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Office of State Mine Inspector

1616 W. Adams, Suite 411
Phoenix, Arizona 85007-2627
(602) 255-5971

October 20, 1988

A. F. Budge (Mining) Limited
4301 North 75th Street
Suite 101
Scottsdale, Arizona 85251-3504

SUBJECT: Request for Variance to Rule R11-1-2231B

Your request for a variance is granted subject to certain conditions listed below:

1. The pregnant solution pond at no time will be filled in excess of 50% of it's capacity.
2. Install steel posts surrounding each pond; string a $\frac{1}{2}$ " steel cable on the posts so that it is at a height of 42" \pm 2" above the ground; provide a life preserver at each pond; require that any employee working inside the cable use a safety belt tied off to the cable.

If you have any questions, please feel free to call.

Sincerely,

James H. McCutchan, C.P.M.
State Mine Inspector

E.R. Martin
Eddie R. Martin
Assistant State Mine Inspector

ERM/jo



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

EVAN MECHAM, GOVERNOR
GERALD H. TELETZKE, PH.D., DIRECTOR

March 16, 1988

Joe Fernandez
A. F. Budge Mining Limited
7340 East Shoeman Lane
Suite 111 "B" (E)
Scottsdale, Arizona 85251-3335

Dear Mr. Fernandez:

RE: Vulture Mine
Draft Groundwater Quality Protection Permit No. G-0090-07

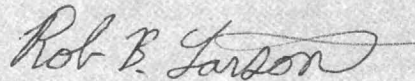
Attached for your review and comment is a draft permit for the referenced facility. The permittee shall be authorized to operate a nondischarge hydrometallurgical precious metal recovery facility utilizing the cyanide solution/heap leaching method. The facility is located approximately 12 miles southwest of Wickenburg, Arizona (T6N, R6W, Sec 36 SE 1/4). The proposed Groundwater Quality Protection Permit shall regulate the containment of the leach solution to be used in the operation of the heap leach facility. The heap pad and ponds (pregnant, barren and surge) shall be constructed with a flexible membrane liner system over a prepared subgrade to form an impermeable boundary between the leaching operations and the land surface. The pad, pregnant pond and barren pond shall have a leak detection/collection system between the upper and lower liner to be monitored for the presence of liner leakage. The facility shall monitor leach solution daily in the form of a water balance record and monitor the leak detection/collection system weekly for liner leakage. The facility shall be protected from runoff associated with a 100-year, 24-hour stormwater event. The facility processing site shall be fenced to provide restricted access. Depth to groundwater at the site is in excess of 400 feet below natural land surface.

The Department of Environmental Quality is An Equal Opportunity Affirmative Action Employer

Mr. Joe Fernandez
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Please return any comments and objectives you may have concerning this permit to the Water Permits Unit within thirty (30) days of the date of this letter. If you have any questions concerning this permit, please contact me at 257-6806.

Sincerely,



Rob B. Larson
Water Permits Unit

RBL:mm

Attachment

cc: U. S. Environmental Protection Agency, Region 9, Mail Drop W-1-G
Arizona Department of Water Resources, Attn: Clay Cady
Arizona Department of Commerce
Bureau of Land Management
Phoenix Active Management Area
Maricopa County Health Department
Central Arizona Association of Governments
Maricopa County Planning and Zoning Commission
Mr. Lawrence A. Hansen
Wickenburg Town Council

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GROUNDWATER QUALITY PROTECTION
PERMIT NO. G-0090-07

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STATE OF ARIZONA

GROUNDWATER QUALITY PROTECTION PERMIT

Part I. AUTHORIZATION FOR FACILITY OPERATION SUCH THAT GROUNDWATER QUALITY OF THE STATE OF ARIZONA IS NOT ADVERSELY IMPACTED.

In compliance with the provisions of A.R.S. 36-1851 et seq; A.A.C. Title 9, Chapter 20, Article 2; A.A.C. Title 9, Chapter 21, Article 2; and conditions set forth in this permit:

Facility Name:	Owner:
Vulture Mine	Joe Fernandez A.F. Budge Mining Limited 7340 E. Shoeman Lane Suite 111 "B" (E) Scottsdale, Arizona 85251-3335

is authorized to operate the Vulture Mine-Heap Leaching facility located 12 miles Southwest of Wickenburg, Arizona in Maricopa County over groundwaters of the Phoenix Active Management Area in Township 6 North; Range 6 West; Section 36, SE 1/4 - Gila and Salt River Base Line and Meridian.

This permit shall become effective on the date of signature and shall be valid for the operational life of the facility provided that the facility is operated and maintained in compliance with the specific conditions, general conditions, and information documented or referenced in Parts I, II, III and IV of this Permit and such that groundwater quality standards are not violated (Part V).

Joe Fernandez
A.F. Budge Mining Limited

Ronald L. Miller, Ph.D., Assistant Director
Arizona Department of Environmental Quality

Signed this ____ day of
_____ 19 ____

Signed this ____ day of
_____ 19 ____

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Part II. SPECIFIC CONDITIONS (R9-20-208.C.)

A. Containment/Disposal Requirements

1. Containment

The permittee is authorized to operate a hydrometallurgical precious metal recovery facility utilizing the cyanide heap leach process. Components of the operation shall include an agglomeration circuit, an impervious lined leach pad with solution collection ditches and containment berms, ~~three~~ impervious lined solution containment ponds (pregnant, barren, ~~surge~~), a product recovery circuit, and stormwater diversion ditches and berms. The facility shall be constructed and maintained in such a manner as to prevent discharge of pollutants to the land surface or subsurface which may have an adverse impact on groundwater.

a. Heap Leach Process

Material (ore) to be processed at the facility include 225,000 tons of existing on-site tailings, ~~and an estimated 100,000 tons of crushed ore from the Vulture Mine Open Pit. Both the tailings and crushed ore will be agglomerated with Portland cement prior to placement on the heap leach pad. Cyanide shall not be allowed to be added in the agglomeration circuit. The pelletized (agglomerated) material shall be stockpiled for curing and then shall be placed on the lined leach pad. The heap will be constructed on the lined leach pad in ~~five~~ lifts, each of which will be 15 feet in height, with a total heap height of approximately 75 feet. The cyanide solution application rate to the heap shall be approximately 0.004 gallons per minute per square foot, with a corresponding design solution flow rate of approximately 100 gpm.~~

Standard practise ? →

change

approximately

b. Leach Pad Design with Leak Detection/Collection

change The leach pad shall cover an area of approximately ~~225,000~~ ^{180,000} square feet (~~5.2~~ acres) and shall be graded at a 1 percent slope from the toe of the pad (collection ditch) to a distance of 75 feet upslope edge of the pad. Prior to installation of the liner, the lining contractor shall inspect and verify the subgrade to be a continuous smooth surface free of protrusions of rock, nested gravels or other abrupt irregularities and that proper compaction has been achieved. The upper 6 inches of subgrade shall be compacted to a minimum of 95 percent of maximum dry density as determined by

HDPE

ASTM D698 method. A leak detection system consisting of a 30 mil ~~PVC~~ underliner, a 16 ounce geotextile and a granular (sand and gravel) fill shall be placed underneath the primary liner at the west toe of the six segment berms which run parallel to the pad slope and divides the pad into six identical segments. The leak detection system shall have ~~six~~ sample access tubes (risers) booted through the primary liner at the toe of each pad segment to provide access for sampling of any leaking fluids. The leach pad primary liner shall consist of a 30-mil ~~PVC~~ material and shall meet or exceed the National Sanitation Foundation minimum material properties (NSF Standard 54). A transition strip of PVC with a factory (dielectric) welded strip of 36 mil Hypalon shall be connected along the downslope edge of the pad segments. This Hypalon strip shall be the collection ditch liner which will be exposed to sunlight. Liner installation shall be supervised by a Lining Contractor which has more than five years experience or more than five million square feet of successfully installed flexible membrane lining. Field seaming shall require a minimum overlap of 6 inches for adjoining PVC sheets and shall be sealed with a bodied solvent with a minimum glued width of 4 inches. All field seams shall be tested using the Air Lance Method. Destructive shear and peel tests (ASTM B3083 and D413) shall be conducted on field seam samples taken every 700 lineal feet of seam.

Substitute
HDPE

c. Solution Storage Ponds with Leak
Detection/Collection

The ~~36~~⁴⁰ mil ~~Hypalon~~^{HDPE} lined solution collection channel located along the downslope toe of the leach pad shall transport pregnant solution and storm water runoff from the leach pad to the ponds. The V-shaped solution channel shall have a discharge capacity capable of handling the operating solution flow rate of 100 gpm with 1.8 foot of freeboard, and a stormwater discharge capacity in excess of 44,000 gpm without freeboard. Pregnant solution shall be directed from the channel down a spillway to the pregnant pond inlet. The pregnant pond shall have a total capacity of 480,000 gallons, which includes approximately 48,000 gallons reserved for stormwater flows. An impervious lined spillway connecting the pregnant and the surge (flood containment) pond shall be constructed capable of gravity flow for the transfer of excessive storm water from the pregnant pond to the ~~surge pond~~.

larger.

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The surge pond shall have a total capacity capable of containing one-half the six-hour PMF (Probable Maximum Flood) (4.7 inches) which may fall on all lined areas. The surge pond shall normally remain empty and shall only be used in the event of excess storm water events to capture its associated runoff. The barren solution storage pond will be approximately the same dimensions and capacity as the pregnant solution pond. The pregnant and barren pond liners shall be composed of three layers. First, a 20-mil PVC underliner shall be covered by a layer of 16 ounce geotextile. The primary liner shall overlay the geotextile and shall be a 36-mil Hypalon geomembrane. The bottom of both ponds shall be sloped to a lined leak detection/collection sump where a PVC pipe shall be installed between the PVC underliner and the Hypalon primary liner extending through (booted) the Hypalon liner at the crest elevation of each pond to provide access for the detection and sampling of any fluid leaks. The stormwater pond shall have prepared subgrade with a 20-mil PVC primary liner. Two feet of compacted tailing shall be placed over the primary liner to ensure the PVC geomembrane is not exposed to sunlight. The surge pond side slope shall be lined with 36-mil Hypalon at the spillway entrance from the pregnant pond. Periodic maintenance of the tailings cover by mine personnel shall be required to ensure the PVC liner is not exposed to sunlight. Geomembrane liner installation and field seaming test as described for the heap pad liner installation shall be required for pond liner installations.

d. Product Recovery and Spill Containment

Precious metals contained in the leach solution shall be recovered in the extraction plant. Solution in the pregnant solution pond shall be pumped to the extraction plant and then into the barren solution storage pond. The extraction plant area shall be sloped to drain to the barren solution pond. The concrete floor of the extraction plant shall be designed to drain to a cement sump, piped to conduct flow to the barren solution pond. The cement structure and sump shall be capable of containing all solutions being processed within the extraction plant.

e. Tailings Disposal

The waste product (leached tailings) generated by the heap leach processing shall be rinsed and neutralized tailings contained on the impervious

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lined pad. The waste product shall not be removed from the lined pad and shall be stacked to prevent slumping and shall not allow discharge of any material or fluids to the land surface of subsurface.

f. Chemical Storage

Sodium cyanide used in the leaching process shall be stored in "air-tight" drums on wooden platforms underlain by a 36 mil Hypalon liner which drains into the barren solution pond. A fresh water spray system shall be installed for washdown of the storage area and for triple rinsing empty cyanide containers. Empty chemical containers which have been triple rinsed shall be stored on-site until disposed of at an approved landfill site. All personnel shall be required to attend a cyanide safety and first-aid seminar offered on-site by the chemical supplier, or the State Mine Inspector. A stock of hypochlorite shall be maintained on-site for the purpose of neutralizing any cyanide in the unlikely event a spill occurs outside the areas of lined containment.

g. Sewage Disposal

Only temporary non-residential structures shall be built on-site to serve as an analytical laboratory, offices, and storage. Domestic sewage disposal shall be by means of portable toilets which shall be properly maintained with disposal of holding tank effluent at an approved location (landfill or wastewater treatment plant). All analytical samples shall be returned to the heap leach circuit so that no discard of leach solution samples to the land surface or subsurface shall be allowed.

h. Facility Protection

A surface water diversion system shall be constructed to prevent any runoff from a stormwater event from entering the processing site. Diversion of runoff from the upslope watershed shall be provided by a trapezoidal channel. The diversion channel shall be ten feet wide at the base with a height of approximately five feet with side slope having a 2 1/2:1 slope. The diversion shall have a discharge capacity of approximately 875 cfs approximately the equivalent of the 100-year, 24-hour storm event for the 4.4 square mile watershed. The channel surface shall be lined with shotcrete for erosion protection. A fence shall be constructed to enclose the leach pad, solution

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ponds, extraction plant, and chemical storage areas. The fence shall have lockable gates on all entrances and shall be posted as a restricted access area.

i. Other Laws and Rules

The operator must maintain compliance with all other State of Arizona laws and rules. The issuance of this permit does not waive any federal, state, county or local government rules, regulations or permits for which this facility have to comply.

2. Unauthorized Materials

a. Materials authorized to be disposed of in all septic tanks are typical household sewage and shall not include motor oil, gasoline, paints, varnishes, solvents, pesticides, fertilizers, or other materials not generally associated with toilet flushing, food preparation, laundry facilities and personal hygiene.

b. Adequate supervision and operation shall be performed to ensure that all users of the facility are aware of and understand the containment/disposal requirements of Part II.A.

c. No commercial operations utilizing hazardous materials or creating hazardous wastes shall dispose of such materials into these systems.

3. Discharge Source Limits

a. There shall be no discharge of pollutants that violate the State of Arizona Groundwater Quality Standards (A.R.S. R9-21-401, et seq.).

b. The exhausted ore (waste product) shall not be removed from the lined heap leach pad.

c. Analytical sampling aliquots shall be returned to the heap leach solution circuit and shall not be disposed of on the land surface or subsurface.

4. Leak Detection Limits

Any fluid collected at the leak detection/collection sampling points shall not exceed a pH of 8.5 or show the presence of free cyanide above 0.20 mg/l.

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5. Modification

This permit is issued contingent upon the above conditions. The permittee shall give ninety (90) days written advance notice to the Department of any modification to the above facility.

6. Other Laws and Rules

The operator must maintain compliance with all other State of Arizona laws and rules. The issuance of this permit does not waive any federal, state, county, or local government rules, regulations, or permits for which this facility may have to comply.

B. Monitoring Requirements, Record Keeping (R9-20-215)

1. Monitoring Type and Conditions

a. Leach Solution Monitoring

The leaching solution used in the hydromethallurgical heap leach process shall be closely monitored at least once daily in the form of a water balance. Representative samples will be taken daily from: Drainage from the heap leach pad into pregnant pond, leach solution entering and leaving barren ponds where chemicals (cyanide, lime) are added. All solutions sampled shall be analyzed by standard field methods for pH and cyanide (free) (EPA method 335.1). A log of these results, as well as daily solution levels in both barren and pregnant ponds, and the amount of fresh water added to leaching system daily shall be kept at the facility available for inspection by ADEQ personnel and shall be submitted to the Department in the form of a water balance along with the monitoring report as outlined in Part II.B.2.

b. Leak Detection and Collection Monitoring

The leak collection sampling point specified in Part II.A.1.b. and c. shall be monitored weekly for the presence of fluid. Any fluid collected shall be analyzed by standard field methods for pH and free cyanide. Refer to contingency requirements (Part II.C.) for action to be taken if cyanide is detected.

5. Reporting Frequency

For daily and weekly field monitoring, including leak detection monitoring and water balance, obtained during the previous 3 months shall be summarized for each month

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and submitted quarterly in duplicate in accordance with the following schedule. The operator shall prepare a quarterly assessment report including the status of the operation, any remedial activities undertaken and analytical results for that quarter.

Monitoring results, water balance and assessment report for the previous quarter shall be postmarked no later than the 28th day of the month following the completed reporting period as follows:

<u>Reporting Period</u>	<u>are due by</u>
1st Quarter (Jan, Feb, Mar)	Apr 28
2nd Quarter (Apr, May, Jun)	Jul 28
3rd Quarter (Jul, Aug, Sep)	Oct 28
4th Quarter (Oct, Nov, Dec)	Jan 28

The results of all monitoring and reporting required by this permit shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this permit. All forms shall be sent to the following address:

Arizona Department of Environmental Quality
Office of Water Quality
Compliance Section
2005 North Central Avenue
Phoenix, Arizona 85004

C. Contingency Requirements (R9-20-206.D.2.)

1. Should any fluid be collected in the leak detection sampling point and exceed the limits of Section A.3., the permittee shall contact the Water Permits/U.S.T. Compliance Unit, adjacent landowners, and the Maricopa County Health Department within 72 hours to determine the appropriate action to mitigate the effects of the violation.

In the event of a spill, it shall be neutralized with a 10% hypochlorite solution stored on site to accommodate such or any other type of unforeseen situation. Any spill shall be reported in the quarterly assessment report.

D. Post-Closure Plan (R9-20-206.D.3. and R9-20-216.C.2.)

1. Before permanent abandonment of the facility site, the permittee shall adhere to the following procedures for closure when utilizing cyanide.
 - a. Operate the leach solution circuit for a minimum of 96 hours without the addition of cyanide, only

200ppb

2

adding fresh water and caustic soda to maintain water levels and a pH of 10 to 11. Test the leach solution for any residual free cyanide. If free cyanide is detected in concentrations of greater than 0.2 mg/l, continue with next steps ("b." and "c." hypochlorite neutralization). If free cyanide is not detected in concentrations of greater than 0.2 mg/l, go to step "e."

- b. Run a 1% hypochlorite solution through the pregnant pond and barren pond for a minimum of 24 hours.
- c. Run a 1% hypochlorite solution through the entire heap leaching system for a minimum of 48 hours.
- d. Test the rinseate for free cyanide as described in Part II.B.1.a. If free cyanide is detected in concentrations of greater than 0.2 mg/l, repeat steps "a." "b." and "c." above and test for cyanide again.
- e. Allow solutions to evaporate from the ponds. Any remaining residues or sludges shall be analyzed by EPA approved test methods (Test Methods for Evaluating Solid Waste, SW-846, 2nd Edition) for the following constituents, and the results reported to the Department.

water/acid test

<u>Constituent</u>	<u>Limits</u>
Cyanide (Total and Free)	10 mg/l
Arsenic	5 mg/l
Barium	100 mg/l
Cadmium	1 mg/l
Chromium	5 mg/l
Lead	5 mg/l
Selenium	1 mg/l
Silver	5 mg/l

If any constituent exceeds its associated limit, the residual sludge shall be removed and disposed of at a landfill approved for handling hazardous waste.

- 2. The permittee shall file a report with the Department's Water Permits Unit following closure describing the results of each step of the closure plan within 60 days after closure.

E. Compliance Schedule (R9-20-219)

No special requirements.

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Part III. REFERENCES: PERTINENT INFORMATION

A. References

The terms and conditions set forth in this permit have been developed based upon the information contained in the following:

1. Groundwater Field Inspection Form(s) dated _____

2. Notice of Disposal dated 5/13/87
3. Groundwater Impact Review dated _____
4. Plan Review File Number N/A
5. Permit Application dated _____
6. Groundwater Impact Review dated _____
7. Amendments to 2 and 4 dated _____
8. Public Notice dated _____
9. Public Hearing comments, correspondence letters, and any additional supplemental information contained in the facility permit file.
10. Other _____

B. Facility Information

1. Facility Contact Person ~~Joe Fernandez~~
Title _____
2. Address 7340 E. Shoeman Lane, Suite 111 "B" (E)
Scottsdale, Arizona 85251-3335
3. Emergency Telephone Number: Bus. (602) 945-4630 or ~~4667~~
Home () _____

The Department shall be notified within 30 days of a change in the facility contact person.

4. Landowner of Facility Site A.F. Budge Mining

C. Definitions

1. "Abandoned" means permanent cessation of facility operation, as determined by the facility owner. Facilities which are temporarily shut down are not considered abandoned within the context of these regulations.
2. "Activity" means any human activity including institutional, commercial, manufacturing, extraction, agricultural, or residential land use which may involve disposal of wastes or pollutants which may result in pollution of groundwaters of the State.
3. "Adverse impact upon groundwater quality" means any measurable change to the physical, chemical or biological character of groundwater caused by addition of pollutants or wastes.
4. "Approved" or "approval" means approved in writing by the Director.
5. "Aquifer" means a geologic unit that contains saturated permeable material to yield usable (drinking water, agriculture, industry, etc.) quantities of water to a well or spring.
6. "Composite sample" means a combination of 4 individual portions obtained at equal time intervals for 1 hour. The volume of each individual portion shall be directly proportional to the discharge flow rate at the time of sampling. The sampling period shall coincide with the period of maximum discharge flow.
7. "Department" means the Arizona Department of Environmental Quality (ADEQ).
8. "Director" means the Director of the Arizona Department of Environmental Quality or his duly authorized representative.
9. "Discharge" means the addition, spilling, leaking, pumping, pouring, emitting or dumping of any pollutant into waters of the State from any point source.
10. "Discharge Impact Area" means the potential area extent of waste or pollutant migration, as projected on the land surface, as a result of a discharge or disposal from a facility.
11. "Discrete sample" means any individual sample collected in less than 15 minutes.

12. "Disposal" means the discharge, deposit, well injection, dumping, spilling, leaking, or placing of any wastes or pollutants into or on any land or water such that groundwater is or may be affected. For the purposes of this Article, irrigation with effluent from a wastewater treatment facility is disposal if the application rate exceeds that amount necessary to satisfy the consumptive use and leaching requirements of the crop or landscaping being irrigated.
13. "Disposal system" means a system for disposing of wastes either by surface or underground methods and includes sewerage systems, treatment works, disposal wells and other systems.
14. "Facility" means any system or activity in which or by which disposal occurs or has occurred on either a continuous or intermittent basis.
15. "Flow rate" means the volume per unit time given to the flow of fluids.
16. "Geologic unit" means a geologic formation, group of formations, or part of a formation.
17. "Groundwater" means water under the surface of the earth regardless of the geologic structure in which it is standing or moving. Groundwater does not include water flowing in underground streams with ascertainable beds and banks.
18. "Groundwater Quality Standards" means the standards in A.A.C. R9-21-403.
19. "Hazardous waste" means a waste as defined by the Federal Resource Conservation and Recovery Act (P.L. 94-580).
20. "Hydraulic conductivity" means a measure of the capability of a geologic unit to transmit a fluid.
21. "Individual disposal system" means a device or system for the treatment or disposal of sewage from a single housing unit or equivalent.
22. "Maximum Disposal Limit (MDL)" means the maximum permissible level for a contaminant in an effluent stream.
23. "Maximum Groundwater Limit (MGL)" means the maximum permissible level for a contaminant in water.

24. "Modification" means a change in the location, volume, constituent(s) or constituent concentration(s) of a disposal which is described in the permit issued pursuant to R9-20-208.
25. "Operator" means any person who makes management decisions regarding facility operations.
26. "Owner" means any person holding legal or equitable title in any real property subject to these regulations.
27. "Permit" means a rule, certificate, letter, or any other document issued by the Director authorizing and conditioning the discharge of any pollutant to groundwater from any point source or disposal of wastes from any disposal system identified in A.R.S. Sec. 36-136.G.8.
28. "Pollute" means to cause pollution.
29. "Regulations" means A.A.C. Title 9, Chapter 20, Article 2, requirements for facilities affecting groundwater quality.
30. "Schedule of compliance" or "compliance schedule" means a written document issued by the Director which identifies requirements and times for compliance with either or both the water quality standards in A.A.C. Title 9, Chapter 21 or the permit regulations in A.A.C. Title 9, Chapter 20.
31. "Sewage" means wastes from toilets, baths, sinks, lavatories, laundries and other plumbing fixtures in residences, and wastes from institutions, commercial buildings, mobile homes and other places of human habitation, employment or recreation which are similar in content to residential wastes.
32. "Site" means the area where any facility is physically located or an activity is conducted, including adjacent land used in connection with the facility.
33. "Treatment works" means any plant or other works used for the purpose of treating, stabilizing, or holding wastes.
34. "Vadose zone" means the zone between the land surface and the principle zone of saturation.

Part IV. GENERAL CONDITIONS: RESPONSIBILITIES

A. Permit Duration (R9-20-210)

1. Permits shall be valid for the expected operational life of the facility under the ownership as set forth in the permit unless otherwise limited by Federal or State statute or transferred pursuant to R9-20-221.C.
2. A permit may be modified or terminated pursuant to R9-20-221.
3. The owner or operator of the facility may request that a permit be issued for a duration that is less than the full allowable term.

B. Permit Rights (R9-20-214)

1. A permit does not convey any property or water right of any sort, or any exclusive privilege.
2. A permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of Federal, State, or local laws or regulations.

C. Monitoring Requirements; Record Keeping (R9-20-215)

1. The permittee shall implement and maintain an approved monitoring system if required as a condition of a permit.
 - a. The permittee shall install, use and maintain all monitoring equipment in acceptable condition or provide alternate methods approved by the Department.
 - b. The permittee is required to conduct monitoring of a type and frequency sufficient to yield data which are representative of the monitored activity.
2. The permittee shall retain records or have access to all monitoring information, for a period of at least three (3) years from the date of the sample, or measurement. This period may be extended by written request of the Department at any time. Copies of records shall be furnished to the Department upon written request.
 - a. Records of monitoring information shall include but are not limited to the following:
 - (1) The date, time, exact place, and name of individual(s) who performed the sampling or measuring;

- (2) the date(s) of, and name(s) of the individual(s) who performed the analyses; and
 - (3) the analytical techniques or methods used to perform the analyses.
- b. Monitoring results shall be reported at intervals specified in the permit.
 - c. Calculations which require the averaging of measurements shall utilize an arithmetic mean unless it can be demonstrated by the permittee that another method would more accurately describe or be representative of the monitored activity.
3. Information submitted as a result of any well boring shall include a complete driller's log and drawings showing details of the well's construction. If information must be submitted more than once for the same well, then subsequent submittals shall note that the driller's log and construction drawings have already been submitted and the date of the initial submittal shall be documented.
- D. Reporting Requirements (R9-20-216)
1. The permittee shall give ninety (90) days written advance notice to the Department of any modification to the facility which is not described in the approved Notice of Disposal or permit application.
 2. The permittee shall notify the Department within seventy two (72) hours of becoming aware of any permit violation. The Department may require the permittee to submit a written report within thirty (30) days documenting the following:
 - a. A description of the noncompliance and its cause;
 - b. the period of noncompliance, including exact date(s) and time(s), and the anticipated time period during which the noncompliance is expected to continue if it has not been completely corrected;
 - c. action taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance: If applicable, such action shall be in accordance with an approved contingency plan;
 - d. monitoring or other information which indicates that any waste or pollutant may cause an endangerment to an aquifer; and

- e. noncompliance with a permit condition, or malfunction of the disposal system which may cause fluid migration into or between aquifers.
3. The Department shall be notified in writing at least one hundred eighty (180) days prior to abandonment of the facility.
- a. The permittee may be required to submit a detailed post-closure plan to the Department for approval which shall describe what the physical condition of the facility will be on the date operations are terminated.
 - b. The Department may require the post-closure plan to include any or all of the following:
 - (1) A description of monitoring procedures to be implemented by the permittee including monitoring frequency, type, and location which will be implemented to ensure post-closure activities will not violate groundwater quality standards;
 - (2) a description of procedures for maintaining existing groundwater quality protection systems;
 - (3) a schedule and description of physical inspections to be conducted at the facility following abandonment;
 - (4) a description of future land or water uses or both which may be precluded as a result of facility abandonment; and
 - (5) identification of responsibilities for post-closure cleanup or remedial action in the event of pollution of waters of the State.

