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1

CONDITIONAL USE PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

No. 84

This Conditional Use Permit Granted this day to Gilt Edge, Inc.. upon recommendation of the Lawrence County Planning Commission and the Lawrence County Board of Commissioners; and upon the results of the required public hearing.

Said Conditional Use Permit is intended to be used only for the specific use so designated herein. Any other use of this Conditional Use Permit is in violation of the Lawrence County Zoning Ordinance and the violator is subject to the penalties set forth in said Ordinance.

Location of Property (address) Near Galena/at the headwaters of Strawberry Creek

Legal Description: Portions of Sections 5, 6, 7 & 8, 14N, R4E, B.H.M. (approximately 155 Acres) A detailed list of specific Lode Claims & Mineral Surveys is available for public examination at the Lawrence County Planning & Zoning Courthouse Office.

Subdivision _____ Block _____ Lot _____

Section _____ Township _____ Range _____

Mineral Survey No. _____

Present Zoning District PF - Park Forest District

Conditional Use For mining/milling Subject to the following stipulation: Gilt Edge, Inc. will maintain the main haul road (F.D.R. #170) according to County and U.S.F.S. specificat

Signature of Property Owner [illegible] as agent for Gilt Edge

Signature of Administrative Official [illegible]

Date Granted March 13, 1985

Lead Daily Call April 22, 1985
Spearfish Mail April 23, 1985
Lawrence County Centennial April 23, 1985

March 13, 1985

The Lawrence County Commission and Gilt Edge, Inc. hereby agree to attach the following conditions to Conditional Use Permit #84:

1. All excavations, extraction of materials and minerals, open pits and impounding of waters hereafter established or enlarged shall conform to the rules of the South Dakota Department of Water and Natural Resources and any applicable United States Environmental Protection Agency water discharge permit standards.

2. Reclamation and reconditioning of the land shall conform with the rules of the South Dakota Department of Water and Natural Resources and the Lawrence County Soil Conservation Service. Reclamation and reconditioning will proceed in a timely and orderly fashion as determined by the South Dakota Department of Water and Natural Resources and the Lawrence County Soil Conservation Service.

3. Applicant will make state required annual reclamation reports available to the public.

4. Applicant will adhere to a dust suppression program to control dust on the access road and all haul roads within the permitted area using methods recommended or approved by the Lawrence County Highway Superintendent.

5. If it is found by a court of competent jurisdiction that Applicant's mining operations are a public nuisance as defined in Chapter 21-10 of the South Dakota Codified Laws, the conditional use shall be reviewed and subject to additional restrictions, suspension, or revocation.

6. If it is found by a court of competent jurisdiction that Applicant's mining operation causes actual damage to structures or other personal property on or near structures in the area, the conditional use shall be reviewed and then subject to additional restrictions, suspension or revocation.

7. Blasting shall take place between the times of 9:00 a.m. and a half hour before sunset.

8. If it is found by a court or state agency of competent jurisdiction that Applicant is polluting a stream, creek or waterway, the conditional use shall be reviewed and subject to additional restrictions, suspension or revocation.

9. Failure to comply with any of the aforementioned restrictions or conditions will result in additional restrictions, suspension or revocation of the permit. If the State of South Dakota or the United States Government impose any conditions on Applicant that conflict with these conditions, those state or federal requirements shall take precedence.

Dated this 23rd day of April, 1986

Dave Richards
Chairman of Lawrence County Commission

The undersigned hereby agrees to the conditions attached to Conditional Use Permit #84.

Dated this 10th day of May, 1986

Gilt Edge, Inc.
Wayne D. McCoy, President

MEMO from

Telephone
(605) 578-3871

PLANNING AND ZONING OFFICE
LAWRENCE COUNTY COURTHOUSE
DEADWOOD, SOUTH DAKOTA 57732

January 30, 1985

Additional information regarding the Gilt Edge project is available at the Lawrence County Planning and Zoning Office

NOTICE OF PUBLIC HEARING

BEFORE LAWRENCE COUNTY BOARD OF COMMISSIONERS

AND LAWRENCE COUNTY PLANNING AND ZONING BOARD

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Notice is hereby given that the following person has applied to the Lawrence County Administrative Official for:

____an amendment to
____a rezone of area under
__X__a conditional use permit
____a variance from

For mining/milling (gold & silver) under
the provisions of the Lawrence County Zoning Ordinance, Section 5.11

as follows:

Location: Near Galena/at the headwaters of Strawberry Creek
NAME Gilt Edge, Inc. (subsidiary of Lacana Gold, Inc.)
Legal: Portions of Sections, 5, 6, 7 & 8, T4N, R4E, B.H.M. (approximately 153 a
A detailed list of specific lode claims & mineral surveys available for public examinatio
at the Lawrence County Planning and Zoning Courthouse Office

Notice is further given that said application will be heard by the Lawrence County Board of Commissioners in its Courthouse Office, on the 13th day of February, 1985, at 1:30 p.m.

At which time and place any such person interested may appear and show cause, if there be any, why such special exception should or should not be granted.

Dated at Deadwood, Lawrence
County, South Dakota
This 21st day of January, 1985

Administrative Official

Publish _____, 19___.

Lead Daily Call	January 29, 1985
Queen City Mail	January 30, 1985
Lawrence County Centennial	January 30, 1985

APPLICATION for

MINING/MILLING PERMIT

and

MINING/MILLING OPERATING

and RECLAMATION PLAN NARRATIVE

Prepared by:

GILT EDGE, INC.

(LACANA GOLD, INC.)

for the

GILT EDGE PROJECT

Submitted to:

SOUTH DAKOTA

DEPARTMENT of WATER

and

NATURAL RESOURCES

Department of Water and Natural Resources
Exploration and Mining Program
Joe Foss Building, Fourth Floor
Pierre, South Dakota 57501
Telephone: 605/773-4201

APPLICATION FOR
MINING/MILLING PERMIT

Pursuant to SDCL 45-6B:
Relating to Extraction and Processing of Minerals in Operations Affecting More Than 10 Acres Per Year and Removing Over 25,000 Tons Per Year

Name of Operator: Gilt Edge, Inc.

General Office Address:

2005 Ironwood Parkway
Coeur d'Alene, Idaho 83814

Telephone: 208-664-1571

Local Address:

P. O. Box 485
Deadwood, SD 57732

Telephone: 605-578-2607

Name and Address of Surface Owner:

Various Surface Owners

See Table 1-1 in operating plan narrative

Name and Address of Mineral Owner:

Various Mineral Owners

See Table 1-1 in operating plan narrative

Legal Description of Affected Land:

Sec. 5 T4N.R.4E.
Sec. 8 T4N.R.4E.

County: Lawrence

Name and Address of Operator's Legal Resident Agent (if out-of-state corporation):

CT Corp.
319 South Coteau St.
Pierre, SD 57501

Minerals to be Extracted and, if Applicable, Milled: Gold and Silver

Proposed Starting Date: April 1, 1985

Proposed Completion Date: 1992

Size of Area to be Worked at Any One Time (acres): Approximately 153 Acres

Estimated Working Days Per Year:

260 days, 210 leaching

Estimated Tonnage to be Mined:

750,000 Tons/Year appr. 5.0 MM Total Tons

7.5 MM Tons Waste

Estimated Duration of Operation (years):
7-10 Years

WNR-521-6/82

Source of Legal Right to Enter and Initiate Operations:

(x) Lease ( ) Letter ( ) US Forest Service Permit

Attach Copy

Source of Legal Right to Dispose of Tailings:

(x) Lease ( ) Letter ( ) US Forest Service Permit

Attach Copy

INSTRUCTIONS (Reference SDCL 45-6B):

This Application Must be Accompanied by:

1. A Narrative Description of Methods of Mining and Milling to be Employed as Per Section 6 (8).
2. A Reclamation Plan Pursuant to Section 7.
3. A Map of the Affected Area Pursuant to Section 10.
4. A Fee of $1,000.00 Pursuant to Section 14. (Units of State and Local Government are Exempt).

Before a Hearing on the Permit May be Conducted by the Board of Minerals and Environment, the Applicant Must Submit the Following Materials:

1. Certified Mail Receipts Confirming Mailing of Notice to All Surface Owners and Lessees Pursuant to Section 17.
2. A Copy of the Affidavit of Publication of Notice Pursuant to Section 16.
3. Proof of Filing a Copy of the Application with the Register of Deeds Pursuant to Section 15.
4. A Surety in an Amount to be Determined by the Department Pursuant to Section 20 (Units of State and Local Government Must Submit a Written Guarantee in Lieu of Surety Stating that the Affected Lands Will be Reclaimed in Accordance with the Permit and SDCL 45-6B, Sections 35 through 46).
5. A Copy of Instruments of Consultation From All Surface Landowners, if Different than the Owner of the Minerals Pursuant to Section 12 and 13.

Applicant hereby affirms that the mining and milling will be conducted pursuant to SDCL 45-6B, or any regulations promulgated thereunder; that he will grant access to the Board of Minerals and Environment or its agents to the area under application from the date of the application and during the life of the permit as is necessary to assure compliance with SDCL 45-6B.

Signature: [illegible]

Title: [illegible] Date: [illegible]

STATE OF Idaho

COUNTY OF Ada

On this 14 day of December 19 84, before me personally appeared Richard James Hall who acknowledged himself to be the Mgr Special Pr. (Title) for Lamana Gold, Inc the sole owner of Gill Edge Inc (Operator) and that he is authorized to execute the Application for Mining/Milling Permit for the purposes contained therein.

[illegible]
Notary Public

My Commission Expires: 1-11-86

SEAL

FOR DEPARTMENT USE ONLY

Date Approved:	Bond Amount:	Permit Number:

Signature:
Chairman, Board of Minerals & Environment

Department of Water and Natural Resources
Exploration and Mining Program
Joe Foss Building, Fourth Floor
Pierre, South Dakota 57501
Telephone: 605/773-4201

MINING/MILLING
OPERATING & RECLAMATION PLAN

Pursuant to SDCL 45-6B-6 and 45-6B-7

Operator's Name: Gilt Edge

Permit Number: _____

In preparing the Operating and Reclamation Plan, please address each item in detail, referring to SDCL 45-6B as needed. Attach additional pages if extra space is needed.

1) Describe the proposed method of mining, and if applicable, milling to be employed:

A) **Contour basis for the mining** - See Figures 2-1 and 2-2 in narrative.

B) **Depth to which and the direction in which mining will proceed** - Mining will be carried out to both the Dakota Maid and Sunday pit. See Figures 2-1 and 2-2. The largest pit is the Sunday and its ultimate pit bottom will be at an approx. elevation of 5300 ft. above mean sea level. The mining of the Sunday pit will be standard open pit methods in a north-south direction. The Dakota Maid pit will have an ultimate pit bottom of about 5300 ft. above mean sea level. Mining, by standard open pit, will proceed east and north-south.

C) **Proposed disposition of mine spoil and tailings** - Due to the proposed heap leach processing method tailings will not exist. The leached material will ultimately be recontoured and revegetated. Waste rock from the mining operation will be used, to as great extent as possible, for fill. These fill areas will then be used for leach pad sites. The rational behind this method is twofold. First it gives a useful purpose to the waste rock and second this method will impact less surface area than having separate waste dumps and leach pad sites. Waste material not used for the pad site construction will be used for mine haul road fill or will be put into a canyon waste dump.

D) **Method of blasting and control** - The Gilt Edge project will use ANFO (ammonia nitrate and fuel oil) explosives. Control will be through the use of experienced and qualified blasters. Also, for safety and control, blast will occur at the end of shifts and according to MSHA approved safety standards.

2) Provide a narrative description of the types of reclamation the operator proposes to achieve in the reclamation of the affected land (e.g., return to cropland, pasture, building sites, recreational area, forest planting, etc. Refer to SDCL 45-6B-7 and 45-6B-45):

Reclamation will be a dynamic process with the intent to return the land to as natural a condition as possible. The current use of the land is forest and recreational uses. See Chapter 2 of narrative.

WNR-529-2/83

3) What is the reason for choosing the above methods of reclamation?

This method of proposed reclamation is consistent with the types of land uses for the given soil types in the area. See Figure 3-2 and page 3-5 of narrative.

4) Itemize the amount of acreage accorded to each of the reclamation types described in Number 2.

Component	Affected Acres	Type of Reclamation	Reclaimed Acreage
Dakota Maid Mine	8-12	Return to forest planting	12
Sunday Mine	17-22	Return to forest planting	22
Crown Point Waste Dump	4-7	Return to forest planting	7
Plant site	11	Return to forest planting	11
Leach pads (waste dumps)	84	Return to forest planting, limited recreation	84
Crushing Area ISW Disposal Site	2-4	Return to forest planting	4
Haul Roads	8	Return to forest planting	8
Other Ancillary Services	5	Return to forest planting	5
		TOTAL	153 acres

5) How will the reclamation plan be implemented to meet the reclamation standards which are described in SDCL 45-6B-37 through 45-6B-46 (Refer to these sections in 45-6B):

45-6B-37 Grading - Grading of the mined areas (2) will be completed following cessation of all mining activities to direct drainage into undisturbed forest areas. Waste dumps (leach pads) will be final graded such that the average slope of the dump will conform to the natural angle of repose (Figure 2-7). These areas will also be resloped to allow natural runoff to spread and prevent erosion of the dump face. Heaps will also be contoured to provide adequate drainage and blend with the topography. Haul roads will be graded and/or ditched and vegetated to reduce erosion. This will include water barring, as necessary. The ancillary facilities sites will be filled, compacted, and final graded as necessary to provide for adequate long-term drainage and revegetation.

45-6B-38 Removal of Refuse - All refuse including construction and domestic waste will be disposed of onsite at the approved landfill, according to State of South Dakota Solid Waste Disposal Regulations (SDCL 34A-6). Disposal of potentially hazardous or toxic wastes will be according

to State of South Dakota Hazardous Waste Management Regulations (SDCL 34A-6-8).

45-6B-39 Revegetation - The revegetation program will involve a number of planting programs and applications. These will include: onsite pilot studies involving mine waste and treated ore to determine reclamation treatment needs and the most adaptable species; interim and long-term revegetation programs to reduce erosion and sedimentation; application of fertilizer and mulch, as necessary; and other activities described in Chapter 2 of the Mining/Milling Operating and Reclamation Plan. Total areal disturbance will be significantly reduced by combining waste disposal requirements with the need for fill upon which the leach pads will be constructed. This will further reduce revegetation needs.

45-6B-40 Topsoil Storage - Based upon site conditions and consultation with J. Nelson, District Conservationist, SCS, only minimal topsoil storage is planned. This is due to the absence of topsoil at the site, which is directly related to past mining activity and the rock composition within the area. Waste material conducive to reclamation will, however, be stockpiled in limited volumes to be utilized in the overall reclamation program. This material will also be tested as to reclamation potential during the 1985 season, as previously described.

45-6B-41 Surface and Groundwater Protection - The protection of local surface and groundwater resources will be a priority goal of project planning and implementation. Short-term and long-term mitigation and water quality protection activities are described in detail in Chapters 1 and 2 of the Mining/Milling Operating and Reclamation Plan. The program includes invididual component applications of BMP's, and engineered pollution control activities involving both surface and groundwater resources. An operational surface and groundwater monitoring program designed to detect subtle changes in existing conditions is also described in the plan. In addition, a baseline monitoring program has been implemented to document existing conditions, such that operational impacts can oe readily identified and responses made in a timely manner. A spill contingency program is also outlined in Appendix E of the plan.

45-6B-42 Highwall Reduction - Highwall reduction within the pit will be by allowing the material to achieve its natural angle of repose. The catchment benches prior to being cut-off will be graded to provide for runoff water control. Also, the benches will be revegetated in accordance with the proposed reclamation plan as outlined in Chapter 2 of the narrative.

45-6B-43 Erosion Control/Weeds - Erosion control is an important element of the overall water quality management plan developed for the project. Interim (short-term) construction measures are outlined in Chapters 1 and 2 of the Mining/Milling Operating and Reclamation Plan. They involve diverting runoff around disturbed areas and into heavily vegetated areas, detention ponds, interim seeding and revegetation, culverting, silt fencing and straw bales, and other BMP's. Longer term erosion control activities include reclamation of the mine areas and waste dumps/leach pads, which will involve installing permanent drainage controls and revegetation, settling ponds where necessary, and an ongoing monitoring program. The Lawrence County Weed Control Board was contacted and the following recommendations have been incorporated into the Operating Plan by Gilt

Edge. Inc: 1) maintain access to areas so weeds can be sprayed; 2) establish grass cover early to prevent establishment of weeds; and 3) establish schedule for Weed Control Board to check for and spray weed growth (every six months). See Appendix O.

~~45-6B-44~~, 45 Type of Reclamation - The primary reclamation will be forest planting. The planting stock will be determined in consultation with the DW&NR. A more detailed description of the overall reclamation program is described in Chapter 2 of the Plan.

~~45-6B-46~~ Reclamation Timetable - Reclamation activities will be carried out throughout the life of the operation, as contemporaneously as possible with the termination of operation of any disturbed areas. In no situation will reclamation not be completed within 5 years after completion of the respective mining/milling activity, unless authorized by the Board of Minerals. The company is currently conducting tests to determine nutrient requirements and potential additional chemical needs. This testing will continue on through the 1985 construction/operating season.

6) Provide a detailed description of how the intended reclamation methods described above will rehabilitate the affected land. This description shall include, but is not limited to, restoration of the natural vegetation, wildlife, water, air, and soil:

A detailed description of reclamation methods is provided in Chapter 2 of the Mining/Milling Operating and Reclamation Plan. This includes compliances with existing regulations covering water quality and water resources, air quality, solid waste management, and hazardous/toxic waste. Additional mitigation elements described in Chapter 2 address reclamation and revegetation, erosion and sedimentation control, fish and wildlife, and public safety. The basic direction of the Plan is to implement an effective two-phased reclamation program which will address interim construction-related impacts on local resources, and long-term operational and abandonment effects.

7) Provide a statement describing the location of proposed reservoirs, tailings ponds, tailings disposal sites, dams, dikes. and diversion canals. Denote such locations on the map required under SDCL 45-6B-10.

No reservoirs, tailings ponds or disposal sites, dams, dikes or major diversion channels are planned for the project. Plate 1-2 shows a conceptual layout for the proposed project. The operation will involve one-time heap leaching of ore on impervious pads. The system is totally contained, and does not involve tailings. Ore will be treated in place on the pad system, and neutralized at the completion of the operation. Ponds (pregnant, barren and fresh water makeup) will be filled in. regraded and reclaimed at the cessation of the operation.

8) Describe what provisions will be made for the stripping and storage of overburden and topsoil:

Topsoil at the site is limited (generally less than 1 inch, J. Nelson, SCS, 1984). Therefore, only minimal amounts will be stockpiled. Mine waste will be disposed of in a single waste dump (see Plate 1-2), and/or utilized for

construciton of the leach pad system. Waste material and treated ore is currently being treated for reclamation potential.

9) Describe the methods to be used in returning the overburden and topsoil during reclamation, and describe when this activity will take place:

As described above, topsoil is limited and will be used sparingly in the overall reclamation program. Initial testing indicates that the mine areas can be revegetated without topsoil application by ripping, limited application of waste conducive to revegetation, and seeded with the approved mixture of grasses. A large portion of the waste material from the mine areas (est. 3.2 million tons) will be utilized as fill material in leach pad construction. Opportunities for limited backfilling in the abandoned mine areas, as practical, is currently being evaluated.

10) What is the expected cost of implementing the proposed reclamation work (cost per acre/total cost)?

Estimated costs for the planned reclamation program are presented in Chapter 2 of the Mining/Milling Operating and Reclamation Plan. Total costs, including end-of-project neutralization are estimated at $405,200. Annual treatment and disposal costs for treated cyanide solutions are estimated at $27,100 - $30,000. Cost per acre for the Gilt Edge project is estimated at $2,648. This cost is based on 153 acres of disturbed area.

11) Provide a statement which describes any characteristics of the affected land of historic, archaeologic, geologic, scientific, or recreational significance which are known to the applicant:

The company has consulted the Historic Preservation Center (Vermillion, S.D.). Gilt Edge, Inc. will be mapping and photographing existing abandoned mill foundations; the locations will be plotted on a topographic map at a scale of 1" - 100'. This work will be completed prior to commencing any mining activities.

****

In addition to addressing the above items, please attach the following items to the Reclamation Plan:

1) A standard <u>soil survey</u> of the affected land prepared by the local Conservation District (paid for by the applicant).

2) A <u>vegetation survey report</u> on the affected land prepared by the local Conservation District (paid for by the applicant), including a description of the dominant species present, approximate size, and density.

3) A <u>reclamation report</u> prepared by the local County District Conservationist giving his recommendations and guidelines concerning how the area should be revegetated. This report should include a recommended seed mixture.

4) A <u>wildlife survey report</u> on the affected land prepared by the

Department of Game, Fish, and Parks (paid for by the applicant), including a description of the dominant species of wildlife inhabiting the area.

5) A post reclamation map showing the anticipated physical appearance of the reclaimed mine, and portraying the outline of the proposed final land use for each portion of the reclaimed land.

6) The baseline water quality and water-level data for the area (the Department shall designate what parameters should be tested for after on-site inspection, and the applicant shall use testing methods as approved by the Department).

Operator's Signature: [signature]

Title: Mgr, Special projects for Lacana Gold Inc. the sole owner of Gilt Edge Inc. Date: Dec. 14, 1984

SUMMARY

Gilt Edge, Inc., a wholly owned subsidiary of Lacana Gold, Inc., has been evaluating the economic potential of a portion of the Bear Butte Mining District, Lawrence County, South Dakota since early 1983. Prior to Gilt Edge, Inc. the area was extensively studied by three other mining companies. The aggregate of this work indicates the presence of a commercially viable gold orebody.

The Dakota Maid and Sunday ore deposits have sufficient proven ore to supply Gilt Edge, Inc.'s proposed mining and processing facilities for at least seven years. Using conventional surface mining techniques the mine will produce up to 750,000 tons of ore and one million tons of waste per year.

A conventional heap leaching process, commonly used throughout the industry, will be utilized for the recovery of the metal values. In this method the ore is piled upon an impervious pad and a dilute solution of sodium cyanide is percolated through the pile. The metal-bearing solution that flows out of the heaped ore is then collected in impervious ponds and pumped through a metal recovery plan. After passing through the plant, the solution is chemically adjusted and recycled back to the heap. The process is a totally enclosed system with no discharge of process solution to the environment.

Construction of mining and plant facilities is scheduled to start in the spring of 1985. The construction will be completed by late summer of 1985. Included in the construction phase will be haul roads, plant buildings, assay and administrative offices, as well as the initial leach pads and collection ponds.

The operation will employ approximately fifty (50) people during the production season. During the winter months, when leaching is impractical, the staff will be reduced to administrative and maintenance personnel. The current plan is to employ the residents of the surrounding communities to as great of an extent as possible.

Following termination of the project, all buildings and concrete structures constructed by Gilt Edge, Inc. will be removed or buried. Reclamation techniques will be used to restore the affected areas to a condition that is as near original as practicable, or to standards agreed upon in the approved reclamation plan.

Lacana Gold, Inc. the owner of Gilt Edge, Inc., is part of Lacana Mining Corp. Lacana Mining Corp. through their associated companies and joint venture partners produces gold and silver from six different operations world wide. Lacana Gold has recently completed the construction and startup of the Relief Canyon Mine near Lovelock, Nevada. Relief Canyon is a heap leach operation that mines and processes about one million tons of ore per year. The personnel who will be involved in the Gilt Edge project have extensive experience in precious metal mining as well as using the heap leach extraction process.

This initial Application for Mining/Milling Permit document describes the elements and facilities comprising the various components of the Gilt Edge Project:

the activities and general schedules associated with construction, operation, abandonment and reclamation of each component, and basic mitigation measures proposed in order to minimize environmental effects of the project activities. Spill contingency considerations and environmental monitoring programs are also outlined.

More detailed information will be submitted by Gilt Edge. Inc. to involved agencies in the form of "operating memoranda" or "supplemental technical design memoranda" involving engineering drawings and specifications, where existing regulations require. This Application for Mining and Milling Operating and Reclamation Plan Permit is intended to meet all requirements of the Mined Land Reclamation Act, Chapter 45-6B. These supplemental submittals will be intended to describe modifications or changes to this initial document, general comments and specific agency review concerns, and engineering design level information, where necessary.

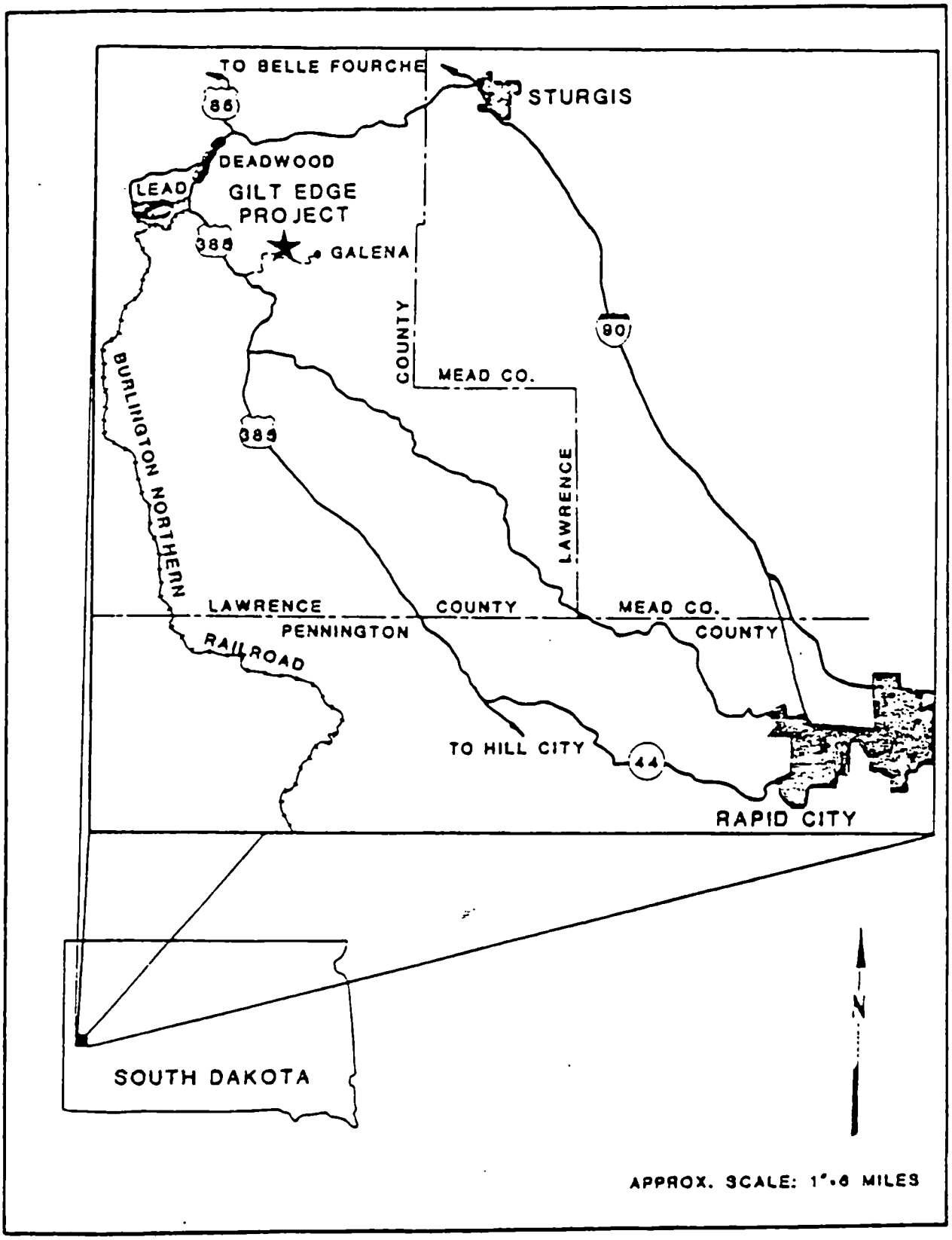


FIGURE 1-1
LOCATION MAP
GILT EDGE, INC.
GILT EDGE PROJECT
LAWRENCE COUNTY, SOUTH DAKOTA

CHAPTER 1

OPERATING PLAN NARRATIVE

LOCATION AND BACKGROUND

The Gilt Edge project is located in Lawrence County, South Dakota, approximately 5 miles southeast of Lead and Deadwood, site of the Homestake Mine. The project area is within the Black Hills National Forest in Sections 5, 6, 7, and 8, T.4N, R.4E. Lead is approximately 45 miles northwest of Rapid City (Figure 1-1).

The Gilt Edge property may be reached by U.S. Highway 385 south from Lead, and then along a gravel road 4.5 miles toward the old mining town of Galena. The property location is near Galena at the headwaters of Strawberry Creek.

Elevations at Gilt Edge vary from 5,000 feet along Strawberry Creek to 5,650 feet along the ridge crest. Local landmarks include Anchor Hill and Dome Mountain.

The climate in the Black Hills is distinctly different from the surrounding plains. The monthly average temperature for January at Lead is 24.1°F and for July is 68.0°F. Lead has an annual precipitation of 27.0 inches.

Water flows in lower Strawberry Creek most of the year. Several geologic formations provide varying water supplies in the general project area.

The entire area is moderately timber covered, typical of the Black Hills. Vegetation types include Ponderosa pine, with scattered Black Hills spruce, birch and quaking aspen. Wildlife in the area includes such big game species as whitetail and mule deer along with a large number of small carnivores and fur bearing mammals. Bird populations consist of raptors, turkeys and passerines.

HISTORY

Most of the individual operations in the Gilt Edge area were developed as small, independent gold mines during the late 1800's and early 1900's. Modest production of some 13,000 ounces of gold from at least five different mines is recorded prior to the turn of the century.

The mines in the central Gilt Edge area were consolidated into the Gilt Edge Maid Mining Company in 1900, and produced approximately 40,000 ounces of gold and 20,000 ounces of silver between 1905-1916. The company was idle until 1935. From 1937-1940, the operation produced approximately 20,000 ounces. The area's production involved conventional cyanide milling. Evidence of these mills are the abandoned mill tailings.

The Commonwealth Mining Company purchased the above property but never operated it. The Gilt Edge project area currently consists of four properties: the Commonwealth Mining Company, the Northwestern Metals Company, the Willis

Aye claims, and land owned or unpatented claims staked or leased by Cyprus Mines Corporation. All property is presently under the control of the Gilt Edge, Inc. joint venture.

Congdon and Carey, in 1969, initiated an exploration program in the project area in order to investigate a copper-molybdenum potential. The project was abandoned in 1971 after drilling approximately 10,000 feet in eleven core holes.

In 1974, Congdon and Carey re-negotiated acquisition of the the property and presented the property package to Azcon Corporation, who in turn referred the property to Cyprus under the terms of an existing exploration agreement. A joint venture between Cyprus (Amoco) and Congdon-Carey (CoCa) was initiated in 1975. Extensive rotary and diamond drilling, initially outlining the Gilt Edge mineralization, was conducted by Cyprus-Amoco.

Gilt Edge, Inc., entered into a joint venture with Amoco-CoCa in 1983 to further explore, evaluate and develop the Gilt Edge property.

SERVICES

Lead is a typical small mining community with a population of 5,500. The Homestake Mine is located at Lead. The mine is one of the largest gold mines in the United States. As a result of the town being the home of the Homestake Mine, all services pertinent to a mining operation are close at hand. This includes housing, schools, hospitals, fire and police protection, water and sewer facilities, and recreational facilities.

The Annie Creek Mine is also located 3.5 miles from Lead, and approximately 7 miles from Deadwood. The Annie Creek operation mines and processes approximately 500,000 tons of gold ore per year.

A portion of the local income is derived from tourism, brought about by the fact that the Black Hills are a unique area for the Plains States. Mining is the major employer, with the Homestake Mine employing over 1500 persons in 1982.

Between 1950 and 1980 the Black Hills experienced over a 60 percent increase in population, well above South Dakota's average population increase. The population of the Black Hills is expected to increase for at least the next two decades. The population of Lawrence County in 1980 was 16,422 with major influx of tourists, recreationists and tourist industry seasonal workers in the summer. The population of Lead was 4,720 in 1980.

Black Hills Power and Light supplies electrical power to the area. A power transmission line crosses the property with substations nearby. Electric power was installed in 1980 on the property for operation of an earlier heap leach test. The Burlington Northern Railroad services Lead, within four miles of the Gilt Edge property.

Materials not available locally may be obtained from Rapid City approximately 45 miles away. This diversified community of 45,000 people also has an airport with scheduled commercial jet service.

DESCRIPTION OF DEVELOPMENT PROPOSAL

Introduction

This section provides a narrative overview of the land status, geology, and mining and processing proposal. The narrative was prepared consistent with the requirements of the Surface Mining Land Reclamation Act, SDCL 45-6B, and the Administrative Procedures Act, SDCL 1-26. The discussion includes:

- Legal description of the mine area and affected land.
- Description of the local geology.
- Description of the proposed operation.
- Documentation of the planning process used to formulate the various components for the proposal.
- General management constraints and mitigation guidelines for the various components.
- Spill contingency and monitoring considerations.
- Information reporting procedures.

Throughout the discussion, the text refers to operational components. These are the major functions of the project which, when linked together, form the Gilt Edge mining project. They include:

- Mine areas
- Waste rock disposal areas
- Leach pads and processing facilities
- Access corridors
- Processing and waste disposal (effluent) requirements

Chapter 2 describes those reclamation procedures which will be implemented by Gilt Edge. Inc. to ensure that affected land is returned to a usable and productive status, following completion and abandonment of the mining operation. This includes a submittal checklist and mitigation components directly related to the overall reclamation program.

Project Description

Gilt Edge. Inc. has a two square mile claim block in the Black Hills Forest in Sections 5, 6, 7 and 8, T. 4N, R.4E, 5 miles southeast of Lead and Deadwood,

South Dakota. The proposed Dakota Maid and Sunday pits are located within the southern one-third of the claim block. All the major project components including the mine areas, waste rock disposal areas, leach pads and processing facilities, access corridors (primary haul roads) and processing and waste disposal sites are located on patented mining claims.

Total land controlled by Gilt Edge, Inc., is 33 unpatented and 100 patented claims for a total of 1,229 acres (Plate 1-1). Actual mining and processing involved in this permit will affect approximately 139-153 acres, excluding access roads. Existing disturbance in these areas to date has involved previous mining activities and the construction of exploration roads by Gilt Edge, Inc. and other companies.

Description of the Mine Area

The total acreage to be affected by the proposed mining activities is estimated at 139-153 acres. A summary breakdown is as follows:

Components	Acres
Mine areas	
o Dakota Maid mine	8-12
o Sunday mine	17-22
Plant site	11
Leach pads (includes waste dumps	84
Solid waste disposal site	2-4
Haul roads	8
Other Ancillary Services	5
Total	139-153

Table 1-1 summarizes the legal description of claims comprising the Gilt Edge project "affected land" area along with surface and mineral ownership. The remarks denote components of the project to be located on the claims.

