Appendix E
Office Correspondence Internal Memorandum

ANACONDA COPPER MINING COMPANY
RESEARCH DEPARTMENT
ANACONDA, MONTANA

FREDERICK F. FRICK
RESEARCH ENGINEER

April 22, 1954

Mr. A. E. Millar, General Manager
A. C. M. Co. Yerington Mine
P. O. Box 1000
Weed Heights, Nevada

RE: Insulmastic Coatings

Dear Bert:

Insulmastic coatings of concrete tanks has become a matter of major importance to us in connection with the Grants Sandstone Plant.

I would much appreciate some detailed information from you in regard to the present status of the Insulmastic coatings used at Yerington.

1) Were the coatings at Yerington put on by representatives of the Insulmastic Company, men who were thoroughly experienced in the matter?

2) A Mr. Bulmer of the Insulmastic Company visited me about a month ago and told me that he had been to Yerington recently. He said that blisters had developed in the Insulmastic coatings due to pin holes and that these blisters were drained and dressed back into place. Is this the case?

3) The information he gave me called for curing the Insulmastic linings from 35 to 45 days in order to allow for complete evaporation of the solvent. Were the original coatings at Yerington cured for 35 days or more? Have any patches been made, and if so, how has the concrete surface been prepared and have the coatings been aged before use?

4) Are you entirely satisfied with the Insulmastic coatings; would you put them in again; would you recommend them for Grants and what suggestions would you make in regard to their choice and use?

I received your letter pertaining to the samples for Selenium determination. I find that the results on these samples are not yet ready for reporting.

You mentioned a visit by Mrs. Frick and myself to Yerington some time during this Spring. It now appears doubtful whether we will make the usual trip to California.

Yours truly,

F. F. Frick

FFF:hv

F. F. FRICK
Research Engineer

ANACONDA COPPER MINING COMPANY

Yerington Mine

P. O. Box 1000

Weed Heights, Nevada

A. E. MILLAR
General Manager

April 27, 1954

Memorandum to: Mr. A. E. Millar, General Manager

Subject: Insul-Mastic Coatings

In reference to Mr. F. F. Frick's letter of April 22, 1954 to Mr. A. E. Millar, the following information regarding Insul-Mastic Coating is submitted.

ITEM 1.

The Insul-Mastic coatings were applied by California Coatings, Inc. of Sacramento, California, a company licensed by Insul-Mastic to handle and apply their products. A field engineer from the home office of Insul-Mastic was present during most of the work, supervising the job.

All these men have presumably done many contracting jobs involving all the products of Insul-Mastic.

ITEM 2.

Blisters appeared on the East, North and West inner walls as well as the floor in a matter of a few hours after application. Atmospheric temperatures during the application period were around 90 degrees and the humidity was quite low. In our opinion, the high daytime temperature and low humidity caused very rapid evaporation of the solvents at the outer surface of the coating, thus sealing off the solvents under the surface. As the coating absorbed the heat from the sun, these entrapped solvents would volatilize, expanding the surface of the coating and forming blisters.

These blisters were all punctured and repaired with glass fabric and additional Insul-Mastic.

The blistering was very prevalent when the total coating thickness over the glass fabric was sprayed in one application. The blistering was practically eliminated when this coating was made in four separate applications, each approximately three days apart.

ITEM 3.

Because of the climatic conditions existing here, we were advised by the Insul-Mastic people that 35 to 45 days was not necessary for complete evaporation. We did not cure the coatings for this period before putting them to use, nor have we made any repairs to the coating as yet.

Subject: Insul-Mastic Coatings

ITEM 4.

It is a little early to tell whether the Insul-Mastic coatings are satisfactory. Apparently, they are standing up under the present conditions, that is, our copper solution to cementation and the Peabody Scrubber water which is running now about 130 degrees Fahrenheit. There is, however, a few blisters showing up now that the daytime temperatures have increased. The causes behind these blisters have not been determined.

We believe these coatings have many applications in metallurgical plants such as ours where there is acid conditions, whether it be storage of dilute acid solutions or protection of equipment or structures from corrosion.

If the acid conditions and solution temperatures at Grants are similar to ours, the Insul-Mastic should stand up satisfactorily.

Judging from the trouble experienced here with blistering, precautions should be taken to prevent uneven evaporation of the solvents such as: protect coating from direct sunlight until sufficiently cured; apply mastic on concrete that is cool and not hot from sun; apply coating in thin layers, waiting two or three days between applications, thus assuring a more complete evaporation of solvents throughout the layer without entrapment of the solvents. It is our understanding that the Insul-Mastic people have solved the blistering problem to some extent by preheating the mastic and applying it hot. This method supposedly releases the solvents almost immediately after application.