E. Site Examination (R9-20-217)

- 1. The Department may routinely inspect the facility or an activity used for the generation, storage, treatment, collection, or disposal of any waste or pollutant, and where records are kept, for the purpose of determining compliance with these regulations or water quality standards, or verifying information submitted in a Notice of Disposal, or permit application, or documented in a permit including any permit conditions.
- 2. The Department may:
 - a. Obtain samples of wastes or pollutants;

- b. analyze or cause to be analyzed any samples either on site or at another location;
 - c. take photographs of waste and equipment processes and conditions at the site; or
 - d. inspect and copy any pertinent records, reports, information, and test results.
3. Any pertinent information required by the permit to be maintained by the permittee shall be available for on-site inspection during normal business hours. Split samples and copies of photographs will be provided to the facility owner or operator if the owner or operator requests them at the time the sample(s) is obtained or the photograph(s) is taken as the case may be.
 4. Inspections shall be conducted pursuant to the appropriate provisions of the Arizona Revised Statutes and policies established by the Department.

F. Proper Operation and Maintenance (R9-20-218)

The permittee shall at all times maintain in good working order and operate properly all treatment works installed or used for water pollution control and abatement to achieve compliance with the terms and conditions of the permit and water quality standards. If required by Article 5 of A.A.C. Title 9, Chapter 20, the permittee shall retain the services of an operator certified by the Department at the level appropriate to the permitted facility.

G. Permit Conditions (R9-20-220)

1. Duty to Mitigate

The permittee shall take all steps to minimize and correct any adverse impact on groundwater quality as defined in A.A.C. Title 9, Chapters 20 and 21 resulting from noncompliance with the permit.

2. Duty to Reapply

If a permittee has not been issued a permit for the life of the facility, a renewal application in the form of an amended Notice of Disposal or permit application shall be submitted to the Department no less than one hundred eighty (180) days prior to expiration of the existing permit.

3. Duty to Comply

The permittee shall comply with all terms and conditions

of the permit, and take such action as is necessary to ensure compliance.

H. Permit Actions (R9-20-221)

1. This permit may be modified, transferred, renewed, or revoked for cause. The filing of a request by the permittee for a permit action does not stay any existing permit condition.

2. Permit Modification

a. Request for modification of a permit may be made by the permittee, the Department, or any affected person and shall identify the specific item(s) to be considered for modification.

b. Public requests for modification of a permit shall be in writing to the Department and shall contain technical facts or reasons which justify the requested changes. The Department upon receipt of the request will notify the permittee, and evaluate and determine whether any request for modification shall be granted.

c. The permittee may be required to submit additional information, including an updated Notice of Disposal or permit application.

d. Only those items considered for modification may be changed, and all other conditions of the existing permit will remain in effect.

e. The following circumstances and occurrences shall require modification of a permit:

(1) Modification to the facility, which justify application of permit conditions that are different from or absent in the existing permit;

(2) other information that was not available when the existing permit was issued, and which justifies application of different permit conditions;

(3) changes in the regulations or standards upon which the permit was based which have been made after the permit was issued;

(4) good cause exists for changes in a compliance schedule because of conditions

- over which the permittee has little or no control, and a change to the permit by modification is a reasonable remedy;
- (5) reason(s) exists for revocation of the permit, and the Department determines that modification is an appropriate method for change; and
 - (6) amendment to an approved abandonment plan or contingency plan or any other portion of an approved Notice of Disposal or permit application.
- f. The suitability of the location of the facility will not be reconsidered during the process of changing the permit unless new information or change to regulations indicate that a violation of adopted groundwater quality standards exist and no other action is possible to mitigate the violation and comply with groundwater quality standards.
- g. The Department will publish a notice of intent pursuant to R9-20-223 to modify a permit before any final action is taken.
- h. With the concurrence of the permittee, the Department may make minor modifications to a permit for any of the following reasons:
- (1) To correct typographical errors;
 - (2) to require more or less frequent monitoring or reporting by the permittee;
 - (3) to change an interim compliance date in a schedule of compliance, provided the new date is not more than sixty (60) days after the date specified in the existing permit, and does not interfere with attainment of the final compliance date requirement;
 - (4) to change quantities or types of fluids discharged which are within the capacity of the facility as permitted, and in the judgment of the Department would not interfere with the operation of the facility or its ability to meet conditions prescribed in the permit, and would not change its classification, if the facility is an injection well; or
 - (5) to change construction requirements approved by the Department, provided that any such

alteration shall comply with the requirements of these regulations.

3. Permit Transfer

- a. This permit is transferrable to any person after thirty (30) days advance written notice to the Department. The Department may require modification of the permit to change the name of the permittee and incorporate any requirements which may be necessary to ensure compliance with State statutes and regulations.
- b. The permittee shall notify by registered letter a new owner or operator of a permitted facility of the existence of the permit thirty (30) days prior to transfer of responsibility. The notice shall include a copy of the permit. A copy of the letter shall be transmitted to the Department.
- c. The new owner or operator shall be responsible for compliance with the permit upon transfer of ownership or operation without regard to whether said owner or operator has in fact received the notice required by R9-20-221.C.2.
- d. Permit transfer does not absolve the previous permittee of any liability existing at or before the time the permit was transferred.

4. Permit Revocation

- a. Request for revocation of a permit may be made by the permittee, Department, or any affected person.
- b. Public requests for permit revocation shall be in writing to the Department and shall contain technical facts or reasons which justify the requested action. The Department upon receipt of the request will notify the permittee and evaluate the request and determine whether any request for revocation should be granted.
- c. Revocation of a permit is initiated when the Department issues a notice of intent to revoke a permit pursuant to R9-20-223 to the permittee and may be initiated for the following reasons:
 - (1) Noncompliance by the permittee with any permit condition;
 - (2) deliberate failure by the permittee to fully disclose all relevant facts when applying for a permit;

- (3) intentional or deliberate misrepresentation of any relevant fact at any time by the permittee; or
 - (4) if it is determined by ADEQ that the permitted activity is causing a violation of groundwater quality standards and such violation can only be regulated to acceptable levels by revoking the permit.
- d. If disposal to an aquifer causes a clear, present, and immediate danger to the health or welfare of persons, the Department may immediately suspend a permit. Within fourteen (14) days of the suspension, the Department shall issue a notice of intent to revoke the permit. The permit shall be considered revoked thirty (30) days after the notice of intent is issued by the Department unless and until a hearing is requested by the permittee pursuant to R9-20-222.

I. Confidentiality of Information (R9-20-224)

- 1. Any information submitted to or obtained by the Department pursuant to these regulations may be claimed as confidential by the facility owner or operator. Any such claim shall be asserted at the time the information is submitted or obtained. If no claim is made at that time, the Department may make the information available to the public without further notice.
- 2. Claims of confidentiality for the following information shall be denied:
 - a. The name and address of any permit applicant or permittee; or
 - b. information which deals with the present or future existence, absence, or level of waste(s) or pollutant(s) in water.
- 3. Criteria for determining confidentiality are:
 - a. A confidentiality claim has been made at the time the information was submitted or obtained;
 - b. the facility owner or operator has shown that reasonable measures have been taken to protect the confidentiality of the information, and intends to continue to take such measures;
 - c. the information is not, and has not been, reasonably obtainable without the facility owner or

operator's consent;

- d. no statute specifically requires disclosure of the information; and
 - e. the facility owner or operator has shown that disclosure of the information is likely to cause harm to its competitive position; or, the information is voluntarily submitted and disclosure would be likely to impair the State's ability to obtain necessary information in the future.
- J. Enforcement and Penalties (R9-20-225)

Any person who constructs, operates, or maintains a facility, disposal system, or introduces wastes or pollutants to waters of the State contrary to the provisions of this permit, falsifies data or information submitted to the Department as a result of the requirements of this permit, or otherwise violates the provisions of this permit, shall be subject to enforcement and penalties pursuant but not limited to A.R.S. 36-1864.01.

PART V. GROUNDWATER QUALITY STANDARDS

A. General Standards Applicable to all Groundwaters (R9-21-403)

1. Discharges of any pollutants and disposal of any wastes shall not impair the uses which have been made, are being made, or will be made of groundwater for every purpose.
2. Discharges of any pollutants and disposal of any wastes to groundwaters of the State shall not cause a public health hazard.
3. Disposal of any hazardous waste, radioactive waste or other waste shall not cause toxic substances to be present in groundwaters of the State in concentrations which are or may be hazardous to public health or which interfere with present and future uses of the groundwater.
4. Discharges of any pollutants and disposal of any wastes to groundwaters of the State shall not directly or indirectly cause violation of surface water quality standards established pursuant to Article 2 of this chapter.



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

P.O. Box 488, Phoenix, Arizona 85001-0488, Phone (602) 257-2310 (800) 234-5677, ext. 2310

Annual Registration Fee Invoice

Aquifer Protection Permit, Groundwater Quality Protection Permit or Notice of Disposal

To: A.F. Budge (Mining) Ltd
4301 N. 75th St., Ste 101
Scottsdale, AZ 85251-3335

Please return to:
Arizona Department of Environmental Quality
Accounts Receivable
P.O. Box 488
Phoenix, AZ 85001-0488

ID Number: 100338

Period: 01/01/91 - 12/31/91

Payment Due Date: 12/13/91

Instructions for completing this form are on the back. Check the box that represents your facility category, determine and enter the daily discharge/influent of pollutants, and enter the respective registration fee:

Table with 3 columns: Facility Category, Discharge/Influent (gallons per day), and Registration Fee. Includes checkboxes for various facility types like Injection Well, Land Treatment Facility, etc., and a section for Amount Enclosed.

I hereby certify that the above information is true and correct to the best of my knowledge:

Signature:

Check your address as printed above, and provide corrections if necessary:

Three horizontal lines for address corrections.

Retain the pink copy for your records. Return the completed signed original and the yellow copy of the form with your remittance payable to the Arizona Department of Environmental Quality.

Pursuant to ARS § 49-242 and Laws 1991, Chapter 184, Section 8, each owner of (1) an injection well, (2) a land treatment facility, (3) a dry well, (4) a septic tank system with a capacity of more than 2,000 gallons/day, (5) a facility which discharges to navigable waters, (6) a surface impoundment, (7) a facility which adds a pollutant to a salt dome formation, salt bed formation, underground cave or mine, (8) a mine tailings pile or pond, (9) a mine leaching operation, (10) a sewage or sludge pond, or (11) a wastewater treatment facility, to whom an individual Aquifer Protection Permit is issued, or each owner of facilities which on September 27, 1990 are operating pursuant to the filing of a notice of disposal or a groundwater quality protection permit issued under Title 36, Arizona Revised Statutes, shall register the permit annually with the Arizona Department of Environmental Quality and pay an annual registration fee. The fee is determined by ARS § 49-242.D.

Instructions for Completing Form

1. Check the box that represents your facility category.
2. Determine the daily discharge of pollutants if your facility is:
 - (a) an injection well,
 - (b) a land treatment facility,
 - (c) a dry well,
 - (d) a septic tank with a capacity of more than 2,000 gallons/day, or
 - (e) a facility which discharges to navigable waters.
3. Determine the daily influent of pollutants if your facility is:
 - (a) a surface impoundment,
 - (b) a facility which adds a pollutant to a salt dome formation, salt bed formation, underground cave or mine,
 - (c) a mine tailings pile or pond,
 - (d) a sewage or sludge pond, or
 - (e) a wastewater treatment facility.

4. Enter the daily discharge or influent in gallons
5. Enter the amount of your remittance according to the following:

Discharge or influent in gallons per day under the permit	Annual Fee
2,000 to 9,999	\$ 25.00
10,000 to 99,999	\$ 100.00
100,000 to 999,999	\$1,000.00
1,000,000 to 9,999,999	\$3,000.00
10,000,000 or more	\$5,000.00

6. Make your remittance payable to Arizona Department of Environmental Quality.



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

FIFE SYMINGTON, GOVERNOR
EDWARD Z. FOX, DIRECTOR

October 28, 1991

Dear Facility Owner:

You are receiving this letter because records at the Department of Environmental Quality (ADEQ) show that between 1984 and September 27, 1989 you either:

- 1) filed a notice of disposal (NOD) for an existing discharging facility¹ under the Groundwater Quality Protection Program; or
- 2) obtained a Groundwater Quality Protection Permit (GWQPP) for a discharging facility¹; or
- 3) registered a dry well.

Recent legislation (S.B. 1170) extended the annual permit registration fee for Aquifer Protection Permits (APP) to those existing facilities for which an APP is required but for which one has not yet been issued. The Department believes you are the owner of a facility(s) which may be subject to this fee. However, changes in the statutes and rules since the time you filed your NOD, GWQPP or registered your dry well may operate to exclude your facility(s) from the fee requirement.

Enclosed with this letter are two forms. The first form, titled "Fee Exclusion Worksheet", lists the types of facilities which do not require individual Aquifer Protection Permits and are therefore **not required to pay the annual registration fee**. If a facility does not meet any of the conditions on the fee exclusion worksheet, an annual fee is required. Use the second form, the Annual Registration Fee Invoice form (and the instructions on the reverse side) to calculate your fee. If you have more than one facility in a given category (i.e. surface impoundments, injection wells, etc.), indicate the number in the box to the left of the facility category and sum the discharge/influent values for each of the facilities in that category.

If you need more forms or have questions concerning either of the forms, please call the number at the top of the invoice form.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph C. Smith".

Joseph C. Smith
Assistant Director
Office of Administration

¹ types of discharging facilities are listed on the enclosed invoice



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

P.O. Box 488, Phoenix, Arizona 85001-0488, Phone (602) 257-2310 (800) 234-5677, ext. 2310

Annual Registration Fee Invoice

Aquifer Protection Permit, Groundwater Quality Protection Permit or Notice of Disposal

To: A.F. Budge (Mining) Limited
Mr. R. R. Short
4301 N. 75th St. Suite 101
Scottsdale, AZ 85251-3504

Please return to:
Arizona Department of Environmental Quality
Accounts Receivable
P.O. Box 488
Phoenix, AZ 85001-0488

ID Number: 100536

Period: 01-01-91 - 12-31-91

Payment Due Date: 1-30-92

Instructions for completing this form are on the back. Check the box that represents your facility category, determine and enter the daily discharge/influent of pollutants, and enter the respective registration fee:

Table with 3 columns: Facility Category, Discharge/Influent (gallons per day), and Registration Fee. Includes checkboxes for various facility types like Injection Well, Land Treatment Facility, etc.

Amount Enclosed \$ 0

I hereby certify that the above information is true and correct to the best of my knowledge:

Signature: [Handwritten Signature]

Check your address as printed above, and provide corrections if necessary:

Three horizontal lines for address corrections.

Retain the pink copy for your records. Return the completed signed original and the yellow copy of the form with your remittance payable to the Arizona Department of Environmental Quality.

Pursuant to ARS § 49-242 and Laws 1991, Chapter 184, Section 8, each owner of (1) an injection well, (2) a land treatment facility, (3) a dry well; (4) a septic tank system with a capacity of more than 2,000 gallons/day, (5) a facility which discharges to navigable waters, (6) a surface impoundment, (7) a facility which adds a pollutant to a salt dome formation, salt bed formation, underground cave or mine, (8) a mine tailings pile or pond, (9) a mine leaching operation, (10) a sewage or sludge pond, or (11) a wastewater treatment facility, to whom an individual Aquifer Protection Permit is issued, or each owner of facilities which on September 27, 1990 are operating pursuant to the filing of a notice of disposal or a groundwater quality protection permit issued under Title 36, Arizona Revised Statutes, shall register the permit annually with the Arizona Department of Environmental Quality and pay an annual registration fee. The fee is determined by ARS § 49-242.D.

Instructions for Completing Form

1. Check the box that represents your facility category.
2. Determine the daily discharge of pollutants if your facility is:
 - (a) an injection well,
 - (b) a land treatment facility,
 - (c) a dry well,
 - (d) a septic tank with a capacity of more than 2,000 gallons/day, or
 - (e) a facility which discharges to navigable waters.
3. Determine the daily influent of pollutants if your facility is:
 - (a) a surface impoundment,
 - (b) a facility which adds a pollutant to a salt dome formation, salt bed formation, underground cave or mine,
 - (c) a mine tailings pile or pond,
 - (d) a sewage or sludge pond, or
 - (e) a wastewater treatment facility.

4. Enter the daily discharge or influent in gallons
5. Enter the amount of your remittance according to the following:

Discharge or influent in gallons per day under the permit	Annual Fee
2,000 to 9,999	\$ 25.00
10,000 to 99,999	\$ 100.00
100,000 to 999,999	\$1,000.00
1,000,000 to 9,999,999	\$3,000.00
10,000,000 or more	\$5,000.00

6. Make your remittance payable to Arizona Department of Environmental Quality.

Fee Exclusion Worksheet

If your facility(s) meets the conditions set forth in any of the paragraphs below, please check the box next to that paragraph. Also, in the space provided at the end of this section, give a description of your facility explaining why you believe your facility meets those conditions and sign the certification statement. If all your facilities are covered by this form, check the box indicating "Not subject to A.R.S. §49-242" and return all forms to Arizona Department of Environmental Quality. No fee is required for facilities covered by this form. If you own other facilities not covered by this form, complete the appropriate sections of the invoice form and return both forms and the required fee to the Arizona Department of Environmental Quality.

- Household and domestic activities.
- Household gardening, lawn watering, lawn care, landscape maintenance and related activities.
- The noncommercial use of consumer products generally available to and used by the public.
- Ponds used for watering livestock and wildlife.
- Mining overburden returned to the excavation site, including any common material which has been excavated and removed from the excavation site and has not been subjected to any chemical or leaching agent or process of any kind.
- Facilities used solely for surface transportation or storage of water for beneficial use, or pumped from the groundwater, if effluent from any waste treatment facility is not added after the original point of diversion.
- Discharge to a community sewer system.
- Facilities which are defined and required to obtain a permit to reuse reclaimed wastewater.
- Leachate resulting from the direct, natural infiltration of precipitation through undisturbed regolith or bedrock if pollutants are not added to the leachate as a result of any material or activity placed or conducted by man on the ground surface.
- Surface impoundments used solely to contain storm runoff.
- Facilities which ceased operations prior to 1986. However, if the facility ever resumes operation the facility shall obtain an aquifer protection permit.
- Facilities for the recharge or underground storage and recovery of water transported or stored in a facility used solely for the transportation or storage of water for beneficial use, or pumped from the groundwater, if effluent from any waste treatment facility is not added after the original point of diversion.
- Facilities using central Arizona project water for underground storage and recovery projects under title 45, chapter 3, article 2.
- Application of water from any source, including groundwater, surface water, or wastewater, to grow agricultural crops or for landscaping purposes, except as provided in section 49-247.

A. F. Budge (Mining)
Mr. R. R. Short
4301 N. 75th St. Suite 101
Scottsdale, AZ 85251-3504

- Facilities which treat, store, or dispose of hazardous waste and which have been issued a permit or which have interim status, pursuant to the Resource Conservation and Recovery Act (P.L. 94-580; 90 Stat. 2796; 42 United States Code sections 6901 et. seq., as amended) or the rules adopted pursuant to A.R.S. §49-922.
- Underground storage tanks which contain regulated substances as defined in A.R.S. §49-1001.8.
- Facilities for the disposal of solid waste, as defined in A.R.S. §49-701.12, which are located in unincorporated areas and which only receive solid waste from four or fewer households.
- Drywells which are used solely to receive storm runoff, except those that drain areas in which hazardous substances are used, stored, loaded, or treated.
- The application of nitrogen fertilizers.
- Animal feeding operations (including dairies and animal feedlots).
- Activities conducted pursuant to a remedial action order issued or a plan approved pursuant to A.R.S. §49-281 through 49-287, and R18-7-101 through R18-7-110.
- Any use of pesticides directly in the commercial production of plants and animals which is subject to the Federal Insecticide, Fungicide, and Rodenticide Act, (P.L. 92-516; 86 Stat. 975; 7 United States Code sections 135 et. seq., as amended), or A.R.S. §49-301 through 49-309 and the rules adopted thereunder, or Title 3, Chapter 2, Article 6 of the Arizona Revised Statutes and the rules adopted thereunder.
- Sewage disposal systems which have flows less than 2000 gallons per day, which are in compliance with R18-9-801 through R18-9-819, and which receive materials which conform to paragraph 1. of Subsection D.
- Sewage disposal systems which have flows greater than or equal to 2000 gallons per day but less than 20,000 gallons per day, which are approved by the Department, the Arizona Department of Health Services, or a county health department pursuant to R18-9-804 and R18-9-805 prior to September 27, 1989 and which are in compliance with the provisions of R18-9-804 and R18-9-805.
- Agricultural applications of wastewater sludge meeting all of the conditions given in R18-9-128.
- Discharge of wash water from sand and gravel operations, and placer mining operations, if only physical processes are employed and no hazardous substances, other than those naturally existing in the sand and gravel or the placer material, have been added or exposed during the processing or removal of the sand and gravel.
- Discharges from hydrostatic tests of drinking water distribution systems, and of other pipelines not previously used for the transmission of fluids, if all of the conditions in R18-9-129B are met.
- Discharges from hydrostatic tests of pipelines previously used for transmission of fluids, other than those previously used for drinking water distribution systems, if all the conditions of R18-9-129C are met.

- Facilities which, for purposes of water quality sampling, hydrologic parameter testing, well development or redevelopment, receive water, drilling fluids or drill cuttings from a well, if the discharge is to the same aquifer in approximately the same location from which the water supply was withdrawn originally.
- Injection wells, surface impoundments, and leach lines receiving discharge from only filter backwash from potable water treatment systems, condensate from refrigeration units, overflows from evaporative coolers, heat exchange systems return water, or swimming pool filter backwash, where the discharge is less than 1,000 gallons per day.
- Lined evapotranspiration beds receiving sewage which are issued an Approval to Construct pursuant to R18-9-804 and 805, and which are inspected and leak tested by the Department or its designated representative during construction.
- Disposal of material that contains only uncontaminated soil, cement, bricks, or other similar inert material.
- Facilities used for transportation of water for beneficial use, or pumped from the groundwater, which contain effluent from any wastewater treatment facility if all of the conditions of R18-9-129H are met.
- Surface impoundments which receive only filter backwash from potable water treatment systems and conditions of R18-9-129I.

I believe my facility is not subject to the fee requirement for the reason(s) checked above because:

We have a zero discharge permit with zero discharge and the sewage disposal system is less than 2,000 gallons per day.

I certify that the above information is true and correct to the best of my knowledge:

Ronald Short
 Signature

Jan. 14, 1992
 Date

January 19, 1990

Arizona Department of
Environmental Quality
Water Permits Unit
Room 202
2005 North Central Avenue
Phoenix, Arizona 85004

Attention: Ms. Abigail Myers
Water Permit Writer
Mr. Tim L. Levandowsky
Water Pollution Compliance Unit
Mr. Michael A. Milczarek
Groundwater Permit Writer

Re: Heap Leach Facility
Vulture Mine Project

Ladies and Gentlemen:

On Monday, January 8, 1990, samples of the compacted material underlying the leach pad were taken by Budge personnel. The samples were taken with a hand auger from locations at the southeast corners of cells #1 and #2, immediately adjacent to the existing leak detection riser pipes. A 12- to 16-inch diameter hole was cut in the HDPE liner, approximately 10 feet from the riser pipes and the hand auger used to auger a 2-inch diameter hole.

As detailed in our letter of January 2, 1990, samples were to be taken at 3-foot intervals to a depth of 15 feet at each location. Unfortunately, the composition of the subsurface material precluded our sampling to these depths. On cell #1, the first hole encountered impenetrable ground at a depth of 3 feet, 8 inches. Thus, only 2 samples were collected from the first hole. The second hole on cell #2 encountered impenetrable ground at a depth of 5 feet 6 inches. Six soil samples were collected from this location.

Samples were placed in containers provided by Arizona Testing Laboratories and stored in a cool place. The samples were delivered to the lab on Tuesday, January 9 at 11:30 a.m. for analyses of total and free cyanide.

On the same day as these samples were collected, the HPDE liner midway between the front and back heaps on cell #1 was cut to expose the leak detection system trench. Solution found in this trench was sampled and will be analysed for total and free cyanide. A riser pipe was installed at this location to permit evacuation of the solution via another FLEX-FLO pump.

During the excavation to expose the leak detection trench, small pin holes were observed in the liner. These holes appear to be the result of rocks in the underlying bed of the trench which, through pressure from the overlying tailings, have punctured the liner above them. It is anticipated that the leak, at least in cell #1, could very well be confined exclusively to the area of the leak detection trench and by pumping the solution from the riser pipe, we may prevent any further contamination of the underlying soils.

Application of all leach solution to the material in cells #1 and #2 has ceased.

Enclosed with this letter are the following items: -

1. Plan view of the leach pad area showing the locations of samples taken and the location of the newly installed riser pipe,
2. Report of analyses of water samples requested by ADEQ: -
Sample F-1: fresh water samples from well at Vulture

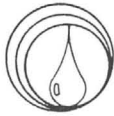
Mine

Sample F-2: fresh water sample from well located on property owned by Mr. David Smith which lies approximately _____ miles south-southeast of the leach pad.

Sample L-1: sample of solution extracted in October, 1989 from riser pipe located on cell #2

Sample L-2: sample of solution extracted in October, 1989 from riser pipe located on cell #1.