Table 1-2 provides the adjacent ownership list. Plate 1-1 shows ownership of claims adjacent to Gilt Edge, Inc.'s holdings. A list, along with addresses of the adjacent landowners can be found in Appendix A.

GEOLOGY

The Gilt Edge project is located in the northern part of the Black Hills is characterized by a domal uplift that expose Precambrian metamorphic rocks rimmed by tilted Paleozoic and Mesozoic sedimentary rocks. Cutting the older rock units within the northern Black Hills is a 12 mile wide by 75 mile long northwest-trending belt of Cenozoic igneous rocks. The majority of the mineralization in the Bear Butte Mining District is associated with these Cenozoic intrusives that compositionally range from acid to intermediate.

TABLE 1-1

GILT EDGE PROJECT
AFFECTED GROUND CLAIM LIST

Legal Description	Claim Name	Mineral Survey No.	Status	Mineral Ownership	Surface Ownership	Remarks
Sec. 5 & 6 T4N, R4E	Little Giant	218	Patented	Commonwealth Group	Commonwealth Group	Ponds, Plant, Office, Roads
Sec. 5 T4N, R4E	Bailey	1871	Patented	Gilt Edge, Inc.	Willis Aye Group	Dump, Proj. Access Road
Sec. 5 T4N, R4E	Union Hall	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pads, Dumps, Access Roads
Sec. 5 T4N, R4E	Comet	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pads, Dumps, Access Roads
Sec. 5 T4N, R4E	South Ruby	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pad 3, 4 Access Road
Sec. 5 T4N, R4E	May	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Haul Roads, Pit Limit
Sec. 5 T4N, R4E	May Frac.	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Haul Road
Sec. 5 T4N, R4E	Waggoner	649	Patented	3/8 Commonwealth Group Gilt Edge, Inc.	3/8 Commonwealth Group Gilt Edge, Inc.	Haul Road
Sec. 5 T4N, R4E	Hoodoo	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Haul Road
Sec. 5 & 8 T4N, R4E	Oro Bella	648	Patented	3/8 Commonwealth Group Gilt Edge, Inc.	3/8 Commonwealth Group Gilt Edge, Inc.	Pit, Haul Road, Access Road, Waste Dump

TABLE 1-1 (cont.)

Legal Description	Claim Name	Mineral Survey No.	Status	Mineral Ownership	Surface Ownership	Remarks
Sec. 5 & 8 T4N, R4E	Hoodoo Gulch Placer	931	Patented	Gilt Edge, Inc.	Gilt Edge, Inc.	Waste Dump
Sec. 5 & 8 T4N, R4E	Montenegro	311	Patented	Commonwealth Group	Commonwealth Group	Pit, Haul Road
Sec. 5 & 8 T4N, R4E	Waggoner	649	Patented	3/8 Commonwealth Group Gilt Edge, Inc.	3/8 Commonwealth Group Gilt Edge, Inc.	Pit, Access Road, Waste Dump
Sec. 8 T4N, R4E	Waggoner Frac.	358	Patented	Commonwealth Group	Commonwealth Group	Waste Dump
Sec. 8 T4N, R4E	Crown Point	912	Patented	Gilt Edge, Inc.	Gilt Edge, Inc.	Waste Dump
Sec. 8 T4N, R4E	Norwich Frac.	358	Patented	Commonwealth Group	Commonwealth Group	Access Road
Sec. 8 T4N, R4E	Norwich	975	Patented	Commonwealth Group	Commonwealth Group	Access Road
Sec. 8 & 7 T4N, R4E	Del High	975	Patented	Commonwealth Group	Commonwealth Group	Access Road
Sec. 7 & 8 T4N, R4E	Binghamton	975	Patented	Commonwealth Group	Commonwealth Group	Access Road
Sec. 8 T4N, R4E	Sunday Frac.	358	Patented	Commonwealth Group	Commonwealth Group	Access Road
Sec. 5 & 6 T4N, R4E	Albert Frac. No. 1	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pads 6, 7, 8, Pit, Haul & Access Road
Sec. 5 & 6 T4N, R4E	Albert	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pad 7, Access Road, Monitor Wells, D.M. Pit

TABLE 1-1 (cont.)

Legal Description	Claim Name	Mineral Survey No.	Status	Mineral Ownership	Surface Ownership	Remarks
Sec. 5 & 6 T4N, R4E	Black Dan	327	Patented	Borsch Estate	Borsch Estate	Pad 7
Sec. 6 T4N, R4E	Nevada	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Neut. Pond, Preg. Pond, Pad 4 & 5, Access Road, S. Pit
Sec. 6 T4N, R4E	Summit	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Preg. Pond, Chlor. Pond, Pad 4 & 5, Haul Road
Sec. 6 T4N, R4E	Union Frac.	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pad 4, Haul Road
Sec. 5 & 8 T4N, R4E	Dakota Maid Frac.	1225	Patented	Commonwealth Group	Commonwealth Group	Preg. Pond
Sec. 5 T4N, R4E	Adrian Frac.	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	D.M. Pit
Sec. 5 & 8 T4N, R4E	Sunday	650	Patented	Commonwealth Group	Commonwealth Group	Pad 5, Pit, Haul Road
Sec. 5 & 8 T4N, R4E	Center Frac.	189	Patented	Commonwealth Group	Commonwealth Group	Pit, Access Road
Sec. 5 & 8 T4N, R4E	Rattlesnake Jack	188	Patented	Commonwealth Group	Commonwealth Group	Pit, Access Road, Pads, Preg. Pond
Sec. 5 T4N, R4E	Rattlesnake Frac.	352	Unpatented	Commonwealth Group	U.S. Government	Pad 5, D.M. Pit, Access Road, Preg. Pond

TABLE 1-1 (cont.)

Legal Description	Claim Name	Mineral Survey No.	Status	Mineral Ownership	Surface Ownership	Remarks
Sec. 5,8,6 T4N, R4E	Dakota Maid	1225	Patented	Commonwealth Group	Commonwealth Group	Pad 4, Pad 5, D.M. Pit, Access Road, Preg. Pond
Sec. 5,6,7,8 T4N, R4E	Jen 10	BLM Document No. 82-1780	Unpatented	Gilt Edge, Inc.	U.S. Government	Neut. Pond, Preg. Pond, Access Road
Sec. 5,6,7,8 T4N, R4E	Gilt Edge	328	Patented	Commonwealth Group	Commonwealth Group	D.M. Pit, Access Road, Neut. Pond, Chlor. Pond
Sec. 5 T4N, R4E	Erwin Frac.	1134	Patented	Northwest Metals Group	Northwest Metals Group	D.M. Pit, Access Road, Pad 8
Sec. 5 & 6 T4N, R4E	Golden Star Frac.	884	Patented	Commonwealth Group	Commonwealth Group	Pad 8
Sec. 5 & 6 T4N, R4E	Eureka	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pad 8, Haul Road, Pad 6
Sec. 5 & 6 T4N, R4E	Albert Frac.	1134	Patented	Northwestern Metal Group	Northwestern Metal Group	Pad 8, Haul Road, Pad 6, Pit

EXHIBIT 'A'

Gilt Edge Project
Affected Ground Claim List

Legal Description	Claim Name	Mineral Survey No.	Status
Sections 5 & 6 T4N, R4E	Little Giant	218	Patented
Sections 5 & 6 T4N, R4E	Old Pennsylvania	1632	Patented
Section 6 T4N, R4E	Anchor	138	Patented
Section 5 T4N, R4E	Bailey	1871	Patented
Section 5 T4N, R4E	Union Hall	1134	Patented
Section 5 T4N, R4E	Comet	1134	Patented
Section 5 T4N, R4E	South Ruby	1134	Patented
Section 5 T4N, R4E	May	1134	Patented
Section 5 T4N, R4E	May Frac.	1134	Patented
Section 5 T4N, R4E	Waggoner	649	Patented
Section 5 T4N, R4E	Hoodoo	1134	Patented
Sections 5 & 8 T4N, R4E	Oro Bella	648	Patented
Sections 5 & 8 T4N, R4E	Hoodoo Gulch Placer	931	Patented
Sections 5 & 8 T4N, R4E	Montenegro	311	Patented
Sections 5 & 8 T4N, R4E	Waggoner	649	Patented

EXHIBIT 'A'

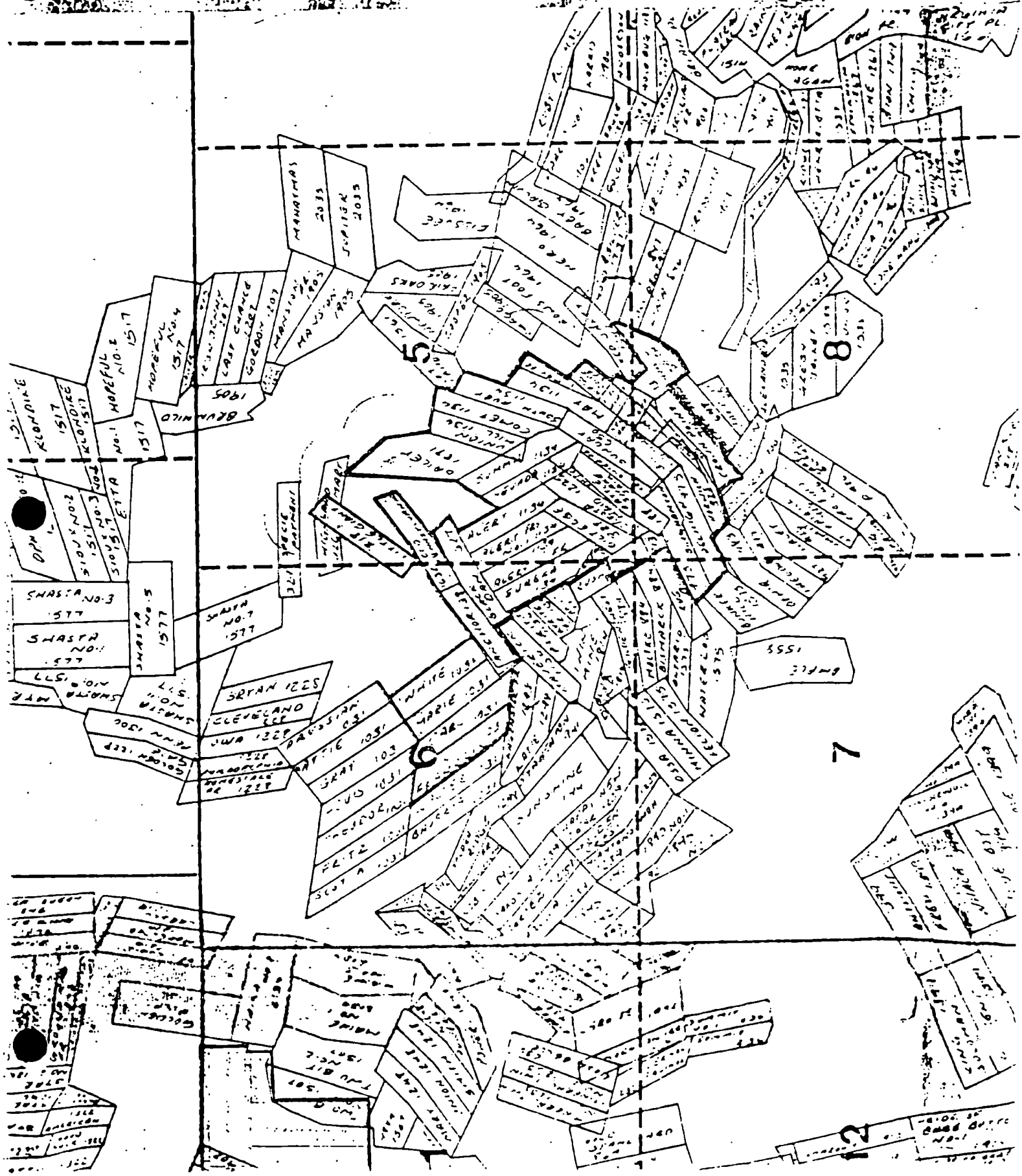
Gilt Edge Project
Affected Ground Claim List

Legal Description	Claim Name	Mineral Survey No.	Status
Section 8 T4N, R4E	Waggoner Frac.	358	Patented
Section 8 T4N, R4E	Crown Point	912	Patented
Section 8 T4N, R4E	Norwich Frac.	358	Patented
Section 8 T4N, R4E	Norwich	975	Patented
Sections 8 & 7 T4N, R4E	Del High	975	Patented
Sections 7 & 8 T4N, R4E	Binghamton	975	Patented
Section 8 T4N, R4E	Sunday Frac.	358	Patented
Sections 5 & 6 T4N, R4E	Albert Frac. No. 1	1134	Patented
Sections 5 & 6 T4N, R4E	Albert	1134	Patented
Sections 5 & 6 T4N, R4E	Black Dan	327	Patented
Section 5 T4N, R4E	Nevada	1134	Patented
Section 5 T4N, R4E	Summit	1134	Patented
Section 5 T4N, R4E	Union Frac.	1134	Patented
Sections 5 & 8 T4N, R4E	Dakota Maid Frac.	1225	Patented

EXHIBIT 'A'

Gilt Edge Project
Affected Ground Claim List

Legal Description	Claim Name	Mineral Survey No.	Status
Section 5 T4N, R4E	Adrian Frac.	1134	Patented
Sections 5 & 8 T4N, R4E	Sunday	650	Patented
Sections 5 & 8 T4N, R4E	Center Frac.	189	Patented
Sections 5 & 8 T4N, R4E	Rattlesnake Jack	188	Patented
Section 5 T4N, R4E	Rattlesnake Frac.	352	Unpatented
Sections 5, 8, 6 T4N, R4E	Dakota Maid	1225	Patented
Sections 5, 6, 7, 8 T4N, R4E	Jen 10	BLM Document No. 82-1780	Unpatented
Sections 5, 6, 7, 8 T4N, R4E	Gilt Edge	328	Patented
Section 5 T4N, R4E	Erwin Frac.	1134	Patented
Sections 5 & 6 T4N, R4E	Golden Star Frac.	884	Patented
Sections 5 & 6 T4N, R4E	Eureka	1134	Patented
Sections 5 & 6 T4N, R4E	Albert Frac.	1134	Patented
Section 6 T4N, R4E	White	1031	Patented
Section 6 T4N, R4E	Marie	1031	Patented
Section 6 T4N, R4E	Carl	1031	Patented
Section 6 T4N, R4E	Franklin	1031	Patented



MAHATMAS 2035
JUPITER 2035
HOPEFUL NO.2 1517
HOPEFUL NO.4 1517
LAST CHANCE
GORDON 1207
MANSION 1905
BRUNHILD 1905
KLONDIKE 1517
ETTA
SHASTA NO.3 1577
SHASTA NO.1 1577
SHASTA NO.5 1577
SHASTA NO.7 1577
SRYAN 1228
CLEVELAND
OWA 1228
PRUSSIAN
WHITE
MARIE
GRAY
SUNSHINE
ALERT
SUMMIT
COMET
MAY
5
6
7
8
12

EXHIBIT 'B' Gilt Edge, Inc.

Property Owners Within 500' Of Affected Ground Claim List

1.	Holbrook, Margie E. 224 Oakland Rapid City, South Dakota 57701	W. Pt. Highland Mary, M.S. 326
2.	Holbrook, David L. etux 23 East Gordon Avenue Palatine Illinois 60067	E. Pt. Highland Mary, M.S. 326
3.	Olson, Jerry etux 864 Cardinal Drive Sierra Vista, Arizona 85635	Specie Payment, M.S. 329 (C.D.)
4.	Deadbroke Mining Co. c/o Homestake Mining Co. Box 875 Lead, South Dakota 57754	Specie Payment, M.S. 329 (W.D.)
5.	Meyertons, Ralph Nederland, Colorado 80466	Black Hawk, M.S. 698 (C.D.)
6.	Cruz, Fuller, Froemel & Stankewicz c/o James Mc Allister etal 7801 South High Littleton, Colorado 80122	Black Hawk, M.S. 698 (Q.C. from W.D. holder)
7.	Eilers, Anna H. & Ruby Gold Mine c/o Louis Eilers 2426 West Avenue 32 Los Angeles, CA 90065	Lina, M.S. 846 Occidental, M.S. 847 Portland, M.S. 1561
8.	Stroschien, Dale A. etux 1215 Spruce Sturgis, South Dakota 57785	Pt. Binghampton, M.S. 975 (surface right)
9.	Gray, Joseph R. etux 405 Hillcrest Drive Hamilton, Montana 59840	Prussian & Hattie, M.S. 1031
10.	Rosypal, Wallace & Albina 3517 South Ridgeland Avenue Berwyn, Illinois 60402	Red Jacket, M.S. 1042
11.	Engels, Cecil T. etux 933 South Poplar Casper, Wyoming 82601	Hagensick Fraction, M.S. 1298

Mine Area Geology

The main Gilt Edge area is geologically characterized by late Tertiary sanidine rhyolite porphyry intrusives cutting and doming metamorphic and igneous rocks that range in age from Precambrian to Tertiary (Figure 1-2). The most highly mineralized rock within the main Gilt Edge area is the Tertiary trachyte porphyry. It is believed the mineral distribution within this unit is a function of fracturing that occurred during the emplacement of the sanidine rhyolite porphyry.

The Cambrian Deadwood Formation and Precambrian rocks in the mine area are also pervasively mineralized, however, not generally to the tenor of the trachyte. The lower tenor of mineralization in the Precambrian and Cambrian rocks is attributed to the lack of fracturing. The mineralization is believed to be post, or concurrent with, the emplacement of the sanidine rhyolite porphyry. Mineralization in the sanidine rhyolite porphyry occurs within narrow shear zones and structures. The unit is not pervasively mineralized and from a mining viewpoint can be considered waste.

Breccias associated with the various intrusive activities are frequently observed. These breccias range from quartz surrounded angular rock fragments to abundant pyrite with angular rock fragments in the matrix. All rock types found in the area occur as fragments within the breccia except the sanidine rhyolite porphyry indicating all brecciation is associated with the emplacement of the stocks.

MINE DEVELOPMENT

Siting Criteria

Throughout the entire period during which the development proposal was formulated, optional possibilities were evaluated by Gilt Edge, Inc. and their consultants. Technically feasible options available to the company were broken down into two categories: operational methodologies and geographic locations. This was accomplished utilizing the siting criteria presented in Table 1-3.

It should be noted that certain components such as the mine areas are fixed, and not subject to operational or geographic alternatives. However, the use of waste rock in constructing leach pads on engineered waste fill provides a sound siting option which was selected through the engineering process.

Open Pit Mines

Gilt Edge, Inc. proposes to mine and process up to 750,000 tons of gold-bearing material per year by open pit mining methods and conventional cyanide heap leaching extraction methods. The gold-bearing material will be developed from two pits; the Dakota Maid and Sunday.

A general site layout for the proposed project is shown on Plate 1-2. The proposed open pit gold mines are located south of Anchor Hill at elevations ranging from 5,300 to 5,650 feet.

SANIDINE RHYOLITE PORPHYRY

TRACHYTE PORPHYRY

HORNBLENDE MONZONITE PORPHYRY

APPROXIMATE CONTACT

HORNBLENDE DIORITE PORPHYRY

DEADWOOD FORMATION
- SANDSTONE & QUARTZITE

PRECAMBRIAN SCHIST

FAULT (SHOWING RELATIVE MOVEMENT)

FIGURE 1-2

GENERALIZED GEOLOGIC MAP OF GILT EDGE PROJECT AREA

TABLE 1-3

PRELIMINARY SITING CRITERIA,
GILT EDGE INC. MINING PROJECT

The following table outlines basic facilities siting criteria utilized to develop the proposed project alternative, as presented in this submittal.

Project Components and Development Criteria Listing

Components		Discussion	
A)	Mine areas	1)	Fixed: Dakota Maid (8 acres) and Sunday (17 acres) are primary ore bodies. Type of mining also fixed as surface mining.
B)	Haul roads	1)	Single (30') and double lane (60') alternatives. Road criteria include: property ownership and rights-of-way, average grade (10% or less), hauling-generated dust, new construction requirements, soils and substrate stability (landslides and sloughing), snow management considerations, erosion potential, hydrology and proximity to stream courses. Geographically, routes should connect components in fairly direct manner.
		2)	Conveyor system may be necessary for staging area (stockpiling, crushing).
C)	Mining waste disposal	1)	Options limited to side hill and valley fill (locational). Potential for filling one mine area after completing mining of priority area considered extremely limited.
		2)	Siting criteria include: property ownership, proximity to mine area, ground stability, hydrology, composition of waste, storage capacity required, visibility, reclamation potential.
		3)	Mine waste to be utilized in pad construction (leach pads built on engineered waste fill).
D)	Millsite locations	1)	Millsite development will be constrained by: land status, ownership, topography, proximity to mining areas, geotechnical considerations, proximity to water supply and stockpile locations, access (including winter) integration of processing facilities (centrality), elevation (pumping requirements).
		2)	Interference with heavy hauling equipment should also be considered in siting evaluation (traffic conflicts, hauling and mill operation).
E)	Process waste disposal	1)	Options are locational. They will also be dependent on type of process.
		2)	Type of process is one-time cyanide heap leaching. Waste disposal requirements will involve end-of-season disposal of treated solutions, potential emergency disposal of treated solutions, and ultimately inplace neutralization and reclamation of ore. Primary overall criteria for pad siting (treated ore) include: truck hauling distance from process facility, geotechnical constraints, distance to upstream drainage areas (hydrology), reclamation potential.
		3)	Primary criteria for land application site selection include land ownership, topography depth to groundwater, type of soil and vegetative cover, proximity to surface water, and other design considerations.
		4)	Other siting requirements or criteria for this component include land ownership and status, proximity to process facility, volume and area of impoundment required, mineral reserves (area should not contain commercial quantities of mineable ore), height of embankment at required volume, area of upstream catchment, additional road requirements, elevation change with respect to mill, distance from closest perennial stream, reclamation considerations, potential for future expansion.

Conventional drill-blast-loader-truck is the mining method to be used at the Gilt Edge project. At present, the mine areas for the Dakota Maid and Sunday pits involve approximately 8 and 17 acres, respectively. The mine areas are considered fixed, with open pit mining the selected mining method due to proximity of the deposit to the surface and mining economics.

Current plans call for mining up to 750,000 tons per year of ore and nearly one million tons of waste per year for at least seven years. Mining costs and mineral prices will ultimately determine production requirements for the project. Additional exploration may also affect the project life.

Very little, if any, ground preparation will be required prior to commencing mining at either pit. Ore grade mineralization occurs at the surface in both locales. Top soil is virtually non-existent therefore stripping and stockpiling of top soil will be a minor event. Due to the lack of trees and vegetation the clearing and grubbing of trees and vegetation will require very little time.

Logging and pre-production stripping will be conducted by Gilt Edge, Inc. or a local contractor. Trees will be cut and decked for sale, or made available to the public for fire wood. Stumps will be removed and burned with other slash at the site.

The mining sequence will be as follows:

- Drilling - Four to six inch in diameter blast holes will be drilled using air-track drills and compressors. Current mining plans call for 20 foot high benches (Figure 1-3). This will require drilling holes on 10 to 15 foot pattern to a depth of 22 feet. This allows for a two foot undercut for each bench. One or two drills will be required to satisfy the drilling needs.

- Blasting - Current plans call for ANFO (ammonia nitrate and fuel oil) explosives with a non-electric initiation system. Blasting will be carried out by experienced and qualified basters. The frequency of the blasting will depend upon the size of the work area, however, two to 3 times per week is anticipated. Blasting will occur at the end of shift and in accordance with MSHA approved safety standards. All explosives handling and storage will comply with state and federal standards.

- Loading and Hauling - The loading and hauling of the broken material will be carried out using rubber tired front-end loaders and off-road trucks. The loaders will have 7-10 cubic yard bucket capacity and the trucks will have a capacity for 35 to 50 tons. The material will be hauled to either a portable crusher unit located close to the active leach pad or a waste disposal site. It is anticipated that one or two loaders and four to six trucks will be required to move the broken rock from the pit.

To maintain a safe and clean working area within the pits and on the haul roads dozers and graders will be used. The ultimate pit limit design calls for an overall pit slope of 45 degrees in both pits (Figure 1-3). The pits will expand both vertically and horizontally over the life of the operation.

Mine Mitigation Program

Reclamation of the Dakota Maid and Sunday pits will occur on an interim basis as portions of the pit reach their design limits, and upon final abandonment of the mine. Year end activities will emphasize temporary stabilization and drainage control. Pit floors will have water collection sumps as necessary at the lowest elevations to collect ground water seepage and precipitation.

Adopted reclamation techniques including topsoil stockpiling where possible, regrading, and revegetation will be conducted according to the provisions of the Initial Reclamation Plan which is presented later in Chapter 2 of this document. The plan was developed to meet the requirements of Chapter 45-6B, Mined Land Reclamation, South Dakota Mined Reclamation Act.

Diversion ditches will be constructed to divert natural surface runoff around the Dakota Maid and Sunday pits as necessary back into natural water courses downstream from the mining area. Corrugated metal pipe culverts will also be installed where needed to carry water beneath roads and surface utilities. Along critical reaches of the diversion ditch system, the channel sides and bottom will be lined with suitable rip-rapping to maintain stable sides and prevent erosion. Sediment detention ponds may also be utilized below the main mine areas to collect and detain runoff and allow for sedimentation of eroded soils as necessary.

While the company does not anticipate that any significant groundwater seepage will be encountered during the mining operation, limited springs and seeps may be intercepted during the excavation of the mine. Within the pit, collection channels will be maintained as necessary to feed a mine sump with groundwater seepage and precipitation falling into the pit. The sump will be located in the lowest elevation of the pit floor, and will be equipped with a submersible pump. Water entering the sump will be transferred via the pump and stand pipe to water trucks for haul road dust control.

MINING AND RECLAMATION EQUIPMENT

Gilt Edge, Inc. will conduct the development and reclamation of the Dakota Maid and Sunday pits with its own personnel and equipment, or by contract mining, or by a combination of both. During the initial season sufficient ore will be exposed to begin production mining and processing.

A preliminary list of mining equipment is shown in Table 1-4. Number of units and usage factors are presently being developed as a priority element of the mine planning and scheduling elements.

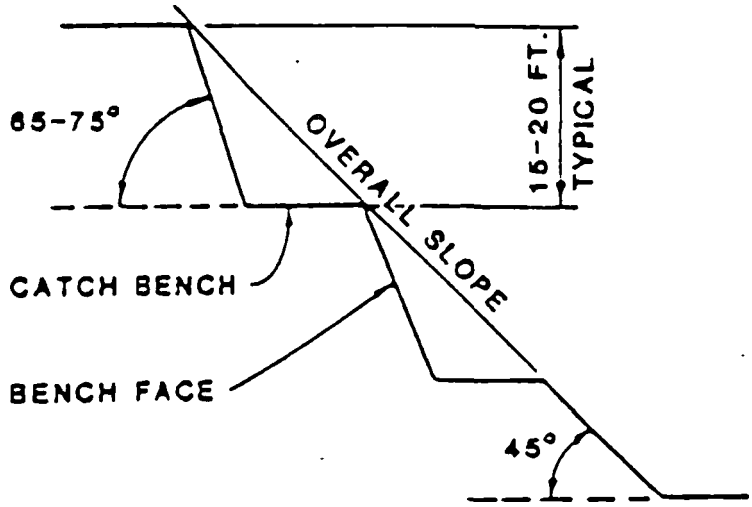


FIGURE 1-3
GENERAL PIT DESIGN CONFIGURATION FOR
GILT EDGE MINE AREA

TABLE 1-4

PRELIMINARY MINE EQUIPMENT LIST FOR GILT EDGE OPERATION*

Equipment	Capacity/Model	Comments
Front end loader(s)	7-10 cu. yd.	Diesel engine powered.
Off-highway truck(s)	35-50 tons	Diesel powered.
Blast hole drill(s)		Air-track and compressor.
Bulldozer(s)	D8 or similar, tracked mounted	
Road grader(s)/snow blower	Size Cat. #14 or similar	Road maintenance.
Water trucks	(3600 gallon)	Water spraying for dust control.
Service hauling trucks (maintenance)	5 ton w/hydraulic cranes	Transport and service
Pickup trucks	3/4 ton	Personnel transportation and operational support.
Portable light plants and tower		Illumination of working areas at night.
Portable crushing plant (Full scale crushing and conveying equipment described in text)	300 tons/hr	Includes production of aggregate for construction.
Backhoe and stemming machine		Ditching work.
Mobile welder		
Mobile crane		Mine and plant facilities construction, bridge work.
Diesel generator(s)		

*Similar or substitute equipment may be utilized based on standard industry requirements.

CRUSHER FACILITIES

Current plans call for a portable screening and crushing plant located as close to the pad being loaded as possible. The ore material will be dumped into a surge pile where it will be fed onto a vibrating 4-inch screen with the oversize dropping into a crusher. The ore will then be transported to the leach pads. It is anticipated that the crusher will operate at a maximum rate of about 300 tons per hour.

CRUSHER MITIGATION

The crusher will be equipped with adequate dust collection equipment at the feeder, crusher and conveyor transfer points. This may involve a dust collection system or wet scrubber facilities.

HAUL ROADS

Mine haul roads will not be utilized for public access and will be constructed for passage of off-highway haul trucks (35-50 ton), other heavy mine equipment, and mine service vehicles. Average grades of the haulage roads will not exceed 10 percent, and alignments will be engineered to provide for safe hauling. Inside shoulder drainage ditches with frequent culverts will also provide drainage control, as may be required. Typical haul road sections for the Sunday and Dakota Maid pits haul road are shown in Figure 1-4 for alternate 30 and 60-feet running surfaces.

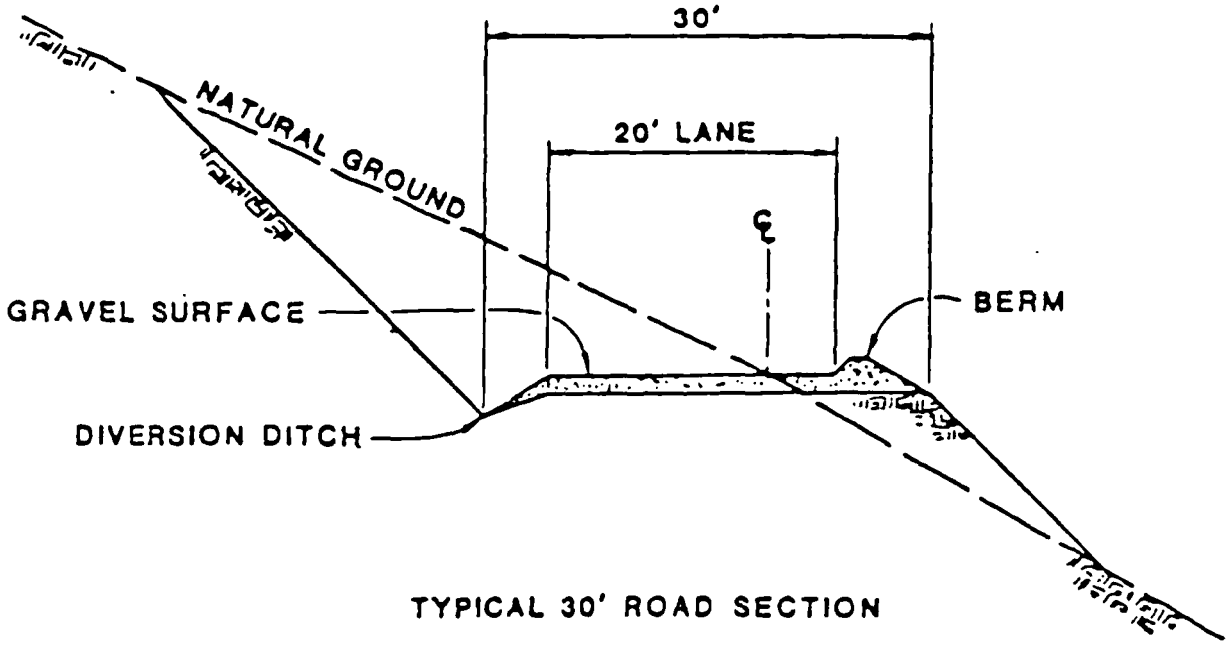
Some of the mine haul roads will, of necessity be, temporary in nature, serving the inner mine area for a limited period of the operation. The placement of these roads will change as the mine operation proceeds and additional mine planning is completed by Gilt Edge, Inc.

Haul Road Mitigation

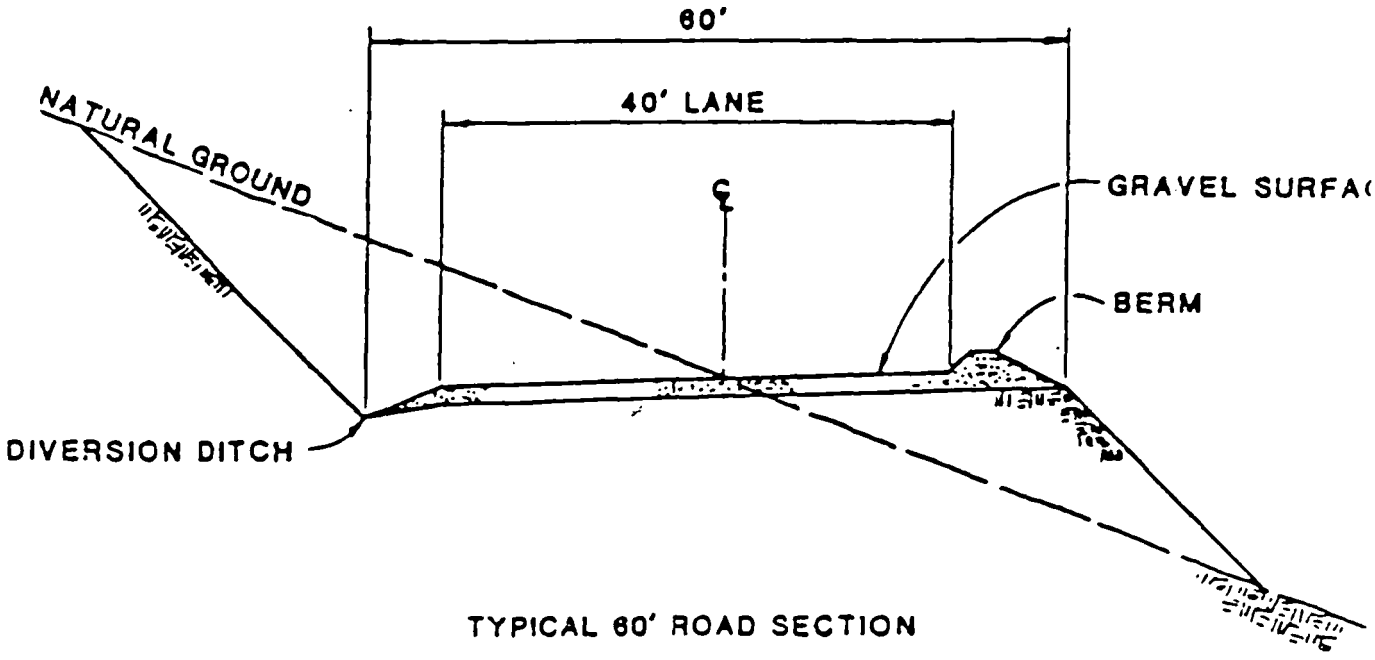
In order to minimize haulage equipment maintenance costs and assist in prevention of erosion, sections of the main haulage roads may be capped with durable rock. Roadside ditches will be sized to provide adequate hydraulic capacity for the accepted design storm. The cut banks and fill slopes of the haulage roads will be stabilized by seeding or other accepted reclamation procedures, as routine maintenance and construction activities allow.

