentrations averaging 1000 mg/L.
- d) **Filtered tailings pond water.** The average flow rate of the filtered tailings pond water is 14 gpm (7 mgy). The pH of this water ranges from 6.0 to 9.0 and TDS averages 3,000 mg/L. Tailings water is the water reclaimed from the tailings pond and returned to mill. A barge-mounted pump located near the dam is used to pump tailings water from the pond for use in the ball mill thereby reducing the amount of fresh water used. The amount of reclaim water varies depending on its quality, but runs between 20% and 60% of the water used in the ball mill.

14. Description of the Effluent Streams

The RO treatment unit is rated at 200 gpm and will produce two waste streams:

- a) A high quality treated wastewater suitable for facility use, land application, or discharge. Flow for this waste stream will average 137 gpm (72 mgy) with a neutral pH (~7.0) and average TDS values of 207 mg/L. (See Attachment D).
- b) A concentrated brine averaging 29 gpm (15 mgy) which will be pumped to the Evaporation Ponds. The TDS of this brine is expected to exceed 24,000 mg/L. [The calculated concentrations of TDS, metals, and radiological constituents are summarized in Attachment E.] The pH of this waste stream may be elevated if water softening with soda ash is required.

Two other flows discharged directly to the Evaporation Ponds are:

- c) Flow in excess of the RO treatment unit capacity averaging 18 gpm with an average TDS of 4144 mg/L. During periods where the influent flow exceeds the filtration system's capacity, influent wastewaters will be pumped directly to the Evaporation ponds.
- d) Brine from the tailings water reclaim filtration system, averaging 11 gpm (6 mgy), with a pH between 6.0 and 9.0 and TDS concentrations around 19,300 mg/L, will be pumped directly to the Evaporation Ponds.

15. Description of the Piping System

The pipelines will be supported at or slightly above grade on pipe supports. Pipelines transporting the brine solutions to the Evaporation Ponds will be steel pipes with an inner polyethylene liner. The annular space between the steel pipe and liner will be monitored to detect leaks in the polyethylene liner.

Pipelines transporting high-quality filtered wastewater will be constructed of high-density polyethylene (HDPE). This HDPE piping will also be supported at or slightly above grade on pipe supports. The approximate percentages of piping on grade, on pipe racks, and below grade are:

- pipelines to ponds: 5% on grade, 15% on pipe racks, and 80% below grade
- land application area: 100% on grade
- water treatment system: 5% on grade, 75% on pipe racks, and 20% below grade

16. Description of the Evaporation Ponds

The four Evaporation Ponds (1, 2, 3, and 4), as shown in Attachment C, are proposed to be double-lined with a leachate collection and removal system (LCRS) and lower-most vadose zone monitoring system (VZMS). The total storage capacity of the four ponds will be approximately 45-million gallons. The Ponds provide a combined evaporation surface of 20 acres and a total footprint of 36 acres. Preliminary drawings of the ponds construction are shown in Attachment F.

The high-TDS brine will be directed from the R.O. Treatment Unit to Pond 1 or Pond 2. Pond 1 will be allowed to fill to a maximum elevation of 4,986.0 feet at which time the wastewater will flow to Pond 2 with a maximum water level of 4956.0 feet and thence to Pond 3 and Pond 4. Ponds 3 and 4 are expected to operate at maximum elevations of 4,933.0 feet and 4,905.5 feet respectively. These elevations will allow a minimum two-foot freeboard for the Ponds.

After Ponds 1, 2, and 3 have reached their operating levels, wastewater will flow to Pond 4. By cascading from pond to pond, salt precipitation will be confined primarily to Pond 4, allowing salt removal activities to be limited to one pond. The discharger estimates that approximately 2,100 tons of salt will be precipitated annually.

The maximum operating levels and corresponding freeboards in Ponds 1, 2, and 3 will be designed to protect against overtopping during extreme wind conditions and the spillways designed to pass the 24-hour probable maximum precipitation event (PMP) of 7-inches. The maximum operating level and corresponding freeboard will also be designed to protect against overtopping during extreme wind conditions as well as contain the PMP from Ponds 1, 2, 3, and 4. It is estimated that the freeboard of Pond 4 will be 4½-feet below the crest of embankment.

Table 1 Summary of Estimated Flows and Estimated Brine Concentrations

	Into Pond 1	From Pond 1 to Pond 2	From Pond 2 to Pond 3	From Pond 3 to Pond 4
Avg. flow (gpm) [mg/y]	58 [30.5]	32 [16.8]	15 [7.9]	3 [1.6]
Avg. TDS (mg/L)	16,502	26,837	61,617	142,559

The proposed Pond construction is as follows:

- a) An upper liner consisting of 80-mil (0.080-inch thick) HDPE. The sump of each pond will also have an 80-mil rub sheet over an 80-mil HDPE liner;
- b) a blanket type LCRS consisting of HDPE geonet with a 7,000-gallon LCRS sump in each Pond. The secondary containment system and liquid collection system are designed to contain and direct any liquid that passes through the upper liner. As the primary LCRS, leachate will be directed by gravity through a porous granular collection system to collection sumps. Liquid collected in the sumps will be removed and pumped to a pond that isn't leaking above the ALR, or an approved holding facility.
- c) a lower liner consisting of 60-mil HDPE;
- d) a basal composite bentonite/geomembrane;
- e) a 6-inch thick layer of material (100% passing ¾-inch, 70-100% passing #4 mesh) below the lower liner, compacted to 90 percent of the maximum dry density according to the American Society of Testing and Materials procedure D1557. The geocomposite liner (GCL) will be placed on prepared bedding to eliminate the possibility of material present that could potentially puncture the liner material; and
- f) precipitation and runoff control facilities upgradient and adjacent to the ponds to provide protection from the 1,000-year, 24-hour storm.

17. Engineered Alternative to Prescriptive Standard for the Evaporation Ponds

Title 27 California Code of Regulations, includes prescriptive standards for waste management unit construction, but also allows for engineered alternatives to such standards. The Discharger's geotechnical testing of the subgrade material below area proposed for the Evaporation Ponds shows that, even after compaction to its maximum density, the soil cannot consistently meet the 1×10^{-6} centimeters per second (cm/s) permeability requirement of Title 27. Therefore, the Discharger has proposed to install a composite bentonite/geomembrane as a basal layer to the double-liner system to contain any leaks that may occur

in the bottom (60-mil) liner. Regional Board staff has reviewed the Discharger's proposed engineered alternative and find that it meets or exceeds the standards required of engineered alternatives under Title 27.

18. Description of the Holding Pond and Land Application Area

The Land Application Area, as shown on Attachment B, is an unlined, uncovered area just south of the On-Site Ponds. The Land Application Area covers an area of 90 acres.

The monitoring program consists of annual sampling of the soil underlying the Land Application Area to evaluate salt concentrations and moisture content in vegetative root zone and to evaluate whether downward infiltration of discharged water poses a significant threat to water quality. This Order requires the Discharger to cease use of the Land Application Area if wastewater-related constituents are detected at concentrations greater than the discharge limits established for the treated water at depths exceeding 20 feet.

19. Authorized Disposal Site - Impoundments

The only authorized disposal facility for the high-TDS wastewater (brine) at the site is the Evaporation Ponds. The only authorized on-site disposal area for the high quality treated wastewater is the Land Application Area, the holding pond and as dust control on mine roads and waste piles. Off-site disposal of wastewater is not affected by this Board Order.

20. Monitoring Systems

The Discharger has proposed using monitoring well 98-10MW as the designated upgradient monitoring point. Monitoring wells 98-5MW and 98-9MW will probably have to be moved or abandoned to accommodate construction of the Ponds. The discharger will install several monitoring wells downgradient from the Ponds at locations agreed to by the Regional Board staff. These wells will be sampled quarterly during operation. The three existing wells have been sampled quarterly since the second quarter of 1998 to establish baseline conditions for the site.

Each pond has a LCRS, beneath the entire pond area, composed of a geonet blanket. A single 7,000-gallon-capacity sump will be constructed at the low point of each pond. Any liquids detected in the sump will be removed with portable pumping equipment.

An unsaturated zone monitoring system is proposed for areas beneath the ponds where flows in the LCRS are expected to be the greatest (e.g., the sumps and breaks in grade). This vadose zone monitoring system is composed of 15-foot-wide trenches lined with HDPE and a geonet drainage layer. These vadose zone monitoring systems will be checked weekly and any liquids detected will be removed with portable pumping equipment.

To monitor water quality, the ground water monitoring system proposed for the Evaporation Ponds consists of two down-gradient, point-of-compliance monitoring wells. As required by Monitoring and Reporting Program (MRP) No. 00-34, the ground water shall be monitored and analyzed for specific inorganic and radiologic constituents and all detected releases shall be reported to the Regional Board.

21. Waste Classification

The high-TDS wastewater (brine) is classified as a liquid designated waste. The high quality treated wastewater does not contain soluble pollutants in concentrations that exceed applicable upper Water Quality Objectives (i.e., it is not a designated waste) and is therefore classified as a nonhazardous waste.

Residual solids remaining after evaporation are predominantly sodium chloride with associated calcium, magnesium and sulfate. Other salt components include barium, boron, fluorine, molybdenum, and strontium. The residual salt is calculated to also contain less than 5 pico-Curies per gram (pCi/g) total radium, 10 pCi/g total thorium, and 10 pCi/g total uranium. This residual salt is classified as a designated waste under the California Water Code.

22. Waste Management Unit Classification

Since the wastewater and residual solid material contained in the surface impoundments are classified as designated wastes the surface impoundments must meet the containment requirements for a Class II facility as defined in Title 27. The Land Application Area is classified as a Class III Land Treatment Unit as defined in Title 27.

23. Water Quality Protection Standard

The Water Quality Protection Standard (WQPS) consists of constituents of concern (including monitoring parameters), concentration limits, Monitoring Points, and the Point of Compliance. The standard applies over the active life of the Impoundments, closure and post-closure maintenance period, and the compliance period. The constituents of concern, Monitoring Points, and Point of Compliance are described in MRP No. 00-34, which is attached to and made part of this Order.

24. Statistical Methods

Title 27 requires statistical analyses of the monitoring data. Statistical analyses of monitoring data are necessary for the earliest possible detection of a statistically significant evidence of a release of waste from the Facility. The MRP includes a list of acceptable methods for statistical analysis. The analytes and monitoring parameters listed in this Order are believed to be the best indicators of a release from the Facility.

25. Detection Monitoring

Pursuant to § 20240 of Title 27, the Discharger has proposed a Detection Monitoring Program for the Facility. The Detection Monitoring Program for the Impoundments consists of monitoring the LCRS and monitoring wells for the presence of liquid and/or constituents of concern. The program to monitor the LCRS and underlying water-bearing media for evidence of a release, as well as the monitoring frequency, is specified in the MRP. The Detection Monitoring Program for the Land Application Area consists of collecting and analyzing samples of the native soil in, and underneath, the treatment zone for the presence of wastewater. The frequency of monitoring is specified in the MRP.

26. Evaluation Monitoring

If there is evidence of a release under the Detection Monitoring Program, an Evaluation Monitoring Program may be required, pursuant to §20425 of Title 27 to further evaluate evidence of a release.

27. Corrective Action

A Corrective Action Program (CAP) to remediate released wastes from the Facility may be required pursuant to §20430 of Title 27 should results of an Evaluation Monitoring Program warrant a CAP.

28. Action Leakage Rate

An action leakage rate of 20 gallons/acre/day has been established for the Evaporation Ponds. The total leakage at this rate is detailed in Table 2 in Section II.C.1 of the Requirements and Prohibitions.

29. Rapid and Large Leakage Rate

The Discharger has submitted a proposal requesting that the Regional Board allow a RLLR through the upper liner of the double lined Impoundments of 2,970 gallons (average) per day per acre of liner surface area into the individual pond leachate collection sumps. The total leak rates for each pond are detailed in Table 5, Section II.C.2 of the Requirements and Prohibitions. These RLLRs are conservative in comparison with a 1992 US EPA rule for maximum design flow rates that the LCRS can remove without the fluid head on the bottom liner exceeding one foot. The RLLRs include an adequate safety margin to allow for uncertainties in design and construction and are 10 percent of the most conservative calculated RLLRs.

This Order requires the Discharger to immediately notify the Regional Board and cease discharge of waste to the affected impoundment if liquids are detected in the LCRS sumps at rates greater than the RLLRs. This Order also requires that the discharge of waste to the affected impoundment be discontinued until the appropriate repairs are made and approval for discharge is granted.

30. Closure and Post-Closure Maintenance of the Evaporation Ponds, Storage Pond and Land Application Area

The Discharger has submitted a preliminary closure plan for the Evaporation Ponds. Closure requirements for surface impoundments are contained in Title 27, §21400 *Closure Requirements for Surface Impoundments*. (C15, §2582) which requires:

- a) Remove free liquids - All free liquid remaining in a surface impoundment at the time of closure shall be removed and discharged at an approved waste management unit (Unit). All residual liquid shall be treated to eliminate free liquid. Following removal and treatment of liquid waste, impoundments shall be closed in one of two ways, as approved by the Regional Board.
 - 1) Mandatory clean-closure attempt — Unless the Discharger demonstrates, and the Regional Board finds, that it is infeasible to attempt clean-closure of the impoundment, then all residual wastes, including sludges, precipitates, settled solids, and liner materials contaminated by wastes, shall be completely removed from the impoundment and discharged to an approved Unit. Remaining containment features shall be inspected for contamination and, if not contaminated, can be dismantled. Any natural geologic materials beneath or adjacent to the closed impoundment that have been contaminated shall be removed for disposal at an appropriate Unit. For surface impoundments that are successfully clean-closed, as herein described, the Regional Board shall declare the Unit no longer subject to the State Water Resources Control Board-promulgated requirements of this title. If, after reasonable attempts to remove such contaminated materials, the Discharger demonstrates that removal of all remaining contamination is infeasible, the surface impoundment shall be closed as a landfill or land treatment unit, as appropriate, pursuant to (b)(2).
 - 2) Fallback Closure Options — In cases where clean-closure [under (a)(1)] is infeasible, the Discharger shall propose for Regional Board approval either:
 - (A) Closure As a Landfill — that all residual wastes, including sludges, precipitates, settled solids, and liner materials, shall be compacted, and the Unit shall be closed as a landfill pursuant to §21090, provided that the closed Unit meets applicable standards for landfill Units in Articles 3 and 4 of Subchapter 2, Chapter 3, Subdivision 1 of this division (§20240 et seq.), and further provided that the moisture content of residual wastes, including sludges, does not exceed the moisture holding capacity of the waste either before or after closure; or
 - (B) Closure As an LTU — for surface impoundments which contain only decomposable wastes at closure, that the Unit be closed as a land treatment unit under §21420(a)(2 B 4).

31. Reasonably Foreseeable Releases from the Evaporation Ponds

In accordance with § 20380(b) of Title 27, the Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the Unit.

32. Financial Assurance for Closure

Section 22207 of Title 27 requires the Discharger to provide for adequate funding to pay for the costs of closure as required by the mining regulations of Article 1, Subchapter 1, Chapter 7 (§22470 et seq.). The Discharger shall provide assurance of financial responsibility acceptable to the Regional Board. The Regional Board shall periodically review financial assurances for mining Units and shall modify the financial assurances as necessary to provide continued compliance with this section. If a lead agency acting under the authority of §2774(a) of the Public Resources Code requires assurances of financial responsibility for a mining Unit, these assurances can be used to fulfill the requirement under this paragraph, provided that:

- (1) the Regional Board approves the assurance; and
- (2) the Regional Board is named as payee.

33. Receiving Waters

The receiving waters are the ground waters of the Ivanpah Valley Hydrologic Unit and the Shadow Valley Hydrologic Subarea of the Amargosa Hydrologic Unit.

34. Lahontan Basin Plan

The Regional Board adopted a Water Quality Control Plan for the Lahontan Basin (Basin Plan) which became effective on March 31, 1995. This Order implements the Basin Plan.

35. Beneficial Ground Water Uses

The present and potential beneficial uses of the ground waters of the Ivanpah Valley and Amargosa Hydrologic Units of the Mojave Hydrologic Unit as set forth and defined in the Basin Plan are:

- a) municipal and domestic supply;
- b) agricultural supply;
- c) industrial service supply; and
- d) freshwater replenishment.

36. California Environmental Quality Act

This project is subject to the provisions of the CEQA (Public Resources Code Section 21000 et seq.) in accordance with Section 15301 of the CEQA Guidelines. The San Bernardino County (SBC) Planning Department has issued a Draft Initial Study addressing the CEQA

requirements for the project on June 23, 1999. A Final Determination and Negative Declaration was passed by the SBC Planning Commission on April 6, 1999.

SBC is the CEQA Lead Agency for the Evaporation Ponds. The Initial Study prepared by SBC staff determined that no significant impacts were expected to occur as a result of the discharge. The Initial Study was issued in accordance with the provisions of CEQA (Public Resources Code Section 21000 et seq.).

37. Notification of Interested Parties

The Regional Board has notified the Discharger and all known interested agencies and persons of its intent to adopt new WDRs for the project.

The Regional Board, in a public meeting, will consider all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

I. DISCHARGE SPECIFICATIONS

A. Documentation Requirements

1. The Discharger shall submit to Regional Board staff, for review and approval, "Construction Design Plans" at least 120 days prior to the start of construction. The plans and specifications shall include, but not be limited to:

Engineering Design and Analyses: designs and analysis of all portions of the project including:

- a) details of the minimum requirements associated with each element of the surface impoundments (e.g., slopes, material shear strengths) required to meet the design slope stability requirements;
- b) slope stability analyses of the liner slopes and actual residual shear strengths associated with the proposed liner interfaces;
- c) seismic and status slope stability calculations for all slopes under the appropriate range of loading conditions;
- d) calculations of the minimum factor of safety for the proposed slopes;
- e) drainage system flow calculations;
- f) settlement analyses of foundation, liner system, and waste; and
- g) any other applicable analyses.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

STANDARD PROVISIONS
FOR WASTE DISCHARGE REQUIREMENTS

Attachment G

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

- a. to enter upon premises in which an effluent source is located or in which any required records are kept;
- b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements;
- c. to inspect monitoring equipment or records; and
- d. to sample any discharge.

2. Reporting Requirements

- a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.
- b. Pursuant to California Water Code Section 13260(c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not limited to, all significant soil disturbances.
- c. The Owners/Discharger of property subject to Waste Discharge Requirements shall be considered to have a continuing responsibility for ensuring compliance with applicable Waste Discharge Requirements in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the Waste Discharge Requirements shall be reported to the Regional Board. Notification of applicable Waste Discharge Requirements shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.
- d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing and correct that information.
- e. Reports required by the Waste Discharge Requirements, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation.

- f. If the Discharger becomes aware that their Waste Discharge Requirements (or permit) is no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their Waste Discharge Requirements (or permit) be rescinded.

3. Right to Revise Waste Discharge Requirements

The Regional Board reserves the privilege of changing all or any portion of the Waste Discharge Requirements upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the Waste Discharge Requirements may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and reissuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the Waste Discharge Requirements which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the Waste Discharge Requirements. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the Waste Discharge Requirements.

7. Waste Discharge Requirement Actions

The Waste Discharge Requirements may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the Waste Discharge Requirements conditions.

8. Property Rights

The Waste Discharge Requirements do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the Waste Discharge Requirements including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the Waste Discharge Requirements shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the Waste Discharge Requirements are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from disposal/treatment facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operator. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

- a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.
- b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

- a. All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

MONITORING AND REPORTING PROGRAM NO. 00-34
WDID NO. 6B369807003

FOR

MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL
ON-SITE WASTEWATER TREATMENT, LINED EVAPORATION PONDS,
AND LAND APPLICATION OF TREATED WASTEWATER

San Bernardino County

I. MONITORING

New and existing Group A and B Mining Units shall comply with the monitoring provisions contained in §20385 through §20430 of Title 27. In addition to satisfying the monitoring requirements of Title 27, the Discharger shall also perform the following monitoring.

A. Surface Impoundment Flow Monitoring Ponds 1, 2, 3, 4

The following shall be recorded in a bound log book:

1. Weekly, the freeboard measured from the top of the lowest part of the dike to the wastewater surface in each evaporation pond. If the pond is dry, indicate this in the monitoring report.
 2. Monthly, the average flow rate, in million gallons per day (mgd), to initial evaporation pond.
 3. Monthly, the cumulative total of wastewater, in millions of gallons.
 4. Monthly, the integrity of the dikes and liners in each disposal pond shall be inspected. Should the inspection indicate the liner has been breached or any unauthorized discharge has occurred, or may occur, the Regional Board shall be notified immediately by telephone. This shall be followed by written confirmation to the Regional Board.
- B. Quarterly, a grab sample of wastewater in each disposal pond shall be collected and analyzed to determine the concentrations of the analytes listed in Table 1.

Table 1 - Grab Sample Analytes

Analyte	Units	Analyte	Units
Ca	mg/L	Mn	mg/L
Mg	"	Mo	"
Na	"	Pb	"
K	"	Zn	"
CO ₃ + HCO ₃	"	TDS	"
SO ₄	"	pH	0-14
Cl	"	Ra ²²⁶	pCi/g
NO ₃ (as Nitrate)	"	Ra ²²⁸	"
As	"	U ²³⁴	"
Ba	"	U ²³⁵	"
Bo	"	U ²³⁸	"
Co	"	Th ²²⁸	"
Cr	"	Th ²³⁰	"
Cu	"	Th ²³²	"
		Th ²³⁴	"

- C. Annually, a composite sample of at least three (3) randomly selected samples of settled solids (salts) in the evaporation ponds shall be collected and analyzed to determine the concentration of the following constituents:

Table 2 – Composite Sample Analytes

Analyte	Units
Arsenic	mg/L
Chromium	"
Copper	"
Lead	"
Selenium	"
Strontium	"
Zinc	"

D. Land Application Area

Monthly, a grab sample of treated wastewater shall be collected and analyzed to determine the concentrations of the analytes listed in Table 1.

The following shall be recorded in a permanent log book:

1. Monthly, volume of wastewater applied to the land application area.
2. Monthly, the integrity of the dikes and liners in each evaporation pond shall be checked. Should the inspection indicate any unauthorized discharge has occurred or may occur, the Regional Board shall be notified immediately by telephone followed by confirmation in writing.

3. Annually the moisture content and salt concentrations (i.e., TDS, major cations and anions) at three locations within the vegetative root zone in the Land Application Area. The moisture data will be compared to baseline conditions to evaluate the percolation depth of the land-applied water. If the moisture profile indicates water has percolated deeper than the root zone, samples will also be obtained sequentially at 5, 10, 15 and 20-foot depths until the depth of moisture front has been determined. Baseline concentrations for all Table 2 constituents will be determined prior to initiation of land application activities. Monitoring data shall be reported in the quarterly report following the sampling event.

E. Unsaturated Zone Monitoring

Monthly, the unsaturated zone monitoring system for each pond shall be inspected to determine if moisture is present. The results shall be reported each quarter.

F. Ground Water Monitoring

1. Based on the ground water flow direction, the placement and designation of the upgradient and downgradient wells shall be verified annually, as appropriate. Annually, a map showing the wells sampled and ground water elevations shall be submitted.
2. Quarterly, samples will be collected to determine concentrations of the following analytes and values of the following parameters:

Table 3 – Quarterly Ground Water Sampling Analytes

Analyte	Units	Analyte	Units
Ca	mg/L	Mn	"
Mg	"	Mo	"
Na	"	Pb	"
K	"	Zn	"
CO ₃ + HCO ₃	"	TDS	"
SO ₄	"	Ra ²²⁶	pCi/g
Cl	"	Ra ²²⁸	"
NO ₃ (as Nitrate)	"	U ²³⁴	"
As	"	U ²³⁵	"
Ba	"	U ²³⁸	"
Bo	"	Th ²²⁸	"
Co	"	Th ²³⁰	"
Cr	"	Th ²³²	"
Cu	"	Th ²³⁴	"

Table 4 – Quarterly Ground Water Sampling Parameters

Parameter	Units
Standing Water Level (SWL)	Feet above msl
Electrical Conductivity (E _c)	µmhos/cm
pH	0 - 14
Temperature (T)	°F or °C

3. Each monitoring well shall be sufficiently purged, in accordance with generally accepted sampling practice, to obtain a "representative" ground water sample. If a non-purging method is used, the method proposed must be approved, in advance, by Regional Board staff.

G. Sampling Methods

Sample analyses shall be in accordance with the current methods contained in one of the following documents:

1. Test Methods for Evaluating Solid Waste, EPA;
2. Methods for Chemical Analysis of Water and Wastes, EPA;
3. Standard Methods for the Examination of Water and Wastewater; and
4. Section 66699 and 66700, Division 4, Title 33, California Code of Regulations, for determination of hazardous waste classifications.

Any modifications to the above methods to eliminate interferences shall be reported with the sample results. The analytical methods used shall also be reported.

H. Operation & Maintenance

A brief summary of any operational problems and maintenance activities shall be submitted to the Regional Board with each monitoring report for Mountain Pass Operations. This summary shall discuss:

1. Any modifications, additions, or major maintenance to the wastewater conveyance system, treatment facilities, or disposal facilities.
2. Any major problems occurring in the wastewater conveyance system, treatment facilities, or disposal facilities.
3. The calibration of any wastewater flow measuring devices.

II. REPORTING

A. Submittal Periods

Monitoring reports including the preceding information shall be submitted to the Regional Board the month following each quarterly sampling. These data shall be combined with the quarterly and yearly Mine and Mill Monitoring Report.

B. Authorization

A principal Executive Officer or other duly authorized employee shall sign monitoring reports.

C. Information

Monitoring reports are to include the following:

1. Name and telephone number of an individual who can answer questions about the report.
2. Monitoring and Reporting Program No. 00-34
3. WDID No. 6B369807003

D. Annual Report

By **March 30** of each year, the Discharger shall submit an annual report to the Regional Board with the following information:

1. The compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the discharge requirements.
2. Evidence that adequate financial assurance for closure is still in effect. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument.
3. Evidence that the amount is still adequate or increase the amount of financial assurance by the appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events.
4. Graphical and tabular data for the monitoring data obtained for the previous year.

5. A description documenting progress in attaining full compliance with Title 27 regulations. The report shall include a description of all actions accomplished and a time schedule for additional proposed compliance actions.
6. A review of the closure plan and certification that it is still adequate.

E. Failure to Furnish Reports

Any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation under Section 13268 of the California Water Code.

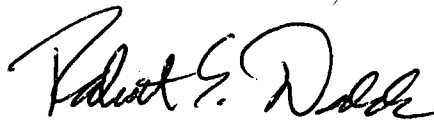
F. Violations

If monitoring data indicate violation of Waste Discharge Requirements, the Discharger shall provide information indicating the cause of violation(s) and action taken or planned to bring the discharge into compliance.

G. Reporting

The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made a part of this Monitoring and Reporting Program.