3. Detailed sampling and analyses of the two leak through January 16, 1990.



Arizona Testing Laboratories

810 East Hammond Lane □ Phoenix, Arizona 85034 □ 602/254-6181

For: A.F. Budge Mining
Attn: Mr. Anthony F. Budge
4301 N. 75th Street, Suite 101
Scottsdale, AZ 85251

Date: December 12, 1989

Lab. No.: 938501

Sample: Groundwater

Marked: F-1 Surface
Sampled: 10/26/89
Time: 10:00 a.m.

Received: 10/27/89

Submitted by: Same

REPORT OF LABORATORY TESTS

Arsenic	< 0.01	mg/L
Barium	< 0.5	
Cadmium	0.0066	
Chromium	< 0.01	
Lead	< 0.005	
Mercury	< 0.001	
Selenium	< 0.005	
Silver	< 0.02	
Cyanide	< 0.01	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

810 East Hammond Lane □ Phoenix, Arizona 85034 □ 602/254-6181

For: A.F. Budge Mining
Attn: Mr. Anthony F. Budge
4301 N. 75th Street, Suite 101
Scottsdale, AZ 85251

Date: December 12, 1989

Lab. No.: 938504

Sample: Groundwater

Marked: L-2

Received: 10/27/89

Sampled: 10/26/89

Time: 11:55 a.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

Arsenic	< 0.01	mg/L
Barium	< 0.5	
Cadmium	< 0.005	
Chromium	< 0.01	
Lead	< 0.005	
Mercury	0.77	
Selenium	0.15	
Silver	1.3	
Cyanide	270.	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake

ACCU-LABS RESEARCH, INC.

11485 West 48th Avenue - Wheat Ridge, CO 80033 - (303) 423-2766

A N A L Y S I S R E P O R T

DATE: 11/06/89 PAGE 1

CAROL A. O'BRIEN
 A.F. BUDGE (MINING) LIMITED
 4301 N. 75TH. STREET
 SUITE 101
 SCOTTSDALE, AZ 85251-3504

Lab Job Number: 9416-32048-4
 Date Samples Received: 10/19/89
 Customer PO Number: (none)

These samples to be disposed of 30 days after the date of this report.

ALR Designation -	9416-32048-4-1	9416-32048-4-2	9416-32048-4-3	9416-32048-4-4
Sponsor Designation -	PAD #1	PAD #2	WELL WATER	MINE 600 LEVEL
Date Collected -	10/16/89	10/16/89	10/16/89	10/09/89

Determinations in mg/L unless noted

Barium - total	----	----	<0.05	0.08
Cadmium - total	----	----	<0.005	<0.005
Chromium - total	----	----	<0.005	<0.005
Mercury - total	----	----	0.0002	<0.0001
Silver - total	----	----	<0.005	<0.005
Arsenic - total	----	----	<0.005	<0.005
Lead - total	----	----	<0.005	0.005
Selenium - total	----	----	<0.005	<0.005
Cyanide, Total	190	140	0.006	----

By: Mary Fabisiak
 Mary Fabisiak
 Water Laboratory Supervisor

MF/dh *dh*



Arizona Testing Laboratories

810 East Hammond Lane □ Phoenix, Arizona 85034 □ 602/254-6181

For: A.F. Budge Mining
Attn: Mr. Anthony F. Budge
4301 N. 75th Street, Suite 101
Scottsdale, AZ 85251

Date: December 12, 1989

Lab. No.: 938503

Sample: Groundwater

Marked: L-1

Received: 10/27/89

Sampled: 10/26/89

Time: 11:00 a.m.

Submitted by: Same

REPORT OF LABORATORY TESTS

Arsenic	< 0.01	mg/L
Barium	< 0.5	
Cadmium	0.0054	
Chromium	< 0.01	
Lead	0.26	
Mercury	0.38	
Selenium	0.22	
Silver	2.2	
Cyanide	170.	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



Arizona Testing Laboratories

810 East Hammond Lane □ Phoenix, Arizona 85034 □ 602/254-6181

For: A.F. Budge Mining
Attn: Mr. Anthony F. Budge
4301 N. 75th Street, Suite 101
Scottsdale, AZ 85251

Date: December 12, 1989

Lab. No.: 938502

Sample: Groundwater

Marked: F-2 Surface
Sampled: 10/26/89
Time: 10:00 a.m.

Received: 10/27/89

Submitted by: Same

REPORT OF LABORATORY TESTS

Arsenic	0.015	mg/L
Barium	< 0.5	
Cadmium	< 0.005	
Chromium	< 0.01	
Lead	< 0.005	
Mercury	< 0.001	
Selenium	< 0.005	
Silver	< 0.02	
Cyanide	< 0.01	

< = less than the detection
limit given

Respectfully submitted,

ARIZONA TESTING LABORATORIES

Robert J. Drake



A.F. Budge (Mining) Limited

(602) 945-4630

4301 North 75th Street
Suite 105
Scottsdale, AZ 85251-3504

FAX (602) 949-1737

July 25, 1990

Mr. Michael A. Milczarek
State of Arizona
Department of Environmental Quality
2005 North Central Avenue
Phoenix, Arizona 85004

Dear Mr. Milczarek:

Enclosed is some information which supports our belief that it would be highly improbable for any solutions from our leaching activities at the Vulture facility to reach the groundwater table. This information, including a memo by C.A. O'Brien and a report by D.C. White, indicates that the historic mining activities took place about 900 feet north-northeast of the leach pad area. The old underground workings followed the apparent "dip" of the "vein" which was north at approximately 35 degrees; this would put the workings, i.e. drifts and stopes, even farther away from the leach pad area. It is highly improbable that any solutions from the leach pad would reach these workings.

The trenches which were dug to the east and west of the leach pad area during our investigation of the placer potential of the area encountered numerous layers of caliche within 30 feet of the surface. The rotary drill holes in the same area encountered the same caliche layers near surface, and at depth, encountered an impervious unit of Precambrian quartz-sericite-chlorite schist. Both these units have a low rate of permeability. Any solution which may be leaking from the pad area would take quite a long time to penetrate these rock types and reach the groundwater table 400 feet below the surface.

We are presently running fresh water on top of the heaps that have exhibited leaks in order to flush out the remaining cyanide more rapidly. Barren solution is being circulated through the rest of the heaps, allowing for a natural degradation of the cyanide. When the cyanide content in the solution has decreased to the level acceptable and specified in our permit, we will stop circulating solution. In the event the cyanide content does not decrease as expected, we will allow the heaps to drain and sit for several months. This will allow for natural degradation of cyanide within the heaps. The drainage solutions will be treated and allowed to evaporate. After an appropriate

M. Milczarek
July 25, 1990
Page 2

period of time, the heaps will be drilled; samples collected during the drilling program will be analysed for free cyanide. At that time, if the levels of cyanide are unacceptable, we would anticipate using hydrogen peroxide as a method for complete detoxification of the heaps.

Respectfully submitted,



Dale H. Allen
Production Manager

encls.

To: Dale H. Allen

Date: July 24, 1990

From: Carole A. O'Brien

Subject: Geology of the Vulture Mine Area

In the immediate vicinity of the Vulture Mine, the geology consists of a Precambrian or Proterozoic volcanoclastic sequence which has been intruded by a quartz monzonite sill. The sill is an apophysis from an intrusive stock lying west of the mine area. The West Incline near Pit #2, is actually a decline which angles north at 35 degrees. The old mine workings lie almost exclusively north of the pits (see Figure 1) and all workings follow the dip on the "vein" which is north, at an average of 35 degrees. Figure 1 is schematic and shows the relative positioning of the pits, mine workings and major faults to the leach pad area. A more detailed description of the geology is contained in the accompanying paper, written by D.C. White in 1989.

The leach pad was constructed in an area approximately 900 feet southwest of the Vulture Mine and immediately southwest of the old cyanide mill which operated in the early 1930's. The substrata consists of old cyanide tailings, plus alluvium and colluvium, derived from the surrounding rock types. During a 1985 evaluation of the placer potential in the area, trenches were excavated to the west of the present leach pad site. Figures 2 and 3 show the detailed mapping in 2 of these trenches. The alluvium and colluvium consists of unconsolidated fine grained sands, gravels and cobble units which are highly cemented with calcium carbonate (= caliche) within 7 to 8 feet of surface.

Prior to construction of the leach pad, three reverse circulation rotary drill holes were drilled in the general area of the leach pad. Figure 4 shows a typical log through one of these holes. The alluvium and colluvium units described above were intersected in the holes and ranged in depths from 16 to 24 feet, and were overlain by the old cyanide tailings, which ranged in depths from 17 to 20 feet.

Below the unconsolidated material is the Precambrian unit consisting of quartz-sericite-chlorite schist, usually grading to a more mafic, or amphibole, schist towards the contact with the quartz monzonite intrusive at depths of approximately 300 feet.

Groundwater levels

Table I shows the sample sites and elevations for the static groundwater level in the area of the Vulture Mine. In the area of the leach pad, it can be safely assumed that the groundwater level may be at an elevation of 1550 to 1600 feet, or 400 to 450 feet below surface.

Comments on Porosity and Permeability

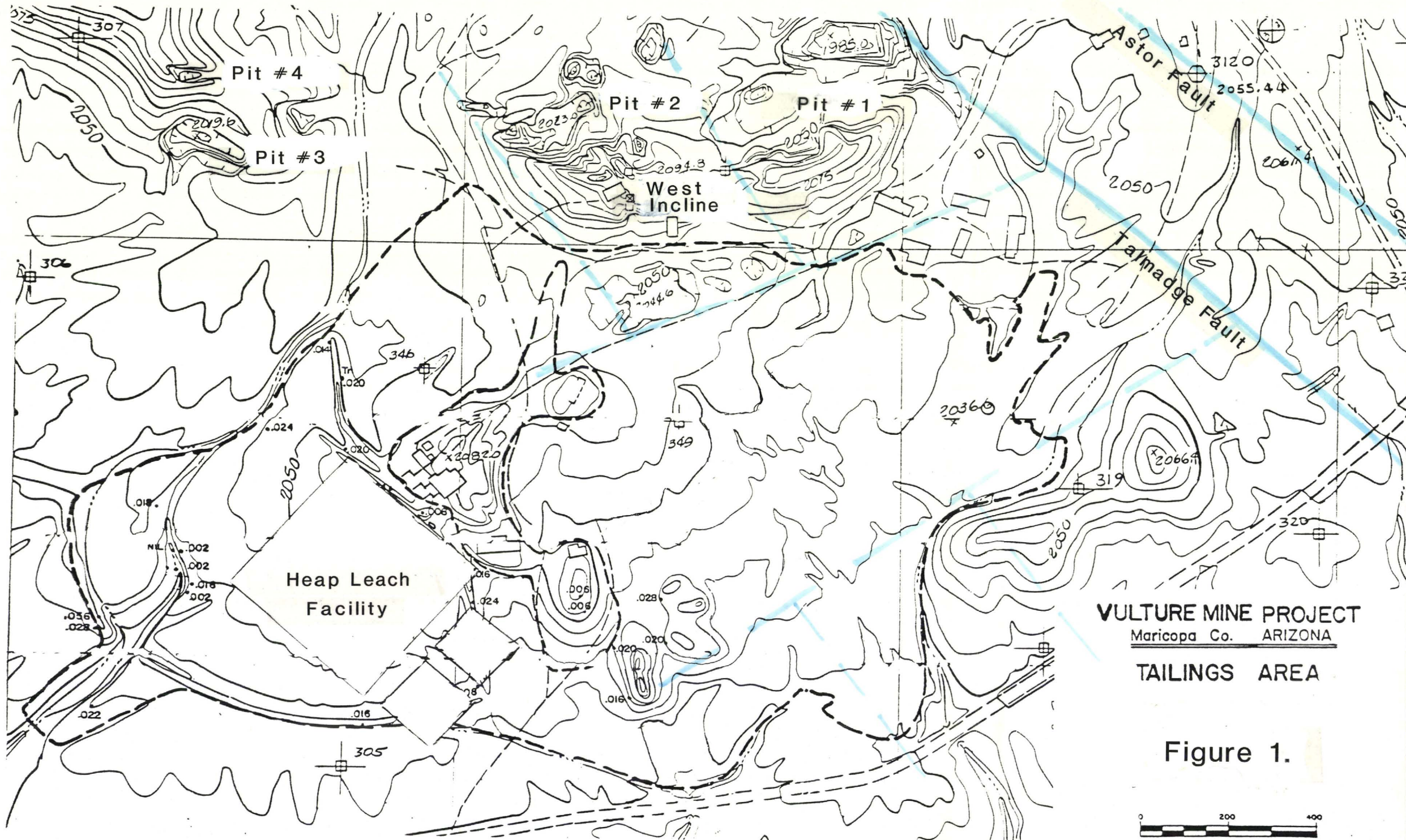
No measurements of either porosity or permeability have been made on any of the materials described above. However, porosities for schist and monzonite porphyries have been documented at 0.70 to 2.40 percent. Porosities in the overlying unconsolidated material may be in the order of 30 to 45 percent. There is no direct correlation between porosity and permeability. A very porous material may have a low permeability rate if the pore spaces are not connected. Finely compacted clay soils and very dense rock with few interlocking fractures have a

permeability factor of 9.7×10^{-7} cm/sec or approximately 1 foot per year. The schist and monzonite, being dense rocks, would therefore be assumed to have such a low permeability rate. A continuous application of solution would reach groundwater in 400 to 450 years.

Table 1.

Summary of Static Groundwater Levels
 Vicinity of Heap Leach Facility
 Vulture Mine

<u>Description</u>	<u>Location</u>	<u>Depth to Water (feet)</u>	<u>Water Surface Elevation (feet)</u>
Vulture Mine Well	NW1/4 SW1/4 NW1/4 Section 31 Township 6 North Range 5 West	430	1,635
West Incline at Mine	NE1/4 NW1/4 SE1/4 Section 36 Township 6 North Range 6 West	376	1,706
Private well	NW1/4 NW1/4 Section 7 Township 5 North Range 5 West	500	1,400



Pit #4

Pit #3

Pit #2

Pit #1

West Incline

Heap Leach Facility

Astor Fault

Talmadge Fault

3120
2055.44

2061.4

306

346

349

2036.0

319

320

.036
.028

.002
.002
.018
.002

.016
.024

.005
.006

.028
.020

.016

.022

305

2050

2019.2

2023.0

2020

2094.3

2050

2044.6

2050

.024

.020

.008

2032.0

2050

2050

2050

320

2066.9

2050

2050

2050

2050

2050

2050

2050

2050

2050

2050

2050

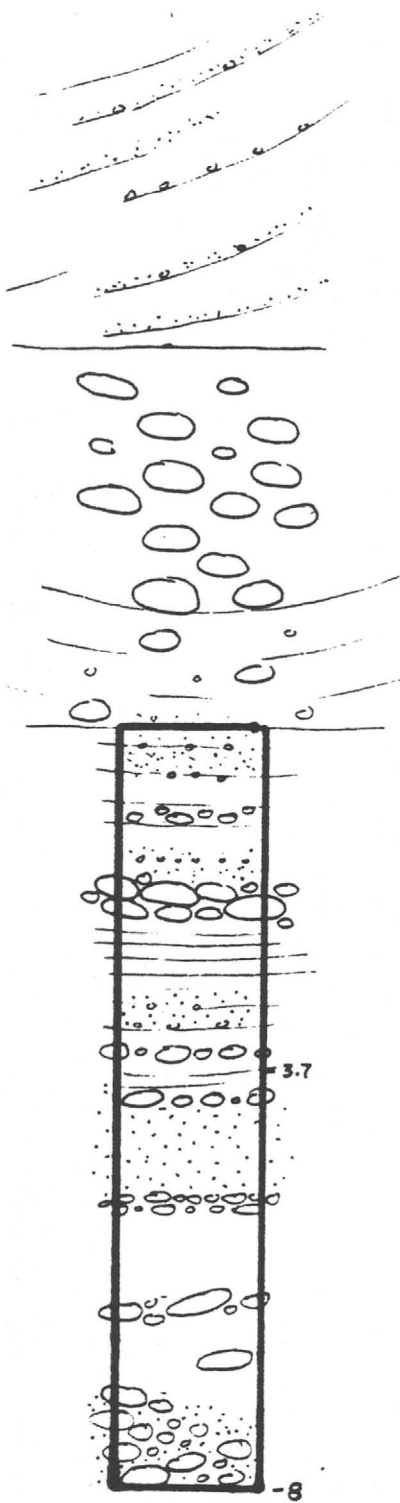
2050

2050

2050

VULTURE MINE
PLACER PROJECT
TRENCH 15
CHANNEL 1

SURFACE



fine grained sands
 containing lenses grits &
 small pebbles; highly
 cemented with $CaCO_3$

unsorted unconsolidated
 weak bedded cobble unit;
 schistose metamorphics to
 15cms. semi-angular (Rounding 3)

zone of rhythmic graded
 low energy fluvial sediments,
 basal gravel mod-well packed
 diorite (Rounding 5) schistose
 metamorphic (Rounding 4)

15-1-1: 0.88 mg/cuyd
 112.73 lb/cuft

moderately sorted coarse
 grained sand-grit

15-1-2: 59.4 mg/cuyd
 152.31 lb/cuft.

cobble-pebble clasts
 to 15cms, semi-rounded
 (Rounding 5-6) in coarse
 grained sand matrix
 suggesting low-moderate
 level fluvial energy

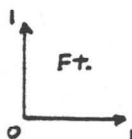


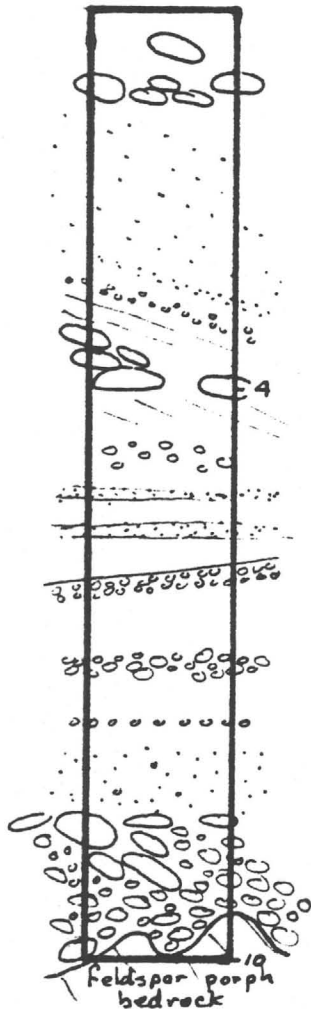
Figure 2.

VULTURE MINE
PLACER PROJECT
TRENCH 16
CHANNEL 1

SURFACE

reddish sandy soil

highly CaCO_3 cemented unsorted coarse grained sand containing highly weathered dioritic clasts to 23 cms.



16-1-1: 8.10 mg/cuyd
 103.83 lb/cu ft

graded sequence, several fluvial cycles of increasing grain size; alternating coarse grained sand bodies with grit and small pebble lenses
 clasts 100% diorite

16-1-2: 222.48 mg/cuyd
 114.33 lb/cu ft.

basal section unsorted pebble-cobble gravel composed 100% dioritic identical to bedrock; very local source for the semi-angular (Rounding 4) clasts; bedding gradients 11% suggests high energy environment.

Figure 3.

VULTURE MINE

HOLE NO. C-1

RVC Condemnation Hole

Inclination: -90°

Direction:

Total Depth: 320

Scale 1" = 40'

Loc 2S, 150N, 20, 780E (approx)

Harris Drilling Co

Presence of:

Assays (oz/t)

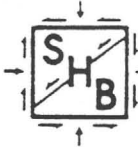
3-04/05-87

Depth (ft)	Unit	Graphic Lbg	Dust Color	Quartz	FeO	Sulfides	Au	Ag	Remarks
0	Qt		Tan						Tailings
18	Qal		Tan/gy						qtz. monz @ top, ptqs rubble below
42±									
50			gy-gr	>5%					Schist & hornfels (locally well fol.)
	ptqsc								Grades downward to qtz-chlorite (± mafic mins)
100			v. dk gr- blk	<5%					rx, locally magnetic.
	pe amph hfs								Epidote to 2%
150									(Several buttons lost from bit, slowed drilling)
180									
200									
250									
270									
	ptqsc		med gy-gr	5%					Chlorite schist
295									
300	alt		grn	10%-20%		py in qtz	2.0003 .0003 .0006		Alt/minz c.s.
	qm		grey				< < .0006		qtz monz, unminz Cx texture.
TD 320									

3-04
3-05

Figure 4.

Logged by Peter Hahn



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SOIL & FOUNDATION ENGINEERING • ENGINEERING GEOLOGY • HYDROGEOLOGY
MATERIALS ENGINEERING • MATERIALS TESTING • ENVIRONMENTAL SERVICES

October 30, 1989

Arizona Department of
Environmental Quality
Water Permits Unit
Room 202
2005 North Central Avenue
Phoenix, Arizona 85004

SHB Job No. E89-217
Letter No. 1

Attention: Ms. Abigail Myers
Water Permit Writer

Re: Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona

Ladies and Gentlemen:

This letter is submitted on behalf of A.F. Budge (Mining) Limited (Budge) in response to the notification of violations of Groundwater Quality Protection Permit G-0090-07 at the above referenced project. The letter of notification, dated September 26, 1989, was prepared by Mr. Michael A. Milczarek, Groundwater Permit Writer for the Arizona Department of Environmental Quality (DEQ), and included a September 15, 1989 site visit report (dated September 25, 1989) and a DEQ internal memorandum (dated September 26, 1989). Subsequent sections of this letter present our understanding of the conditions at the project facility and our responses to the DEQ requests.

1. Site Visit

A site visit was conducted by the writer on October 4, 1989, in order to review existing conditions at the heap leach facility and collect the data necessary to develop

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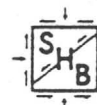
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FAX 331-4153

recommendations. Subsequent to the site visit, a meeting involving Ms. Carole O'Brien and Mr. Dale Allen of Budge and the writer was held on October 20, 1989.

2. Leakage Through Heap Leach Pad
Geomembrane Liner

Leach solution was originally detected in the cell no. 2 leak detection system riser pipe, located at the southeast corner of the pad cell, on August 7, 1989. The attached Figure 1 presents a plan view of the heap leach facility. The leakage rate was initially estimated at about 0.0013 gallons per minute (gpm), and tests on the fluid performed by Budge personnel indicated a pH of 11.1 and a free cyanide concentration of 250 milligrams per liter (mg/l). In accordance with the requirements of Parts II.A.4, II.B.1.b and II.C.1 of Groundwater Quality Protection Permit No. G-0090-07, this initial leak was reported to the DEQ and the Maricopa County Health Department in our letter of August 10, 1989.

Table 1 presents the results of leakage flow rate measurements and laboratory testing performed by Budge personnel for fluid encountered in the cell no. 2 leak detection system. As indicated in the table, prior to September 8, 1989, the leakage flow rate was roughly estimated. After September 8, a dedicated "Flexflo" pump was used for fluid extraction and leakage flow rate estimation.



Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
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SHB Job No. E89-217
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Application of leach solution to the south half of cell nos. 1, 2 and 3 (the heap no. 3 area as presented in Figure 1) was discontinued on September 22, 1989. As can be seen in Table 1, as of October 17, 1989, the leakage flow rate had generally decreased from an upper limit of 0.04 gpm to 0.01 gpm, with minor fluctuations in mid-September, 1989. The free cyanide concentration and pH also decreased from highs of 300 mg/l and 11.7 to 50 mg/l and 8.3, respectively.

On September 21, 1989, leach solution was detected in the cell no. 1 leak detection system riser pipe. The collected fluid had a cyanide concentration of 250 mg/l and a pH of 7.8; no estimate of the leakage flow rate was made. Table 2 presents the Budge monitoring records for the cell no. 1 leak detection system. As indicated in this table, a dedicated "Flexflo" pump was installed in the cell no. 1 riser pipe on October 4, 1989. Over the period of October 5 to October 17, 1989, the leakage flow rate from cell no. 1 has decreased from 0.013 to 0.007 gpm, accompanied by decreases in the cyanide concentration and the pH. Collected fluid from the leak detection system riser pipes at cell nos. 1 and 2 is presently being pumped to the existing pregnant solution pond.

It is our understanding that leaching activities on cell nos. 1 & 2 are complete, and that no additional leach

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Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
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solution will be applied to these cells. It is also understood that all project leaching operations will be completed in about 6 months.

3. Location of Leaks in Leach Pad
Geomembrane Liner

Based on our understanding of the operations and conditions at the heap leach facility, it is anticipated that the leaks through the 30-mil thickness high density polyethylene (HDPE) geomembrane pad liner are most likely in the form of pinholes beneath the sand and gravel overliner material at the toe of cell nos. 1 and 2 (Figure 1). Other than physically removing the overliner material and vacuum testing the suspected damaged liner area, there are no reliable methods for identifying defects in an in-place geomembrane liner. It is our opinion that, given the cessation of leach solution application to cell nos. 1 and 2 and the anticipated remaining 6-month project life, it would be of no productive use to attempt to remove the overliner material and repair the suspected defects. It is felt that any repair attempts would most likely result in more damage to the liner from the hand labor necessary to expose the liner than presently exists.

It is anticipated that the leakage flow rate, cyanide concentration and pH will continue to decrease as excess

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leach solution drains from heaps 1 and 3 on the south half of cell nos. 1 and 2 and no additional solution is applied to these areas.

As requested by DEQ, results of bonded seam strength and peel adhesion tests, performed by Precision Laboratories on samples of the heap leach pad liner field seams, are attached. Daily progress reports covering the vacuum testing of the entire length of all field seams are available upon request.

4. Hydrogeology of Site Area

The heap leach facility site area lies within the upper portion of the Hassayampa River basin, which extends from the Date Creek, Weaver and Bradshaw Mountains north of Wickenburg to the confluence with the Salt River near Phoenix, covering a total area of about 1,300 square miles.

Groundwater conditions in this area are discussed in detail in a report by Sanger and Appel (1980).* The report includes data on groundwater depths and water quality from numerous wells in the region, including the Vulture Mine well discussed below. The report also delineates the limits of several groundwater basins within the Hassayampa River drainage system.

*References are listed at the end of this letter.

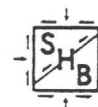
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The Vulture Mountains are flanked on the south by a deep alluvial basin referred to as the Hassayampa Plain. This area receives recharge, primarily in the form of groundwater, from the southern slopes of the Vulture Mountains, including the site area. The general flow direction of groundwater beneath the site is therefore to the south. Groundwater occurs in saturated alluvial materials at elevations ranging from about 1250 to 1500 feet in the Hassayampa Plain.

The static water table at the site is reported by Sanger and Appel to lie at an elevation of about 1645 feet above sea level, at an average depth of about 435 feet below the ground surface. Table 3 presents static water levels and water surface elevations for two wells and a mine decline in the vicinity of the site. The depths to water as presented in the table are consistent with the data reported by Sanger and Appel.