Frank M. Monninger
General Plant Foreman

FMM:dw

Eng. 011

July 27, 1955

MEMORANDUM TO: Mr. A.J. Gould, Plant Superintendent

SUBJECT: Water: Supply and Use

With the objective of determining the reasons for the variation in the amount of water available for Plant use, a survey of the supply and use of water has been conducted.

In general, no specific cases of misuse or waste have been revealed and the supply from the 6 active wells and its delivery into the water system has been constant. The only explanation lies in short periods of greater-than-average use that depletes the storage facilities and can only be replenished by a relatively small amount available over normal demands.

SUPPLY

The 6 wells supplying water for the project produce at a constant rate with little variation from day to day and no apparent variation between the three shifts. The fact that one or more of the wells does not pump for a short period, due to power failure or other cause, has little effect on the total volume pumped over the 24-hour period. On one day checked, a power failure occurred resulting in down-time of about 30 to 45 minutes per well. The pumping rate over the 24-hour period was 2424 GPM. Average rates the 24-hour periods preceding and following were 2478 and 2426 GPM respectively.

The average pumping rates of the 6 wells during July 1 to 22 were:

	Gallons/day	GPM
Well No. 1	622,080	432
Well No. 2	285,120	198
Well No. 3	490,920	343
Well No. 5	1,159,200	805
Well No. 6	403,200	280
Well No. 7	570,240	396
	3,530,760	2454

Four pumps in the main reservoir pump house transferring water from wells to the water system are operated on a completely automatic set-up dictated by water levels in the Plant head tanks and the main pump reservoir.

This system offers a more even supply to the head tanks than the manual-automatic combinations practiced in the past, as well as to minimize the amount of water allowed to flow to the Walker River. At the present rate of flow from the wells with the head tanks calling for water all the time, as is normally the case, two pumps run constantly and the third about 20% of the time to maintain the water level in the main pump station reservoir at between 2 1/2 and 3 1/4 feet. This puts the entire well output into the water system allowing none to flow to the river.

From time studies conducted on the operation of the third pump, it has been determined that each pump will deliver an average of 1165 GPM with 2 pumps operating and 974 GPM with 3 pumps operating. During the time the studies were made the water level in the head tanks averaged 4 feet and withdrawal from the 14" line was generally heavy, allowing a high average pumping efficiency.

USE

The table below shows the average daily water requirements of the project from July 1 to July 21, 1955, except for townsite use which has only been metered since July 15th, hence, averaged from that date.

	Gals per Day	GPM
Mine: Roads, drills, etc	90,000	62
Townsite	490,000	340
Plant:		
Acid Plant:		
Peabody Scrubber	930,000	600
Calcine Disposal (estimate)	200,000	140
Cooling Water	145,000	100
Misc. (estimate)	30,000	20
Total Acid Plant	1,355,000	940
Leaching Plant:		
Copper Solution	1,010,000	702 - 1/3 Reduced to
Tailings	395,000	275
Evaporation	90,000	63
	1,495,000	1040
Cementation (estimate)	175,000	121
Miscellaneous (Garage, Shops, Leaching, plant cleanup, etc. Estimate)	75,000	52
Total Plant	3,100,000	2151
Total Project	3,600,000	2553

Since the average requirement exceeds the average supply by 100 GPM, it is necessary to take that amount of Peabody Scrubber effluent into the leaching circuit to make up the difference. It is not taken at a constant or scheduled rate, but rather when shortage of fresh water necessitates.

Peabody Scrubber effluent enters the settling pond at an average temperature of 137° F. and discharges at 115° to 120° F depending upon wind conditions. An estimated 250 GPM of pond discharge is taken to cementation where it joins the spent solution to augment the volume pumped for calcine disposal. The remaining 430 GPM of scrubber water is divided between needs of leaching and direct transfer to the drainage area. The amount taken to leach is held to a minimum to maintain the lowest possible temperature in water pumped to the leaching circuit.

Introduction of scrubber water into the spent solution has released some fresh water used in disposal of calcine for use in the leaching circuit. Because the fresh water enters the calcine launders at higher velocity, it is more effective in cleaning the launders when calcine is coarse or rate of discharge increases. Normally there is a fluctuation in the rate of discharge requiring intermittant use of fresh water which adds to considerable volume during a 24-hour period.

The rate of flow to the drainage area has averaged about 2,000,000 gallons per day, or 1383 gallons per minute, since July 1, 1955. In spite of this high flow, the water level in the area is receding steadily.

A sample of water from immediately behind the dam showed the following analysis:

Free Acid	1.0 gm/liter
Total soluble Salts	171 gms/liter
Total Fe	37.5 gms/liter
P_2O_5	1.0 gm/liter

In view of the high salts content of this water which would require some 1/4 lb. of soda ash per gallon to neutralize and precipitate the iron, phosphate, and some sulfates, reclamation of the water for leaching plant use would be impractical.

