

Chino Mines Company
Hurley, New Mexico 88043
505 537-3381

DP-484

May 5, 1987

HAND DELIVERED

Mr. Michael Burkhart, Director
State of New Mexico
Environmental Improvement Division
P.O. Box 968
Santa Fe, NM 87504-0968

Dear Mr. Burkhart:

Enclosed with this letter is a proposed ground-water discharge plan for the No. 7 tailing dam.

This dam promises to be a vital part of the Chino operation, and we intend to ensure that it complies with all applicable environmental regulations. To this end, we look forward to working with you and your staff to obtain an approved ground-water discharge plan for the No. 7 tailing dam as soon as possible.

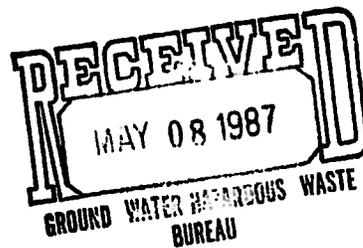
Yours very truly,

C. Vance

C. K. Vance
Manager

CKV/MRK:jw
Enclosure

cc: D. P. Milovich
T. S. Oliver
M. R. Koranda



EXHIBIT

tabbies

Freeport-J

DP-484

CHINO MINES COMPANY
HURLEY, NEW MEXICO 88043

DISCHARGE PLAN
NO. 7 TAILING DAM

MAY, 1987

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- B. MONITOR WELL QUALITY AND LEVEL DATA

CHINO MINES COMPANY
HURLEY, NEW MEXICO 88043

DISCHARGE PLAN
NO. 7 TAILING DAM

SPECIFICS

The No. 7 tailing dam is shown on figure 1 in the Groundwater Resources Consultants, Inc. report, which has been previously sent to the New Mexico Environmental Improvement Division. This tailing dam is located in all or portions of sections 16, 18, 19, 20, 21, 28, 29, and 30, T. 19 S., R. 12 W. and will cover an area of approximately 1,905 acres. A low starter dam will be constructed, of compacted soil, around the perimeter of the No. 7 tailing dam. Successive lifts upon the starter dam will be constructed of tailing sands. The tailing material slopes back from the starter dam with each lift.

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1325.7
ACRES.

WOODWAY
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USED IN

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STUDY

The tailing will flow by gravity or will be pumped to the No. 7 tailing dam where there is an initial separation of sand from water and slimes for lift construction. A pond is created behind the dam where additional clarification takes place by settling. Water decanted or pumped from this pond is returned to the mill for reuse.

The construction and operation of the proposed tailing dam will be in accordance with design and procedures approved by the New Mexico State Engineer.

The tailing flow is estimated to be 48,400 TPD at 40% solids, based upon the mill processing 50,000 TPD of ore.

SEEPAGE QUANTITY

A water balance has been calculated to attempt to estimate the seepage quantity from the No. 7 tailing dam. The assumptions used for this water balance are the following:

1. A 50,000 TPD average ore throughput, resulting in an estimated 48,400 TPD tailings at 40% solids.
2. A recycle of approximately 48.5% of the total inflow to the tailing dam back to the concentrator, based upon historical data.
3. A retention of approximately 22% of the water in the tailing solids, based upon historical data.
4. A net evaporation of 62 inches per year, based upon historical data. The No. 7 tailing dam will cover a total area of approximately 1,905 acres. It was determined that approximately 50% of this area should be used to calculate the output from the No. 7 tailing dam due to evaporation, using a 0.7 evaporation factor.

Reference?

The calculated water balance to determine by difference the annual average seepage rate in GPM from the No. 7 tailing dam is as follows:

<u>Inputs</u>	<u>GPM</u>
Water in tailings	12,100
Sewage effluent	825
Smelter effluent	<u>460</u>
Total	13,385
<u>Outputs</u>	<u>GPM</u>
22% Water retention in solids	2,662
48.5% recycle to concentrator	6,492
Annual evaporation - 953 acres	<u>2,137</u>
Total	11,291
Seepage (annual average)	2,094

This estimated seepage rate compares favorably with other estimates of seepage presented in the 1983 proposed discharge plan for Bolton pond and pond 7.

SEEPAGE QUALITY

Seepage quality is assumed to be the quality of tailing decant return water. This water may be sampled at the No. 7 tailing dam by bailing from the decant return water pond. A recent analysis of a decant return water sample obtained from Axiflo Lake is enclosed as appendix A.

WATERCOURSES

Whitewater Creek is the principal watercourse in the area of the No. 7 tailing dam. It is shown on figure 1 of the Groundwater Resources Consultants, Inc. report.