It is expected that the extent of contamination beneath the leach pad is limited to the upper few feet of sub-grade soils underlying the southern end of cell nos. 1 and 2. Groundwater at the site evidently only occurs at significant depths in bedrock, generally at about 400 feet. Thus, infiltration of the contaminants to the water table from the leach pad is not likely to occur, unless the contaminants are introduced via underground mine workings.



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Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
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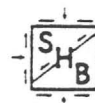
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5. Sampling & Laboratory Analysis
of Collected Leaking Fluid &
Mine Water Well

It is our understanding that Budge personnel are presently engaged in recovering water samples from the cell no. 1 and 2 leak detection riser pipes and the Vulture Mine well for purposes of water quality testing as requested by the DEQ. It is further understood that appropriate sampling techniques and a certified laboratory experienced in Environmental Protection Agency-approved analytical procedures will be utilized. It is anticipated that the results of these tests will be submitted to the DEQ as soon as they become available.

6. Existing Slopes of Heaps

The existing leach pile height is about 30 feet, comprised of two 15-foot lifts. The individual 15-foot lifts are numbered as shown in Figure 1. The separation between the north and south heaps as shown in Figure 1 was purposely maintained during stacking of the tailings on the leach pad in order to provide some independence between the north and south halves. Four to six corrugated, perforated drainage pipes per cell are located on the pad liner, immediately beneath heaps 1 and 2. These pipes function to keep the solution head in the heaps at a low level by augmenting the drainage of the heaped tailings.



SERGENT, HAUSKINS & BECKWITH

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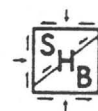
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The existing exterior slopes of the heaps at the facility are in the range of 1.15:1 to 1.73:1 (horizontal to vertical), based on measurements by Budge personnel; a seismic setback between the lower and upper lifts is not provided. The angle of repose of the tailings was originally estimated to be about 1.73:1, with an anticipated maximum pile height of 75 feet. In the original facility design, 5-foot seismic setbacks were included for each 15-foot lift, because of the 75-foot pile height. Details of the original facility design can be found in our Geotechnical Design Development Report (SHB, 1987). It should also be noted that the maximum allowable pile height in the facility permit is 45 feet.

As depicted in Figure 1, a 20-mil thickness HDPE geomembrane liner panel was placed on the crest of heap no. 2, prior to stacking the heap no. 4 lift. This liner panel was placed by Budge personnel in an attempt to confine the leach solution to the upper (heap no. 4) lift, preventing releaching of the spent heap no. 2 tailings. It is our understanding that during leaching of heap no. 4, a leach solution line located at the southeast corner of the crest of heap no. 4 failed, resulting in inundation of that portion of the heap. Aided by the low basal frictional resistance caused by the underlying geomembrane liner, the saturated tailings slope then failed.



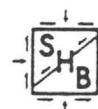
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It is our opinion that the slopes of the heaps as presently configured are in a stable condition, except as noted below. During stacking of the tailings, the slopes assumed angles of repose particular to the materials involved. As discussed previously, the existing slopes are in the range of 1.15:1 to 1.73:1, yielding angles of repose of about 30 to 41 degrees. This range in slope angles is both typical and reasonable for the heaped tailings. It is felt that, for the 30-foot pile height involved, a seismic setback between lifts is not necessary. Because of the underlying liner panel, it is anticipated that localized failures of the heap no. 4 slope may occur in areas that become overly wetted by leach solution; however, it is expected that such failures will be of insufficient extent to restrict the solution channel or extend over the perimeter berm.

7. Leach Pad Perimeter Berm

The leach pad perimeter berms along the east, west and north sides of the pad were designed and constructed to a height of 2 feet. Within certain areas of the pad perimeter, the effective height of the perimeter berm has been reduced due to the placement of about 1 foot of tailings on the interior of the berm. It is our understanding that Budge personnel plan to relocate these



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excess tailings to the main pile area, increasing the effective containment height of the perimeter berm to its original dimension.


Based on conversations with Budge personnel, it is our understanding that the "white residue...present on the soil of the southernmost furrow indicating leachate solution had breached that (perimeter) berm" on the southeast side of the pad was in fact not due to leach solution exiting the pad, but rather to a broken mine waterline. It is also our understanding, however, that Budge personnel are in the process of arranging for sampling and testing of the affected area for the presence of cyanide under DEQ supervision.

Should any questions arise concerning this letter, please do not hesitate to contact the undersigned.

Respectfully submitted,

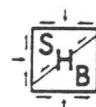
Sergent, Hauskins & Beckwith Engineers

By 
NICHOLAS J. LaFronz, P.E.

Reviewed by 
Lawrence A. Hansen, P.H.D. P.E.

Copies: Addressee (1)
A.F. Budge (Mining) Limited
Attn: Ms. Carole A. O'Brien (2)

blc/bc-j14/10-26-89



SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
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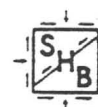
Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
SHB Job No. E89-217
Letter No. 1

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REFERENCES

Sanger, H.W. and Appel, C.L., 1980, Maps Showing Ground-Water Conditions in the Hassayampa Area, Maricopa and Yavapai Counties, Arizona - 1978, U.S. Geological Survey, Water Resources Investigations, Open-File Report 80-584, Tucson, Arizona, June.

Sergent, Hauskins & Beckwith, 1987, Geotechnical Design Development Report, Heap Leach Facility Design, Vulture Mine Project, Near Wickenburg, Arizona, SHB Job No. E87-11, April 10.



SERGENT, HAUSKINS & BECKWITH
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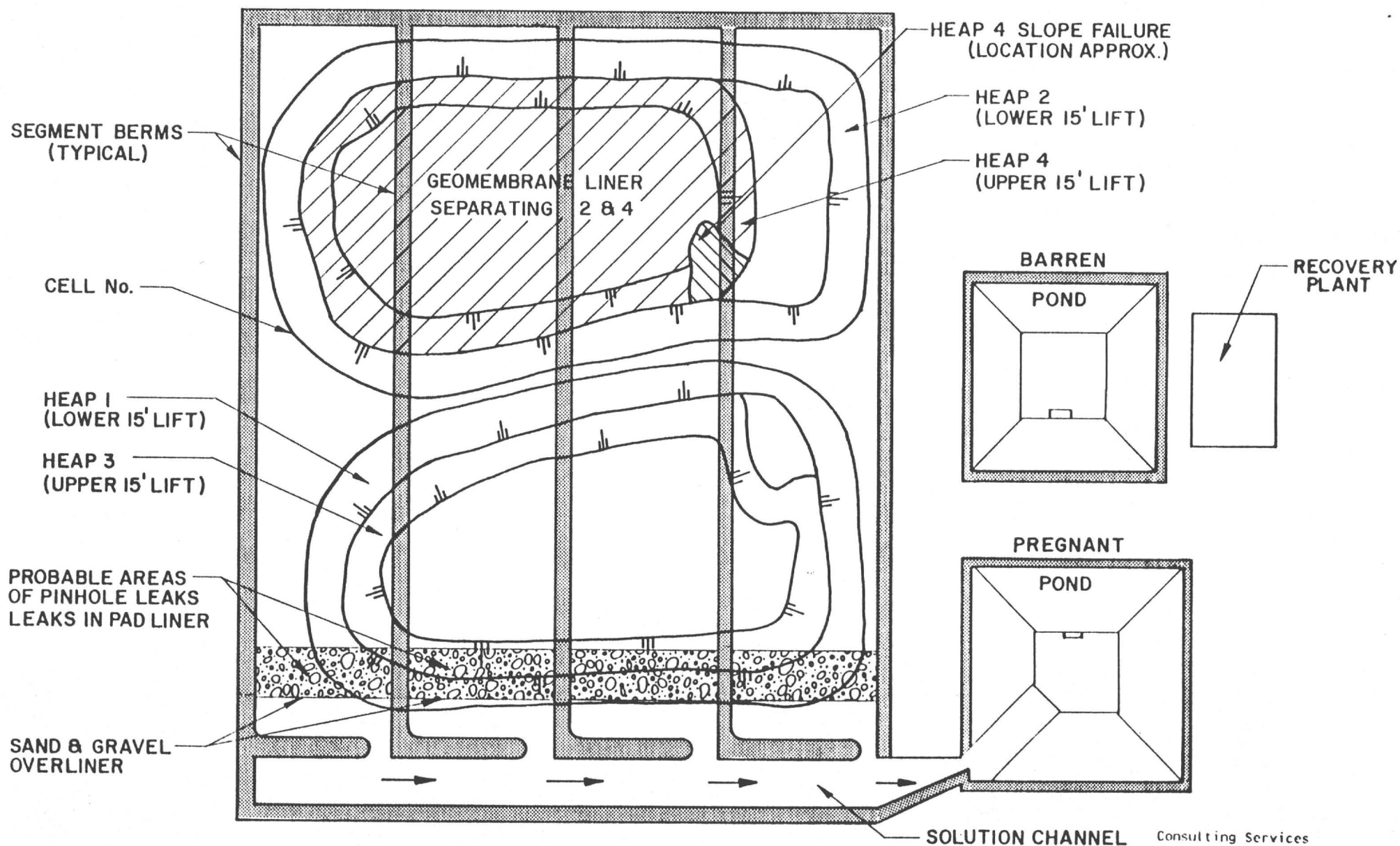


FIGURE 1
PLAN VIEW OF HEAP LEACH FACILITY
 APPROX. SCALE: 1"=100'

Consulting Services
 Heap Leach Facility
 Vulture Mine Project
 Approximately 7 Miles South
 of Wickenburg, Arizona
 SHB Job No. E89-217
 Letter No. 1



SHERMAN, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS

TABLE 1

A.F. Budge (Mining) Limited
 Vulture Mine Project
 Statistics on Leak in Detection Unit located on Cell # 2

Date	Time	Contained Cyanide	pH	Flowrate
8-07-89	15:00	0.50 lb/ton = 250 mg/l	11.1	
	20:10	0.50 lb/ton = 250 mg/l	11.5	
8-08-89	24:00	0.60 lb/ton = 300 mg/l	11.6	
	05:00	0.60 lb/ton = 300 mg/l	11.5	
8-09-89	07:40	0.50 lb/ton = 250 mg/l	11.5	
	19:20	0.50 lb/ton = 250 mg/l	11.6	
	23:08	0.50 lb/ton = 250 mg/l	11.5	
	03:28	0.50 lb/ton = 250 mg/l	11.4	
8-10-89	11:00	0.50 lb/ton = 250 mg/l	11.4	
	22:00	0.50 lb/ton = 250 mg/l	11.4	
8-11-89	09:05	0.50 lb/ton = 250 mg/l	11.4	
	13:00	0.50 lb/ton = 250 mg/l	11.4	
8-14-89	10:00	0.50 lb/ton = 250 mg/l	11.5	
	19:15	0.50 lb/ton = 250 mg/l	11.4	
8-15-89	no samples taken			
8-16-89	08:00	0.50 lb/ton = 250 mg/l	11.3	
	19:30	0.60 lb/ton = 300 mg/l	11.4	
	02:12	0.50 lb/ton = 250 mg/l	11.4	
8-17-89	11:29	0.40 lb/ton = 200 mg/l	11.2	150 ml/min estimated 0.040 gpm
	23:13	0.50 lb/ton = 250 mg/l	11.3	
8-18-89	13:00	0.40 lb/ton = 200 mg/l	11.3	150 ml/min estimated 0.040 gpm
8-21-89	11:00	0.50 lb/ton = 250 mg/l	11.8	150 ml/min estimated 0.040 gpm
	19:16	0.50 lb/ton = 250 mg/l	11.7	
8-22-89	09:00	0.50 lb/ton = 250 mg/l	11.7	
8-23-89	09:32	0.50 lb/ton = 250 mg/l	11.5	150 ml/min estimated 0.040 gpm
	19:30	0.50 lb/ton = 250 mg/l	11.6	
8-24-89	10:00	0.50 lb/ton = 250 mg/l	11.8	150 ml/min estimated 0.040 gpm
	23:00	0.50 lb/ton = 250 mg/l	11.7	
8-25-89	09:00	0.50 lb/ton = 250 mg/l	11.6	150 ml/min estimated 0.040 gpm
8-28-89	12:00	0.50 lb/ton = 250 mg/l	11.7	150 ml/min estimated 0.040 gpm
	24:00	0.50 lb/ton = 250 mg/l	11.6	
8-29-89	09:00	0.50 lb/ton = 250 mg/l	11.7	
	13:30	0.50 lb/ton = 250 mg/l	11.5	
	01:30	0.50 lb/ton = 250 mg/l	11.4	
8-30-89	15:00	0.50 lb/ton = 250 mg/l	11.4	150 ml/min estimated 0.040 gpm
	01:15	0.50 lb/ton = 250 mg/l	11.4	
8-31-89	07:00	0.40 lb/ton = 200 mg/l	11.5	150 ml/min estimated 0.040 gpm
9-01-89	08:30	0.50 lb/ton = 250 mg/l	11.3	130 ml/min estimated 0.034 gpm
9-05-89	07:30	0.50 lb/ton = 250 mg/l	11.5	120 ml/min estimated 0.032 gpm
	20:45	0.50 lb/ton = 250 mg/l	11.5	
	02:10	0.50 lb/ton = 250 mg/l	11.5	
9-06-89	09:15	0.50 lb/ton = 250 mg/l	11.4	110 ml/min estimated 0.029 gpm
	13:30	0.50 lb/ton = 250 mg/l	11.4	
9-07-89	11:30	0.50 lb/ton = 250 mg/l	11.7	100 ml/min estimated 0.026 gpm
	01:15	0.50 lb/ton = 250 mg/l	11.6	
9-08-89	INSTALLATION OF "FLEXFLO" PUMP			
	13:15	0.50 lb/ton = 250 mg/l	11.0	80 ml/min estimated 0.021 gpm
9-11-89	08:30	0.40 lb/ton = 200 mg/l	11.0	50 ml/min = 0.013 gpm

TABLE 1 (CONT.)

9-12-89	21:45	0.50 lb/ton	=	250	mg/l	10.0	28	ml/min	=	0.007	gpm
	10:00	0.40 lb/ton	=	200	mg/l	9.9					
	22:20	0.50 lb/ton	=	250	mg/l	9.9	27	ml/min	=	0.007	gpm
9-13-89	07:45	0.40 lb/ton	=	200	mg/l	9.9					
	20:40	0.50 lb/ton	=	250	mg/l	9.9	26	ml/min	=	0.007	gpm
9-14-89	07:30	0.40 lb/ton	=	200	mg/l	9.9	26	ml/min	=	0.007	gpm
9-15-89	07:15	0.40 lb/ton	=	200	mg/l	9.6	35	ml/min	=	0.009	gpm
9-19-89	07:00	0.40 lb/ton	=	200	mg/l	9.6	30	ml/min	=	0.008	gpm
9-20-89	09:15	0.40 lb/ton	=	200	mg/l	9.5	38	ml/min	=	0.010	gpm
9-21-89		0.40 lb/ton	=	200	mg/l	9.7					
9-22-89		0.40 lb/ton	=	200	mg/l	9.5					
9-25-89		0.30 lb/ton	=	150	mg/l	9.0					
9-26-89		0.30 lb/ton	=	150	mg/l	9.0	40	ml/min	=	0.011	gpm
9-27-89		0.30 lb/ton	=	150	mg/l	9.0	40	ml/min	=	0.011	gpm
9-28-89		0.30 lb/ton	=	150	mg/l	9.0	40	ml/min	=	0.011	gpm
9-29-89		0.20 lb/ton	=	100	mg/l	9.0	40	ml/min	=	0.011	gpm
10-02-89		0.20 lb/ton	=	100	mg/l	9.1	40	ml/min	=	0.011	gpm
10-03-89		0.20 lb/ton	=	100	mg/l	9.1	40	ml/min	=	0.011	gpm
10-04-89		0.20 lb/ton	=	100	mg/l	9.1	40	ml/min	=	0.011	gpm
10-05-89		0.20 lb/ton	=	100	mg/l	9.1	40	ml/min	=	0.011	gpm
10-06-89		0.20 lb/ton	=	100	mg/l	8.7	40	ml/min	=	0.011	gpm
10-09-89		0.15 lb/ton	=	75	mg/l	8.7	50	ml/min	=	0.013	gpm
10-10-89		0.15 lb/ton	=	75	mg/l	8.7	50	ml/min	=	0.013	gpm
10-11-89		0.15 lb/ton	=	75	mg/l	8.7	50	ml/min	=	0.013	gpm
10-12-89		0.15 lb/ton	=	75	mg/l	8.7	45	ml/min	=	0.012	gpm
10-16-89		0.10 lb/ton	=	50	mg/l	8.5	45	ml/min	=	0.012	gpm
10-17-89		0.10 lb/ton	=	50	mg/l	8.4	43	ml/min	=	0.011	gpm
						8.5	43	ml/min	=	0.011	gpm

10-16-89 AccuLab Sample 140 mg/l.

A.F Budge (Mining) Limited
Vulture Mine Project

Statistics on Leak in Detection Unit on Cell # 1

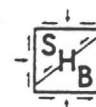
Date	Contained Cyanide		pH	Flowrate			
9-21-89	0.50 lb/ton	=	250 mg/l	7.8			
9-22-89	0.50 lb/ton	=	250 mg/l	8.0			
9-25-89	0.50 lb/ton	=	250 mg/l	8.0			
9-26-89	0.50 lb/ton	=	250 mg/l	8.0			
10-04-89	INSTALLATION OF "FLEXFLO" PUMP						
10-05-89	0.40 lb/ton	=	200 mg/l	8.0	50 ml/min	=	0.013 gpm
10-06-89	0.40 lb/ton	=	200 mg/l	8.0	30 ml/min	=	0.008 gpm
10-09-89	0.40 lb/ton	=	200 mg/l	8.0	25 ml/min	=	0.007 gpm
10-10-89	0.40 lb/ton	=	200 mg/l	8.0	24 ml/min	=	0.006 gpm
10-11-89	0.40 lb/ton	=	200 mg/l	8.0	25 ml/min	=	0.007 gpm
10-12-89	0.40 lb/ton	=	200 mg/l	8.0	25 ml/min	=	0.007 gpm
10-16-89	0.35 lb/ton	=	175 mg/l	7.9	28 ml/min	=	0.007 gpm
10-17-89	0.35 lb/ton	=	175 mg/l	7.9	28 ml/min	=	0.007 gpm
10-16-89	Accu-Lab sample 190 mg/l.						

Consulting Services
 Heap Leach Facility
 Vulture Mine Project
 Approximately 7 Miles South
 of Wickenburg, Arizona
 SHB Job No. E89-217
 Letter No. 1

TABLE 3

Summary of Static Groundwater Levels
 Vicinity of Heap Leach Facility
 Vulture Mine

<u>Description</u>	<u>Location</u>	<u>Depth to Water (feet)</u>	<u>Water Surface Elevation (feet)</u>
Vulture Mine Well	NW1/4 SW1/4 NW1/4 Sec. 31 T6N R5W	430	1635
Mine Decline (35 degrees)	NE1/4 NW1/4 SE1/4 Sec. 36 T6N R6W	376	1706
Private Well (David Smith, owner)	NW1/4 NW1/4 Sec 7 T5N R5W	500	1400



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Precision Laboratories

11834 Western Avenue, P.O. Box 915 Garden Grove California 92642-0915 (714) 891-7832

August 15, 1988

Mr. Nick La Fronz
Sergent, Hauskins & Beckwith
3232 W. Virginia
Phoenix, AZ 85009

Dear Mr. La Fronz:

Thank you for consulting Precision Laboratories for your material testing needs.

Enclosed please find the laboratory report for the testing of the polyethylene seams received August 2, 1988.

If you have any questions or if I may be of further service, please do not hesitate to call.

Sincerely,

PRECISION LABORATORIES

Lance S. Reed
Assistant Laboratory Manager

Enclosure





Precision Laboratories

11834 Western Avenue, P.O. Box 915, Garden Grove, California 92642-0915 (714) 891-7832

August 15, 1988

VERIFICATION OF MATERIAL PROPERTIES

Polyethylene Seams

For: Sergeant, Hauskins & Beckwith

(Sergeant, Hauskins & Beckwith Job No: E88-41 - Precision Reference: 88793)

INTRODUCTION

Precision Laboratories conducted physical testing on seven (7) polyethylene seams for Sergeant, Hauskins & Beckwith of Phoenix, Arizona. The samples were identified as originating from Sergeant, Hauskins & Beckwith's Vulture Mine project. The samples were further identified as *area 1*, *area 2*, *area 3*, *area 4*, *pad 7-8-88*, *barren pond 6-7-88* and *pregnant pond 6-9-88*. Delivery to the laboratory was made by United Parcel Service on August 2, 1988.

TEST PROCEDURES

The samples were tested for seam peel adhesion and bonded seam strength. Seam peel adhesion was determined in accordance with ASTM D413 as modified by the National Sanitation Foundation (NSF) Standard 54 using one inch wide specimens, an initial gage of 2 inches and a strain rate of 2 inches per minute. Bonded seam strength was determined in accordance with ASTM D3083 as modified by the National Sanitation Foundation Standard 54 using one inch wide specimens, an initial gage of 4 inches plus the width of the seam and a strain rate of 20 inches per minute.

TEST RESULTS

The test results are reported on Tables 1 through 5, attached. The units in which the data are reported are included on the tables. The break types are described as either film tearing bond (FTB) or peel (PEEL).

PRECISION LABORATORIES

Lance S. Reed
Assistant Laboratory Manager

TABLE 1. MATERIAL PROPERTIES

Polyethylene Seams

For: Sergent, Hauskins & Beckwith

(Sergent, Hauskins & Beckwith Job No: E86-41 - Precision Reference: 88793)

AREA 1

	BONDED SEAM STRENGTH (lbs/inch-width)	BREAK TYPE	SEAM PEEL ADHESION (lbs/inch-width)	BREAK TYPE
	73.0	FTB	37.5	FTB
	80.5	FTB	54.6	FTB
	75.1	FTB	32.9	FTB
	75.8	FTB	23.8	PEEL
	70.0	FTB	33.0	FTB
Avg:	74.9		36.4	
SD:	3.9		11.3	

AREA 2

	BONDED SEAM STRENGTH (lbs/inch-width)	BREAK TYPE	SEAM PEEL ADHESION (lbs/inch-width)	BREAK TYPE
	77.1	FTB	51.3	FTB
	78.7	FTB	61.2	FTB
	73.2	FTB	56.6	FTB
	73.7	FTB	56.6	FTB
	75.8	FTB	61.6	FTB
Avg:	75.7		57.5	
SD:	2.3		4.2	

TABLE 2. MATERIAL PROPERTIES

Polyethylene Seams

For: Sergent, Hauskins & Beckwith

(Sergent, Hauskins & Beckwith Job No: E88-41 - Precision Reference: 88793)

AREA 3

	BONDED SEAM STRENGTH (lbs/inch-width)	BREAK TYPE	SEAM PEEL ADHESION (lbs/inch-width)	BREAK TYPE
	89.3	FTB	60.0	FTB
	89.1	FTB	31.3	FTB
	89.2	FTB	52.0	FTB
	86.9	FTB	59.0	FTB
	89.1	FTB	50.3	FTB
Avg:	88.7		50.5	
SD:	1.0		11.5	

AREA 4

	BONDED SEAM STRENGTH (lbs/inch-width)	BREAK TYPE	SEAM PEEL ADHESION (lbs/inch-width)	BREAK TYPE
	94.7	FTB	62.4	FTB
	93.3	FTB	71.4	FTB
	94.1	FTB	65.2	FTB
	93.7	FTB	58.0	FTB
	93.1	FTB	68.4	FTB
Avg:	93.8		65.1	
SD:	0.6		5.2	

TABLE 3. MATERIAL PROPERTIES

Polyethylene Seams

For: Sergent, Hauskins & Beckwith

(Sergent, Hauskins & Beckwith Job No: E88-41 - Precision Reference: 88793)

PAD 7-8-88

	BONDED SEAM STRENGTH (lbs/inch-width)	BREAK TYPE	SEAM PEEL ADHESION (lbs/inch-width)	BREAK TYPE
	103	FTB	75.1	FTB
	103	FTB	71.8	FTB
	102	FTB	68.5	FTB
	102	FTB	66.2	FTB
	101	FTB	79.9	FTB
Avg:	102		72.3	
SD:	1		5.4	

BARREN POND 6-7-88

	BONDED SEAM STRENGTH (lbs/inch-width)	BREAK TYPE	SEAM PEEL ADHESION (lbs/inch-width)	BREAK TYPE
	63.5	FTB	41.8	FTB
	61.4	FTB	40.7	FTB
	65.4	FTB	47.3	FTB
	65.2	FTB	44.1	FTB
	64.9	FTB	49.9	FTB
Avg:	64.1		44.8	
SD:	1.7		3.8	

TABLE 4. MATERIAL PROPERTIES
 Polyethylene Seam
 For: Sergent, Hauskins & Beckwith
 (Sergent, Hauskins & Beckwith Job No: E88-41 - Precision Reference: 88793)

PREGNANT POND 6-9-88

	BONDED SEAM STRENGTH (lbs/inch-width)	BREAK TYPE	SEAM PEEL ADHESION (lbs/inch-width)	BREAK TYPE
	122	FTB	68.8	FTB
	124	FTB	79.2	FTB
	123	FTB	77.4	FTB
	122	FTB	84.8	FTB
	*		*	
Avg:	123		77.6	
SD:	1		6.6	