Mark B. Nesbitt

MBN:ec

THE ANACONDA COMPANY

YERINGTON MINE

WEED HEIGHTS, NEVADA

April 12, 1957

Continental Can Company
Fibre Drum Division
Van Wert, Ohio

Gentlemen:

We would appreciate quotation including price and delivery F.O.B. Yerington, Nevada, on the following:

150 - #1-5501-10K, 21-1/2" x 35", 12,705 cu. in. capacity, 400 lb. Leverpak Drums with locking bands.

150 - Fiberpak Drums, 400 lb. capacity, 12,705 cu. in. (approximately same size as above.)

We will desire these drums for shipment of dry selenium concentrates, weighing 60 lbs. per cubic ft.,

May we hear from you promptly and oblige.

Yours very truly,

R.K. Owen,
Storekeeper

RKO:eg

THE ANACONDA COMPANY

YERINGTON MINE

WEED HEIGHTS, NEVADA

April 25, 1957

Continental Can Company, Inc.
Fibre Drum Division
Russ Building
San Francisco 4, California

ATTENTION: Mr. T. H. Eldredge

Gentlemen:

Many thanks for your letter of April 23, 1957 in answer to our letter of April 12 covering quotation on Leverpak Drums as requested.

It is necessary to again ask you to quote on the various sizes of Leverpak Drums, in order that they may be nested for lowest freight cost.

Please quote on the following drums, advising price and freight rate to Weed Heights, Nevada:

50 - M5501-10X, 21-1/2 x 35, 400 lb. Leverpak Type.
50 - 300 lb., Same Type as above, so as to nest in the 400 lb. size.
50 - 200 lb., Same Type as above, so as to nest in the 300 lb. size.
50 - 100 lb., Same Type as above, so as to nest in the 200 lb. size.

We intend to use these drums for shipments of Selenium Concentrates, dry from, weighing 60 lbs. per cubic foot, from Weed Heights, Nevada to Perth Amboy, New Jersey and intend to have empty drums returned to us in Weed Heights. We will, of course, use equal quantity of different size drums in shipments so return shipment of drums to us can be nested.

Your prompt reply will be appreciated.

Yours sincerely,

R. K. Owen
Storekeeper

RKO:mac

Selenium
X-20-A (1958)

THE ANACONDA COMPANY

YERINGTON MINE

WEED HEIGHTS, NEVADA

April 14, 1956

X-20-A

Mr. R. O. Erickson
General Traffic Manager
The Anaconda Company
25 Broadway
New York, New York

Dear Mr. Erickson:

Please refer to your copy of letter dated January 21, 1956 addressed to Mr. A. E. Millar from Butte Traffic Department with reference to shipments of selenium concentrates from Weed Heights, Nevada to Perth Amboy, New Jersey.

Wish to advise that we made shipment today covering 43 Fibre Drums selenium, weighing 13,280 pounds to Perth Amboy, New Jersey, as per Ringsby Truck Lines Bill of Lading No. 865 attached. You will note that we showed, in the proper space on the Bill of Lading form, the released value of the property as 5¢ per pound, as we were instructed to do so by you and in this case where the value is not known, you will obtain such value from Perth Amboy Plant and report it to the Insurance Company to protect us against loss above the value of 5¢ per pound as released.

We would appreciate your acknowledging receipt of this letter and oblige.

Yours truly,

R. K. Owen, Storekeeper

RKO:amb

Enclosure

cc - Mrs. Cross

INTERNATIONAL SMELTING AND REFINING COMPANY

RARITAN COPPER WORKS

ANACONDA

PERTH AMBOY, NEW JERSEY

August 1, 1958

Mr. A. E. Millar, Manager
The Anaconda Company
Weed Heights, Nevada

Dear Sir:

R.C.W. Lot No. 13, selenium concentrates (mist precipitator mud), was received July 9, 1958. It will be taken up in our August, 1958 accounts.

Yours very truly,

K. Fristoe

K. Fristoe,
Chief Clerk

H

File 165

THE ANACONDA COMPANY

Box 1000—Weed Heights, Nevada, 89443

July 31, 1964

MEMORANDUM TO: Richard M. Stewart

FROM: K. W. Humphreys

SUBJECT: Weed Heights Water

The following will review the happenings during the past several weeks with regard to the domestic water supply in Weed Heights.