Chino Mines Company will divert Whitewater Creek around the No. 7 tailing dam, and there will be no surface discharges from this dam to Whitewater Creek.

Whitewater Creek is an ephemeral stream, and water level measurements indicate that baseflow to this stream cannot occur in the area of the No. 7 tailing dam.

GROUND-WATER DISCHARGE SITES

Axiflow Lake and a number of wells are located within a one-mile perimeter of the No. 7 tailing dam. These wells are the following:

DM6S	DM3D	DM14S	7ES
DM6D	DM11S	DM14D	7ED
DM7S	DM11D	7NS	7FS
DM7D	DM12S	7AS	7GS
WW20	DM12D	7BS	7LS
DM2S	DM8S	7BD	7MS
DM2D	DM8I	7CS	7IS
DM1D	DM13S	7DS	7JS
DM3S	DM13D	7KS	7HS

Apache Tejo wells (12)
Bolton field wells (14)

GEOLOGY

A geologic description of the site of the No. 7 tailing dam is as follows:

The drainage channel of Whitewater Creek has exposed outcrops of geologic units ranging in age from Paleozoic to Recent age. Composition of these units includes sedimentary and intrusive and extrusive igneous rocks. North and east of the No. 7 tailing dam site, volcanic rocks are exposed and form steep slopes where they have been eroded by Whitewater Creek. The volcanic units dip gently toward the east between 6 and 13 degrees and strike toward the north-northeast. North of the Apache Tejo well field, limited outcrops of Paleozoic limestones are exposed, and these units strike approximately north and dip toward the east. Outcrops of sedimentary units of the Gila Conglomerate, Quaternary alluvium, and surface deposits cover the entire No. 7 tailing dam site. Erosion and weathering of surface outcrops have mantled the area with reworked deposits of exposed rock units, and altered outcrops of the Gila Conglomerate are not observed. Along Whitewater Creek, well-developed alluvial deposits are present. At the site of the No. 7 tailing dam, these deposits are indistinguishable from the surface deposits and the Gila Conglomerate.

The elevation of the contact between the Gila Conglomerate and the underlying volcanic and Paleozoic rock units under the No. 7 tailing dam site is extremely variable. It is estimated to range from approximately 600 to 1,200 feet. The variability of this contact is probably the result of erosion in ancient stream channels prior to the deposition of the Gila Conglomerate. These ancient stream channels have depths in excess of 1,300 feet and extremely steep sides. These channels appear to have resulted from the rapid erosion of the uplifted rock units exposed on the north side of the Silver City Fault.

There are no geologic structures within the site of the No. 7 tailing dam. The presence of the Silver City Fault has been inferred by Trauger¹ (1972) to the south and west of the site. The ground surface topography is consistent with this fault location. North of this location, the surface topography is variable with many hills and valleys where streams have eroded the bedrock. South of this location, the ground surface slopes gently toward the south.

Geologic logs of the following wells are enclosed in the Groundwater Resources Consultants, Inc. report:

7AS	7HS
7BD	7IS
7CS	7JS
7DS	7KS
7ED	7LS
7FS	7MS
7GS	7NS

Geophysical logs of the following wells are enclosed in the Groundwater Resources Consultants, Inc. report:

7AS	7ED
7BD	7GS
7CS	7HS
7DS	7JS

FLOODING POTENTIAL

Precipitation runoff can result in flood water entering the Whitewater drainage system. The construction of the No. 7 tailing dam requires diversion of the lower Whitewater drainage to the east around the new tailing area.

The Whitewater Creek diversion will be designed and constructed to flow a 10-year, 24-hour storm event, or such other

¹Trauger, F. D., The Water Resources and General Geology of Grant County, New Mexico, Hydrologic Report No. 2, New Mexico Bureau of Mines and Mineral Resources, 1972.

event as the New Mexico State Engineer may require. This design will be such that flow in the Whitewater Creek during a flood event will not impact the No. 7 tailing dam.

Precipitation onto the No. 7 tailing dam area from the design event will be totally contained within this area by the starter dam and tailing lifts on the perimeter of the tailing area.

GROUND WATER MOST LIKELY TO BE AFFECTED
BY THE DISCHARGE AND FLOW CHARACTERISTICS

During the operation of the No. 7 tailing dam, there is potential for decant return water to infiltrate the tailing dam base to ground water.

The estimated rate of seepage for the No. 7 tailing dam is given in the above section titled "Seepage Quantity."

Based upon ground-water level information obtained from wells around and within the No. 7 tailing dam area, the ground-water gradient and resulting flow underlying the No. 7 tailing dam is to the south-southeast.

The ground-water elevation contours in the area of the No. 7 tailing dam are shown on figure 4 of the Groundwater Resources Consultants, Inc. report.