Ordered by:



h HAROLD J. SINGER
EXECUTIVE OFFICER

Dated: May 10, 2000

Attachment: General Provisions for Monitoring and Reporting Program

5/2000 molyonsite-mrp

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

- a. All analyses shall be performed in accordance with the current edition(s) of the following documents:
 - i. Standard Methods for the Examination of Water and Wastewater
 - ii. Methods for Chemical Analysis of Water and Wastes, EPA
- b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board. Specific methods of analysis must be identified on each laboratory report.
- c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The method used shall also be reported. If methods other than USEPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.
- d. The Discharger shall establish chain-of-custody procedures to ensure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.
- e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall ensure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.
- f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.
- g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be obtained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

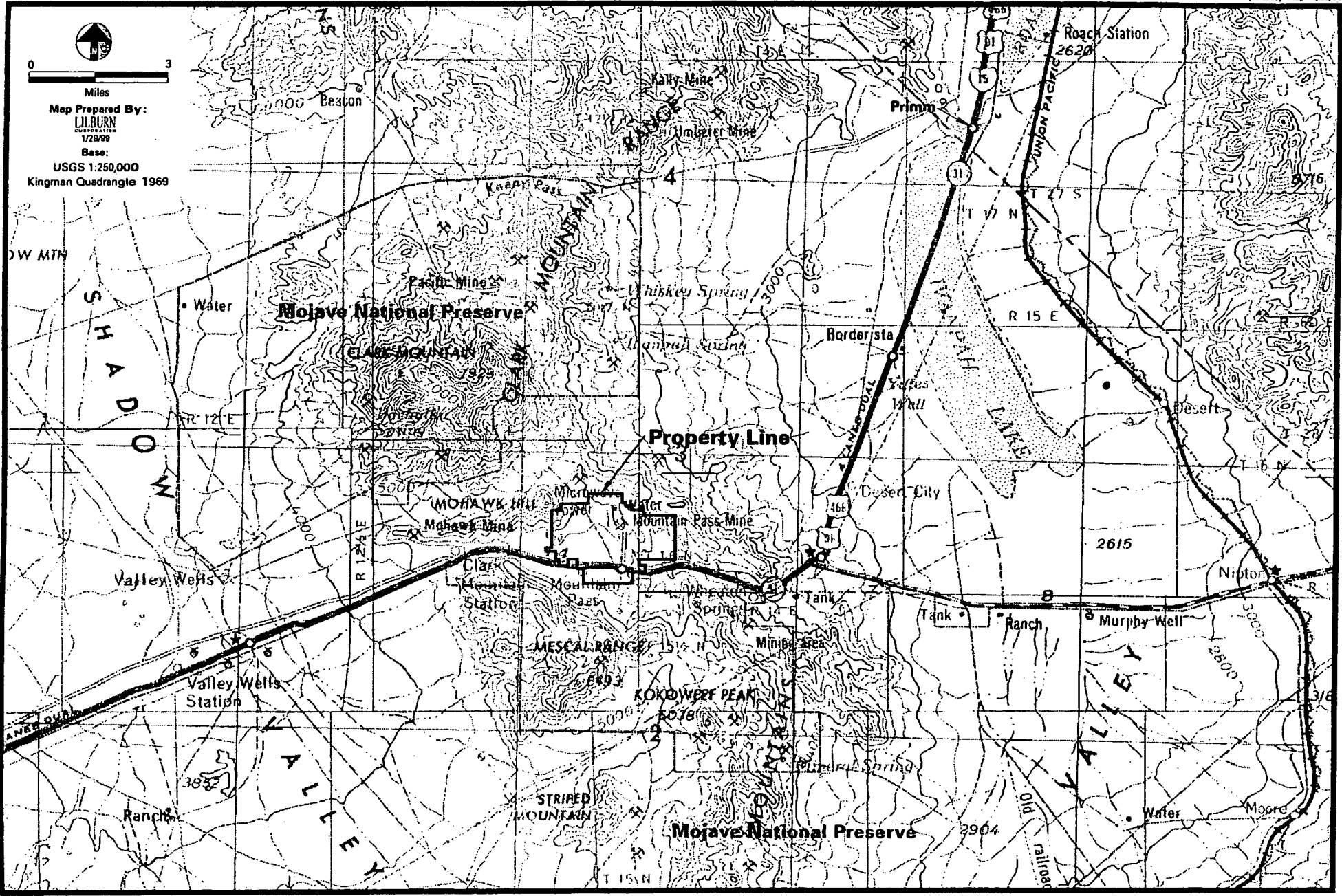
- a. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.
- b. Pursuant to California Water Code Section 13267(b), all sampling shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Regional Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.
- d. Monitoring reports shall be signed by:
 - i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;
 - ii. In the case of a partnership, by a general partner;

- iii. In the case of a sole proprietorship, by the proprietor;
 - iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.
- e. Monitoring reports are to include the following:
- i. Name and telephone number of individual who can answer questions about the report.
 - ii. The Monitoring and Reporting Program Number.
 - iii. WDID Number.
- f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation under Section 13268 of the Water Code.



UNOCAL

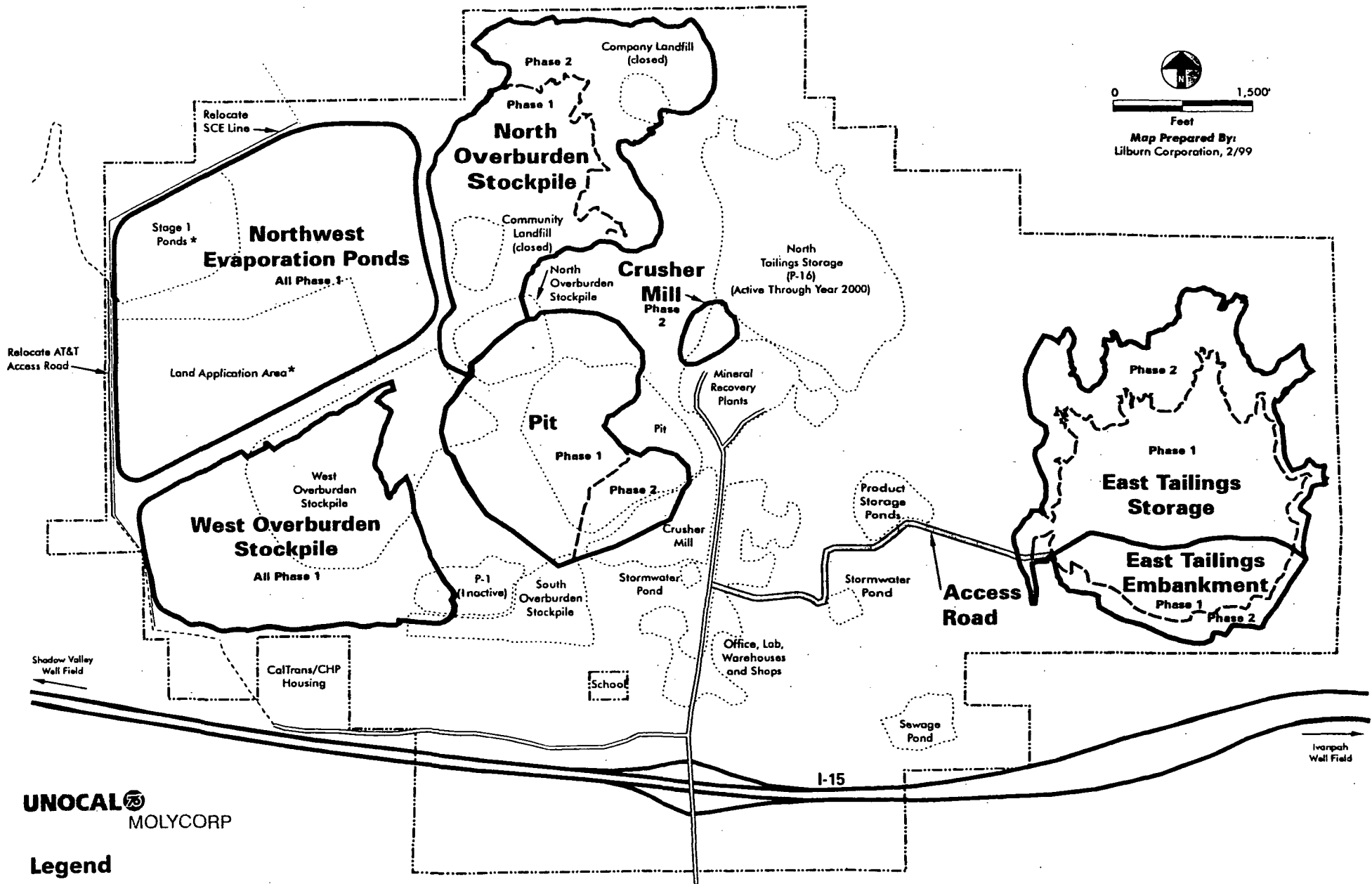
MOLYCORP

ATTACHMENT "A"

Project Site Location Map

Mountain Pass Mine
San Bernardino County, California

Figure 1



0 1,500'
 Feet
 Map Prepared By:
 Liburn Corporation, 2/99

UNOCAL
 MOLYCORP

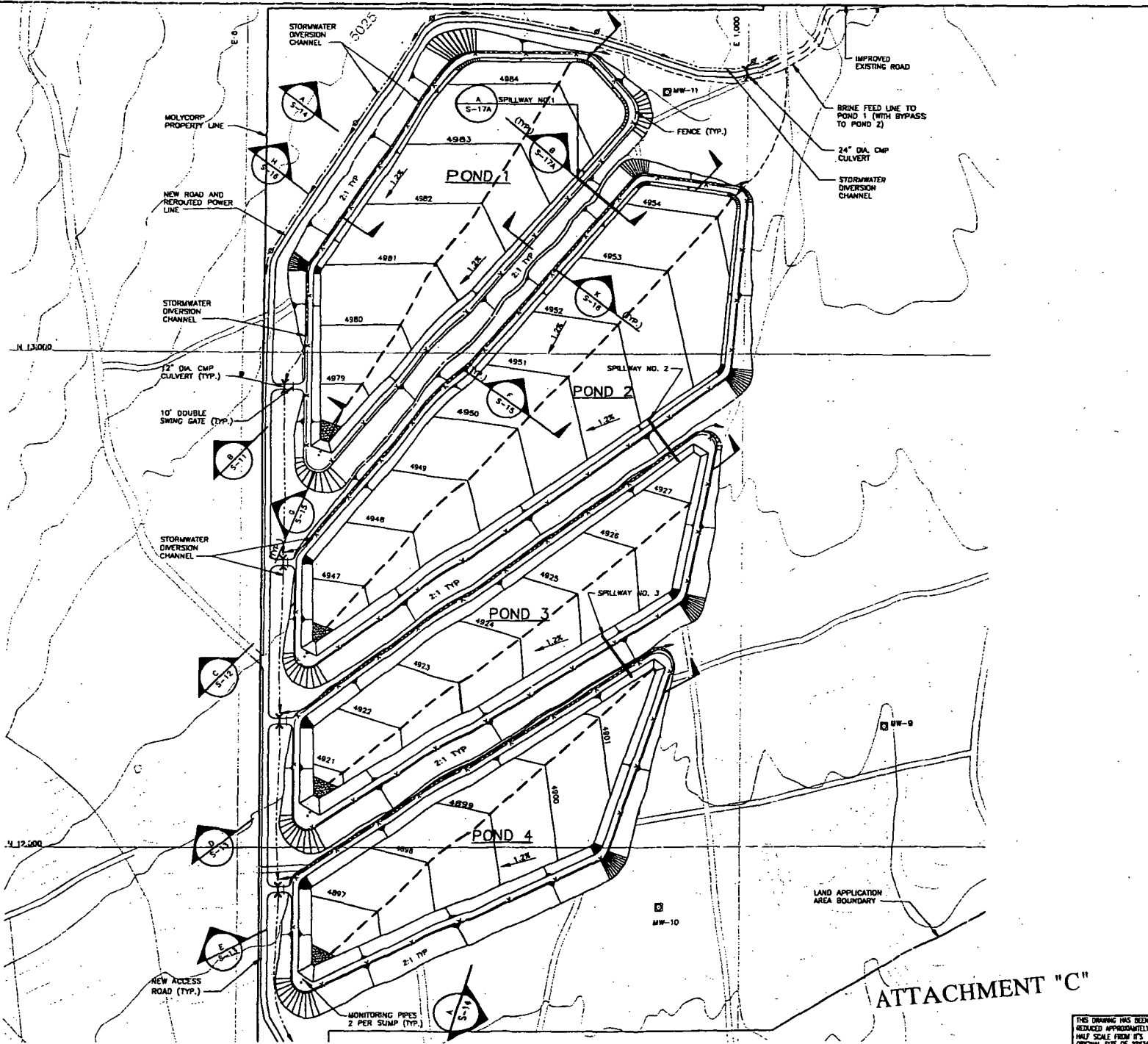
- Legend**
- Project Site Boundary
 - Existing Facilities
 - ▭ Facilities to be Expanded
 - * To be constructed in 1999

ATTACHMENT "B"

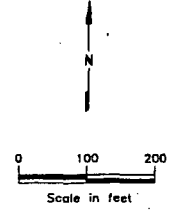
Project Location Map

Mountain Pass Mine
 San Bernardino County, California

Figure 3



POND	MAX. WATER ELEV (FT)	SURFACE AREA (AC)
1	4986.0	5.16
2	4955.8	6.89
3	4932.9	4.32
4	4905.8	3.75



Harding Lawson Associates
Engineering and Environmental Services
707 Seventeenth Street
Suite 2400
Denver, Colorado 80202
(303) 292-5365

#4	3/2/00	WATER BOARD SUBMITTAL	SLJ	QAB
#5	12/16/99	REVISED EVAPORATION POND LAYOUT	CWC	QAB
#4	10/29/99	PRELIMINARY DESIGN - REVISED LAYOUT	CWC	TJM
#3	8/24/99	BOB DESIGN SUBMITTAL	CWC	TJM
#2	8/5/99	REVISED PRELIMINARY DESIGN	CWC	TJM
#1	1/23/99	PRELIMINARY DESIGN	LOZ	TJM

MolyCorp

LANHAMME GROUP - ROUBIDOU PASS, CALIFORNIA

MOLYCORP MOUNTAIN PASS
ONSITE EVAPORATION POND PROJECT
CHAL - ONSITE EVAPORATION POND
AREA SITE PLAN

DESIGNED BY: TJM
SCALE: 100

DATE: 07-022-S-09

REVISIONS: P6

ATTACHMENT "C"

THIS DRAWING HAS BEEN REVISED APPROXIMATELY HALF SCALE FROM ITS ORIGINAL SIZE OF 22x34.

REVISED
TABLE 4

ESTIMATED AVERAGE FINAL FILTRATION SYSTEM
TREATED WATER QUALITY
AND BACKGROUND WATER QUALITY
MOLYCORP MOUNTAIN PASS MINE

ANALYTE	FINAL FILTRATION SYSTEM TREATED WATER ⁽¹⁾	WELL LOCATIONS				
		93-2MW ⁽²⁾ Upgradient of Community Landfill (Bedrock)	93-1MW Upgradient of P-16 (Bedrock)	SRK-27 Non-Impacted Debris Flow Well	Test Hole 2 Upgradient of Proposed Evaporation Pond (Bedrock)	Background Averages
TDS (mg/L)	207	650	360	250	582	461
Chloride (mg/L)	94	49	24	52	55	45
Calcium (mg/L)	19.7	30	63	6	82	45
Strontium (mg/L)	3.35	0.26	0.4	0.42	0.72	0.45
Sulfate (mg/L)	15.5	150	47	31	99	82
Nitrate (mg/L)	1.01	1.6	3.1	1.8	--	2.2
Barium (mg/L)	0.016	<0.2	0.17	0.06	0.08	0.13
Fluoride (mg/L)	0.26	1	<0.5	<0.4	--	0.6
Lead (mg/L)	0.003	<0.003	<0.002	<0.002	0.002	0.002
Iron (mg/L)	0.048	<0.1	0.03	<0.1	--	0.08
Boron (mg/L)	0.05	<0.2	0.2	0.15	--	0.18
Magnesium (mg/L)	12	26	16	<0.5	64	27
Manganese (mg/L)	0.05	<0.015	<0.005	<0.005	--	0.008
Potassium (mg/L)	0.97	--	3.4	4.6	11	6
Sodium (mg/L)	27	54	54	76	60	61
Antimony (mg/L)	0.00003	<0.06	<0.05	<0.05	0.002	0.04
Arsenic (mg/L)	0.00003	<0.01	<0.05	<0.1	0.001	0.04
Chromium (mg/L)	0.0009	<0.01	<0.01	0.013	ND	0.01
Cobalt (mg/L)	0.00001	<0.05	<0.01	<0.01	ND	0.02
Copper (mg/L)	0.00003	<0.025	<0.005	<0.005	0.0044	0.01
Molybdenum (mg/L)	0.011	<0.067	<0.01	<0.01	0.019	0.03
Zinc (mg/L)	0.00017	<0.02	<0.01	<0.1	ND	0.04
Radium 226 (pCi/L)	0.04	--	0.1 ± 0.4	0 ± 0.3	--	--
Radium 228 (pCi/L)	0.34	--	1.9 ± 1.3	0.3 ± 1.2	--	--
Uranium 234 (pCi/L)	1.15	--	1.8 ± 1	0.4 ± 0.5	--	--
Uranium 235 (pCi/L)	0.019	--	0 ± 0.3	0 ± 0.3	--	--
Uranium 238 (pCi/L)	0.54	--	1 ± 0.8	0.1 ± 0.4	--	--
Thorium 228 (pCi/L)	0.0125	--	0 ± 0.3	0 ± 0.4	--	--
Thorium 230 (pCi/L)	0.005	--	0 ± 0.3	0.1 ± 0.4	--	--
Thorium 232 (pCi/L)	0.005	--	0 ± 0.3	0 ± 0.4	--	--
Thorium 234 (pCi/L)	--	--	--	--	--	--
Gross Alpha (pCi/L)	2.42	--	6 ± 2.7	2.4 ± 2.2	--	--
Gross Beta (pCi/L)	1.93	--	4.6 ± 2.3	4.5 ± 3.5	--	--

98-160/Rpu/ROWD (M/31/99/L)

mg/L = Milligrams per liter.
-- = Not available.
ND = Non-detect.
pCi/L = Picocuries per liter.

(1) Calculated from flow model and limited analytical data. Individual constituents may be lower based on molecular sizes.
(2) Fourth Quarter 1996 Data (well has since been dry).

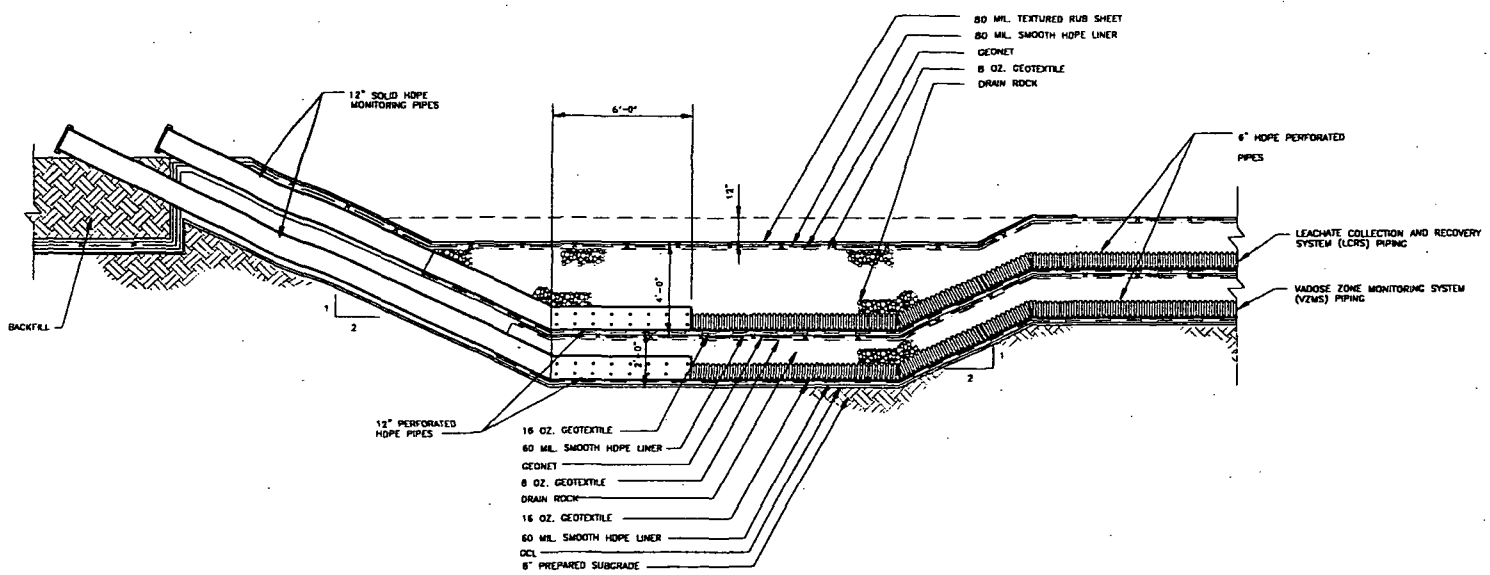
Note: CCR Title 22 constituents are shown in bold.

ATTACHMENT "D"

ESTIMATED WASTE WATER STREAM QUALITY

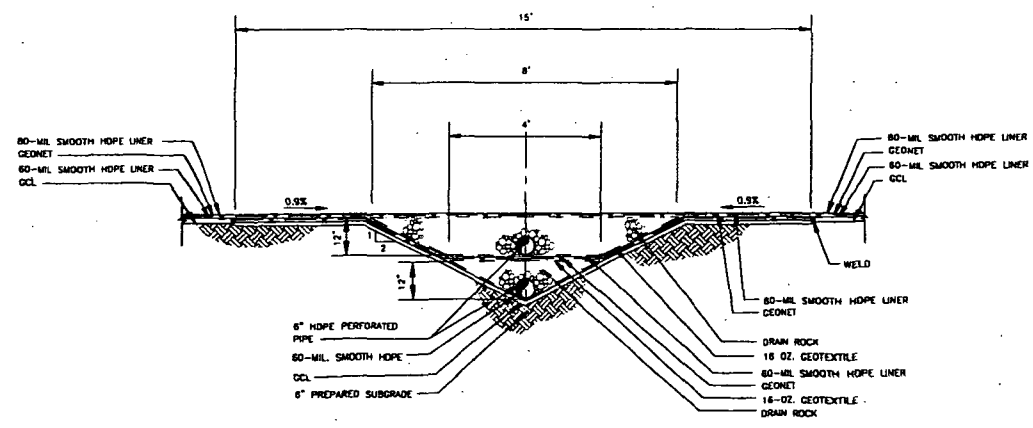
Weighted Average Factors		
	Flow Rate (GPM)	Percent
Pit Water	107	57.9%
Groundwater Recovery Wells	56	30.5%
Vsep Filter (Treated Water)	14	7.7%
Stormwater for Separations and Specialty Plants	7	3.9%
	184	100.0%
Tailings Water Reclaim	11	18.6%
Final Filtration System	29	49.4%
Water Collection Tank Outflow	18	31.9%
	58	100.0%

CONSTITUENT	WATER CONCENTRATIONS (mg/l)									
	FLOWS FROM THE WATER COLLECTION TANK AND FINAL FILTRATION SYSTEM					FLOWS TO THE EVAPORATION PONDS				
	FROM PIT WATER	FROM GROUNDWATER RECOVERY SYSTEM	FROM TAILINGS WATER FILTRATION SYSTEM (FILTERED WATER)	FROM STORM WATER FROM SEPERATIONS AND SPECIALTY	FROM WATER COLLECTION TANK (WEIGHTED)	FROM TAILINGS WATER FILTRATION SYSTEM (BRINE)	FROM FINAL FILTRATION (BRINE)	FROM DISCHARGE FROM WATER COLLECTION TANK (WEIGHTED)	DISCHARGE TO THE EVAPORATION PONDS (WEIGHTED)	
	TO Dust Control and Water Collection Tank (See Table attached)	TO Water Collection Tank (See Table attached)	TO Water Collection Tank (See Table attached)	TO Water Collection Tank (Assumed)	TO Final Filtration	TO Evaporation Ponds (From test run (See Table attached))	TO Evaporation Ponds (For Modeling (Pro-rated))	TO Evaporation Ponds (Ratio brine/influent 5.82 (Values adjusted for flow averaging))	TO Evaporation Ponds	Weighted Average of Salt
TDS (mg/L)	3,265	8,510	2,950	1,000	4,144	23,500	19,345	24,121	4,144	17,628
CHLORIDE (mg/L)	1,480	2,980	1,380	400	1,889	11,000	9,055	10,993	1,889	8,087
CALCIUM (mg/L)	400	480	193	50	395	1,530	1,260	2,299	395	1,548
STRONTIUM (mg/L)	65	62	136	-	67	1,090	897	390	67	417
SULFATE (mg/L)	220	570	102	35	311	810	687	1,808	311	1,144
NITRATE (mg/L)	30	9	1	-	20	10	8	118	20	68
BARIUM (mg/L)	0.15	0.7	0.21	-	0.32	1.7	1.4	1.84	0.32	1.33
FLUORIDE (mg/L)	-	12	20	-	5.21	160	132	30.3	5.21	46.5
LEAD (mg/L)	0.004	0.12	0.25	-	0.06	2	2	0.34	0.06	0.56
IRON (mg/L)	0.05	3	0.2	-	0.96	1.5	1.2	5.8	0.96	3.35
BORON (mg/L)	0.3	0.8	8.5	-	1.01	70	58	5.90	1.01	16.3
MAGNESIUM (mg/L)	250	310	27	-	241	210	173	1405	241	811
MANGANESE (mg/L)	0.06	3	0.7	-	1.00	6	5	5.8	1.00	4.33
POTASSIUM (mg/L)	16	19	58	-	19.4	450	370	113	19.4	148
SODIUM (mg/L)	220	1180	590	300	545	4,700	3,869	3,171	545	2,617
ANTIMONY (mg/L)	-	-	0.008	-	0.0008	0.08	0.05	0.0038	0.00082	0.01
ARSENIC (mg/L)	-	-	0.008	-	0.0008	0.06	0.05	0.0038	0.00082	0.01
CHROMIUM (mg/L)	-	0.06	0.002	-	0.0185	0.015	0.012	0.1075	0.01847	0.0619
COBALT (mg/L)	-	-	0.003	-	0.0002	0.025	0.021	0.0014	0.00023	0.0054
COPPER (mg/L)	-	-	0.008	-	0.0008	0.08	0	0.0038	0.00082	0.013
MOLYBDENUM (mg/L)	-	0.8	0.5	-	0.22	4	3	1.29	0.22	1.45
ZINC (mg/L)	-	0.01	0.005	-	0.003	0.04	0.03	0.020	0.0034	0.018
RADIUM 226 (PIC/L)	1	0.34	0.07	-	0.89	0.6	0.5	4.00	0.69	2.31
RADIUM 228 (PIC/L)	9.3	1.78	0.2	-	5.94	1.4	1.2	34.8	5.94	19.3
URANIUM 234 (PIC/L)	31.7	6.3	16.1	-	21.5	128.6	106	125	21.5	83
URANIUM 235 (PIC/L)	0.47	0.02	0.71	-	0.33	5.68	4.68	1.94	0.33	2.12
URANIUM 238 (PIC/L)	13.7	4.8	11.1	-	10.2	88.7	73.0	59.3	10.2	49.1
THORIUM 228 (PIC/L)	-	1.9	0.025	-	0.58	0.2	0.2	3.39	0.58	1.90
THORIUM 230 (PIC/L)	0.07	0.22	0.09	-	0.11	0.7	0.6	0.67	0.11	0.50
THORIUM 232 (PIC/L)	-	0.14	-	-	0.04	0	-	0.249	0.043	0.137
GROSS ALPHA (PIC/L)	41	70	25	-	47.0	201	165	274	47.0	188
GROSS BETA (PIC/L)	30	38	86.5	-	35.0	670	552	204	35.0	237



TYPICAL LEACHATE COLLECTION SUMP

SECTION C
S-00



TYPICAL LEACHATE COLLECTION SYSTEM AND VADOSE ZONE MONITORING SYSTEM TRENCH

SECTION F
S-08

HLA Harding Lawson Associates Engineering and Environmental Services 707 Seventeenth Street Suite 2400 Denver, Colorado 80202 (303) 792-5385			
DATE	DESCRIPTION	BY	CHECKED
2/7/00	WATER BOARD SUBMITTAL	CNC	LSB
12/10/99	REVISED EVAPORATION POND LAYOUT	CNC	LSB
8/29/99	FINAL DESIGN SUBMITTAL	CNC	LSB
7/23/99	PRELIMINARY DESIGN	CNC	TLM
Molycorp LANTHIER GROUP - MOUNTAIN PASS, CALIFORNIA			
MOLYCORP MOUNTAIN PASS ONSITE EVAPORATION POND PROJECT			
LEACHATE COLLECTION SYSTEM PLAN, PROFILE & DETAILS			
DESIGNED BY	TLM	CHECKED BY	MS
DATE	12/10/99	SCALE	07-022-S-15
PROJECT NO.	07-022-S-15	DATE	12/10/99
BY	TLM	DATE	12/10/99
CHECKED	MS	DATE	12/10/99

THIS DRAWING HAS BEEN
RELEASSED UNCLASSIFIED
DATE 12/10/99 BY 6032
HALF SCALE FROM ITS
ORIGINAL SIZE OF 22x34

C. Leachate Collection and Removal System

1. If liquids are detected in the LCRS sumps at a rate equal to or greater than the "Action Leakage Rate" as described in Table 4, then the Discharger shall comply with the notice of evidence of response to exceeding the action leakage rate requirements presented in Section II.B.2. of the Monitoring and Reporting Program (MRP).

Table 4 - Action Leakage Rates

Impoundment	Surface Area (Acres)	Action Leakage Rate (gallons per day)
Pond 1	5.9	118
Pond 2	4.9	98
Pond 3	5.0	100
Pond 4	4.8	96

Note: The Action Leakage Rate is the equivalent of 20 gallons per acre per day

2. If liquids are detected in the LCRS sumps at rates greater than the "Rapid and Large Leakage Rate" as described in Table 5, the Discharger shall immediately notify the Regional Board and cease discharge of waste to the affected impoundment. Discharges of waste to the affected impoundment shall be prohibited until the appropriate repairs are made and approval for discharge is granted.

Table 5 - Rapid and Large Leakage Rates

Impoundment	Surface Area (Acres)	Rapid and Large Leakage Rate (gallons per day)
Pond 1	5.9	17,523
Pond 2	4.9	14,553
Pond 3	5.0	14,850
Pond 4	4.8	14,256

Note: The Rapid and Large Leakage Rate is the equivalent of 2,970 gallons per acre per day

3. The depth of leachate in the leachate collection sump shall be kept at the minimum needed to ensure efficient sump dewatering pump operation.
4. The LCRSs shall be operated to function without clogging throughout the life of the project including closure and post closure maintenance periods.
5. The LCRSs shall be tested in the event no leachate is being generated by the system and the vadose zone monitoring system (VZMS) indicates no seepage for a period of 12 months. If leachate is collected in either the LCRS or VZMS, it is inferred that the system is operating as designed. If testing is warranted, it will involve pouring either 100-gallon slugs or a continuous flow of water into 1-inch pipes installed at the crest of the slope to the floor of the LCRS. The equilibrated difference between the input and recovered volume of water will be recorded and reported.

6. The LCRSs shall be capable of removing twice the maximum anticipated daily volume of leachate from the waste management unit.