Date Sample Taken	Location	Analysis Results	Remarks
7/8/64	609 Goldfield	Not Safe	Taken after complaint by occupant of taste of oil in water.
7/8/64	611 Goldfield	Not Safe	Taken after complaint by occupant of taste of oil in water.
7/8/64	Main Booster Pump	Safe	
7/14/64	602 Goldfield	Safe	
7/14/64	601 Goldfield	Not Safe	
7/14/64	600 Goldfield	Not Safe	At this time it was deemed advisable to take samples to Reno rather than mail them, to avoid bacteria build-up from warm weather.
7/20/64	600 Goldfield	Not Safe	
7/20/64	601 Goldfield	Not Safe	
7/20/64	611 Goldfield	Not Safe	
7/20/64	609 Goldfield	Not Safe	

Date Sample Taken	Location	Analysis Results	Remarks
7/22/64	500 Fairview	Not Safe	After reviewing these results, Webb Hunter called Mr. Stewart and expressed concern over the situation. It was decided to put HTH in the Head Tanks to clear up the water.

NOTE: The following samples were taken on July 23 and the first HTH was used in the Head Tanks on July 24.

7/23/64	Main Booster Pump	Safe	
7/23/64	302 Dayton Street	Not Safe	
7/23/64	508 Fairview	Not Safe	
7/23/64	Head Tank	Not Safe	
7/23/64	129 Bonanza	Not Safe	

HTH was used on July 24. The following two samples were taken on July 27 and HTH was again used after the following two samples were taken.

7/27/64	Head Tank #1	Safe	
7/27/64	Head Tank #2	Safe	

The townsite Head Tanks were again chlorinated on July 29. On July 30 samples were taken from all 3 head tanks, from one plant head tank and from three houses. These samples were taken to Reno on July 30. On July 31, water was tested with Orthotolodane and showed no residual chlorine.

In order to avoid contamination while taking samples from the head tanks, R. E. Bentley fabricated a metal bottle holder to dip water from the tank.

I was advised by the Health Department laboratory technician that we should not re-sterilize sample bottles as we have in the past. They are sterilized in both wet and dry sterilizer before we receive them, and it was the Health Department's thought that we might contaminate them by our efforts to boil them before using.

On July 30, I spoke with Webb Hunter in his office. He expressed great concern about the situation, and stated that if it wasn't cleared the Company should consider a chlorinating system.

K. W. Humphreys
Personnel Director

KWH:lh

THE ANACONDA COMPANY

Office of
General Manager

April 28, 1965

Box 1000
Weed Heights, Nevada
Tel. Yerington [redacted]
463-2222

Mr. R. S. Newlin
Vice President
The Anaconda Company
25 Broadway, Room 1710
New York, New York 10004

Dear Mr. Newlin:

We are planning to clean the vanadium pent-oxide catalyst in the converter section of the acid plant beginning about the eighth of May. After the converters have been cleaned and returned to service we believe we can manufacture 450 tons of 93.19% H_2SO_4 daily. This is the equivalent to 419 tons of 100% H_2SO_4.

During the past three months, while using 300 tons of crude sulphur monthly in the acid plant, we have manufactured an average of 380 tons of 100% H_2SO_4 monthly. We believe that by increasing our use of crude sulphur to 500 tons per month, we will be able to increase production to 419 tons of 100% H_2SO_4 daily. Consequently I have increased our purchases of crude sulphur to 500 tons monthly.

This increase in acid production will give us more acid to use on the W-3 dump and increase copper production from there. It will be especially necessary for us to have a maximum acid production in the summer months since in warm weather usage in the leaching is somewhat greater.

For maximum efficiency and to maintain a proper grind of the feed to the reactors from the rod mills, we cannot grind more than 577 tons of ore per day in the rod mill section, With the present grade of Leviathan ore, it would be necessary to grind 624 tons per day, but by using 500 tons of crude sulphur monthly, we can reduce this to 577 tons which we can grind and burn.

Very truly yours,

H. R. Burch
General Manager

HRB:p

THE ANACONDA COMPANY

Office of
General Manager

January 4, 1965

Box 1000
Weed Heights, Nevada
Tel. Yerington 463-2222

MEMORANDUM: No. 29

TO: Messrs. Monninger, Houck, Humphreys, Chesarek, Owen, Bentley, Bissett, McCollum.

SUBJECT: DUMP LEACHING CONSTRUCTION WORK.

All construction work in connection with the leaching of the W-3 Dump has been completed, with the exception of the following items:

1. Installation of dump sump pumps.

2. Testing of solution lines up to and on top of the W-3 Dump.

3. Installation of a few plastic hoses in the gutters in the iron launders.

4. Copper solution sample lines and surge pond sample lines.

No further construction pay will be given for work on the parts of the jobsthat have been completed.

H. R. Burch
Manager.

HRB:m

cc: Plant Bulletin Boards.