Runoff from the haul roads will be diverted along the roads by berms and ditches to prevent uncontrolled erosion of road surfaces and sedimentation. Other techniques to control runoff and sedimentation involve selective seeding of road and cut fills as road construction and operations will allow.

Culverts will be installed as necessary in areas where embankment construction would otherwise disrupt existing drainage patterns. These installations would be according to accepted State of South Dakota requirements where stream courses are involved, and applicable Forest Service standards and regulations. At key



TYPICAL 30' ROAD SECTION



TYPICAL 60' ROAD SECTION

FIGURE 1-4
TYPICAL HAUL ROAD
SECTIONS FOR
30 AND 60-FEET ROADS

points where primary culverts discharge, silt barriers (rip-rap and hay bales) may be installed to collect silt and reduce water velocities.

Opportunities to spread flows over larger areas so that vegetation can effectively filter silt will also be evaluated during planning and construction of facilities. This would also include an active maintenance and debris control program to be conducted throughout the operating season.

Roads will also be maintained by graders, with dust control provided by water trucks. Collected mine drainage will be utilized in this program to the extent feasible to maximize water reuse and conservation.

ANCILLARY FACILITIES

Ancillary facilities will include the following:

- Offices - A prefabricated metal building will be established to accommodate supervisory, engineering and accounting personnel. A maintenance shop for mill and mining service may also be constructed at the site.

- Assay Laboratory - An assay laboratory will be erected to handle solution assays from the plant, as well as rock assays from the mine pit. The laboratory will include a sample preparation area and an analysis area. The analysis room will house an atomic absorption unit and/or fire assaying facilities.

- Wastewater Facilities - A septic tank-soil absorption unit will be installed at the plant. Wastewater facilities will also be installed at the truck maintenance shop (if constructed). The design and construction of the sewage systems will be coordinated through and permitted by the State Department of Water and Natural Resources.

- Water Supply - Fresh water will be required for drinking, fire protection and general utility uses. The average domestic use is estimated at 50-75 gpm. This supply will be met by construction of a well near the plant site. The potable supply will be treated to meet requirements of the Federal Safe Water Drinking Act and regulations promulgated by the State Department of Water and Natural Resources. If the supply is not acceptable for domestic purposes. bottled water will be provided. The well will also be developed for the purpose of providing the industrial process supply. Maximum water requirements for the heap leach process are estimated at about 115-130 gpm. Both supplies will be supported by adequate distribution and storage facilities.

- Fuel Storage - Fuel storage facilities adequate to satisfy the needs of the operation will be established at the site. The fuel storage will be located and designed consistent with all federal, state and local

regulations. This will include diking to contain any accidental spills, and preparation of a Spill Prevention and Control Countermeasure Plan, if required by EPA.

- Power Supply and Distribution - It is anticipated that ultimately electrical power will be supplied by the local utility utilizing already existing rights-of-way. However, initial power during the startup phase will probably be supplied by a 440 volt diesel generator and backup. Relative to other types of mining, the power supply for the proposed type of operation is minor. Electrical power will be required for such activities as air compressors, pumps, lights and electric heat. Automatic switching and startup will be provided to prevent power outages in the event of a generator malfunction. Short-term shutdown is anticipated for servicing.

- Explosive Magazine - An explosive magazine will be established consistent with the design specifications of Mine Safety and Health Administration (MSHA). The magazine will also be located in accordance with the current American Table of Distances for storage of explosives. The site will be an inactive area with natural topographic shielding if available. Explosives will be transported at times and over routes that will expose a minimum number of persons.

- Fencing - An eight foot high game fence will be erected around ponds and other areas where hazardous chemicals are located. Gates and warning signs will be posted at the entrances to the operation.

- Parking Area - A parking area adequate to supply the needs of the operation will be established. The parking area will be graveled, and a proper drainage system will be installed.

- Security and Public Safety - Security in the mine and mill areas will be the responsibility of Gilt Edge, Inc. This will include certain direct security measures supported by employees involved in day-to-day operations, and special provisions related to internal security in the refinery. The leaching facilities complex will be fenced to prevent the entrance of unauthorized personnel, as previously described. Other hazardous areas will also be signed and fenced, as appropriate.

- Solid Waste Management - In accordance with State of South Dakota regulations governing solid waste management, Gilt Edge, Inc. will prepare a solid waste management plan for the operation. This will probably involve construction of a small landfill site near the mill facilities, or contracting for waste disposal with a local hauler. Mitigation measures and reclamation activities related to solid waste management are described later in this section.

Mitigation for Ancillary Facilities

Excluding processed ore treatment, primary mitigation requirements for the mill and support facilities are expected to be related to fugitive dust emissions from road traffic, onsite drainage control needs, domestic wastewater treatment and disposal, solid waste management, and public safety and security needs. Dust emission controls were described earlier in this section, and involve sprinkler trucks for road dust and potentially wet scrubbers at the crusher. Domestic wastewater needs will be met by the installation of State-approved septic tank-soil absorption systems or an acceptable alternative at the plant site, with a separate holding tank facility installed for laboratory wastes. The company will either develop an approved landfill facility at the site to accommodate domestic solid waste generated during the life of the project, or contract for hauling of these wastes to a State-approved facility.

Demolition materials to be disposed of such as wood, non-salvageable building material, etc. will not be mixed with regular domestic wastes. Any potential hazardous material will be disposed of in a State-approved facility. Solid wastes disposed of onsite (if a facility is developed) will be covered and compacted with inert waste rock or subsoil to a minimum accepted uniform thickness on a regular schedule. Final grading and reclamation will also be applied after abandonment.

Fire protection will be provided from the barren pond (approximately 1.75 million gallons), groundwater wells and mobile equipment strategically located throughout the mill complex in accordance with standards of the National Fire Protection Association. A company fire-fighting organization will be established, equipped and trained in conjunction with the operation's spill contingency program. Other public safety and security mitigation measures were discussed earlier in this section.

PROCESSING (HEAP LEACHING) METHOD AND MATERIALS

Due to the limited amount of available relatively flat land at the Gilt Edge project site, there are few alternative locations for siting the processing and ancillary facilities. Additionally, the limited amount of flat area results in the need to optimize combined facilities, and minimize the total area disturbed to as great a degree possible.

Under the proposed project such major elements as the processing facilities leach pads, solution ponds, cyanide recovery facility, laboratory, power plant and crusher would be located either in relatively gentle sloping areas along ridge tops, or in areas made suitable for leach pads by using competent waste material. All of these areas are located immediately north of the Sunday and Dakota Maid pit areas and occur on patented claims (see Plate 1-3).

Basic siting criteria involved in selecting these sites include:

- Gentle Topography - The area is relatively flat and minimizes the amount of earth work or fill required, which in turn reduces facilities' costs.

- Hydrology and Drainage - The pad sites are located high in the selected subdrainages so as to reduce the volumes of runoff dealt with in maintaining an optimum water balance. No major streams are located near the pad sites.

- Proximity to the Mining Operations - The facilities are immediately adjacent to the mine areas, but would not interfere with mining activities. Condemnation drilling has also confirmed that the potential for additional mineralization under the mill sites is limited.

- Geotechnical Constraints - A preliminary geotechnical reconnaissance performed for the leach pad sites indicates the selected areas are structurally stable. Compaction, if necessary, will be conducted and monitored through the construction phase of the project. This valley-fill method of pad construction is common in mountainous areas. The method is currently being employed at the Landusky-Zortman operation in Montana and the Summitville operation in Colorado.

- Integration with the Processing Facilities - The ponds, gold recovery system, processed ore disposal sites and ancillary facilities are all integrated with the leach pads. This limits the total disturbed area, manpower requirements are reduced, and process control is enhanced.

- Water Supply and Access - The processing facilities would receive a reliable water supply from a well(s) at the processing site. Access to the processing area is direct and easy.

Construction of the leach pads for the Gilt Edge project would be combined with waste removal from the mine areas. This effectively reduces the total affected or disturbed area, and by constructing on the hilltops minimizes drainage control requirements.

The proposed processing method involves hauling ore to crushing facilities where the rock would be reduced to 4 inches or less and loaded onto an impervious pad. Crushed ore would then be chemically processed (cyanidation) to remove gold and silver. An option involving the processing of "run-of-mine" ore was also considered by Gilt Edge, Inc. Run-of-mine ore does not involve crushing the ore. However, based on the results of large column testing and the present inability to predict the nature of the ore deeper in the ore body, the need to process crushed ore (minus 4 inches) is anticipated.

The final heap configurations are expected to resemble truncated pyramids 50-60 feet high, ranging in volume from just over 100,000 to nearly 700,000 tons. The heaps would be built in a layered effect with leaching of the individual 12-15 foot high layers until all available metal values have been extracted. A second and third layer of ore is then piled on top of the first layer for additional leaching.

Heap construction will involve 1-1/2 to 2 feet of selected crushed and screened rock or ore placed on the pad surface to provide a "drainrock" effect. This layer will also protect the liner during operations. Perforated drain pipe (8-inch diameter) would also be placed on the pad liner surface to improve the drainage. The minus 4-inch crushed ore will be trucked onto the heap with precautions taken not to damage the liner and minimize compaction on the heap, and the ore is then pushed into place with a dozer. Preliminary stability investigations indicate that the heaps and prepared pads will be stable with adequate safety factors to a height of at least 60 feet. An adequate buffer will also be maintained between the edge of the heap and the two-foot high berm surrounding the leach heaps to insure that cyanide spray does not leave the pad area and cyanide mist drift is minimized.

Figure 1-5 provides a schematic diagram of the proposed chemical process. Ore is piled on impervious pads (less than 10^{-7} cm/sec penetration). As proposed, the piles are initially stacked approximately 12-15 feet high. The pile is saturated with fresh water. A weak solution of sodium hydroxide is then sprinkled on the pile, and the pH of the wetted pile is adjusted to approximately 11. A dilute alkaline sodium cyanide solution (0.025-0.05% sodium cyanide) is then sprinkled or irrigated over the ore. The solution passes through the pile, dissolving the gold and silver. The metal-laden solution is then captured in the pregnant solution ponds.

Following irrigation of the heaps, pregnant (gold-bearing) solution is pumped through the carbon columns where the gold and silver cyanide complex is adsorbed onto activated carbon. The stripped process solution is adjusted with fresh sodium cyanide and sodium hydroxide, and returned to the system for reuse. The liquid portion of the process is a closed circuit. No cyanide liquid waste is discharged to the environment. Makeup water (approximately 180 gallons per ton) is required to replace the amount absorbed by the rock and lost through evaporation. This amount would be the maximum makeup water required during the startup phase for each new heap.

The gold and silver-bearing carbon is further processed by stripping the metal cyanide complex from the carbon with hot caustic, then plating the gold and silver in the resultant solution onto steel wool (electrowinning). The plated steel wool is then melted in a small furnace to separate the steel from the gold and silver. The complete process will be carried out on site.

The leaching cycle is estimated at 30-60 days. Barren solutions are collected in the pond system after processing through the activated carbon columns to remove any gold and silver values. These barren solutions will be alkaline-chlorinated at the conclusion of the operating season and land applied to maximize storage capacities in the ponds for precipitation and snowmelt. Any solution that is disposed of would be: 1) super-chlorinated to insure cyanide destruction; 2) neutralized; and 3) land applied at a pre-selected area, with appropriate consideration given to local environmental constraints. Application rates for land disposal would be controlled to ensure that maximum infiltration occurs at the disposal site. No direct discharge to streams or other watercourses will occur.

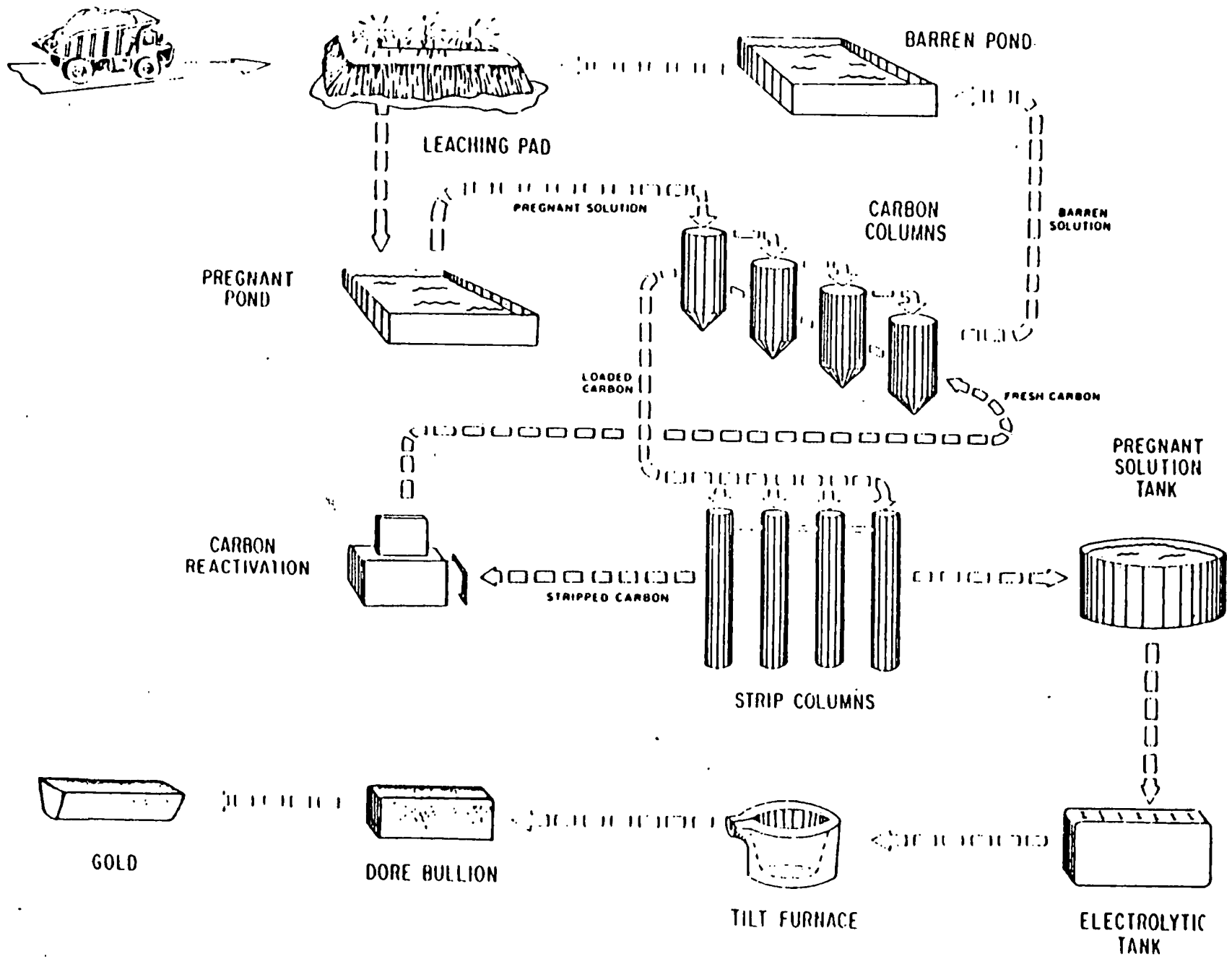
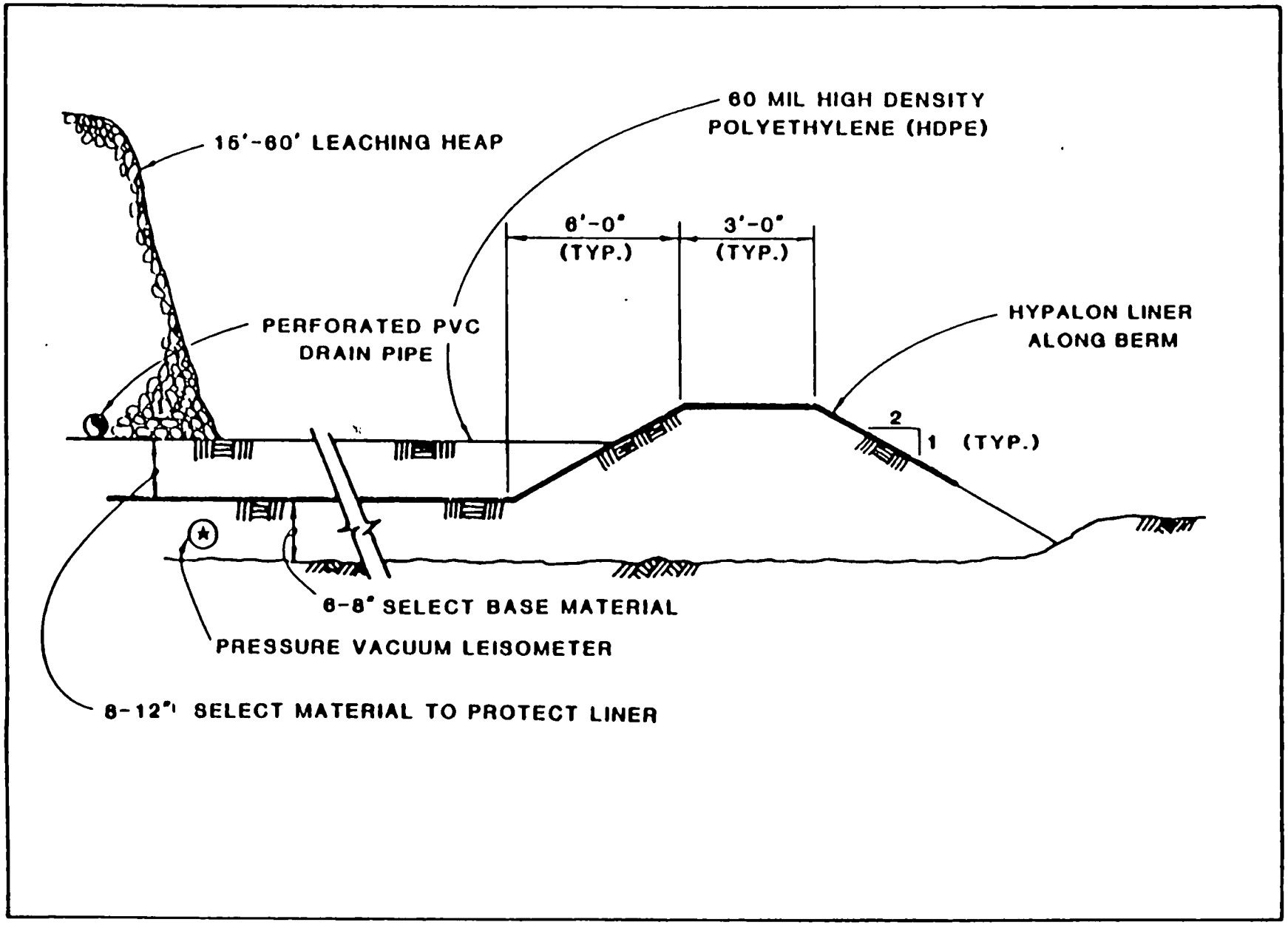


FIGURE 1-5
SCHEMATIC OF HEAP LEACHING PROCESS


60 MIL HIGH DENSITY
POLYETHYLENE (HDPE)
15'-60' LEACHING HEAP
6'-0"
(TYP.)
3'-0"
(TYP.)
PERFORATED PVC
DRAIN PIPE
HYPALON LINER
ALONG BERM
2
1 (TYP.)
6-8" SELECT BASE MATERIAL
PRESSURE VACUUM LEISOMETER
6-12" SELECT MATERIAL TO PROTECT LINER

FIGUR 1-6

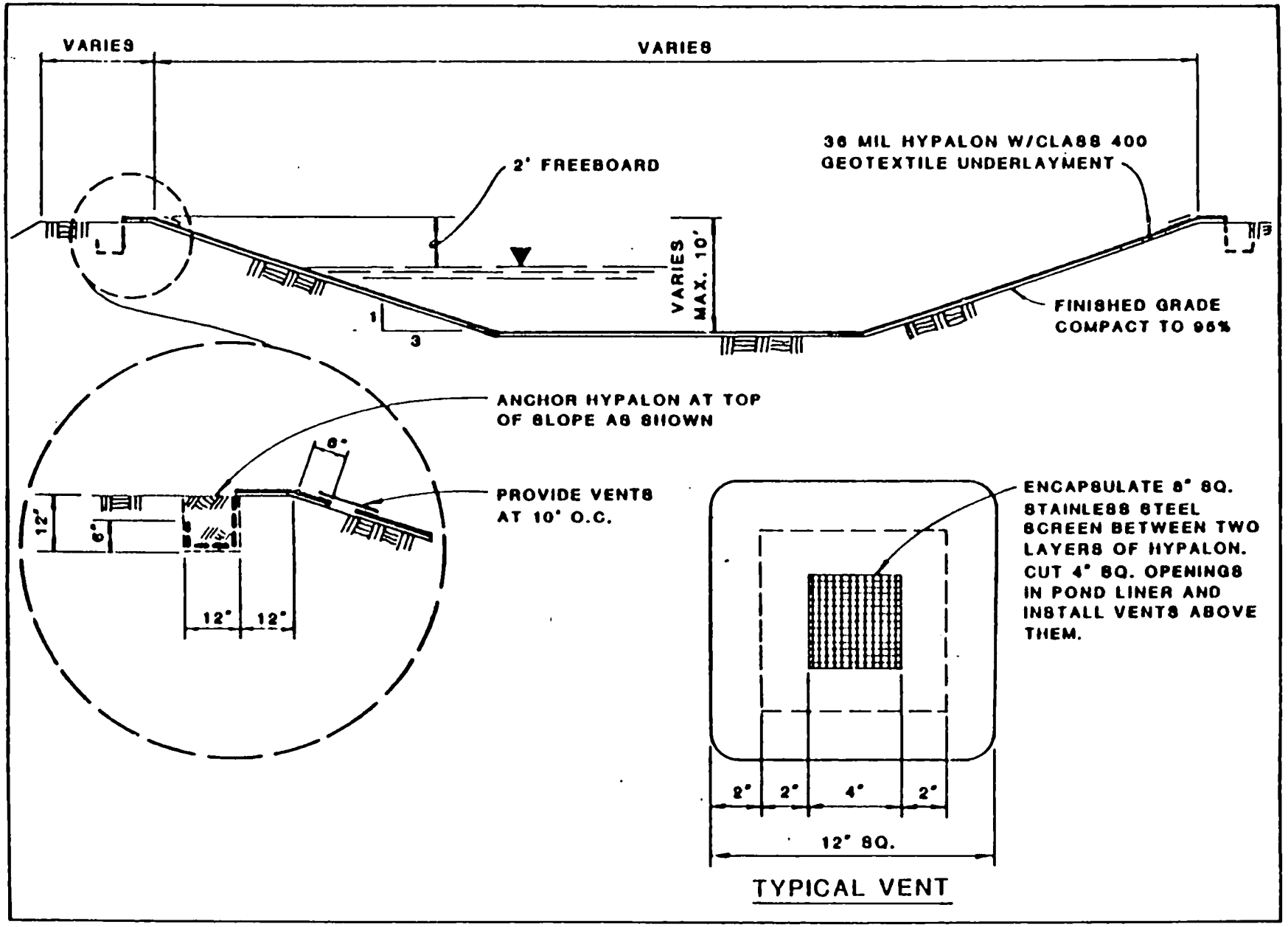


FIGURE 1-7

TYPICAL LINED PROCESS POND

NOT TO SCALE

TABLE 1-5

POND VOLUME STORAGE REQUIREMENTS FOR
6-HOUR MAXIMUM PROBABLE PRECIPITATION

Pad No.	Pad Area ft^2	Runoff ft	Volume ft^3
1	307,000	1.63	500,000
2	95,000	1.63	154,000
3	253,000	1.63	412,000
4	317,000	1.63	517,000
5	200,000	1.63	326,000
6	154,000	1.63	251,000
7	146,000	1.63	238,000
8	340,000	1.63	555,000
			2,953,000 ft^3
			22,089,000 gal

utilizing proven state-of-the-art siting criteria and application techniques. These criteria were developed by the U.S. Environmental Protection Agency (Technical Bulletin EPA 520/9-75-001). The application techniques and process has been utilized at the Stibnite mining project in central Idaho during the past four years. Other criteria include those set forth within "Guidelines for Land Treatment of Municipal and Industrial Wastewater, May 1983" and Guidelines for Land Application of Municipal Sewage Sludge, June 1979," both of which are published by the Idaho Department of Health and Welfare.

Evaluation of site suitability for land application of wastewater includes consideration of the geology, climate, sociology, economic and legal implications. The extent to which any one of these areas is investigated will be determined according to existing knowledge of the proposed sites. Following is a summary of the general criteria which will be used in evaluating land disposal sites.

- Composition and flow of wastewater.
- Pretreatment needed to protect public health and to prevent nuisances.
- Storage requirement during period of no application.
- Depth to groundwater.
- Topography.
- Climatic conditions.
- Types of soil present and how they will react to long-term application of the constituents in the wastewater.
- Means and rate of application.
- Amount of land required.
- Potential for surface water pollution and elevation of water table.
- Remoteness of area and potential for encroachment upon this area.
- Monitoring required to determine the effects on ground and surface waters.
- Operation and maintenance.

Also included as Appendix C is a checklist from a preliminary draft of Technical Bulletin EPA 520/9-75-001. This checklist outlines pertinent factors in the planning, design and operation of systems employing land application of municipal effluents.

LAND APPLICATION OF NEUTRALIZED CYANIDE SOLUTIONS

At the conclusion of each operating season solutions in the barren ponds will be alkaline-chlorinated utilizing chlorine gas or hypochlorite treatment. The basic chemical formula is:

$$NaCN + Cl_2 \longrightarrow CNCl + NaCl$$

dependent on pH

$$CNCl + 2NaOH \longrightarrow NaCNO + NaCl + H_2O$$

The use of chlorine for the treatment of cyanide-containing waste waters is the most highly developed of all available methods from the standpoint of background experience, operational simplicity, control techniques, availability of equipment, and engineering expertise. The advantages are summarized below:

- Very widely-used method, expertise is available.
- Influence to process already basic.
- Reactions complete and reasonably rapid.
- Toxic metals removed.
- Chlorine readily available in several different forms.
- Readily adaptable to either continuous or batch operation.
- Capital outlay relatively low.
- Good fail-safe control.
- Easily controlled to first stage of oxidation.

*From Cyanide for Mineral Processing, Utah Mining and Mineral Resources Research Institute. 1983.

Following treatment of the cyanide solution with chlorine or calcium hypochlorite until the free cyanide concentration is 0.2 mg/l or less, the neutralized liquid waste stream will be sprayed at designated land disposal sites utilizing a movable irrigation gun (Rainbird Model 105C or comparable). The application will be such that the infiltration rate does not exceed 0.6 inches/hour. Surface runoff from external sources will be diverted around the land treatment sites. This may also require the installation of interceptor drains or diversion terraces. No surface flow runoff would be allowed. Application would be followed by prespecified resting period (probably 4-7 days), based on the actual soil infiltration rates and runoff potential.

The wastewater effluent will be chemically analyzed for toxic elements prior to application. Elements to be analyzed for are listed in Table 1-6. Down gradient monitoring stations will be installed at the disposal to provide for long-term sampling and testing of the shallow (less then 50 feet) groundwater system (if present). Periodic sampling will include cyanide (free, WAD and total) and chlorides. Based on the results of the toxic element analysis, additional heavy metals may also be monitored.

TABLE 1-6

MAXIMUM PERMITTED LEVELS OF POTENTIALLY TOXIC ELEMENTS APPEARING IN WASTES AND WASTEWATER (after Garrigan, 1976)

Elements	Max. Level in Drinking Water (mg/l)[a]	Max. Level for Continuous Use Irrigation Water All Soils (mg/l)[b]
As Arsenic	0.05	0.01
Cd Cadmium	0.01	0.01
Cr Chromium	0.05	0.10
Co Cobalt		0.05
Cu Copper		0.20
Hg Mercury	0.002	
Mn Manganese		0.020
Ni Nickel		0.20
Pb Lead	0.05	5.0
Se Selenium		0.02
Ag Silver	0.05	
Zn Zinc		2.0

[a]Train, 1975.

[b]EPA, 1975.

EP TOXICITY AND LEACHATE CONSIDERATIONS

In the treatment of ore by both chlorination and cyanidation, several constituents of the ore other than gold will be dissolved. In order to evaluate the long term leachate potential associated with treated effluent solution disposal, and runoff from reclaimed ore piles, ore samples were leached and water extracted from the samples and analyzed for arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver, according to the standard extraction process called the toxic extract procedure (EP). The results of the 1983 testing program, which was performed according to U.S. Environmental Protection Agency and South Dakota Department of Water and Natural Resources procedures to assess the hazardous nature of waste materials is summarized in Table 1-7.

As shown in Table 1-7, the materials tested were not toxic. This is based on the "Maximum Concentration of Contaminants for Characteristic of EP Toxicity," which defines the material as toxic if the effluent is 100 times the Federal Drinking Water Standard. The concentrations in the leachate was far below toxic levels, and in most cases below the minimum detectable level.

TABLE 1-7

EP TOXICITY TESTING,
GILT EDGE MINING PROJECT

Parameter	Units	Maximum Concentration	No. 1 Composite	No. 2 Composite
Arsenic	mg/l	5	0.006	0.020
Barium	mg/l	100	0.24	0.22
Cadmium	mg/l	1.0	<0.001	<0.001
Chromium	mg/l	5.0	<0.001	<0.001
Lead	mg/l	5.0	<0.01	<0.01
Mercury	mg/l	0.2	0.0004	0.0002
Selenium	mg/l	1.0	<0.001	<0.001
Silver	mg/l	5.0	<0.001	<0.001
Free Cyanide	mg/l	20.0	0.02	0.01
Total Cyanide	mg/l	—	0.74	2.20

Source: D'Appolonia Consulting Engineers, 1983.

Additional testing performed on samples of ore for ignitability, corrosivity and reactivity showed ore material representative of the Gilt Edge site will not generate acid conditions, and that current saturated pH values are neutral to slightly alkaline. Therefore, the materials should not be considered corrosive. Appendix D contains the ore leachate testing results, as performed by D'Appolonia Consulting Engineers.

SPILL CONTINGENCY PLANNING, MITIGATION AND MONITORING

Spill Contingency Planning

Gilt Edge, Inc. has developed basic guidelines and management constraints for the project related to hazardous materials use and management. The primary objectives of the program are to:

1. Reduce the potential for accidental spills and environmental contamination through a well-defined materials management program;

2. Provide the operating facility with the necessary information to properly respond to a hazardous material or oil spill event;

3. Clearly define line of function responsibilities for a spill situation; and

4. Provide a response and clean-up program which minimizes environmental impacts.

A Hazardous Materials Spill Contingency Plan is included as Appendix E of this document. As noted in the plan the goal is to eliminate or reduce the potential for hazardous materials spill situations, and to minimize chemical use and the amount of waste generated at the site.

Operational Monitoring

Chapter 4 of this document identifies a baseline water quality monitoring program which was implemented in 1984 by Gilt Edge, Inc. to:

- Provide data necessary to determine the impact of future mining activities on local water quality conditions in the study area, particularly as related to those parameters most likely to be affected by a full-scale operation.

- Ensure that adequate monitoring is conducted to measure construction and operational impacts related to priority resource considerations.

- Identify and prioritize ongoing water quality monitoring needs including scheduling considerations as they relate to a continued environmental evaluation of the project.

- Provide the level of information necessary to make adjustments in the plan to achieve desired environmental effects.

In addition, the project will also include an operational monitoring element. This element includes the following components:

- Surface water quality monitoring sites.
- Groundwater monitoring sites (peripheral wells, lysimeter system at pads, domestic water supply).

Methods and Sampling Schedule for Operational Monitoring

The configuration operational monitoring network, which will include primarily surface and groundwater monitoring stations, will be dependent on the final facilities layout and design of the leach pads and plant site. For that reason, the monitoring program and sampling schedule presented in the discussion which follows is conceptual. Upon approval of the Application for Mining/Milling Permit and Mining/Milling Operating and Reclamation Plan, a final Operational Monitoring Plan will be completed and a formal "operating memorandum" submitted to the DW&NR for review and concurrence. The plan will include:

- Surface Water Quality Monitoring - Primary emphasis is expected to be placed on Strawberry Creek and Bear Butte Creek, as all facilities (as currently planned) ultimately drain to these watercourses. These drainages have already been sampled as a priority element of the 1984 baseline environmental studies. Downstream from the leach pads and mine areas, stations will be established, and the following parameters will be measured on a seasonal basis to detect water quality changes associated with high, mean, and low-flow conditions:

Temperature	Total Dissolved Solids
Electrical Conductivity	Turbidity (FTU)
Total Kjeldahl Nitrogen	pH (units)
Ammonia (N)	Cyanide (total*, free, WAD*)
Nitrate (N)	Arsenic
Total Phosphorus	Iron
Sulfate	Mercury
Temperature	Magnesium
Hardness (as $CaCO_3$)	Sodium
Total Suspended Solids	Antimony

*Selected analyses.

All chemical samples will be preserved and analyzed by standard EPA-approved methods as presented in the Standard Methods for the Examination of Water and Wastewater, 15th Edition, except as otherwise indicated. The analyses will be conducted by Travis Laboratories in Rapid City, or an EPA-approved facility.

In addition, during the initial full-term operating season, the following priority parameters will be sampled by the company on a monthly schedule during operation and water shutdown.

- Temperature
- Turbidity
- Total suspended solids
- Total dissolved solids
- Electrical conductivity
- pH
- Iron
- Arsenic
- Lead
- Cyanide (total, free, WAD)

Flow measuring devices (probably weirs) will also be installed at key "design points" potentially affected by the operation. The company will maintain flow records during the operating season to correlate with the water quality monitoring program, and to assist in determining long-term seasonal flow trends.