Any leachate collected in an LCRS shall be pumped into an Evaporation Pond that is not leaking above the ALR or to another approved holding facility.

D. Detection Monitoring Program

The Discharger shall maintain a Detection Monitoring Program as required in Section 20385(a)(1) of Title 27.

E. Evaluation Monitoring Program

The Discharger shall establish an Evaluation Monitoring Program whenever there is statistically significant evidence of a release from the Facility as required in Section 20385(a)(2) or (3) of Title 27.

F. Corrective Action Program

The Discharger shall institute a CAP when required pursuant to Section 20385(a)(4) of Title 27.

III. WATER QUALITY MONITORING AND RESPONSE PROGRAMS

A. Water Quality Protection Standard

1. The Discharger shall propose to the Regional Board any constituents of concern not included in the list and proposed for discharge to the Impoundments at least 180 days before discharge of any new constituents of concern. Before a new discharge commences, the Discharger shall estimate the concentration for such constituents within the wastewater stream and submit written statistical method(s) in order to detect a release of such constituents.
2. At any given time, the concentration limit for each monitoring parameter constituent of concern shall be equal to the background value of that constituent.
3. If the Discharger or Executive Officer determines that concentration limits were or are exceeded, the Discharger may immediately institute verification procedures upon such determination as specified below or submit an amended RWD within 90 days of such determination in order to establish an Evaluation Monitoring Program.

B. Statistical Methods

1. The Discharger shall use approved statistical data analysis methods to evaluate Point of Compliance data in order to determine "measurably significant" (as defined in §20164 of Title 27) evidence of a release from the Evaporation Ponds. Approved methods may include an intrawell statistical approach proposed by the Discharger.
2. Allowable statistical methods include: Parametric Analysis of Variance (ANOVA) Nonparametric ANOVA, Tolerance Interval, Control Chart, or other statistical method approved by the Regional Board.
3. The Discharger shall determine, within 45 days after completion of sampling, whether there is statistically significant evidence of a release from the Impoundments at each Monitoring Point. The analysis shall consider all monitoring parameters and constituents of concern. The Executive Officer may make an independent finding that there is statistically significant evidence of a release or physical evidence of a release.
4. If there is statistically significant evidence of a release, the Discharger shall immediately notify the Regional Board by certified mail (see notification procedures contained in the MRP). Subsequently, the Discharger may immediately initiate verification procedures as specified below whenever there is a determination by the Discharger or Executive Officer that there is statistically significant evidence of a release.
5. If the Discharger does not use verification procedures to evaluate evidence of a release, then there is confirmation that there is statistically significant evidence of a release. The Discharger is required to submit, within 90 days of such confirmation, an amended RWD in order to establish evaluation monitoring (see subsection, II.E, entitled "Evaluation Monitoring Program") or make a demonstration to the Regional Board that there is a source other than the Impoundments that caused evidence of a release (see notification procedures contained in the MRP).

C. Nonstatistical Methods

The Discharger shall determine whether there is significant physical evidence of a release from the Facility. Significant physical evidence may include, but is not limited to, unexplained volumetric changes in the Facility, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the Facility, or any other change in the environment that could be reasonably be expected to be the result of a release from the Facility (see notification procedures contained in the MRP).

D. Verification Procedures

1. The Discharger shall immediately initiate verification procedures as specified below whenever there is a determination by the Discharger or Executive Officer that there is evidence of a release. If the Discharger declines the opportunity to conduct verification procedures, the Discharger shall submit a technical report as described below under the heading Technical Report without Verification Procedures.
2. The verification procedure shall only be performed for the constituent(s) that has shown a statistically significant evidence of a release, and shall be performed for those Monitoring Points at which a release is indicated.
3. If a determination is made that there is evidence of a release using the Prediction or Tolerance Interval Method, the Discharger may, within 30 days of such determination, update the Upper Tolerance Limit and reevaluate Point of Compliance data in order to verify evidence of a release from the Impoundments. The Discharger must also collect three additional samples from the affected Monitoring Points and compare the results to the updated Upper Tolerance Limit.
4. The Discharger shall either conduct a composite retest using data from the initial sampling event with all data obtained from the resampling event or shall conduct a discrete retest in which only data obtained from the resampling event shall be analyzed to verify evidence of a release.
5. The Discharger shall report to the Regional Board by certified mail the results of the verification procedure, as well as all concentration data collected for use in the retest within seven days of the last laboratory analysis.
6. If the Discharger or Executive Officer verify evidence of a release, the Discharger is required to submit, within 90 days of such a determination that there is, or was, a release, a technical report pursuant to Section 13267(b) of the California Water Code. The report shall propose an Evaluation Monitoring Program (see subsection, II.E., entitled "Evaluation Monitoring Program"), **OR**, make a demonstration to the Regional Board that there is a source other than the Impoundments that caused evidence of a release (see notification procedures contained in the MRP).

E. Technical Report without Verification Procedures

If the Discharger chooses to not initiate verification procedures after there has been a determination made for evidence of a release, a technical report shall be submitted pursuant to Section 13267(b) of the California Water Code. The report shall propose an evaluation monitoring program, **OR**, attempt to demonstrate that the release did not originate from the Facility.

IV. PROVISIONS

A. Standard Provisions

The Discharger shall comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, in Attachment "D," which is made part of this Order.

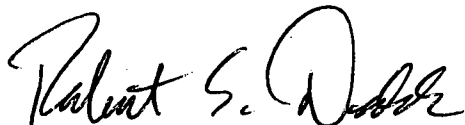
B. Monitoring and Reporting

1. Pursuant to California Water Code Section 13267(b), the Discharger shall comply with MRP No. 00-34.
2. The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994 which is attached to and made part of the MRP.

C. Closure and Post Closure Maintenance Plan

The preliminary Closure and Post-closure Maintenance Plan shall be updated if there is a substantial change in operations or costs for closure, and a report shall be submitted annually indicating conformance with existing operations. A final plan shall be submitted at least 180 days prior to beginning any partial or final closure activities or at least 120 days prior to discontinuing the use of the site for waste treatment, storage or disposal, whichever is greater. The final plan shall be prepared by or under the supervision of either a California Registered Civil Engineer or a Certified Engineering Geologist.

I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by California Regional Water Quality Control Board, Lahontan Region, on May 10, 2000.



HAROLD J. SINGER
EXECUTIVE OFFICER

- Attachments:
- A. Location Map
 - B. Mountain Pass Site Map
 - C. Evaporation Ponds and Land Application Area Map
 - D. Estimated Treated Water Quality
 - E. Estimated Waste Water Stream Quality
 - F. Evaporation Pond Construction Detail
 - G. Standard Provisions for Waste Discharge Requirements

Construction Drawings and Specifications: set of construction drawings and specifications of sufficient detail to build the piping and surface impoundment containment systems. For critical systems, such as the evaporation ponds, construction drawings shall include horizontal coordinates and elevations (± 0.1 -ft) and grades ($\pm 0.1\%$) at construction and control points. For non-critical systems, such as the general routing of pipelines, accuracy at construction points will be ± 1.0 -ft. The plans should show all interim and permanent berms, ditches, sumps, ridges, pipe connection details, liner overlaps, liner seaming and welds, and minimum layer thickness.

Cut and Fill Plan: details of the proposed cut and fill showing the acceptable geometries for all cut and fill materials.

Construction Quality Assurance/ Quality Control (CQA/QC): A Construction CQA/QC plan to be implemented by an independent (not owned in whole or in part by the discharger) engineering firm during construction of the containment system. The Plan shall contain, at a minimum:

2. construction quality assurance/quality control procedures for each geosynthetic and natural material to be incorporated into the liner (containment) system;
3. testing, inspection, and acceptance criteria for each geosynthetic and natural material to be incorporated into the liner (containment) system;
4. foundation acceptance criteria;
5. a plan for performing interface shear strength tests, prior to installation, using the specified geosynthetic materials. The tests shall be performed for the range of normal stress, moisture conditions, and displacement rates applicable to the extant field conditions. The determined shear strength values must be equal to, or greater than, the shear strengths employed in the slope stability analyses performed during final design.

Contractor Quality Control – each contractor or manufacturer is responsible for implementing their own quality control plan as required by the construction specifications. All materials and workmanship shall be tested in accordance with the QA/AC Plan. All tests may be observed the CQA/QC firm and all test results shall be submitted to the CQA/QC firm for review and approval.

B. Field Changes

1. Construction Drawings and specifications shall be developed to minimize, to the extent feasible, the need for “significant field changes.” Significant field changes include, but are not limited to:

- a) changes in material specifications;
 - b) changes in soil liner compaction criteria;
 - c) changes in liner system component thickness;
 - d) increase in side slope grade;
 - e) decrease in bottom slope grade;
 - f) decrease or increase in the height of the slopes;
 - g) decrease or increase in the width of the benches; and
 - h) changes to the foundation grading plan.
2. A plan outlining the steps necessary for approval of significant field change should include, but not be limited to:
- a) The contractor shall notify the construction manager regarding the proposed change.
 - b) The construction manager shall have the responsible design engineer review the proposed change. The review shall include any engineering analyses required to ensure that all design criteria are met with the proposed change.
 - c) The Discharger shall submit the proposed to Regional Board staff for review and approval. The proposed changes shall be accompanied by explanation of the change, a copy of the engineering analyses, and any changes to the final design drawings and specifications.
 - d) Regional Board staff shall approve the proposed changes before they are implemented. Such approval shall be given only if the slope stability analysis demonstrates that the field changes do not result in slope stability factors of safety less than the minimum acceptable values.

The foundation material shall be compacted, in accordance with ASTM Standards, to at least 90 percent relative compaction for any material used as part of the Evaporation Ponds' foundation.

C. Receiving Water Limitations

1. The discharge of waste shall not cause the presence of the following substances or conditions in ground waters of the Ivanpah Valley or Shadow Valley Ground Water Basins:
 - a) any perceptible color, odor, taste, or foaming;
 - b) any presence of toxic substances in concentrations that individually, collectively, or cumulatively cause detrimental physiological response in humans, plants, animals, or aquatic life; and
 - c) the presence of constituents of concern listed in Attachment "D" ("Revised Table 4") in concentrations that exceed background levels.

D. Discharge Limitations-Impoundments

1. Only liquid designated waste, as described in the Findings of this Order, shall be accepted at the impoundments.
2. The flow of wastewater to the Impoundments shall not exceed a total of 0.308 mgd for any consecutive 12 month period.
3. The maximum average daily flow rate of wastewater shall not exceed 0.340 mgd.
4. The liquid wastes discharged to the initial Evaporation Pond shall not exceed the concentration limits listed in Table 2.

Table 2 Evaporation Ponds Discharge Limits

Analyte	Discharge Limit (mg/L)
As	5.0
Ba	100.0
Cd	1.0
Cr (total)	5.0
F	160
Pb	5.0
Hg	0.2
Sb	5.0
Radioisotope	Discharge Limit (pCi/L)
Ra ²²⁶	4.0
Ra ²²⁸	34.6
U ²³⁴	125.0
U ²³⁵	5.0
U ²³⁸	59.3
Th ²²⁸	3.4
Th ²³⁰	0.67
Th ²³²	0.25
Th ²³⁴	0.0

Table 3. Discharge Limits for Holding Pond and Land Application Area

Analyte	Discharge Limit (mg/L)
Ca	40.0
Mg	16.0
Na	54.0
K	3.4
CO ₃ + HCO ₃	80.0
SO ₄	47.0
Cl	190.0
NO ₃ (as Nitrate)	3.1
As	0.05
Ba	1.0
Bo	0.2
Co	0.01
Cr	0.05
Cu	0.005
F	2.0
Mn	0.05
Mo	0.02
Pb	0.006
Sb	0.006
Sr	4.2
Zn	0.1
TDS	360
Radioisotope	Discharge Limit (pCi/L)
Ra ²²⁶	0.53
Ra ²²⁸	3.2
U ²³⁴	2.8
U ²³⁵	0.3
U ²³⁸	1.8
Th ²²⁸	0.3
Th ²³⁰	0.3
Th ²³²	0.3
Th ²³⁴	0.04

II. REQUIREMENTS AND PROHIBITIONS

A. General

1. There shall be no discharge, bypass, or diversion of wastewater from the collection, conveyance, or disposal facilities to adjacent land areas or surface waters.
2. All facilities used for the collection, conveyance, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage, or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

3. Direct pipeline discharge to the Evaporation Ponds shall be either equipped with devices or shall have fail-safe operating procedures to prevent overfilling. Discharges shall be stopped immediately in the event of any containment system failure and the system repaired.
4. There shall be no discharge from the Evaporation Ponds except as authorized by WDRs.
5. The Evaporation Ponds shall be designed and constructed to prevent scouring of the containment structures at points of discharge into the impoundments and by wave action at the waterline.
6. The discharge of waste exhibiting hazardous waste characteristics as defined in Title 22, CCR, to the Evaporation Ponds or generation of waste exhibiting hazardous waste characteristics in the Impoundments is prohibited.
7. The Discharger shall not cause a pollution, or threatened pollution, as defined in Section 13050 of the California Water Code.
8. Neither the treatment nor the discharge shall cause a nuisance as defined in Section 13050 of the California Water Code.

B. Impoundments

1. The discharge of wastewater at the facility except to the authorized disposal sites listed in Finding No. 19 of this Order is prohibited.
2. All lined facilities shall be effectively sealed to prevent the exfiltration of liquids. For this project, "effectively sealed" facilities are the Impoundments that are designed and constructed in accordance with the requirements of Title 27.
3. The Evaporation Ponds shall have sufficient free board to accommodate seasonal precipitation and the design storm specified in Table 4.1 of Title 27. But in no case will the vertical distance between the liquid surface elevation and the lowest part of a pond dike or the invert of an overflow structure be less than two feet.
4. As a part of each regularly scheduled monitoring report [under Article 1, Subchapter 3, Chapter 3 of this division (§20380 et seq.)], the total volume of leachate collected each month since the previous monitoring report.
5. All visible portions of the liners shall be inspected weekly until all free liquid is removed as part of the pond closure. If, during the active life of the ponds the wastes are removed and the impoundment is cleaned down to the liner, an inspection shall be made of the bottom of the liner prior to refilling the impoundment.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. 6-00-101
WDID NO. 6B360009001

REVISED WASTE DISCHARGE REQUIREMENTS
FOR

MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL SITE
NORTH TAILINGS POND (P-16)

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Regional Board) finds:

1. Discharger

Molycorp, Inc. (Molycorp) has submitted the following items to the Regional Board constituting a complete Revised Report of Waste Discharge (RWD).

- a. June 8, 2000 cover letter transmitting a report titled: P-16 Closure Plan (Including Interim Operations), June 2000, prepared by Molycorp and TRC, June (MC, 2000a).
- b. June 21, 2000 cover letter, transmitting a letter report titled: North Tailings Pond (P-16) – Dust Control Plan, prepared by Molycorp (MC, 2000b).
- c. June 26, 2000 cover letter, transmitting a letter report titled: Proposed Interim Measures, P-16 Tailings Pond, prepared by Molycorp. The report described a proposal and included a schedule for implementing the proposal with the goal of capturing all P-16 leakage (MC, 2000c).
- d. July 3, 2000 cover letter, transmitting a letter report titled: Operation of Turbo Misters at P-16, prepared by Molycorp (MC, 2000d).
- e. August 7, 2000 cover letter, transmitting a completed application for a Revised Report of Waste Discharge, prepared by Molycorp.
- f. September 26, 2000 Negative Declaration and Amended Initial Study, prepared by San Bernardino County.
- g. September 5, 2000 and October 4, 2000 cover letters transmitting maps showing property boundary changes.
- h. October 2, 2000 cover letter transmitting design calculations for the Cyclone Pad.

Molycorp (hereinafter referred to as the "Discharger") is a wholly owned subsidiary of Union Oil Company of California (UNOCAL).

2. Facilities

Molycorp operates an open pit mine with ore processing facilities for the economic extraction of lanthanide elements. The primary mineral containing the lanthanide elements is Bastnaesite. The mine and processing facilities are located on 2,223 acres of land (Mine Site) owned by Molycorp. Molycorp processes the ore at the Mill to produce Bastnaesite concentrate. The Mill includes the Ore Crushing Plant, Ball Mill (Fine Ore Grinding), Flotation Plant and Acid Leach Plant.

The "Facilities" for the collection, transport, storage, treatment, and disposal of waste, which are regulated under this Board Order include the:

- a. Temporary Slurry Storage Sump (P-2) and associated pipelines located adjacent to Flotation Plant;
- b. pH Adjustment Unit inside the Acid Leach Plant;
- c. Mill Slurry Sump;
- d. Mill Slurry Waste Outfall Pipeline (3,300 feet long);
- e. North Tailings Pond (P-16) and associated lined areas and facilities/equipment described in Table 1 of Finding No. 14;
- f. Recovered-Wastewater Storage Tank and Outfall Pipeline (3,300 feet long);
- g. P-16 Primary Ground Water Corrective Action System (P-16 Primary GWCAS)¹;
- h. P-16 Secondary GWCAS (or Eastern Drainage GWCAS)¹; and
- i. P-16 Shallow Leakage Interception System¹.

The primary purpose of P-16 is to dispose of Mill Slurry Waste (tailings solids and wastewater) generated at the Flotation Plant. Mining and processing of lanthanide ore at this mine began in 1950. Since that time, both lined and unlined facilities have received wastes and lanthanide products. Many of these facilities are closed or no longer in use. P-16 was initially designed to be an unlined tailings pond. Discharge to P-16 began in 1967. Waste from P-16 and other unlined facilities have leaked to ground water causing a pollution. The leakage has created ground water plumes that have migrated and merged in some areas, forming Commingled Ground Water Plumes (Commingled Plumes).

3. Order History

a. Waste Discharge Requirements (Board Order No. 6-91-836)

On June 13, 1991, the Regional Board adopted Board Order No. 6-91-836, which prescribed Revised Waste Discharge Requirements (WDRs) for P-16. Board Order No. 6-91-836 no longer regulates P-16, but currently remains in effect to regulate other facilities located at the Mine Site. The other facilities include Product Storage Ponds and the Domestic Wastewater Disposal Pond.

Board Order No. 6-91-836 required Molycorp to implement actions by January 1, 1996 to address the leakage from P-16. Molycorp constructed two systems to address this requirement: the P-16 Primary GWCAS and the Shallow Leakage Interception System.

b. Cleanup and Abatement Order No. 6-98-19 (CAO No. 6-98-19)

The P-16 Primary GWCAS and Shallow Leakage Interception System are not completely effective in achieving their intended purpose. On March 25, 1998, the Regional Board's Executive Officer issued CAO No. 6-98-19 after determining that the discharge was still violating WDRs and causing a pollution. CAO No. 6-98-19 includes time schedules ordering the Discharger to:

¹ The system includes an aboveground storage tank and associated distribution system (pipelines). The storage tank and a portion of the distribution system are located outside the boundary of the P-16.

- i. Abate the leakage of waste from the P-16;
- ii. Complete a Site Investigation to determine the lateral and vertical extent of contaminants in soil and ground water; and
- iii. Implement an acceptable ground water Corrective Action Program.

On April 1, 2000, the Discharger shut down the Mill to stop the discharge of Mill Slurry Waste to P-16 and significantly abate the leakage of waste from P-16 and comply with the requirement described in Finding No. 3.b.i.

c. CAO No. 6-98-19A1

In October 2000, the Regional Board's Executive Officer issued Amended CAO No. 6-98-19A1 allowing the Discharger additional time to comply with the requirements described in Finding No. 3.b.ii and 3.b.iii, above. Amended CAO No. 6-98-19A1 also adds schedules requiring the Discharger to:

- i. Complete the Discharger's proposed improvements to the existing P-16 Primary GWCAS and Shallow Leakage Interception System;
- ii. Implement an acceptable ground water Corrective Action Program for onsite portions of the Commingled Plumes to shorten the cleanup time for the Plumes; and
- iii. Submit to the Regional Board a Final Soil Investigation Report that describes the extent of mine related waste contamination (including P-16 tailings) in soil, and a workplan and schedule for determining whether contaminants in soil are a threat to waters of the State.

4. Reason for Action

The Discharger has filed a Revised RWD describing an Interim Plan for resuming the mining of ore, processing of ore at the Mill, and disposal of tailings generated by the Mill. The Plan proposes that the Discharger resume mining in a manner protective of water quality, while it completes permitting and construction for a long-term tailings disposal facility. As part of the Interim Plan, a portion of the existing P-16 will be lined and used for disposal of Mill Slurry Waste generated at the Mill. The Discharger will process ore at the Mill and discharge Mill Slurry Waste to P-16 during two 150-day periods, with the second period ending by November 1, 2002.

The Discharger's Revised RWD includes a Preliminary Closure and Post-Closure Maintenance Plan (CPCMP) and schedule for closure of P-16. The Discharger's schedule for closure of P-16 is included in a Provision of this Order. The Provision requires the Discharger to complete closure of P-16 by October 1, 2004.

5. Location of Facilities

The facilities listed in Finding No. 2 are located on the Discharger's 2,223-acre Mine Site, with exception of the Farmer's Wash Ground Water Extraction Subsystem, which is part of the P-16 Secondary GWCAS. The Mine Site is located along Interstate 15 in the Community of Mountain Pass. The Mine Site straddles the boundary between the Ivanpah

and Amargosa Hydrologic Units within Sections 11, 12, 13, 14 and 15, T16N, R13E and Sections 30 and 31, T16N, R14E, SBB&M as shown on Attachment A and B. The facilities described in Finding No. 2 are located in the Ivanpah Hydrologic Unit. The Farmer's Wash Ground Water Extraction Subsystem is located in Section 32, T16N, R14E on land owned by the US Government and administered by the US Department of the Interior, BLM.

6. Climatology

The climate at Mountain Pass is arid to semi-arid with rainfall varying from three to 10 inches per year. The mean annual precipitation at the mine site is 7.89 inches per year. Most precipitation occurs during the winter months. Daytime temperatures during the summer frequently exceed 100°F and may fall to less than 10°F at night during the winter. Estimated pan evaporation is 115 inches per year.

7. Site Geology

P-16 is located at the north edge of the Mine Site in a small canyon that slopes in a southeasterly direction. The surface geology of the Mine Site includes older alluvium (debris flow) and outcropping bedrock in the topographically higher areas and recent alluvial deposits and low terrace alluvium in the wash areas. The wash deposits consist of moderately to well-sorted pebbles and cobbles within a fine to medium sand matrix, and range from a few feet to about 30 feet in thickness. These deposits are the most permeable at the site, exhibiting hydraulic conductivities of around 1×10^{-2} centimeters/second (cm/sec).

Bedrock in the area consists of Pre-Cambrian metamorphic and intrusive rocks. The older metamorphic rocks consist primarily of granitic gneiss. The main igneous body at the mine site, which has intruded the older metamorphic complex, consists of shonkinite-syenite stock and associated carbonatites. Ground water permeability within the bedrock is fracture controlled. Hydraulic conductivities in fractured zones range up to 6×10^{-3} cm/sec, while those in less fractured zones are estimated to be around 1.5×10^{-5} cm/sec (GSi/Water, 1991). P-16 is located over fractured bedrock. Portions of P-16 are also located over recent alluvial deposits (channel deposits) discussed above. These channel deposits overlie the fractured bedrock.

P-16 is located upgradient of older (Tertiary-age) alluvium (also referred to as older alluvium and debris flows). These deposits are comprised of poorly sorted pebble to boulder-sized clasts in a finer-grained matrix. In some areas, these deposits extend to great depth (i.e., on the order of hundreds of feet) and probably represent debris flows that have infilled deep channels in the bedrock. These deposits are less permeable than the shallow alluvium, exhibiting hydraulic conductivities of around 1×10^{-5} cm/sec (Environmental Solutions, Inc., October 1994).

8. Surface Hydrology and Hydrogeology

P-16 is located within the northeastern portion of the Mine Site in the Ivanpah Hydrologic Unit. Farmer's Wash, which is located east of P-16, is also located in this portion of the Mine Site. The eastern portion of the Mine Site (including Farmer's Wash) is tributary to Wheaton Wash, which is tributary to Ivanpah Dry Lakebed. Ivanpah Dry Lakebed is located eight miles downgradient of the Mine Site. Wheaton Wash and Ivanpah Dry

Lakebed appear on the U.S. Geological Survey (USGS) 15-Minute Quadrangle(s) for the area. Surface waters in the area include ephemeral surface water present during and following storm events. Other surface waters include springs located in the Ivanpah Hydrologic Unit, primarily in Farmer's Wash and Wheaton Wash. One of the springs (Roseberry Spring) appears on the USGS 15-Minute Quadrangle published in 1912. It does not however appear on more recent quadrangle maps. Roseberry Spring is an ephemeral spring located in Wheaton Wash within Section 31, T16N, R14E, SBB&M on federal land administered by BLM. The other springs located on or downgradient of the Mine Site are typically ephemeral and may only be present for short periods either during or following wet weather. These springs do not appear on USGS quadrangle maps.

Ground water at the Mine Site generally flows toward the south and then splits into an east and west component along a north-south-trending ground water divide. Both the eastern and western ground water flow directions follow the topographic drainages down Wheaton Wash and the Western Drainage, respectively. The total dissolved solids concentration in ground water from Monitoring Well 93-1MW, which is located upgradient and not influenced by leakage from P-16, averages 380 milligrams/liter. Radiological constituents, metals and minerals are present in the ground water at low concentrations.

Depth to ground water on or downgradient of MolyCorp's Mine Site varies depending on the topography and other factors. The depth to ground water ranges from zero feet (at springs/wastewater seeps) to approximately 100 feet. The Discharger estimates the depth to the ground water table at P-16 was about 70 feet before construction of P-16 in 1967. Percolating wastewater has caused the water table to rise and created a ground water mound. The mound extends up into the tailings solids in P-16. Because of the mound, the direction of ground water flow under ranges from a southwesterly to a southeasterly direction. Extraction wells that are part of the ground water Corrective Action Program have created local "cones of depression" in the ground water table. The capture zone created by dewatering of the open pit mine intercepts flow under P-16 that drains to the southwest. Capture zones created by Extraction Wells 95-1RW and 98-1RW intercept a portion of the remaining flow to the south and southeast. Flow that is not intercepted ultimately drains to Wheaton Wash and then eastward into the Ivanpah Valley Basin. Ground water migration velocities are highly variable due to the varying hydraulic conductivities and localized fracturing.

9. Faulting and Seismicity

The California Division of Safety of Dams (DSD) regulates certain operation and design aspects of the P-16 to ensure adequate structural stability of the P-16 embankment. The Mine Site area is not within an active earthquake fault zone as defined by the Alquist-Priolo statute. The Clark Mountain Fault is the most prominent fault in the area and trends northwesterly for approximately 20 miles along the western flank of the Clark Mountain Range. This fault is considered inactive based on its age and lack of geologic evidence of recent movement.

A search of the National Earthquake Information Center reveals that most earthquakes greater than a magnitude of 4.0 are more than 100 km away. The largest earthquake within a 100-km radius was an estimated magnitude of 6.1 in 1916 approximately 45 km west of site. The strongest historic earthquake in the northeastern Mojave Desert was the magnitude of 7.1 (Hector Mine Earthquake) located approximately 120-km west of Mountain Pass which occurred on October 16, 1999. A magnitude of 6.2 event on the Mannix Fault occurred in 1947 about 110-km west of the mine site.

The Pahrump-Stateline fault located about 18 km east of the mine is the controlling fault for calculating the maximum credible earthquake (MCE) for the site. The fault is thought to have been last active in the Pleistocene (700,000 – 1,600,000 years ago) and is, therefore considered potentially active.

10. Land Uses

Lands located adjacent to the Mine Site include public lands managed by the BLM and by the National Park Service. The Mojave National Preserve lands, which are administered by the National Park Service, are located south of Interstate 15 and north and west of the Mountain Pass property. A public elementary school is located within the Mine Site boundary on a separate parcel of land owned by the Baker Unified School District. California Department of Transportation (Caltrans) highway maintenance station and California Highway Patrol (CHP) residences are located adjacent to the Mine Site. There are also several parcels of privately owned land, some with residences, located in the general area.

11. Description of Mill

The Mill processes mined ore to generate leached and unleached Bastnaesite concentrate. Approximately 90% of the Mill feed is ore (fresh ore). The remaining 10% is dewatered tailings excavated from P-16. The sources for makeup water for the Mill are: freshwater (47 gallons per minute (gpm)), steam (94 gpm), Recovered Wastewater (137 gpm) and Recovered Product Storage Unit (PSU) Water (< 10 gpm). WDRs established in a separate Board Order regulate the PSUs and associated pipelines located between the PSUs and the Mill.

The Flotation Plant produces unleached Bastnaesite concentrate. Chemicals introduced into the Flotation Plant at various points consist of: sodium silica fluoride, calcium ligninsulfonate, and soda ash (sodium carbonate). The Discharger processes unleached concentrate at the Acid Leach Plant by acid leaching, dewatering and drying. These processes produce a leached Bastnaesite concentrate. Chemicals introduced into the Acid Leach Plant at various points consist of: hydrochloric acid, soda ash and liquid cationic flocculent. Soda ash is used to neutralize the wastewater prior to transport by pipeline to the Mill Slurry Sump. Mill Slurry Waste is comprised of the Flotation and Acid Leach Plant waste streams. The ratio of waste stream flowrates for the Flotation Plant and Acid Leach Plant is approximately seven to one (7:1), respectively.