* Not tested due to insufficient material

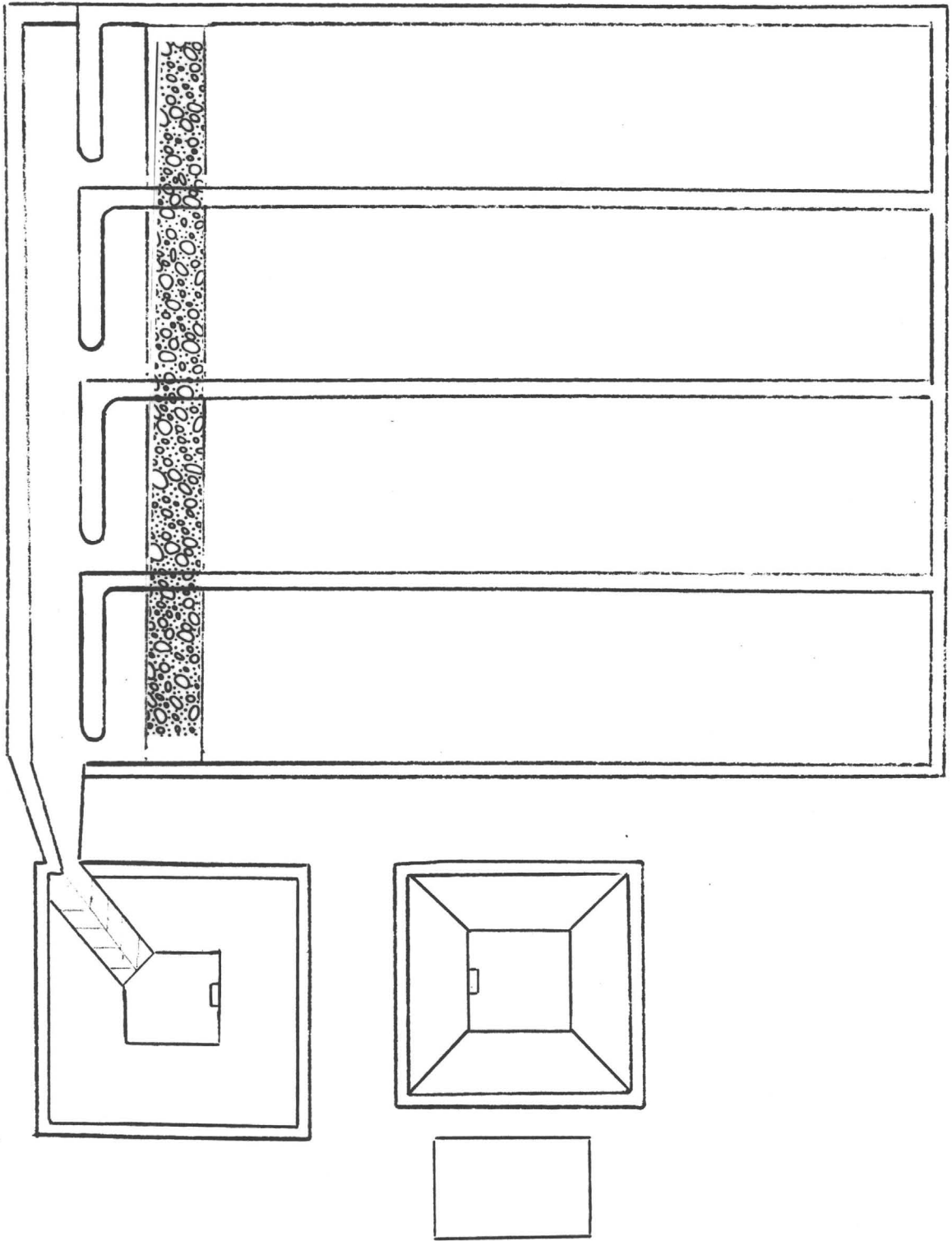
TABLE 5. THICKNESS (MILS)
 Polyethylene Seams
 For: Sergeant, Hauskins & Beckwith
 (Sergeant, Hauskins & Beckwith Job No: E88-41 - Precision Reference: 88793)

	AREA 1		AREA 2	
	<u>TOP SHEET</u>	<u>BOTTOM SHEET</u>	<u>TOP SHEET</u>	<u>BOTTOM SHEET</u>
	27.0	29.3	32.0	30.5
	29.3	27.3	36.7	30.3
	27.0	28.4	39.2	31.0
Avg:	27.8	28.3	36.0	30.6
SD:	1.3	1.0	3.7	0.4

	AREA 3		AREA 4	
	<u>TOP SHEET</u>	<u>BOTTOM SHEET</u>	<u>TOP SHEET</u>	<u>BOTTOM SHEET</u>
	33.4	32.5	34.0	32.0
	33.2	33.1	31.8	33.5
	30.1	33.0	31.6	34.8
Avg:	32.2	32.9	32.5	33.4
SD:	1.9	0.3	1.3	1.4

	PAD 7-8-88		BARREN POND 6-7-88	
	<u>TOP SHEET</u>	<u>BOTTOM SHEET</u>	<u>TOP SHEET</u>	<u>BOTTOM SHEET</u>
	37.1	38.0	22.7	23.5
	38.7	36.8	22.8	23.2
	35.4	38.6	22.7	22.7
Avg:	37.1	37.8	22.7	23.1
SD:	1.7	0.9	0.1	0.4

	PREGNANT POND 6-9-88	
	<u>TOP SHEET</u>	<u>BOTTOM SHEET</u>
	38.5	41.5
	39.2	41.4
	37.2	41.9
Avg:	38.3	41.6
SD:	1.0	0.3





A.F. Budge (Mining) Limited

January 30, 1990

4301 North 75th Street
Suite 101
Scottsdale, AZ 85251-3504
(602) 945-4630
FAX (602) 949-1737

Ms. Jeanmarie Haney
Hydrologist
Department of Environmental Quality
Water Permits Unit
Room 202
2005 North Central Avenue
Phoenix, Arizona 85004

Dear Jeanmarie:

My apologies for the delay in sending this material to you; it was really buried in the files!

Enclosed are the logs I promised, for the holes which we drilled on the site of the old tailings prior to the construction of the leach pads. The holes went to an average depth of 300 feet, however, the tailings and alluvium did not exceed 42 feet, and in one case were only 20 feet deep. I am also sending a copy of a memo written by one of our consultants, Peter H. Hahn, indicating that no water or moisture was encountered in the drilling.

Best regards.

Sincerely,

Carole A. O'Brien
Carole A. O'Brien
Mining & Financial Coordinator

encls.



A.F. Budge (Mining) Limited

January 30, 1990

4301 North 75th Street
Suite 101
Scottsdale, AZ 85251-3504
(602) 945-4630
FAX (602) 949-1737

Ms. Jeanmarie Haney
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Best regards.

Sincerely,

Carole A. O'Brien
Carole A. O'Brien
Mining & Financial Coordinator


encls.

Peter H. Hahn, Geologist

3608 Big Bend Lane Reno, Nevada 89509 (702) 825-1948

MEMORANDUM

To: A. F. Budge (Mining) Ltd.
A. J. Fernandez, Sr. Mining Engineer

From: Peter H. Hahn
Consulting Geologist 

Date: 29 April 1987

Subject: Vulture Mine, Maricopa County, Arizona: Water

During the period 2-26-87 to 3-07-87, I supervised reverse circulation drilling at the Vulture mine; I was present at all times during drilling operations and personally sampled all of the drill cuttings.

Ten holes were drilled, roughly on a N 15° W alignment along a trail from just inside the south line of Sec. 36, T6N, R6W, at the intersection of the trail with the Vulture Mine Road, to a point within Sec. 1, T5N, R6W about 1500 feet NW from the SE corner. These holes varied from 250 to 340 feet deep on a -60° angle (216 to 294 feet vertical depth). Vertical thickness of overburden varied from 16 to 52 feet. No water or moist cuttings were intersected in any of these holes.

Three vertical holes, 300 to 320 feet deep, were drilled within the old Vulture mill tailings, near the center of Sec. 36, T6N, R6W, a few hundred feet west of the old cyanide mill. No water or moist cuttings were intersected.

No water or moisture was found in the five angle holes in and near the Vulture Pit #1, to a depth of 120 feet below the pit floor, nor in the three short "peepholes", 55-75 feet deep, about a mile west of the Vulture townsite.

VULTURE MINE

HOLE NO. C-3

RVC Condemnation Hole

Scale 1" = 40' Inclinaton: -90° Direction: Total Depth: 300
 Loc (Approx) 2S, 470 N, 20, 630 E

Harris Drlg Co
 3-05/06-87

Depth (ft)	Unit	Graphic Log	Dust Color	Presence of:			Assays (ppm)		Remarks
				Quartz	FeO	Sulfides	Au	Ag	
0	Qtz		tan						tailings
20									Qal (if any) < 6"
50	peqsc		tan to gy-grn	loc veins 45-50					Chlorite schist
100					strox 95 ↓ 115	∅			
150	qpi sill								poss. thin qpi sill 150'
180									
200									
250									Schist grades down to dk grn hfs- amphibolite.
265-275	pehfs		? dk grn ↓ blk	up to 4%		tr?			lt cream qtzt or qpi 265-275 (<10% of cuttings.)
T.D. 300									

3-05
3-06

Peter Hahn
 Logged by ~~_____~~

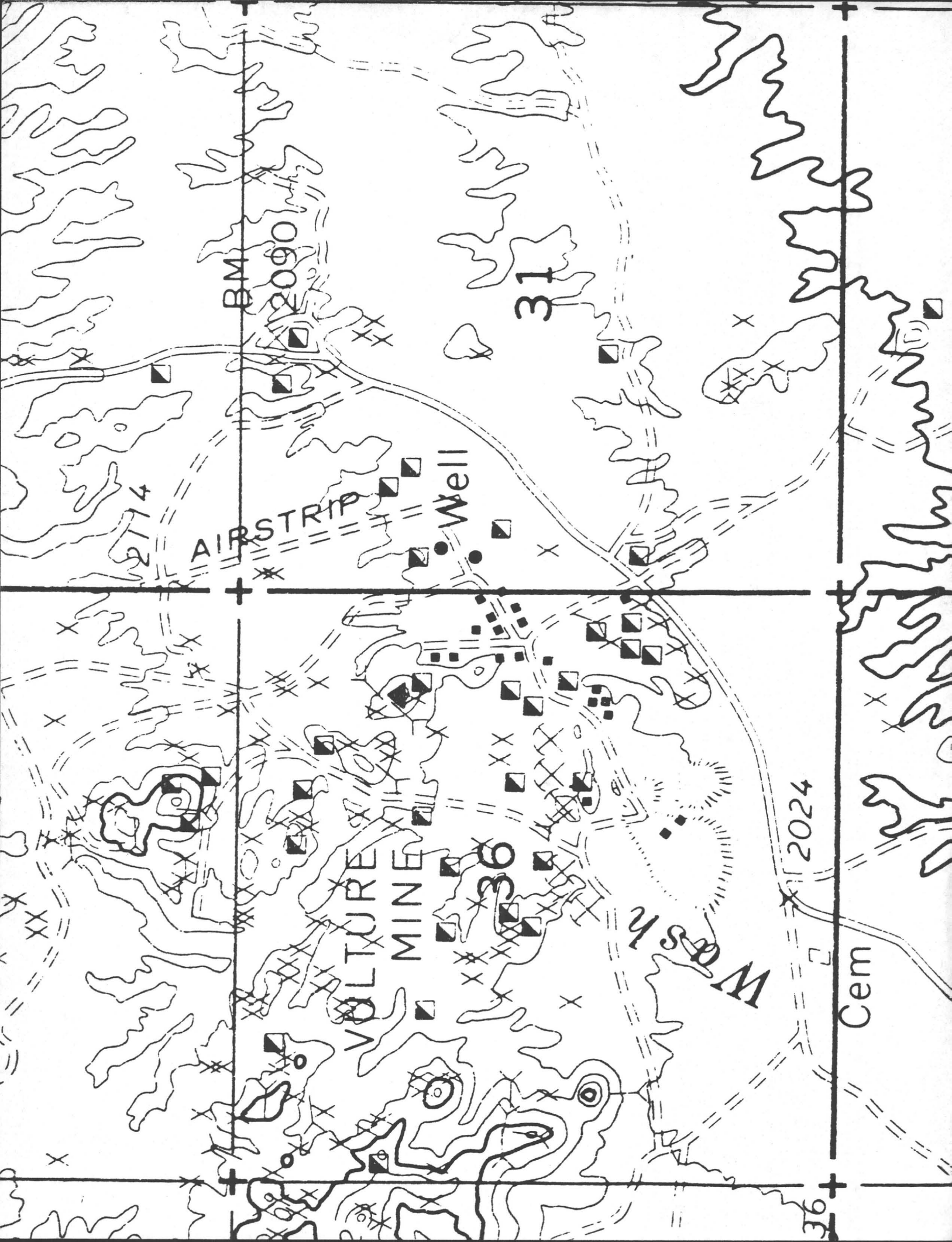
VULTURE MINE HOLE NO. C-2

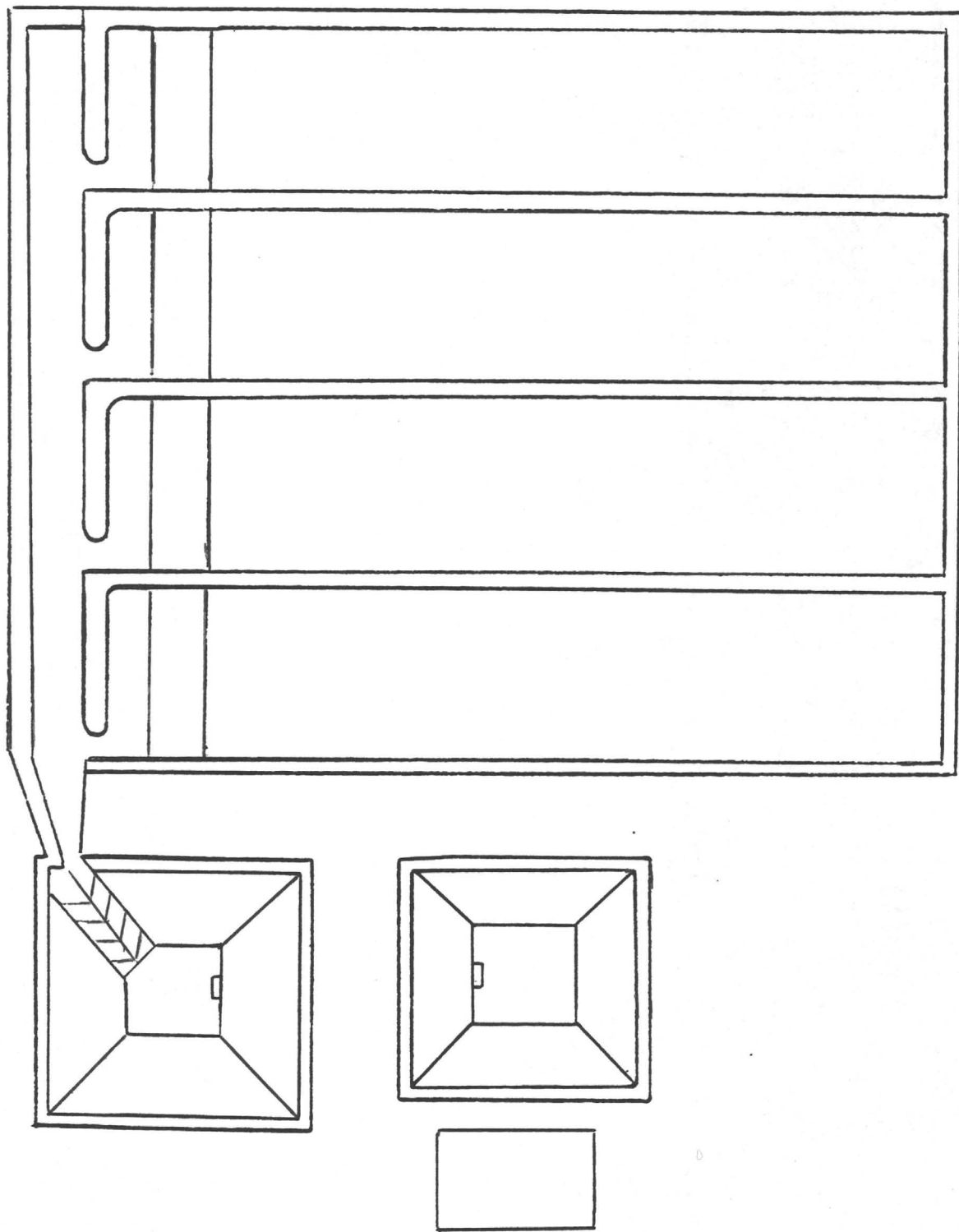
RVC Cond: emnation Hole

Inclination: -90° Direction: _____ Total Depth: 300
 Scale 1" = 40' Loc (approx) 2S, 290 N, 20, 630 E Harris Drlg. Co. 3-05-87

Depth (ft.)	Unit	Graphic Lbg	Dust Color	Presence of:			Assays (oz/t)		Remarks
				Quartz	FeO	Sulfides	Au	Ag	
0	Qt		tan						tailings
17	Qal		tan						
±33				10%	wk-mod.				chlorite schist, weathered
50									
	ptqsc				Feox 70-100				
100									
150									up to 5% thin rhyolite (?) veins 140-175
200						<2% py			Grades downward to amphibolite/hfs. Py in qtz-rich zones.
250			v dk grn to blk						
	plhfs					5% py			Up to 5% disseminated py on foliation. V. hard
T.D. 300	qm		grey						

Logged by Peter Hahn







A.F. Budge (Mining) Limited

February 13, 1990

4301 North 75th Street
Suite 101
Scottsdale, AZ 85251-3504

(602) 945-4630
FAX (602) 949-1737

Michael A. Milczarek
Department of Environmental Quality
Water Permits Unit
Room 202
2005 North Central Avenue
Phoenix, Arizona 85004

Dear Mike:

Per your call today, I am enclosing a copy of the results on soil samples taken under the pad near the leak detection riser pipes, as described in our memo dated January 19, 1990.

Sincerely,

Carole A. O'Brien

encl. (1)

Date	Contained Cyanide	pH	Flowrate
11-13-89	generator down; no readings		
11-14-89	generator down; no readings		
11-15-89	0.25 lb/ton = 125 mg/l	8.6	42 ml/min = 0.011 gpm
11-16-89	0.20 lb/ton = 100 mg/l	8.5	38 ml/min = 0.010 gpm
11-20-89	0.40 lb/ton = 200 mg/l	8.5	35 ml/min = 0.009 gpm
11-21-89	0.40 lb/ton = 200 mg/l	8.5	33 ml/min = 0.009 gpm
11-22-89	0.30 lb/ton = 150 mg/l	8.5	30 ml/min = 0.008 gpm
11-23-89	0.30 lb/ton = 150 mg/l	8.3	32 ml/min = 0.008 gpm
11-27-89	0.30 lb/ton = 150 mg/l	8.3	29 ml/min = 0.008 gpm
11-28-89	0.30 lb/ton = 150 mg/l	8.6	23 ml/min = 0.006 gpm
12-05-89	0.40 lb/ton = 200 mg/l	9.1	25 ml/min = 0.007 gpm
12-06-89	0.40 lb/ton = 200 mg/l	9.3	20 ml/min = 0.005 gpm
12-07-89	0.30 lb/ton = 150 mg/l	9.9	45 ml/min = 0.012 gpm
12-11-89	0.30 lb/ton = 150 mg/l	9.0	
12-12-89	0.30 lb/ton = 150 mg/l	8.8	52 ml/min = 0.014 gpm
12-13-89	0.30 lb/ton = 150 mg/l	9.4	48 ml/min = 0.013 gpm
12-14-89	0.30 lb/ton = 150 mg/l	9.4	38 ml/min = 0.010 gpm
12-18-89	0.30 lb/ton = 150 mg/l	9.1	40 ml/min = 0.011 gpm
12-19-89	0.30 lb/ton = 150 mg/l	9.1	44 ml/min = 0.012 gpm
12-20-89	0.30 lb/ton = 150 mg/l	9.2	42 ml/min = 0.011 gpm
12-27-89	0.30 lb/ton = 150 mg/l	9.3	38 ml/min = 0.010 gpm
12-28-89	0.30 lb/ton = 150 mg/l	9.2	38 ml/min = 0.010 gpm
01-08-90	0.30 lb/ton = 150 mg/l	9.2	30 ml/min = 0.008 gpm
01-09-90	0.30 lb/ton = 150 mg/l	9.1	30 ml/min = 0.008 gpm
01-10-90	0.30 lb/ton = 150 mg/l	9.2	30 ml/min = 0.008 gpm
01-11-90	0.30 lb/ton = 150 mg/l	9.1	38 ml/min = 0.010 gpm
01-15-90	0.40 lb/ton = 200 mg/l	9.6	38 ml/min = 0.010 gpm
01-16-90	0.40 lb/ton = 200 mg/l	8.1	25 ml/min = 0.007 gpm

A.F Budge (Mining) Limited
Vulture Mine Project

Statistics on Leak in Detection Unit on Cell # 1

Date	Contained Cyanide				pH	Flowrate				
9-21-89	0.50	lb/ton	=	250	mg/l	7.8				
9-22-89	0.50	lb/ton	=	250	mg/l	8.0				
9-25-89	0.50	lb/ton	=	250	mg/l	8.0				
9-26-89	0.50	lb/ton	=	250	mg/l	8.1				
10-04-89	INSTALLATION OF "FLEXFLO" PUMP									
10-05-89	0.40	lb/ton	=	200	mg/l	8.0	50	ml/min	=	0.013 gpm
10-06-89	0.40	lb/ton	=	200	mg/l	8.0	30	ml/min	=	0.008 gpm
10-09-89	0.40	lb/ton	=	200	mg/l	8.0	25	ml/min	=	0.007 gpm
10-10-89	0.40	lb/ton	=	200	mg/l	8.0	24	ml/min	=	0.006 gpm
10-11-89	0.40	lb/ton	=	200	mg/l	8.0	25	ml/min	=	0.007 gpm
10-12-89	0.40	lb/ton	=	200	mg/l	8.0	25	ml/min	=	0.007 gpm
10-16-89	0.35	lb/ton	=	175	mg/l	7.9	28	ml/min	=	0.007 gpm
10-17-89	0.35	lb/ton	=	175	mg/l	7.9	28	ml/min	=	0.007 gpm
10-18-89	0.40	lb/ton	=	200	mg/l	8.2	34	ml/min	=	0.009 gpm
10-19-89	0.35	lb/ton	=	175	mg/l	8.3	41	ml/min	=	0.011 gpm
10-20-89	0.35	lb/ton	=	175	mg/l	8.3	38	ml/min	=	0.010 gpm
10-23-89	0.35	lb/ton	=	175	mg/l	8.3	37	ml/min	=	0.010 gpm
10-24-89	0.50	lb/ton	=	250	mg/l	8.3	41	ml/min	=	0.011 gpm
10-25-89	0.50	lb/ton	=	250	mg/l	8.3	40	ml/min	=	0.011 gpm
10-26-89	0.40	lb/ton	=	200	mg/l	8.5	35	ml/min	=	0.009 gpm
10-27-89	0.40	lb/ton	=	200	mg/l	8.4	38	ml/min	=	0.010 gpm
10-30-89	0.30	lb/ton	=	150	mg/l	8.5	33	ml/min	=	0.009 gpm
10-31-89	0.40	lb/ton	=	200	mg/l	8.5	38	ml/min	=	0.010 gpm
11-03-89	0.40	lb/ton	=	200	mg/l	8.4	40	ml/min	=	0.011 gpm
11-06-89	0.40	lb/ton	=	200	mg/l	8.2	45	ml/min	=	0.012 gpm
11-07-89	0.30	lb/ton	=	150	mg/l	8.1	48	ml/min	=	0.013 gpm
11-08-89	0.30	lb/ton	=	150	mg/l	8.2	40	ml/min	=	0.011 gpm
11-09-89	0.30	lb/ton	=	150	mg/l	8.3	46	ml/min	=	0.012 gpm
11-10-89	0.30	lb/ton	=	150	mg/l	8.5	50	ml/min	=	0.013 gpm

Date	Time	Contained Cyanide	pH	Flowrate			
11-13-89		generator down; no readings					
11-14-89		generator down; no readings					
11-15-89		0.15 lb/ton = 75 mg/l	8.6	42 ml/min	=	0.011	gpm
11-16-89		0.15 lb/ton = 75 mg/l	8.5	39 ml/min	=	0.010	gpm
11-20-89		0.20 lb/ton = 100 mg/l	8.7	40 ml/min	=	0.011	gpm
11-21-89		0.30 lb/ton = 150 mg/l	8.7	41 ml/min	=	0.011	gpm
11-22-89		0.20 lb/ton = 100 mg/l	8.7	39 ml/min	=	0.010	gpm
11-23-89		0.20 lb/ton = 100 mg/l	8.2	38 ml/min	=	0.010	gpm
11-27-89		0.20 lb/ton = 100 mg/l	8.2	37 ml/min	=	0.010	gpm
11-28-89		0.30 lb/ton = 150 mg/l	8.4	40 ml/min	=	0.011	gpm
12-05-89		0.30 lb/ton = 150 mg/l	9.0	40 ml/min	=	0.011	gpm
12-06-89		0.30 lb/ton = 150 mg/l	9.2	40 ml/min	=	0.011	gpm
12-07-89		0.30 lb/ton = 150 mg/l	10.0	35 ml/min	=	0.009	gpm
12-11-89		0.30 lb/ton = 150 mg/l	9.0				
12-12-89		0.30 lb/ton = 150 mg/l	8.7	40 ml/min	=	0.011	gpm
12-13-89		0.30 lb/ton = 150 mg/l	8.9	41 ml/min	=	0.011	gpm
12-14-89		0.30 lb/ton = 150 mg/l	9.6	49 ml/min	=	0.013	gpm
12-18-89		0.30 lb/ton = 150 mg/l	9.3	38 ml/min	=	0.010	gpm
12-19-89		0.30 lb/ton = 150 mg/l	9.4	36 ml/min	=	0.010	gpm
12-20-89		0.30 lb/ton = 150 mg/l	9.4	38 ml/min	=	0.010	gpm
12-27-89		generator down; no readings					
12-28-89		generator down; no readings					
01-08-90		0.30 lb/ton = 150 mg/l	9.2	45 ml/min	=	0.012	gpm
01-09-90		0.30 lb/ton = 150 mg/l	9.2	50 ml/min	=	0.013	gpm
01-10-90		0.30 lb/ton = 150 mg/l	9.4	45 ml/min	=	0.012	gpm
01-11-90		0.30 lb/ton = 150 mg/l	9.2	42 ml/min	=	0.011	gpm
01-15-90		0.30 lb/ton = 150 mg/l					
01-16-90		0.30 lb/ton = 150 mg/l	8.6	28 ml/min	=	0.007	gpm