- Groundwater Quality Monitoring - An evaluation of the groundwater systems in the project area by W.J. Bangsund indicates that only a limited potential for perched groundwater above the Tertiary sills and the basal Deadwood quartzite exists. Existing records indicate wells in the area have been developed at depths ranging from 57 to 1061 feet, but most consistently between 100 and 180 feet in the Deadwood Formation.

  During the 1985 season, the company will be initiating a groundwater development program in the vicinity of the plant site and primary leach pad locations. The objective will be to explore, test and develop adequate groundwater supplies to support the planned facilities. This will include determining depth to groundwater, quality and lithology of strata beneath the site.

  Regarding operational groundwater monitoring, the company currently plans to develop a two-phased program of operational monitoring. This will involve a grid network of monitoring wells located down-gradient from the processing facilities (plant site. processing pads and ponds) to intercept and detect any seepage from the ore processing operation. The network will be designed to monitor both small and deep groundwater. The final monitoring program will be submitted to the DW&NR for review and approval prior to startup.

The initial sampling parameters are expected to include:

Cyanide (free, total, WAD)	Calcium
Aluminum	Magnesium
Arsenic	Sodium
Antimony	Iron
Hardness	Mercury
pH	

Depth
Direction of flow
Rate of flow

These parameters will be modified and reduced to key elements after the initial operating season. Frequency will be determined, once the operating schedule is finalized by the company. The plant well and the other utility wells will be monitored for the USEPA Drinking Water parameters in spring and early fall (May and October) of each operating season.

In addition, pressure/vacuum lysimeters will be installed at the pad sites beneath the membrane liners (2 to 8 feet) as primary leak detection device (between the liner and the prepared subbase). Units will also be installed under the pregnant ponds. This will provide for analysis of available soil moisture drawn by vacuum through the porous material into the lysimeter chamber and then collected from the access tubes. Monitoring will involve both baseline (pre-operations) and operational testing. This will be coordinated with the construction contractor.

Other Operating Testing (Environmental Related)

1) Precipitation and Temperature Records - The company will keep daily rainfall/precipitation and temperature data.

2) Pond Testing - The company will inspect all ponds prior to commencing ore processing. In addition, a combined groundwater-lysimeter monitoring network will be installed and operated by Gilt Edge, Inc. The washed water will be analyzed parameter and the results submitted to the DW&NR prior to disposal. The testing program is described in detail earlier in this chapter.

3) Treated Leach Solution Disposal - The accepted 24 hour CN^- monitoring (described earlier) requiring a solution concentration of less than 0.2 mg/l for disposal will be utilized. The pH of the treated solution will not exceed 10 units only when it is to be sprayed upon natural vegetation.

Environmental Data Reporting

An end-of-season Monitoring Report will be provided to the DW&NR and by the beginning of February of the following year. All data collected for environ-

mentally related parameters will be made available on request to the department's designated representative as it becomes available. Environmental data collected by plant personnel will be maintained in a bound notebook at the site. A more detailed discussion on reporting and compliance commitments is included in the section which follows.

INFORMATION REPORTING AND OTHER REGULATORY COMPLIANCES AND COMMITMENTS

In order to provide the DW&NR with a timely and accurate record of environmental monitoring and other pertinent non-proprietary data and information, and to improve necessary communication between Gilt Edge, Inc. and the Department, the following procedures will be implemented to facilitate a workable information transfer. The elements of this procedure would be agreed upon prior to startup by both the DW&NR and Gilt Edge, Inc. in order for the system to work effectively. Once the procedures are reviewed and accepted by both parties, the following conditions would be implemented unless modified in writing and approved by both participants.

1) The DW&NR will have access to all environmental monitoring data collected by Gilt Edge, Inc.

2) Environmental monitoring data will include:

   a) All information described in the approved 1985 Monitoring Plan.

   b) Information collected by plant personnel including and limited to:

      i) Cyanide analysis of plant monitoring wells.

      ii) Monitoring data from the pad/pond lysimeter system.

      iii) Results of the solution neutralization tests conducted prior to land application.

3) All plant environmental data will be recorded in a neat, understandable, and consistent manner in a bound data book maintained by trained staff.

4) The DW&NR will (on request) be provided photocopies of the data book entries at the end of the operating season. The company will also supply the Department copies of raw laboratory data twice during the operating season (startup and mid-season). Any unusual or potentially harmful occurrences will be reported to DW&NR immediately.

5) All requests for change in established operating procedures described in this section will be directed in writing to both the DW&NR and the

Gilt Edge, Inc. Project Manager. All requests will be acknowledged in writing within 7 days.

SNOW MANAGEMENT/WINTERIZATION

Snow Management

Removal and management of snow on the main access routes and portions of the project area may be required to insure safe access to the site, and to maximize the length of the construction and operating season. Light to moderately heavy snow, however, is not expected to create any major obstruction or problem for mining at the project site during the operating season (March 15 to November 15).

Snowfall data from the surrounding area and at the Gilt Edge project site indicates an average annual snowfall of 97 inches, mainly occurring in December, January and February. During the 1985 construction season, and ongoing operational period, Gilt Edge, Inc. plans to clear snow on the main access routes (Galena/Bear Butte Creek Road or Strawberry Ridge/U.S. Highway 385) and portions of the primary inner-project service roads utilizing a grader and/or snow plow. A sand truck will also be utilized to minimize icing conditions over the primary access route(s).

Project mobilization and clearing would occur prior to major spring runoff. Snow would be moved to the downhill side of the roadways. A thin snow and ice surface would be maintained on these surfaces where possible, to minimize disturbance of the surface beneath. Excessive snow from active work areas would be removed by front end loader and trucks, and hauled to predesignated snow disposal areas (adjacent to natural drainage where practical) to facilitate melting and natural runoff.

As presently envisioned, an active snow management program would also be developed, once the mine sites and related facilities have been constructed and operation commences. This program is expected to be an integral part of an ongoing water management program, and may include such activities as placement of snow fencing and other techniques. Actual facilities design would also take into account snow conditions. The priority areas for snow removal and management and general snow management techniques are expected to include, on a continuing basis:

- Roads - Snow blowing or grading and plowing, and special construction techniques and drainage improvements. Accumulated snow will be allowed to stand off the downhill shoulder of the road during winter. Spring runoff will be diverted off the roadway and into the road culvert and drainage system.

- Plant Site - Grading, hauling, dozing and/or snowblowing with selective placement of snow accumulations to facilitate meltoff. Spring runoff will be directed by dispersion facilities into undisturbed vegetated areas.

- Mine Sites - Front end loading and hauling with selective placement of snow accumulations. Snow disposal areas will be designed adjacent to natural drainages where practical.

As these facilities are developed, more specific snow removal techniques will be evaluated and implemented by Gilt Edge, Inc. in conjunction with the actual needs of the mining activities.

Winterization

Plant Facilities. Current plans call for a seasonal operation with the operation on a standby, or maintenance, basis from mid-November to mid-March. During this time it is possible the plant may operate intermittently for the purpose of managing solutions developing in the pregnant basins. It is anticipated that during the winter preventive maintenance will be the major activity regarding the plant facilities.

Crusher Facility. The crusher will probably be removed each season upon completion of mining activities. Interim reclamation activities will also be implemented, as practical, at the end of the season.

Maintenance Facility and Equipment. It is currently anticipated that the contract miner will move all trucks and earth moving equipment from the site when mining and hauling is completed. However, professional and maintenance staff will remain onsite throughout the winter.

Chemicals

All chemicals will be stored onsite in a designated facility. Security will be provided by Gilt Edge, Inc. Chemical inventories will be kept to an absolute minimum.

Shutdown Monitoring

Winter monitoring will be limited to the plant site wells and leach pad wells sampled for cyanide and pH utilizing the accepted analytic procedures. This will also include visual inspection of the ponds and pads. If any tests indicate unusually high cyanide readings, the site will be resampled and the analysis conducted by a certified laboratory utilizing the methods recommended in Standard Methods for Water and Waste Water Analysis, and the approved Monitoring Plan. The following sites will be monitored:

Sampling Sites

Pad drain systems (lysimeter network)
Pad subdrain systems (lysimeter network)
Wells at the plant site
Strawberry Creek at Station 2 (see Initial Monitoring Plan, Appendix F)

During the final detailed sampling session in late October or early November, soil samples will be taken in and around the pad areas and extracted with acid to determine effects of any potential aerosol drift or overspray situation. A final set of leached ore tests will also be conducted to determine the cyanide attentuation characteristic under cold weather conditions.

Snow removal by snowblower and other equipment may be conducted at the plant site and pad locations, if necessary, to insure access to the monitoring locations. Special attention will be directed to maintaining access to the pad drain and subdrain systems. This will include high lath staking of the monitoring wells, to provide access to locations under heavy snow conditions. The monitoring wells will also be retrofitted with locks to reduce the potential for contamination.

End-of-Season Drainage Control

The general discussion and strategies for drainage control presented throughout this document are also applicable for winter shutdown with several additions. End of season drainage control measures are one of the primary means of providing for proper runoff control during the spring melt, and therefore a key to spring start up schedules.

Mine Area and Roads. The need for construction of several small sediment settling ponds or detention basins at the pit sites will be reviewed. The need and placement of straw bales and other temporary drainage and sediment control structures will also be identified in the field by the company in cooperation with the DW&NR representative.

Crusher Area. The crusher area will be maintained in a manner similar to that described for the mine areas.

Plant Area. Drainage in the plant area is permanently controlled in order that all surface runoff is collected in one of the solution ponds and/or collected in cut-off and re-routed around the site back into the natural drainage courses. As presently envisioned limited snow removal services will occur around the plant and service building(s), if necessary, which will further reduce the necessity for spring drainage control and any potential for pond overflow.

2

CONDITIONAL USE PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

No. 127
(So as to amend CUP #84)

This Conditional Use Permit Granted this day to Brohm Mining Corporation upon recommendation of the Lawrence County Planning Commission and the Lawrence County Board of Commissioners; and upon the results of the required public hearing.

Said Conditional Use Permit is intended to be used only for the specific use so designated herein. Any other use of this Conditional Use Permit is in violation of the Lawrence County Zoning Ordinance and the violator is subject to the penalties set forth in said Ordinance.

Location of Property (address) Gilt Edge Mine/approximately 4 miles southeast of Deadwood/ at the headwaters of Strawberry Creek

Legal Description:

Subdivision _____ Block _____ Lot _____

Portions of Sections 5, 6, 7 and 8 Township T4N Range R4E

Mineral Survey No. See attached Exhibit A and Exhibit A-2

Present Zoning District PF-Park Forest District

Conditional Use For mining, processing and related activities subject to the following conditions: (See attached Exhibit B)

Signature of Property Owner _____

Signature of Administrative Official _____

Date Granted February 10, 1988

EXHIBIT A
COUNTY C.U.P.
AFFECTED LAND CLAIM LIST

LEGAL DESCRIPTION TSHP	RANGE	SECT.	CLAIM NAME	PATENTED M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	REMARKS
4N	4E	5:NW4 6:N2	* Old Pennsylvania	1632	Borsch/Fahrni	Borsch/Fahrni	Leased	1
4N	4E	6:SE4	* Anchor (partial)	138	Commonwealth	Commonwealth	Leased	2
4N	4E	5:N2 6:SE4	* Black Dan	327	Borsch/Fahrni	Borsch/Fahrni	Leased	1
4N	4E	5:N2	* Bailey (partial)	1871	Brohm	Willis Aye	Owned/Leased	4,3
4N	4E	6:SE4	Maverick (partial)	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	6:SE4	Pyrite (partial)	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	6:SE4	Pyrite Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	6:SE4	Argo Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	6:SE4	Lucky Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4 6:SE4	* Golden Star Fraction	884	Commonwealth	Commonwealth	Leased	2
4N	4E	5:SW4 6:SE4 7:NE4 8:NW4	Rush	884	Commonwealth	Commonwealth	Leased	2
4N	4E	5:SW4 6:SE4	* Eureka	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4 6:SE4	* Alert Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4 6:SE4	* Alert Fraction No. 1	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4 6:SE4	* Alert	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* Nevada	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* Summit	1134	Northwestern Metal	Northwestern Metal	Leased	5

COUNTY C.U.P.
AFFECTED LAND CLAIM LIST
(cont.)

LEGAL DESCRIPTION TSHP	RANGE	SECT.	CLAIM NAME	PATENTED M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	REMARKS
4N	4E	5:SW4	* Union Hill	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* Comet	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* South Ruby	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:All	Portland	1561	Louis Eilers	Louis Eilers	Leased	6
4N	4E	5:E2	New York	1905	Ruth Hankins Trust	Ruth Hankins Trust	Leased	7
4N	4E	5:E2	Fair Oaks (partial)	1905	Ruth Hankins Trust	Ruth Hankins Trust	Leased	7
4N	4E	5:All	Cooper	1905	Ruth Hankins Trust	Ruth Hankins Trust	Leased	7
4N	4E	5:SE4	Chicago	1905	Ruth Hankins Trust	Ruth Hankins Trust	Leased	7
4N	4E	5:SW4	* May	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* May Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* Union Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* Hoodo	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4 8:NW4	* Oro Bella	648	Commonwealth (3/8) Brohn (5/8)	Commonwealth (3/8) Brohn (5/8)	Leased Owned	2 8
4N	4E	5:SW4 6:SE4	* Gilt Edge	328	Commonwealth	Commonwealth	Leased	2
4N	4E	5:SW4	* Dakota Maid	1225	Commonwealth	Commonwealth	Leased	2
4N	4E	5:SW4 8:NW4	* Dakota Maid Fraction	1225	Commonwealth	Commonwealth	Leased	2
4N	4E	5:SW4 8:NW4	* Rattlesnake Jack	188	Commonwealth	Commonwealth	Leased	2
4N	4E	5:SW4 8:NW4	* Center Fraction	189	Commonwealth	Commonwealth	Leased	2
4N	4E	5:SW4 8:NW4	* Sunday	650	Commonwealth	Commonwealth	Leased	2
4N	4E	8:NW4	* Sunday Fraction	STA	Commonwealth	Commonwealth	Leased	2,12

COUNTY C.U.P.
AFFECTED LAND CLAIM LIST
(cont.)

LEGAL DESCRIPTION TSHP	RANGE	SECT.	CLAIM NAME	PATENTED M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	REMARKS
4N	4E	5:SW4 8:NW4	* Montenegro	311	Commonwealth	Commonwealth	Leased	2
4N	4E	6:SE4 7:NE4	Golden West	884	Commonwealth	Commonwealth	Leased	2
4N	4E	6:SE4 7:NE4	Moltke	884	Commonwealth	Commonwealth	Leased	2
4N	4E	6:SE4 7:NE4	Bismarck	884	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4	Ontario	975	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4 8:NW4 5:SW4	True Blue (partial)	975	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4 8:NW4	* Binghamton	975	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4 8:NW4	* Delhigh	975	Commonwealth	Commonwealth	Leased	2
4N	4E	8:NW4	* Norwich	975	Commonwealth	Commonwealth	Leased	2
4N	4E	8:NW4	* Crown Point	912	Brohn (1/4) Gary Froemel (3/4)	Brohn (1/4) Gary Froemel (3/4)	Owned Leased	8 9
4N	4E	8:NW4	Blackhawk (partial)	698	Gary Froemel	Gary Froemel	Leased	9
4N	4E	5:S2 8:N2	* Hoodoo Gulch Placer (partial)	931	Brohn	Brohn	Owned	8
4N	4E	5:S2 8:N2	Red Jacket No. 3	1042	Brohn	Brohn	Owned	10
4N	4E	5:SE4 8:NE4	Lina (partial)	846	Louis Eilers	Louis Eilers	Leased	6
4N	4E	5:SE4 8:NE4	Occidental (partial)	847	Louis Eilers	Louis Eilers	Leased	6
4N	4E	5:SE4	Crows Foot	1964	Borsch/Fahrni	Borsch/Fahrni	Leased	11

COUNTY C.B.P.
AFFECTED LAND CLAIM LIST
(cont.)

LEGAL DESCRIPTION TSHP-RANGE-SECT.			CLAIM NAME	PATENTED U.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	REMARKS
4N	4E	5:SE4	Nero	1964	Borsch/Fahrni	Borsch/Fahrni	Leased	11
4N	4E	5:E2	Fissure (partial)	1964	Borsch/Fahrni	Borsch/Fahrni	Leased	11
4N	4E	5:SE4	Cedar Hill	1964	Borsch/Fahrni	Borsch/Fahrni	Leased	11
4N	4E	5:SW4	* Erwin Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	5:SW4	* Adrian Fraction	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	8:NW4	* Norwich Fraction	STA	Commonwealth	Commonwealth	Leased	2,12
4N	4E	8:NW4	Norwich Fraction No. 1	STA	Commonwealth	Brohn	Leased/Owned	2,12,13
4N	4E	5:SW4 8:NW4	* Waggoner	649	Commonwealth (3/8) Brohn (5/8)	Commonwealth (3/8) Brohn (5/8)	Leased Owned	2 8
4N	4E	8:NW4	* Waggoner Fraction	STA	Commonwealth	Commonwealth	Leased	2,12
4N	4E	8:NW4	Waggoner Fraction No. 1	STA	Commonwealth	Brohn	Leased/Owned	2,12,14
4N	4E	5:S2	Wallace	Unpat.	U.S.A	Borsch/Fahrni	Leased	11,15
4N	4E	5:S2	Wallace Fraction	Unpat.	U.S.A.	Borsch/Fahrni	Leased	11,15
4N	4E	5:All	Last Chance No. 1	Unpat.	U.S.A.	Borsch/Fahrni	Leased	11,15
4N	4E	5:All	Last Chance No. 2	Unpat.	U.S.A.	Borsch/Fahrni	Leased	11,15
4N	4E	5:SW4	Lowry Fraction	1992	Brohn	Brohn	Owned	16
4N	4E	8:NW4	Joe King Lot	975	Brohn	Commonwealth	Owned/Leased	17,2
4N	4E	5:N2	Erik 1	STA	Brohn	Marcia Darland	Owned/Leased	19,18
4N	4E	5:N2 6:E2	Erik 2	STA	Brohn	Marcia Darland	Owned/Leased	19,18
4N	4E	5:NW4	Erik 3 (partial)	STA	Brohn	Marcia Darland	Owned/Leased	19,18
4N	4E	8:NW4	Magus 1	STA	Brohn	Brohn	Owned	20,36
4N	4E	5:SW4	Magus 3	STA	Brohn	Brohn	Owned	21,36
4N	4E	5:SW4	Magus 4	STA	Brohn	Brohn	Owned	22,36

COUNTY C.U.P.
AFFECTED LAND CLAIM LIST
(cont.)

LEGAL DESCRIPTION TSHP	RANGE	SECT.	CLAIM NAME	PATENTED M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	REMARKS
4N	4E	5:SW4	Lori 1	STA	Brohm	Brohm	Owned	24,37
4N	4E	5:SW4	Lori 2	STA	Brohm	Brohm	Owned	24,37
4N	4E	5:SW4	Lori 3	STA	Brohm	Brohm	Owned	26,36
4N	4E	5:SW4	Lori 4	STA	Brohm	Brohm	Owned	27,37
4N	4E	5:SW4	Lori 5	STA	Brohm	Brohm	Owned	28,37
4N	4E	5:SW4	Lori 6	STA	Brohm	Brohm	Owned	29,37
4N	4E	6:SE4	Lori 7	STA	Brohm	Brohm	Owned	30,37
4N	4E	6:SE4	Lori 8	STA	Brohm	Brohm	Owned	31,37
4N	4E	6:SE4	Lori 9	STA	Brohm	Brohm	Owned	32,37
4N	4E	5:SW4	Lori 11	STA	Brohm	Brohm	Owned	33,36
4N	4E	8:NW4	Lori 12	STA	Brohm	Brohm	Owned	34,36
4N	4E	8:NW4	Lori 13	STA	Brohm	Brohm	Owned	35,36
4N	4E	8:NW4	Jen 9	STA	Commonwealth	Brohm	Leased/Owned	2,12,38
4N	4E	8:NW4	* Jen 10	STA	Brohm	Brohm	Owned	39,36

COMMENTS:

A. Clalin Name: See attached map for claims partially affected by permit boundaries.

B. Patented M.S. #:
   1. STA - Titles acquired under the Small Tracts Act
   2. Unpat. - Application has been made for surface title under the Small Tracts Act.

C. Status: Numbers appearing to right are keyed in to copies of the underlying leases or deeds made available to Planning and Zoning.

* CUP Original Claims

Revised 2/29/88

BORSCH/FABRNI

Jeraldine Borsch Fabrni
HCR 73, Box 535
Deadwood, SD 57732

Chester A. Borsch, Jr., Trustee
1896 N. 1225 West
Clinton, MT 80415

COMMONWEALTH

Commonwealth Mining Company of South Dakota
P.O. Box 995
Oshkosh, WI 54901

BROHM

Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

NORTHWESTERN METAL

Northwestern Metal
Box 81826
Lincoln, NE 68501

WILLIS AYE

Willis Aye
Route 1, P.O. Box 2547
Miles City, MT 59301

LOUIS BILERS

Louis Bilers, Agent
2426 N. Avenue 32
Los Angeles, CA 90065

GARY FROEMEL

Gary Froemel, Agent
206 Spring Circle
Pine, CO 80470

MARCIA DARLAND

Marcia Darland
211 Meier
Spearfish, SD 57783

RUTH HANKINS TRUST

Ruth Hankins
9608 N. Oregon Place
Lakewood, CO 80226

COUNTY C.B.P.
BUFFER ZONE CLAIM LIST

LEGAL DESCRIPTION TSHP	RANGE	SECT.	CLAIM NAME	M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	
4N	4E	6:E2	White (partial)	1031	Commonwealth	Commonwealth	Leased	2
4N	4E	6:SE4	Anchor (partial)	138	Commonwealth	Commonwealth	Leased	2
4N	4E	6:E2	Marie (partial)	1031	Commonwealth	Commonwealth	Leased	2
4N	4E	6:SE4	Pyrite (partial)	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	6:S2	Carl (partial)	1031	Commonwealth	Commonwealth	Leased	2
4N	4E	6:S2	Hagensick Fraction (pt)	1298	Cecil Engels etux	White House Congress	Leased/leased	40, 41
4N	4E	6:SE4	Bluebird (partial)	1814	David Walberg etux	White House Congress	Leased/Leased	42, 41
4N	4E	6:SE4	Twin Mine (partial)	1814	David Walberg etux	White House Congress	Leased/Leased	42, 41
4N	4E	6:SE4	Maverick (partial)	1134	Northwestern Metal	Northwestern Metal	Leased	5
4N	4E	6:SE4 7:N2	Minna (partial)	1575	Commonwealth	Commonwealth	Leased	2
4N	4E	7:N2	Pelion (partial)	1575	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4	Waterloo (partial)	1575	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4 8:NW4 5:SW4	True Blue (partial)	975	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4	Bunker Hill (partial)	1575	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4 8:NW4	Ophir (partial)	483	Commonwealth	Commonwealth	Leased	2
4N	4E	8:NW4	Magus 2	57A	Brohn	Brohn	Owned	36
4N	4E	8:NW4	Lori 10	57A	Brohn	Brohn	Owned	36
4N	4E	8:NW4	Algol Fraction	1069	Commonwealth	Commonwealth	Leased	2
4N	4E	8:NW4	Sonora	700	Commonwealth	Commonwealth	Leased	2
4N	4E	8:NW4	Blackhawk (partial)	698	Gary Froemel etal	Gary Froemel etal	Leased	9
4N	4E	8:NW4	Two Bears	699	Commonwealth	Commonwealth	Leased	2

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COUNTY C.U.P.
BUFFER LAND CLAIM LIST
(cont.)

LEGAL DESCRIPTION TSHP	RANGE	SECT.	CLAIM NAME	M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	
4N	4E	8:NW4	Barrett	1681	Borsch/Fahrni	Borsch/Fahrni	Leased	43
4N	4E	8:N2 9:NW4	Strawberry Creek Placer (partial)	712	Commonwealth	Commonwealth	Leased	2
4N	4E	8:N2	Lori 14 (partial)	Unpat.	U.S.A.	Brohn	Waiver/Owned	44, 46
4N	4E	8:NE4	Lori 15 (partial)	Unpat.	U.S.A.	Brohn	Waiver/Owned	45, 46
4N	4E	5:SE4 8:NE4	Nancy Golden (partial)	Unpat.	U.S.A.	Alan Herbert	Waiver/Leased	46, 47
4N	4E	5:SE4	Gold and Silver (partial)	1737	Homestake	Homestake	Waiver letter	48
4N	4E	5:SE4 8:NE4	Lina (partial)	846	Louis Eilers, etal	Louis Eilers, etal	Leased	6
4N	4E	5:SE4 8:NE4	Occidental (partial)	847	Louis Eilers, etal	Louis Eilers, etal	Leased	6
4N	4E	5:SE4	Baby Galvin (partial)	1964	Borsch/Fahrni	Borsch/Fahrni	Leased	11
4N	4E	5:SE4	Lori 23 (partial)	Unpat.	U.S.A.	Brohn	Waiver/Owned	46, 49
4N	4E	5:SE4 4:SW4	Ruby Placer (partial)	432	Richard Repke, etux	Richard Repke, etux	Leased	50
4N	4E	5:N2	Lunnel (partial)	Unpat.	U.S.A.	Alan Herbert	Waiver/Leased	46, 47
4N	4E	5:N2	Liselotte (partial)	Unpat.	U.S.A.	Alan Herbert	Waiver/Leased	46, 47
4N	4E	5:N2 SW4	Wheelbarrow (partial)	Unpat.	U.S.A.	Alan Herbert	Waiver/Leased	46, 47
4N	4E	5:All	Wheelbarrow #1	Unpat.	U.S.A.	Brohn	Waiver/Owned	46, 51
4N	4E	5:NW4	Rohebo (partial)	Unpat.	U.S.A.	Alan Herbert	Waiver/Leased	46, 47
4N	4E	5:NW4	Ganico (partial)	Unpat.	U.S.A.	Alan Herbert	Waiver/Leased	46, 47
4N	4E	6:SE4	Maverick Fraction	Unpat.	U.S.A.	Brohn	Waiver/Owned	46, 52
4N	4E	6:SE4	Magus 5	Unpat.	U.S.A.	Brohn	Waiver/Owned	46, 53

COUNTY C.U.P.
BUFFER LAND CLAIM LIST
(cont.)

LEGAL DESCRIPTION TSHP	RANGE	SECT.	CLAIM NAME	M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	
4N	4E	5:W2	Bailey (partial)	1871	Brohn	Willis Aye	Owned/Leased	4, 3
4N	4E	5:W2	Bailey Fraction	Unpat.	U.S.A.	Brohn	Waiver/Owned	46, 54
4N	4E	6:all	Franklin (partial)	1031	Commonwealth	Commonwealth	Leased	2
4N	4E	6:S2 7:N2	Ossa (partial)	1575	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4 8:NW4	Theodor (partial)	927	Commonwealth	Commonwealth	Leased	2
4N	4E	7:NE4 8:NW4	Haley (partial)	927	Commonwealth	Commonwealth	Leased	2
4N	4E	7:E2 8:NW4	Summit (partial)	926	Commonwealth	Commonwealth	Leased	2
4N	4E	7:E2 8:W2	St. Patrick (partial)	926	Commonwealth	Commonwealth	Leased	2
4N	4E	8:W2	Oro Fino (partial)	646	Commonwealth	Commonwealth	Leased	2
4N	4E	8:NW4	Evezic Parcel	712	Brohn	Brohn	Owned	55
4N	4E	4:SW4 5:SE4	Harris No. 1 (partial)	1906	Harlan Schmidt	Harlan Schmidt	Leased	56
4N	4E	5:E2	Fair Oaks (partial)	1905	Ruth Hankins Trust	Ruth Hankins Trust	Leased	7
4N	4E	5:NE4	Jupiter (partial)	2035	Brohn	Brohn	Owned	57
4N	4E	5:W2	Mansion (partial)	1905	Ruth Hankins Trust	Ruth Hankins Trust	Leased	7
4N	4E	5:E2	Fissure (partial)	1964	Borsch/Fahrni	Borsch/Fahrni	Leased	11
4N	4E	5:NW4 6:NE4	Little Giant (partial)	218	Commonwealth	Commonwealth	Leased	2
4N	4E	5:NW4	Erik 4 (partial)	87A	Brohn	Marcia Darland	Owned/Leased	19, 18

Revised 2/29/88

COUNTY C.U.P.
BUFFER LAND CLAIM LIST
(cont.)

LEGAL DESCRIPTION TSHP-RANGE-SECT.			CLAIM NAME	M.S. #	SURFACE OWNER	MINERAL OWNER	STATUS	
4N	4E	5:NW4	Brik 3 (partial)	STA	Brohm	Marcia Darland	Owned/Leased	19, 18
4N	4E	6:E2	Jen 3 (partial)	Unpat.	U.S.A.	Brohm	Waiver/Owned	46, 58
4N	4E	6:E2 5:W2	Maria (partial)	Unpat.	Orba Bosrch	Orba Borsch	Leased	59
4N	4E	7:NE4	Magus 6	STA	Brohm	Brohm	Owned	23, 36
4N	4E	9:W2	Ridge (partial)	1537	Brohm	Brohm	Owned	60

Comments:

A. Claim Name: See attached map for claims partially affected by permit boundaries.

B. Patented M.S.#: 'STA' - Title acquired under the Small Tracts Act.

C. Status: Numbers appearing to right are keyed in to copies of the underlying leases or deeds made available to Planning and Zoning.

Revised 2/29/88

COMMONWEALTH
Commonwealth Mining Company of South Dakota
P.O. Box 995
Oshkosh, WI 54901

HOMESTAKE
650 California Street
San Francisco, CA 94108
Attn: Mark Nesbitt

CECIL ENGELS
933 S. Poplar
Casper, WY 82601

RICHARD REPKE etux
Box 736
Lead, SD 57754

ALAN HERBERT
445 E. Ellefson
Iola, WI 54945

HARLAN SCHMIDT etux
P.O. Box 1048
Spearfish, SD 57783

DAVID WALBERG et ux
David and Cheryl Walberg
Box 95
Britton, SD 57430

RUTH HANKINS TRUST
9608 W. Oregon Place
Lakewood, CO 80226

WHITE HOUSE CONGRESS, INC./WILLIS AYE
Willis Aye
P.O. Box 2547
Miles City, MT 59301

MARCIA DARLAND
211 Meier
Spearfish, SD 57783

BROHM
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

LOUIS EILERS, ET AL
Louis Eilers, agent
2426 W. Avenue 32
Los Angeles, CA 90065

BORSCH/FAHRNI
Jeraldine Borsch Fahrni
HCR 73, Box 535
Deadwood, SD 57732

Chester A. Borsch, Jr., Trustee
1896 N. 1225 West
Clinton, UT 84015

ORBA BORSCH
Rose Borsch
HCR 73, Box 550
Deadwood, SD 57732

Mary Helen Borsch
5524 Club Hill West
Lakeland, FL 33803

NORTHWESTERN METAL
Northwestern Metal Company
Box 81826
Lincoln, NE 68501

GARY FROEMEL, ET AL
Gary D. Froemel, agent
206 Spring Circle
Pine, CO 80470

Revised 2/29/88

EXHIBIT B

BROHM MINING CORPORATION CUP #127
GILT EDGE PROJECT

1. Brohm Mining Corporation shall file, with the Zoning Administrator, a written annual report on each anniversary date of the approval of the Conditional Use Permit setting forth Brohm Mining Corporation's compliance with the terms, requirements, conditions and general operations and reclamation of the Gilt Edge Project. Such report shall address selected key socioeconomic information such as production, employment, payroll, work force residency, taxes, anticipated activities and employment, impacts on adjacent lands (i.e. drilling, blasting, noise, dust, traffic, etc.) and any additional areas as may be determined by the Lawrence County Commission. The annual report shall enable the county to compare actual impacts to those projected by the preproject assessment and to take corrective measures if impacts are either more or less severe than anticipated.

2. Brohm Mining Corporation shall comply with Public Law 99-499, Title III: Emergency Planning and Community Right-To-Know. They shall, as per Title III, report all spills to the Lawrence County Sheriff's Office Dispatch Center in Deadwood, South Dakota, and issue an appropriate press release to the press. Chemical spills subject to reporting shall be those found in Title III List of Lists, Chemicals Subject To Reporting under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and amendments thereto. All other spills, leaks or breaches of the leaching pads or ponds into the environment shall be reported to the Lawrence County Civil Defense Director at the beginning of the next regularly scheduled business day. The Lawrence County Civil Defense Director and the Chairman of Lawrence County Commission shall determine when it is appropriate that Brohm Mining Corporation be required to issue a press release in reference to the above. This condition shall not be construed to limit Brohm Mining Corporation in any way from issuing a press release when not required by Lawrence County.

3. Brohm Mining Corporation shall continue a dust suppression program to control dust on all access roads and all haul roads within the permit area. Brohm Mining Corporation shall confer with Lawrence County Highway Superintendent as to appropriate controls. Should legitimate dust concerns be raised by adjoining property owners, Brohm Mining Corporation shall increase its dust suppression activities on affected roads and increase air quality surveillance to insure compliance with state and federal regulations.

4. Brohm Mining Corporation shall assist Lawrence County in road maintenance, dust suppression and improvement efforts on all impacted county roads, commensurate with the degree of impact, as recommended by Lawrence County Highway Superintendent. Brohm Mining Corporation shall continue to maintain the main access road (F.D.R. #170) during the life of the project according to county and United States Forest Service specifications.

5. Brohm Mining Corporation shall cooperate with Lawrence County in regulating vehicle speeds and the observance of traffic signs on all public roads in the vicinity of the Gilt Edge property.

6. Brohm Mining Corporation shall schedule normal off site heavy truck and equipment operations and deliveries for daylight hours.

7. Brohm Mining Corporation shall conduct blasting operations only during daylight hours.

8. Brohm Mining Corporation shall, to the extent possible, continue to maintain at least fifty percent (50%) of its workforce from within Lawrence County.

9. Brohm Mining Corporation shall continue to make every reasonable effort to make initial and recurrent purchases of materials and supplies from within Lawrence County communities first and regional communities secondly, to the extent such items are available at comparable costs, quality and delivery schedules of suppliers outside the area.

10. Blasting parameters within the Gilt Edge Project shall be as determined by the Bureau of Mines Report of Investigations/1980 (RI 8507), unless superceded by a more recent document, to establish safe seismic disturbances and air blast limits. If legitimate complaints arise, monitoring equipment shall be used to investigate the complaints, and mitigation measures, such as the reduction of charge sizes, shall be employed should problems exist.