THE ANACONDA COMPANY

January 12, 1965

Office of
General Manager

Box 1000
Weed Heights, Nevada
Tel. Yerington 463-2222

MEMORANDUM: No. 30

TO: Messrs. Monninger, Houck, Humphreys, Chesarek, Owen, Bentley, Bissett, McCollum.

SUBJECT: DUMP LEACHING CONSTRUCTION WORK.

Yesterday, January 11, 1965, construction work on installation of leaching facilities for the W-3 Dump was completed and this project has been turned over to operation and is in operation.

No further construction wages will be paid on the W-3 Dump Leaching.

H. R. Burch
Manager

HRB:m

THE ANACONDA COMPANY

Box 1000—Weed Heights, Nevada, 89443

April 27, 1965

MEMORANDUM TO: Mr. F. M. Monninger
Plant Superintendent

SUBJECT: Concerning Increased Purchase of Raw Sulfur from 300 Tons per Month to 500 Tons.

The cleaning of the vanadium catalyst in the converter section of the Acid Plant should raise the overall production. Even with this cleaning it is believed that a 450 ton 93.19% acid average daily production is the maximum that can be maintained with this Acid Plant.

From past experience, the Acid Plant operates about 96% of the available time. This necessitates holding the production rate to 469 tons daily production while operating.

The present grade of the Leviathan ore is estimated to average 26% sulfur. This estimate is based on current usage from the ore pile and may vary somewhat over the entire pile.

To maintain a proper grind of the feed to the reactors in the 5'x10' Marcy Rod Mills the feed rate should not exceed 8.0 dry tons/hour to each mill, or 577 dry tons/day to the three (3) Rod Mills.

Our conversion efficiency from ore to acid is 88%.

Therefore, with the present ore we would have to burn 624 tons of ore/day or 8.7 tons/hour in each Rod Mill to maintain the 469 ton/day 93.19% acid production rate.

The addition of 500 tons/month (or about 16.7 tons/day) of 100% sulfur would reduce this tonnage to 577 tons of ore and added sulfur/day or 8.0 tons/hour in each Rod Mill.

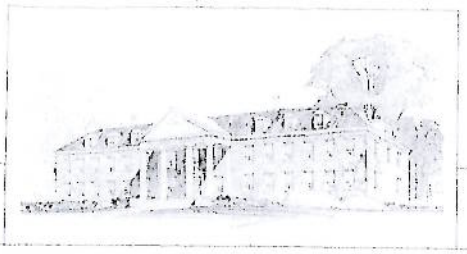
There will be times when additional sulfur will be required, such as when the ore pile becomes extremely wet due to weather conditions.

Respectfully submitted

Robert E. Gray

Robert E. Gray
Fluo-Solids & Acid Plant Foreman

REG:lt



THE ASPHALT INSTITUTE

Executive Offices and Laboratories • University of Maryland • College Park, Maryland

March 2nd, 1962

Mr. Walter Gadkoski
Chief Engineer
The Anaconda Company
25 Broadway
Room 1903
New York 4, New York

Dear Mr. Gadkoski:

On February 23rd, 1962, I had a very pleasant visit with a Mr. Otto of your Engineering Department. Mr. Otto asked if I would visit with him to discuss a problem of sealing leaching vats at your installation in Yerington Mine, Weed Heights, Nevada.

After discussing the various aspects and details of the project, I informed Mr. Otto that I could not, in good conscience, offer sound recommendations. My reasoning for this decision was the lack of sufficient information. One of the major items lacking details, is the degree of deterioration of the concrete walls of the vats, in particular, that area immediately behind the mastic lining.

Without belaboring you with a lot of details, I would like to offer a suggestion:

Make an on-the-site inspection of these leaching vats to determine the condition of the concrete behind the mastic lining. I feel this inspection is very important and should be carried out under the direction of your Department, or that Department which will have the responsibilities of drawing up the specifications. It would also seem advisable that those individuals at the plant location, such as engineering, production, and management, be part of this inspection team, however, this would not be for me to decide.

As an additional item of information, should it be decided that such an inspection would be desirable, it may be worthwhile to have our District Engineer located in that area go along with the inspection team. This, of course, would have to be worked out with our engineer in the area, as to proper scheduling, but I am sure he would be willing to help.

c/o

I simply offer this for what value you may feel it is worth. I sincerely hope we have been of assistance to you in regard to this problem. Should you have any questions or comments, please do not hesitate to give me a call.

Very truly yours,

THE ASPHALT INSTITUTE

Harry J. Thompson
District Engineer

HJTter

THE ANACONDA COMPANY

25 Broadway, New York 4, N.Y.

ANACONDA
from mine to consumer

March 6, 1962

Re: Mastic Lining-Leaching Vats
Yerington Mine, Nevada

Mr. A. E. Millar, General Manager
The Anaconda Company
P. O. Box 1000
Yerington Mine
Weed Heights, Nevada

Dear Mr. Millar:

Further to our recent telephone conversation relative to repair of the mastic lining in the leaching vats, we enclose herewith one (1) copy of the Asphalt Institute's letter of March 2nd, the content of which is self-explanatory.