Date	Time	Contained Cyanide	pH	Flowrate
9-08-89	INSTALLATION OF "FLEXFLO" PUMP			
	13:15	0.50 lb/ton = 250 mg/l	11.0	50 ml/min = 0.013 gpm
9-11-89	08:30	0.40 lb/ton = 200 mg/l	10.0	
	21:45	0.50 lb/ton = 250 mg/l	10.0	28 ml/min = 0.007 gpm
9-12-89	10:00	0.40 lb/ton = 200 mg/l	9.9	
	22:10	0.50 lb/ton = 250 mg/l	9.9	27 ml/min = 0.007 gpm
9-13-89	07:45	0.40 lb/ton = 200 mg/l	9.9	
	20:40	0.50 lb/ton = 250 mg/l	9.9	26 ml/min = 0.007 gpm
9-14-89	07:30	0.40 lb/ton = 200 mg/l	9.9	26 ml/min = 0.007 gpm
9-15-89	07:15	0.40 lb/ton = 200 mg/l	9.6	35 ml/min = 0.009 gpm
9-19-89	07:00	0.40 lb/ton = 200 mg/l	9.6	30 ml/min = 0.008 gpm
9-20-89	09:15	0.40 lb/ton = 200 mg/l	9.5	38 ml/min = 0.010 gpm
9-21-89		0.40 lb/ton = 200 mg/l	9.7	
9-22-89		0.40 lb/ton = 200 mg/l	9.5	
9-25-89		0.30 lb/ton = 150 mg/l	9.0	
9-26-89		0.30 lb/ton = 150 mg/l	9.0	40 ml/min = 0.011 gpm
9-27-89		0.30 lb/ton = 150 mg/l	9.0	40 ml/min = 0.011 gpm
9-28-89		0.30 lb/ton = 150 mg/l	9.0	40 ml/min = 0.011 gpm
9-29-89		0.20 lb/ton = 100 mg/l	9.1	40 ml/min = 0.011 gpm
10-02-89		0.20 lb/ton = 100 mg/l	9.1	40 ml/min = 0.011 gpm
10-03-89		0.20 lb/ton = 100 mg/l	9.1	40 ml/min = 0.011 gpm
10-04-89		0.20 lb/ton = 100 mg/l	9.1	40 ml/min = 0.011 gpm
10-05-89		0.20 lb/ton = 100 mg/l	8.7	40 ml/min = 0.011 gpm
10-06-89		0.20 lb/ton = 100 mg/l	8.7	50 ml/min = 0.013 gpm
10-09-89		0.15 lb/ton = 75 mg/l	8.7	50 ml/min = 0.013 gpm
10-10-89		0.15 lb/ton = 75 mg/l	8.7	50 ml/min = 0.013 gpm
10-11-89		0.15 lb/ton = 75 mg/l	8.7	45 ml/min = 0.012 gpm
10-12-89		0.15 lb/ton = 75 mg/l	8.5	45 ml/min = 0.012 gpm
10-16-89		0.10 lb/ton = 50 mg/l	8.4	43 ml/min = 0.011 gpm
10-17-89		0.10 lb/ton = 50 mg/l	8.3	43 ml/min = 0.011 gpm
10-18-89		0.10 lb/ton = 50 mg/l	8.3	43 ml/min = 0.011 gpm
10-19-89		0.15 lb/ton = 75 mg/l	8.4	48 ml/min = 0.013 gpm
10-20-89		0.15 lb/ton = 75 mg/l	8.4	48 ml/min = 0.013 gpm
10-23-89		0.15 lb/ton = 75 mg/l	8.4	45 ml/min = 0.012 gpm
10-24-89		0.20 lb/ton = 100 mg/l	8.3	46 ml/min = 0.012 gpm
10-25-89		0.20 lb/ton = 100 mg/l	8.3	52 ml/min = 0.014 gpm
10-26-89		0.10 lb/ton = 50 mg/l	8.5	43 ml/min = 0.011 gpm
10-27-89		0.10 lb/ton = 50 mg/l	8.4	43 ml/min = 0.011 gpm
10-30-89		0.20 lb/ton = 100 mg/l	8.4	37 ml/min = 0.010 gpm
10-31-89		0.20 lb/ton = 100 mg/l	8.7	40 ml/min = 0.011 gpm
11-03-89		0.10 lb/ton = 50 mg/l	8.6	83 ml/min = 0.022 gpm
11-06-89		0.20 lb/ton = 100 mg/l	8.3	45 ml/min = 0.012 gpm
11-07-89		0.15 lb/ton = 75 mg/l	8.1	48 ml/min = 0.013 gpm
11-08-89		0.10 lb/ton = 50 mg/l	8.4	47 ml/min = 0.012 gpm
11-09-89		0.10 lb/ton = 50 mg/l	8.3	50 ml/min = 0.013 gpm
11-10-89		0.10 lb/ton = 50 mg/l	8.5	46 ml/min = 0.012 gpm

A.F Budge (Mining) Limited
 Vulture Mine Project
 Statistics on Leak in Detection Unit located on Cell # 2

Date	Time	Contained Cyanide	pH	Flowrate		
8-07-89	15:00	0.50 lb/ton = 250 mg/l	11.1			
	20:10	0.50 lb/ton = 250 mg/l	11.5			
8-08-89	24:00	0.60 lb/ton = 300 mg/l	11.6			
	05:00	0.60 lb/ton = 300 mg/l	11.5			
8-09-89	07:40	0.50 lb/ton = 250 mg/l	11.5			
	19:20	0.50 lb/ton = 250 mg/l	11.6			
	23:08	0.50 lb/ton = 250 mg/l	11.5			
	03:28	0.50 lb/ton = 250 mg/l	11.4			
8-10-89	11:00	0.50 lb/ton = 250 mg/l	11.4			
	22:00	0.50 lb/ton = 250 mg/l	11.4			
8-11-89	09:05	0.50 lb/ton = 250 mg/l	11.4			
	13:00	0.50 lb/ton = 250 mg/l	11.4			
8-14-89	10:00	0.50 lb/ton = 250 mg/l	11.5			
	19:15	0.50 lb/ton = 250 mg/l	11.4			
8-15-89	no samples taken					
8-16-89	08:00	0.50 lb/ton = 250 mg/l	11.3			
	19:30	0.60 lb/ton = 300 mg/l	11.4			
	02:12	0.50 lb/ton = 250 mg/l	11.4	150 ml/min	estimated	0.040 gpm
8-17-89	11:20	0.40 lb/ton = 200 mg/l	11.1			
	23:13	0.50 lb/ton = 250 mg/l	11.3	150 ml/min	estimated	0.040 gpm
8-18-89	10:00	0.40 lb/ton = 200 mg/l	11.3	150 ml/min	estimated	0.040 gpm
8-21-89	11:00	0.50 lb/ton = 250 mg/l	11.8			
	19:16	0.50 lb/ton = 250 mg/l	11.7			
8-22-89	09:00	0.50 lb/ton = 250 mg/l	11.7	150 ml/min	estimated	0.040 gpm
8-23-89	09:32	0.50 lb/ton = 250 mg/l	11.5			
	19:30	0.50 lb/ton = 250 mg/l	11.6	150 ml/min	estimated	0.040 gpm
8-24-89	10:00	0.50 lb/ton = 250 mg/l	11.8			
	23:00	0.50 lb/ton = 250 mg/l	11.7	150 ml/min	estimated	0.040 gpm
8-25-89	09:00	0.50 lb/ton = 250 mg/l	11.6	150 ml/min	estimated	0.040 gpm
8-28-89	12:00	0.50 lb/ton = 250 mg/l	11.7			
	24:00	0.50 lb/ton = 250 mg/l	11.6			
8-29-89	09:00	0.50 lb/ton = 250 mg/l	11.7			
	13:30	0.50 lb/ton = 250 mg/l	11.5			
	01:30	0.50 lb/ton = 250 mg/l	11.4	150 ml/min	estimated	0.040 gpm
8-30-89	15:00	0.50 lb/ton = 250 mg/l	11.4			
	01:15	0.50 lb/ton = 250 mg/l	11.4	150 ml/min	estimated	0.040 gpm
8-31-89	07:00	0.40 lb/ton = 200 mg/l	11.5	130 ml/min	estimated	0.034 gpm
9-01-89	08:30	0.50 lb/ton = 250 mg/l	11.3	120 ml/min	estimated	0.032 gpm
9-05-89	07:30	0.50 lb/ton = 250 mg/l	11.5			
	20:45	0.50 lb/ton = 250 mg/l	11.5			
	02:10	0.50 lb/ton = 250 mg/l	11.5	110 ml/min	estimated	0.029 gpm
9-06-89	09:15	0.50 lb/ton = 250 mg/l	11.4			
	13:30	0.50 lb/ton = 250 mg/l	11.4	100 ml/min	estimated	0.026 gpm
9-07-89	11:30	0.50 lb/ton = 250 mg/l	11.7			
	01:15	0.50 lb/ton = 250 mg/l	11.6	80 ml/min	estimated	0.021 gpm



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November 30, 1989

Arizona Department of
Environmental Quality
Groundwater Monitoring Unit
Central Palm Plaza Building
2005 North Central Avenue
Phoenix, Arizona 85004

SHB Job No. E89-217
Letter No. 2

Attention: Abigail A. Myers, Hydrologist
Groundwater Monitoring Unit

Re: Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona

Ladies and Gentlemen:

This letter is submitted on behalf of A.F. Budge (Mining) Limited (Budge) at the request of the Arizona Department of Environmental Quality (ADEQ), pursuant to a meeting attended by the writer and various ADEQ and Budge personnel at the above referenced project site. Subsequent sections of this letter present a brief description of the site meeting and our response to the ADEQ requests for additional sampling and testing.

1. Site Visit

A site meeting was attended by the writer on November 15, 1989, in order to review existing conditions at the

REPLY TO: 3232 W. VIRGINIA, PHOENIX, ARIZONA 85009



PHOENIX
(602) 272-6848
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FAX 888-0014

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(505) 884-0950
FAX 884-1694

SANTA FE
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FAX 438-7156

SALT LAKE CITY
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FAX 266-0727

EL PASO
(915) 564-1017
FAX 562-7739

RENO/SPARKS
(702) 331-2375
FAX 331-4153

Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
SHB Job No. E89-217
Letter No. 2

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heap leach facility and discuss with ADEQ and Budge personnel the need for future actions at the facility.

Attendees at the meeting included Abigail A. Myers, Hydrologist, Mr. Michael A. Milczarek, Groundwater Permit Writer and Jeanmarie Haney, Hydrologist for ADEQ, and Messrs. Dale Allen and Ronald Short of Budge. During the site meeting, a tour of the heap leach pad was conducted and discussions were held concerning the existing conditions at the pad and recommendations for future actions to possibly identify the source(s) of and mitigate the solution leakage.

2. Proposed Sampling & Testing Program

Consistent with the discussions referenced above, it was proposed at the meeting that a program of sampling and testing of subgrade soils and leaching solution be instituted. Specifically, the proposed program will consist of the following tasks:

- ° Motorized hand auger borings will be advanced to a maximum depth of 15 feet below the leach pad grade at the southeast corner of leach pad cells 1 and 2, immediately adjacent to the existing leak detection system riser pipe at each location, as indicated in Figure 1 attached. Grab samples of the hand-auger cuttings will be recovered from the soils immediately beneath the pad liner and at depths of 5, 10 and 15 feet in each of the two borings. Sampling procedures



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Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
SHB Job No. E89-217
Letter No. 2

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will be in accordance with procedures approved by ADEQ; all samples will be tested for the presence of cyanide by an approved independent laboratory. Subsequent to the completion of sampling at each location, the pad liner will be patched.

- The existing leak detection system trench adjacent to the cells 1 and 2 segment berms will be exposed by opening up the primary pad liner at approximately the north-south midpoint of each cell, at the two locations shown in Figure 1. Any fluid encountered in the trench will be sampled and tested for cyanide. Hydraulic communication of the leak detection system with the south half of each cell will be prevented via the installation of a flap of liner material sealed to the trench bottom liner and extending to the top (primary) liner. A riser pipe permitting future sampling will be installed at each location and the primary liner resealed and booted to the new riser pipe.

It is requested that ADEQ personnel be present for observation purposes during the sampling operation and riser pipe installation.

As requested by Abigail A. Myers, Hydrologist, of ADEQ, also attached are the results of EP toxicity, reactivity, corrosivity and gross alpha/beta potential tests conducted on bulk samples of existing (subgrade) tailings obtained from the leach pad site in April and May 1987 (Test Pits 10 and 15, SHB Job No. E87-11).

Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
SHB Job No. E89-217
Letter No. 2

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Should any questions arise concerning this letter, please do not hesitate to contact the undersigned.

Respectfully submitted,
Sergent, Hauskins & Beckwith Engineers

By Nicholas J. LaFronz
Nicholas J. LaFronz, P.E.

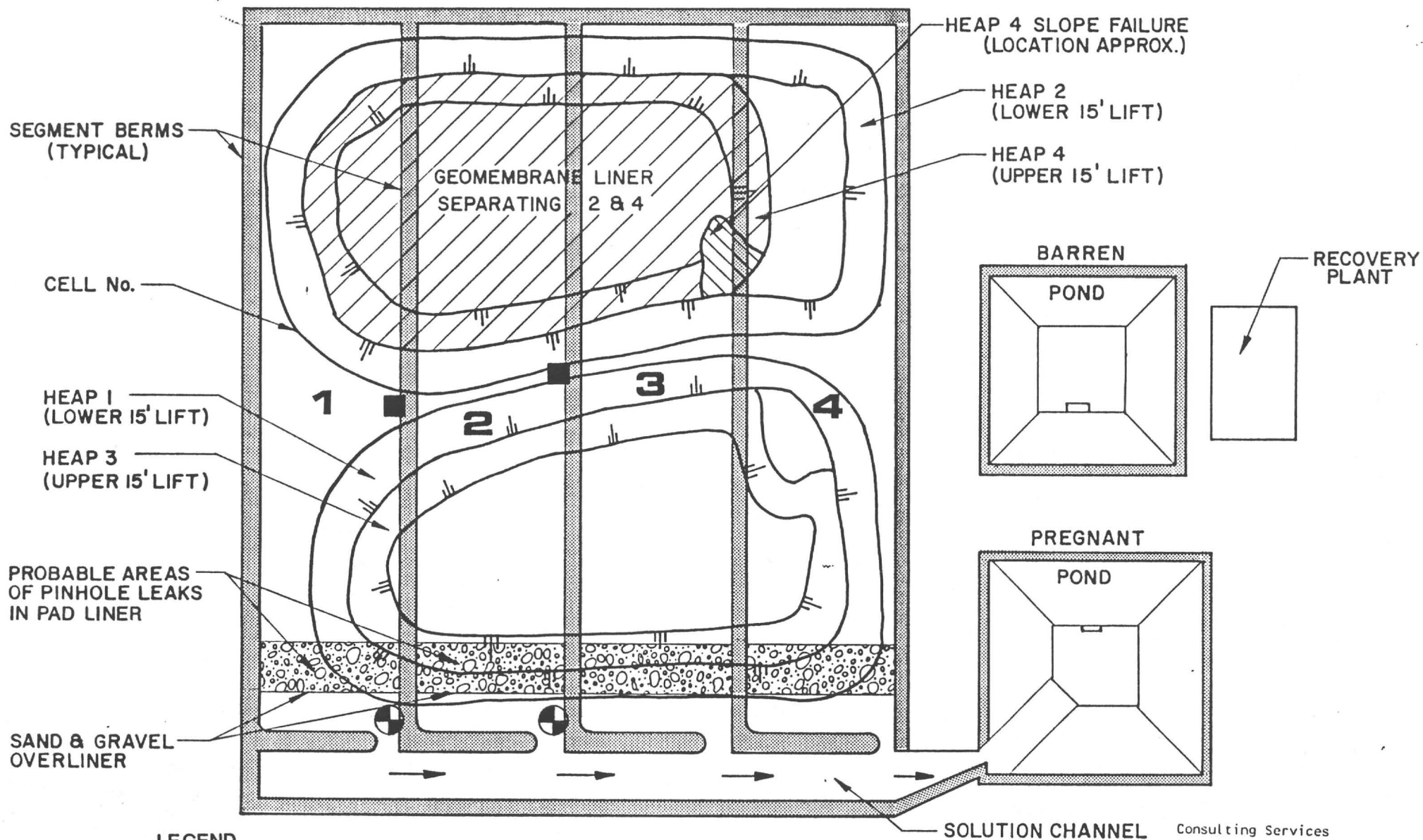
Reviewed by L. Hansen
Lawrence A. Hansen, Ph.D., P.E.

Copies: Addressee (1)
A.F. Budge (Mining) Limited
Attn: Ms. Carole A. O'Brien (2)

1a/J79/11-29-89



SERGENT, HAUSKINS & BECKWITH
CONSULTING GEOTECHNICAL ENGINEERS
PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO
RENO SPARKS • LAS VEGAS



LEGEND

 Approximate Location of Proposed Hand-Auger Boring

 Approximate Location of Proposed New Riser Pipe Installation



FIGURE 1
PLAN VIEW OF HEAP LEACH FACILITY
 APPROX. SCALE: 1"=100'

Consulting Services
 Heap Leach Facility
 Vulture Mine Project
 Approximately 7 Miles South
 of Wickenburg, Arizona
 SHB Job No. E89-217
 Letter No. 1



SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
 PHOENIX • TUCSON



Analytical **Technologies, Inc.**

METALS 2133 48th Street Suites 107-110 Tempe, AZ 85282 (602) 438-1530
PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-10
LOCATION:
LAB SAMPLE #: 9597-1
UNITS: mg/l as EPTOX

<u>ANALYSIS DATE</u>	<u>CONSTITUENT NAME</u>	<u>DILUTION FACTOR</u>	<u>DETECTION LIMIT</u>	<u>RESULT</u>
4/27/87	ARSENIC (As)		0.010	ND
5/01/87	BARIUM (Ba)		0.07	0.09
4/27/87	CADMIUM (Cd)		0.003	0.154
4/27/87	TOTAL CHROMIUM (Cr Tot)		0.010	ND
4/30/87	LEAD (Pb)		0.02	2.39
5/01/87	MERCURY (Hg)		0.0005	ND
4/27/87	SELENIUM (Se)		0.010	ND
4/30/87	SILVER (Ag)		0.010	ND

NOTE: ND = NOT DETECTED
NA = NOT ANALYZED

SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987



METALS

PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-15
LOCATION:
LAB SAMPLE #: 9597-2
UNITS: mg/l as EPTOX

<u>ANALYSIS DATE</u>	<u>CONSTITUENT NAME</u>	<u>DILUTION FACTOR</u>	<u>DETECTION LIMIT</u>	<u>RESULT</u>
4/27/87	ARSENIC (As)		0.010	ND
5/01/87	BARIUM (Ba)		0.07	ND
4/27/87	CADMIUM (Cd)		0.003	0.254
4/27/87	TOTAL CHROMIUM (Cr Tot)		0.010	0.010
4/30/87	LEAD (Pb)		0.02	42.1
5/01/87	MERCURY (Hg)		0.0005	ND
4/27/87	SELENIUM (Se)		0.010	ND
4/30/87	SILVER (Ag)		0.010	ND

NOTE: ND = NOT DETECTED
NA = NOT ANALYZED

SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987

TMA/Norcal

2030 Wright Avenue

Richmond, CA 94804-0040

(415) 235-2633

SOIL ANALYSIS REPORT

TMA/Norcal CN No.: 4227
Customer P.O. No.: ----
Date Received: 4/27/87
Date Reported: 5/19/87
No. of Samples: 2

Kathy Meinders
Analytical Technology
2113 South 48th. St., Ste. 110
Tempe, AZ 85282

Sample Number	Collection Date	Results pCi/g $\pm 2 \sigma$	
		Gross Alpha	Gross Beta
9597-1	4/22/87	6 \pm 3	52 \pm 6
9597-2	4/22/87	15 \pm 3	68 \pm 7

Mr. P. Hunt

Marvin P. Hunt
Program Manager
TMA/Norcal

MPH/ss

Enclosure: Chain of Custody



INDICATORS
PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-10
LOCATION:
LAB SAMPLE #: 9597-1
UNITS: mg/kg

<u>ANALYSIS DATE</u>	<u>CONSTITUENT NAME</u>	<u>DILUTION FACTOR</u>	<u>DETECTION LIMIT</u>	<u>RESULT</u>
4/23/87	CYANIDE (CN)		0.5	ND
4/27/87	PHENOLS		2.0	ND
4/23/87	CORROSIVITY (pH)		----	8.46
5/06/87	S=		20	ND
	REACTIVITY			NONE

NOTE: ND = NOT DETECTED
NA = NOT ANALYZED

SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987



INDICATORS
PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-15
LOCATION:
LAB SAMPLE #: 9597-2
UNITS: mg/kg

<u>ANALYSIS DATE</u>	<u>CONSTITUENT NAME</u>	<u>DILUTION FACTOR</u>	<u>DETECTION LIMIT</u>	<u>RESULT</u>
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4/27/87	PHENOLS		2.0	ND
4/23/87	CORROSIVITY (pH)		----	8.30
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NOTE: ND = NOT DETECTED
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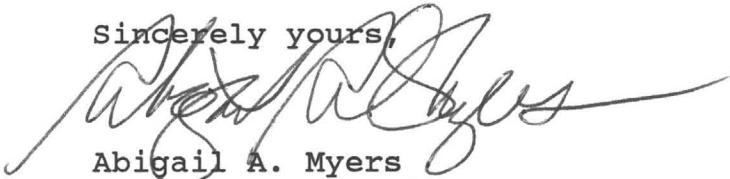
SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987

Page 2
December 26, 1989
Ms. O'Brien

Do not hesitate to call if you have questions.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'Abigail A. Myers', written in dark ink.

Abigail A. Myers
Water Permits Unit

cc: Tim Levandowsky
Mike Milczarek
Roger Kennett
Jeanmarie Haney



A.F. Budge (Mining) Limited

4301 North 75th Street
Suite 101
Scottsdale, AZ 85251-3504

(602) 945-4630
FAX (602) 949-1737

January 2, 1990

Arizona Department of
Environmental Quality
Water Permits Unit
Room 202
2005 North Central Avenue
Phoenix, Arizona 85004

Attention: Ms. Abigail Myers
Water Permit Writer
Mr. Tim L. Levandowsky
Water Pollution Compliance Unit
Mr. Michael A. Milczarek
Groundwater Permit Writer

Re: Heap Leach Facility
Vulture Mine Project

Ladies and Gentlemen:

This letter is being submitted at the request of the Arizona Department of Environmental Quality (ADEQ) pursuant to recent telephone conversations between Mr. Michael A. Milczarek of ADEQ and Mr. Dale H. Allen of A.F. Budge (Mining) Limited (Budge) regarding the referenced property and proposals to identify the source(s) of and mitigate the solution leakage.

Proposed Sampling and Testing Program

Consistent with the description of a general sampling program contained in the November 30, 1989 letter submitted to ADEQ by Sergent, Hauskins and Beckwith Consulting Geotechnical Engineers (SHB), Budge personnel will sample the soils underlying the leach pad on cells 1 and 2, immediately adjacent to the

existing leach detection system riser pipes. The sampling procedure will involve cutting the HDPE liner at each location and removing samples of the underlying soil. Samples will be taken at 3-foot intervals using a hand-held auger with sampler attachment; 5 samples will be taken, to a depth of 15 feet, from each location. Following extraction of the samples, the HDPE liner will be promptly resealed by personnel from Field Lining Services, Inc. (FLS). Samples will be put in bottles furnished by Arizona Testing Laboratories (ATL), refrigerated, and will be submitted within 24 hours to ATL for analysis. The sampling will be done on Monday, January 8, 1990. Ms. Jeanmarie Haney, hydrologist for ADEQ will be present to observe the sampling procedures. Samples will be analysed for total cyanide and free cyanide. Results are expected within 3 weeks following delivery of the samples to the lab. The purpose of this exercise is to determine the extent of contamination, if any, of cyanide in the soils underlying cells 1 and 2 which have exhibited leakage.

Concurrent with the above sampling program, the area between the front (south) portion of the leach pad and the back (north) portion will be carefully excavated to expose the liner adjacent to the segment berms at an approximate midpoint in cells 1 and 2; locations are shown in Figure 1. The liner will be cut to expose

Department of Environmental Quality
January 2, 1990
Page 3

the leak detection system; any fluid encountered in the trench will be sampled and tested for cyanide. The front and back portions of the leach pad on cells 1 and 2 will be physically separated by installation of additional HDPE liner and a leak detection riser pipe installed at the two locations for the purpose of future monitoring and sampling. It is anticipated that the westernmost portion will be exposed first and a riser pipe installed and liner patched by FLS on January 8. The excavation on cell 2 is expected to be the most time-consuming aspect of this program, as it will involve manual labor in order to carefully expose the liner without damaging it. The second riser pipe on cell 2 should be installed no later than January 30. The purpose of this exercise is an attempt to determine if the leak is coming from the back portion of the leach pad, or if it is confined to the front portion of the pad.

Respectfully submitted,

Carole A. O'Brien



A.F. Budge (Mining) Limited

4301 North 75th Street
Suite 101
Scottsdale, AZ 85251-3504

(602) 945-4630
FAX (602) 949-1737

January 2, 1990

Arizona Department of
Environmental Quality
Water Permits Unit
Room 202
2005 North Central Avenue
Phoenix, Arizona 85004

Attention: Ms. Abigail Myers
Water Permit Writer
Mr. Tim L. Levandowsky
Water Pollution Compliance Unit
Mr. Michael A. Milczarek
Groundwater Permit Writer

Re: Heap Leach Facility
Vulture Mine Project

Ladies and Gentlemen:

This letter is being submitted at the request of the Arizona Department of Environmental Quality (ADEQ) pursuant to recent telephone conversations between Mr. Michael A. Milczarek of ADEQ and Mr. Dale H. Allen of A.F. Budge (Mining) Limited (Budge) regarding the referenced property and proposals to identify the source(s) of and mitigate the solution leakage.

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existing leach detection system riser pipes. The sampling procedure will involve cutting the HDPE liner at each location and removing samples of the underlying soil. Samples will be taken at 3-foot intervals using a hand-held auger with sampler attachment; 5 samples will be taken, to a depth of 15 feet, from each location. Following extraction of the samples, the HPDE liner will be promptly resealed by personnel from Field Lining Services, Inc. (FLS). Samples will be put in bottles furnished by Arizona Testing Laboratories (ATL), refrigerated, and will be submitted within 24 hours to ATL for analysis. The sampling will be done on Monday, January 8, 1990. Ms. Jeanmarie Haney, hydrologist for ADEQ will be present to observe the sampling procedures. Samples will be analysed for total cyanide and free cyanide. Results are expected within 3 weeks following delivery of the samples to the lab. The purpose of this exercise is to determine the extent of contamination, if any, of cyanide in the soils underlying cells 1 and 2 which have exhibited leakage.