11. If dust or noise due to blasting or dumping becomes a problem to local residents, one or more of the following mitigative measures shall be employed:

a. Blast and/or dumping parameters shall be reviewed for possible adjustment.

b. Weather conditions shall be monitored and blasting and/or dumping shall be conducted with favorable meteorological conditions (i.e. precipitation or favorable winds);

c. Spraying of blasts with water during and after ignition shall be tested;

d. Air quality surveillance shall be increased to insure compliance with state and federal regulations.

12. Any change in ownership of the company or transfer of the Conditional Use Permit to another company shall be reported to the Lawrence County Commission no more than ten (10) working days after such change or transfer. The new ownership or company shall meet with the Lawrence County Commission, at the Commission's convenience, to review and accept the conditions of this permit.

13. Copies of all written notices of violations from the Department of Water and Natural Resources of the State of South Dakota or the United States Environmental Protection Agency sent to Brohm Mining Corporation shall be transmitted to the Zoning Administrator within ten (10) days of Brohm Mining Corporation's receipt.

14. If any term, condition or requirement of the Conditional Use Permit is not fully complied with in all respects, or any permit issued by the State of South Dakota, Department of Water and Natural Resources, or any permit issued by the United States Environmental Protection Agency is not fully complied with in all respects, this permit shall be reviewed and may result in suspension, revocation or additional conditions.

15. The Lawrence County Board of Commissioners may from time to time, as they deem necessary, appoint a citizens' advisory committee for the purpose of responding to legitimate complaints lodged against Brohm Mining Corporation by the public. Brohm Mining Corporation shall cooperate with said committee and the Lawrence County Board of Commissioners to develop workable solutions to issues of concern (i.e. noise, dust, traffic, etc.).

16. Brohm Mining Corporation shall, ninety (90) days prior to any planned, permanent closure or long term cessation of the Gilt Edge Project, give notice of said closure or cessation to the Lawrence County Planning and Zoning Commission and Lawrence County Board of Commissioners. Brohm Mining Corporation shall cooperate with any inspections undertaken by said Planning and Zoning Commission and Board of Commissioners for the purpose of identifying any impacts on affected roads and compliance with reclamation plans.

17. Brohm Mining Corporation shall cooperate in training programs for civil defense personnel. Said training programs shall be coordinated by the Lawrence County Civil Defense Director and shall pertain to the handling of hazardous materials used by Brohm Mining Corporation.

18. If the State of South Dakota or the United States Government impose any conditions that conflict with these conditions, those state or federal requirements shall take precedence.

3

South Dakota Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

cc Ken
Carl
Dan
Grant Shelton
Mike Newman

May 2, 1988

Mr. John Wilbanks
Brohm Mining Corp.
P.O. Box 485
Deadwood, SD 57732

RE: Permit Amendment - Mining Permit No. 439

Dear Mr. Wilbanks:

On April 21, 1988, the South Dakota Board of Minerals and Environment conditionally approved Brohm's amendment request to modify their mining and milling operations.

Per the Board's approval, enclosed is a copy of the amended application (No. 439) with the conditions attached.

Please note that this amendment allows Brohm to conduct only that type and amount of work which has hereby been approved.

Thank you for your continued interest in and consideration for the resources of South Dakota.

Sincerely,

Robert Townsend

Robert Townsend
Program Chief
Exploration and Mining Program
Telephone: (605) 773-4201

Enclosure

RECEIVED
MAY - 4 1988
BROHM MINING CO.

STATE OF SOUTH DAKOTA
U.S. SECURITIES OR CASH

RECEIVED
MAR 7 1988
EXPLORATION AND MINING PROGRAM

1. This Agreement and Assignment is entered into by the South Dakota Board of Minerals and Environment, hereinafter referred to as "State", and Brohm Mining Corp. P.O. Box 485, Deadwood, SD 57732, hereinafter referred to as "Assignor", following Assignor's procurement of a (___ Sand & Gravel License) (_X_ Mining/Milling Permit) (___ Exploration Notice of Intent) (___ Uranium Exploration Permit) Permit Number 439.

2. For value received, Brohm Mining Corp., Assignor, does hereby assign, transfer, and set over to the State, in lieu of posting a surety bond, the sum of $672,376 in cash or United States Government Securities hereafter listed.

3. The Assignor makes this assignment pursuant to the requirements of SDCL Chapter 45-6, 45-6B, 45-6C, and 45-6D, as applicable.

4. The United States Securities hereby pledged are described as follows:

Size of Security	Number	Date	Amount

The cash deposit hereby pledged is described as follows:

Date	Amount	Number	Bank
2/26/88	$672,376	M52306	First Bank South Dakota

5. The United States Securities or cash deposit shall be held by the State of South Dakota during the term of this assignment.

6. The Assignor is entitled to any earnings or interest upon the cash proceeds after the State has surrendered the United States Securities. The Assignor is entitled to any earnings or interest upon the cash proceeds of a cash deposit while the cash deposit is being held by the State.

7. The State may at any time after the Assignor fails to fully comply with all the requirements of the permit, reclamation plan, operating plan, SDCL 45-6, 45-6B, 45-6C, and 45-6D, as applicable, and the Rules and Regulations adopted thereunder, and after giving written notice to the Assignor, surrender the United States Securities to any bank in exchange for money, or proceed against the cash deposit.

8. The United States Securities or cash deposit may be released by the State when the Assignor's obligations under the permit, reclamation plan, operating plan, SDCL 45-6, 45-6B 45-6C, and 45-6D, as applicable, and the Rules and Regulations adopted thereunder are fully performed, or when the Assignor is succeeded by another mining operator who has a permit and bond involving the same affected land covered by the Assignor's permit.

9. Signed and dated at DEADWOOD, SOUTH DAKOTA, this 4th day of MARCH, 1988.

P.O. Box 485, DEADWOOD, SD 57732
Address

Brohm Mining Corp. by [signature]
Assignor's Signature

STATE ACCEPTANCE

10. The State of South Dakota, Board of Minerals and Environment, hereby accepts the foregoing assignment of the United States Securities or cash, as the case may be, in the amount of $672,376 this 21st day of April, 1988.

[signature]
Chairman, South Dakota Board of Minerals and Environment/
Secretary, Department of Water and Natural Resources

WNP-504-3 [illegible]

Department of Water and Natural Resources
Exploration and Mining Program
Joe Foss Building, Fourth Floor
Pierre, South Dakota 57501
Telephone: 605/773-4201

EXCHANGE OF SURETY REQUEST

RECEIVED
MAR 7 1988
EXPLORATION AND MINING PROGRAM

Operator's Name: Brohm Mining Corp.

Activity Type:

Permit Number: 439

Mining/Milling X

Present Surety Company/Bank: First Bank of South Dakota, Rapid City

Mineral Exploration ____

Replacement Surety Company/Bank: First Bank

Uranium Exploration ____

Present Surety Amount: $672,376

Replacement Surety Amount: $672,376

Present Surety Number: M51654

Replacement Surety Number: M52306

A) I hereby request release of the above-described "present surety" in exchange for the acceptance of the likewise described "replacement surety".

Brohm Mining Corp. by [illegible]
Operator's Signature

March 4, 1988
Date

B) The South Dakota Board of Minerals and Environment finds that the above-named operator has provided the State with an equivalent replacement for the surety hereto in effect and, thereby approves the exchange.

Chairman, South Dakota Board of Minerals and Environment

April 21, 1988
Date

WNR-513-2 '83

Department of Water and Natural Resources
Exploration and Mining Program
Joe Foss Building, Fourth Floor
Pierre, South Dakota 57501
Telephone: 605/773-4201

RECEIVED
DEC 17 1984
EXPLORATION AND MINING PROGRAM

AMENDED
APR 21 1988

APPLICATION FOR MINING/MILLING PERMIT

Pursuant to SDCL 45-6B: Relating to Extraction and Processing of Minerals in Operations Affecting More Than 10 Acres Per Year and Removing Over 25,000 Tons Per Year

Name of Operator: Gilt Edge, Inc.

General Office Address:

2005 Ironwood Parkway
Coeur d'Alene, Idaho 83814

Telephone: 208-664-1571

Local Address:

P. O. Box 485
Deadwood, SD 57732

Telephone: 605-578-2607

Name and Address of Surface Owner:

Various Surface Owners

See Table 1-1 in operating plan narrative

Name and Address of Mineral Owner:

Various Mineral Owners

See Table 1-1 in operating plan narrative

Legal Description of Affected Land:

Sec. 5 T4N.R.4E.
Sec. 8 T4N.R.4E.

County: Lawrence

Name and Address of Operator's Legal Resident Agent (if out-of-state corporation):

CT Corp.
319 South Coteau St.
Pierre, SD 57501

Minerals to be Extracted and, if Applicable, Milled: Gold and Silver

Size of Area to be Worked at Any One Time (acres): Approximately 153 Acres

Estimated Tonnage to be Mined:

[illegible]0 Tons/Year appr. 5.0 MM Total Tons
7.5 MM Tons Waste

Proposed Starting Date: April 1, 1985

Proposed Completion Date: 1992

Estimated Working Days Per Year:

260 days, 210 leaching

Estimated Duration of Operation (years):
7-10 Years

NR-531-6/82

Source of Legal Right to Enter [illegible]d Initiate Operations:

(x) Lease ( ) Letter ( ) US Forest Service Permit

Attach Copy

Source of Legal [illegible]ght to Dispose of Tailings:

(x) Lease ( ) Letter ( ) US Forest Service Permi

Attach Copy

INSTRUCTIONS (Reference SDCL 45-6B):

This Application Must be Accompanied by:

1. A Narrative Description of Methods of Mining and Milling to be Employed as Per Section 6 (8).
2. A Reclamation Plan Pursuant to Section 7.
3. A Map of the Affected Area Pursuant to Section 10.
4. A Fee of $1,000.00 Pursuant to Section 14. (Units of State and Local Government are Exempt).

Before a Hearing on the Permit May be Conducted by the Board of Minerals and Environment, the Applicant Must Submit the Following Materials:

1. Certified Mail Receipts Confirming Mailing of Notice to All Surface Owners and Lessees Pursuant to Section 17.
2. A Copy of the Affidavit of Publication of Notice Pursuant to Section 16.
3. Proof of Filing a Copy of the Application with the Register of Deeds Pursuant to Section 15.
4. A Surety in an Amount to be Determined by the Department Pursuant to Section 20 (Units of State and Local Government Must Submit a Written Guarantee in Lieu of Surety Stating that the Affected Lands Will be Reclaimed in Accordance with the Permit and SDCL 45-6B, Sections 35 through 46).
5. A Copy of Instruments of Consultation From All Surface Landowners, if Different than the Owner of the Minerals Pursuant to Section 12 and 13.

Applicant hereby affirms that the mining and milling will be conducted pursuant to SDCL 45-6B, or any regulations promulgated thereunder; that he will grant access to the Board of Minerals and Environment or its agents to the area under application from the date of the application and during the life of the permit as is necessary to assure compliance with SDCL 45-6B.

Signature: [illegible]

Title: [illegible] Date: [illegible]

STATE OF Idaho

COUNTY OF Ada

On this 14 day of [illegible]

19 [illegible], before me personally appeared

Richard James Hall

acknowledged himself to be the [illegible] (Title)

for [illegible] (Operator) and t[illegible]

he is authorized to execute the Application f[illegible]

Mining/Milling Permit for the purposes contai[illegible]

therein.

[illegible]

Notary Public

My Commission Expires: 1-11-86

SEAL

FOR DEPARTMENT USE ONLY

Date Approved:	Bond Amount:	Permit Number:
Nov. 20, 1986	$ 672,376.00	439

Signature: Lee M. McCahren

Chairman, Board of Minerals & Environment

Acting

Lacana Gold Inc.
2005 Ironwood Parkway
Coeur d'Alene, Idaho 83814
(208) 664-1531

RECEIVED
JAN 9 1985
EXPLORATION AND MINING PROGRAM

January 4, 1985

Mr. Bob Townsend
Dept. of Water and Natural Resources
Joe Foss Building
523 East Capital Avenue
Pierre, SD 57501

Re: Gilt Edge, Inc., Mining/Milling Permit Application

Dear Bob:

This letter confirms our conversation of this morning that a portion of the affected land in our permit application is in Sec. 6, T4N, R6E. Would you please amend our permit application to reflect this.

Thank you for bringing this oversight to my attention so promptly.

Regards,

Richard J. Hall
Manager-Special Projects

RJH/cam

CONDITIONS OF PERMIT

TO BE ATTACHED TO AND FORM A PART OF MINING PERMIT NO. 439

(See attached pages containing the conditions of this permit)

DATED THIS 20th DAY OF November, 1986

Lee M. McCahren

SOUTH DAKOTA DEPARTMENT OF WATER AND NATURAL RESOURCES

WWR-51C-9/81

Affected Land Ownership

1. Concerning the property ownership of affected lands, two lists of mining claims have been submitted. The list submitted as Table 1-1 with the April 29, 1986 Supplemental Information, and the list submitted as Table 1-1 with the original application do not include all the claims in the area illustrated on the Affected Land Map submitted with the Gilt Edge Project, Comprehensive Reclamation Plan. An amended claim list shall be submitted to include the claim name, Mineral Survey Number, status, mineral ownership and surface ownership for the area addressed in the Comprehensive Reclamation Plan. Table 1-1 shall be resubmitted, with the addition of property descriptions for the following claims:

Claim Name	Use
Erick 1	Corridor
Erick 2	Corridor
Erick 3	Access road
Erick 4	Access road
Anchor	Access road
Maria	Access road
Gamico	Access road
Rohebo	Access road
Wheelbarrow	Access road
True Blue	Land application site, corridor

2. The following claims are shown on the Facilities Index Map in the Construction Drawings as not being under Gilt Edge control:

Claim Name	Survey No.	Status	Surface Ownership	Use
Highland Mary	326	Patented	Margory Holbrook	Access road
Joe King (part of Binghamton)	975	Patented	Dale Stroschian	Stream culvert outlet

Pursuant to SDCL 45-6B-12, before conducting a mining operation in the permit area, the applicant shall submit to the Board of Minerals and Environment an instrument of consultation from the surface landowner of the permit area, if different from the owner of the mineral interest.

3. It appears on Figure 7, Attachment 3, near the leach pad and Ruby Waste Dump, that drainage stabilization controls, such as dispersion terrace level spreaders and silt fences, cross over permit boundaries and into adjacent landowners property. The areas in question are east of the South Ruby claim, and north and east of the May Fraction claim. If this indeed the case, the landowners shall be consulted pursuant to SDCL 45-6B-12.

4. The Jen No. 10 unpatented mining claim was staked to cover an open fraction that existed in the area. It is unclear on the Facilities Index Map in the Construction Drawings where this particular fraction within Jen No. 10 is located. A map shall be submitted showing the location of this fraction, and if the fraction lies within the affected area addressed in the Gilt Edge Project, Comprehensive Reclamation Plan, the landowner shall be consulted pursuant to SDCL 45-6B-12.

General

1. Erosion and sedimentation control shall be in place and functional during all phases of construction, operation, and reclamation. Periodic maintenance shall be required to insure control effectiveness.

2. Gilt Edge shall prepare and submit a report to the Department outlining a plan for determining the effects of aerosol drift related to heap spraying. The plan shall include criteria for discontinuing spraying (e.g. wind speed) in the case where excess aerosol drift occurs. The plan shall be subject to review and approval by DWNR.

3. Gilt Edge shall maintain a chemical and petroleum product usage inventory and shall deliver it to DWNR upon request.

4. Prior to the commencement of cyanide leach solution application, Gilt Edge shall have a registered professional engineer certify in writing to DWNR that construction of the leaching system is complete and that all necessary monitoring systems are functional. Prior to the commencement of cyanide leach solution application and after receipt of certification, a ten day period shall be allowed for the Department and Board to inspect the facilities and for the Department to either grant or deny permission in writing to commence cyanide leach solution application. Permission to grant commencement of cyanide leach solution application shall not be withheld without cause.

5. The operation shall be conducted in compliance with all Lawrence County zoning requirements.

6. Gilt Edge shall establish and maintain a weather monitoring station capable of recording wind speed and direction, precipitation, ambient temperature, relative humidity and evaporation. Weather monitoring data shall be submitted to DWNR on a quarterly basis.

7. In accord with SDCL 45-6B-42, Gilt Edge shall take precautions to limit access to highwall areas by fencing and posting warning signs. Upon completion of mining, highwall areas shall be adequately fenced to prevent hazards to the public.

8. Gilt Edge, in consultation with the Lawrence Conservation District and the Lawrence County Weed Superintendent, shall develop and implement a plan for noxious weed control.

9. The water quality, air quality, meterological, vegetation, and wildlife monitoring systems as presented in the permit application or as modified by the Board shall be followed. Any changes in these monitoring systems shall first be approved by the Department of Water and Natural Resources.

10. During the course of mining, should sulfide mineralization be encountered in amounts capable of causing acid generation or potential leaching and neutralization problems, Gilt Edge shall take appropriate actions to ensure that these effects do not occur.

11. A back-up power supply shall be maintained on-site in case a major power failure occurs.

12. The historical remains of the Gilt Edge site shall be plotted on a topographic map at a scale of 1:1200. A series of black-and-white photographs shall be taken to

document the Gilt Edge mill foundation. This work shall be conducted by a qualified person and shall be incorporated into a brief summary report on the mine. Before this work is commenced, Gilt Edge shall notify the State Archeologist's Office.

Plans and Specifications - General

1. The plans and specifications of any facilities that are designed to either prevent environmental contamination or to treat contaminated material shall be submitted and approved by the Department of Water and Natural Resources prior to the construction of any such facility. It is recognized that the plans and specifications submitted during the mining permit application process are approximately 50 percent complete. These plans and specifications which include the basic components to ensure process solution containment shall be completed to the 100 percent constructible stage and submitted to DWNR for final written approval. DWNR shall not unreasonably withhold its final approval of the plans and specifications if they reflect the technical parameters specified in the permit. The final plans and specifications shall reflect any process solution containment modifications required by the Board during the course of the permit hearing. Facilities for which plans and specifications are required include, but may not be limited to:

   a. Land application system
   b. Leach pad
   c. Process ponds
   d. Leach solution application system
   e. Process plant (spill containment)
   f. Cyanide make-up tank or mixing facility
   g. Acid wash and carbon reactivation facilities (containment)
   h. Chlorination facility
   i. Chemical storage areas including petroleum storage tanks and containment
   j. Sewage systems
   k. Water supply system
   l. Powder magazines
   m. Major sedimentation control structures (for berms, ditches, dikes, dams and culverts; include runoff and flow calculations for sizing of structures)

2. Plan maps showing locations of ancillary facilities shall be submitted, along with general plans for these facilities. Facilities for which plan maps and plans are required include, but may not be limited to:

   a. Shop areas/equipment maintenance buildings
   b. Equipment storage areas
   c. Parking lots
   d. Perimeter fencing

3. The Department shall respond to plans and specifications within 30 days of receipt.

4. As-built (record drawings) shall be submitted to DWNR within 60 days of completion of each component of the facility for which plans and specifications are required.

Soil Liner

1. Cilt Edge shall submit the following information concerning the soil liner bedding material (tailings):

   a. The available quantity of material suitable for liner construction
   b. Particle size distribution
   c. Percentage of bentonite required to meet specifications
   d. Moisture-density relationship (Atterberg limits)
   e. Strength of the material
   f. Hydraulic conductivity of the material.

2. The minimum thickness of the soil liner for ponds shall be 24 inches compacted in 6 inch lifts to at least 95% standard proctor density. The soil liner for the pad shall include one 6 inch lift incorporating processed bentonite and one 6 inch lift of tailings only, both compacted to at least 95% standard proctor density. Tests to demonstrate the adequacy of the soil liner shall include lab hydraulic conductivity tests to verify a hydraulic conductivity of 1×10^{-7} cm/sec. Processed bentonite in an amount 50% greater than that required to meet the 10^{-7} cm/sec lab hydraulic conductivity shall be used in constructing the pad and pond soil liner.

3. Prior to soil liner emplacement, liner bedding material shall be inspected for homogeneity and to ensure that the appropriate amount of bentonite has been added. These determinations shall be documented in the overall CQA program report.

4. Cilt Edge shall conduct an evaluation of the potential for soil liner failure due to potential "piping" that may occur as the result of the coarse particle nature of the subgrade. Results shall be submitted to DWNR for review prior to construction of the soil liner.

5. An analysis of the acid-base potential of the soil liner material shall be performed. Appropriate measures shall be taken to ensure that acid leachate generation from the soil liner is not possible.

6. Tests to determine the capacity of the soil liner material to attenuate cyanide, metals and sodium shall be performed with the results submitted to DWNR.

7. An evaluation of the total salts and sodium content of the process solution and their potential effects on the hydraulic conductivity of the soil liner shall be conducted with the results submitted to DWNR prior to construction.

8. The minimum slope of the pond bottoms shall be 2%.

9. Tests to determine the largest allowable aggregate in the liner bedding material to prevent damage of the flexible membrane liner shall be conducted prior to construction. The test shall be conducted using the highest plausible overburden pressure plus a safety factor. The results shall be submitted to DWNR.

10. Cilt Edge shall develop a method to monitor mass movement and settling of the leach pad. Monthly reports of this monitoring program shall be submitted to the Department. Should significant settling or movement of the heap occur, Cilt Edge shall submit a report regarding the behavior of the liner in response to the movement or settling and include mitigative measures to be taken should such an event occur.

Flexible Membrane Liners

1. Liner-effluent compatibility tests shall be conducted to determine the suitability of the proposed flexible membrane liners with the results submitted to DWNR.

2. Hydrostatic testing of both primary and secondary liners shall be conducted at the time of installation to ensure liner integrity.

3. Test welds, as described in the specifications, shall be conducted for each welding machine each day prior to commencing liner welding operations, and shall also be conducted whenever a change in the ambient temperature exceeds 15°F.

Leachate Detection/Collection System

1. The leachate collection sumps shall be equipped with a 6 inch riser connected directly to the sumps rather than equipped with the 90 degree elbow and 4 inch riser as indicated in the project plans (page 13).

2. Gilt Edge shall establish a monitoring program for all leachate detection/collection systems and submit a plan outlining the mitigative measures to be taken should excessive leachate be found in the system.

Pad & Pond P&S Conditions

General

1. The leach pads and process ponds shall be generally constructed as follows:

   Pad - top to bottom

   a. 24 inches of select material;
   b. 100 mil geotextile fabric (if required to secure manufacturer's guarantee);
   c. 60 mil HDPE flexible membrane liner;
   d. Geonet drainage material;
   e. 40 mil HDPE flexible membrane liner;
   f. 6 inches tailings mixed with processed bentonite sufficient to reach a permeability of 10^{-7} cm/sec;
   g. 6 inches of tailings material.

   Ponds

   a. 60 mil HDPE flexible membrane liner;
   b. Geonet drainage material;
   c. 60 mil HDPE flexible membrane liner;
   d. 24 inches of tailings mixed with processed bentonite sufficient to reach a permeability of 10^{-7} cm/sec and compacted in 4-6 inch lifts. The 24 inches of tailings and bentonite mixture will be graded approximately 2 feet up the side walls of the ponds. The pond side walls will have a slope of 1.5(H) to 1.0(V).

2. A Construction Quality Assurance (CQA) plan for the pad and ponds shall be submitted to DWNR for review and approval. The CQA plan shall be reviewed in accordance with guidelines set out by the EPA in Construction Quality Assurance for Hazardous Waste Land Disposal Facilities (EPA/530-SW-85-021). The plan should include construction of soil and flexible membrane liners, field tests of the soil and flexible membrane liners, installation and testing of the leachate detection/collection system, construction monitoring and documentation and operational maintenance and inspection procedures.

Land Application

1. Prior to the initiation of each cycle of land application of treated process water, a complete chemical characterization of the process water shall be conducted. The following parameters shall be included in the analysis:

   a. Total Metals Including: Al, As, B, Ba, Be, Cd, Cr, Cu, Fe, Pb, V, Mn, Hg, Mo, Ni, Se, Ag, Zn, Co, Li

   b. Total Cyanide, Free Cyanide, Weak Acid Dissociable Cyanide (WAD)

   c. Sodium Absorption Ratio (SAR)

   d. Electrical Conductivity (EC)

   e. Radon, Uranium, Radium 226, Radium 228, Total Alpha Radiation, Total Gamma Radiation

   f. pH

   g. Major Cations

   h. Major Anions

   i. Cation-Anion Balance

   j. Na, Ca, Mg, K, Cl, SO_4, CO_3, HCO_3, Nitrate, Nitrite, Ammonia,

   k. Total Dissolved Solids (TDS)

   The results of the analysis shall be submitted with the notice of intent to implement land application.

2. Operational monitoring of treated process water to be land applied shall consist of one grab sample per 100,000 gallons of solution. Each grab sample shall be of sufficient volume so that the sample may be split and analyzed for all required operational monitoring parameters. One split sample of each consecutive five grab samples shall be composited and analyzed for the required monitoring parameters. The remaining split sample for all grab samples shall be stored for further individual analysis if analyses of composited samples indicates the presence of a problematic concentration of a given parameter. Sampling parameters shall include the following: Sodium Absorption Ratio, Conductivity, pH, Free Cyanide, WAD Cyanide, Total Cyanide, Total Metals (those found to be above detection limit during initial characterization analysis), Na, Ca, Mg, K, Chloride, Sulfate, Carbonate, Bicarbonate, Nitrate, Ammonia, Major Cations, Major Anions, TDS Cation-Anion Balance, Radioneuclides, Radon, and Total Alpha and Total Gamma radiation (the last 4 only if above background levels).

3. Solution to be land applied shall meet the following limits:

   a. Total Metals (mg/l) - not all-inclusive (see section e)

B - .20	Cr - .05	V - .10	Ag - .05
Cd - .01	Co - .01	Ni - .20	Zn - 2.0
Mo - .01	Cu - .20	Se - .02	Li - .10

b. WAD Cyanide 0.2 mg/l utilizing ASTM Method-D2036-80(C) (weak acid dissociable cyanide)

c. SAR < 10

d. Sulfate 200 mg/l

e. Values for pH, additional total metals (including Al, As, Be, Fe, Hg, Pb, and Mn), electrical conductivity, chloride, bicarbonate, total dissolved solids, ammonia, nitrate, radioneuclides, radiation, and other common ions to be based on initial chemical analysis, site specific variables, and EPA or other standard land application or irrigation siting and criteria documents - values derived must be approved by DWNR.

4. Gilt Edge shall give the Department written notice of intent to implement land application at least one week prior to the initiation of each land application cycle unless extenuating circumstances prevent it. The notice shall include the date on which application will commence, the amount of solution to be treated and land applied, the estimated duration of land application, and analytical results for the first sampling of treated process water (chemical characterization analysis). Following each land application cycle, a written report shall be submitted to the Department and shall include the total amount of solution applied, the total hydraulic loading rate per acre per set, the total metals and cyanide loading rates per acre per set, the duration of the application cycle, all sampling data, and a general discussion of the success of the system.

5. The hydraulic loading rate of land application shall not result in surface runoff.

6. Prior to the initiation of land application, Gilt Edge shall submit a written plan for operational monitoring of the land application area to DWNR and the Department of Game, Fish, and Parks. The plan shall include methods for soil and soil water sampling, vegetation sampling and analysis, soil characteristics and parameters to be monitored, proposed analytical techniques and sampling frequency. The plan shall also include criteria for determining if and when land application should be initiated or discontinued and shall include maximum metals accumulation values. The plan shall be subject to review and approved by DWNR and the Department of Game, Fish, and Parks.

7. The land application system shall be operated in such a manner so as to minimize erosion and physical disturbance of vegetation.

8. Plans and specifications for the land application system shall be submitted to DWNR for review and approval prior to construction. DWNR shall not unreasonably withhold its approval of plans and specifications if they reflect the technical parameters specified in the permit.

9. The land application rating system contained in Attachment No. 2 of the permit application utilizes less than conservative assumptions concerning the land application area. Gilt Edge shall prepare and submit a revised rating system utilizing conservative assumptions and actual values determined by on-site testing. Design of the land application system shall be revised as necessary to ensure that it is consistent with the findings of the revised rating system.

Water Quality Monitoring

1. Gilt Edge Inc. shall submit a yearly surface and groundwater characterization report beginning the year a mine permit is granted. This report shall include, but is not limited to all chemical, discharge, and water level data gathered and a summary and analysis of this data.

2. Gilt Edge shall submit an operational groundwater and surface water monitoring plan including, at a minimum, ten groundwater monitoring stations and six surface water monitoring stations. The plan shall include the parameters to be monitored and frequency of monitoring. The monitoring plan shall be subject to DWNR review and approval prior to construction. The operational monitoring plan shall be continued until final bond release.

3. Gilt Edge shall measure water levels in all groundwater wells quarterly. Shallow well water level measurements shall be done in conjunction with surface water gauging and sampling.

4. Gilt Edge shall submit a land application site monitoring program including, but not limited to, monitoring methodology, number of monitoring stations, sampling parameters, and sampling frequency. The monitoring program shall be subject to DWNR review and approval prior to the commencement of construction of the land application system.

5. Requests to refine or modify water quality monitoring parameters or procedures must be accompanied by a rationale for the refinements and must be approved in writing by the Department.

6. Surface water, ground water, and land application monitoring sites shall be sampled once for Uranium, Radon, Radium 226, Radium 228, Total Alpha Radiation, and Total Gamma Radiation prior to operation to determine their presence and background concentrations. Should the chemical characterization of the treated process water indicate above background concentrations of these parameters, they shall be included in the operational surface and ground water sampling programs. Results of this sampling and analysis shall be submitted to DWNR.

7. All surface and groundwater sampling data sheets shall be submitted to DWNR on a quarterly basis or as dictated by monitoring frequency.

8. All chemical analysis required for water quality monitoring shall be conducted by an EPA certified lab.

9. All water quality sample collection, preservation, and holding times shall be in accord with established QA/QC procedures. A QA/QC plan outlining the above shall be submitted to DWNR.

Table 1

Parameters for Baseline Water Quality Monitoring

Required	Recommended
pH	Fecal coliform
Conductivity	Dissolved oxygen
Total suspended solids (surface water)	Total solids
Total dissolved solids	Ba
Turbidity (NTU)	Fluoride
Hardness (Calcium Carbonate)	
Bicarbonate	
Sulfate	
Alkalinity	
Nitrate	
Nitrite	
N, total Kjeldahl	
N, ammonia	
Phosphorus, total	
Cyanide, total	
Cyanide, free	
Cyanide, WAD	
Chloride	
Ca	
Mg	
Na	
K	
Total metals including:	
Ag	
As	
Cd	
Cr	
Cu	
Ni	
Pb	
Zn	
Hg	
Al	
Se	
Fe	
Mn	
Sb	
Mo	
B	
Co	
V	
Li	
Be	

Spill Contingency Plan

1. The definition of "spill" contained in Attachment No. 11 of the permit application entitled Modifications to Hazardous Materials Spill Contingency Plan, page 5, shall be as follows: Any discharge of hazardous material, "special waste", or oil into or upon waters of the State of South Dakota or to a location which threatens the public health, environment, or waters of the State.

2. There shall not be any loss or release of cyanide or any other hazardous material, "special waste", oil, or toxic element associated with the gold recovery process to the surface environment outside the project boundary or to any surface or subsurface waters of the State.

3. No distinction shall be made by Gilt Edge as to the major or minor nature of a spill. All spills shall be treated equally and corrective actions shall continue until the spill material is at or below a concentration equivalent to background concentration.

4. Any evidence indicating that cyanide or any hazardous material, special waste, oil, or toxic element associated with the gold recovery process is being or has been released to the environment, or evidence indicating possible structural failure of the leach pads, process ponds, or processing facility shall be reported to the Department of Water and Natural Resources within 24 hours at one of the following numbers: (605) 773-3231, (605) 773-3296, (605) 773-4201.

5. Neutralizing chemicals shall be stored on-site in quantities sufficient to neutralize the maximum amount of cyanide that may occur in the processing system at any one time.

6. Gilt Edge shall identify all access routes to be used to transport any hazardous material, special waste, or oil to the site and shall acquire any necessary approvals for use of such routes from the appropriate agencies.

7. Gilt Edge shall submit information concerning the possible negative impacts of neutralizing cyanide utilizing alkaline chlorination and shall provide an explanation of how these potential negative impacts will be mitigated if they occur.

8. Spill response equipment and supply inventories shall be maintained by Gilt Edge with copies submitted to DWNR on request.

9. Gilt Edge shall prepare an inventory of potential points of containment and shall prepare and submit a map depicting them prior to operation.

10. Gilt Edge shall consult Lawrence County Civil Defense officials to determine how and if they want to be involved in emergency response actions.

11. Gilt Edge shall submit a completed spill report form to DWNR within 72 hours of the spill event. In addition to the information included in the form as outlined on pages 19 and 20 of Attachment No. 11 of the permit application, the following shall also be included:

    a. The title of the person reporting the incident;
    b. Containment measures taken;
    c. Treatment measures undertaken;
    d. Recovery measures taken;

e. Proposed further mitigation if required;
f. Monitoring and sampling results;
g. Location for disposal of removed contaminants;
h. Photographic documentation.

Written progress reports shall be submitted every fifteen days after the initial report, until corrective action is complete.

12. The Gilt Edge Spill Contingency Plan shall in no way limit the Boards enforcement power as outlined in SDCL 45-6B (in specific reference to closure criteria).

13. Plans and specifications for petroleum product storage tank installation and containment shall be submitted to DWNR for review and approval prior to construction. Containment shall include any diking necessary to prevent overland flow and lining systems and recovery systems to prevent infiltration and groundwater contamination. Underground storage tanks and lines shall meet RCRA Subtitle I Interim Standards.

14. Plans and specifications for chemical storage area containment shall be submitted to DWNR for review and approval prior to construction.

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Reclamation

1. Any old underground workings intercepted by mining activities shall be covered or otherwise sealed off during the course of reclamation activities.

2. Available topsoil or other soil material suitable for use as a plant growing medium shall be stripped and stockpiled for use in reclamation. Topsoil stockpiles shall be stabilized to prevent wind and water erosion.

3. Areas to be revegetated shall be topdressed, topsoiled, fertilized and mulched as necessary to establish and maintain a long lasting vegetative cover that is capable of self regeneration.

4. All accessible areas of the open pits and other affected land capable of supporting vegetation shall be revegetated.

5. During the course of operations, Gilt Edge shall establish reclamation test plots utilizing the proposed foundation growth medium, topdressing, fertilizing, mulching, and seeding specifications found in the Gilt Edge Project Comprehensive Reclamation Plan. Test plots shall be located on the complete range of slopes expected to be present on affected lands to be reclaimed and revegetated following mining and processing operations. Results of the test plot studies shall be submitted to DWNR, the Department of Game, Fish, and Parks and the Lawrence Conservation District.