Should you desire to follow through on Mr. Thompson's suggestion that someone from this office and/or one of the Institute's western representatives thoroughly inspect the condition of the lining and concrete before making any recommendations, please advise and we shall make the necessary arrangements for this to be accomplished at the convenience of your staff.

Yours truly,

Walter Gadkowski,
Chief Engineer

by Arthur L. Otto
Arthur L. Otto
Structural Engineer

ALO:jf
In triplicate
Encl. 1

THE ANACONDA COMPANY

Box 1000—Weed Heights, Nevada

May 15, 1962

MEMORANDUM TO: Mr. A. J. Gould
Plant Superintendent

SUBJECT: Repair of Mastic Lining in No. 3 and No. 4 Leaching Tanks

The following is a summation of the work recently completed in repairing the mastic wall linings in No. 3 and No. 4 leaching tanks together with a brief accounting of the contributing factors necessitating the eventual repair work.

Factors Leading to Repair:

About four years ago, small cracks in the mastic lining of the north wall of No. 4 leaching tank were observed. These cracks were predominate in the upper four feet of the wall. Since then, the cracks steadily enlarged and others began to appear on the upper portion of the east wall as well as in the corners of the tank. Shortly after the first cracks were noticed in No. 4, similar cracks appeared in No. 3, again predominately on the upper portion of the north and east walls.

In December, 1961 and January, 1962, small sections of the lining in the cracked area began to break loose, exposing the concrete wall. The loss of these sections is attributed to a spalling action caused by the freezing of moisture which had penetrated between the mastic and the concrete. On careful observation of these areas, it was found that the reinforcing mesh and the 3/8 inch reinforcing bar had completely corroded in the spalled areas and within the cracks. It was also observed that the concrete behind the cracked areas was softened from one to 1-1/2 inches deep by the acid action of the leaching solutions.

Because of the danger of losing a portion of the reinforcing in the concrete walls and also to prevent further loss of the mastic and concrete, it was decided early in February of 1962 to proceed with some type of lining material that would effectively seal and cover all the cracked areas of both No. 3 and No. 4 leaching tanks. Replacement of the bad areas with the original 4 inch mastic material was discarded as an approach because of high costs and complexity and also the fact that perhaps a more simple and economical method of lining could be found.

small patches in the other tanks could possibly be repaired in two days. The procedure to be followed would be:

1. Determine area to be patched. The area should be small enough so that the patch can be completed in two days time.

2. Wash area thoroughly with water.

3. Chip out cracks and loose mastic.

4. Fill cracks and exposed areas with quick setting mortar. (This step must be completed the first day).

5. Apply primer coat immediately at start of second day. Use fast catalyst (0-841 or faster).

6. Apply one heavy coat of epoxy using fast catalyst (0-841 or faster) as soon as primer is dry.

7. Apply heavy second coat of epoxy using fast catalyst. By using a fast catalyst, the primer and two coats of epoxy could be applied in one day providing the atmospheric temperature is about 70°F or above.

It is desirable that the first coat of epoxy be dry to the touch before applying the second coat, however, in order to complete the repair, the second coat could possibly be applied sooner without impairing the seal.

During colder days when a considerably longer time is necessary for drying, the second coat could be applied at the end of the next tank cycle. In this case, the patch should be thoroughly cleaned with Methyl Ethyl Ketone (MEK thinner) before applying the second or possibly a third epoxy coat. The epoxy oxidizes somewhat on the surface and it is necessary that this film be removed by MEK to assure a good bond between the old and new epoxy.

MEK should also be used to clean the surface of old epoxy coatings in need of repair before applying fresh epoxy.

The use of a paint spray as against a brush is recommended when applying epoxy. The rough surface and small cracks of the old mastic are more effectively filled and covered by the use of spray equipment. For relatively small patches and repairs to the old epoxy, application by brush would be acceptable.

F. M. Mouninger
General Plant Foreman

FMM:lh

Coverage and Cost Breakdown:

The following is the estimated square footage covered in repairing the cracked areas of No. 3 and No. 4 leaching tanks:

#3 Tank----------2,200 sq. ft.
#4 Tank----------3,200 sq. ft.
Total Area----------5,400 sq. ft.