The Discharger proposes to transport Mill Slurry Waste through the existing 3,300-foot Mill Slurry Waste Outfall Pipeline to P-16 for disposal. The Discharger will recover wastewater from P-16 and transport it by the Recovered-Wastewater Outfall Pipeline to the Mill for reuse. In order to control dissolved solids buildup in the Recovered Wastewater, the

Discharger is proposing to treat and dispose of approximately 16 gpm of Recovered Wastewater at separate onsite facilities (Lined Onsite Evaporation Ponds). The Regional Board regulates those facilities under WDRs in a separate Board Order.

Concentrations of constituents in the tailings solids and wastewater fractions of the Mill Slurry Waste are provided in the Attachments E.1, E.2, F.1 and F.2. The maximum net weight of tailings solids added to P-16 each day will be approximately 1,630 tons² (dry-weight basis).

12. Existing North Tailings Pond (P-16)

Construction began for the P-16 in 1967 when a rock starter dam (embankment) was placed across the drainage channel in a small canyon. Over the years, a series of new embankments were added to increase the tailings pond height and capacity for solids disposal. The existing P-16 embankment height (maximum) is 190 feet. The areal extent of P-16 is 80 acres. Twenty (20) acres of the areal extent is the embankment area and 60 acres is the surface of the tailings solids. Ponded wastewater (Wastewater Pool) is typically present at the lowest elevation of the tailings surface.

13. Interim Plan

The Discharger's Interim Plan is a component of a project referred to as the P-16 Expansion Project. The P-16 Expansion Project includes construction to raise the P-16 embankment to provide additional disposal capacity for tailings solids expected to be generated by the Mill over a three-year period. In early 1998, the Discharger completed the construction for raising the embankment. This increased the disposal capacity of P-16 by 980,000 tons (726,000 cubic yards) to a total capacity of approximately 9,600,000 tons (7,110,000 cubic yards) on a dry-weight basis. The Discharger has not used 590,000 tons (437,000 cubic yards) of the total disposal capacity. Under the Interim Plan, the Discharger proposes to dispose of an additional 492,000 tons (364,000 cubic yards) of tailings solids to P-16.

In accordance with in the Interim Plan, the Discharger proposes to line the northern half of the tailings surface in the P-16 before startup of the Mill. The surface area to be lined (P-16 North/Lined Area) is approximately 30 acres. The southern half of the tailings surface (P-16 South/Unlined Area) will remain unlined. The proposed P-16 North/Lined Area will include the Cyclone Pad and Slime Pond located as shown in Attachments C and D. The Discharger's proposed liner system consists of a single 40-mil polyvinyl chloride (PVC) geomembrane placed on top of one-foot (minimum) of tailings.

Before startup of the Mill, the Discharger will mechanically place coarse tailings to form a small compacted embankment at the boundary of the lined and unlined areas. The embankment crest will be located at a height of three feet above the maximum wastewater surface elevation. The embankment will separate the lined and unlined areas and provide a location for anchoring the proposed synthetic liner (See Attachment C). At the northern

² This value excludes the weight of dewatered tailings solids used as Mill Plant feed. Tailings used for Mill Plant feed is excavated from dewatered portions of the P-16 tailings beach and to hauled to the Mill Plant. Fresh ore and dewatered tailings are fed to the Mill Plant at a rate of 2,000 tons per day.

perimeter of P-16, tailings sands will be mechanically placed and compacted against the natural subgrade to provide a minimum thickness of one-foot of compacted tailings. In steep slope areas, mechanical equipment will place coarse tailings to flatten the sideslope to a maximum slope of two horizontal to one vertical (2:1). The Discharger will place the geomembrane once the Wastewater Pool has evaporated, tailings solids have dried/dewatered sufficiently, and mechanical grading is complete.

In the Slime Pond, the Discharger will place a system of plastic drainpipes on top of the liner to dewater tailings (Tailings Dewatering System). The purpose of the drains is to collect wastewater from deposited tailings and expedite the process of tailings dewatering and final closure of P-16. Wastewater collected by the drains will flow by pipeline to the Recovered-Wastewater System. Adequate dewatering of solids must occur before P-16 closure can commence. During and following Mill operation under the proposed Interim Plan, the primary source of P-16 leakage will be settlement and drainage of free water from tailings solids discharged to P-16 prior to April 1, 2000. The Interim Plan will not delay this dewatering process.

Since heavy equipment will be present in the Cyclone Pad area, the Discharger proposes an 18-inch-thick protective layer for the 40-mil PVC liner. The protective layer will consist of a minimum of 12 inches of coarse tailings overlain with a six-inch thick geocell filled with coarse tailings. The six-inch-thick geocell is composed of polyethylene webbing, which is expandable. It will serve as a surface for heavy-equipment operation and as a marker to show that the protective layer is intact. Attachment C lists the elevations of the various facilities that will be used to contain waste during the Interim Plan, including the existing Emergency Spillway and the proposed Internal Spillway.

14. Interim Plan Operations

Table No. 1 describes facilities/equipment the Discharger proposes to operate within the boundary of the P-16 during the Interim Plan. The Mill Slurry Waste transported to P-16 by the 3,300-foot Outfall Pipeline will be processed by a cyclone located on the Cyclone Pad. The cyclone is a cylindrical-shaped device that uses centrifugal force to separate the waste stream into Coarse and Fine Tailings Slurries. The solids in the fine tailings slurry are referred to as slimes. The Discharger will discharge Fine Tailings Slurry directly into the Slime Pond. The Coarse Tailings Slurry will drop from the cyclone, directly downward onto the Cyclone Pad. A cone-shaped mound of coarse tailings will form on the Pad. Wastewater that drains from the mound will flow into the Slime Pond.

Table 1
North Tailings Pond (P-16) Facilities/Equipment

Location on P-16	Sub-Location on P-16	Facilities/Equipment
North/Lined Area	Cyclone Pad	Cyclone and associated piping
"	"	Tractor with bulldozer blade
"	Slime Pond	Tailings Dewatering System, Barge Pumps in the Wastewater Pool, and associated piping
South/Unlined Area	Tailings Beach	Tractor with bulldozer blade
"	"	Spray irrigators and 10,000 to 15,000-gallon tank truck with water bar for control of windblown tailings
North/Lined or South/Unlined Areas	"	Portions of the Wastewater Evaporation System (Mechanical evaporators and the associated distribution system.)

The Discharger proposes to operate the Slime Pond by discharging the fine tailings slurry at the north end of the pond. Deposition of solids from the slurry forms a sloped tailings beach. Coarser tailings particles drop out of the slurry before finer particles. Tailings wastewater will be allowed to collect at the lowest end (east end) of the Slime Pond forming a Wastewater Pool.

The Discharger will recover wastewater from the Slime Pond through the previously - mentioned Tailings Dewatering System and barge pumps that will float in the Wastewater Pool. Recovered-Wastewater will be piped to the Recovered-Wastewater Storage Tank located adjacent to P-16. From this location, pipelines will transport the Recovered-Wastewater to authorized disposal/reuse sites as described in Table 2.

15. Description of the Waste Streams

The following table lists waste streams and authorized disposal/reuse sites.

Table 2
Existing and Proposed Waste Streams and Authorized Disposal/Reuse Sites

Waste	Source	Source (Additional Description)	GPM ³ Average	Authorized Disposal/Reuse Sites
Mill Slurry Waste	Mill	Operation of Mill (proposed)	560	Disposal to P-16 North/Lined Area (proposed)
Recovered Wastewater	P-16 Shallow Leakage Intercept System	Infiltration Trenches 1, 2 and 3; and Infiltration Trench 4 or RW-8 (existing)	33	<ul style="list-style-type: none"> o Control of windblown tailings on P-16 South/Unlined Area (existing), o Mechanical evaporators in P-16 South/Unlined Area or North/Lined Area (existing), o Reuse in Mill (proposed), or o P-16 North/Lined Area (proposed)
Recovered Wastewater	P-16 North/Lined Area	Tailings Dewatering System & Wastewater Pool Barge Pump (proposed)	250	<ul style="list-style-type: none"> o Control of windblown tailings on P-16 South/Unlined Area (proposed), o Mechanical evaporators in P-16 South/Unlined Area or North/Lined Area (proposed), o Reuse in Mill (proposed), o P-16 North/Lined Area (proposed), or o Discharge to onsite treatment, disposal and reuse facilities regulated under WDRs in a separate Board Order for the Onsite Evaporation Ponds (proposed)
Extracted Ground Water	Wells	Purge water from sampling of wells (existing)	< 1	<ul style="list-style-type: none"> o Offsite disposal/reuse at a legal location (existing) or o P-16 North/Lined Area (proposed)
Extracted Ground Water	P-16 Primary GWCAS ⁴	Extraction Well 95-1RW and 98-1RW (existing)	40	<ul style="list-style-type: none"> o Control of windblown tailings on P-16 South/Unlined Area (existing), o Mechanical evaporators in P-16 South/Unlined Area or North/Lined Area (existing), o Reuse in Mill (proposed), or o P-16 North/Lined Area (proposed)
Extracted Ground Water	P-16 Primary GWCAS	Pit Well (existing)	150	Regulation is separate from this Board Order
Extracted Ground Water	P-16 Secondary GWCAS	Mexican Well and Farmer's Wash Subsystems (existing)	11	<ul style="list-style-type: none"> o Offsite disposal/reuse at a legal location (existing) or o Reuse in Mill (proposed) o Discharge to onsite treatment, disposal and reuse facilities regulated under WDRs in a separate Board Order for the Onsite Evaporation Ponds (proposed)

³ Average flowrate in gallons per minute (gpm) for the first quarter of 2000 as reported in the Discharger's self-monitoring report dated April 15, 2000. The Mill Slurry Waste flowrate of 560 gpm in Table 2 is only for the wastewater fraction. The Discharger indicates the maximum flowrate for both the wastewater and tailings solids fractions is approximately 1,600 gpm.

⁴ P-16 Primary Ground Water Corrective Action System

16. Characteristics of Waste Streams

Mill Slurry Waste consists of approximately 65% wastewater and 35% suspended tailings solids (by weight). The composition of the tailings solids is similar to the mined ore, which contains Calcite (CaCO_3), Barite (BaSO_4), Celestite (SrSO_4), Strontianite (SrCO_3), Bastnaesite (La, Y, Ce) (CO_3) F, Silica (Si), Galena (PbS), Hematite (Fe_2O_3) and Monazite [(Ce, La, Nd, Th) PO_4]. The lanthanide content of the mineral Bastnaesite consists of 49% cerium and 51% lanthanum. Cerium, lanthanum, neodymium and praseodymium are the most abundant lanthanides in the ore. Other lanthanides are also present, but at much lower concentrations. The natural radioactivity of the ore and tailings solids is primarily due to the radionuclides of the Thorium-234 and Uranium-238 Decay Series. Potassium-40, Lanthanum-138 and Cerium-136 are responsible for a much smaller portion of the natural radioactivity. Attachments E.1, E.2, F.1, and F.2 provide laboratory results for analysis of tailings solids and wastewater.

17. Leakage Interception Systems - North Tailings Pond (P-16)

a. Description of P-16 Shallow Leakage Interception System

In 1994, the Discharger constructed the Shallow Leakage Interception System to intercept the shallow component of the P-16 leakage before it reached ground and surface waters. This component of leakage surfaces along the toe of the P-16 dam. It also flows in shallow, highly permeable geologic material just below the ground surface. Shallow infiltration trenches (Infiltration Trenches 1, 2, 3 and 4 (RW-8)) are used to intercept the leakage. The leakage collected by the trenches is transported by pipeline back to P-16.

b. Description of P-16 Primary Ground Water Corrective Action System (P-16 Primary GWCAS)

In 1994, the Discharger proposed the existing P-16 Primary GWCAS to contain and prevent migration of pollutants after reaching ground water. It includes two ground water extraction wells (Extraction Wells 95-1RW and 98-1RW) located around P-16, and an extraction well located in the open pit mine, which removes ground water underlying the bottom of the pit.

c. Description of P-16 Secondary Ground Water Corrective Action System (P-16 Secondary GWCAS)

The P-16 Secondary GWCAS consists of the following facilities located in Wheaton Wash:

- i. Mexican Well System: A subsurface concrete cut-off wall constructed across the wash in shallow alluvium and six ground water extraction wells (Wells MEX-1A, 1B, 2A, 2B, 3A and 3B) located on the upgradient-side of the wall.

- ii. Farmer's Wash System: A subsurface infiltration trench constructed across shallow alluvium in the wash and two ground water extraction wells (Wells FW-1 and FW-2) located within the trench.

The Mexican Well System is located in the entrance to Wheaton Wash at a site referred to as Mexican Well. The Farmer's Wash System is located further downgradient in Wheaton Wash, approximately 1.0 mile from Mexican Well just downgradient of where Farmer's Wash enters Wheaton Wash.

d. Effectiveness of Systems

To significantly abate the leakage of waste from P-16, the Discharger shut down the Mill on April 1, 2000. This stopped the discharge of Mill wastewater and tailings to P-16. Currently, leakage from P-16 is primarily due to the settlement and drainage of free water from the tailings solids. The Leakage Interception Systems described in Finding No. 17.a, b and c, above, are not completely effective. CAO No. 6-98-19A1 includes a schedule the Discharger is required to meet to improve the effectiveness of the P-16 Secondary GWCAS and Shallow Leakage Interception System.

18. Description of the Temporary Slurry Storage Sump (P-2)

The lower portion of P-2 is a sump constructed of concrete and divided into three cells. The Discharger uses the sump primarily for temporary storage of slurry from the Flotation Plant. In the event of a power failure or operational upset, the Discharger discharges slurry from the tailings pipeline, flotation tanks and thickeners to P-2. This is to prevent the solids in the slurry from settling in the equipment causing significant down time. Flotation Plant waste streams that flow to P-2 consist of slurry overflows or spills, pump seal gland water, water from storm events and streams from wash down of floors, flotation tanks and thickener tanks. The characteristics of the slurry and waste streams are similar to the Mill Slurry Waste discharged to P-16.

Once the Mill Slurry Waste flows into one or more of the P-2 sump cells, the solid materials settle from the slurry. The back wall of each cell has a series of ports that may be unplugged allowing water to decant from the cell into a pump sump. The water is then pumped to the Mill Slurry Sump for use as Mill make up water. The solids remaining in the cell are allowed to dry and are then removed from the cell with a front-end loader and transported by truck to the P-16.

To increase the volumetric capacity of P-2, the Discharger has paved the ground surface surrounding the sump with asphalt. The paved surface slopes toward the pump sump used to transport water to the Mill Slurry Sump. The Discharger periodically empties P-2 and inspects the concrete liner surfaces for problem areas where excessive leakage could occur (cracks, deterioration of damage). The Discharger either replaces or repairs the concrete in problem areas.

19. Description of Wastewater Evaporation System and Controls for Windblown Tailings

The Discharger is currently using a Wastewater Evaporation System, which includes several mechanical evaporators. The purpose of the System is to increase wastewater evaporative capacity and assist in control of windblown tailings. For additional control of windblown tailings, the Discharger also applies wastewater to the tailings surface in the P-16 South/Unlined Area by spray irrigators and a tank truck with a water bar. In July 1999, the Discharger began reporting to the Regional Board the quantity of wastewater applied by tank truck and spray irrigators. Since that time, the Discharger has applied a maximum of 39,000 gallons per day (27.1 gpm) for this purpose. The need for application varies as a function of weather and exposed tailings surface.

Since 1967, wind has transported tailings solids from P-16 to adjacent areas within the Mine Site. The Discharger estimates that approximately 50,000 cubic yards of windblown tailings from P-16 are present within the Mine Site in the drainage area (Farmer's Wash) located east of P-16. Results of investigation indicate that ephemeral surface water flow in Farmer's Wash has transported windblown tailings within the Mine Site. The amount and areal extent of any discharged tailings offsite is unknown. CAO No. 6-98-19A1 includes a schedule requiring the Discharger to address tailings deposited outside of P-16.

The capacity of each mechanical evaporator is 66 gallons per minute (gpm). Use of the evaporators will continue throughout the Interim Plan. In addition to the evaporators, the Wastewater Evaporation System includes the Recovered-Wastewater Storage Tank, two pumps (including a pressure-release recycle valve), and a pipeline system with automatic valves. Each evaporator discharges a stream of wastewater mist into the surrounding air. The evaporators discharge the mist from adjustable nozzles. The Discharger can manually rotate the nozzle in a horizontal plane (360-degrees) or vertical plane (approximately 90-degrees). In the vertical plane, the rotation ability ranges from a 45-degree angle (pointing into the surrounding air) down to a 45-degree angle (pointing at the tailings surface). The Discharger inspects the system every two hours.

The Discharger proposes controls to prevent overspray and deep percolation. Overspray is defined as the discharge of airborne waste outside the boundary of the authorized disposal/reuse sites located on P-16. Deep percolation pertains to the P-16 South/Unlined Area and is defined as excessive application of wastewater that causes percolation to depths that result in a discharge or threatened discharge of applied wastewater to underlying ground wastewater. Discharge Specifications contained in these WDRs specify that the activities on P-16 shall not result in overspray or deep percolation.

To assist in control of overspray and deep percolation, the Discharger proposes proper evaporator positioning on the tailings surface, evaporator shutdown and/or evaporator nozzle adjustment. The mechanical evaporators are equipped with a wind-speed measurement device, which will shutdown operations automatically if the wind speed is greater than 20 miles per hour (mph). The Discharger, however, has not submitted information to justify that shutdown at 20 mph will prevent overspray of dry particulate matter. The attached Monitoring and Reporting Program requires that the Discharger submit to the Regional Board Office an Overspray Monitoring Plan and Workplan. The Overspray Monitoring Plan is to include a plan for monitoring for overspray of dry particulate from the evaporators and

a schedule for implementing the plan. The Workplan is for conducting an investigation to determine evaporator operating procedures and restrictions needed to prevent such overspray. The Workplan is to include a proposed schedule for completing the investigation and a proposed date for submitting an Investigation Report to the Regional Board Victorville Office. The Investigation Report is to include the results and conclusions of the investigation and the Discharger's recommendations for presenting overspray of dry particulate matter.

20. Storm/Flood Protection

During the Interim Plan for operation, storm runoff management around and outside of P-16 will remain unchanged from current practices.

The proposed Slime Pond is designed to contain a 100-year, 24-hour design storm (approximately 3.6 inches of precipitation). The estimated run-on volume from the upgradient watershed (175-acre watershed) is 11.7 acre-feet. The run-on would cause the Wastewater Pool surface elevation to rise approximately 0.4 feet at the maximum pool operating elevation. This volume would spread over the Slime Pond Area and would be contained below the invert of both the proposed Internal Spillway and the existing Emergency Spillway shown in Attachment C.

The Discharger is proposing to construct the Internal Spillway. To adequately address the Probable Maximum Flood (PMF) associated with the Probable Maximum Precipitation (PMP). Internal Spillway is located on the berm separating the P-16 North/Lined Area and South/Unlined Area. The Discharger estimates the PMP to be 8.5 inches. In the event of a PMF, the entire P-16 footprint would be used to contain the floodwater. The Internal Spillway would allow flood flows into the P-16 South/Unlined Area.

These WDRs specify minimum freeboards of two-feet for the Emergency Spillway and P-16 North/Lined Area, and one-foot for the proposed Internal Spillway. Design calculations show a one-foot freeboard is required at the Internal Spillway to properly manage a PMF (i.e., allow sufficient overflow to the P-16 South/Unlined Area during a PMF). Calculations indicate the maximum expected wind speed will not create waves in the Wastewater Pool in excess of one foot. The Discharger proposes a baffle/boom at the surface of the Wastewater Pool, which will further reduce wave size.

21. Authorized Disposal/Reuse Sites

Table 2 in Finding No. 15 lists the only authorized disposal/reuse sites for disposal or reuse of waste.

22. Waste Classification

In accordance with Section 22480, Title 27, California Code of Regulations (27 CCR §22480), the waste streams listed in the preceding Table 2 are classified Group B Mining Waste. Section 22480 states:

“... mining waste of Group B are either:

(A) mining waste that consist of or contain hazardous wastes, that qualify for a variance under Chapter 11 of Division 4.5, of Title 22... provided that the Regional Board finds that such mining wastes pose a low risk to water quality; or

(B) mining waste that consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives or could cause degradation of waters of the state ...”

The Regional Board has regulated the wastes in Table 2 as a Group B Mining Waste since the Board previously revised WDRs on June 13, 1991. The wastes are a low risk to water quality provided they are properly disposed/reused in accordance with WDRs contained herein.

The California Department of Toxic Substance Control (DTSC) regulates hazardous waste under Division 4.5, Title 22, CCR (Division 4.5). Division 4.5 includes threshold criteria and exemptions used in determining if a waste must be regulated as a hazardous waste. Laboratory analyses indicate the wastes listed in Table 2 are below the threshold criteria in Division 4.5, with the exception of the tailings solids in Mill Slurry Waste. The tailings exceed criteria for the metal lead (See Attachment F.2). The tailings, however, are exempt under an exemption that applies to mining waste generated by beneficiation of ore. Beneficiation of ore is defined to include processing of ore by crushing, grinding, flotation and leaching (22 CCR §66261.4). As discussed in Findings above, these are the processes located at the Discharger's Mill. Moreover, DTSC granted an exemption from the regulation of tailings as hazardous waste under Division 4.5 in a letter dated March 10, 1986. DTSC's position has not changed since that date.

23. Waste Management Unit Classification

The P-16 is an Existing Group B Tailings Pond (Waste Management Unit (WMU)) as defined in Sections 22480 and 22490, Title 27, CCR (Title 27). Title 27 specifies that Existing Mining WMUs comply with siting and construction standards of §22490 as required by the Regional Board. All New Group B Tailings Ponds are required to include the prescribed liner system or an approved engineered alternative system that meets (or exceeds) the performance standard of the prescribed system. The prescribed liner system includes two liners with a leachate collection and removal system (LCRS) located between the liners. Since P-16 is an Existing Group B Tailings Pond, the Regional Board has authority to either require or not require a liner system. If the Regional Board requires a liner system, it also has authority to specify the type of liner system. The required liner system may differ from the prescribed liner system.

The Discharger's Revised RWD shows that providing the prescribed liner system or an engineered alternative is not feasible. Due to the characteristics of the existing tailings surface, the Discharger cannot construct a LCRS that would function properly. There is very little slope to the existing tailings surface. The slope is not great enough to allow flow to occur in the LCRS in the event of any leakage from the upper liner. If leakage did occur, the wastewater would backup in the LCRS making it non-functional. Due to the instability of wet tailings solids, the Discharger is not able to move heavy equipment onto the tailings surface where the liner system must be installed. The Discharger, therefore cannot conduct grading required to increase the slope.

In this case, the prescribed liner system or an approved engineered alternative is not feasible to construct. For the Interim Plan, the Discharger proposes a liner system consisting of a single 40-mil PVC geomembrane placed on top of one-foot (minimum) of tailings. The proposed liner system allows the Discharger to resume mining on short-term basis in a manner protective of water quality. During this period, the Discharger will be able to complete permitting and construction for a long-term tailings disposal facility that will include a prescribed liner system or approved engineered alternative system.

24. Water Quality Protection Standard

The Discharger submitted a Water Quality Monitoring and Response (WQM&R) Plan dated August 1995 to the Regional Board. The Executive Officer has subsequently established additional monitoring requirements through written correspondence to the Discharger. WQM&R Plans propose a Water Quality Protection Standards (WQPSs), which consists of Constituents of Concern (including Monitoring Parameters), Concentration Limits, Monitoring Points, and the Point of Compliance. WQPSs apply over the active life of the tailings pond, closure and post-closure maintenance period, and the compliance period as defined in Title 27 (27 CCR §20410) (Section 20410 Compliance Period). The attached Monitoring and Reporting Program describes the Constituents of Concern, Monitoring Points, and Points of Compliance.

25. Statistical Methods

Title 27 requires statistical analyses of the monitoring data. Statistical analyses of monitoring data are necessary for the earliest possible detection of a statistically significant evidence of a release of waste from P-16. The attached Monitoring and Reporting Program includes a list of acceptable methods for statistical analysis. The Discharger is required to use statistical methods to evaluate progress in stopping leakage and cleaning up ground water. The current Section 20410 Compliance Period (27 CCR §20410) will end once the Discharger has achieved compliance with the WQPSs (i.e., completed cleanup of ground water).

26. Detection Monitoring Program

a. Unsaturated Zone

The Discharger proposes to use piezometers to monitor the:

- i. Progress in dewatering of the unsaturated zone and tailings, and
- ii. Performance of the proposed liner system

Before regulation by these WDRs, P-16 was operated as an unlined tailings pond. Leakage of wastewater from P-16 has created a ground water mound that has caused portions of the formerly unsaturated zone to become saturated. On April 1, 2000, the Discharger stopped the discharge of Mill Slurry Waste to P-16. Beginning on this date, the Wastewater Pool in P-16 began to shrink in size. At the same time, leakage from P-16 and the elevation of the top of the mound should have begun decreasing with time. Because the Wastewater Pool has virtually disappeared, the current leakage is primarily due to the settlement and drainage of free water from the tailings solids. Leakage will continue for a number of years until settlement of tailings solids is complete, free moisture has drained from the tailings and the Discharger has completed final closure of P-16. The Discharger proposes to use piezometers to monitor the performance of the proposed liner system. Provided the liner performance is adequate, the elevation of the ground water mound should continue to decrease with time.

b. Ground Water

The Discharger has installed ground water monitoring wells upgradient and downgradient of the P-16. For Detection Monitoring, the point of compliance is defined as "a vertical surface located at the hydraulically downgradient limit of the WMU that extends through the uppermost aquifer underlying the unit" along which the WQPS applies. The Discharger will use data from ground water monitoring wells and statistical methods to assist in evaluating the performance of the proposed liner system for the P-16 North/Lined Area and controls in the P-16 South/Unlined Area to prevent deep percolation of wastewater applied to that area.

27. Evaluation Monitoring Program

The Discharger has not been able to fully define the extent of the Commingled Plumes. A separate Cleanup and Abatement Order (CAO) includes a schedule that the Discharger is required to meet for defining the extent of the Plumes.

28. Corrective Action Program

The Discharger is required to maintain and operate a Corrective Action Program pursuant to Title 27 (27 CCR § 20385(a)(4)). The Discharger's existing Corrective Action Program includes the P-16 Primary GWCAS and P-16 Secondary GWCAS as described in Finding No. 17. A separate CAO includes schedules that the Discharger is required to meet for making improvements and additions to the existing Corrective Action Program so it will be acceptable to the Regional Board.

29. Closure and Post-Closure Maintenance Plan (CPCMP)

The Discharger's Revised RWD (*MC, 2000a*) includes a Preliminary CPCMP proposing a plan and schedule for closure of P-16. The Discharger's preferred final cover as described in the Preliminary CPCMP consists of a three-foot monolithic soil cover. The total estimated cost for closure is \$2,314,000. The estimated annual post closure maintenance and sampling cost is \$23,600. A Provision in this Order includes a schedule that the Discharger must follow for submitting a Final CPCMP to the Regional Board and completing closure of P-16.

30. All Known and Reasonably Foreseeable Releases

Title 27 (27 CCR §20380(b)) requires that the Discharger obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known and reasonably foreseeable releases from P-16. CAO No. 6-98-19A1 establishes a schedule the Discharger must follow for providing: (a) an estimate of the amount of financial assurance needed and (b) documentation that financial assurance is available in that amount.

31. Financial Assurance for Closure and Post-Closure Maintenance

The Revised RWD includes a copy of a March 31, 1993 Irrevocable Stand-by Letter of Credit for \$3,630,000 (*MC, 2000a*). This amount of financial assurance is sufficient to cover the cost of closing P-16.

32. Receiving Waters

The receiving waters are ground and surface waters of the Ivanpah Hydrologic Unit. The surface waters include springs, and ephemeral surface water present during and following storm events.

33. Lahontan Basin Plan

The Regional Board adopted a Water Quality Control Plan for the Lahontan Basin (Basin Plan), which became effective on March 31, 1995. This Order implements the Basin Plan.

34. Beneficial Uses

The present and potential beneficial uses of the ground waters of the Ivanpah Hydrologic Unit as set forth and defined in the Basin Plan are:

- a. Municipal and Domestic Supply (MUN);
- b. Agricultural Supply (AGR);
- c. Industrial Service Supply (IND); and
- d. Freshwater Replenishment (FRSH).

The present and potential beneficial uses of surface waters of the Ivanpah Hydrologic Unit are set forth and defined in the Basin Plan under Minor Surface Waters. Those beneficial uses include the above beneficial uses and the following beneficial uses:

- e. Water Contact Recreation (REC-1);
- f. Non-contact Water Recreation (REC-2);
- g. Commercial and Sport Fishing (COMM);
- h. Warm Freshwater Habitat (WARM);
- i. Cold Freshwater Habitat (COLD);
- j. Wildlife Habitat (WILD);
- k. Water Quality Enhancement (WQE); and
- l. Flood Peak Attenuation/Flood Water Storage (FLD).