6. Prior to final closure and bond release, Gilt Edge shall maintain sufficient access to reclaimed areas to allow for any necessary reclamation maintenance required. Access roads that are not necessary for future use shall be reclaimed upon determination of the success of reclamation of all other affected and reclaimed areas.

7. A revised post reclamation map shall be submitted pursuant to SDCL 45-6B-7-(8). The map submitted April 29, 1986, in Supplement 7 is inconsistent with the Gilt Edge Project, Comprehensive Reclamation Plan. The following changes shall be included:

   a. The Leach Pad Access Road shall be outlined and the proposed final land use given.

Tailings Reclamation

1. Gilt Edge shall, following removal of the existing mine tailings, reclaim the area which they presently occupy in accord with the Gilt Edge Project Comprehensive Reclamation Plan. The reclaimed area shall be treated as necessary to prevent further surface and groundwater contamination.

2. If any of the existing tailings are not removed, they shall be graded to approximate existing slopes, stabilized, revegetated and treated as necessary to prevent further surface and groundwater contamination.

3. Any tailings removed and utilized elsewhere in the project shall be treated as necessary to prevent surface and groundwater contamination.

Heap Neutralization

1. Following cessation of leaching, the spent ore of the heap shall be neutralized such that the heap contains less than 0.2 mg/L weak acid dissociable cyanide (ASTM Method-D2036-80(C)) cyanide and contains acceptable levels of other parameters (as listed below). Following the neutralization cycle, effluent from the heap shall be chemically characterized by analyzing for the following parameters:

   a. Total Metals Including: Al, As, B, Be, Ba, Cd, Cr, Fe, Pb, V, Mn, Hg, Mo, Ni, Se, Si, Ag, Zn, Co, Li,

   b. Total Cyanide, Free Cyanide, WAD Cyanide

   c. Free Chlorine

   d. pH

   e. Radon, Uranium, Radium 226, Radium 228, Total Alpha Radiation, Total Gamma Radiation

   f. Major Cations

   g. Major Anions

   h. Cation-Anion Balance

   i. Na, Ca, Ng, K, Cl, SO_4, CO_3, HCO_3, NO_3, NH_4

   j. Total Dissolved Solids (TDS)

   Effluent samples from the heap shall be collected on a quarterly basis for 2 consecutive years and analyzed for any parameters occurring above detection limits during the initial effluent chemical characterization. Should monitoring indicate the presence of cyanide or unacceptable levels of any other parameter, Gilt Edge shall take appropriate measures to reduce the levels to acceptable values. For purposes of heap neutralization, acceptable values shall be defined as the concentration or level of a given parameter sufficient to meet EPA Drinking Water Standards or Surface Water Quality Standards for potential receiving streams in the area, whichever is more stringent. In the case where a given parameter is not included in either the EPA Drinking Water Standards or Surface Water Quality Standards of if these standards cannot feasibly be met for a given parameter, acceptable values shall be determined by utilizing best professional judgement based on existing criteria documents and approved by DWNR. All effluent monitoring data shall be submitted to DWNR.

Stream Rehabilitation

1. Willow cuttings shall be planted at a rate of one clump of five willow cuttings per fifteen lineal feet to provide for bank stabilization and wildlife habitat on the rehabilitated stream channel.

Bond Conditions

1. Gilt Edge shall submit a reclamation surety in the amount of $672,376 prior to commencement of operations.

2. Gilt Edge shall earmark $50,000 of the reclamation bond for open pit landshaping purposes as described in the reclamation plan. Prior to commencing landshaping activities, the appropriate agencies (Game, Fish and Parks, Soil Conservation Service and DWNR) shall be consulted by Gilt Edge to determine the extent and specifics of the landshaping activities. In the event that the cost of the landshaping is less than $50,000, the remaining funds shall be used to establish wildlife habitat in the open pit.

STATE OF SOUTH DAKOTA

BOARD OF MINERALS AND ENVIRONMENT

DEPARTMENT OF WATER AND NATURAL RESOURCES

IN THE MATTER OF THE APPLICATION OF BROHM MINING CORPORATION FOR AMENDMENTS TO MINING PERMIT NO. 439	)))))	FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER

A hearing was held before the State Board of Minerals and Environment (hereinafter Board) on March 16 and 17, 1988, in Pierre, South Dakota to consider the Application of Brohm Mining Corporation (hereinafter Brohm) for Amendments to their Mining Permit No. 439. The Application for Amendments included the following: change in pit configuration and affected land area, including corridor areas and new waste dump area; increase in annual ore mining rate and increase in life of mine up to ten years; adopt on/off leach concept with amended pad design and neutralized spent ore disposal site; change to zinc precipitation processing and add diatomaceous earth facility; revise processing facility utilizing a single process pond; change in location of administrative offices; authorize operation 365 days per year; amendments to reclamation plan; amend cyanide neutralization level for heap leach pads to .5 weak acid dissociable to conform with state mining regulations; authority to use best technology for neutralizing solution for land application; Board of Minerals and Environment authorization to Department of Water and Natural Resources to approve technical revisions for original permit area

and amendment areas; option to process old tailings; and establish permit boundaries around original permit area and amended areas.

Present at the hearing were the following members of the Board: Acting Chairman Lee McCahren, Richard Sweetman, Tom Graslie, Grace Petersen, Charles Mickel, Wilbert Blumhardt, Linda Hilde and George Valentine.

Appearing on behalf of the South Dakota Department of Water and Natural Resources (hereinafter Department) was Assistant Attorney General Larry Donovan; and appearing for Brohm was Marvin D. Truhe.

Evidence and testimony was presented on behalf of Brohm and the Department. Brohm presented the following witnesses: Rex Outzen, Steve Narkiewicz, Ed Cryer, Maxwell Botz, and Dr. Larry Brown. The Department presented Michael Cepak, Robert Townsend and Department Secretary John Smith. The Department recommended conditional approval of the Application for Amendments.

Based upon the evidence, arguments, and testimony presented at the hearing, the Board makes the following:

FINDINGS OF FACT

1. Brohm made written application dated January 11, 1988, to the Board of Minerals and Environment for amendments to its Mining Permit No. 439 for the following purposes: change in pit configuration and affected land area, including corridor areas and new waste dump area; increase in annual ore mining rate and increase in life of mine up to ten years; adopt on/off leach

concept with amended pad design and neutralized spent ore disposal site; change to zinc precipitation processing and add diatomaceous earth facility; revise processing facility utilizing a single process pond; change in location of administrative offices; authorize operation 365 days per year; amendments to reclamation plan; amend cyanide neutralization level for heap leach pads to .5 weak acid dissociable to conform with state mining regulations; authority to use best technology for neutralizing solution for land application; Board of Minerals and Environment authorization to Department of Water and Natural Resources to approve technical revisions for original permit area and amendment areas; option to process old tailings; and establish permit boundaries around original permit area and amended areas.

2. The application as supplemented by Brohm was complete and contains all requested and required information.

3. Brohm's mining permit amendment application was properly filed with the Lawrence County Register of Deeds office.

4. The Department caused to be published proper and timely notices of the Board hearing in the Rapid City Journal, Brookings Daily Register, Sioux Falls Argus Leader, Queen City Mail, and Lead Daily Call.

5. Copies of the application were sent to the South Dakota Departments of Health; Education and Cultural Affairs; Game, Fish and Parks; Agriculture; the Lawrence County Conservation District; and the U.S. Department of Agriculture,

Forest Service. The written responses received from the above agencies were admitted into evidence at the hearing.

6. The Lawrence County Board of County Commissioners reviewed the amendment application, and submitted its written response confirming that the proposed amendments were in full compliance with Brohm's existing permits, Lawrence County's Comprehensive Plan, and all applicable zoning and subdivision regulations. The letter was admitted into evidence at the hearing.

7. Brohm agreed (subject to its position taken at the hearing regarding the applicability of the new backfilling regulations) that the substantive provisions, but not the procedural provisions, of the Board's new mining regulations A.R.S.D. Chapters 74:29:05, :07, and :08 applied to the amendment application.

8. The Department proposed Conditions to the Permit Amendment which Permit Conditions are marked Exhibit A and attached hereto and incorporated herein by reference. Brohm agreed to said Conditions subject to its rights as specified to contest or have modified some of the conditions.

9. The Department recommended conditional approval of Brohm's Application for Permit Amendments with the recommendation being expressly subject to the Conditions set forth in Exhibit A.

10. The Department requested that it be authorized to approve specific technical revisions listed in the "Technical Revisions" section of the Conditions of Exhibit A, and such authorization is hereby specifically approved by the Board.

11. Backfilling of the Sunday and Dakota Maid mine pits is not economically or physically feasible. Brohm has agreed, however, to store mine waste rock in mined out areas to the fullest extent practical to maximize the amount of material that is available for grading, backfilling, and topographic reconstruction of the open pits following mining.

12. The Board hereby specifically approves Brohm's requested Mine Permit Boundary as set forth in the map introduced into evidence as Exhibit 2-1.

13. The Board hereby specifically approves the additional bond amount of $558,500 to adjust for the additional reclamation costs associated with the Amendments; and approves phased bonding for the Amendments.

Based upon the above, the Board makes the following:

CONCLUSIONS OF LAW

1. The Board has jurisdiction over the parties to this proceeding and the subject matter thereof.

2. Brohm's Application for Amendments to its Mining Permit No. 439 is complete, contains all of the items required by law, and otherwise fulfills all of the statutory and legal requirements for issuance of the Amendments.

3. Brohm's proposed Amendments, if conducted in accordance with the submitted application as conditioned by the Board, will not cause adverse, unmitigated impacts to the environment or natural resources of this state.

Based on the above Findings of Fact and Conclusions of Law and the evidence received at the hearing, including the

application and all related documents on file herein, the Board of Minerals and Environment hereby ORDERS

That the above-referenced Amendments to Mining Permit No. 439, as conditioned by Exhibit A, attached hereto, be issued to Brohm Mining Corporation.

Dated and signed this 21st day of April, 1988.

South Dakota Board of Minerals
and Environment

By: Lee McCahren

Lee McCahren,
Hearing Chairman

4

March 1, 1988

BROHM MINING AMENDMENT CONDITIONS

Technical Revisions

The Board, pursuant to ARSD 74:29:03, hereby authorizes the Department to approve proposed technical revisions to Brohm Mining for the following:

1. Monitoring plans and parameters;

2. Plans and specifications;

3. Revegetation techniques, seeding mixtures or planting rates;

4. Modification or relocation of erosion, sedimentation, or drainage control;

5. Compliance limits for chemical parameters;

6. Quality control and quality assurance plans;

7. Topsoil stripping or storage piles and slash piles;

8. Adding contiguous affected land within the permit boundary area. The sum of such additions by technical revisions shall not exceed twenty percent of the permitted affected land area;

9. Adopting new reagents and/or processes for cyanide destruction, as they become available in the industry;

10. Implementing new and improved reclamation techniques, as they are developed;

11. Relocation of proposed roads within permit boundary;

12. Relocation of chemical or petroleum product storage areas;

13. Implementing new surface mining techniques and/or equipment, as available; and

14. Modifying the gold recovery process within the process facility for maximum performance.

Technical revisions shall be submitted to the Department in writing. The Department shall either approve, disapprove, conditionally approve or request additional information deemed necessary to approve technical revisions within thirty days of receipt.

General

1. The leach pad and process ponds shall be designed and constructed for total containment of all process fluids. The leach pad and process ponds shall permit zero detectable discharge of process fluids from the bottom of the soil liner. If leakage from the bottom of the soil liner is detected, remedial action shall be required.

2. Brohm Resources shall submit documentation to the Department that demonstrates that the proposed liners and aggregate used in the Leak Detection Collection and Recovery Systems (LDCRS) are chemically compatible and suitable for use with the process solutions.

3. Conditions placed on plans and specifications approval by the Department shall be considered conditions of this amendment. The conditions placed on plans and specifications approval will not alter the conceptual design of the facility as amended. Brohm Mining may request a hearing before the Board to contest any conditions placed on plans and specifications approvals.

4. Brohm Mining shall obtain a water permit, if required, for the leach pad and surge pond in accordance with ARSD 74:02:08 (Safety of Dams) prior to loading of the pad.

5. Brohm Mining shall not commence waste or spent ore disposal in those amended areas of Ruby Gulch and Hoodoo Gulch which show U.S. Forest Service surface ownership, until Brohm Mining has acquired surface ownership title to these lands or Brohm Mining has obtained an approved U.S. Forest Service operating permit for these lands. The specific tracts of land showing Forest Service ownership are the following unpatented mining claims: Wallace, Wallace Fraction, Last Chance No. 1 and Last Chance No. 2.

6. Prior to operational leaching Brohm Mining shall install a game fence around the leach pad area to prevent wildlife from entering the site.

7. Analysis of spoil material may be required whenever mining encounters new mineralogy which has potential to be a source of water pollution, such as, greater sulfide mineralization than encountered previously.

8. The Department may sample and analyze drainage, if present, from the toe of all spoil piles, to determine Brohm Mining's compliance with applicable water quality standards.

9. For all exposed open pit surfaces that are determined to be toxic acid forming or capable of preventing reestablishment of vegetation, Brohm Mining shall submit a mitigation plan to the Department for review and approval.

Plans and Specifications - Heap Leach Pad - Process Ponds

1. The heap leach pad shall be generally constructed as follows (top to bottom):

   a. 3 inches asphaltic concrete;

   b. Impervious asphalt impregnated geotextile (petromat) or 200 mil of rubberized asphalt;

   c. 3 inches asphaltic concrete;

   d. 18 inches of select drainage aggregate (1/2 inch nominal size) to serve as the LDCRS;

   e. 60 mil HDPE flexible membrane liner;

   f. 6 inches tailing mixed with processed bentonite and lime sufficient to reach a permeability of 10^{-7} c/sec; and

   g. 6 inches of mixed tailings and lime material.

2. The process ponds shall be generally constructed as follows (top to bottom):

   a. 60 mil HDPE flexible membrane liner;

   b. Geonet drainage material;

   c. 60 mil HDPE flexible membrane liner; and

   d. 24 inches of tailings mixed with processed bentonite and lime sufficient to reach a permeability of 10^{-7} cm/sec and compacted in four 6 inch lifts. The 24 inches of tailing/bentonite/lime will be graded approximately 2 feet up the side walls of the ponds. The pond side walls will have a slope of 1.5(H) to 1.0(V).

Construction Quality Assurance (CQA)

1. Brohm Mining shall employ qualified independent CQA consultants to perform inspections and testing of all of the components of the facility required to have CQA plans. The duties, qualifications, responsibilities and authority of independent CQA consultants shall be submitted to the Department prior to construction.

2. Brohm Mining shall have designated quality assurance personnel on the site at all times during the construction of the facility.

3. Brohm Resources shall have CQA samples sent to the laboratory as soon as possible following collection to optimize turnaround time. This will allow for timely action on repairs necessitated by test results. Construction which would inhibit the ability to conduct repairs shall not be initiated until laboratory results have been evaluated to either confirm proper construction or determine repairs are needed. When material is rejected because observation and tests indicate that the work does not meet design specifications, further testing shall be conducted to define the extent of the problem and to allow adequate corrective measures to be implemented. The material shall be reworked, or replaced, and retested until it meets the design requirements. Any component of the facility whose construction is contingent on the completion of the failed component, shall not commence until the failed component meets design requirements.

4. Operational leaching shall not commence until all components necessary for environmental protection are entirely completed and meet design specifications.

Soil Liner

1. Lime shall be added to the tailings/bentonite soil liner material to act as an buffering agent with the acidic tailings. The lime shall be added in an approximate amount of .6% by weight to the soil liner.

Geomembrane and Asphalt Liners

1. The integrity of geomembrane liners shall be protected throughout construction and operation. Specific design features and quality assurance methods shall be incorporated in liner construction to protect the lining systems from puncture and excessive stresses.

Leak Detection, Collection and Recovery System (LDCRS)

1. Brohm Mining shall establish a monitoring program for all LDCRS and shall report findings and flow data to the Department on a quarterly basis.

2. For the pad and pond liner systems, leakage through a primary liner shall have the following Action Leakage Rate (ALR) schedule:

(1) Heap leach pad:

0 to 20 gals/acre/day (gpad)	No response required
20 to 100 gpad	Initiate response action, additional monitoring and reporting required, and areas of leakage located
100 to 300 gpad	Change pad loading/spraying sequence to reduce leakage
300 to 500 gpad	Repair leaks
> 500 gpad	Shutdown of section contributing to leakage, replace primary liner as necessary

(2) Surge pond and neutralization pond:

0 to 20 gpad	No response required
20 to 200 gpad	Initiate response action, additional monitoring and reporting required, and areas of leakage located
200 to 500 gpad	Repair leaks
>500 gpad	Unit shut down, replace primary liner as necessary

Brohm Mining shall in the framework of the ALR schedule develop a detailed leakage response action plan. The plan shall be submitted to and approved by the Department prior to operational leaching. If Brohm Mining can demonstrate that the ALR schedule is unattainable with present technology, the Department may revise the ALR requirements.

3. Prior to operational leaching, the leach pad and process ponds shall be tested for leakage by methods approved by the Department. If testing reveals leakage through the primary liner, the appropriate action as defined by the ALR schedule shall be taken and the liner retested for suitability for use. The leach pad and process ponds shall not operate in excess of the ALR scheduled leakage of 500 gpad except during Department approved testing.

4. LDCRS receptacles for both the leach pad and process ponds shall be formally observed on a weekly basis when the ALR is less than 20 gpad. LDCRS receptacles shall be observed on a daily basis or as necessary when the ALR is 20 gpad or more. If an ALR threshold is exceeded, Brohm Mining shall notify the Department within 24 hours of detection.

Spent Ore Disposal Site - General

1. Brohm Mining shall obtain a Solid Waste Disposal permit, if required, for the tailings (treated spent ore) disposal site in accordance with SDCL 34A-6 and ARSD 74:27 prior to disposal in Ruby Gulch.

2. Final reclamation of the 2.5(H):1(V) slopes in the Ruby Gulch tailings (treated ore) disposal site shall include grading the slopes to a hummocky topography and clump plantings of trees to break up the smooth, uninterrupted slope faces in order that the risk of snow slab failure may be minimized and to improve visual effects.

Reclamation

1. Brohm Mining shall store mine waste rock in mined out areas to the fullest extent practicable to maximize the amount of material that is available for grading, backfilling and topographic reconstruction of the open pits following mining.

2. All underground mine openings and workings intercepted by surface mining activities shall be appropriately sealed during reclamation. Final plans for mine opening closures shall be submitted to the Department for approval prior to closure. Brohm Mining shall notify the Department at least 48 hours prior to closure of mine opening so that Department inspectors may witness the closure.

3. All final reclamation drainage channels shall be designed to be non-erosive for a DWNR approved precipitation event. Brohm Mining Corporation shall have rock check dams dipersion ditches, or other adequate structures, as approved by DWNR, installed to prevent channelization of surface runoff and subsequent erosion and sedimentation.

4. Mulching rates shall be established in test plots which will determine the amount of mulching necessary to sustain vegetative vigor. Prior to final reclamation, results of the mulching tests shall be submitted to the Department for approval of the recommended mulching rates.

Water Quality Monitoring

1. No surface water discharge of spent ore or waste rock leachate downstream of the toe of the Ruby and Hoodoo Gulch dumps shall exceed South Dakota Ground and Surface Water Quality Standards or if this criteria proves to be inappropriate alternate site-specific criteria based on a pathway and fate analysis may be developed by the Department.

2. Brohm Mining shall obtain a Ground Water Discharge Permit, if required, for the spent ore and waste rock disposal sites in accordance with ARSD 74:03:15 and 74:03:16, as applicable, prior to any off loading or disposal.

3. Soil and subsoil sufficient to provide the attenuation properties appropriate to protect water quality as described in the amendment submittal and consistent with the ground water discharge permit, if required, shall remain in place at the spent ore and waste rock disposal sites.

4. All new ground water quality monitoring stations shall be sampled and analyzed monthly, and all new surface water quality monitoring stations shall be sampled and analyzed bi-monthly, for the parameters listed in the original conditions (No. 6 and Table 1) to establish baseline and correlations with existing data. Baseline water quality to characterize Ruby and Hoodoo Gulch shall be submitted to the Department before any disposal of spent ore and waste rock. The following locations shall be used to establish the baseline water quality for Ruby and Hoodoo Gulch, Bed 18, GW-8, Bed 19, SW 35, Bed and Bes 15, GW-10, SW28, Bes 17 SW4, the spring in the unnamed gulch, and 1 bedrock well to be located adjacent to GW-8 in Ruby Gulch.

5. Any underground mine openings located in the spent ore or waste rock disposal areas shall be plugged prior to disposal. Final plans for mine opening closures shall be submitted to the Department for approval prior to closure. Brohm Mining shall notify the Department at least 48 hours prior to closure so that Department inspectors may witness the closure. Any mine openings which are located near the waste dumps that may be a potential pathway for leachate from the dumps to reach the ground water shall also be plugged.

6. Operational monitoring shall be conducted on a quarterly basis, unless otherwise required by these permit conditions or other Departmental permits. Water levels in the ground water wells shall be taken in conjunction with water quality sampling.

7. Monitoring wells shall be constructed according to the South Dakota Well Construction Standards, ARSD 74:02:04, and the appropriate variances shall be obtained from the Division of Water Rights. Monitoring wells shall meet the following criteria:

   a. All wells monitoring in the same aquifer shall be screened to yield correlative water quality. The screen shall be isolated from all other water sources.

   b. All wells shall be properly developed prior to sampling.

   c. Wells utilized to measure ambient water quality shall be located beyond the up-gradient extent of potential contamination.

   d. Down-gradient wells shall be located to allow for the earliest possible detection of leachate.

   e. Wells may be located to allow monitoring of more than one facility if such locations are approved by the department.

   f. Wells shall be clearly marked with an identification code corresponding to the code on the approved map of monitoring locations.

   g. Wells shall be securely capped to prevent vandalism and contamination.

   h. Well casing elevations and locations shall be accurately surveyed by a competent person and indicate on the monitoring point location map.

   i. The surveyed elevation point shall be clearly and permanently marked on the casing.

   j. Water levels shall be measured from the surveyed and marked measuring point to an accuracy with 0.01 foot.

   k. Concurrent surveys of all well casings shall be made annually determine if movement has occurred. These surveys shall include the elevation and location of all wells.

8. All surface and ground water sampling data sheets shall be submitted to DWNR no later than ten days after Brohm Mining's receipt from the lab.

9. The french drain located below the fill of the plant/pond site shall be monitored at a point down gradient of the plant/ponds on a monthly basis for pH, conductivity, TDS, WAD Cyanide, Free Cyanide, Sodium, Gold, and Arsenic. Additionally, this point shall be monitored on a quarterly basis for the complete set of operational monitoring parameters designated for other surface and groundwater sampling sites.

Heap Neutralization

Brohm shall comply with the requirements fo ARSD 74:29:05:05 through 74:29:05:11, inclusive, in regard to spent ore treatment and monitoring prior to off-loading, including the following:

A) Intensive treatment characterization shall be conducted on the first and second heaps in accordance with the following:

1) Based on the initial sampling and chemical characterization of effluent or pore water required by ARSD 74:29:05:06, the Department will designate key monitoring parameters for the intensive treatment characterization. These parameters will include any of those found above detection limits and any parameter which may be likely to occur in the effluent or pore water.

2) Monitoring during the intensive treatment characterization shall include the following:

a) Following treatment, effluent from the heaps shall be sampled 6 times over a 48 hour period. The 6 samples shall be composited and shall be analyzed for the parameters designated in (1) above. Each individiual sample shall be analyzed for WAD cyanide; and

b) Following treatment Brohm shall collect a minimum of ten solid samples from locations in the heap to provide a representative sampling of the heap. These samples shall be subjected to a laboratory leachate test approved by the Department and analyzed for the parameters designated in (1) above.

3) Compliance with treatment standards - the spent ore will be considered suitable for off-loading when:

a) The mean value for WAD cyanide in the 6 effluent samples is less than 0.5 mg/l., with no individual sample exceeding 2.5 times the mean;

b) The values for other key parameters in the 6 sample effluent composite meet the treatment standards designated in 74:29:05:08; and

c) The mean values for leachate from solids samples meet the treatment standards designated in 74:29:05:08, with no individual sample exceeding 2.5 times the mean.

d) Should sampling according to this schedule indicate that treatment standards have not been met, Brohm shall take measures to investigate the cause and reduce the levels to meet treatment standards prior to off-loading.

B) Operational monitoring of treatment following the intensive treatment characterization shall include the following:

1) Based on the results of the intensive treatment characterization, the Department will designate key operational monitoring parameters to be analyzed for during routine operations. WAD cyanide will be one of the key operational monitoring parameters;

2) Operational monitoring shall include collecting 3 individual effluent samples over a 24 hour period from each heap, if the intensive treatment characterization indicates extreme variablility or unpredictability in analytical results, more intensive sampling may be required;

3) Each heap shall be considered suitable for off-loading when the mean value for the designated operational monitoring parameters in the 3 individual effluent samples meet the treatment standards of 74:29:05:08, with no individual sample exceeding 2.5 times the mean;

4) During each seven-cell leaching cycle, one heap shall be sujected to the monitoring required under intensive treatment monitoring, (A-2) above. This monitoring will begin with heap cell #3 following its second use, and shall continue with heap cell #4 after its third use, #5 after its fourth use, and so on. Compliance for off-loading must be demonstrated in accordance with (A-3) above. If these intensive monitoring procedures clearly indicate that the reliability of the operational monitoring schedule or parameters is inadequate, the Department may revise the operational monitoring schedule to correct deficiencies.

C) Prior to off-loading, each heap Brohm shall submit copies of all sampling and analytical data required by the monitoring schedules indicated above.

D) Following cessation of ore leaching activities by Brohm, any spent ore left. on the pad area shall be treated to meet the treatment standards of ARSD 74:29:05:08. Final monitoring shall be done in accordance with (B) above.

E) Upon final reclamation, all spent ore heaps not designated for retention of fluids, shall be free draining. Drainage from such areas shall not cause erosion, interfere with post-closure monitoring systems, cause water pollution, or limit necessary access to the site.

Relic Tailings

1. Prior to reprocessing relic tailings Brohm Mining shall submit for DWNR approval a plan for the disposal of the tailings. The plan shall include analyses performed on the tailings, a description of the processing to be performed, and any special reclamation requirements. Relic tailings not reprocessed or utilized in soil liner construction shall be reclaimed by covering with a minimum of two feet of foundation growth medium, topdressing and revegetating.

Bond Conditions

1. Brohm Mining shall submit an additional surety in the amount of 558,500 dollars to adjust for the additional reclamation costs associated with the amendment. Brohm Mining may submit the surety in phases corresponding the land disturbance of the amended affected land.

2. Condition No. 2 of the original Bond Condition earmarked 50,000 dollars of the reclamation bond for open pit landshaping, with any remaining funds not needed for landshaping to be used for wildlife habitat in the pits. That bond condition is amended to require earmarking 60,000 dollars of the bond for landshaping with any remaining funds to be used for additional tree planting on all affected lands, except for the access corridors.

South Dakota
Department of
Game, Fish and Parks
3305 West South Street
Rapid City, SD 57702
(605) 394-2391

Division of Wildlife

REQUIREMENT FROM GAME, FISH + PARKS WITH MARCH 88 PERMIT AMENDMENT.
John Wilbanks
3-18-88

SCOTT
FOR YOUR FILE

March 7, 1988

Mr. John Wilbanks
Brohm Mining Corp.
P.O. Box 485
Deadwood, SD 57732

Dear John

Based on our review of the proposed amendment to the Gilt Edge mine permit we have the following comments:

1. Trees shall be planted on all affected lands, excluding corridors, to optimize habitat for game and nongame species. It is recommended that spruce and bur oak be included in test plot evaluation.

2. Prior to disturbing the amendment area in Ruby Gulch baseline wildlife inventories shall be conducted and the report presented to this department. Based on these baseline studies further comments may be forthcoming. Previous baseline work on the remainder of the permit amendment area is adequate.

3. Deciduous trees shall be included in the planting mixtures for the mine pit benches to increase the quality of wildlife habitat.

Sincerely

Barry

Barry Parrish
Wildlife/Mineral
Environmental Coordinator

BP:mg

c: Kirk
Townsend
Donovan

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MAR - 9 1988
BROHM MINING CO.

South Dakota
Department of
Game, Fish and Parks
3305 West South Street
Rapid City, SD 57702
(605) 394-2391

Division of Administration
Sigurd Anderson Building
445 East Capitol
Pierre, South Dakota 57501

February 15, 1985

Mr. Richard J. Hall
Manager, Special Projects
LACANA Mining, Inc.
2005 Ironwood Parkway, Rm. 105
Coeur d'Alene, ID 83814

Dear Rich

As per request we are sending a list of wildlife related items which were discussed at the February 12 meeting in Pierre. For the most part we are requesting further details specific to the Gilt Edge mine program.

These items are:

1. Game fencing around any site with exposed cyanide bearing solution.

2. Develop a set of alternatives to prevent cyanide related avian mortality.

3. A revegetation plan for all disturbed areas. This should include seeding mixtures, woody species plantings, planting densities and expected cover. Plans will need to be specific for the various mine components (eg. mine pit, waste rock, spent heaps). As discussed this will need to be coordinated with Jerry Nelson (S.C.S.) and my department.

4. Outline of objectives and methods to be used in revegetation studies for anomalous sites (eg. spent heaps).

5. Plans and specifications for the removal of the old tailing piles.

The wildlife and fisheries baseline work will continue during the construction stage and through the first year of operation. Based on the three years data a biological monitoring program will be developed for the life of the mine. The 1985 field work will be modified by conducting bird censusing prior to July 1, and by using an artificial substrate sampler for macroinvertebrate collections. The rest of the baseline work should be the same as in 1984. Please contact this office prior to initiating the field work so that we can provide the proper permits.

If you have questions concerning any of these items or if you feel I have omitted any item, please contact me.

Sincerely

Barry

Barry Parrish
Wildlife/Mineral
Development Coordinator

BP:mg

cc: Kirk
Townsend

South Dakota
Department of
Game, Fish and Parks

Division of Wildlife

3305 West South St.
Rapid City, SD 57701

August 29, 1986

Ritch Hall
Gilt Edge Inc.
2005 Ironwood Parkway, #222
Coeur d'Alene, ID 83814

Dear Ritch:

The South Dakota Department of Game, Fish & Parks has reviewed the Gilt Edge permit application and reclamation plan. Based on this review and field inspections we have the following comments.

A. Reference the reclamation plan.

1. Under Quantification on pages 18-19 it is stated that an "estimated 50% of the bench and floor areas of the pits will be rendered inaccessible to equipment, and that revegetation of the remaining 50% will be made more difficult. The company will revegetate the remaining 50% to the best of its ability, and within the limits of practicality."

   While we agree that landshaping will temper the appearance of the pit, vegetation also will have that affect while providing wildlife habitat. Wildlife habitat is a stated post-mining land use; however the quoted statement does not commit Gilt Edge, Inc. to revegetate a specified percentage of the pit. We will need further clarification of this point for our review of the pit reclamation proposal.

2. We recommend that reclamation be an ongoing process during the course of mining. In terms of wildlife there are three primary benefits to reclaimi as areas are mined out.

   a) By providing habitat during mining, displacement time for some species is shortened.
   b) The final reclamation product will consist of a series of plantings in various development stages. This will supply wildlife with some established habitat at the termination of mining and will add to the structural diversity of the area.
   c) Ongoing reclamation will yield data on successful species, methods, planting times, etc., that can be used to fine tune the revegetation methodology.

3. Seedlings and samplings of woody species are susceptible to livestock grazing; therefore, the area will have to be porotected from livestock until the vegetation becomes firmly established.

B. Reference the technical supplements.

1. The mine is situated in Elk and Deer range. To minimize potential big game mortalities, fencing, adequate to preclude elk and deer from areas with exposed cyanide solution or other toxic materials, shall be constructed and maintained through the life of the mine.

2. Exposed cyanide solutions (eg. ponds, collection ditches etc.) are particularly lethal to birds. Flagging shall be installed over any exposed soltuion sites to prevent birds from landing. Installation of flagging should be coordinated with this office so that on-site recommendations can be made.

3. The processing facilities are to be constructed in the Strawberry Creek riparian zone. The Department will require off-site mitigation for loss of this habitat.

C. Reference wildlife monitoring programs.

1. The aquatic baseline surveys conducted in 1985 in Strawberry Creek and Bear Butte Creek shall be repeated ~~in 1987~~ [illegible]. This will allow assessment of impacts on the aquatic stream system resulting from mine construction. Scheduling for further aquatic monitoring will be determined based on collected data and water quality data.

2. Water quality monitoring data in Bear Butte Creek shall be made available to this office and shall include stream flows (cubic feet per second) and stream temperature. This data will be used to evaluate fish habitat conditions during intervals between aquatic surveys. Anomalies in the data may necessitate unscheduled surveys.

3. The full scale wildlife monitoring completed for baseline inventories will be continued through mine construction and one full year of mine operation to assess impacts on wildlife. An evaluation will be made at the end of the first full year of operation to design an appropriate wildlife monitoring system for the life of the mine.

4. The Land Application System (LAS) will impact the designated site to an unknown degree. Therefore, this department will require that a baseline habitat inventory be conducted to assess this impact. The collected data will include species canopy cover, production and shrub densities (excluding mat-forming shrubs). This will allow assessment of habitat

impacts due to introduction of neutralized solution into the environment. In addition there is the potential for heavy metals in the neutralized solution. This department will require annual heavy metal analysis for an indicator plant and rodent species to determine if any heavy metals are affecting the environment.

5. Monthly summaries of wildlife mortality will be provided to this department once mine construction has begun. Data will include species, date and probable cause of death. This information will be used to minimize future conflicts with wildlife.

6. Prior to clearing vegetation during the nesting season (March through August) this department shall be provided the opportunity to inspect the site. If any indicator or rare species are found we will work with Gilt Edge to minimize the conflict.

Please note that further comments or recommendations may be forthcoming as additional information is received. If you have any further questions please contact this office.

Sincerely,

Barry Parrish

Barry Parrish
Wildlife/Mineral
Development Coordinator

BP/i
cc: John Kirk
Bob Townsend
Larry Brown

South Dakota
Department of
Game, Fish and Parks

Division of Wildlife

3305 West South St.
Rapid City, SD 57702

RECEIVED

June 14, 1984

Richard J. Hall
Manager, Special Projects
LACANA Mining Inc.
3005 Ironwood Parkway Rm 105
Coeur d'Alene, Idaho 83814

Dear Mr. Hall:

As per our discussion of your proposed exploration activities at the Gilt Edge Mine which may lead directly into production, the Department of Game, Fish and Parks will require the following restrictions pursuant to SDCL 45-6B:

1. Due to the possibility that a mining operation may be feasible using the cyanide heap leach process, beginning as early as next year, certain baseline studies involving indicator wildlife species and habitat associated with those species shall be required so that the dominant species of wildlife may be determined, SDCL 45-6B-7 (4) and (7).