The following is the actual materials used together with costs of material necessary to cover the total of 5,400 sq. ft.:

Material	Gallons Used	Unit Cost	Total Cost
Macor 501-M Primer	45	$10.65	$ 479.25
Macor 559-M-100 Coating	390	$12.00	$4,680.00
Thinner	175	$ 1.95	$ 341.25
Fiberglass Cloth	--	.....	$ 278.80
		Total Cost	$5,779.30

This breaks down to a figure of $1.07 per sq. ft. cost of materials only.

The actual coverage of the 3 coats of 559-M epoxy amounted to 13.8 sq. ft. per gallon or .072 gallons per sq. ft.

Observation and Comments:

The completed job looked excellent. The bond attained between the old mastic and the epoxy was very secure. The sealing effect of the epoxy appeared excellent with the method of application previously described. Resistance to the corrosive effects of the leaching liquors appears excellent after tanks were returned to service.

The only adverse factor that has appeared thus far is the weakness of the fiberglass cloth. The cloth in itself is quite strong prior to the application of the epoxy, but after the coatings of epoxy have been applied and have thoroughly dried, the glass cloth becomes very brittle and is quite easily torn or broken. It is questionable whether the glass cloth is necessary in any future patch work. It may prove to be the weak link in the work done on No. 3 and No. 4 tanks. The epoxy itself is far stronger and more flexible than the cloth. For this reason, it would be advisable to omit the glass cloth for the time being in any repair work, or at least until sufficient operating time has been logged on the epoxy linings in No. 3 and No. 4 to prove or disprove the use of glass cloth.

7. In order to cover the badly cracked portions of the tank, it was determined that the east wall would be coated in a solid strip for the entire length of the wall and 6 feet down from the top. The north wall would be similar except a strip 7 feet in width was necessary. In No. 4 leaching tank, a 10 foot wide strip on the east wall and an 8 foot wide strip on the north wall was deemed necessary. Small individual patches would be necessary on the other two walls of both tanks.

8. The areas to be patched were then primed with a single coat of Macor No. 501-M-0 clear epoxy primer furnished by the Magna Corporation of Oakland, California. This material was applied with heavy duty paint spray equipment. The drying time of the primer coat was 2 to 4 hours depending on atmospheric temperatures and the type of catalyst used. Macor No. 0-841 catalyst was used with the primer.

9. After the primer coat was thoroughly dry, one heavy coat of Macor No. 559-M-100 white epoxy coating using No. 0-841 catalyst was sprayed over the primer.

10. The next step was the application of a fiberglass cloth over the first coat of epoxy. The fiberglass used is identified as Trevarno No. 2-P122, 4 oz., Volan treated, 50 inch width, supplied by Coast Manufacturing and Supply Company of Livermore, California.

When the first coat of epoxy became quite tacky, the fiberglass cloth was pressed into the epoxy. The use of small brushes with fairly stiff bristles aided in seating the cloth firmly into the epoxy. The cloth overlapped at the joints about 3 inches and was carried a few inches over the top of the wall. On the small patches, the glass cloth was allowed to extend beyond the bad area by 8 to 12 inches.

11. After the glass cloth was applied and the initial coat of epoxy was thoroughly dry (usually from 12 to 24 hours depending on atmospheric temperature and type of catalyst used), one medium coat of epoxy was sprayed over the glass cloth and allowed to completely dry. This was followed by a final coat of epoxy which was applied in such a thickness so as to completely cover the weave or pattern of the glass cloth, thus assuring a solid, uniform seal.

Thus the completed coating comprised five layers estimated to be an average of 90 mils in thickness:

1. Primer
2. Epoxy coat (heavy)
3. Fiberglass cloth
4. Epoxy coat (medium)
5. Epoxy coat (medium to heavy)

Several coating companies were contacted and their representatives called in to inspect the tank walls and make recommendations for repair. Two methods employing asphaltic materials and one method employing epoxy materials were evaluated. It was found that the epoxy type coating possessed the most desirable features of the three methods. It had excellent bonding characteristics with the mastic surface, high corrosion, abrasion and temperature resistance, comparatively low cost, and it was fairly simple to apply and repair, should repairs become necessary in the future. An epoxy coating was therefore designated as the approach to be taken for the repair of the two tanks.

Method of Repair:

The No. 3 tank was the first to be repaired. Jumper lines were installed between No. 2 and No. 4 tanks to isolate No. 3 from the circuit. It was anticipated that from two to three weeks would be necessary for repairs of each tank.

Prior to taking No. 3 tank out of the circuit for repairs, several test patches of the epoxy coating were applied around the top of the tank to determine the optimum coating technique. From this, the following procedure was adopted and carried out for the repairs:

1. After tank was excavated and isolated from circuit, tank walls and tops were thoroughly washed with high pressure water to remove as much loose material and soluble salts as possible.