35. California Environmental Quality Act (CEQA)

The Discharger's Interim Plan for operation is a component of the P-16 Expansion Project. On November 20, 1997, the County of San Bernardino (Planning Commission) adopted a Negative Declaration for the P-16 Expansion Project in accordance with the CEQA (Public Resources Code, Section 21000 et seq.). On September 26, 2000, the County of San Bernardino:

- a. Completed an amended Initial Study in response to changes proposed under the Discharger's Interim Plan for operation, and
- b. Re-adopted the November 20, 1997 Negative Declaration.

The September 26, 2000 action was in accordance with Section 15164, Title 14, CCRs (CEQA Guidelines).

36. Notification of Interested Parties

The Regional Board has notified the Discharger and all known interested parties of its intent to adopt Revised WDRs for the discharge.

37. Consideration of Public Comments

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

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

I. DISCHARGE SPECIFICATIONS

A. Effluent Limits and Limits on Surface Impoundment Liquids

1. The discharge into the Mill Slurry Waste Pressurized Outfall Pipeline shall have a pH that is neither less than 4.0 pH units nor more than 10.5 pH units.
2. The pH of the discharge from the Mill Slurry Waste Pressurized Outfall Pipeline and the Wastewater Pool present in the Slime Pond shall not be less than 6.0 pH units nor more than 9.0 pH units.

B. Receiving Water Limitations

The discharge of waste shall not cause the presence of the following substances or conditions in ground or surface waters of the Ivanpah Hydrologic Unit:

1. Any perceptible color, odor, taste, or foaming;
2. Any presence of toxic substances in concentrations that individually, collectively, or cumulatively cause detrimental physiological response in humans, plants, animals, or aquatic life; and
3. The presence of constituents of concern in concentrations that exceed background levels.

C. Requirements and Prohibitions

1. General

- a. The discharge of waste except to the authorized disposal/reuse sites is prohibited.
- b. There shall be no discharge, bypass, or diversion of waste from the collection, transport, storage, treatment or disposal facilities to adjacent land areas or surface waters. Surface flow or visible discharge of wastewater to adjacent land areas or surface waters is prohibited.
- c. The discharge of waste to the authorized disposal/reuse sites shall be limited to those wastes described in Finding No. 15.
- d. All facilities used for the collection, transport, storage, treatment or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage, or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

- e. The Discharger shall not cause a pollution, or threatened pollution, as defined in Section 13050 of the California Water Code.
 - f. Neither the treatment nor the discharge shall cause a nuisance as defined in Section 13050 of the California Water Code.
 - g. The vertical distance between the liquid surface elevation and the lowest part of the embankment for the P-16 North/Lined Area (or the invert of the Emergency Spillway) shall not be less than two feet). The vertical distance between the liquid surface elevation in the P-16 North/Lined Area and the lowest part of the invert of Internal Spillway shall not be less than one foot.
 - h. The Discharger shall operate all facilities used for collection, transport, storage, treatment or disposal of waste as effectively as possible to comply with the WDRs.
2. North/Lined Area of the North Tailings Pond (P-16 North/Lined Area)
The P-16 North/Lined Area (Cyclone Pad and Slime Pond) shall be effectively sealed⁵ to prevent the exfiltration of liquids.
 3. South/Unlined Area of the North Tailings Pond (P-16 South/Unlined Area)
The amount of wastewater/freshwater applied to the tailings surface shall not result in deep percolation or exceed the amount needed to prevent windblown tailings.
 4. P-16 North/Lined Area and South/Unlined Area
The Discharger shall operate the mechanical evaporators and apply wastewater for control of windblown tailings in a manner that does not result in overspray (the discharge of airborne waste outside the P-16 North/Lined Area and South/Unlined Area).

II. WATER QUALITY MONITORING AND RESPONSE PROGRAMS

A. Detection Monitoring Program

The Discharger shall maintain a Detection Monitoring Program for the authorized disposal/reuse sites as required in Section 20385(a)(1) of Title 27. If there is evidence of a release from the authorized disposal/reuse sites, the Discharger shall immediately notify the Regional Board in accordance with the notification procedures in Item 2.a of the attached "Standard Provisions for Waste Discharge Requirements." Evidence of a release includes both statistical and nonstatistical (physical) evidence of a release as specified, below, in Discharge Specifications II.D, II.E, and II.F, below.

⁵ For this project, "effectively sealed" is a liner system that consists of a single 40-mil polyvinyl chloride (PVC) geomembrane underlain by a minimum of one-foot of tailings solids.

B. Evaluation Monitoring Program

The Discharger shall perform an Evaluation Monitoring Program whenever there is statistically significant evidence of a release from the authorized disposal/reuse sites as required in Section 20385(a)(2) or (3) of Title 27.

C. Corrective Action Program

The Discharger shall maintain a Corrective Action Program when required pursuant to Section 20385(a)(4) of Title 27.

D. Water Quality Protection Standard

1. The Discharger shall propose to the Regional Board any constituents of concern not included in the list and proposed for discharge to the authorized disposal/reuse sites at least 180 days before discharge of any new constituents of concern. Before a new discharge commences, the Discharger shall estimate the concentration for such constituents within the wastewater stream and submit written statistical method(s) in order to detect a release of such constituents.
2. At any given time, the concentration limit for each monitoring parameter constituent of concern shall be equal to the background value of that constituent.
3. If the Discharger or Executive Officer determines that concentration limits were or are exceeded, the Discharger shall complete actions described in Discharge Specification G.1, below.

E. Statistical Methods

1. The Discharger shall use approved statistical data analysis methods to evaluate Point of Compliance data in order to determine "measurably significant" (as defined in §20164 of Title 27) evidence of a release from the authorized disposal/reuse sites.
2. Allowable statistical methods include: Parametric Analysis of Variance (ANOVA), Nonparametric ANOVA, Tolerance Interval, Control Chart, or other statistical method approved by the Regional Board.
3. The Discharger shall determine, within 60 days after completion of sampling, whether there is statistically significant evidence of a release from the authorized disposal/reuse sites at each Monitoring Point. The analysis shall consider all monitoring parameters and constituents of concern. The Executive Officer may make an independent finding that there is statistically significant evidence of a release or physical evidence of a release.

F. Nonstatistical Methods

The Discharger shall determine whether there is significant physical evidence of a release from the authorized disposal/reuse sites. Significant physical evidence may include, but is not limited to:

1. Unexplained volumetric changes in the Wastewater Pool located within the P-16 North/Lined Area, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to P-16, or
2. Any other change in the environment that could be reasonably expected to be the result of a release from the authorized disposal/reuse sites.

G. Verification Procedures

1. The Discharger may immediately initiate verification procedures as specified below whenever there is a determination by the Discharger or Executive Officer that there is evidence of a release. The Discharger is required to submit to the Regional Board, within 90 days of such determination:
 - a. An Amended RWD proposing an Evaluation Monitoring Program (see subsection II.B, above entitled "Evaluation Monitoring Program"), or
 - b. A technical report to demonstrate there is a source other than the authorized disposal/reuse sites that caused evidence of a release (See Section II.H. titled Technical Report without Verification Procedures. When the Discharger declines the opportunity to conduct verification procedures, there is considered to be evidence of a release from the authorized disposal/reuse sites unless the Discharger has submitted the technical report and the report demonstrates to the Regional Board there is a source other than the authorized disposal/reuse sites.)
2. The verification procedure shall only be performed for the constituent(s) that has shown a statistically significant evidence of a release, and shall be performed for those Monitoring Points at which a release is indicated.
3. If a determination is made that there is evidence of a release using the Prediction or Tolerance Interval Method, the Discharger may, within 30 days of such determination, update the Upper Tolerance Limit and reevaluate Point of Compliance data in order to verify evidence of a release from the authorized disposal/reuse sites. The Discharger must also collect three additional samples from the affected Monitoring Points and compare the results to the updated Upper Tolerance Limit.

4. The Discharger shall either conduct a composite retest using data from the initial sampling event with all data obtained from the resampling event or shall conduct a discrete retest in which only data obtained from the resampling event shall be analyzed to verify evidence of a release.
5. The Discharger shall report to the Regional Board by certified mail the results of the verification procedure, as well as all concentration data collected for use in the retest within seven days of the last laboratory analysis.

H. Technical Report without Verification Procedures

If the Discharger chooses to not initiate verification procedures after there has been a determination made for evidence of a release, a technical report shall be submitted pursuant to Section 13267(b) of the California Water Code. The report shall demonstrate to the Regional Board whether there is a source other than the authorized disposal/reuse sites that caused the evidence of a release.

III. PROVISIONS

A. Standard Provisions

The Discharger shall comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, which is attached and is made a part of this Order.

B. Monitoring and Reporting

1. Pursuant to California Water Code Section 13267(b), the Discharger shall comply with Monitoring and Reporting Program No. 00-101.
2. The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of the Monitoring and Reporting Program.

C. CPCMP

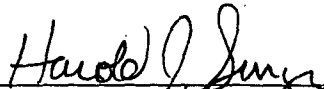
The Discharger shall update the Preliminary CPCMP if there is a substantial change in operations or costs for closure, and submit a report annually describing any updates to the Preliminary CPCMP and the status of conformance with the CPCMP.

D. Time Schedule

The Discharger shall complete closure of North Tailings Pond (P-16) and comply with applicable closure requirements of Title 27 in accordance with the following schedule:

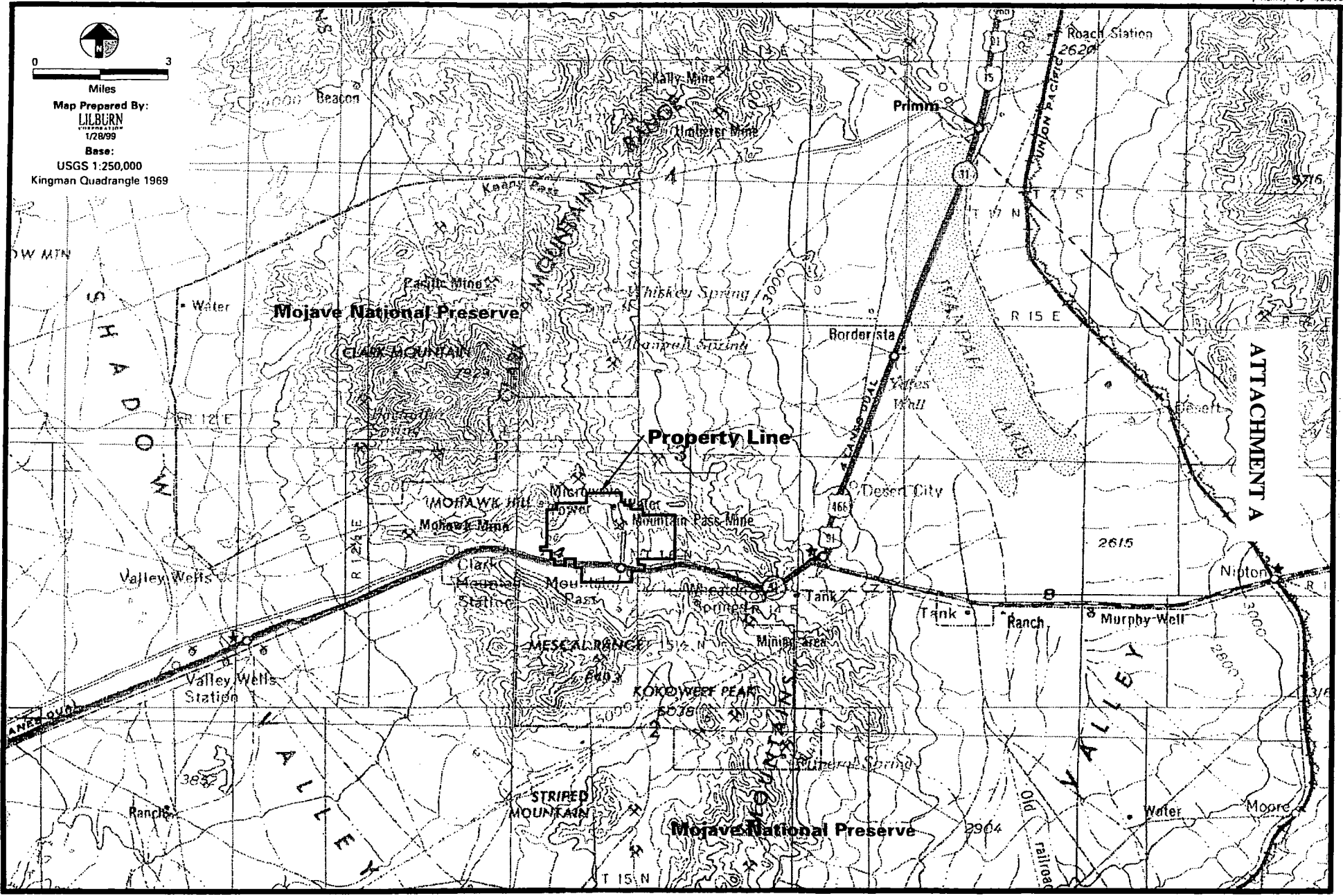
- a. By **November 6, 2002**, begin dewatering of any remaining ponded liquids in P-16 (Any removed liquids shall be discharged only to authorized disposal/reuse sites.)
- b. By **June 10, 2003**, submit to the Regional Board a **Revised Report of Waste Discharge** for closure of P-16. The Revised RWD shall include a **Final Closure and Post-Closure Maintenance Plan** (Final CPCMP) complying with Title 27 (27 CCR §21400). The Final CPCMP shall be prepared by or under the supervision of either a California Registered Civil Engineer or Certified Engineering Geologist.
- c. By **January 1, 2004**, begin construction for closure of P-16.
- d. By **October 1, 2004**, complete construction for closure of P-16.

I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by California Regional Water Quality Control Board, Lahontan Region, on November 16, 2000.



HAROLD J. SINGER
EXECUTIVE OFFICER

- Attachments:
- | | |
|-------------|---|
| A. | Location Map |
| B. | Mine Site Map |
| C. | North Tailings Pond (P-16) Plan-View Map |
| D. | North Tailings Pond (P-16) Cross-Section Map |
| E.1 and E.2 | Concentrations in Mill Slurry Waste (Wastewater) |
| F.1 and F.2 | Concentrations in Mill Slurry Waste (Tailings Solids) |
| G. | Standard Provisions for Waste Discharge Requirements |



ATTACHMENT A

Project Site Location Map

Mountain Pass Mine
San Bernardino County, California



ATTACHMENT B
Mine Site Map
(Conceptual)

Boundary of Commingled
Ground Water Plumes

North Tailings
Pond (P-16)

Mine Site Property
Boundary



Scale (Approx)
1" = 2,000 ft

Interstate 15

Western
Drainage

Wheaton
Wash

Legend



Ground Water Flow Direction



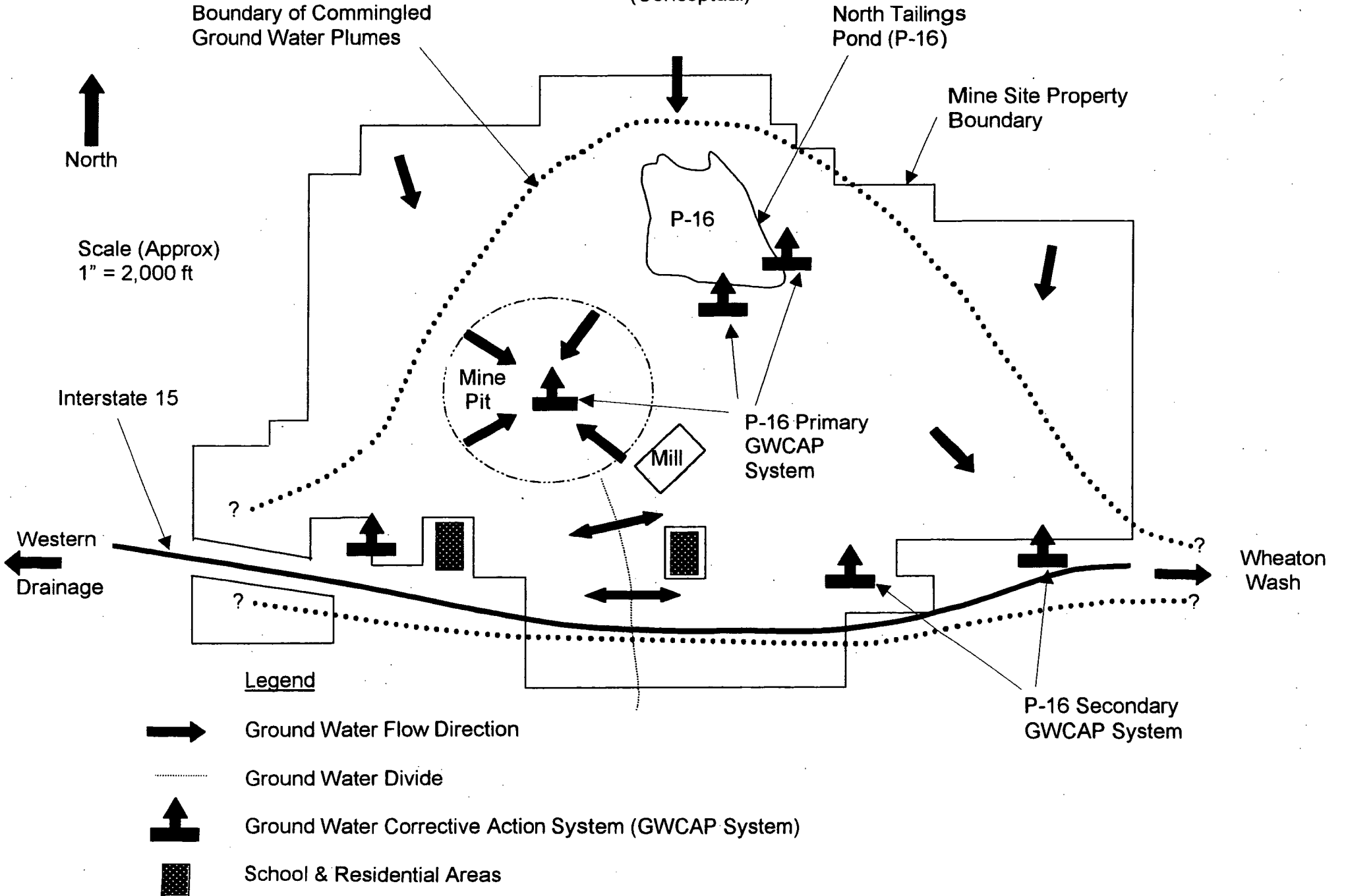
Ground Water Divide



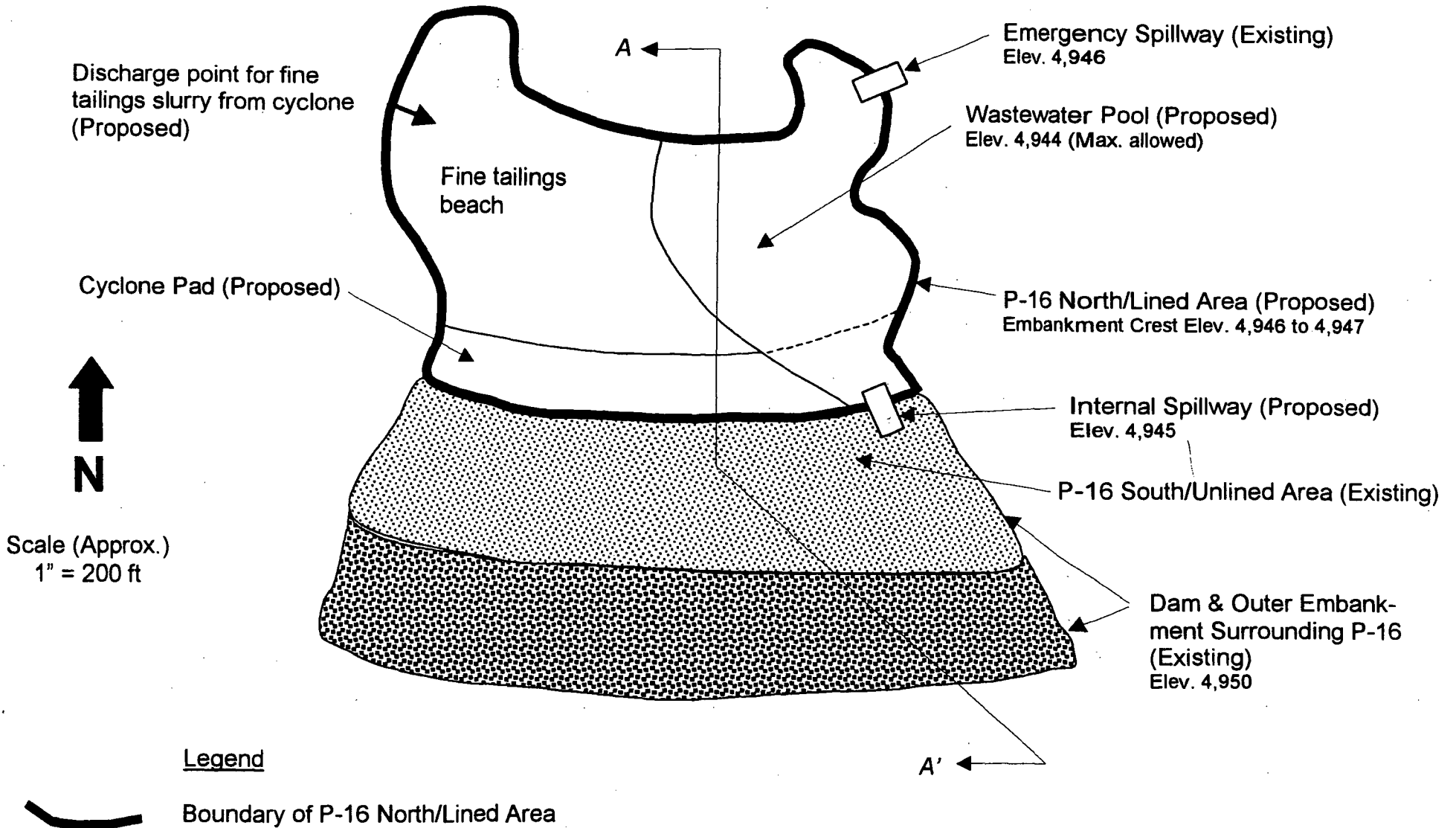
Ground Water Corrective Action System (GWCAP System)



School & Residential Areas



ATTACHMENT C
North Tailings Pond (P-16)
Plan View Map
(Conceptual)



Discharge point for fine tailings slurry from cyclone (Proposed)

Fine tailings beach

Cyclone Pad (Proposed)



Scale (Approx.)
1" = 200 ft

A

Emergency Spillway (Existing)
Elev. 4,946

Wastewater Pool (Proposed)
Elev. 4,944 (Max. allowed)

P-16 North/Lined Area (Proposed)
Embankment Crest Elev. 4,946 to 4,947

Internal Spillway (Proposed)
Elev. 4,945

P-16 South/Ulined Area (Existing)

Dam & Outer Embankment Surrounding P-16 (Existing)
Elev. 4,950

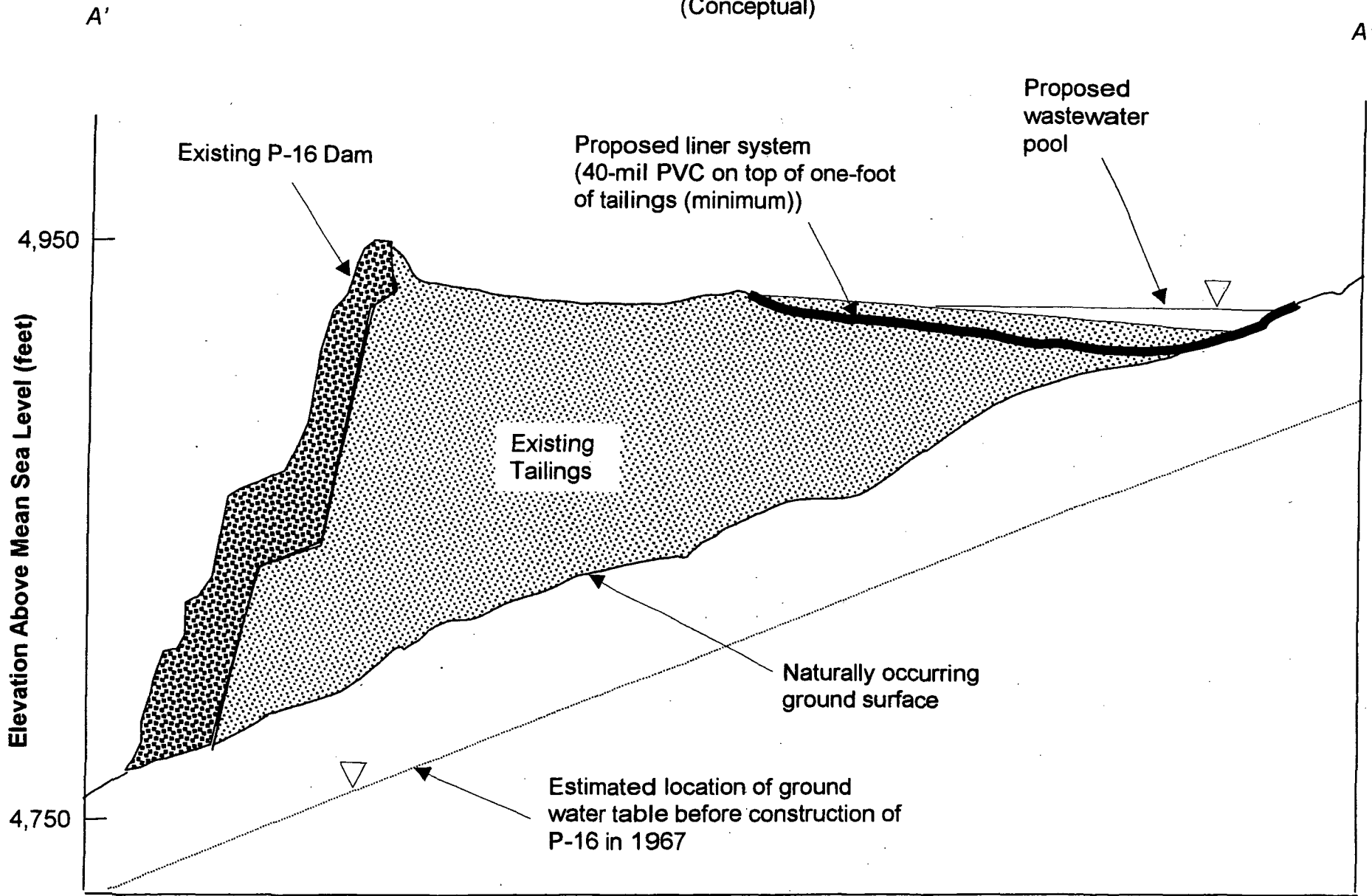
Legend



Boundary of P-16 North/Lined Area

A'

ATTACHMENT D
North Tailings Pond (P-16)
Cross-Section Map
Section A' to A Looking West
(Conceptual)



Horizontal Scale (Approx) 1" = 200 ft

Attachment E.1
Laboratory Results for
Mill Slurry Waste (Wastewater)

CONSTITUENT	CONCENTRATIONS (mg/L)		
	MINIMUM	AVERAGE	MAXIMUM
TDS	7800	11887	17000
pH	5.4	8.0	8.4
Chloride	2600	5160	8600
Carbonate	<25	<25	<25
Calcium	67	598	1240
Cerium	0.024	0.935	1.7
Strontium	1.5	435	1600
Sulfate	83	460	1000
Nitrate	<1	3.79	17
Silica	16	18	20
Barium	0.068	1.1	4.7
Fluoride	35	66.8	110
Lead	0.011	0.85	3.49
Iron	0.56	1.23	3
Boron	3	12	34
Magnesium	<50	114.7	230
Manganese	2.9	5.6	8
Potassium	43	118	300
Sodium	2000	2923	3800
Antimony	0.01	0.025	0.04
Arsenic	0.014	0.03	0.041
Beryllium	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005
Chromium	<0.01	0.0105	0.011
Cobalt	0.01	0.016	0.031
Copper	0.028	0.034	0.048
Lanthanum	0.011	0.48	1.3
Mercury	<0.0002	0.00067	0.0017
Molybdenum	0.84	1.47	2.1
Nickel	<0.04	0.059	0.092
Selenium	0.008	0.008	0.008
Silver	<0.005	<0.005	<0.005
Thallium	<0.002	0.017	0.033
Vanadium	<0.005	0.017	0.025
Yttrium	<0.01	<0.01	<0.01
Zinc	0.017	0.022	0.027

NA = Not Analyzed Note: all constituent units are in mg/L except pH.

From Table 2.2 of report titled: P-16 Closure Plan (Including Interim Operations), 2000,
 Prepared by Molycorp and TRC, June.

**Attachment E.2
Laboratory Results for
Concentrations in Mill Slurry Waste (Wastewater)**

CONSTITUENT	CONCENTRATIONS (pci/L)		
	MINIMUM	AVERAGE	MAXIMUM
Radium 226	0	0.3	0.6
Radium 228	0	1.15	2.3
Total Radium	0	1.45	2.9
Thorium 228	0	0.075	0.15
Thorium 230	0.1	0.3	0.5
Thorium 232	0	0	0
Total Thorium	0.1	0.375	0.65
Uranium 234	40	90	192
Uranium 235	2.7	4.1	8.85
Uranium 238	33	67.3	141
Total Uranium	6.0	71.4	149.85
Gross Alpha	41.4	369	531
Gross Beta	21.3	269	445

(M)-137/P-16 (6/8/00) (cm)

NA = Not Analyzed

From Table 2.2 of report titled: P-16 Closure Plan (Including Interim Operations), 2000,
Prepared by Molycorp and TRC, June.