   The Department of Game, Fish and Parks will provide the areas of concern regarding wildlife and associated habitat and will suggest methods of addressing those concerns which shall include:

   (a) Statistical sampling of a minimum of 3 wildlife indicator species in and adjacent to the project area. A "Wildlife Zone of Influence" immediately adjacent to the project area shall be determined using the approved wildlife indicator species.

   (b) Initial analysis shall be provided to the Game, Fish and Parks by LACANA prior to full-time mining operations commencing. A three year study shall be done to determine potential on-going wildife, habitat and fisheries problem areas. At the termination of the mining project an evaluation of the reclamation procedures on the fish and wildlife resource shall be provided. LACANA Mining Company shall provide a fish and wildlife study plan for the approval of South Dakota Game, Fish and Parks prior to the full scale mining operation.

2. Low-level photography of the type taken by the Remote Sensing Institute in Brookings, SD shall be taken of the area affected by the mining operation on a periodic basis to determine the overall effects to wildlife and fisheries habitat.

3. Cyanide haul routes shall be established to avoid any accidental CN spills into Black Hills streams or drainages.

4. Heap leach pads and ponds shall be fenced to exclude large and small mammals. All ponds shall have wire strung across the ponds at 2-foot intervals with 2-3 foot aluminum streamers hanging at every 2-foot intervals to scare birds and waterfowl from the pond areas.

5. Any expansion or change of operations shall be reported to the Department of Game, Fish & Parks and may be cause to require further wildlife/aquatic studies prior to or concurrent with those expansion or changes.

We would suggest that surveys involving breeding birds be started at once so that there is no delay should LACANA decide to begin their mining operations early next year.

Please feel free to contact this office if you have any questions regarding these recommendations and restrictions.

Thank you for your interest in South Dakota wildlife.

Sincerely,

Don C. Sharps
Wildlife/Mineral
Development Coordinator

DCS/i
cc: Ron Fowler
Robert Townsend
USFS Nemo Ranger District, Deadwood, SD

5

BROHM MINING CORP.

LEAKAGE RESPONSE ACTION PLAN

(FINAL COPY)

GENERAL

This Response Action Plan (RAP) has been submitted in compliance with the requirements of the Department of Water and Natural Resources and the technical guidance presented in "Background Document on Proposed Liner and Leak Detection Rule," EPA report No. 530-SW-87-015, May 1987.

PURPOSE

The RAP is a vehicle for site-specific response actions to be taken when leakage above the designated levels in the Action Leakage Rate (ALR) is detected within the Leak Detection, Collection and Recovery System (LDCRS). The goal of the RAP is to prevent the migration of leachate out of the unit by providing a mechanism to initiate appropriate actions to mitigate the potential for such migration once the LDCRS reveals the presence of leakage above the designated levels in the ALR.

Since leakage through the top liner will fluctuate during a unit's operation, it is logical to develop a RAP that has a range of leakage bands and a response for each band. Thereby, the leakage rate may fluctuate over time without the need to implement a different response for each small fluctuation. The primary goal of the RAP is to prevent the leakage rate hour exceeding a "Rapid and Extremely Large Leak" (RLL) rate.

Rapid and extremely large leakage is leakage that is equal to or larger than the maximum design leakage rate that the LDCRS can remove without the hydraulic head over the bottom liner exceeding the thickness of the LDCRS drainage medium (about 18 inches for the Gilt Edge leach pad). Leakage rates in excess of the RLC pose a potential for migration of leachate into the bottom liner system. For the Gilt Edge systems, the RLL occurs at some rate greater than 2,500 gallons per acre day (gpad).

At leakage rates less than the RLL, complete containment is provided with a high level of confidence and, therefore, immediate and significant response actions are not required. For leakage rates less than the RLL, the immediate concern is identification of the source and mechanism of the leakage, and prediction of whether the RLL will be exceeded. For these reasons, our RAP provides for identification of the source and mechanism as the primary function of the response actions.

BROHM MINING CORPORATION

LEAKAGE RESPONSE ACTION PLAN

HEAP LEACH PAD:

0 to 20 gals/acre/day (gpad):

a. Pump LDCRS Dry - continue monitoring on weekly schedule.
b. The cell sumps will be pumped as necessary, to keep the head on the secondary liner to a minimum.
c. Quarterly sampling of LDCRS for WAD CN, pH, NO_3 and Na, with quarterly submission to the DWNR.

20 to 100 gpad

a. Notify DWNR within 24 hours of detection with leakage rate, cell number, and any other pertinent information relating to the leakage.
b. Initiate daily leakage monitoring of the LDCRS sumps contributing significantly to the leakage rate. Leakage rate of LDCRS sumps will be reported to the DWNR weekly.
c. Inspect all joints around the cell(s) and repair all suspect areas. Documentation of areas of leakage and documentation of repairs will be submitted to DWNR.
d. The LDCRS pipes will be sampled once per week for WAD, cyanide, conductivity, NO_3, pH, and arsenic. Results of the monitoring will be submitted to the Department on a weekly basis.
e. A semi-monthly analysis of pregnant solution for WAD CN, NO_3 and pH, will be used for a comparison basis with the LDCRS sampling. Results submitted monthly to the DWNR.
f. A mitigation report/plan will be submitted to the DWNR within one week of detection, which will include: a description of the problem, pertinent data, proposed course of action, and a time schedule for implementation.

100 to 300 gpad:

a. Notify DWNR within 24 hours of detection with leakage rate, cell number, and any other pertinent information relating to the leakage.
b. Initiate daily leakage monitoring of the LDCRS sumps contributing significantly to the leakage rate. Report daily leakage monitoring of LDCRS sumps to the DWNR weekly.
c. LDCRS solution will be sampled once per week for WAD CN, pH, conductivity, NO_3, Na and As, with results reported to DWNR on weekly basis.
d. A semi-monthly analysis of pregnant solution for WAD CN, NO_3 and pH, will be used for a comparison basis with the LDCRS sampling, and submit results semi-monthly to the DWNR.

e. Inspect all joints around the cell(s) and repair all suspect areas. Documentation of areas of leakage and documentation of repairs will be reported to DWNR.
f. Adjust sprinkler locations and/or application rate within those areas contributing significantly to the leakage rate. Begin sampling of monitor wells GW-1, 2 and 10 on a weekly basis for WAD CN, As, NO_3, Au, pH, and Na, with results submitted weekly to the DWNR. Also, conduct daily field testing of GW-1, 2 and 10 for free CN and pH, with results submitted daily to the DWNR.
g. Revise pad loading sequence to reduce the total simultaneous application rates to areas contributing signficantly to the leakage rate.
h. Monitor wells GW-1, 2, and 10 will be sampled on a weekly basis for WAD cyanide, arsenic, nitrate, gold, pH and sodium. Results of this sampling will be submitted to the Department on a weekly basis. Also on a daily basis, the monitoring wells will be field tested for pH and free cyanide. Results of this testing will also be submitted to the Department on a weekly basis.
i. A mitigation report/plan will be submitted to the DWNR within one week of detection, which includes: description of problem, pertinent data, proposed course of action, and a time schedule for implementation.
j. The testing program will be implemented within 24 hours of receipt of written approval from DWNR. Progress and results of the testing will be submitted to DWNR on a weekly basis.
k. As the cells which are contributing significantly to the leakage are neutralized and off-loaded, the asphalt surface will be inspected. Any distressed areas will be repaired, and the cell placed back into normal operation.
l. If a portion of a pad is off-loaded the ore will be placed on adjacent cells.

<u>300 to 500 gpad</u>:

a. Notify DWNR within 24 hours of detection with leakage rate, cell number, and any other pertinent information relating to the leakage.

300 to 500 gpad (continued):

b. Initiate or continue daily leakage monitoring. Report daily leakage monitoring of LDCRS sumps to the DWNR weekly.
c. Inspect all joints around the cell(s) and repair all suspect areas. Documentation of areas of leakage and documentation of repairs will be submitted to DWNR.
d. Daily sampling of LDCRS solution for WAD CN, NO_3, pH, Na, As and conductivity, with results reported to the DWNR on a weekly basis.
e. Adjust sprinkler locations and/or application rate within those areas contributing significantly to the leakage rate.
f. Once leaking cell(s) is unloaded, clean to asphalt surface and visually inspect.
g. Seal any suspect areas with asphalt sealant.
h. Include a semi-monthly analysis of pregnant solution for WAD CN, NO_3, pH, and Na, to be used for a comparison basis with the LDCRS sampling, and submit results semi-monthly to the DWNR.
i. Begin sampling of monitor wells GW-1, 2 and 10 on a weekly basis for WAD CN, As, NO_3, Au, pH, and Na, with results submitted weekly to the DWNR. Also, conduct daily field testing of GW-1, 2 and 10 for free CN and pH, with results submitted daily to the DWNR.
j. A mitigation report/plan will be submitted to the DWNR within one week of detection, which includes: description of the problem, pertinent data, proposed course of action, and a time schedule for implementation.
k. A testing program will be implemented within 24 hours of receipt of written approval from DWNR. Progress and results of the testing will be submitted to the DWNR on a weekly basis.

> 500 gpad:

a. Notify DWNR within 24 hours of detection with leakage rate, cell number, and any other pertinent information relating to the leakage.
b. Pad loading will cease until written approval to continue is given by the DWNR.
c. Shut down the section of the pad that is leaking and repair the leak area. Begin DAILY leakage monitoring and sampling of LDCRS sumps. Sample ~~weekly~~ daily for WAD CN, NO_3, pH, Na, As and conductivity, with results reported to the DWNR on a WEEKLY basis.
d. Semi-monthly analysis of pregnant solution for WAD CN, NO_3, pH, conductivity, Na, and As, to be used for a comparison basis with the LDCRS sampling, and submit results semi-monthly to the DWNR.

per phone/conc M. Cyrak 5-4-8?

e. Begin sampling of monitor wells Gw-1, 2 and 10 on a weekly basis for WAD CN, As, NO_3, Au, pH, and Na, with results submitted weekly to the DWNR. Also, conduct daily field testing of GW-1, 2 and 10 for free CN and pH, with results submitted daily to the DWNR.
f. Submit a testing program, within seven (7) days, to DWNR to allow identification of the source(s) and mechanism of the leakage. The testing program shall include such measures as determination of hydraulic head, application rate versus leakage rate, and the leakage rate by cell or subcell area. Submit a mitigation report/plan, which includes: description of the problem, pertinent data, proposed course of action, and a time schedule for implementation.

PROCESS PONDS:

0 to 20 gals/acre/day (gpad):

a. Pump LDCRS dry. Continue monitoring on weekly schedule.
b. The pond sumps will be pumped as necessary, to keep the head on the secondary liner to a minimum with documentation of flows and quarterly reports to the DWNR.

20 to 200 gpad:

a. Notify DWNR within 24 hours of detection with leakage rate and any other pertinent information relating to the leakage.
b. Initiate daily pumping and leakage monitoring. With weekly reporting to the DWNR for LDCRS daily monitoring.
c. Monitor leak at various pond levels to help locate leak. With documentation of areas of leakage and repairs made and submission of report to the DWNR.
d. Sample LDCRS pipes weekly for WAD cyanide, pH, NO_3, results to DWNR weekly.
e. A mitigation report/plan will be submitted to the DWNR within one week of detection, which includes: description of the problem, pertinent data, proposed course of action, and a time schedule for implementation.

200 to 500 gpad:

a. Notify DWNR within 24 hours of detection with leakage rate, name of pond, and any other pertinent information relating to the leakage.
b. Initiate or continue daily leakage monitoring with daily reporting to the DWNR.
c. Begin daily sampling of LDCRS solution for WAD CN, NO_3, pH, with results submitted weekly to the DWNR.
d. Drain pond to below leak.

e. Inspect and vacuum test for leaks or suspect areas with documentation of areas of leakage and repairs made, and submission of report to the DWNR.
f. Repair any suspect areas.
g. GW4 and the French drain below the ponds will be monitored daily for pH and free cyanide and sampled weekly for WAD cyanide, arsenic, nitrate, gold pH, conductivity and sodium. Results of the tests will be submitted to DWNR weekly.
h. A mitigation report/plan will be submitted to the description of the problem, pertinent data, proposed course of action, and a time schedule for implementation.

> 500 gpad:

a. Notify DWNR within 24 hours of detection with leakage rate, cell number, and any other pertinent information relating to the leakage.
b. Initiate or continue daily leakage monitoring, and pumping LDCRS dry with daily reporting to the DWNR.
c. Inspect and vacuum test for leaks or suspect areas, with documentation of areas of leakage and repairs made, and submission of report to DWNR. Begin daily sampling of LDCRS solution for WAD CN, NO_3, and pH, with results submitted weekly to the DWNR.
d. Repair or replace damaged liner as necessary.
e. Begin sampling of monitor well GW-4 and French Drain below the ponds and monitor daily for pH and free CN, with results submitted daily to the DWNR. Begin weekly sampling of GW-4 and French Drain for WAD-CN, NO_3, pH, As, conductivity, Au and Na, with results submitted weekly to the DWNR.
f. Shutdown of unit, until pond drains below leak and until the DWNR is notified and approves.
g. A mitigation report/plan will be submitted to the DWNR within one week of detection, which includes: description of the problem, pertinent data, proposed course of action, and a time schedule for implementation.

PROCESS PLANT

ALR (For process solution entering sump: excluding freshwater used for cleaning and rinsing.)

0-20 gals/day (gpd):

Response: No response required, other than weekly monitoring and documentation of flow and quarterly reports to DWNR. Any leakage in this range will be removed as soon as practical.

20-250 gpd

Response: Initiate response action: notification of DWNR within 24 hours. Daily monitoring of flow with reports to DWNR. Locate areas/units of leakage (use approved dye if needed). Submit a mitigation report/plan to DWNR within one week of detection, which includes description of problem, pertinent data, proposed course of action, and a time schedule for implementation. Analyze solution once a week for WAD cyanide, NO_3 and pH, results of analysis to be submitted to DWNR. Document area of leakage and repairs with report to DWNR. Repair leaks. Inspect repaired area/unit weekly for one month and report to DWNR.

250-500 gpd:

Response: Initiate response action: notification of DWNR within 24 hours. Daily monitoring of flow and daily reports to DWNR. Locate areas/units of leakage (use approved dye if needed). Submit a mitigation report/plan to DWNR within one week of detection, which includes description of problem, pertinent data, proposed course of action, and a time schedule for implementation. Analyze solution once a week for WAD cyanide, NO_3 and pH, results to be submitted to DWNR. Document area of leakage and repairs made with report to DWNR. Repair leaks. Inspect repaired area/unit daily for first week and weekly thereafter for one month and report to DWNR. Sample Groundwater Wells in the vicinity (GW 3, 4) and (FD-1) on a weekly basis for WAD cyanide, pH, As, NO_3, conductivity, Au, Total cyanide and sodium. Field test monitor wells (GW 3, 4) and (FD-1) on a daily basis for Free cyanide and GW 3 and 4 pH. Results to be submitted to DWNR.

>500 gpd:

Response: Initiate response action: immediate shutdown of leaking area/unit. Notification of DWNR within 24 hours. Daily monitoring of flow and daily reports to DWNR. Locate areas/units of leakage. Submit a mitigation report/plan to DWNR within one week of detection, which includes: description of problem, pertinent data, proposed course of action, and a time schedule of implementation. Analyze solution daily for WAD cyanide, NO_3 and pH, results to be submitted to DWNR. Document area of leakage and repairs with report to DWNR. Repair leaks. Inspect repaired area daily for first week and weekly thereafter for one month and report to DWNR. Sample Groundwater wells in the vicinity (GW 3, 4) and (FD-1) on a daily basis for WAD cyanide, pH, As, NO_3, conductivity, Au, total cyanide and sodium. Field tests groundwater wells (GW 3, 4) and

> 500 gpad (continued):

(FD-1) on a daily basis for free cyanide and pH. Results to be submitted to DWNR.

UNDERGROUND PROCESS SOLUTION PIPING

Allowable leakage from the primary pipe shall be ten gallons per day per inch diameter of pipe per mile of pipe. Notify the DWNR within 24 hours if the leakage exceeds 10 gallons per day per inch diameter of pipe per mile of pipe. Include any pertinent information relating to the leakage. For amounts greater than this rate repairs shall be made.

The discharge points for the secondary containment piping shall be formally observed on a weekly basis to check leakage from piping. Brohm Mining shall maintain flow data records for the secondary containment piping and shall make the records available to Departmental inspectors for review.

CYANIDE MAKE-UP TANK

The cyanide make-up area spill containment LDCRS will be formally observed for leakage on a weekly basis. All leakage detected in the stand pipe will be removed and sources for the leakage identified and repaired. As the cyanide make-up area LDCRS is designed to overflow into the surge pond LDCRS, the surge pond LDCRS shall be monitored in conjunction with the cyanide make-up area LDCRS. Brohm Mining shall maintain LDCRS data records for the cyanide make-up are and shall make the records available to Departmental inspectors for review.

NEUTRALIZATION FACILITY (spill containment)

The neutralization facility LDCRS shall be formally observed for leakage on a weekly basis when the neutralization facility is in operation. All leakage detected in the standpipe shall be removed and sources for the leakage identified and repaired. As a depth of approximately 3.75 inches in the LDCRS standpipe is indicative of the neutralization facility LDCRS overflowing into the neutralization pond LDCRS, the neutralization pond LDCRS shall be monitored in conjunction with the neutralization facility LDCRS. Brohm Mining shall maintain LDCRS data records for the neutralization facility and shall make the records available to Departmental inspectors for review.

LEAK DETECTION, COLLECTION AND RECOVERY SYSTEM (LDCRS)

Brohm Mining has established a monitoring program for all LDCRS and will report findings and flow data to the Department on a quarterly basis.

Brohm has installed dedicated pumps to each LDCRS sump at the pad and ponds and will continously pump any sump which contains liquid. This will keep the hydrostatic head off the secondary liners.

As each threshold value is exceeded, Brohm will submit an assessment report of the current condition of all components of the leak detection and monitoring system.

The overall goal of our Action Response Plan is to ultimately reduce leakage in the pad and ponds to less than a 20 gpad threshold. Our commitment to this goal is evidenced by initiation of studies between the 20-100 gpad range and continued investigation and/or corrective action when the leakage is above 100 GAD during the course of normal loading and unloading of the leach pads.

Brohm is committed to conduct the activities in this Response Plan in a timely manner and keep the Department fully apprised of the status of the leak detection systems for all LDCRS locations.

NOTIFICATION TO DWNR

If obvious defects or causes of leakage are found, repairs will commence immediately. Notification procedures and reporting to the DWNR will apply, even though the leakage problem may have already been corrected.

Notification of ALR leakage rates and any continous reporting will be accomplished by telephone to the names and numbers listed below:

During normal work day hours use:

Mike Cepak 773-4201
Bob Townsend 773-4201
Dale Snyder 394-2385

For weekend notification:

State Radio 773-3231

6

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____
Building Permit No. 2444

Date March 1, 1989

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor NALCO Chemical Co. Owner Brohm

For Construction of 10X10 Metal Frame Building (Industrial)

Location or Address Brohm Mine (NE corner of neutralization pond)

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section 6 Township T4N Range R4E B.H.M.
Mineral Survey No. 1134 Alert Fraction (CUP #127) H.E.S. No. _____

Zoning Mining/Milling

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 10.00
Receipt # 56578

Administrative Official
1st Deputy

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Kris A. Brandt, Deputy
Administrative Official
10-12-89

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____

Date March 1, 1989

Building Permit No. 2443

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor NALCO Chemical Co. Owner Brohm

For Construction of 10X10 Metal Frame Building (Industrial)

Location or Address Brohm Mine (NW corner of surge pond)

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section 6 Township T4N Range R4E B.H.M.
Mineral Survey No. 1134 H.E.S. No. _____
(CUP #127)

Zoning Mining/Milling

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 10.00
Receipt # 56578

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____

Date March 1, 1989

Building Permit No. 2442

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor Nalco Chemical Co. Owner Same (Brohm)

For Construction of 10X10 Metal Frame Building (Industrial)

Location or Address Brohm Mine (SW corner of leach pad)

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section 5 Township T4N Range R4E B.H.M.
Mineral Survey No. Nevada M.S. 1134 H.E.S. No. _____
(CUP #127)

Zoning Mining /Milling

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 10.00
Receipt # 56578

Administrative Official
1st Reading

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official

10-12-8

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. 408
Building Permit No. 2294

Date January 13,1988

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485 Phone 578-2107

Contractor _____ Owner Same

For Construction of 40'x80' Metal Frame Lab

Location or Address Strawberry Hill/Gilt Edge Mine

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section Sec. 6 Township T4N Range R4E
Mineral Survey No. Eureka M.S. #1134 H.E.S. No. _____

Zoning PF-Park Forest CUP #84

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 72.00
Receipt # 54126

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. 408
Building Permit No. 2295

Date January 13, 1988

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485 Deadwood, SD. 57732 Phone 578-2107

Contractor _____ Owner Same

For Construction of 80'x120' Metal Frame Process Plant

Location or Address Strawberry Hill - Gilt Edge Mine

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section Section 6 Township T4N Range R4E
Mineral Survey No. Eureka #1134 & Alert Fraction #1134 H.E.S. No. _____

Zoning PF-Park Forest CUP #84

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 128.00
Receipt # 54126

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official
1st Deputy

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. 408
Date January 13,1988 Building Permit No. 2296

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485 Phone 578-2107

Contractor _____ Owner Same

For Construction of 15'x30' Metal Frame Fire/Process Water Pumphouse

Location or Address Strawberry Hill - Gilt Edge Mine

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section Sec. 6 Township T4N Range R4E
Mineral Survey No. Alert Fraction M.S.#1134 H.E.S. No. _____

Zoning PF-Park Forest CUP #84

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 31.00
Receipt # 54126

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official
Not Required

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. N/A
Building Permit No. 2316

Date 5-2-88

Permit Issued to: Name Brohm Mining Corporation

Address P.O. Box 485 Phone 578-2107

Contractor Ainsworth Benning Owner Brohm

For Construction of 24 x 40 Building

Location or Address Brohm Mining Corporation

Legal Description: M.S. 1134, SW1/4, Sec. 5, T4N, R4E.

Subdivision N/A Tract N/A Block N/A
Lot N/A Section SW1/4 Sec. 5 Township T4N Range R4E
Mineral Survey No. May M.S. 1134 H.E.S. No.

Zoning Mining

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 68.00
Receipt # 54722

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official
Inst Deputy

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Date 5-2-88

Individual Sewage Disposal System Permit No. N/A
Building Permit No. 2317

Permit Issued to: Name Brohm Mining Corporation

Address P.O. Box 485 Deadwood, So. Dak. 57732 Phone 578-2107

Contractor Fisher Industries Owner Brohm

For Construction of 8 x 12 Building

Location or Address Brohm Mining Corporation

Legal Description: Sunday M.S. 650, SW1/4 Sec.5, T4N, R4E.

Subdivision N/A Tract N/A Block N/A
Lot N/A Section SW1/4 Sec.5 Township T4N Range R4E
Mineral Survey No. Sunday M.S. 650 H.E.S. No.

Zoning Mining

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 48.00
Receipt # 54722

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official
1st Deputy

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. 439
Building Permit No. 2352

Date July 7, 1988

Permit Issued to: Name Brohm Mining Corporation

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor Same Owner Same

For Construction of 60X96 Metal Frame Building

Location or Address Brohm Mine

Legal Description: CUP #127, True Blue MS 975, Sec. 7, T4N, R4E B.H.M.

Subdivision CUP # 127 Tract ____ Block ____
Lot ____ Section Sec. 7 Township T4N Range R4E
Mineral Survey No. True Blue MS 975 H.E.S. No. ____

Zoning Park Forest CUP #127

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 421.00
Receipt # 55194

Ronny Dean 1st Deputy
Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Ronny Dean
Administrative Official
1st Deputy

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____

Date November 14, 1988

Building Permit No. 2419

Permit Issued to: Name Brohm Mining Corp.

Address Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor D.H. Blattner & Sons Owner Same

For Construction of 42X48 Metal Frame Building

Location or Address Brohm Mine

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section NE¼ SW¼ Sec. 5 Township T4N Range R4E B.H.M.
Mineral Survey No. Summit Claim MS 1134 H.E.S. No. _____

Zoning Park Forest

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 48.00
Receipt # 55960

Administrative Official
1st Deputy

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official
1st Deputy

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____

Date December 28, 1988

Building Permit No. 2432

Permit Issued to: Name Brohm Mining Corporation

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor Alley Construction Company - Belle Fourche Owner Same

For Construction of 16X14X8 Pole Pump House

Location or Address Brohm

Legal Description:

Subdivision Buffer Zone of CUP #127 Tract _____ Block _____
Lot _____ Section 8 Township T4N Range R4E B.H.M.
Mineral Survey No. 646 (Oro Fino) H.E.S. No. _____

Zoning Park Forest

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 26.00
Receipt # 56215

Administrative Official
1st Deputy

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official
1st Deputy

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____

Date March 1, 1989

Building Permit No. 2444

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor NALCO Chemical Co. Owner Brohm

For Construction of 10X10 Metal Frame Building (Industrial)

Location or Address Brohm Mine (NE corner of neutralization pond)

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section 6 Township T4N Range R4E B.H.M.
Mineral Survey No. 1134 Alert Fraction (CUP #127) H.E.S. No. _____

Zoning Mining/Milling

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 10.00
Receipt # 56578

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____

Date March 1, 1989

Building Permit No. 2443

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor NALCO Chemical Co. Owner Brohm

For Construction of 10X10 Metal Frame Building (Industrial)

Location or Address Brohm Mine NW corner of surge pond

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section 6 Township T4N Range R4E B.H.M.
Mineral Survey No. 1134 H.E.S. No. _____
(CUP #127)

Zoning Mining/Milling

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 10.00
Receipt # 56578

Administrative Official
Act Deputy

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official

BUILDING PERMIT

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. _____

Date March 1, 1989

Building Permit No. 2442

Permit Issued to: Name Brohm Mining Corp.

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor Nalco Chemical Co. Owner Same (Brohm)

For Construction of 10X10 Metal Frame Building (Industrial)

Location or Address Brohm Mine (SW corner of leach pad)

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section 5 Township T4N Range R4E B.H.M.
Mineral Survey No. Nevada M.S. 1134 H.E.S. No. _____
(CUP #127)

Zoning Mining/Milling

Construction plans have been submitted to, approved by, and are on file at the Administrative Official's Office located in the Lawrence County Courthouse.

Fee Paid $ 10.00
Receipt # 56578

Administrative Official

CERTIFICATE OF ZONING COMPLIANCE

This certifies that the proposed use of this building or land conforms to the requirements of the Lawrence County Zoning and Subdivision Regulations.

Administrative Official

RESOLUTION VACATING HIGHWAY A PORTION OF
WHICH IS LOCATED ON A SECTION LINE

WHEREAS, a petition was presented to the Board of County Commissioners of Lawrence County, South Dakota, signed by eighty-three (83) freeholders of Lawrence County, requesting that the highway and section line right-of-ways described below be vacated, and

WHEREAS, the Board of County Commissioners set a date for hearing and evidence having been presented to the Board of County Commissioners; the notice has been given of the time, place and purpose of said hearing by publication of a notice in the Lead Daily Call, Spearfish Queen City Mail and Lawrence County Centennial, once each week for two (2) consecutive weeks prior to the date of said hearing, and

WHEREAS, the Board of County Commissioners having acted as a committee of the whole concerning said vacation, and

WHEREAS, said highway does not constitute a portion of a South Dakota State Trunk Highway system nor the Lawrence County Highway System,

NOW THEREFORE, be it resolved by the Lawrence County Board of County Commissioners, that the following described highway be and the same is hereby vacated:

Starting at the point where the section line between sections 7 and 8, T4N, R4E, BHM, Lawrence County, South Dakota, intersects the South Boundary of Mineral Survey No. 926 (St. Patrick), which is the beginning, proceed North along said section line to where said section line intersects the North boundary of Mineral Survey No. 1632 (Old Pennsylvania), between Section 5 and 6, T4N, R4E, BHM, Lawrence County South Dakota, at which the vacated portion of the section line ends, as shown on the plot which is attached hereto (petitions). Starting at the point where section line between Section 6 and 7, T4N, R4E, BHM, Lawrence County, South Dakota, intersects the West boundary of Mineral Survey No. 1441, (1895 No. 4), which is the point of the beginning, proceed East along said section line to where said section line intersects the South West boundary of Mineral Survey No. 1042 (Red Jacket), between Section 5 and 8, T4N, R4E, BHM, Lawrence County, South Dakota, at which point the vacated portion of the section line ends as shown on the plot which is attached hereto (petitions).

The names of the owners through which the above described section line runs are the following:

Brohm Mining Corporation, Gilt Edge Mine, a South Dakota Corporation

Dated this 9th day of December, 1987.

George Opitz, Chairman

DOC NO. 87-5352
FEE No fee Jct
1987 DEC 17 PM 3:59
RUBY R. MEVERDEN
LAWRENCE COUNTY
REGISTER OF DEEDS

ATTEST:

Ardene A. Olson
Lawrence County Auditor

REGISTER OF DEEDS SEAL LAWRENCE COUNTY SOUTH DAKOTA

I, Ardene A. Olson, the duly elected Auditor of Lawrence County, South Dakota, do hereby certify that the within and foregoing Resolution was passed by the Lawrence County Board of County Commissioners at a regular session held December 9, 1987.

Dated at Deadwood, South Dakota, this 9th day of December, 1987.

Ardene A. Olson, Auditor

COPY

7

SOUTH DAKOTA Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

May 5, 1988

John Wilbanks, Director
Environmental Affairs
Brohm Mining Corporation
PO Box 485
Deadwood, South Dakota 57732

Dear Mr. Wilbanks:

We have reviewed the plans and specifications for the Brohm Mining Corporation leach pad and process system ponds under Water Permit Application No. 1345-1. The plans and specifications as submitted are approved.

Our review was to determine compliance with Water Management Board Rules Chapter 74:02:08, Safety of Dams that dams (ponds) constructed to store tailings shall be sized to retain the PMF plus at least a 100-year flood. Approval applies only to the portion of the plans and specifications that involve the storage of the PMF plus 100-year flood. Approval of these plans and specifications does not release Brohm Mining Corporation from the respcnsibility for operating and maintaining the leach pad and process system ponds in good repair to assure safety.

If you have any questions, please contact us.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Division
605 773-3352

RECEIVED
MAY - 6 1988
BROHM MINING CO.

CELEBRATE THE CENTURY
1889-1989
South Dakota

[redacted]

Ltg to Nav.

South Dakota Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501

Water Rights Division
605 773-3352

MAY 5 1987

APR 30 1987

Gilt Edge Incorporated
2005 Ironwood Parkway
Coeur d'Alene, Idaho 83814

Dear Sir:

Enclosed herewith is your Water Permit No. 1324A-1 as approved by the Water Management Board authorizing you to construct your water diversion system and the water to beneficial use, not exceeding the limits as specified in said Water Permit No. 1324A-1 .

Also enclosed is Form 10, Notice of Completion of Works and Application of Water to Beneficial Use, which you are to complete and submit to the Chief Engineer when you have completed the system and/or have put the water to beneficial use. An inspection can then be scheduled so that your Water License may be issued to you, thus completing your acquistion of a Water Right.

Very truly yours,

John Hatch

JOHN HATCH, Chief Engineer
Water Rights Division

JH:ms

enclosure

PLEASE NOTE: Certain changes can be made in your permit within the five year construction period, usually without affecting the priority date provided an application to amend your permit is made within the five year period-i.e. changes in location or number of diversion points (wells) or location of land to be irrigated. Well locations for wells into the same aquifer can be moved up to 660 feet without application.

Applications to amend a permit after the five year construction period will be assigned a new priority date. Applications to change water sources, to add lands or increase original diversion rates, if approved will usually receive the date of the new application as a priority date regardless of the five year construction period.

WNR-809-5/83

FORM 2 Application for uses other than irrigation (type or print)

No. 1324A-1 Hydrologic Unit 10120202
Map No. same Basin Belle Fourche R.
Newspaper Lead Daily Call, P.O. Box 876, Lead

Mail to: Water Rights Div.
DWNR, Foss Bldg.
Pierre, SD 57501
(605) 773-3352

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use of water: Industrial [XX] Commercial [ ] Municipal [ ] Other Common Distribution System [ ]
Rural Water System [ ] Suburban Housing [ ] Geothermal Heat [ ] Institutional [ ] Recreational [ ]
Domestic [ ] (above 18gpm) Other [ ]

Type of Application: Check one or more of the following

New [XX] Vested Right [ ] Future Use [ ] Change Use [ ]
[XX] Amend Permit No. 1324-1 with old priority date retained
Change diversion point(s) [XX] Add diversion point(s) [XX] Other [ ]
[ ] Application to: Change diversion point(s) [ ] Add diversion point(s) [ ] on Permit No.
[ ] Construction to use water reserved by Future Use Permit No.

JAN 1987 DIVISION OF WATER RIGHTS Pierre, SD

1. Name of Applicant Gilt Edge, Inc. Phone No.
   Post Office Address 2005 Ironwood Parkway, Coeur d'Alene (Street, RR or Box) State Idaho 83814 (Zip Code)
2. Amount of water claimed (c.f.s) .25 cfs (no change from original permit) no add'l.
3. Source of water supply groundwater - Deadwood Fm. and Precambrian Rocks
4. Location of point of diversion change to SW 1/4 x NW 1/4, Sec. 8 from SE 1/4 x NE 1/4, Sec. 6
   Add points: SW 1/4 x SW 1/4 and NW 1/4 x SW 1/4, Section 5.
   County Lawrence
5. Counties where water will be used Lawrence
6. Annual period during which water is to be used highest April-October, some use year-round January 1 - December 31
7. Give a brief description of proposed project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)
   Water is to be used in a heap leach gold mining operation. The details of the mining operation are provided in the Gilt Edge, Inc. Mine Permit Application No. 439 (November 20, 1986) on file with the South Dakota Dept. of Water and Natural Resources Attachment No. 4 to that Application, the Groundwater Characterization Report, is attached herewith.

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction)

STATE OF SOUTH DAKOTA)
County of _____)ss

I, Jack E. Kelly (Engineer for) the applicant, certify that I have read the foregoing application, have examined the attached map and that the matters therein stated are true and that I intend, and am able to complete the necessary construction.