2. Scaffolding was installed along east and north walls to permit access to cracked areas of mastic.

3. All loose mastic was chipped out back to concrete. Any decomposed concrete was removed back to solid concrete. Larger cracks were widened slightly by chipping to facilitate filling cracks with mortar.

4. Steel pins were driven into exposed concrete with a Ramset gun. Two inch wire reinforcing mesh was hung on the pins. This step was necessary only where the exposed area was large enough to warrant reinforcing to keep the mortar filler from sagging.

5. All chipped out areas and cracks were filled with a quick-setting sand, cement and lime mortar. The mortar was then troweled so as to be flush with adjacent mastic surfaces.

6. After the mortar had set (minimum set time of about 12 hours) the surface was brushed with a stiff broom to remove loose material. The surface was now ready for the epoxy coating.

INTERDEPARTMENTAL

THE ANACONDA COMPANY

YERINGTON MINE
P. O. Box 1000
WEED HEIGHTS, NEVADA, 89443

March 17, 1976

MEMORANDUM TO: Mr. M. B. Nesbitt

FROM: R. A. Bailey

On March 17, 1976 the townsite water tanks were checked visually by removing man hole covers. Nothing could be seen floating on the water, but there is a film of some type in the tank. The top and ladder frame work is very badly pitted with rust. There is a vent that is completely open on each tank, 6 inches in diameter, that should be bolted or welded so no one could open them unless authorized. One tank also has an access hole which allows rain water and dirt into the tank.

I would recommend draining and flushing each tank as it is drawn down. Also, increasing the amount of chlorine put into the system at mine and concentrator to increase the reading in the townsite. The past few readings at mine and concentrator have been .5 ppm or less; in the townsite .05 ppm or less.

R. A. Bailey
Personnel Assistant

RAB/dg

August 29, 1995

INTERNAL MEMORANDUM

TO: Bob Kelso
Supervisor
Bureau of Corrective Actions

FROM: Matt McAuliffe
Environ. Mang. Specialist
Bureau of Waste Management

SUBJECT: Hydrocarbon Contaminated Soil at the Arimetco, Inc., Yerington Mine

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During the Compliance Evaluation Inspection of 8-9-95, heavy staining was discovered around an underground storage tank located north of the vehicle maintenance shop at the Arimetco, Inc., Yerington Mine. The tank reportedly contains used oil and spent solvent. The extent of contamination can be significant considering the age of the tank and the waste management practices at the site. This matter is also being referred to Jim Najima, Supervisor, UST\LUST.

Two photographs of this area are available for viewing in a file located in the Office of the Bureau of Waste Management. If you have any questions, please call me at extension 3046.

August 29, 1995

INTERNAL MEMORANDUM

TO: Jim Najima
Supervisor
Bureau Supervisor, UST/LUST

FROM: Matt McAuliffe
Environ. Mang. Specialist
Bureau of Waste Management

SUBJECT: Underground Storage Tank, Arimetco, Inc., Yerington Mine

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During the Compliance Evaluation Inspection of 8-9-95, an underground storage tank reportedly containing used oil and solvent from the parts washers, was discovered. It is not known whether the tank is registered through your office. Hydrocarbon staining around the tank was also discovered. This matter is also being referred to Bob Kelso, Supervisor, Corrective Actions.

The tank is located just north of the vehicle maintenance shop at the Arimetco, Inc., Yerington mine. The Bureau of Waste Management has available for viewing, a file containing the inspection report, Warning Letter and photographs of the tank.

If you have any questions, please call me at extension 3046.

(b)

August 29, 1995

INTERNAL MEMORANDUM

TO: David Gaskin
Branch Supervisor
Bureau of Mining Regulation & Reclamation

FROM: Matt McAuliffe
Environ. Mang. Specialist
Bureau of Waste Management

SUBJECT: Synthetically lined pond containing sludge from the Solvent Extraction Cells and Stockpiled Hydrocarbon Contaminated Soil at the Arimetco, Inc., Yerington Mine

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During the Compliance Evaluation Inspection of 8-9-95, a synthetically lined pond was discovered which I have not seen during previous inspections. The pond contains sludge which flows from the Solvent Extraction cells. The solids accumulate as the liquid portion is evaporated. It was stated that the pond does not have a leak detection system and that the solids will be addressed at closure. The pond is located approximately 200 yards east of the Solvent Extraction Cells.

I'm not sure whether you are aware of this pond or whether the BMR&R has any concerns with it.

Located west of the main office near the "Compressor Pump House #1" is a concrete pond containing what looks like hydrocarbon contaminated soil. When asked, mine personnel could not identify the material.

If the BMR&R requires permits for hydrocarbon remediation activities, you might consider inquiring about this issue.

Unfortunately, no photographs were taken of these areas. If you have any questions, please call me at extension 3046.