Concurrent with the above sampling program, the area between the front (south) portion of the leach pad and the back (north) portion will be carefully excavated to expose the liner adjacent to the segment berms at an approximate midpoint in cells 1 and 2; locations are shown in Figure 1. The liner will be cut to expose

the leak detection system; any fluid encountered in the trench will be sampled and tested for cyanide. The front and back portions of the leach pad on cells 1 and 2 will be physically separated by installation of additional HDPE liner and a leak detection riser pipe installed at the two locations for the purpose of future monitoring and sampling. It is anticipated that the westernmost portion will be exposed first and a riser pipe installed and liner patched by FLS on January 8. The excavation on cell 2 is expected to be the most time-consuming aspect of this program, as it will involve manual labor in order to carefully expose the liner without damaging it. The second riser pipe on cell 2 should be installed no later than January 30. The purpose of this exercise is an attempt to determine if the leak is coming from the back portion of the leach pad, or if it is confined to the front portion of the pad.

Respectfully submitted,

Carole A. O'Brien
Carole A. O'Brien



SERGEANT, HAUSKINS & BECKWITH CONSULTING GEOTECHNICAL ENGINEERS

SOIL & FOUNDATION ENGINEERING • ENGINEERING GEOLOGY • HYDROGEOLOGY
MATERIALS ENGINEERING • MATERIALS TESTING • ENVIRONMENTAL SERVICES

November 30, 1989

Arizona Department of
Environmental Quality
Groundwater Monitoring Unit
Central Palm Plaza Building
2005 North Central Avenue
Phoenix, Arizona 85004

SHB Job No. E89-217
Letter No. 2

Attention: Abigail A. Myers, Hydrologist
Groundwater Monitoring Unit

Re: Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona

Ladies and Gentlemen:

This letter is submitted on behalf of A.F. Budge (Mining) Limited (Budge) at the request of the Arizona Department of Environmental Quality (ADEQ), pursuant to a meeting attended by the writer and various ADEQ and Budge personnel at the above referenced project site. Subsequent sections of this letter present a brief description of the site meeting and our response to the ADEQ requests for additional sampling and testing.

1. Site Visit

A site meeting was attended by the writer on November 15, 1989, in order to review existing conditions at the

REPLY TO: 3232 W. VIRGINIA, PHOENIX, ARIZONA 85009

PHOENIX
(602) 272-6848
FAX 272-7239

TUCSON
(602) 792-2779
FAX 888-0014

ALBUQUERQUE
(505) 884-0950
FAX 884-1694

SANTA FE
(505) 471-7836
FAX 438-7156

SALT LAKE CITY
(801) 266-0720
FAX 266-0727

EL PASO
(915) 564-1017
FAX 562-7739

RENO/SPARKS
(702) 331-2375
FAX 331-4153



Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
SHB Job No. E89-217
Letter No. 2

Page 2

heap leach facility and discuss with ADEQ and Budge personnel the need for future actions at the facility.

Attendees at the meeting included Abigail A. Myers, Hydrologist, Mr. Michael A. Milczarek, Groundwater Permit Writer and Jeanmarie Haney, Hydrologist for ADEQ, and Messrs. Dale Allen and Ronald Short of Budge. During the site meeting, a tour of the heap leach pad was conducted and discussions were held concerning the existing conditions at the pad and recommendations for future actions to possibly identify the source(s) of and mitigate the solution leakage.

2. Proposed Sampling & Testing Program

Consistent with the discussions referenced above, it was proposed at the meeting that a program of sampling and testing of subgrade soils and leaching solution be instituted. Specifically, the proposed program will consist of the following tasks:

- ° Motorized hand auger borings will be advanced to a maximum depth of 15 feet below the leach pad grade at the southeast corner of leach pad cells 1 and 2, immediately adjacent to the existing leak detection system riser pipe at each location, as indicated in Figure 1 attached. Grab samples of the hand-auger cuttings will be recovered from the soils immediately beneath the pad liner and at depths of 5, 10 and 15 feet in each of the two borings. Sampling procedures



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Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
SHB Job No. E89-217
Letter No. 2

Page 3

will be in accordance with procedures approved by ADEQ; all samples will be tested for the presence of cyanide by an approved independent laboratory. Subsequent to the completion of sampling at each location, the pad liner will be patched.

- The existing leak detection system trench adjacent to the cells 1 and 2 segment berms will be exposed by opening up the primary pad liner at approximately the north-south midpoint of each cell, at the two locations shown in Figure 1. Any fluid encountered in the trench will be sampled and tested for cyanide. Hydraulic communication of the leak detection system with the south half of each cell will be prevented via the installation of a flap of liner material sealed to the trench bottom liner and extending to the top (primary) liner. A riser pipe permitting future sampling will be installed at each location and the primary liner resealed and booted to the new riser pipe.

It is requested that ADEQ personnel be present for observation purposes during the sampling operation and riser pipe installation.

As requested by Abigail A. Myers, Hydrologist, of ADEQ, also attached are the results of EP toxicity, reactivity, corrosivity and gross alpha/beta potential tests conducted on bulk samples of existing (subgrade) tailings obtained from the leach pad site in April and May 1987 (Test Pits 10 and 15, SHB Job No. E87-11).

Consulting Services
Heap Leach Facility
Vulture Mine Project
Approximately 7 Miles South
of Wickenburg, Arizona
SHB Job No. E89-217
Letter No. 2

Page 4

Should any questions arise concerning this letter, please do not hesitate to contact the undersigned.

Respectfully submitted,
Sergent, Hauskins & Beckwith Engineers

By Nicholas J. LaFronz
Nicholas J. LaFronz, P.E.

Reviewed by L. Hansen
Lawrence A. Hansen, Ph.D., P.E.

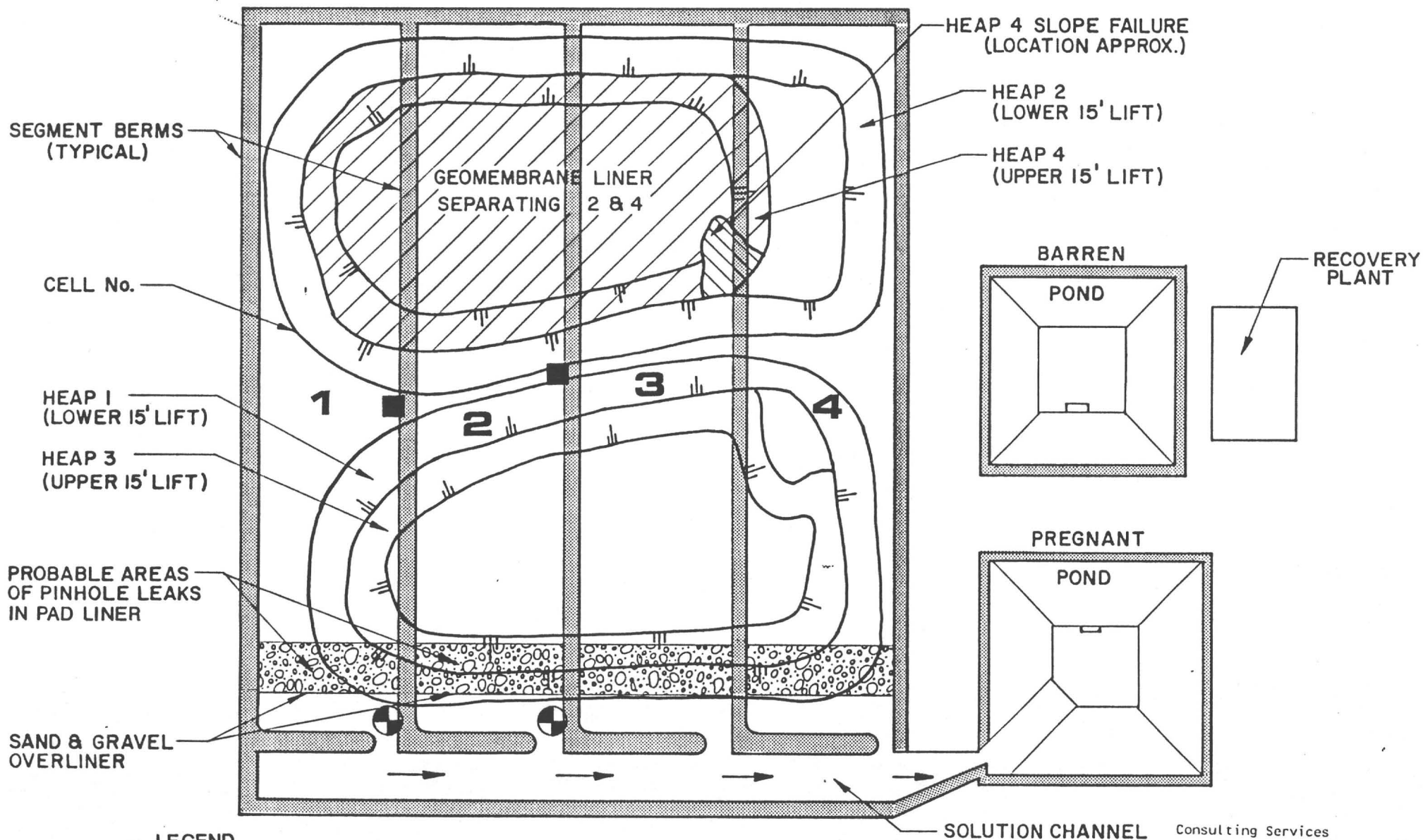
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Attn: Ms. Carole A. O'Brien (2)

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PHOENIX • TUCSON • ALBUQUERQUE • SANTA FE • SALT LAKE CITY • EL PASO
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LEGEND

 Approximate Location of Proposed Hand-Auger Boring


 Approximate Location of Proposed New Riser Pipe Installation



FIGURE 1
PLAN VIEW OF HEAP LEACH FACILITY

APPROX. SCALE: 1"=100'

Consulting Services
 Heap Leach Facility
 Vulture Mine Project
 Approximately 7 Miles South
 of Wickenburg, Arizona
 SHB Job No. E89-217
 Letter No. 1



SERGENT, HAUSKINS & BECKWITH

CONSULTING GEOTECHNICAL ENGINEERS
 PHOENIX • TUCSON



Analytical **Technologies, Inc.**

METALS

2100 43rd Street Suites 107-110 Tempe, AZ 85282 (602) 438-1530

PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-10
LOCATION:
LAB SAMPLE #: 9597-1
UNITS: mg/l as EPTOX

<u>ANALYSIS DATE</u>	<u>CONSTITUENT NAME</u>	<u>DILUTION FACTOR</u>	<u>DETECTION LIMIT</u>	<u>RESULT</u>
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NOTE: ND = NOT DETECTED
NA = NOT ANALYZED

SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987



METALS
PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-15
LOCATION:
LAB SAMPLE #: 9597-2
UNITS: mg/l as EPTOX

<u>ANALYSIS DATE</u>	<u>CONSTITUENT NAME</u>	<u>DILUTION FACTOR</u>	<u>DETECTION LIMIT</u>	<u>RESULT</u>
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NOTE: ND = NOT DETECTED
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SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987

TMA/Norcal

2030 Wright Avenue

Richmond, CA 94804-0040

(415) 235-2633

SOIL ANALYSIS REPORT

TMA/Norcal CN No.: 4227
Customer P.O. No.: ----
Date Received: 4/27/87
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No. of Samples: 2

Kathy Meinders
Analytical Technology
2113 South 48th. St., Ste. 110
Tempe, AZ 85282

Sample Number	Collection Date	Results pCi/g $\pm 2 \sigma$	
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Marvin P. Hunt

Marvin P. Hunt
Program Manager
TMA/Norcal

MPH/ss

Enclosure: Chain of Custody



INDICATORS
PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-10
LOCATION:
LAB SAMPLE #: 9597-1
UNITS: mg/kg

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5/06/87	S=		20	ND
	REACTIVITY			NONE

NOTE: ND = NOT DETECTED
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SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987



INDICATORS
PROJECT: VULTURE MINE E 87-11

SAMPLE DATE: 04/22/87
LAB RECEIPT DATE: 04/22/87
MATRIX: SOIL

SAMPLE ID: TP-15
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LAB SAMPLE #: 9597-2
UNITS: mg/kg

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	REACTIVITY			NONE

NOTE: ND = NOT DETECTED
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SUPERVISORY REVIEW: R. GERRY MCCULLOUGH

DATE: 15 MAY 1987

318

RECORDED IN OFFICIAL RECORDS
OF MARICOPA COUNTY, ARIZONA
DEC 22 '87 - 12 00
KEITH POLETIS, County Recorder
FEE 2300 PGS 14 M.A.

AFFIDAVIT OF PERFORMANCE OF ANNUAL LABOR 87 752769

STATE OF ARIZONA)
County of Maricopa) ss.

AFF. LABOR (AL)

ARTHUR J FERNANDEZ III, being duly sworn, upon his oath states as follows:

1. He is a citizen of the United States, more than eighteen (18) years of age, and is personally acquainted with the 460 unpatented lode and placer mining claims situated in the Vulture Mining District, Maricopa County, Arizona, the names of which are indicated on Exhibit A attached hereto (the "Claims"), which exhibit also includes the location of said claims together with the serial number assigned to the Claims by the Arizona State Office of the Bureau of Land Management and/or the Recordation Number recorded in the official records of Maricopa County, Arizona.

2. This Affidavit is made for, on behalf of, and at the direction of A.F. BUDGE (MINING) LIMITED, a Nevada corporation, the Lessee of the Claims from V.M.P., INC., an Arizona corporation, whose address is c/o Larry W. Beal, 1414 E. Purdue, Phoenix, Arizona, 85020, the owner of such claims.

3. The location notices of the Claims are posted within Sections 24, 25, 26, 27, 34, 35 and 36, Township 6 North, Range 6 West; Sections 16, 17, 19, 20, 21, 28, 29, 30, 31 and 32, Township 6 North, Range 5 West; Sections 1, 2 and 12, Township 5 North, Range 5 West, G&SRM, Maricopa County, Arizona, and the Claims form a contiguous block.

4. Between the 1st day of September, 1986, and the 1st day of September, 1987, not less than FIFTY THOUSAND DOLLARS (\$50,000.00) worth of work and improvements were done and performed upon or for the benefit of each of the Claims, not including the location work of the Claims.

5. Such work and improvements consisted of a program of drilling and sampling and supervision thereof.

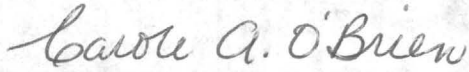
(a) The drilling program was conducted by Harris Drilling Company of San Diego, utilizing a reverse circulation rotary drill rig. A total of 7,577 feet were drilled in 53 holes, at a cost of \$59,912. The drilling program was supervised by Peter H. Hahn, a consulting geologist from Reno, Nevada, and Donald C. White, a consulting geologist from Prescott, Arizona. Professional fees paid to Messrs. Hahn and White for this supervision amounted to \$12,256.

6. All of the above work and improvements were performed by or at the expense of A. F. BUDGE (MINING) LIMITED, the Lessee of the Claims from the owner thereof for the purpose of complying with the laws of the United States pertaining to assessment or annual work.



Arthur J. Fernandez III

Subscribed and sworn before me this 15th day of December, 1987, by Arthur J. Fernandez III.



Notary Public

My Commission expires:

APRIL 14, 1991



87 752769

Unpatented	Lode	Mining	Claims			
Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
Vulture	# 1	AMC160432	85 549372	27/34/35	6N	6W
	# 2	AMC160433	85 549373	34/35	6N	6W
	# 3	AMC160434	85 549374	34/35	6N	6W
	# 4	AMC160435	85 549375	35	6N	6W
	# 5	AMC160436	85 549376	35	6N	6W
	# 6	AMC160437	85 549377	35	6N	6W
	# 7	AMC160438	85 549378	35	6N	6W
	# 8	AMC160439	85 549379	35	6N	6W
	# 9	AMC160440	85 549380	35	6N	6W
	# 10	AMC160441	85 549381	35	6N	6W
	# 11	AMC160442	85 549382	35	6N	6W
	# 12	AMC160443	85 549383	35	6N	6W
	# 13	AMC160444	85 549384	35	6N	6W
	# 14	AMC160445	85 549385	35	6N	6W
	# 15	AMC160446	85 549386	35	6N	6W
	# 16	AMC160447	85 549387	25/26	6N	6W
	# 17	AMC160448	85 549388	25/26	6N	6W
	# 18	AMC160449	85 549389	25/26	6N	6W
	# 19	AMC160450	85 549390	25/26	6N	6W
	# 20	AMC160451	85 549391	25/26	6N	6W
	# 25	AMC160452	85 549392	35	6N	6W
	# 26	AMC160453	85 549393	35	6N	6W
	# 27	AMC160454	85 549394	35	6N	6W
	# 28	AMC160455	85 549395	35	6N	6W
	# 29	AMC160456	85 549396	35	6N	6W
	# 30	AMC160457	85 549397	35	6N	6W
	# 31	AMC160458	85 549398	35	6N	6W
	# 32	AMC160459	85 549399	2/35	5N/6N	6W
	# 33	AMC160460	85 549400	25	6N	6W
	# 34	AMC160461	85 549401	25	6N	6W
	# 35	AMC160462	85 549402	25	6N	6W
	# 36	AMC160463	85 549403	25	6N	6W
	# 37	AMC160464	85 549404	25	6N	6W
	# 38	AMC160465	85 549405	25/26	6N	6W
	# 39	AMC160466	85 549406	25/26/35	6N	6W
	# 40	AMC160467	85 549407	25/26/35/36	6N	6W
	# 41	AMC160468	85 549408	35/36	6N	6W
	# 42	AMC160469	85 549409	35/36	6N	6W
	# 43	AMC160470	85 549410	35/36	6N	6W
	# 44	AMC160471	85 549411	35/36	6N	6W
	# 45	AMC160472	85 549412	35/36	6N	6W
	# 46	AMC160473	85 549413	35/36	6N	6W
	# 47	AMC160474	85 549414	1/2/35/36	5N/6N	6W
	# 48	AMC160475	85 549415	1/2/35	5N/6N	6W
	# 49	AMC160476	85 549416	1/2	5N	6W
	# 50	AMC160477	85 549417	1/2	5N	6W

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Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
Vulture	# 51	AMC160478	85 549418	1/2	5N	6W
	# 52	AMC160479	85 549419	1/2	5N	6W
	# 53	AMC160480	85 549420	25	6N	6W
	# 54	AMC160481	85 549421	25	6N	6W
	# 55	AMC160482	85 549422	25	6N	6W
	# 56	AMC160483	85 549423	25	6N	6W
	# 57	AMC160484	85 549424	25	6N	6W
	# 58	AMC160485	85 549425	25	6N	6W
	# 59	AMC160486	85 549426	25/36	6N	6W
	# 60	AMC160487	85 549427	36	6N	6W
	# 61	AMC160488	85 549428	36	6N	6W
	# 62	AMC160489	85 549429	36	6N	6W
	# 67	AMC160494	85 549434	1	5N	6W
	# 68	AMC160495	85 549435	1	5N	6W
	# 69	AMC160496	85 549436	1	5N	6W
	# 70	AMC160497	85 549437	1	5N	6W
	# 71	AMC160498	85 549438	1	5N	6W
	# 72	AMC160499	85 549439	25	6N	6W
	# 73	AMC160500	85 549440	25	6N	6W
	# 74	AMC160501	85 549441	25	6N	6W
	# 75	AMC160502	85 549442	25	6N	6W
	# 76	AMC160503	85 549443	25	6N	6W
	# 77	AMC160504	85 549444	25	6N	6W
	# 78	AMC160505	85 549445	25/36	6N	6W
	# 79	AMC160506	85 549446	36	6N	6W
	# 80	AMC160507	85 549447	36	6N	6W
	# 84	AMC160512	85 549452	1	5N	6W
	# 85	AMC160513	85 549453	1	5N	6W
	# 86	AMC160514	85 549454	1	5N	6W
	# 87	AMC160515	85 549455	1	5N	6W
	# 88	AMC160516	85 549456	1	5N	6W
	# 89	AMC160517	85 549457	25/30	6N	5W/6W
	# 90A	AMC160518	85 549458	25/30	6N	5W/6W
	# 91	AMC160519	85 549459	31/36	6N	5W/6W
	# 92	AMC160520	85 549460	31/36	6N	5W/6W
	# 93	AMC160521	85 549461	31/36	6N	5W/6W
	# 94	AMC160522	85 549462	31/36	6N	5W/6W
	# 95	AMC160523	85 549463	1/6/31/36	5N/6N	5W/6W
	# 96	AMC160524	85 549464	1/6	5N	5W/6W
	# 97	AMC160525	85 549465	1	5N	6W
	# 98	AMC160526	85 549466	1	5N	6W
	# 99	AMC160527	85 549467	1	5N	6W
	# 100	AMC160528	85 549468	1	5N	6W

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Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
Vulture	# 101	AMC160529	85 549469	1	5N	6W
	# 102	AMC160530	85 549470	31	6N	5W
	# 103	AMC160531	85 549471	31	6N	5W
	# 104	AMC160532	85 549472	31/36	6N	5W/6W
	# 105	AMC160533	85 549473	31	6N	5W
	# 106	AMC160534	85 549474	6/31	5N	5W
	# 107	AMC160535	85 549475	6	5N	5W
	# 108	AMC160536	85 549476	6	5N	5W
	# 109	AMC160537	85 549477	1/6	5N	5W/6W
	# 110	AMC160538	85 549478	1/6	5N	5W/6W
	# 111	AMC160539	85 549479	1/6	5N	5W/6W
	# 112	AMC160540	85 549480	1/6	5N	5W/6W
	# 113	AMC160541	85 549481	1/6	5N	5W/6W
	# 114	AMC160542	85 549482	31	6N	5W
	# 115	AMC160543	85 549483	31	6N	5W
	# 116	AMC160544	85 549484	31	6N	5W
	# 117	AMC160545	85 549485	31	6N	5W
	# 118	AMC160546	85 549486	31	6N	5W
	# 119	AMC160547	85 549487	31	6N	5W
	# 120	AMC160548	85 549488	6/31	5N/6N	5W/6W
	# 121	AMC160549	85 549489	6	5N	5W
	# 122	AMC160550	85 549490	6	5N	5W
	# 123	AMC160551	85 549491	6	5N	5W
	# 124	AMC160552	85 549492	6	5N	5W
	# 125	AMC160553	85 549493	6	5N	5W
	# 126	AMC160554	85 549494	6	5N	5W
	# 127	AMC160555	85 549495	6	5N	5W
	# 128	AMC160556	85 549496	31	6N	5W
	# 129	AMC160557	85 549497	31	6N	5W
	# 130	AMC160558	85 549498	31	6N	5W
	# 131	AMC160559	85 549499	31	6N	5W
	# 132	AMC160560	85 549500	31	6N	5W
	# 133	AMC160561	85 549501	6/31	5N/6N	5W
	# 134	AMC160562	85 549502	6/31	5N/6N	5W
	# 135	AMC160563	85 549503	6	5N	5W
	# 136	AMC160564	85 549504	6	5N	5W
	# 137	AMC160565	85 549505	6	5N	5W
	# 138	AMC160566	85 549506	6	5N	5W
	# 139	AMC160567	85 549507	6	5N	5W
	# 140	AMC160568	85 549508	6	5N	5W
	# 141	AMC160569	85 549509	6	5N	5W
	# 142	AMC160570	85 549510	31/32	6N	5W
	# 143	AMC160571	85 549511	31/32	6N	5W
	# 144	AMC160572	85 549512	31/32	6N	5W
	# 145	AMC160573	85 549513	31/32	6N	5W
	# 146	AMC160574	85 549514	31/32	6N	5W
	# 147	AMC160575	85 580568	5/6/31/32	5N/6N	5W
	# 148	AMC160576	85 549516	5/6	5N	5W
	# 149	AMC160577	85 549517	5/6	5N	5W

Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
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Vulture	# 150	AMC160578	85 549518	5/6	5N	5W
	# 151	AMC160579	85 549519	5/6	5N	5W
	# 152	AMC160580	85 549520	5/6	5N	5W
	# 153	AMC160581	85 549521	5/6	5N	5W
	# 154	AMC160582	85 549522	5/6	5N	5W
	# 155	AMC160583	85 549523	5/6	5N	5W
	# 156	AMC160584	85 549524	32	6N	5W
	# 157	AMC160585	85 549525	32	6N	5W
	# 158	AMC160586	85 549526	32	6N	5W
	# 159	AMC160587	85 549527	32	6N	5W
	# 160	AMC160588	85 549528	32	6N	5W
	# 161	AMC160589	85 549529	5/32	5N/6N	5W
	# 162	AMC160590	85 549530	5	5N	5W
	# 163	AMC160591	85 549531	5	5N	5W
	# 164	AMC160592	85 549532	5	5N	5W
	# 165	AMC160593	85 549533	5	5N	5W
	# 166	AMC160594	85 549534	5	5N	5W
	# 167	AMC160595	85 549535	5	5N	5W
	# 168	AMC160596	85 549536	5	5N	5W
	# 169	AMC160597	85 549537	5	5N	5W
	# 170	AMC160598	85 549538	32	6N	5W
	# 171	AMC160599	85 549539	32	6N	5W
	# 172	AMC160600	85 549540	32	6N	5W
	# 173	AMC160601	85 549541	32	6N	5W
	# 174	AMC160602	85 549542	5/32	5N/6N	5W

Desert	# 1A	AMC160603	85 549217	25/30	6N	5W/6W
	# 2	AMC160604	85 549218	25/30	6N	5W/6W
	# 3	AMC160605	85 549219	25/30/31/36	6N	5W/6W
	# 4	AMC160606	85 549220	31/36	6N	5W/6W
	# 5A	AMC160607	85 549221	24/25	6N	6W
	# 6	AMC160608	85 549222	25/30	6N	5W/6W
	# 7	AMC160609	85 549223	25/30	6N	5W/6W
	# 8A	AMC160610	85 549224	25/30	6N	5W/6W
	# 9A	AMC160611	85 549225	25/30	6N	5W/6W
	# 10	AMC160612	85 549226	30	6N	5W
	# 11	AMC160613	85 549227	30	6N	5W
	# 12	AMC160614	85 549228	30	6N	5W
	# 13	AMC160615	85 549229	30	6N	5W
	# 14	AMC160616	85 549230	30/31	6N	5W
	# 15	AMC160617	85 549231	30/31	6N	5W
	# 16	AMC160618	85 549232	19/24/25	6N	5W/6W
	# 17	AMC160619	85 549233	19/24/25/30	6N	5W/6W
	# 18	AMC160620	85 549234	19/30	6N	5W

Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
Desert	# 19	AMC160621	85 549235	30	6N	5W
	# 20	AMC160622	85 549236	30	6N	5W
	# 21	AMC160623	85 549237	30	6N	5W
	# 22	AMC160624	85 549238	30	6N	5W
	# 23	AMC160625	85 549239	30	6N	5W
	# 24	AMC160626	85 549240	30	6N	5W
	# 25	AMC160627	85 549241	30	6N	5W
	# 26	AMC160628	85 549242	30	6N	5W
	# 27	AMC160629	85 549243	31/30	6N	5W
	# 28	AMC160630	85 549244	29/30/31	6N	5W
	# 29	AMC160631	85 549245	19	6N	5W
	# 30	AMC160632	85 549246	19	6N	5W
	# 31	AMC160633	85 549247	19/30	6N	5W
	# 32	AMC160634	85 549248	19/30	6N	5W
	# 33	AMC160635	85 549249	19/30	6N	5W
	# 34	AMC160636	85 549250	30	6N	5W
	# 35	AMC160637	85 549251	30	6N	5W
	# 36	AMC160638	85 549252	30	6N	5W
	# 37	AMC160639	85 549253	30	6N	5W
	# 38	AMC160640	85 549254	29/30	6N	5W
	# 39	AMC160641	85 549255	29/30	6N	5W
	# 40	AMC160642	85 549256	29/30	6N	5W
	# 41	AMC160643	85 549257	29/30	6N	5W
	# 42	AMC160644	85 549258	29/32	6N	5W
	# 43	AMC160645	85 549259	29/32	6N	5W
	# 44	AMC160646	85 549260	19	6N	5W
	# 45	AMC160647	85 549261	19	6N	5W
	# 46	AMC160648	85 549262	19	6N	5W
	# 47	AMC160649	85 549263	19	6N	5W
	# 48	AMC160650	85 549264	19/30	6N	5W
	# 49	AMC160651	85 549265	19/30	6N	5W
	# 50	AMC160652	85 549266	30/29	6N	5W
	# 51	AMC160653	85 549267	29/30	6N	5W
	# 52	AMC160654	85 549268	29/30	6N	5W
	# 53	AMC160655	85 549269	29/30	6N	5W
	# 54	AMC160656	85 549270	29	6N	5W
	# 55	AMC160657	85 549271	29	6N	5W
	# 56	AMC160658	85 549272	29	6N	5W
	# 57	AMC160659	85 549273	29	6N	5W
	# 58	AMC160660	85 549274	29	6N	5W
	# 59	AMC160661	85 549275	19	6N	5W
	# 60	AMC160662	85 549276	19	6N	5W
	# 61	AMC160663	85 549277	19/20	6N	5W
	# 62	AMC160664	85 549278	19/20	6N	5W
	# 63	AMC160665	85 549279	19/20	6N	5W

Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
Desert	# 64	AMC160666	85 549280	19/20	6N	5W
	# 65	AMC160667	85 549281	20/29	6N	5W
	# 66	AMC160668	85 549282	20/29	6N	5W
	# 67	AMC160669	85 549283	29	6N	5W
	# 68	AMC160670	85 549284	29	6N	5W
	# 69	AMC160671	85 549285	29	6N	5W
	# 70	AMC160672	85 549286	29	6N	5W
	# 71	AMC160673	85 549287	29	6N	5W
	# 72	AMC160674	85 549288	29	6N	5W
	# 73	AMC160675	85 549289	29	6N	5W
	# 74	AMC160676	85 549290	19/20	6N	5W
	# 75	AMC160677	85 549291	19/20	6N	5W
	# 76	AMC160678	85 549292	19/20	6N	5W
	# 77	AMC160679	85 549293	20	6N	5W
	# 78	AMC160680	85 549294	20	6N	5W
	# 79	AMC160681	85 549295	20	6N	5W
	# 80	AMC160682	85 549296	20	6N	5W
	# 81	AMC160683	85 549297	20/29	6N	5W
	# 82	AMC160684	85 549298	20/29	6N	5W
	# 83	AMC160685	85 549299	20/29	6N	5W
	# 84	AMC160686	85 549300	29	6N	5W
	# 85	AMC160687	85 549301	29	6N	5W
	# 86	AMC160688	85 549302	29	6N	5W
	# 87	AMC160689	85 549303	29	6N	5W
	# 88	AMC160690	85 549304	29	6N	5W
	# 89	AMC160691	85 549305	20	6N	5W
	# 90	AMC160692	85 549306	20	6N	5W
	# 91	AMC160693	85 549307	20	6N	5W
	# 92	AMC160694	85 549308	20	6N	5W
	# 93	AMC160695	85 549309	20	6N	5W
	# 94	AMC160696	85 549310	20	6N	5W
	# 95	AMC160697	85 549311	20	6N	5W
	# 96	AMC160698	85 549312	20	6N	5W
	# 97	AMC160699	85 549313	20	6N	5W
	# 98	AMC160700	85 549314	20/29	6N	5W
	# 99	AMC160701	85 549315	20/21/29	6N	5W
	# 100	AMC160702	85 549316	20/21/28/29	6N	5W
# 101	AMC160703	85 549317	28/29	6N	5W	
# 102	AMC160704	85 549318	28/29	6N	5W	
# 103	AMC160705	85 549319	28	6N	5W	
# 104	AMC160706	85 549320	17/20	6N	5W	

Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
Desert	# 105	AMC160707	85 549321	17/20	6N	5W
	# 106	AMC160708	85 549322	17/20	6N	5W
	# 107	AMC160709	85 549323	20	6N	5W
	# 108	AMC160710	85 549324	20	6N	5W
	# 109	AMC160711	85 549325	20	6N	5W
	# 110	AMC160712	85 549326	17	6N	5W
	# 111	AMC160713	85 549327	17	6N	5W
	# 112	AMC160714	85 549328	17/20	6N	5W
	# 113	AMC160715	85 549329	16/17/20/21	6N	5W
	# 114	AMC160716	85 549330	20/21	6N	5W
	# 115	AMC160717	85 549331	20/21	6N	5W
	# 116	AMC160718	85 549332	16/17	6N	5W
	# 117	AMC160719	85 549333	16/17	6N	5W
	# 120	AMC160722	85 549336	16/21	6N	5W
	# 121	AMC160723	85 549337	21	6N	5W
	# 123	AMC160725	85 549339	16	6N	5W
	# 124	AMC160726	85 549340	16	6N	5W
	# 125	AMC160727	85 549341	20	6N	5W
	# 126	AMC160728	85 549342	20	6N	5W
	# 127	AMC160729	85 549343	21	6N	5W
	# 128	AMC160730	85 549344	21	6N	5W
	# 129	AMC160731	85 549345	21	6N	5W
	# 130	AMC160732	85 549346	21	6N	5W
	# 131	AMC160733	85 549347	16/21	6N	5W
	# 132	AMC160734	85 549348	21	6N	5W
	# 133	AMC160735	85 549349	32	6N	5W
	# 134	AMC160736	85 549350	32	6N	5W
	# 135	AMC160737	85 549351	32	6N	5W
	# 136	AMC160738	85 549352	32	6N	5W
	# 137	AMC160739	85 549353	25/30/36	6N	5W
	# 138	AMC160740	85 549354	25/30/31/36	6N	5W
	# 139	AMC160741	85 549355	30/31	6N	5W
	# 140	AMC160742	85 549356	31	6N	5W
	# 141	AMC160743	85 549357	31	6N	5W
	# 142	AMC160744	85 549358	31	6N	5W
	# 144	AMC160745	85 549360	30/31	6N	5W
	# 145	AMC160746	85 549361	31	6N	5W
	# 146	AMC160747	85 549362	31	6N	5W
	# 147	AMC160748	85 549363	31	6N	5W
	# 148	AMC160749	85 549364	31	6N	5W
	# 149	AMC160750	85 549365	31	6N	5W
	# 150	AMC160751	85 549366	31/32	6N	5W
	# 151	AMC160752	85 549367	31/32	6N	5W
	# 152	AMC160753	85 549368	31/32	6N	5W
	# 153	AMC160754	85 549369	32	6N	5W
	# 154	AMC160755	85 549270	32	6N	5W
	# 155	AMC160756	85 549271	32	6N	5W

Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
B-lan	1	AMC167064	85 549194	35	6N	6W
	2	AMC167065	85 549195	35	6N	6W
	3	AMC167066	85 549196	34/35	6N	6W
	4	AMC167067	85 549197	34/35	6N	6W
	5	AMC167068	85 549198	34/35	6N	6W
	6	AMC167069	85 549199	34/35	6N	6W
	7	AMC167070	85 549200	34/35	6N	6W
	8	AMC167071	85 549201	34	6N	6W
	9	AMC167072	85 549202	34	6N	6W
	10	AMC167073	85 549203	34	6N	6W
	11	AMC167074	85 549204	34	6N	6W
	12	AMC167075	85 549205	34	6N	6W
	13	AMC167076	85 549206	27/34	6N	6W
	14	AMC167077	85 549207	26/35	6N	6W
	15	AMC167078	85 549208	26	6N	6W
	16	AMC167079	85 549209	26	6N	6W
	17	AMC167080	85 549210	26	6N	6W
	18	AMC167081	85 549211	26/27/34/35	6N	6W
	19	AMC167082	85 549212	26/27	6N	6W
	20	AMC167083	85 549213	26/27	6N	6W
	21	AMC167084	85 549214	26/27	6N	6W
	22	AMC170741	85 549215	35	6N	6W
	23	AMC170742	85 549216	2/35	5N/6N	6W
Zen	1	AMC167085	85 549545	20/21	6N	5W
	2	AMC167086	85 549546	20/21	6N	5W
	3	AMC167087	85 549547	20/21	6N	5W
	4	AMC167088	85 549548	21/28	6N	5W
	5	AMC167089	85 549549	21/28	6N	5W
	6	AMC167090	85 549550	21/28	6N	5W
	7	AMC167091	85 549551	28	6N	5W
	8	AMC167092	85 549552	21	6N	5W
	9	AMC167093	85 549553	21	6N	5W
	10	AMC167094	85 549554	21	6N	5W
	11	AMC167095	85 549555	21	6N	5W
	12	AMC167096	85 549556	21	6N	5W
	13	AMC167097	85 549557	21/28	6N	5W
	14	AMC167098	85 549558	21/28	6N	5W
	15	AMC167099	85 549559	21	6N	5W
	16	AMC167100	85 549560	21	6N	5W
	17	AMC167101	85 549561	21	6N	5W
	18	AMC167102	85 549562	21	6N	5W
	19	AMC167103	85 549563	21	6N	5W
	20	AMC167104	85 549564	21	6N	5W
	21	AMC167105	85 549565	21	6N	5W
A-lan	1	AMC167034	85 549188	1	5N	6W
	2	AMC167035		1	5N	6W
	3	AMC167036		1	5N	6W

Claim Name	Number	BLM Number	Recordation No.	Section	Township	Range
A-lan	4	AMC167037		1/12	5N	6W
	5	AMC167038		1/12	5N	6W
	6	AMC170729		1/12	5N	6W
	7	AMC170730		1/12	5N	6W
	8	AMC167039	85 549189	1	5N	6W
	9	AMC167040		1	5N	6W
	10	AMC167041		1/12	5N	6W
	11	AMC167042		1/12	5N	6W
	12	AMC167043		12	5N	6W
	13	AMC170731		12	5N	6W
	14	AMC170732		12	5N	6W
	15	AMC167044	85 549190	1	5N	6W
	16	AMC167045		1	5N	6W
	17	AMC167046		1/12	5N	6W
	18	AMC167047		12	5N	6W
	19	AMC167048		12	5N	6W
	20	AMC170733		12	5N	6W
	21	AMC170734		12	5N	6W
	22	AMC167049	85 549191	1/6	5N	5W/6W
	23	AMC167050		1/6	5N	5W/6W
	24	AMC167051		1/6/7/12	5N	5W/6W
	25	AMC167052		7/12	5N	5W/6W
	26	AMC167053		7/12	5N	5W/6W
	27	AMC170735		7/12	5N	5W/6W
	28	AMC170736		7/12	5N	5W/6W
	29	AMC167054	85 549192	6	5N	5W
	30	AMC167055		6/7	5N	5W
	31	AMC167056		7	5N	5W
	32	AMC167057		7	5N	5W
	33	AMC167058		7	5N	5W
	34	AMC170737		7	5N	5W
	35	AMC170738		7	5N	5W
	36	AMC167059	85 549193	6	5N	5W
	37	AMC167060		6/7	5N	5W
	38	AMC167061		7	5N	5W
	39	AMC167062		7	5N	5W
	40	AMC167063		7	5N	5W
	41	AMC170739		7	5N	5W
	42	AMC170740		7	5N	5W
Vulture Annex #	1		85 549543	25/30	6N	5W/6W
Vulture Annex #	2		85 549544	31	6N	5W
Desert #	118		86 046761	16/17	6N	5W
Desert #	119		86 046762	16/17	6N	5W
Desert #	122		86 046763	16	6N	5W
Vulture #	63		86 046764	36	6N	6W
Vulture #	64		86 046765	36	6N	6W
Vulture #	65		86 046766	36	6N	6W
Vulture #	66		86 046767	1/36	5N/6N	6W

Placer Mining Claims

87-752769

Claim Name	Number	BLM Number	Section	Township	Range	
V.M.P.	1	AMC77018	26	6N	6W	
	2	AMC77019	35	6N	6W	
	3	AMC77020	35	6N	6W	
	4	AMC77021	35	6N	6W	
	5	AMC77022	35	6N	6W	
	6	AMC77023	2	5N	6W	
	7	AMC77024	2	5N	6W	
	8	AMC77025	25	6N	6W	
	9	AMC77026	25	6N	6W	
	10	AMC77027	25	6N	6W	
	11	AMC77028	26	6N	6W	
	12	AMC77029	19	6N	5W	
	13	AMC77030	19	6N	5W	
	18	AMC77031	6	6N	5W	
	19	AMC77032	6	6N	5W	
	20	AMC77033	6	6N	5W	
	21	AMC77034	6	6N	5W	
	22	AMC77035	20	6N	5W	
	23	AMC77036	20	6N	5W	
	24	AMC77037	20	6N	5W	
	25	AMC77038	20	6N	5W	
	26	AMC77039	29	6N	5W	
	27	AMC77040	29	6N	5W	
	28	AMC77041	29	6N	5W	
	29	AMC77042	29	6N	5W	
	30	AMC77043	32	6N	5W	
	31	AMC77044	32	6N	5W	
	32	AMC77045	32	6N	5W	
	33	AMC77046	32	6N	5W	
	34	AMC77047	5	5N	5W	
	35	AMC77048	5	5N	5W	
	36	AMC77049	21	6N	5W	
	37	AMC77050	21	6N	5W	
	38	AMC77051	28	6N	5W	
	J.S.	1	AMC71781	30	6N	5W
		2	AMC71782	30	6N	5W
		3	AMC71783	30	6N	5W
		4	AMC71784	30	6N	5W
5		AMC71785	36	6N	6W	
6		AMC71786	36	6N	6W	
7		AMC71787	36	6N	6W	
8		AMC71788	36	6N	6W	
9		AMC71789	1	5N	6W	
10		AMC71790	1	5N	6W	

Claim Name	Number	BLM Number	Section	Township	Range
J.S.	11	AMC71791	1	5N	6W
	12	AMC71792	1	5N	6W
	13	AMC71793	31	6N	5W
	14	AMC71794	31	6N	5W
	15	AMC71795	31	6N	5W
	16	AMC71796	31	6N	5W

Total: 410 Lode Claims, 50 Placer Claims

To: Anthony F. Budge

From: Carole A. O'Brien

Date: November 15, 1989

Ron called at 2 p.m. and asked me to pass along results of the meeting and site visit by DEQ. They did not show up until 11:30 and so visit extended until 2 p.m. They actually stayed beyond that time to sample in the area where they thought we had breached the berm on north^{east}~~west~~ side.

The meeting, Ron said, went well and everyone was quite cordial. We have agreed to carry out some extensive sampling, to determine the extent of contamination and also possible detection of the leak(s).

Just south of the 2 leak detection units on cells #1 and #2, DEQ want us to excavate below the 2 layers of 30 mil HDPE liners and take samples at 1-ft., 5-ft., and 10-ft. intervals into the underlying sub-soil; we will have these samples analysed for cyanide and other metal contaminants.

DEQ also want us to excavate between the 2 piles, also in cells #1 and #2, and test the sub-soil below the HDPE liners. This exercise may determine positively whether leak is coming from the front or back portion of the heap.

A picture is supposedly worth 1,000 words. Diagram follows showing desired sample locations.

Ron said he would be in the office tomorrow should you want more detail.

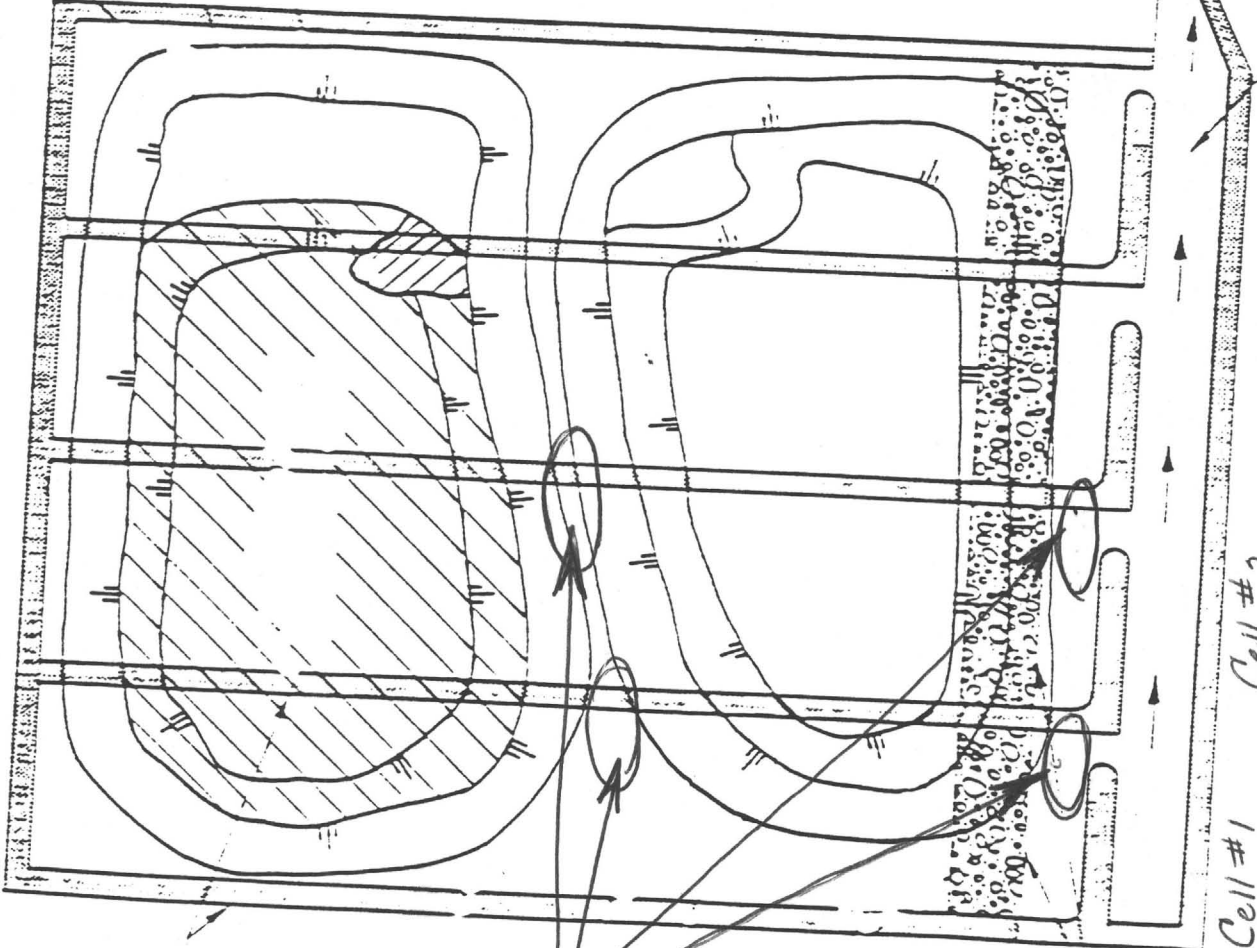


RECOVERY PLANT

BARREN POND

PREGNANT POND

SOLUTION CHANNEL



SEGMENT BERMS
(TYPICAL)

Location of
Sub-soil
Samples
requested by
DEQ

SAND & GRAVEL
OVERLINER

Cell #1
Cell #2



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

RECEIVED OCT 6 1989

ROSE MOFFORD, GOVERNOR
RANDOLPH WOOD, DIRECTOR

CERTIFIED MAIL:

Return Receipt Requested

October 3, 1989

REF#: 333

Ms. Carole A. O'Brien
A. F. Budge Mining Limited
4301 North 75th Street, Suite 101
Scottsdale, Arizona 85251-3504

RE: Vulture Mine, Groundwater Quality Protection
Permit No. G-0090-07

Dr. Ms. O'Brien:

The Water Pollution Compliance Unit (WPCU) of the Arizona Department of Environmental Quality (ADEQ) has received the notification of violation letter from the Vulture Mine Facility (Groundwater Quality Protection Permit [GQPP] No. G-0090-07).

The leak reported in the letter was also observed by several staff members of ADEQ's Water Permits Unit on September 15, 1989. They reported that a peristaltic pump had been installed on the eastern detection sampling point and that Dave Allen, the production manager, indicated that nine gallons of leakage per day was being measured. The concentration of cyanide and pH of the fluid collected had been tested and exceeded the limits set in Part II.A.4. of your GQPP. ("...shall not exceed a pH of 8.5 or show the presence of free cyanide above 0.20 mg/l.")

Part II.C.1., of your GQPP, stipulates that if any fluid is collected in any of the leak detection sampling points and exceeds the limits set in Part II.A.4., appropriate action to mitigate the effects of the violation must be determined.

The ADEQ's Water Permits Unit staff has determined the following requirements for the Vulture mine Facility.

1. Immediately upon the receipt of this letter:
 - a. Cease the application of cyanide solution to the two cells which are exhibiting leakage;
 - b. Pump all the leaked leachate solution from the leak collection system to the pregnant pond; A second pump should be installed at the western leak detection sampling point that is not currently equipped; Pump intakes should be

Ms. Carole O'Brien
October 3, 1989

located as deeply as possible; The volume of leaked leachate should be measured.

This should minimize the hydrostatic pressure on the secondary liner to reduce the possibility of its failure.

2. Within thirty (30) days of the receipt of this letter a plan and implementation schedule should be submitted which at a minimum includes the means by which the following tasks will be accomplished.
 - a. Show the extent and magnitude of any contamination that may have occurred and how it will impact groundwater quality. Information on local groundwater flow direction should be included in the plan. Static water levels and water level elevations should be measured at each of the three wells in the vicinity and at the mine shaft. This information will be necessary in the event that additional monitoring locations are required.
 - b. Sample the leachate solution collected at the leak detection point and the groundwater at the on-site process water well. Analysis must be conducted for pH, total Cyanide, and dissolved Arsenic, Barium, Cadmium, Lead, Selenium, Silver, and Mercury. Appropriate sampling techniques and EPA-approved analytical procedures must be used by a laboratory certified by the State of Arizona.
 - c. Locate the leak.
 - d. Remediate the leak and ensure that the facility will not discharge further and will thus be brought into compliance with the your permit.
 - e. Submit the Quality Assurance data from the seam testing on the pad that was required in Part II.A.1.b., of your permit. This will aid in the determination of the cause of the leak.

All submittals should be sent to the following address:

Arizona Department of Environmental Quality
Water Pollution Compliance Unit, Room 300
2005 North Central Avenue
Phoenix, Arizona 85004


Attention: Tim L. Levandowsky

Ms. Carole O'Brien
October 3, 1989

Failure to comply with all the requirements of your permit may result in revocation as stated in Part IV.H.4., of the permit or administrative or legal action by ADEQ or the Arizona Attorney Generals Office.

If you have any questions or problems meeting the requirements of this letter you may call me at 257-2368.

Sincerely,



Tim L. Levandowsky
Water Pollution Compliance Unit

CC: Sarah Mapes, Compliance
Roger Kennett, Water Permits Unit
Debra Daniel, State Permits Hydrology Unit
Robert Hollander, Central Regional Office



ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

ROSE MOFFORD, GOVERNOR
RANDOLPH WOOD, DIRECTOR

RECEIVED SEP 28 1989

September 26, 1989

Carole A. O'Brien
A.F. Budge Ltd.
7340 E. Shoeman Ln
Suite 111 "B" (E)
Scottsdale 85251

Dear Ms. O'Brien,

Attached is a copy of the site visit report which has been placed in your Groundwater Quality Protection Permit file and the inter-department memo regarding the steps to be taken on your leak problem.

We have determined that your facility is in violation of three permit conditions. Please initiate our recommendations to correct the three violations in accordance with the time schedule as stipulated. You will receive a letter from our compliance unit verifying the actions to be taken with regards to the leak. This is required as part of the contingency requirements. If the other two violations are not rectified within a timely manner, then our compliance unit will be directed to enforce those conditions.

Please forward all proposals regarding this issue to Abigail Myers at the department address. If you have any questions, feel free to call her at 257-6825.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael A. Milczarek".

Michael A. Milczarek
Groundwater Permit Writer

cc: GWQPP G-0090-07 file

The Department of Environmental Quality is An Equal Opportunity Affirmative Action Employer.

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Inter-Office Memorandum

DATE: September 26, 1989

TO: Tim Levandowsky
Water Pollution Compliance Unit

THROUGH: Gary Ullinskey *gmu*
Roger Kennett *RK*
Water Permits Unit

FROM: Abigail Myers *asm*
Water Permits Unit

RE: Vulture Mine
Groundwater Quality Protection Permit No. G-0090-07

Gary Ullinskey, Mike Milczarek and I visited the Vulture Mine gold heap leaching facility on September 15, 1989. At that time we observed that a leak had occurred on the pad and cyanide leachate solution was being collected in the leak collection/detection system for the two western-most cells of the pad. A peristaltic pump had been installed on the eastern detection sampling point and Dave Allen, the production manager, indicated that nine gallons of leakage per day was being measured. The concentration of cyanide and pH of the fluid collected had been tested and exceeded the limits set in Part II.A.4. of the referenced permit.

Part II.C.1 of the Vulture Mine Groundwater Quality Protection Permit No. 0090-07 stipulates that if any fluid is collected in any of the leak detection sampling points and exceeds the limits set in part II.A.(4), appropriate action must be determined to mitigate the effects of the violation. Following are the recommendations of the Water Permits Unit.

The following should be done immediately.

1. Application of cyanide solution to the two cells which are exhibiting leakage should be halted.

2. All of the leaked leachate solution should be pumped from the leak collection system to the pregnant pond. Hydrostatic pressure on the secondary liner must be minimized to reduce the possibility of its failure. A second pump should be installed at the western leak detection sampling point that is not currently equipped. Pump intakes should be located as deeply as possible. The volume of the leaked leachate should be measured.