Attachment F.1
Laboratory Results for
Concentrations in Mill Slurry Waste (Tailings Solids)

CONSTITUENT/ PARAMETER	UNITS	TAILINGS SOLIDS SAMPLES			
		1983 ⁽¹⁾ Analysis	1991 to 1994 ⁽²⁾ Analyses	1995 ⁽³⁾ Analysis	1996 ⁽³⁾ Analysis
Antimony	mg/kg	54	N/A	5.8	N/A
Arsenic	mg/kg	9.4	24	32	<5 - 19
Barium	mg/kg	17,000	12,000	15,000	N/A
Beryllium	mg/kg	4	N/A	3.5	N/A
Cadmium	mg/kg	2	N/A	<1	N/A
Chromium	mg/kg	37	9.1	43	<5
Cobalt	mg/kg	16	N/A	9.4	N/A
Copper	mg/kg	48	<5	36	<5
Lead	mg/kg	3,600	1,100	920	13 to 1,200
Fluoride	mg/kg	153	N/A	N/A	N/A
Mercury	mg/kg	0.2	N/A	0.57	N/A
Molybdenum	mg/kg	60	N/A	19	N/A
Nickel	mg/kg	27	N/A	31	N/A
Selenium	mg/kg	1.3	<5	2.5	<1 to 11
Silver	mg/kg	1	N/A	<1	N/A
Thallium	mg/kg	1.3	N/A	<1	N/A
Vanadium	mg/kg	28	N/A	23	N/A
Zinc	mg/kg	48	45	64	3.9 to 36
Strontium	mg/kg	N/A	18,000	7,100	7,300 to 9,600

00-137(P-16 (6/8/00)rm)

- (1) From "Progress Report, Tailings and Chemical Wastewater Analysis and Ground Water Monitoring; Mountain Pass, California". D'Appolonia Consulting Engineers, Inc. February 1993.
(2) From Molycorp Chemical Monitoring database.
(3) Samples collected September 7, 1995 and October 6, 1996.

N/A = Not analyzed.

From Table 2.1 of report titled: P-16 Closure Plan (Including Interim Operations), 2000, Prepared by Molycorp and TRC, June.

**Attachment F.2
Characteristics of
MILL SLURRY WASTE (TAILINGS SOLIDS)**

RADIOLOGICAL

CONSTITUENT	Laboratory Results (pCi/g)		Number of Samples ¹
	Minimum	Maximum	
Radium 226	4.77	5.96	9
Radium 228	1.33	1.93	9
Uranium 234	5.45	7.47	9
Uranium 235	0.176	0.333	9
Uranium 238	5.99	7.75	9
Thorium 228	13.2	13.2	1
Thorium 230	3.62	3.62	1
Thorium 232	7.43	7.43	1
Gross Alpha	83.3	120	9
Gross Beta	63.5	85.7	8

Lead

Laboratory Test Procedure	Description of Limit	Units	Limit	Laboratory Results		Number of Samples
				Minimum	Maximum	
Toxicity Characteristic Leaching Procedure (TCLP)	TCLP Limit (maximum)	mg/l	5.0	0.8	13	7 ²
Waste Extraction Test (WET)	Soluble Threshold Limit Concentration (STLC)	mg/l	5.0	6.5	38	14 ³
Analysis for Total Lead	Total Threshold Limit Concentration (TTLC)	mg/kg	1,000	13	3,600	14 ⁴

¹ Laboratory results are from Table 4-10, Page 4-19 of the report titled Human Health and Ecological Risk Assessment, Field Summary Report Volume 1, Prepared by Tetra Tech Inc for County of San Bernardino, March 2000. The laboratory results are for samples of windblown tailings.

² Laboratory results are from: Factors Controlling Wastecake Stabilization, PTI Environmental Services, October 1992
Special Waste Application Request, Prepared by Molycorp for California Department of Toxic Substances Control (DTSC), March 1993.

³ Lead Stabilization in Filtercake/Tailings Mixtures, PTI Environmental Services, June 1993

⁴ Results of IT Corporation laboratory analyses sent to DTSC for classification of mine tailings, January 24, 1986. (MC, 2000a)

ATTACHMENT G
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

STANDARD PROVISIONS
FOR WASTE DISCHARGE REQUIREMENTS

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

- a. to enter upon premises in which an effluent source is located or in which any required records are kept;
- b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements;
- c. to inspect monitoring equipment or records; and
- d. to sample any discharge.

2. Reporting Requirements

- a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.
- b. Pursuant to California Water Code Section 13260(c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not limited to, all significant soil disturbances.
- c. The Owners/Discharger of property subject to Waste Discharge Requirements shall be considered to have a continuing responsibility for ensuring compliance with applicable Waste Discharge Requirements in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the Waste Discharge Requirements shall be reported to the Regional Board. Notification of applicable Waste Discharge Requirements shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.
- d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing and correct that information.
- e. Reports required by the Waste Discharge Requirements, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation.

- f. If the Discharger becomes aware that their Waste Discharge Requirements (or permit) is no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their Waste Discharge Requirements (or permit) be rescinded.

3. Right to Revise Waste Discharge Requirements

The Regional Board reserves the privilege of changing all or any portion of the Waste Discharge Requirements upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the Waste Discharge Requirements may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and reissuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the Waste Discharge Requirements which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the Waste Discharge Requirements. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the Waste Discharge Requirements.

7. Waste Discharge Requirement Actions

The Waste Discharge Requirements may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the Waste Discharge Requirements conditions.

8. Property Rights

The Waste Discharge Requirements do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the Waste Discharge Requirements including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the Waste Discharge Requirements shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the Waste Discharge Requirements are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from disposal/treatment facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operator. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

- a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.
- b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

- a. All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

REVISED MONITORING AND REPORTING
PROGRAM NO. 00-101
WDID NO. 6B360009001
FOR

MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL SITE
NORTH TAILINGS POND (P-16)

San Bernardino County

I. MONITORING

A. Amendments to Water Quality Monitoring and Response Plan

The Discharger submitted a Water Quality Monitoring and Response Plan (WQM&R Plan) dated August 1995 to the Regional Board. The Executive Officer has subsequently established additional monitoring requirements through written correspondence to the Discharger. The Discharger has proposed amendments to the WQM&R Plan in the following documents, which the Discharger submitted to the Regional Board in support of a Revised Report of Waste Discharge (RWD).

1. June 8, 2000 cover letter transmitting a report titled: P-16 Closure Plan (Including Interim Operations), 2000, Prepared by Molycorp and TRC, June (MC, 2000a);
2. June 21, 2000 cover letter, transmitting a letter report titled: North Tailings Pond (P-16) – Dust Control Plan, prepared by Molycorp (MC, 2000b); and
3. June 26, 2000 cover letter, transmitting a letter report titled: Proposed Interim Measures, P-16 Tailings Pond, prepared by Molycorp. The report described a proposal, and included a schedule, for implementing the proposal with the goal of capturing as much of the North Tailings Pond (P-16) leakage as possible (MC, 2000c).

In an August 11, 2000, letter the Discharger proposes to prepare a site-wide ground water monitoring and reporting plan. Once the Regional Board office receives the proposed plan, the Executive Officer will consider revision of this Monitoring and Reporting Program.

The North Tailings Pond (P-16) shall comply with the monitoring provisions contained in Section 20385 through 20430 of Title 27, California Code of Regulations (Title 27). In addition to satisfying the monitoring requirements of Title 27, the Discharger shall also perform the following monitoring.

B. Flow Monitoring

The Discharger shall measure and record:

1. The volume of flow, in million gallons, that occurred each month (and each quarter) at each of the stations listed in the attached Table No. 2;
2. The average flowrate, in gallons per minute, that occurred each month at each of the stations listed in Table No. 2;
3. The volumes of flow, in million gallons, each month (and each quarter) for each of the following: (a) wastewater applied for control of windblown tailings and (b) wastewater discharged from mechanical evaporators; and
4. The average flowrate, in gallons per minute, each month for each of the following: (a) wastewater applied for control of windblown tailings and (b) wastewater discharged from mechanical evaporators.

C. Pond Monitoring

1. Freeboard

Each week, the Discharger shall measure and record the surface impoundment freeboard (distance from the top of the lowest part of the dike to the waste surface) for each of the following individual surface impoundments: P-16 North/Lined Area and Temporary Slurry Storage Sump (P-2).

2. Pond Integrity

Monthly, the integrity of the dikes and liners shall be checked. Should the inspection indicate any unauthorized discharge has occurred or may occur, the Discharger shall give immediate verbal notification to the Regional Board, followed by written confirmation within ten business days.

3. Wastewater/Pond Liquid Quality

The Discharger shall collect a grab sample from the Wastewater Pool in the P-16 North/Lined Area. The sample shall be analyzed to determine the concentration of the parameters and analytes listed in the attached Tables No. 3, 4, 5 and 6. The frequency of sampling and analysis shall be as follows:

<u>Constituents</u>	<u>Frequency</u>
Table No. 3 Constituents	Monthly
Table No. 4, 5 and 6 Constituents	Annually

D. Corrective Action Monitoring

1. The Discharger shall collect a grab sample from each ground water monitoring well, wastewater seep, and spring listed in Table No. 7.

The samples shall be analyzed to determine the concentration of the parameters and analytes listed in the attached Tables No. 3, 4, 5 and 6. The frequency of sampling and analysis shall be as follows:

<u>Constituents</u>	<u>Frequency</u>
Tables No. 3 and 4 Constituents	Quarterly ¹
Tables No. 5 and 6 Constituents	Annually

2. The Discharger shall collect a grab sample from each ground water extraction well listed in Table No. 7. The samples shall be analyzed to determine the concentration of the parameters and analytes listed in the attached Tables No. 3, 4, 5 and 6. The frequency of sampling and analysis shall be annually.
3. The Discharger shall sufficiently purge each monitoring well before sampling. Purging shall be in accordance with generally accepted sampling practice, to obtain a "representative" ground water sample. If a non-purging method is used, the method proposed must be approved, in advance, by Regional Board staff.

E. Detection Monitoring

In conjunction with the Corrective Action Monitoring described above, the Discharger shall continue to conduct a Detection Monitoring Program to provide the best assurance of the early detection of any releases from the P-16 North/Lined and South/Unlined Areas.

Monitoring shall be completed as follows:

1. Unsaturated Zone Monitoring

Before regulation of the North Tailings Pond (P-16) by the attached Waste Discharge Requirements, P-16 was operated as an unlined tailings pond. Leakage of wastewater from P-16 created a ground water mound that caused portions of the former underlying unsaturated zone to become saturated. The Discharger proposes two new piezometers (M-1 and M-2) for detection monitoring in the former unsaturated zone. Provided there are no releases from operations at the proposed P-16 North/Lined and South/Unlined Areas, piezometer data will show the elevation of the mound decreasing with time.

¹ The frequency of sampling shall be quarterly, unless the Discharger submits justification showing a reduction in frequency is appropriate and Regional Board staff grants approval.

Monitoring of the piezometers shall be conducted as described below in Section F (General Ground Water Monitoring).

The Discharger also proposes to conduct weekly visual inspections of the exposed liner area as a means of detecting releases. The results of inspections shall be recorded and reported in quarterly monitoring reports.

2. Ground Water Monitoring

The Discharger shall evaluate results for each quarterly ground water sampling event conducted under Section I.D. (Corrective Action Monitoring), above. The evaluation shall be designed for detecting whether there has been a release from the P-16 North/Lined or South/Unlined Areas. The Discharger shall use appropriate statistical or non-statistical methods to evaluate the data.

F. General Ground Water Monitoring

Quarterly, the Discharger shall:

1. Measure and record the depth below the ground surface and the elevation above mean sea level of the ground water surface in the ground water monitoring wells and piezometers listed in Table No. 7;
2. Plot the above-described elevations and elevation isopleths on a 11" x 17" copy of a site plan, which shows the locations of the site and monitoring wells; and
3. Calculate and record the ground water gradient, the direction of the gradient, and velocity of ground water flow.

G. Monitoring Settlement of Tailings Solids

The Discharger proposes to install two permanent benchmarks (BM-1 and BM-2) and two settlement-monitoring benchmarks (S-1 and S-1). The purpose of the benchmarks is to obtain a better understanding of the rate of settlement of tailings and to allow improved estimation of total remaining settlement to assist in design of the final cover for closure. The Discharger shall survey the benchmarks before startup of the Interim Project and on a quarterly basis, thereafter. The benchmark elevations shall be recorded and reported in quarterly monitoring reports.

H. Monitoring of Wastewater Evaporation and Windblown Tailings Control Systems

1. Purpose of Monitoring

The requirements in this Section (Section I.H.) are for monitoring the effectiveness of controls to prevent:

- a. Windblown tailings;
- b. Wastewater overspray (liquid overspray); and
- c. Deep percolation of wastewater applied in the P-16 South/Unlined Area.

The Discharger is currently using Systems to increase wastewater evaporative capacity and control windblown tailings. The Systems utilize wastewater streams described in the attached Waste Discharge Requirements. For the purposes of this Monitoring and Reporting Program, the Systems are referred to as the Wastewater Evaporation and Windblown Tailings Control Systems.

2. Monitoring Devices and Frequency of Monitoring

The following table provides a summary of monitoring devices and frequency of monitoring:

Table 1
Monitoring Devices and Frequency of Monitoring

Controls to Prevent:	Required Number of Proposed Stations:	Required Number and Type of Sampling Devices:	Minimum Required Frequency for Inspecting Sampling Devices
Windblown tailings	One upgradient Two down-gradient	Nine windblown particle samplers	Once following each significant wind event, with a minimum inspection frequency of once per week.
Wastewater overspray	One upgradient Two down-gradient	Three rain guages	Two times per day on days when the Discharger is operating the evaporators or applying wastewater by other means.
Deep percolation	Two stations on tailings surface in the P-16 South/Unlined Area	<ul style="list-style-type: none"> • One pan lysimeter • Six to eight tensiometers 	Two times per day on days when the Discharger is operating the evaporators or applying wastewater by other means.

3. Weather Monitoring

Monitoring stations will include the Discharger's existing weather station located near the administration building. The station includes a 33-foot tower, precipitation gauge, relative humidity sensor, wind speed sensor, wind direction sensor, temperature sensor and data logger (MC, 2000b).

4. Monitoring Effectiveness of Controls for Windblown Tailings

The Discharger proposes three monitoring stations that each include a one-meter high metal pole anchored to a concrete base. Three windblown-particle samplers will be attached to each pole at heights of 5, 50 and 100 centimeters. The proposed samplers collect coarser-sized, windblown particles, which are travelling horizontally. Particle-laden air passes through the inlet port of the sampler. Once inside, particles settle into a removable sampling container. The proposed stations will be located along a line oriented in the directions of winds most likely to generate windblown tailings.

To obtain a reading from the windblown-particle samplers, the Discharger will remove the sampling pan from each sampler. Each pan will be weighed and the amount (grams) of particulate matter in each pan recorded (*MC, 2000b*). The Discharger shall also record times and dates for the Sampling Period (time and date the sampling begins and the time and date the sampling ends).

The Discharger proposes to compare the total amount (grams) of particulate matter for each downgradient station with the total amount for the upgradient station. If there is a significant difference (i.e., more than 20 percent), the Discharger will evaluate pertinent monitoring and operational data to determine if generation of windblown tailings was possible. Data evaluated will include operational data for the Wastewater Evaporation and Windblown Tailings Control Systems (*MC, 2000b*).

If a significant difference occurs, the Discharger shall report such incidents in quarterly monitoring reports including pertinent monitoring data (e.g., soil moisture, wind speed, wind direction and precipitation, etc.) If the source of particulate matter is determined to be windblown tailings from the P-16, the Discharger will increase controls for windblown tailings (*MC, 2000b*).

5. Monitoring for Wastewater Overspray (Liquid Overspray)

The Discharger proposes three monitoring stations that each include a metal pole anchored to a concrete base and a rain gauge attached to the post at a height of two feet (*MC, 2000b*).

If water is detected during reading of the rain gauge, the amount will be recorded and reported in the quarterly monitoring report, except when the following occurs during the Sampling Period:

- a. There is precipitation, or
- b. The Wastewater Evaporation and Windblown Tailings Control Systems are not used.

Molycorp will evaluate and implement appropriate corrective measures if overspray is measured. The Discharger will report corrective actions in quarterly monitoring reports (*MC, 2000b*).

6. Monitoring for Deep Percolation

The Discharger shall provide two stations in the P-16 South/Unlined Area. One located where evaporator mist hits the tailings surface. The second station located beyond evaporator mist where the Discharger applies wastewater by other means. The stations shall be used to measure the depth of penetration of wastewater applied to control windblown tailings. The stations will be located below the surface of the tailings beach. One station will include a pan lysimeter installed below the tailings surface, with four tensiometers placed in

tailings located between the pan lysimeter and tailings surface (*MC, 2000b*). The second station shall consist of from two to four tensiometers placed in tailings below the tailings surface.

Tensiometer readings will be recorded in a log (*MC, 2000b*). If water is present in the lysimeter, the Discharger shall record and report the amount in the quarterly monitoring report. Molycorp shall evaluate and implement appropriate corrective measures to prevent deep percolation of wastewater. The Discharger shall report corrective actions in quarterly monitoring reports.

7. Additional Required Reports and Actions

a. By **January 12, 2001**, the Discharger shall submit the following to the Regional Board Victorville Office:

- i. A map showing the final proposed locations for the sampling stations described in Table 1, above.
- ii. An **Overspray Monitoring Plan** describing proposed monitoring for overspray of dry particulate matter from the evaporators, including a schedule for implementing the monitoring plan, and
- iii. A **Workplan** for conducting an investigation to determine evaporator operating procedures and restrictions needed to prevent dry particulate overspray. The **Workplan** shall include a proposed schedule for completing the investigation and a proposed date for submitting an **Investigation Report** to the Regional Board Victorville Office. The **Investigation Report** shall contain the results and conclusions of the investigation and the Discharger's recommendations for preventing overspray of dry particulate matter.

The investigation described in the above **Workplan** shall be designed to determine: (a) the appropriate wind speed(s) for evaporator shutdown, and (b) the corresponding buffer zone width(s) needed to prevent overspray of dry particulate matter. The buffer zone width is defined as the distance between the evaporator discharge nozzle and the boundary of the authorized disposal/reuse sites.

- b. The Discharger shall submit a report by **February 16, 2001** confirming completion of installation and startup of operation for the proposed monitoring stations described in Table 1.
- c. If the Discharger installs bollards to protect monitoring stations from traffic, the bollards shall be positioned so they do not significantly affect the operation of monitoring devices (e.g., do not significantly affect the flow of any windblown particles to the inlet for the

windblown particle sampler).

I. Operation & Maintenance

A brief summary of any operational problems and maintenance activities shall be submitted to the Regional Board with each monitoring report for Mountain Pass Operations. This summary shall discuss:

1. Any modifications, additions, or major maintenance to the wastewater conveyance system, treatment facilities, or disposal facilities;
2. Any major problems occurring in the wastewater conveyance system, treatment facilities, or disposal facilities; and
3. The calibration of any wastewater flow measuring devices.

II. DATA EVALUATION AND PRESENTATION

A. Topographic Maps

The Discharger shall prepare two sets of topographic maps that show the lateral distribution of pollutant concentrations in ground water. The first set shall consist of several large-scale maps (Scale: 1 inch = 1300 feet). The second set shall consist of one or more small-scale map(s) (Scale: 1 inch = 500 feet). The maps shall include:

1. The Background Water Quality Objective (WQO) Boundary (The boundary that surrounds the ground water monitoring points where one or more Background WQO is exceeded. Background WQOs are listed in Table No. 10);
2. Health-Based WQO Boundary (The boundary that surrounds the ground water monitoring points where one or more Health-Based WQO is exceeded. Identification of the Boundary location within capture zones is not required. Health-Based WQOs are listed in Table No. 8);
3. Sensory-Based WQO Boundary (The boundary that surrounds the ground water monitoring points where one or more Sensory-Based WQO is exceeded. Identification of the Boundary location within capture zones is not required). Sensory-Based WQOs are listed in Table No. 9);
4. Isoconcentration lines for total thorium and the constituents listed in Tables No. 8 and 9;
5. Areas up to 0.5 mile beyond the Background WQO Boundary;
6. Lines of equal ground water table elevations in feet above mean sea level;
7. Lines of equal ground surface elevations in feet above mean sea level;

8. Property boundaries;
9. Boundaries of Molycorp's locator grid lines and U.S. Geological Survey (USGS) sections, townships and ranges;
10. Ponds, buildings, dwellings, and other significant structures within a boundary located 0.5 mile beyond the Background WQO Boundary;
11. Locations of existing monitoring, extraction and water supply wells (both active and inactive) within a boundary located 0.5 mile beyond the Background WQO Boundary, including ownership of land on which the well(s) are constructed;
12. Locations of springs and wastewater seeps (both ephemeral and perennial) within a boundary located 0.5 mile beyond the Background WQO Boundary, including the ownership of land where the spring(s) are located; and
13. Ground water capture zones².

The listed maps shall be prepared quarterly, unless the Discharger submits justification showing a reduction in frequency is appropriate and Regional Board staff approves of the justification.

B. Geohydrologic Cross-Sectional Maps

The Discharger shall prepare two sets of cross-section maps. The first set shall consist of several large-scale maps (Horizontal Scale: 1 inch = 1300 feet). The second set shall consist of one or more small-scale map(s) (Horizontal Scale: 1 inch = 500 feet). The maps shall include:

1. Ground surface, ground water table and contacts separating different geologic material;
2. Health-Based WQO Boundary; and
3. Isoconcentration lines for total thorium and the constituents listed in Tables No. 8 and 9.

The listed maps shall be prepared quarterly, unless the Discharger submits justification showing a reduction in frequency is appropriate and Regional Board staff approves of the justification.

C. Graphs (Ground Water Elevations)

Annually, the Discharger shall prepare graphs of the ground water elevation versus time for each piezometer and ground water monitoring well listed in Table 7. The graphs shall start from the time the monitoring device was installed.

²

Calculations used to determine the ground water capture zones shall be included with the self-monitoring reports.

D. Graphs (Ground Water Quality)

Annually, the Discharger shall prepare graphs of the constituents listed in Tables No. 8 and 9 versus time for each ground water monitoring well, extraction well, spring and wastewater seep listed in Table 7. The graphs shall start from the first time the Discharger sampled monitoring station for the constituent.

III. REPORTING

A. General Provisions

In accordance with General Provisions 3.a., the Discharger shall make a compliance statement in each submitted monitoring report, noting each violation that occurred during the reporting period and actions taken and/or proposed to return into compliance.

B. Quarterly Reports

Monitoring reports including the preceding information shall be submitted to the Regional Board the **month following each quarter**.

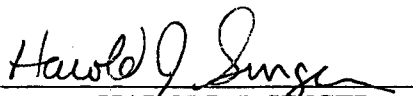
C. Annual Report

By **March 30** of each year, the Discharger shall submit an annual report to the Regional Board with the following information:

1. The compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the discharge requirements;
2. Evidence that adequate financial assurance for closure is still in effect (Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument.);
3. Evidence that the amount is still adequate or increase the amount of financial assurance by the appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events;
4. Graphical and tabular data for the monitoring data obtained for the previous year; and

5. A description documenting progress in attaining full compliance with Title 27 CCRs. (The report shall include a description of all actions accomplished and a time schedule for additional proposed compliance actions.)

Ordered by:


HAROLD J. SINGER
EXECUTIVE OFFICER

Dated: November 16, 2000

- Attachments:
- A. Tables No. 2 through 10
 - B. General Provisions for Monitoring and Reporting Program

**Table 2
WASTE STREAMS**

WASTE	SOURCE	SUB-SOURCE
Mill Slurry Waste	Mill	---
Recovered P-16 Wastewater	P-16 Shallow Leakage Intercept System	Infiltration Trenches 1, 2 and 3
"	"	Infiltration Trench 4 (RW-8)
"	P-16 North/Lined Area	Tailings Dewatering System & Barge Pump
Extracted Ground Water	P-16 Primary GWCAP ¹ System	Extraction Well 95-1rw
"	"	Extraction Well 98-1rw
"	"	Extraction Well (Pit Well)
"	P-16 Secondary GWCAP System	Extraction Wells (Mexican Well 1A, 2A & 3A)
"	"	Extraction Well (Farmers Well)

**Table 3
FIELD PARAMETERS**

Parameter	Units
Electrical Conductivity (E _c)	µmhos/cm
pH	pH Units
Temperature	°F or °C

**Table 4²
LABORATORY ANALYTES**

Constituent	Units
Strontium (Sr)	mg/L
Nitrate as N	mg/L
Barium	mg/L
Gross Alpha	pCi/l
Gross Beta	pCi/l
Radium ²²⁶	pCi/l
Radium ²²⁸	pCi/l
Total Radium (Ra ²²⁶ + Ra ²²⁸)	pCi/l
Uranium ²³⁴	pCi/l
Uranium ²³⁵	pCi/l
Uranium ²³⁸	pCi/l
Total Uranium (U ²³⁴ + U ²³⁵ + U ²³⁸)	pCi/l

¹ P-16 Primary Ground Water Corrective Action System

² These constituents of concern (COCs) have Health-Based Water Quality Objectives (WQOs) and are more mobile than COCs listed in Table 6, which also have Health-Based WQOs.

Table 5
LABORATORY ANALYTES

Constituent	Units
Calcium	mg/L
Magnesium	mg/L
Sodium	mg/L
Potassium	mg/L
Carbonate + Bicarbonate	mg/L
Sulfate	mg/L
Chloride	mg/L
Total Dissolved Solids	mg/L
Ph (Laboratory pH)	pH Units
Lignin Sulfonate	mg/L
Color	Color Units

Table 6³
LABORATORY ANALYTES

Constituent	Units
Lead	mg/L
Thorium ²²⁸	pCi/l
Thorium ²³⁰	pCi/l
Thorium ²³²	pCi/l
Thorium ²³⁴	pCi/l
Total Thorium (TH ²²⁸ + TH ²³⁰ + TH ²³² + TH ²³⁴)	pCi/l

**Table 7
MONITORING STATIONS**

No.	Type	Location In Relation To The North Tailings Pond (P-16)
93-1MW	Background Ground Water Monitoring Well	Upgradient
SRK-14A	Ground Water Monitoring Well	Downgradient
SRK-15	“	“
SRK-16 M & L	“	“
SRK-17U & M	“	“
SRK-18U, M & L	“	“
SRK-19	“	“
SRK-20U & M	“	“
SRK-21A	“	“
SRK- 22	“	“
SRK-24	“	“
SRK-26	“	“
SRK-27A	“	“
SRK-29	“	“
94-1MW	“	“
94-2MW	“	“
94-4MW	“	“
94-5MWU&L	“	“
94-6MW	“	“
94-7MWU&L	“	“
94-8MW	“	“
94-9MW	“	“
94-10MW	“	“
94-11MW	“	“
94-13MW	“	“
94-15MWU&L	“	“
94-16MW	“	“
94-17MW	“	“
98-6MWU&L	“	“
98-7MW	“	“
98-8MW	“	“
98-11MW	“	“
98-12MWU&L	“	“
98-13MW	“	“
98-15MW	“	“
98-16MW	“	“
98-17MW	“	“
98-18MW	“	“
98-19MW	“	“
98-20MW	“	“
98-21MW	“	“
98-22MW	“	“
98-23MW	“	“
M-1 & M-2 (Proposed)	Piezometers	Within P-16 Boundary
94-5P	“	“
94-6P	“	“
94-7P	“	“

No.	Type	Location In Relation To The North Tailings Pond (P-16)
95-1P	"	"
95-2P	"	"
98-1P	"	"
98-2P	"	"
95-1RW	Extraction Well	Downgradient
98-1RW	"	"
FARMERS RWA & RWB	"	"
MEXICAN 1A, 2A & 3A	"	"
95-1RW	"	"
95-1RW	"	"
P-20A, P-20G, U-2	Wastewater Seeps	"
ROSEBERRY SPRING	Spring	"
SPRING 17	"	"

**Table 8
HEALTH-BASED WATER QUALITY OBJECTIVES (WQOS)**

Constituent	Health-Based WQOS
Strontium (Sr)	4.2 mg/L ⁴
Nitrate as N	10 mg/L ⁵
Barium	1 mg/L ⁷
Gross Alpha	15 pCi/l ⁷
Gross Beta	50 pCi/l ⁷
Radium (226 + 228)	5 pCi/l ⁷
Total Uranium (U)	20 pCi/l ⁷

⁴ US Environmental Protection Agency (USEPA) Lifetime Health Advisory [The Lifetime Health Advisory (LHA) is based on data published in the USEPA's Integrated Risk Information System (IRIS) for waters used in domestic supply systems.]