The wells most likely to be affected by seepage from the No. 7 tailing dam are the wells recently installed around the site. These wells are the following:

7AS	7FS
7BS	7GS
7BD	7LS
7CS	7MS
7DS	7IS
7KS	7JS
7ES	7NS
7ED	7HS

The available water quality and level data for these wells are enclosed as appendix B (well 7IS has been dry since drilled).

WELL ABANDONMENT

All monitor and production wells within the No. 7 tailing dam area will be plugged in accordance with New Mexico Environmental Improvement Division and New Mexico State Engineer requirements. Monitor wells in this area will be sampled for as long as possible before plugging to obtain the maximum amount of ground-water quality and level information.

These wells (18 total) are the following:

- | | | |
|--------------------------|---------|---------|
| <i>not to be plugged</i> | DM8S | DM4D. |
| | DM8D | DM19S ✓ |
| | DM9S | DM19D |
| | DM9D | WW17 |
| | DMIUS ✓ | WW18 |
| | DM10D | WW21 |
| | DM5S | WW22 |
| | DM5D | WW23 |
| DM4S | WM21 | |

MONITORING

1. Samples of decant return water from the No. 7 tailing dam will be obtained semiannually by bailing.
2. Samples of the ground water at the sources (16 wells) most likely to be affected by the discharge will be obtained semiannually by bailing or pumping.
3. Analyses of the samples obtained will be made for the following constituents:

- | | |
|-----------------|------------------|
| TDS | Mg |
| SO ₄ | Na |
| pH | K |
| Conductivity | HCO ₃ |
| Temperature | Cu |
| Ca | Mo |

4. The results of the analyses will be sent to the New Mexico Environmental Improvement Division upon receipt by Chino Mines Company.

CONTINGENCY PLAN

Subsequent water users will be protected in the following manner:

1. Monitoring of the No. 7 tailing dam monitor wells will be conducted as described previously.
2. An analysis of the analytical results of the monitoring will be made to detect any increase in the concentration of any of the constituents.
3. Chino Mines Company will begin the following upon chemical evidence indicating a consistent increase in concentrations beyond that expected due to normal analytical error and natural geochemical variation in aquifer water quality:
 - a. A feasibility study will be made to determine the method which will be used to prevent harm to subsequent users.
 - b. Based upon the method selected, an engineering study will be conducted to determine how the method will be implemented.
 - c. Upon completion of the engineering study, any construction required to implement the method will be done.
 - d. The scheduling of the above steps 1, 2, and 3 will be such that they will be completed, and operation of the method will be commenced, before any subsequent user is harmed.

4. The Environmental Improvement Division will be notified by Chino Mines Company of all actions regarding the contingency plan.
5. The final contingency plan for the No. 7 tailing dam will be the product of the Environmental Improvement Division review of this proposed discharge plan.

FACILITY EXPANSION, INC.

Chino Mines Company will notify the Director of the Environmental Improvement Division of any facility expansion, production increase, or process modification that would result in any significant change in the discharge of water contaminants (Section 3-107.C).

CONCLUSION

The above proposed monitoring system, with the contingency provision activated by it, will protect the quality of the ground water at any place of withdrawal for present or reasonably foreseeable future use. Therefore, the plan is approvable because it meets the conditions as set forth in Section 3-109.C.2 of the New Mexico Water Quality Control Commission Regulations.

A P P E N D I X A.

DECANT WATER QUALITY ANALYSIS

SOURCE = TDRW
TAILINGS DECANT RETURN WATER

DATE	2-18-87
SAMPLE NO.	263
LAB	CEP
Na	89.9 mg/L
K	5.4 mg/L
Ca	556 mg/L
Mg	4.9 mg/L
Cl	73 mg/L
F	
NO3-N	
HCO3	
SO4	1460 mg/L
TDS	2970 mg/L
Conductance	1900 vinhos/cm
pH	6
CN	mg/L
Phenols	mg/L
Ag	mg/L
Al	mg/L
As	mg/L
B	mg/L
Ba	mg/L
Cd	mg/L
Co	mg/L
Cr	mg/L
Cu	mg/L
Fe	mg/L
Hg	mg/L
Mn	mg/L
Mo	mg/L
Ni	mg/L
Pb	mg/L
Se	mg/L
Zn	mg/L
TK-N	mg/L
NO2-N	mg/L
CO3	mg/L
Be	mg/L
PO4	mg/L
U	mg/L
Ra-226	pCi/L
Ra-228	pCi/L
Benzene	Vg/L
TOC	mg/L
DOC	mg/L
V	mg/L
CaCO3 Hardness	mg/L
CaCO3 Alkalinity	mg/L