⁵ Maximum Contaminant Level (MCL)

Table 9
SENSORY-BASED WATER QUALITY OBJECTIVES (WQOs)

Constituent	Sensory-Based WQOs
Total Dissolved Solids (TDS)	500 mg/L
Chloride	250 mg/L

Table 10
BACKGROUND WQOs

	Units	Background WQOs ⁶ Well 93-1MW ⁷
TDS	mg/L	391
Strontium	mg/L	0.4
Nitrate As N	mg/L	3.42
Barium	mg/L	0.10
Gross Alpha	pCi/l	4.15
Gross Beta	pCi/l	4.05
Uranium	pCi/l	3.65
Radium	pCi/l	0.274

⁶

Background may vary in the Mountain Pass area.

⁷

Each result for TDS, strontium, nitrate and barium is an average of quarterly sampling rounds for Well 93-1MW reported in First Quarter 1997 Self Monitoring Report, Molycorp, Inc. Radiological results are for two analyses for samples collected by Molycorp staff from Well 93-1MW on March 15, 1994 as requested by Regional Board letter dated February 10, 1994. Average values may change once newer data is included in the average.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

ATTACHMENT B

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

- a. All analyses shall be performed in accordance with the current edition(s) of the following documents:
 - i. Standard Methods for the Examination of Water and Wastewater
 - ii. Methods for Chemical Analysis of Water and Wastes, EPA
- b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board. Specific methods of analysis must be identified on each laboratory report.
- c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The method used shall also be reported. If methods other than USEPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.
- d. The Discharger shall establish chain-of-custody procedures to ensure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.
- e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall ensure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.
- f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.
- g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be obtained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

- a. For every item 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 submit a timetable for correction.
- b. Pursuant to California Water Code Section 13267(b), all sampling shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Regional Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.
- d. Monitoring reports shall be signed by:
 - i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;
 - ii. In the case of a partnership, by a general partner;

- iii. In the case of a sole proprietorship, by the proprietor;
 - iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.
- e. Monitoring reports are to include the following:
- i. Name and telephone number of individual who can answer questions about the report.
 - ii. The Monitoring and Reporting Program Number.
 - iii. WDID Number.
- f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation under Section 13268 of the Water Code.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. 6-00-74
WDID NO. 6B360008001

NEW WASTE DISCHARGE REQUIREMENTS

FOR

MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL SITE
CLOSURE AND POST-CLOSURE MAINTENANCE; WEST (OLD) TAILINGS POND P-1

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Regional Board) finds:

1. Discharger

Molycorp, Inc. (Molycorp) has submitted to the Regional Board the following reports and information composing a complete Report of Waste Discharge (RWD) for closure of the West (old) Tailings Pond P-1, a Class II waste management facility pursuant to regulations contained in Division 2, Title 27, California Code of Regulations (hereinafter referred to as Title 27).

- a. Site Characterization Report and Recommendations for Closure. Volumes I and II, dated March 1995.
- b. Closure and Post-Closure Maintenance Plan West (Old) Tailings Pond P-1. Volume 1: Waste Relocation and Foundation Layer Design, dated August 1995.
- c. Closure and Post-Closure Maintenance Plan West (Old) Tailings Pond P-1. Volume 2: Final Cover Design, dated May 1997.
- d. Addendum to Closure and Post-Closure Maintenance Plan, West (Old) Tailings Pond P-1, dated February 2000.

Molycorp (hereinafter referred to as the "Discharger"), a wholly owned subsidiary of Union Oil Company of California (UNOCAL), owns the land on which the P-1 Facility is located.

2. Facilities

The Discharger operates an open pit mine for the economic extraction of lanthanide elements. P-1, covering approximately 14 acres, was constructed in 1966 and was used until 1985 for the disposal of flotation tailings and flotation plant slurries. P-1 was constructed as an unlined, packed-earth surface impoundment by constructing earthen embankments on its south, west, and east (downhill) sides. The embankments were raised in the late 1970s by 15 to 20 feet to a crest elevation of 4,750 feet. While the discharge of tailings to P-1 ceased in 1985, from 1985 through 1992, P-1 has received various materials from other on-site storage ponds as they were clean closed. For the purposes of this Regional Board Order (Order), the "Facility" is the former Tailings Impoundment P-1.

3. Order History

The Regional Board previously adopted Waste Discharge Requirements (WDRs) for the Discharger under the following Board Orders:

- a. Resolution 65-5, dated June 26, 1965, established Industrial WDRs for the disposal of ore beneficiation wastewaters.
- b. Board Order No. 6-75-73, dated July 24, 1975, established WDRs for the Mine and Mill.
- c. Board Order No. 6-80-9, dated January 10, 1980, allowed the construction of and evaporation pond near Ivanpah Dry Lake for the disposal of wastewater from the Mine and Mill.
- d. Board Order No. 6-81-73 was adopted on September 19, 1981, for the Mountain Pass (Mine and Mill) Operations wastewater disposal system modifications.
- e. Board Order No. 6-90-41 was adopted on June 14, 1990, for the New Ivanpah Dry Lake Wastewater Evaporation Ponds for the disposal of wastewater from the mill and contaminated ground water extracted from the mill area.
- f. Board Order No. 6-90-56 was adopted on September 13, 1990, for the closure of the Old Ivanpah Dry Lake Wastewater Evaporation Ponds.
- g. Board Order No. 6-91-836 was adopted on June 13, 1991 (superceding Board Order No. 6-81-73) revising the mine and mill site's WDRs to reflect changes to Chapter 15, to include modifications to the Discharger's waste management strategy, and to incorporate provisions for a contaminated ground water Corrective Action Plan (CAP).

This Order will supercede these Orders in regards to P-1. Additionally, site investigations and cleanups are being conducted under the following Cleanup and Abatement Orders:

- h. 6-97-66A2, Discharges from the Outfall Pipeline
- i. 6-98-19, Mine and Mill Site
- j. 6-98-20A2, New Ivanpah Evaporation Ponds
- k. 6-98-21A1, Old Ivanpah Evaporation Ponds

4. Reason for the Action

The Regional Board is issuing WDRs to:

- a. approve the Discharger's proposed final cover for the former tailings impoundment;
- b. approve an engineered alternative to Title 27 prescriptive cover requirements; and
- c. establish Closure and Post-Closure monitoring and maintenance requirements.

5. Facility Location

The Molycorp Mine and Mill occupy 2,100 acres immediately north of Interstate 15 at Mountain Pass. The site straddles the boundary between the Ivanpah Valley and Amargosa Hydrologic Units within Sections 11, 12, 13, and 14, T16N, R13E, SBB&M (as shown on

Attachment A). P-1 is located southwestern portion of the Mine and Mill Site, approximately 1700 feet north of Interstate Highway 15, near the western edge of Section 13 (as shown on Attachment B).

6. Climatology

The climate at Mountain Pass is arid to semi-arid with rainfall varying from 3 to 10 inches per year. The mean annual precipitation at the mine site is 7.9-inches per year. Most precipitation occurs during the winter months. Daytime temperatures during the summer frequently exceed 100°F and may fall to less than 10°F at night during the winter. Estimated annual gross evaporation is 115.5-inches per year.

7. Site Geology

The surficial geology of P-1 is characterized by older gravels and outcropping bedrock. The older (Tertiary-age) gravels (also referred to as older alluvium and debris flows) are comprised of poorly-sorted, pebble- to boulder-sized clasts in a finer-grained matrix. These materials, overlying granitic bedrock, are approximately 800 feet thick and are usually firmly cemented with calcareous mud. This older alluvium is less permeable than the shallow alluvium exhibiting hydraulic conductivities on the order of 1×10^{-5} cm/sec (Environmental Solutions, Inc., October 1994).

Bedrock in the area consists of Precambrian metamorphic and intrusive rocks. The older metamorphic rocks consist primarily of granitic gneiss. The main igneous body at the mine site, which has intruded the older metamorphic complex, consists of shonkinite-syenite stock and associated carbonatites.

8. Site Hydrogeology

Ground water at the Mine and Mill Site generally flows toward the south and then splits into an east and west component along a north-south-trending ground-water divide. Both the eastern and western flow follows the topographic drainages down Wheaton wash and the Western Drainage, respectively, starting at the southern edge of the mine site.

Ground water beneath the Facility is found approximately 100 to 120-feet below ground surface and flow direction is toward the south-southwest into the Shadow Valley Drainage and the Upper Kingston Valley Basin. Ground water levels and flows at the site have been significantly affected by corrective action pumping and pit dewatering activities. These activities have created local "cones of depression" in the ground water surface due to the capture and extraction of ground water.

Ground water velocities are highly variable due to the varying hydraulic conductivities and localized fracturing. Ground water permeability within the bedrock is fracture controlled. Typical velocities are estimated to range from four to five feet per day (ft/day) in shallow alluvium and fractured bedrock; from 0.03 to 1.0 ft/day for old alluvium and moderately fractured bedrock; and from negligible to 0.02 ft/day for slightly fractured bedrock.

9. Site Surface Hydrology and Storm Water Runoff

Surface runoff in the area is primarily by sheet flow within localized drainage courses. As the site is located on a sloping alluvial fan surface, the area is not prone to flooding and is not located in a flood plain. Review of flood insurance rate map indexes published by the Federal Emergency Management Administration (FEMA), indicates the site has not been mapped for flooding potential.

10. Faulting and Seismicity

The Mountain Pass Mine area is not within an Alquist-Priolo Earthquake Fault Zone. The Clark Mountain Fault is the most prominent fault in the area and trends northwesterly for approximately 20 miles along the western flank of the Clark Mountain Range. This fault is considered to be inactive based on its age and lack of geologic evidence of recent movement.

A search of the National Earthquake Information Center reveals that most earthquakes greater than M4.0 are more than 100 km away. The largest earthquake within a 100-km radius was an estimated M6.1 in 1916 approximately 45 km west of site. The strongest historic earthquake in the northeastern Mojave Desert was the M7.1 Hector Mine Earthquake located approximately 120-km west of Mountain Pass. A M6.2 event on the Mannix Fault occurred in 1947 about 110-km west of the mine site (Real et.al., 1964).

The Pahrump-Stateline fault located about 18 km east of the mine is the controlling fault for calculating the maximum credible earthquake (MCE) for the site. The fault is thought to have been last active in the Pleistocene (700,000 – 1,600,000 years ago) and is therefore considered potentially active. The MCE associated with this fault was calculated to be M7.5 with a peak acceleration of 0.32 gravity (g). This 0.32g figure was used to perform the design and stability analysis.

11. Site Topography

The site slopes generally toward the south and ground surface elevation ranges from approximately 4,700-feet to 4,750-feet elevation.

12. Land Uses

Uses for the immediately adjacent land are related to the mine operations. Surrounding the mine operations are public lands managed by the Bureau of Land Management (BLM) and by the National Park Service. The Mojave National Preserve lands, administered by the National Park Service, are located south of the Interstate 15 and north and west of the Mountain Pass property. A public elementary school is located at the Mountain Pass, adjacent to the plant site. A California Department of Transportation (Caltrans) highway maintenance station and California Highway Patrol (CHP) residences are located near the mine at Mountain Pass. There are also several parcels of privately owned land, some with residences, located in the general area.

13. Description of the Final Cover

The P-1 cover is composed of (from top to bottom):

- a. a minimum of 6-inches of native soil composing a growth medium for revegetated grasses;
- b. 1.5-feet of select cover soil composed of minus one-inch material from screening onsite soils or mine overburden materials;
- c. a geocomposite layer (GCL) composed of a layer of sodium bentonite clay sandwiched between, and bonded to, two layers of nonwoven geotextiles; and
- d. 2.0-feet of prepared foundation material consisting of compacted tailings.

The cover is graded with minimum slopes of 3% and maximum slopes (around the perimeter) of 3:1 (3 horizontal to 1 vertical) in accordance with California Code of Regulations, Title 27, §21090. The slope of the cover over the tailings varies between 3% and 10% and a minimum of 0.8% in the channel areas. All slopes steeper than 10% cover mine overburden and compacted native alluvial materials. The maximum grade of the cover containing the GCL is 10%.

14. Description of Surface Water Diversion

Surface water run-on to the cover is minimized by a diversion channel located north of P-1. This channel collects run-on from the upstream catchment and diverts the water towards the east to an existing natural drainage. Surface water diversion channels are designed to accommodate a 100-year, 24-hour storm event for the Mountain Pass Site. Channel grades have been minimized to reduce the requirements for channel lining to protect from erosion.

15. Cover Equivalency to Title 27 Prescriptive Cover

Title 27 California Code of Regulations, includes prescriptive standards for waste management unit closure, but also allows for engineered alternatives to such standards. The prescriptive Title 27 cover, contained in §21090, requires an infiltration barrier of 12-inches of compacted clay with a permeability of 1×10^{-6} cm/s (or less) covered by soil (erosion-resistant layer) capable of supporting vegetation.

In arid and semi-arid regions, a compacted clay layer would suffer the deleterious effects of desiccation and cracking during the hot dry periods and freezing/thawing during cold wet periods. These cracks in the clay layer would allow infiltration of precipitation through the cover. Furthermore, if used, clay would have to be trucked in making a compacted clay layer prohibitively expensive. Therefore, the Discharger developed an alternative to Title 27 prescriptive requirements.

A GCL is proposed as an alternative to the compacted clay layer. GCL products are less subject to desiccation and freeze/thaw effects and tend to expand and seal when wetted. The GCL contains a minimum thickness of 0.25-inches of bentonite and exhibits an effective hydraulic conductivity of 5×10^{-8} cm/s when tested under low confining stresses.

Calculations of the rate of seepage through the GCL and prescriptive compacted clay layer show the amount of infiltration through the GCL is approximately 10 times less than the prescriptive clay liner.

The Facility is located in a semi-arid environment where natural topsoil is limited. However, the top, 6-inch-thick layer of soil cover is capable of supporting (shallow-rooting) grasses. The 1.5-foot thick select soil layer is overlying the GCL will protect it from environmental factors such as desiccation, freeze/thaw, and root penetration.

For the reasons listed, Regional Board staff concurs that the Discharger has met the requirements of §20080(b) of Title 27 allowing an engineered alternative by demonstrating that:

- a. the construction or prescriptive (compacted clay) standard is not feasible;
- b. the proposed alternative is consistent with the performance goal addressed by the prescriptive standard; and
- c. the alternative affords equivalent protection against water quality impairment.

16. Settlement of Tailings and Cover Materials

Tailings material in P-1 has been allowed to dewater for an extended period. As a result, the tailings are relatively dense and consolidated. Any additional settlement would be due to changes in the vertical stress from grading activities and application of the cover system.

Application of the final cover system will result in minor settlement due to the stress change of approximately 240 pounds per square foot ($\sim 1.7 \text{ lbs/in}^2$). Differential settlement will be minor due the uniform application of the cover resulting in an expected settlement of less than 1% or 0.3 feet over a maximum thickness of 30 feet of tailings and other fill. Benchmarks placed on the final cover will be used to monitor any post-closure settlement.

17. Slope Stability

The minimum factor of safety against sliding under static conditions is calculated to be 7.85 for the steepest portion of the cover system. The seismic design acceleration was 0.32g. The yield acceleration for the minimum factor of safety determined during the static analysis was 0.66g. Because the yield acceleration is more than twice the expected peak ground acceleration, no deformation of the cover system under seismic loading is expected. The final cover, even at a maximum grade of 10% is designed to be stable under both static and seismic loading conditions.

18. Monitoring Systems

To monitor water quality, the ground water monitoring system proposed for the P-1 consists of two down-gradient, point-of-compliance monitoring wells. As required by Monitoring and Reporting Program (MRP) No. 00-74, the ground water shall be monitored and analyzed for specific inorganic and radiologic constituents and all detected releases shall be reported

to the Regional Board. Monitoring wells 94-13MW and SRK 12 are the designated downgradient ground water monitoring points.

19. Waste Classification

Mining waste contained in P-1 is composed of the solid residues, sludges, and liquids from the beneficiation of ores and mineral commodities at Mountain Pass Operations. The now dry waste meets the definition of a Group B mining waste in that it consists of or contains non-hazardous soluble pollutants (and in this case radionuclides) of concentrations which could (if transported to the water table) exceed water quality objectives for, or could cause degradation of, waters of the State.

20. Waste Management Unit Classification

The surface impoundment meets the criteria for classification as a Class II facility as defined in Title 27.

21. Water Quality Protection Standard

The Water Quality Protection Standard (WQPS) consists of constituents of concern (including monitoring parameters), concentration limits, Monitoring Points, and the Point of Compliance. The standard applies over the active life of the Impoundment, closure and post-closure maintenance period, and the compliance period. The constituents of concern, Monitoring Points, and Point of Compliance are described in MRP No. 00-74, which is attached to and made part of this Order.

22. Statistical Methods

Title 27 requires statistical analyses of the monitoring data. Statistical analyses of monitoring data are necessary for the earliest possible detection of a statistically significant evidence of a release of waste from the Facility. The MRP includes a list of acceptable methods for statistical analysis. The analytes and monitoring parameters listed in this Order are believed to be the best indicators of a release from the Facility.

23. Detection Monitoring

Pursuant to § 20240 of Title 27, the Discharger has proposed a Detection Monitoring Program for the Facility. The frequency of monitoring is specified in the MRP.

24. Evaluation Monitoring

If there is evidence of a release under the Detection Monitoring Program, an Evaluation Monitoring Program may be required, pursuant to §20425 of Title 27 to further evaluate evidence of a release.

25. Corrective Action

A Corrective Action Program (CAP) to remediate released wastes from the Facility may be required pursuant to §20430 of Title 27 should results of an Evaluation Monitoring Program warrant a CAP.

26. Post-Closure Maintenance of P-1

Post-Closure monitoring of P-1 will include:

- a. monitoring any settlement of the cover system annually; and
- b. performing semi-annual inspections and maintenance of the cover system before and after the rainy season, including a leak detection survey to identify any damaged areas, and evaluation of the (re)vegetation.

27. Receiving Waters

The receiving waters are the ground waters of the Ivanpah Valley Hydrologic Unit and the Shadow Valley Hydrologic Subarea of the Amargosa Hydrologic Unit.

28. Lahontan Basin Plan

The Regional Board adopted a Water Quality Control Plan for the Lahontan Basin (Basin Plan) which became effective on March 31, 1995. This Order implements the Basin Plan.

29. Beneficial Ground Water Uses

The present and potential beneficial uses of the ground waters of the Ivanpah Valley and Amargosa Hydrologic Units of the Mojave Hydrologic Unit as set forth and defined in the Basin Plan are:

- a. municipal and domestic supply;
- b. agricultural supply;
- c. industrial service supply; and
- d. freshwater replenishment.

30. California Environmental Quality Act

These WDRs govern an existing Facility. The project consists only of closure and post-closure maintenance of the Facility in accordance with an approved Closure and Post-Closure Maintenance Plan and is therefore categorically exempt from the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.) in accordance with Section 15301 of the CEQA Guidelines.

31. Notification of Interested Parties

The Regional Board has notified the Discharger and all known interested agencies and persons of its intent to adopt new WDRs for the project. The Regional Board, in a public meeting, will consider all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

I. REQUIREMENTS AND PROHIBITIONS

A. General

1. The discharge shall not cause a pollution or a nuisance as defined in Section 13050 of the California Water Code.
2. The Discharger shall provide for adequate funding to pay for the costs of post closure maintenance at mining Units, as required by the mining regulations of Article 1, Subchapter 1, Chapter 7 of this Division (§22470 et seq.). The Discharger shall provide assurance of financial responsibility acceptable to the Regional Board. The Regional Board shall periodically review financial assurances for mining Units and shall modify the financial assurances as necessary to provide continued compliance with this section. If a lead agency acting under the authority of §2774(a) of the Public Resources Code requires assurances of financial responsibility for a mining Unit, these assurances can be used to fulfill the requirement under this paragraph, provided that:
 - a. the Regional Board approves the assurance; and
 - b. the Regional Board is named as alternate payee.
3. In accordance with § 20380(b) of Title 27, the Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the Unit.
4. The owner or operator, upon completion of closure of the site, shall file a detailed description of the closed site, including a map, with the San Bernardino County Recorder, and with the Regional Board. The site description, upon completion of closure of the site, shall include but not be limited to the following:
 - a. the date that closure was completed;
 - b. the boundaries including height and depths of the filled area;
 - c. the location where the closure and post-closure plans can be obtained; and
 - d. a statement that the future site use is restricted in accordance with the post-closure maintenance plan.

5. Post-closure maintenance shall be conducted to ensure the integrity of the final cover and environmental control systems. P-1 shall be maintained and monitored for a period of not less than thirty (30) years after the completion of closure. Maintenance and monitoring shall include, but not be limited to: site security; and maintenance as specified in the Final Closure, and Post-Closure Maintenance Plans.
6. The Discharger shall provide the Regional Board copies of the maps and reports §21090(e)(2) describing the amount of differential settlement.
7. All proposed post-closure land uses, other than non-irrigated open space, on the closed P-1 shall be submitted to the Regional Board and the San Bernardino County Planning Commission for review and approval. The County shall review and approve proposed post-closure land uses if the project involves structures within 1,000 feet of the disposal area, structures on top of waste, modification of the low permeability layer, or irrigation over the Facility.
8. Any construction on the P-1 site shall maintain the integrity of the final cover, drainage and erosion control systems, and storm water control systems. The Discharger shall demonstrate to the satisfaction of the Regional Board that the activities will not pose a threat to public health and safety and the environment. Any proposed modification or replacement of the low permeability layer of the final cover shall not begin until approval by the Regional Board.
9. The Discharger shall perform ongoing monitoring and site maintenance to ensure that the closed surface impoundment does not discharge any waste materials to land areas, ground waters, or surface waters.
10. The Discharger shall routinely inspect and maintain all control features necessary to prevent run-on of stormwater or erosion or scouring of the containment structures or structural elements of the closed surface impoundment resulting from a 24-hour storm or flood having a recurrence interval of once in 100 years.
11. The Discharger shall provide, at a minimum, provisions for the following as part of the Final Closure and Post-Closure Maintenance for P-1:
 - a. continued ground water quality monitoring;
 - b. maintenance and proper grading of the final cover's surface features and surrounding berms;
 - c. maintenance of sufficient financial assurance documents for post-closure maintenance and reasonably foreseeable releases; and

- d. effective restriction of public access to the final cover, stormwater diversion channel, and any other features associated with P-1's closure.

B. Detection Monitoring Program

The Discharger shall maintain a Detection Monitoring Program as required in Section 20385(a)(1) of Title 27.

C. Evaluation Monitoring Program

The Discharger shall establish an Evaluation Monitoring Program whenever there is statistically significant evidence of a release from the Facility as required in Section 20385(a)(2) or (3) of Title 27.

D. Corrective Action Program

The Discharger shall institute a CAP when required pursuant to Section 20385(a)(4) of Title 27.

II. WATER QUALITY MONITORING AND RESPONSE PROGRAMS

A. Water Quality Protection Standard

1. At any given time, the concentration limit for each monitoring parameter constituent of concern shall be equal to the background value of that constituent.
2. If the Discharger or Executive Officer determines that concentration limits were or are exceeded, the Discharger may immediately institute verification procedures upon such determination as specified below or submit an amended RWD within 90 days of such determination in order to establish an Evaluation Monitoring Program.

B. Statistical Methods

1. The Discharger shall use approved statistical data analysis methods to evaluate Point of Compliance data in order to determine "measurably significant" (as defined in §20164 of Title 27) evidence of a release from the Evaporation Ponds. Approved methods may include an intrawell statistical approach proposed by the Discharger.
2. Allowable statistical methods include: Parametric Analysis of Variance (ANOVA) Nonparametric ANOVA, Tolerance Interval, Control Chart, or other statistical method approved by the Regional Board.

3. The Discharger shall determine, within 60 days after completion of sampling, whether there is statistically significant evidence of a release from the Impoundments at each Monitoring Point. The analysis shall consider all monitoring parameters and constituents of concern. The Executive Officer may make an independent finding that there is statistically significant evidence of a release or physical evidence of a release.
4. If there is statistically significant evidence of a release, the Discharger shall immediately notify the Regional Board by certified mail (see notification procedures contained in the MRP). Subsequently, the Discharger may immediately initiate verification procedures as specified below whenever there is a determination by the Discharger or Executive Officer that there is statistically significant evidence of a release.
5. If the Discharger does not use verification procedures to evaluate evidence of a release, then there is confirmation that there is statistically significant evidence of a release. The Discharger is required to submit, within 90 days of such confirmation, an amended RWD in order to establish evaluation monitoring (see subsection, II.E, entitled "Evaluation Monitoring Program") or make a demonstration to the Regional Board that there is a source other than the Impoundments that caused evidence of a release (see notification procedures contained in the MRP).

C. Nonstatistical Methods

The Discharger shall determine whether there is significant physical evidence of a release from the Facility. Significant physical evidence may include, but is not limited to, unexplained volumetric changes in the Facility, unexplained stress in biological communities, unexplained changes in soil characteristics, visible signs of leachate migration, and unexplained water table mounding beneath or adjacent to the Facility, or any other change in the environment that could be reasonably be expected to be the result of a release from the Facility (see notification procedures contained in the MRP).

D. Verification Procedures

1. The Discharger shall immediately initiate verification procedures as specified below whenever there is a determination by the Discharger or Executive Officer that there is evidence of a release. If the Discharger declines the opportunity to conduct verification procedures, the Discharger shall submit a technical report as described below under the heading Technical Report without Verification Procedures.
2. The verification procedure shall only be performed for the constituent(s) that has shown a statistically significant evidence of a release, and shall be performed for those Monitoring Points at which a release is indicated.

3. If a determination is made that there is evidence of a release using the Prediction or Tolerance Interval Method, the Discharger may, within 30 days of such determination, update the Upper Tolerance Limit and reevaluate Point of Compliance data in order to verify evidence of a release from the Impoundments. The Discharger must also collect three additional samples from the affected Monitoring Points and compare the results to the updated Upper Tolerance Limit.
4. The Discharger shall either conduct a composite retest using data from the initial sampling event with all data obtained from the resampling event or shall conduct a discrete retest in which only data obtained from the resampling event shall be analyzed to verify evidence of a release.
5. The Discharger shall report to the Regional Board by certified mail the results of the verification procedure, as well as all concentration data collected for use in the retest within seven days of the last laboratory analysis.
6. If the Discharger or Executive Officer verify evidence of a release, the Discharger is required to submit, within 90 days of such a determination that there is, or was, a release, a technical report pursuant to Section 13267(b) of the California Water Code. The report shall propose an Evaluation Monitoring Program (see subsection, II.E., entitled "Evaluation Monitoring Program"), **OR**, make a demonstration to the Regional Board that there is a source other than the Impoundments that caused evidence of a release (see notification procedures contained in the MRP).

E. Technical Report without Verification Procedures

If the Discharger chooses to not initiate verification procedures after there has been a determination made for evidence of a release, a technical report shall be submitted pursuant to Section 13267(b) of the California Water Code. The report shall propose an evaluation monitoring program, **OR**, attempt to demonstrate that the release did not originate from the Facility.

III. PROVISIONS

A. Standard Provisions

The Discharger shall comply with the "Standard Provisions for Waste Discharge Requirements," dated September 1, 1994, in Attachment "E," which is made part of this Order.


B. Monitoring and Reporting

1. Pursuant to California Water Code Section 13267(b), the Discharger shall comply with MRP No. 00-74.
2. The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994 which is attached to and made part of the MRP.

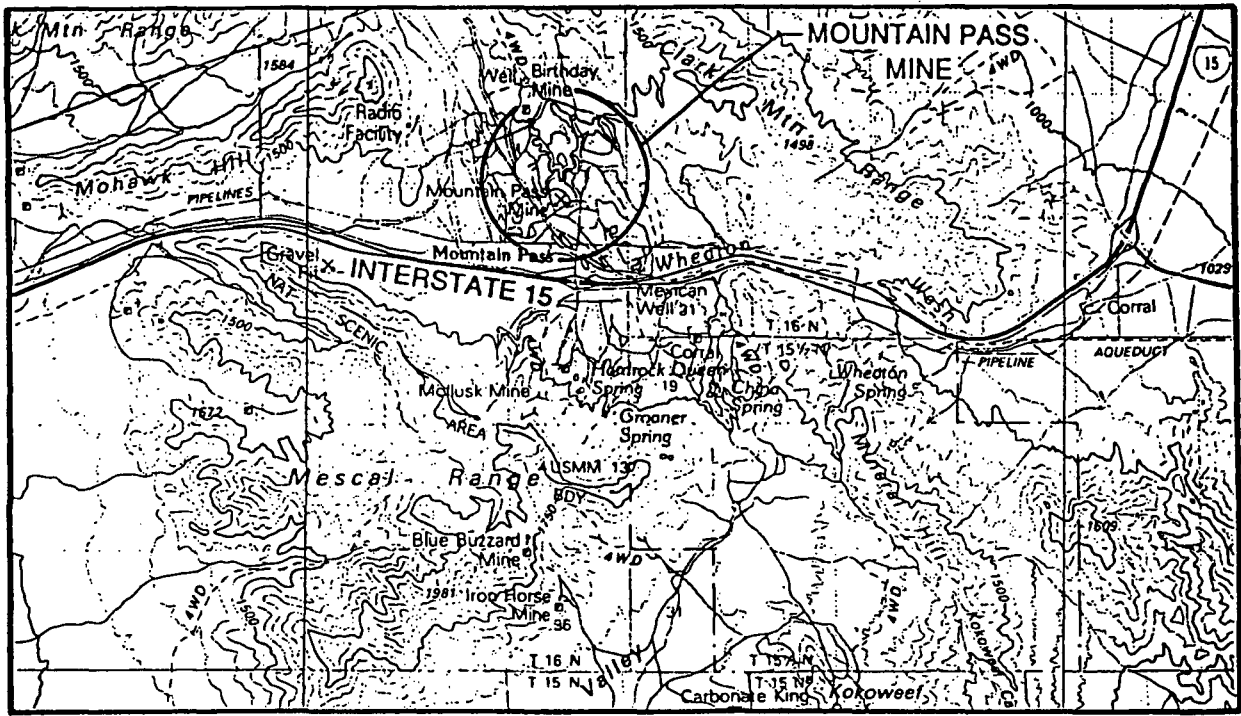
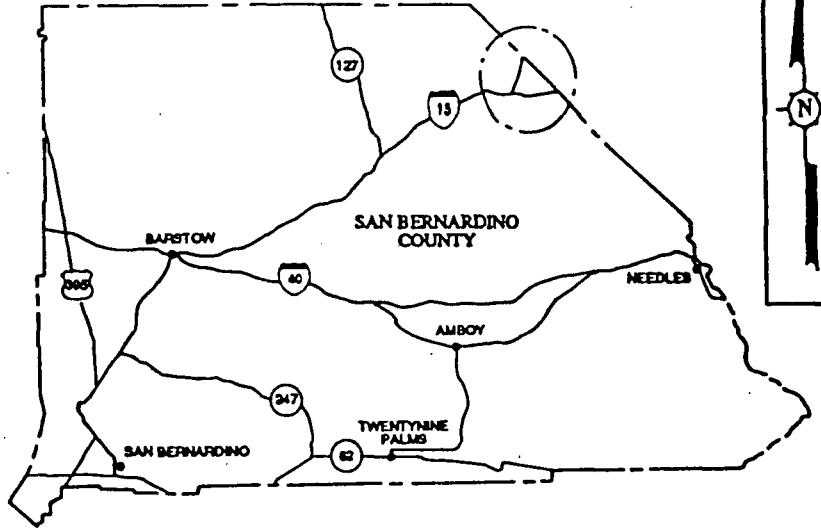
C. Post Closure Maintenance Plan

The Post-Closure Maintenance Plan shall be updated if there is a substantial change in operations and a report shall be submitted annually indicating conformance with the existing plan. Any amended Post-Closure Maintenance Plan shall be prepared by or under the supervision of either a California Registered Civil Engineer or a Certified Engineering Geologist.

I, Harold J. Singer, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by California Regional Water Quality Control Board, Lahontan Region, on September 14, 2000.


HAROLD J. SINGER
EXECUTIVE OFFICER

- Attachments:
- A. Location Map
 - B. Mountain Pass Site Map
 - C. P-1 Area Map
 - D. Cross Section Map
 - E. Standard Provisions for Waste Discharge Requirements



NOT TO SCALE

FIGURE 1.1

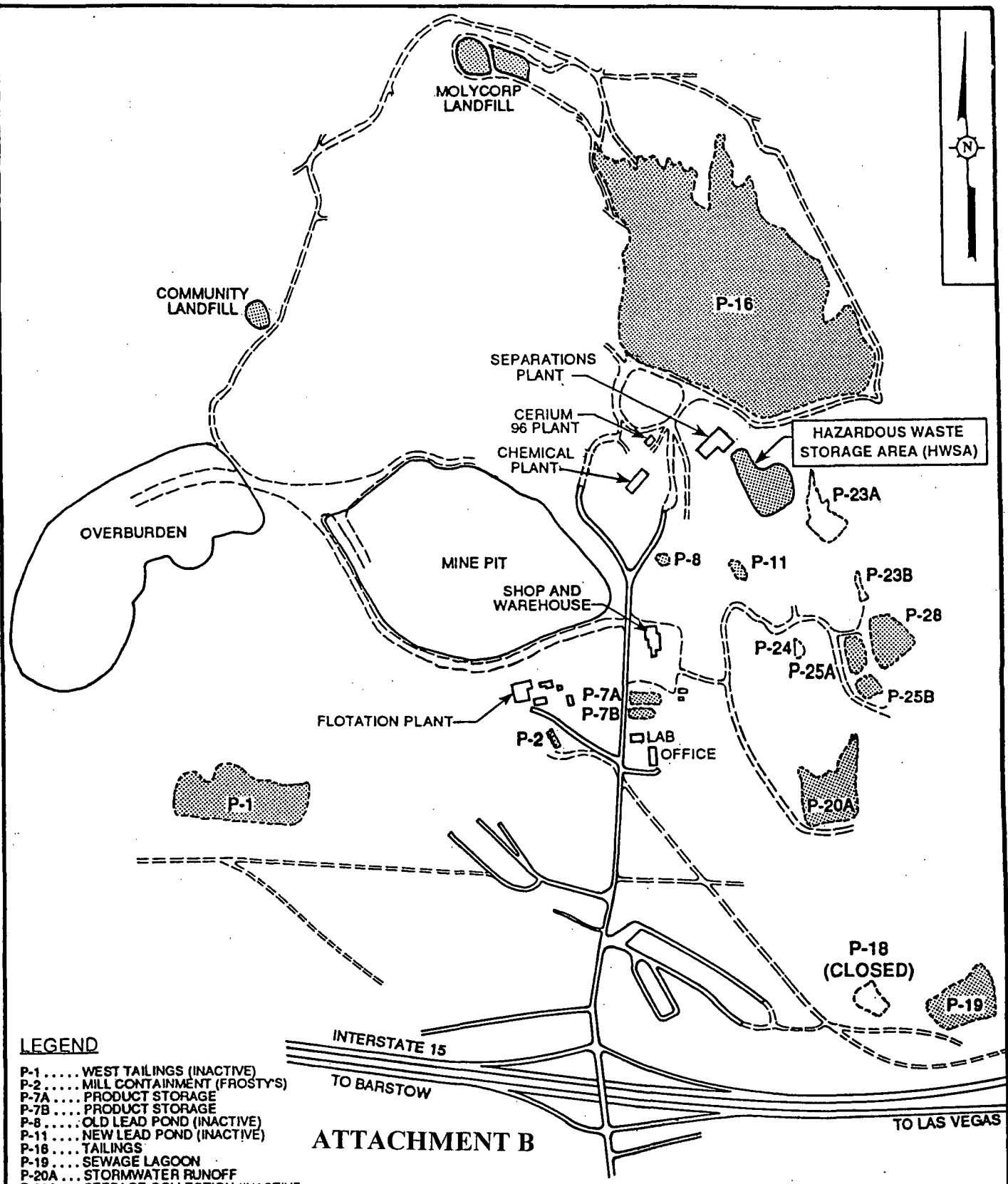
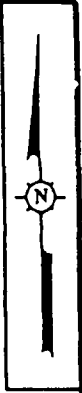
SITE LOCATION MAP

MOUNTAIN PASS MINE
MOLYCORP, INC.

ENVIRONMENTAL SOLUTIONS, INC.

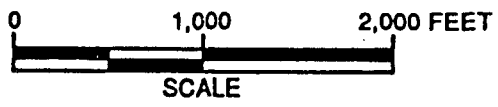
ATTACHMENT A

REFERENCE: USGS 30 X 60 MINUTE QUADRANGLE TOPOGRAPHIC MAP OF IVANPAH CALIFORNIA-NEVADA. 1985.



LEGEND

- P-1 WEST TAILINGS (INACTIVE)
- P-2 MILL CONTAINMENT (FROSTY'S)
- P-7A PRODUCT STORAGE
- P-7B PRODUCT STORAGE
- P-8 OLD LEAD POND (INACTIVE)
- P-11 NEW LEAD POND (INACTIVE)
- P-16 TAILINGS
- P-19 SEWAGE LAGOON
- P-20A STORMWATER RUNOFF
- P-23A SEEPAGE COLLECTION (INACTIVE)
- P-23B SEEPAGE COLLECTION (INACTIVE)
- P-24 OLD LEAD POND (INACTIVE)
- P-25A PRODUCT STORAGE
- P-25B PRODUCT STORAGE
- P-28 PRODUCT STORAGE



REFERENCE: COOPER AERIAL SURVEY COMPANY OF TUCSON, ARIZONA.
 MAP DATED MARCH 1978 AND AERIAL PHOTOGRAPH WAS
 TAKEN ON OCTOBER 10, 1977.

ATTACHMENT B

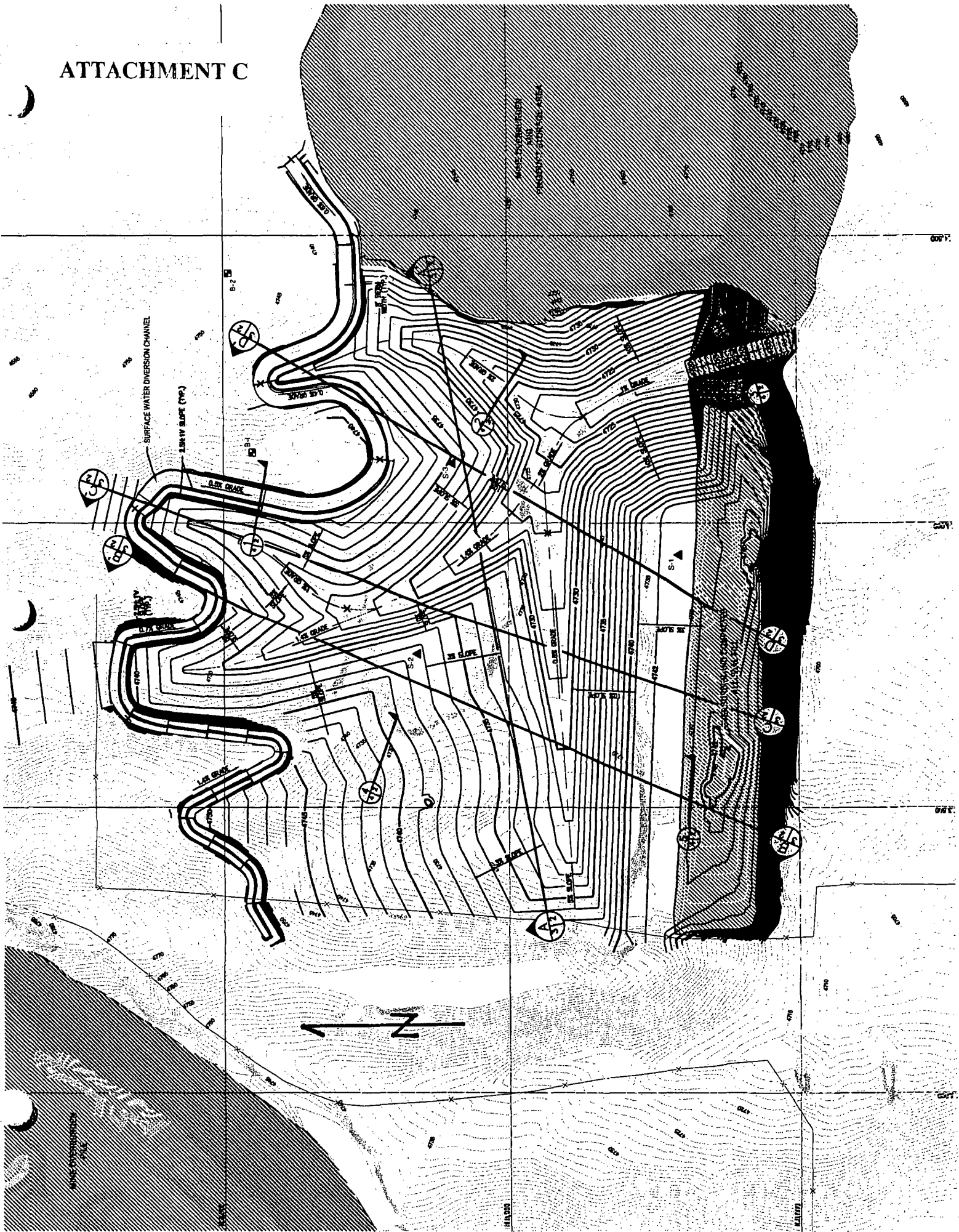
FIGURE 2.1

SITE FACILITY MAP

MOUNTAIN PASS MINE
 MOLYCORP, INC.

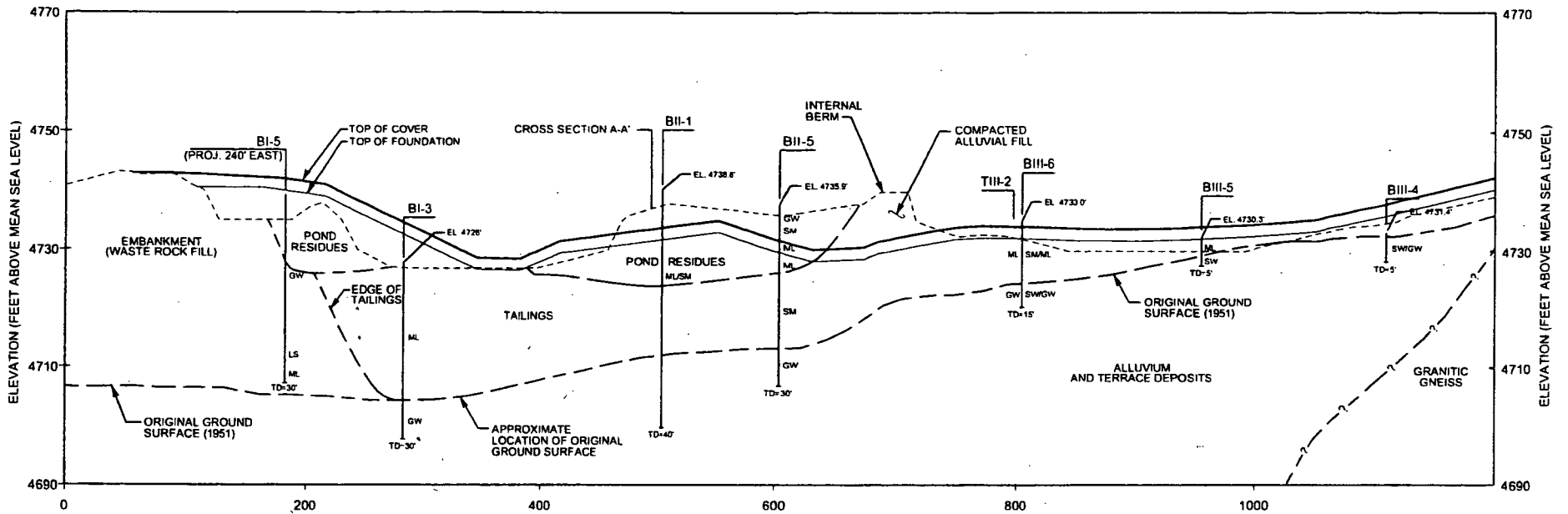
ENVIRONMENTAL SOLUTIONS, INC.

ATTACHMENT C

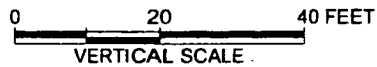
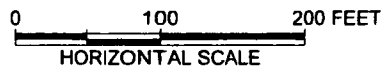


C
SOUTHWEST

C'
NORTHEAST



CROSS SECTION C-C'



ATTACHMENT D

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

STANDARD PROVISIONS
FOR WASTE DISCHARGE REQUIREMENTS ATTACHMENT E

1. Inspection and Entry

The Discharger shall permit Regional Board staff:

- a. to enter upon premises in which an effluent source is located or in which any required records are kept;
- b. to copy any records relating to the discharge or relating to compliance with the Waste Discharge Requirements;
- c. to inspect monitoring equipment or records; and
- d. to sample any discharge.

2. Reporting Requirements

- a. Pursuant to California Water Code 13267(b), the Discharger shall immediately notify the Regional Board by telephone whenever an adverse condition occurred as a result of this discharge; written confirmation shall follow within two weeks. An adverse condition includes, but is not limited to, spills of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance.
- b. Pursuant to California Water Code Section 13260(c), any proposed material change in the character of the waste, manner or method of treatment or disposal, increase of discharge, or location of discharge, shall be reported to the Regional Board at least 120 days in advance of implementation of any such proposal. This shall include, but not limited to, all significant soil disturbances.
- c. The Owners/Discharger of property subject to Waste Discharge Requirements shall be considered to have a continuing responsibility for ensuring compliance with applicable Waste Discharge Requirements in the operations or use of the owned property. Pursuant to California Water Code Section 13260(c), any change in the ownership and/or operation of property subject to the Waste Discharge Requirements shall be reported to the Regional Board. Notification of applicable Waste Discharge Requirements shall be furnished in writing to the new owners and/or operators and a copy of such notification shall be sent to the Regional Board.
- d. If a Discharger becomes aware that any information submitted to the Regional Board is incorrect, the Discharger shall immediately notify the Regional Board, in writing and correct that information.
- e. Reports required by the Waste Discharge Requirements, and other information requested by the Regional Board, must be signed by a duly authorized representative of the Discharger. Under Section 13268 of the California Water Code, any person failing or refusing to furnish technical or monitoring reports, or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation.

- f. If the Discharger becomes aware that their Waste Discharge Requirements (or permit) is no longer needed (because the project will not be built or the discharge will cease) the Discharger shall notify the Regional Board in writing and request that their Waste Discharge Requirements (or permit) be rescinded.

3. Right to Revise Waste Discharge Requirements

The Regional Board reserves the privilege of changing all or any portion of the Waste Discharge Requirements upon legal notice to and after opportunity to be heard is given to all concerned parties.

4. Duty to Comply

Failure to comply with the Waste Discharge Requirements may constitute a violation of the California Water Code and is grounds for enforcement action or for permit termination, revocation and reissuance, or modification.

5. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of the Waste Discharge Requirements which has a reasonable likelihood of adversely affecting human health or the environment.

6. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the Waste Discharge Requirements. Proper operation and maintenance includes adequate laboratory control, where appropriate, and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the Waste Discharge Requirements.

7. Waste Discharge Requirement Actions

The Waste Discharge Requirements may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for waste discharge requirement modification, revocation and reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any of the Waste Discharge Requirements conditions.

8. Property Rights

The Waste Discharge Requirements do not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

9. Enforcement

The California Water Code provides for civil liability and criminal penalties for violations or threatened violations of the Waste Discharge Requirements including imposition of civil liability or referral to the Attorney General.

10. Availability

A copy of the Waste Discharge Requirements shall be kept and maintained by the Discharger and be available at all times to operating personnel.

11. Severability

Provisions of the Waste Discharge Requirements are severable. If any provision of the requirements is found invalid, the remainder of the requirements shall not be affected.

12. Public Access

General public access shall be effectively excluded from disposal/treatment facilities.

13. Transfers

Providing there is no material change in the operation of the facility, this Order may be transferred to a new owner or operator. The owner/operator must request the transfer in writing and receive written approval from the Regional Board's Executive Officer.

14. Definitions

- a. "Surface waters" as used in this Order, include, but are not limited to, live streams, either perennial or ephemeral, which flow in natural or artificial water courses and natural lakes and artificial impoundments of waters. "Surface waters" does not include artificial water courses or impoundments used exclusively for wastewater disposal.
- b. "Ground waters" as used in this Order, include, but are not limited to, all subsurface waters being above atmospheric pressure and the capillary fringe of these waters.

15. Storm Protection

- a. All facilities used for collection, transport, treatment, storage, or disposal of waste shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a storm or flood having a recurrence interval of once in 100 years.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

MONITORING AND REPORTING PROGRAM NO. 00-74
WDID NO. 6B360008001

FOR

MOLYCORP, INC.
MOUNTAIN PASS MINE AND MILL SITE
CLOSURE AND POST-CLOSURE MAINTENANCE, WEST (OLD) TAILINGS POND P-1

San Bernardino County

I. MONITORING

New and existing Group A and B Mining Units shall comply with the monitoring provisions contained in Section 20385 through Section 20430 of Title 27, California Code of Regulations.

A. Settlement Monitoring

Yearly, the Discharger shall survey, using a licensed survey or other appropriate method, the benchmarks on the final cover to determine the amount of settlement during the previous year. This information shall be submitted in the yearly report.

B. Integrity of Final Cover

Semi-Annually, before and after the rainy season, the Discharger shall inspect the final cover to identify (and repair) any damaged areas, cracked areas, or other breaches of the final cover system. Any slope stability problems shall be identified and remedied. The Discharger shall also evaluate the (re)vegetation of the final cover.

C. Ground Water Monitoring

1. Based on the ground water flow direction, the placement and designation of the upgradient and downgradient wells shall be verified annually, as appropriate. Annually, a map showing the wells sampled and ground water elevations shall be submitted.
2. Quarterly, samples will be collected to determine concentrations of the following analytes and values of the following parameters:

Quarterly Ground Water Sampling Analytes

Analyte	Units	Analyte	Units
Ca	mg/L	Mn	"
Mg	"	Mo	"
Na	"	Pb	"
K	"	Zn	"
CO ₃ + HCO ₃	"	TDS	"
SO ₄	"	Ra ²²⁶	pCi/g
Cl	"	Ra ²²⁸	"
NO ₃ (as Nitrate)	"	U ²³⁴	"
As	"	U ²³⁵	"
Ba	"	U ²³⁸	"
Bo	"	Th ²²⁸	"
Co	"	Th ²³⁰	"
Cr	"	Th ²³²	"
Cu	"	Th ²³⁴	"

Quarterly Ground Water Sampling Parameters

Parameter	Units
Standing Water Level (SWL)	Feet above msl
Electrical Conductivity (E _c)	µmhos/cm
pH	0 - 14
Temperature (T)	°F or °C

- Each monitoring well shall be sufficiently purged, in accordance with generally accepted sampling practice, to obtain a "representative" ground water sample. If a non-purging method is used, the method proposed must be approved, in advance, by Regional Board staff.

D. Sampling Methods

Sample analyses shall be in accordance with the current methods contained in one of the following documents:

- Test Methods for Evaluating Solid Waste, EPA;
- Methods for Chemical Analysis of Water and Wastes, EPA;
- Standard Methods for the Examination of Water and Wastewater; and
- Section 66699 and 66700, Division 4, Title 33, California Code of Regulations, for determination of hazardous waste classifications.

Any modifications to the above methods to eliminate interferences shall be reported with the sample results. The analytical methods used shall also be reported.

E. Operation & Maintenance

A brief summary of any operational problems and maintenance activities shall be submitted to the Regional Board with each monitoring report for Mountain Pass Operations. This summary shall discuss:

1. Any modifications, additions, or major maintenance to the stormwater conveyance system, treatment facilities, or disposal facilities.
2. Any major problems occurring in the stormwater conveyance system, treatment facilities, or disposal facilities.
3. The calibration of any wastewater flow measuring devices.

II. REPORTING

A. Submittal Periods

Monitoring reports including the preceding information shall be submitted to the Regional Board 60 days following each quarterly sampling. If any re-analyses are required, these data shall be submitted with the next quarter report. These data shall be combined with the quarterly and yearly Mine and Mill Monitoring Report.

B. Authorization

A principal Executive Officer or other duly authorized employee shall sign monitoring reports.

C. Information

Monitoring reports are to include the following:

1. Name and telephone number of an individual who can answer questions about the report.
2. Monitoring and Reporting Program No. 00-74
3. WDID No. 6B360008001

D. Annual Report

By **March 30** of each year, the Discharger shall submit an annual report to the Regional Board with the following information:

1. The compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the discharge requirements.

2. Evidence that adequate financial assurances for Post-Closure Maintenance and Reasonably Foreseeable Release are still in effect. Evidence may include a copy of the renewed financial instrument or a copy of the receipt for payment of the financial instrument.
3. Evidence that the amount is still adequate or increase the amount of financial assurance by the appropriate amount if necessary, due to inflation, a change in the approved closure plan, or other unforeseen events.
4. Graphical and tabular data for the monitoring data obtained for the previous year.
5. A description documenting progress in attaining full compliance with Title 27 regulations. The report shall include a description of all actions accomplished and a time schedule for additional proposed compliance actions.
6. A review of the closure plan and certification that it is still adequate.

E. Failure to Furnish Reports

Any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation under Section 13268 of the California Water Code.

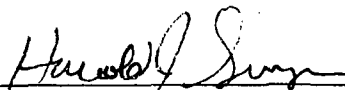
F. Violations

If monitoring data indicate violations of WDRs, the Discharger shall provide information indicating the cause of violation(s) and action taken or planned to bring the discharge into compliance.

G. Reporting

The Discharger shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made a part of this Monitoring and Reporting Program.

Ordered by:



HAROLD J. SINGER
EXECUTIVE OFFICER

Dated: September 14, 2000

Attachment: General Provisions for Monitoring and Reporting Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

- a. All analyses shall be performed in accordance with the current edition(s) of the following documents:
 - i. Standard Methods for the Examination of Water and Wastewater
 - ii. Methods for Chemical Analysis of Water and Wastes, EPA
- b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board. Specific methods of analysis must be identified on each laboratory report.
- c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The method used shall also be reported. If methods other than USEPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.
- d. The Discharger shall establish chain-of-custody procedures to ensure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.
- e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall ensure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.
- f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.
- g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be obtained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

- a. For every item 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 submit a timetable for correction.
- b. Pursuant to California Water Code Section 13267(b), all sampling shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.
- c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Regional Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.
- d. Monitoring reports shall be signed by:
 - i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;
 - ii. In the case of a partnership, by a general partner;

- iii. In the case of a sole proprietorship, by the proprietor;
 - iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.
- e. Monitoring reports are to include the following:
- i. Name and telephone number of individual who can answer questions about the report.
 - ii. The Monitoring and Reporting Program Number.
 - iii. WDID Number.
- f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars (\$1,000) for each day of violation under Section 13268 of the Water Code.

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

MEETING OF SEPTEMBER 14, 2000

Primm

ITEM:

8

SUBJECT:

**NEW WASTE DISCHARGE REQUIREMENTS-
MOLYCORP, INC., MOUNTAIN PASS MINE AND MILL
SITE, CLOSURE AND POST-CLOSURE MAINTENANCE;
WEST (OLD) TAILINGS POND P-1, SAN BERNARDINO
COUNTY**

CHRONOLOGY:

March 1995	Molycorp submits Site Characterization Report and Recommendations for Closure. Volumes I and II
August 1995	Molycorp submits Closure and Post-Closure Maintenance Plan West (Old) Tailings Pond P-1. Volume 1: Waste Relocation and Foundation Layer Design
May 1997	Molycorp submits Closure and Post-Closure Maintenance Plan West (Old) Tailings Pond P-1. Volume 2: Final Cover Design
February 2000	Molycorp submits Addendum to Closure and Post-Closure Maintenance Plan, West (Old) Tailings Pond P-1

ISSUE:

Whether to allow Molycorp, Inc., to install an Alternative Final Cover to Title 27's prescriptive requirements.

DISCUSSION:

The prescriptive Title 27 cover requires an infiltration barrier of 12-inches of compacted clay with a permeability of 1×10^{-6} cm/s (or less) covered by soil (erosion-resistant layer) capable of supporting vegetation.

In arid and semi-arid regions, a compacted clay layer would suffer the deleterious effects of desiccation and cracking during the hot dry periods and freezing/thawing during cold wet periods. These cracks in the clay layer would allow infiltration of precipitation through the cover. Furthermore, if used, clay would have to be trucked in making a compacted clay layer prohibitively expensive.

Therefore, the Discharger is proposing a geocomposite layer (GCL) as an alternative to the prescriptive Title 27 compacted clay layer. The GCL contains a minimum thickness of 0.25-inches of bentonite and exhibits an effective hydraulic conductivity of 5×10^{-8} cm/s when tested under low confining stresses. GCL products are less subject to

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION**

FACT SHEET

ITEM NO.: 8

DISCHARGER NAME: Molycorp, Inc.

PROJECT NAME: Closure and Post-Closure Maintenance, West (Old) Tailings Pond P-1

WDID NO.: 6B360008001

FACILITY TYPE: Tailings pond for the disposal of flotation plant slurries and tailings.

LOCATION: Mountain Pass, San Bernardino County T16N, R13E, Sections 11, 12, 13, & 14 SBB&M

TYPES OF WASTE: Dried mill tailings from the processing of basnasite ore classified as Group B mining wastes

WASTE MANAGEMENT CLASSIFICATION: Class II Surface Impoundments required to comply with closure requirements of Title 27, California Code of Regulations

TREATMENT FACILITIES: N/A

DISPOSAL FACILITIES: Evaporation pond

THREAT/COMPLEXITY/PROGRAM: 2/B/Title 27

VOLUME OF WASTE: Approximately 450,000 cubic yards

CEQA COMPLIANCE: Project consists only of closure and post-closure maintenance in accordance with an approved closure and post-closure maintenance plan and is therefore categorically exempt from the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code, §21000 et seq.) in accordance with §15301 of the CEQA Guidelines.

LAND OWNED CONTROLLED BY: Molycorp, Inc.

NEARBY DEVELOPMENT: Public lands in the vicinity of the mine are managed by the Bureau of Land Management and by the National Park Service. A public elementary school is located at the Mountain Pass, adjacent to the plant site. A California Department of Transportation highway maintenance station and California Highway Patrol residences are at Mountain Pass near I-15. There are also several parcels of privately owned land, some with residences, located in the general area.

NATURE OF AREA: Arid high desert with alternating north-south trending basin and mountain range topography