Signed Jack E. Kelly

Subscribed and sworn to before me this 6 day of January 1987

Notary Public (or other qualified officer)

No. 1345-1 Hydrologic Unit 10120202
Map No. 1345-1 Basin Belle Fourche
Newspaper Lead Daily Call

Pierre, SD 57501
(605) 773-3352

Application For Permit To Appropriate Water Within The State Of South Dakota

Intended use of water: Industrial [X] Commercial [ ] Municipal [ ] Other Common Distribution System [ ]
Rural Water System [ ] Suburban Housing [ ] Geothermal Heat [ ] Institutional [ ] Recreational [ ]
Domestic [ ] (above 18gpm) Other [ ]

[redacted]

Type of Application: Check one or more of the following

New [X] Vested Right [ ] Future Use [ ] Change Use [ ]

[ ] Amend Permit No._____ with old priority date retained

Change diversion point(s) [ ] Add diversion point(s) [ ] Other [ ] _____

[ ] Application to: Change diversion point(s) [ ] Add diversion point(s) [ ] on Permit No. _____

[ ] Construction to use water reserved by Future Use Permit No._____

1. Name of Applicant Gilt Edge Inc. Phone No. (208) 664-1571

   Post Office Address 2005 Ironwood Parkway, Coeur d'Alene (Street, RR or Box) State Idaho 83814 Zip Code

2. Amount of water claimed (c.f.s) 0.25 cfs

3. Source of water supply [redacted] - see Attachment A for source locations

   Location of point of diversion Multiple diversion points - see Attachment A for source locations, Attachment B for written description of diversion points.

   _____ County Lawrence

5. Counties where water will be used Lawrence

6. Annual period during which water is to be used year round

7. Give a brief description of proposed project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)
   Water supply to be developed for use in heap leach gold mining operation at the Gilt Edge Mine. Heap leach operation is a totally contained system. Primary water requirements are for startup (saturating new ore piles) and make up solutions due to evaporation losses. Neutralization washing requirements will account for additional use at end-of-project. Peak consumption to occur in early spring.

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction) See typical

STATE OF ~~SOUTH DAKOTA~~ IDAHO
County of Kootenai)ss

I, Richard J. Hall the applicant, certify that I have read the foregoing application, have examined the attached map and that the matters therein stated are true and that I intend, and [illegible]le to complete the necessary construction.

Signed [signature]

Subscribed and sworn to before me this 8th day of October 19 85

[signature]
Notary Public (or other qualified officer)

The Water Management Board hereby approves Water Permit Application No. 1345-1

Gilt Edge Inc. (Applicant) 2005 Ironwood Parkway, Coeur d'Alene (Post Office Address)

Idaho (State) 83814 (Zip Code) With the following qualifications

Before any diversions of water under this Permit are made flows as needed for downstream domestic use, including livestock watering, and prior water rights must be by-passed.

Date of first receipt of application October 9, 1985

Date of return to applicant for correction, amendments or changes required _____, 19____

Date of receipt of corrected application _____, 19____. Approved March 5, 1986

The Water Management Board hereby approves this Water Permit No. 1345-1 authorizing the construction of the water use system and the placing of water to beneficial use as stated in the Application and as qualified in the Water Permit approval, subject, however, to the following limitations and conditions:

1. The date from which applicant may claim right is October 9, 1985
2. The equivalent of at [redacted] of the specified work is to be completed on or before [redacted].
3. The whole of said work is to be completed on or before March 5, 1991
4. The limit of time from proof of beneficial use of water appropriated in accordance herewith is March 5, 1995.
5. The water appropriated shall be used for the purpose of industrial use
6. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be unlawfully impaired by this appropriation.
7. The amount of the appropriation herein granted shall not exceed .25 cubic feet per second; neither shall it exceed the capacity of the above described water supply system nor shall it exceed the amount of water needed for beneficial uses served and to which water is actually and beneficially applied for industrial use on or before March 5, 1995; said water to be used during the following described annual period: January 1 to December 31

WATER MANAGEMENT BOARD

By: John Hatch
Chief Engineer JOHN HATCH
Division of Water Rights
Dept. of Water and Natural Resources

APR 21 1986 ..19..

8

MEMO

NORTHERN HILLS
ENVIRONMENTAL HEALTH DEPARTMENT

341 SPEARFISH, SOUTH DAKOTA 57783 (605)642-4972

Nº 55203

ta

6-30-88

Page

DOLLARS

Farrier

County Treasurer.

Dept 6, 1988

John:

Enclosed is the signed off. copies of the sewer permits.

I'm not able to send inspection sheets as both systems were installed when I was out there.

The main thing that I don't agree on is the schedule 2729/thin wall pipe that was used in the d/f's hopefully - you won't have problems with it.

Dept of WNR was concerned about the Admin bldg - septic system but after talking to Brad Rief - I'm sure you will have enough d/f.

Sincerely
Roger Marshall

mer Same

consisting of a 1,000 gallon

lled trenches installed

Block

Range R4

een submitted to, approved
ice located in the Lawrence

Marshall
ative Official

ATE

al sewage disposal system has been inspected and based on the data provided by the applicant, conforms to the minimum requirements of South Dakota Department of Environmental Protection Guidelines. WARNING: This permit does not guarantee, warrant or in anyway insure the operation, reliability or longevity of said system, the risk of which is strictly that of the applicant.

Roger Marshall
Administrative Official

Individual Sewage Disposal System Permit

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Date September 24, 1987

Individual Sewage Disposal System Permit No. 408
Building Permit No. _____

Permit Issued to: Name Bro hm Mining Company

Address P.O. Box 485 Deadwood,SD.57732 Phone 578-2107

Contractor Unknown at present Owner _____

For installation of: a 1000 gallon septic tank and properly constructed drainfield consisting of 330 sq/ ft/ or 3 laterals of 55' each per info from the engineer.

Located at: Gilt Edge mine

Legal Description:

Subdivision _____ Tract _____ Block _____
Lot _____ Section 6 Township 4 Range 4
Mineral Survey 1134 H.E.S. _____

Individual Sewage Disposal System specifications have been submitted to, approved by, and are on file at the Administrative Official's office located in the Lawrence County Courthouse.

Fee Paid $ 100.00
Receipt # _____

Roger Marshall
Administrative Official

SEWER INSPECTION CERTIFICATE

This certifies that the installation of the individual sewage disposal system has been inspected and based on the data provided by the applicant, conforms to the minimum requirements of South Dakota Department of Environmental Protection Guidelines. WARNING: This permit does not guarantee, warrant or in anyway insure the operation, reliability or longevity of said system, the risk of which is strictly that of the applicant.

_____
Administrative Official

Individual Sewage Disposal System Permit

OFFICE OF LAWRENCE COUNTY
PLANNING AND ZONING COMM.
DEADWOOD, SOUTH DAKOTA 57732

Individual Sewage Disposal System Permit No. 439

Date June 29, 1988

Building Permit No. _____

Permit Issued to: Name Brohm Mining Co.

Address P.O. Box 485, Deadwood, SD 57732 Phone 578-2107

Contractor _____ Owner Same

For installation of: A septic system for Admin. Building consisting of a 1,000 gallon septic tank and 268 sq. ft. of propterty constructed drain filled trenches, installed according to the engineers specifications.

Located at: Gilt Edged Rd.

Legal Description:

Subdivision CUP #127 Tract _____ Block _____
Lot _____ Section 8 Township T4N Range R4E
Mineral Survey _____ H.E.S. _____

Individual Sewage Disposal System specifications have been submitted to, approved by, and are on file at the Administrative Official's office located in the Lawrence County Courthouse.

Fee Paid $ 100.00
Receipt # _____

Roger Marshall
Administrative Official

SEWER INSPECTION CERTIFICATE

This certifies that the installation of the individual sewage disposal system has been inspected and based on the data provided by the applicant, conforms to the minimum requirements of South Dakota Department of Environmental Protection Guidelines. WARNING: This permit does not guarantee, warrant or in anyway insure the operation, reliability or longevity of said system, the risk of which is strictly that of the applicant.

_____
Administrative Official

Notes

LAWRENCE COUNTY

APPLICATION FOR UTILITY PERMIT

Highway No. FDR170 County Lawrence Approximately 1.5 mi. W.N.W.

from Junction with Galena Rd. (City or well defined point) for construction of Overhead Powerline (type of utility facility)

Begin Section 9 Township 4N Range 4E End Section 8 Township 4N

Range 4E

Intended usage or rating 12 K

Cable size and type 1/0 quad

Outside pipe diameter DNA

Maximum pipeline operating pressure DNA

Size and type of metal casing DNA

Minimum depth of cable or pipeline Overhead distribution

Method of installation same

Approximate construction dates - Start Sept. 8, 1987 Finish Nov. 1, 1987

Special conditions None

I, the undersigned, request permission to construct and maintain a utility facility on public right-of-way at the above location and as shown on the attached layout sheet and in accordance with provisions of Administrative Rule chapter 70:01:08 of the South Dakota Department of Transportation. In consideration for this permission, I agree to abide by all conditions as herein stated.

1. To furnish all materials, labor, incidentals and pay all costs involved with the construction and maintenance of the utility facility. To perform approved open c trench operations in accordance with current Open Cut Trench Policy. To restore any damaged portions of the roadway and right-of-way to equal or better conditio than existed prior to beginning work covered by this permit.

2. To provide protection to highway traffic during construction and maintenance by the use of proper signs, barricades, flagpersons and lights as prescribed in the "Manual of Uniform Traffic Control Devices".

3. To furnish a performance bond if deemed necessary by the Lawrence County Commissioners .

4. In the event it is deemed necessary by the Lawrence County Commissioners to move or alter the line in any way due to maintenance or highway construction within i present right-of-way width, the alteration will be accomplished by the owner without cost to Lawrence County.

APPLICATION FOR UTILITY PERMIT - page 2

5. In the event it is deemed necessary by the Lawrence County Commissioners to have an inspector present at the utility construction, all wages and expenses incurred by such inspector shall be paid for by the permit applicant.

6. To indemnify, hold and save harmless Lawrence County, its Officers and Employees, from any and all suits, actions and claims of any kind or nature brought because of any injuries or damage received or sustained by any person or property on accou of the use or occupancy of highway right-of-way designated in this application.

COMPANY Brohm Mining Corporation DATE 9-23-87

ADDRESS P.O. Box 485, Deadwood, SD 57732 TELEPHONE (605) 578-2107

BY J.C. Wilbanks TITLE Dir. - Gov/Environ Affair

- -

* * * to be completed by County Highway Superintendent * * *

Project No. _____

1. Prior to commencing construction and upon completion of work the applicant shall notify _____ at _____ Telephone _____.

2. Special conditions: _____

3. Failure to construct and maintain the utility facility in accordance with the provisions of this permit will automatically render this permit null and void and constitute grounds for its removal and/or restoration of the site at the applicants expense.

Recommended for approval by _____
Lawrence County Highway Superintendent

Approved: Sept. 23, 19 87

By _____ for George Oatey, chairman
Lawrence County Board of Commissioners
South Dakota

South Dakota Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

July 29, 1988

Mr. John Wilbanks
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

Dear Mr. Wilbanks:

Enclosed is your permit to construct. Any changes from the approved application must be approved by this Department before its implementation. Again, please apply for your operational permit no less than 30 days from the date you plan to go on line.

If you have any questions, please contact this Office at 773-3153.

Sincerely,

Keith Gestring

Keith Gestring
Natural Resources Engineer
Division of Air Quality & Solid Waste
Air Quality Program

Enclosure

cc: Division of Air Quality and Solid Waste

S343.aq

Celebrate the Century
1889 - 1989
South Dakota

PERMIT TO CONSTRUCT

Under the South Dakota Air Pollution Control Regulations

Pursuant to Chapter 34A-1-21 of the South Dakota Codified Laws, and the Air Pollution Control Regulations of the State of South Dakota, and in reliance on statements made by the owner designated below, a permit to construct is hereby issued by the South Dakota Board of Minerals and Environment authorizing such owner to operate the source unit(s) at the location designated below and under the listed conditions:

A. Owner

1. Company Name and Address

   Brohm Mining Corporation
   P.O. Box 485
   Deadwood, SD 57732

2. Actual Source Location and Mailing Address if Different From Above

   4 miles southeast of Deadwood.

3. Contact Person, Phone Number, Address if Different From Above

   John Wilbanks
   (605)578-2107

B. Permit Number 28.1163-09

C. Date Permit Granted July 29, 1988

D. Date Permit Expires July 29, 1990

E. Type of Operation Precious metal mining and recovery.

PERMIT TO CONSTRUCT

SOURCE UNIT(S)

Allis Chalmer 42 x 48" RT Crusher
Alis Chalmer Model 600 Crusher
Trane Thermal combustion Heater
Scotia Mercury Retort
Dore' Induction Furnace
Transfer Points

PERMIT TO CONSTRUCT

CONDITIONS

A. The owner or operator shall operate the source unit(s) in accordance with the statements, representations and supporting data contained in the application dated May 18, 1988

B. This Permit to Construct shall be effective thirty (30) days following publication for a period of three (3) years, unless sooner suspended, revoked or surrendered. An application for renewal shall be submitted thirty (30) days prior to the expiration date.

C. This Permit to Construct may not be transferred and shall be returned to the Department upon sale, destruction or change of ownership of the source unit or upon permit expiration, suspension or revocation.

D. Any alteration, rebuilding, repairing or expansion of the existing installation which results in the emission of an additional or greater amount of air contaminants must be reviewed and approved by the Department prior to the start of such alteration, rebuilding, repairing or expansion. In addition, any alteration of existing or installation of new emission control equipment must be reviewed and approved by the Department prior to the alteration or installation. This does not include routine maintenance and repairs.

E. This permit is issued in reliance upon the accuracy and completeness of the information set forth in the application. The conditions herein become upon the effective date of this permit, enforceable by the Department and the Board of Minerals and Environment. Each and every condition of this permit is a material part thereof and is not severable.

F. The operating rate for the operation shall be determined by the maximum capacity of the primary crusher and shall be limited to 700 tons per hour.

G. The allowed yearly rate of 2,500,000 tons of ore mined shall be based upon the total production of any one month period combined with the total production of the previous eleven month period.

PERMIT TO CONSTRUCT

CONDITIONS (cont.)

H. The management will agree to make records of process weight rate available upon inspection by the Department to insure the allowed yearly rate is not being exceeded.

I. In accordance with ARSD 74:26:21, no owner or operator shall cause to be discharged into the atmosphere: 1) any stack emissions that exhibit greater than 7 percent opacity; (2) any fugitive emissions that exceed 10 percent opacity.

J. All unpaved, active haul roads shall be wetted sufficiently to efectively suppress fugitive dust, or twice per day, whichever is greater. Days with greater than 0.01 inches of rainfall are excluded from the wetting program. Alternative dust suppression techniques, such as petroleum resins or calcium chloride, that are at least as effective as wetting, shall also be acceptable.

K. In accordance with ARSD 74:26:02:02 and :04, the facility shall maintain an on-going ambient air monitoring program which must be approved by the Department.

L. All air pollution control equipment shall be maintained and operated in such a manner as to ensure efficient operation.

M. An inventory of spare parts necessary for routine maintenance of the air pollution control equipment shall be kept on site.

Richard C. Sweetman

Richard C. Sweetman, Chairman
Board of Minerals and Environment

SOUTH DAKOTA Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

November 2, 1988

Mr. John Wilbanks, Director
Environmental Affairs
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

Dear Mr. Wilbanks:

Enclosed is your permit to operate. This permit will not relieve the owner or operator of this facility from operating this source in compliance with the State of South Dakota's Air Pollution Control Regulations. Please check the equipment listed on the permit and notify our office of any discrepancies. Our Department will conduct inspections to insure that this facility remains in compliance with our regulations.

If you have any questions, please contact this Office at 773-3153.

Sincerely,

Keith Gestring

Keith Gestring
Natural Resources Engineer
Division of Air Quality & Solid Waste
Air Quality Program

Enclosure

S347.AQ

CELEBRATE THE CENTURY
1889 · 1989
South Dakota

PERMIT TO OPERATE

Under the South Dakota Air Pollution Control Regulations

Pursuant to Chapter 34A-1-21 of the South Dakota Codified Laws; and the Air Pollution Control Regulations of the State of South Dakota, and in reliance on statements made by the owner designated below, a permit to operate is hereby issued by the South Dakota Board of Minerals and Environment authorizing such owner to operate the source unit(s) at the location designated below and under the listed conditions:

A. Owner

1. Company Name and Address

   Brohm Mining Corporation
   P.O. Box 485
   Deadwood, South Dakota 57732

2. Actual Source Location and Mailing Address if Different From Above

   5 1/2miles southeast of Deadwood, South Dakota

3. Contact Person, Phone Number, Address if Different From Above

   John Wilbanks, Director of Environmental Affairs
   (605) 578-2107

B. Permit Number 28.1163-09

C. Date Permit Granted November 1, 1988

D. Date Permit Expires November 1, 1991

E. Type of Operation Operation of excavation, crushing and precious metal recovery equipment for a heap leach operation.

PERMIT TO OPERATION

SOURCE UNIT(S)

1988 Seco Model #258 vibrating screen with water sprays
1988 Allis-chalmers 42 x 48 RT Jaw crusher equipped with water sprays
1988 Seco Model #2620 vibrating screen equipped with water sprays
1988 Allis-chalmers Model #600 cone crusher equipped with water sprays
1988 Aerro Tank cement bin equipped with a dynamic air conveying systems/Modu-Kleen dust collection system
1988 Fisher Industries belt conveyors with water sprays
1988 Scota mercury retort equipped with a 1988 Scotia mercury condenser - carbon trap
1988 Inductotherm Corporation Dore bullion furnace equipped with a 1988 Mikro Pulsair 6458 baghouse
1988 T-thermal 12049 sub-x-heater propane fired water heater

PERMIT TO OPERATE

CONDITIONS

A. The owner or operator shall operate the source unit(s) in accordance with the statements, representations and supporting data contained in the application dated August 26, 1988.

B. This Permit to Operate shall be effective thirty (30) days following publication for a period of three (3) years, unless sooner suspended, revoked or surrendered. An application for renewal shall be submitted thirty (30) days prior to the expiration date.

C. This Permit to Operate may not be transferred and shall be returned to the Department upon sale, destruction or change of ownership of the source unit or upon permit expiration, suspension or revocation.

D. Any alteration, rebuilding, repairing or expansion of the existing installation which results in the emission of an additional or greater amount of air contaminants must be reviewed and approved by the Department prior to the start of such alteration, rebuilding, repairing or expansion. In addition, any alteration of existing or installation of new emission control equipment must be reviewed and approved by the Department prior to the alteration or installation. This does not include routine maintenance and repairs.

E. This permit is issued in reliance upon the accuracy and completeness of the information set forth in the application. The conditions herein become upon the effective date of this permit, enforceable by the Department and the Board of Minerals and Environment. Each and every condition of this permit is a material part thereof and is not severable.

F. The owner or operator shall not operate any source unit(s) unless the pollution control equipment is operating properly.

PERMIT TO OPERATE

CONDITIONS (cont.)

G. The operating rate for the operation shall be determined by the maximum capacity of the primary crusher and shall be limited to 700 tons per hour.

H. The allowed yearly rate of 2,500,00 tons of ore mined shall be based upon the total production of any one month period combined with the total production of the previous eleven month period.

I. The management will agree to make records of process weight rate available upon inspection by the Department to insure the allowed yearly rate is not being exceeded.

J. In accordance with ARSD 74:26:21, no owner or operator shall cause to be discharged into the atmosphere: (1) any stack emissions that exhibit greater than 7 percent opacity; (2) any fugitive emissions that exceed 10 percent opacity.

K. All unpaved, active haul roads shall be wetted sufficiently to effectively suppress fugitive dust, or twice per day, whichever is greater. Days with greater than 0.01 inches of rainfall are excluded from the wetting program. Alternative dust suppression techniques, such as petroleum resins or calcium chloride, that are at least as effective as wetting, shall also be acceptable.

L. In accordance with ARSD 74:26:02:02 and :04, the facility shall maintain an on-going ambient air monitoring program which must be approved by the Department.

M. All air pollution control equipment shall be maintained and operated in such a manner as to ensure efficient operation.

N. An inventory of spare parts necessary for routine maintenance of the air pollution control equipment shall be kept on site.

Richard C. Sweetman

Richard C. Sweetman, Chairman
Board of Minerals and Environment

DATE: AUGUST 27, 1990

TO: MIKE ATTAWAY
MYRON ANDERSON
LANCE HUBBARD
MARV TRUHE

FROM: PAT GOCHNOUR

RE: GROUNDWATER DISCHARGE PERMIT (GWD3-88)

Enclosed please find the above referenced Groundwater Discharge Plan with its Approved Water Quality Variance and Construction Permit.

Included with this permit is the "Fact Statement" issued by the Department of Water and Natural Resources on groundwater quality program on June 22, 1990 by Barb K. Neilson.

Also included with this is a letter from Barb K. Neilson dated August 16, 1990 that clarifies Condition 2, Condition 6, and Condition 9 of the fact statement.

This should bring all of your records up to date on the above reference subject. If you have any questions regarding this, please let me know.

enc:

/rrl

MEMORANDUM

DATE: JULY 27, 1990
TO: MIKE ATTAWAY
MYRON ANDERSON
LANCE HUBBARD
FROM: PAT GOCHNOUR
SUBJECT: GROUNDWATER DISCHARGE PERMIT RENEWAL GWD 3-88

Attached for your records is a copy of the approved renewal of the above referenced permit. A clarification letter from the Department will be arriving shortly. This letter will clear up the problems we had with:

- Characterization
- Specification of the "unnamed spring"
- Dual reports and approval to offload

This will be subject to one more renewal in 1992!

/rrl

Plan No. GWD 3-88

South Dakota Department of Water and Natural Resources
Ground-Water Quality Program
523 East Capital Avenue, Joe Foss Building
Pierre, South Dakota 57501
Telephone: (605) 773-3296

GROUND-WATER DISCHARGE PLAN

A Ground-water Discharge Plan is hereby conditionally approved by the Board of Water Management pursuant to ARSD 74:03:16:09 for:

Applicant: Brohm Mining Corporation

Location: NW 1/4, SE 1/4, Section 5, T. 4N., R. 4E., Lawrence County

Description: See the attached fact statement and conditions.

This plan includes:

1. Water Quality Variance

   Approved 7/26/88 Amended 4/11/89 Reviewed 7/26/90

2. Construction Permit

   Approved 7/26/90

As stated in the attached fact statement and conditions. The plan is not transferable.

Signed this Twenty-sixth day of July, 1990.

Chairman, Board of Water Management

SOUTH Dakota Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

CC: - Lance Hubbard
- Myron Anderson
- Mary Tolley

August 16, 1990

PAT GOCHNOUR
BROHM MINING CORPORATION
PO BOX 485
DEADWOOD SD 57732

Dear Pat:

This is to confirm your letter dated July 25, 1990. The Department provides the following comments.

Condition #2: This condition has been met.

Condition #6: The spring in the unnamed gulch is the equivalent to SW35.

Condition #9: It is not the Department's intent to hold up or delay off-loading. This condition can be handled in accordance to the procedure that was used on August 7, 1990. That is, submit the data and stipulate the off-loading date. If there is a problem with the data, the Ground-Water Quality Program will respond.

If you have any questions regarding this response, please let me know.

Sincerely,

Barbara K Niel

Barbara K. Nielsen
Hydrologist
Ground-Water Quality Program
Phone: (605) 773-3296

Plan No. GWD 3-88

South Dakota Department of Water and Natural Resources
Ground-Water Quality Program
523 East Capital Avenue, Joe Foss Building
Pierre, South Dakota 57501
Telephone: (605) 773-3296

GROUND-WATER DISCHARGE PLAN

A Ground-water Discharge Plan is hereby conditionally approved by the Board of Water Management pursuant to ARSD 74:03:16:09 for:

Applicant: Brohm Mining Corporation

Location: NW 1/4, SE 1/4, Section 5, T. 4N., R. 4E
Lawrence County

Description: See the attached fact statement and conditions.

This plan includes:

1. Water Quality Variance

   Approved 7/26/88 Amended 4/11/89 Reviewed 7/26/90

2. Construction Permit

   Approved 7/26/90

As stated in the attached fact statement and conditions. The plan is not transferable.

Signed this Twenty-sixth day of July, 1990.

Chairman, Board of Water Management

Post-it™ brand fax transmittal memo 7671 # of pages ▸ 11

To Pat Gochnour	From Tom Brandreo
Co. Brohm Mining Co	Co. DWNR
Dept.	Phone # 773-3296
Fax # 578-1709	Fax # 773-6035

GROUND-WATER DISCHARGE PLAN
WATER QUALITY VARIANCE REVIEW
FACT STATEMENT

APPLICANT: Brohm Mining Corporation, Deadwood, South Dakota

PERMIT NUMBER: GWD 3-88

PERMIT TYPE: Mining - Land application of neutralized ore

LOCAL CONTACT: Pat Gochnour, Director
Environmental Affairs
(605) 578-2107

LOCATION: NW 1/4, SE 1/4, Section 5, T. 4N., R. 4E., Lawrence County

Description

Brohm has been land applying spent ore in Ruby Gulch, approximately five miles southeast of Lead, South Dakota. To date, approximately one million tons of washed and neutralized ore have been placed in Ruby Gulch. An additional five million tons of washed and neutralized ore may be placed in Ruby Gulch over the remaining 5 to 8 years of the expected project life. In accordance with SDCL 34A-2-24, the ground-water quality variance is subject to a biennial review by the Board of Water Management. The plan involves manangement of the neutralized ore to protect ground and surface water quality.

Receiving Waters

Overland flow through Ruby Gulch occurs during wet periods with year-round flow at the mouth of the gulch, which discharges to Bear Butte Creek. A considerable amount of overland flow is lost to infiltration as the Ruby Gulch drainage serves as a source for ground-water recharge to the shallow unconsolidated aquifer in the valley of Bear Butte Creek. The shallow aquifer in turn serves as a recharge for the bedrock aquifer via faults, fractures, and old mine workings.

The aquifers impacted in the area are a shallow unconsolidated aquifer and a bedrock aquifer. The shallow aquifer consists of unconsolidated alluvial and colluvial material and weathered bedrock. The water table is generally five to 15 feet below ground level. The bedrock aquifer consists of three basic rock groups:

1. Precambrian metamorphic rocks (schists, gneisses, cherts),
2. Cambrian Deadwood Formation (hornfels and quartzite), and
3. Tertiary intrusives (primarily trachyte porphries).

Related studies show water levels in the bedrock are stratigraphically and structurally controlled and occur from 35 to 55 feet below ground level. Water-bearing zones in the bedrock aquifer are generally limited to areas where the bedrock permeability has been chemically or mechanically altered. This corresponds to the mineralized contact between the hornfels and quartzite members of the Deadwood Formation. Both aquifers have a relatively low permeability. The total dissolved solids concentration of less than 10,000 mg/L for both aquifers classify them as having a beneficial use for drinking water.

Discharge Water

Any discharge will be leachate resulting from natural infiltration of precipitation through the spent ore. Annual precipitation in the area averages 29 inches, of which 5% is estimated to infiltrate.

Before the spent ore can be off-loaded, the values of all the parameters measured in the effluent or pore water of the spent ore are expected to be less than the South Dakota Ground-Water Quality Standards with the exception of arsenic, nitrite, pH, and TDS. The calculated allowable off-load criteria for the effluent is as follows:

Total Dissolved Solids	2500 mg/L
pH	6.5 to 10

Subsoil attenuation of arsenic is expected to remove arsenic from the leachate prior to reaching the ground water. Ground water degradation due to arsenic and other metals is not expected to occur. Ground water monitoring data from GW-8 and GW-9 during the past two years has indicated no degradation from metals.

A concentration limit for nitrite is not currently being set because of rapid bacterial conversion of nitrite to nitrogen gas. The Department does reserve the right to set an off-load compliance limit in the future, if applicable.

Perimter of Operational Pollution (POP) and Permitted Allowable Limits

The Department requested two years of ground water monitoring to verify ground water degradation and ambient water quality in Ruby Gulch. Based on the two years of monitoring, it has been determined that limited degradation is occurring in upper Ruby Gulch, however, the Department is requesting an additional two years in which to establish ambient water quality and permitted allowable limits for the compliance monitoring points. The compliance monitoring point consists of two wells (one shallow and one bedrock) located at the farthest downgradient edge of the POP, approximately 800 feet from the edge of the nearest disposal area. The compliance monitoring point, based on contaminant travel times, is expected to remain uneffected for the next two years. The POP includes the spent ore disposal area, waste rock disposal area, and undisturbed area downgradient from the disposal site within Ruby Gulch.

Monitoring and Reporting Requirements

Brohm is required to monitor the effluent or pore water at the toe of every neutralized cell to determine suitability for disposal. Brohm's State Life-of-Mine Permit conditions establish characterization, treatment, and monitoring of the effluent or pore water prior to disposal (Attachment 2). Brohm is also required to do solid sampling of the spent ore. The solid sampling is designed to represent conditions that may exist in the depository. Cyanide concentrations are required through the mining permit.

Brohm is also required to maintain adequate monitoring to determine the total mass loading of arsenic in Ruby Gulch so as not to exceed the mass attenuation capacity of the subsurface materials for arsenic. Since the issuance of GWD 3-88, a little under one million tons of spent ore have been off-loaded into Ruby Gulch. A metals attenuation study calculated an arsenic attenuation capacity of 920 milligrams of arsenic per square foot of soil in Ruby Gulch. This is equivalent to a total mass loading of 6,202 pounds of arsenic. To date, the total loading of arsenic into Ruby Gulch has been 340 pounds. The arsenic concentration used to determine loading is measured in the effluent of every neutralized cell.

The spring in the unnamed gulch and six monitoring wells (BED-18, GW-8, GW-9, GW-10, GW-12, GW-13) are currently sampled quarterly for the parameters listed in ARSD 74:03:15, Ground-Water Quality Standards (Attachment 1). All metals are measured as "dissolved" except mercury which is "total". In addition, Brohm will install and monitor a new well (GW-13A) located downgradient of the current leading edge of the spent ore depository for the parameters listed in ARSD 74:03:15 (Attachment 1).

Monitoring results will be submitted to the Department of Water and Natural Resources, Ground-Water Quality Program within 10 days after Brohm's receipt from the laboratory. If the results indicate probable out-of-compliance status, the Department will be notified within 24 hours, at which time required accelerated monitoring would be initiated. The monitoring data obtained to date shows variability and unpredictability in analytical results. Therefore, the Department is recommending another two years of monitoring before calculating an ambient water quality for the compliance monitoring point. A contingency plan will be initiated if out-of-compliance status is determined.

Permit Review

The Ground-Water Quality Variance Permit is subject to a biennial review by the Board of Water Management.

Date: June 22, 1990
Prepared By: Barbara L. Niel
Reviewed By: Jane Goodman

CONDITIONS
GWD 3-88 (7/90 REVIEW AND RENEWAL)

All conditions in the original plan and the April 20, 1989, amendment shall be replaced by these conditions.

1. Brohm Mining Corporation will submit, at the end of 3 years, a post closure monitoring plan based on water quality monitoring during operation of the facility. The post closure monitoring plan will include a contingency plan for clean-up of any ground-water contamination beyond the POP zone.

2. Prior to the initiation of neutralization, fluoride, nitrite, and gross alpha to include uranium shall also be included and characterized with the parameters set forth in attachment 2, Heap Neutralization conditions for intensive treatment characterization.

3. Before the neutralized ore can be off-loaded for disposal in Ruby Gulch, the effluent or the pore water must meet the numeric ground-water quality standards, with the exception of arsenic, nitrite, pH, and total dissolved solids. Operational monitoring shall be consistent with the requirements set forth in Attachment 2, Heap Neutralization conditions for operational monitoring. The effluent must be measured for total dissolved solids, pH, and arsenic prior to off-loading. The concentration of total dissolved solids in the effluent must be equal to or less than 2500 mg/L, and the pH of the effluent will be in the range of 6.5 to 10.0 prior to the ore being off-loaded.

4. Brohm shall not exceed the calculated total mass loading capacity of 6,202 pounds of arsenic for Ruby Gulch. If the total mass loading capacity is reached, Brohm shall cease off-loading in Ruby Gulch and within the boundaries of the approved perimeter of operational pollution (POP).

5. Brohm will maintain adequate monitoring to determine the total mass loading of arsenic in Ruby Gulch so as not to exceed the mass attenuation capacity of the subsurface materials for arsenic. The arsenic concentration used to determine loading is measured in the effluent of the neutralized heap.

6. Brohm shall sample quarterly the spring in the unnamed gulch, BED-18, GW-8, GW-9, GW-10, GW-12, GW-13, and GW-13A, during operation for the parameters listed in ARSD 74:03:15 (Attachment 1). Metals concentrations are measured as "dissolved" except for mercury which is "total".

7. For a minimum of 2 years, Brohm shall be required to maintain ambient water quality at the compliance monitoring point at all times, subject to the Secretary of the Department setting permitted allowable limits.

8. Brohm shall submit the analytical results from the monitoring wells to the Ground-Water Quality Program within 10 days of Brohm's receipt from the laboratory.

9. Brohm shall submit the analytical results for neutralization compliance monitoring for each cell to the Ground-Water Quality Program for approval prior to off-loading.

10. Brohm shall submit an annual report each year in January, which shall address the amount of spent ore disposed, the total mass loading of arsenic, and a summary of the water quality monitoring conducting to date. The water quality monitoring discussion must address any noticeable changes in water quality.

ATTACHMENT 1

Arsenic
Barium
Cadmium
Chromium
Copper
Cyanide (WAD)
Fluoride
Lead
Mercury
Selenium
Silver
Nitrate as N
Nitrite
Chloride
pH
Sulfate
Total Dissolved Solids

ATTACHMENT 2

Heap Neutralization

Brohm shall comply with the requirements fo ARSD 74:29:05:05 through 74:29:05:11, inclusive, in regard to spent ore treatment and monitoring prior to off-loading, including the following:

A) Intensive treatment characterization shall be conducted on the first and second heaps in accordance with the following:

1) Based on the initial sampling and chemical characterization of effluent or pore water required by ARSD 74:29:05:06, the Department will designate key monitoring parameters for the intensive treatment characterization. These parameters will include any of those found above detection limits and any parameter which may be likely to occur in the effluent or pore water.

2) Monitoring during the intensive treatment characterization shall include the following:

a) Following treatment, effluent from the heaps shall be sampled 6 times over a 48 hour period. The 6 samples shall be composited and shall be analyzed for the parameters designated in (1) above. Each individiual sample shall be analyzed for WAD cyanide; and

b) Following treatment Brohm shall collect a minimum of ten solid samples from locations in the heap to provide a representative sampling of the heap. These samples shall be subjected to a laboratory leachate test approved by the Department and analyzed for the parameters designated in (1) above.

3) Compliance with treatment standards - the spent ore will be considered suitable for off-loading when:

a) The mean value for WAD cyanide in the 6 effluent samples is less than 0.5 mg/l., with no individual sample exceeding 2.5 times the mean;

b) The values for other key parameters in the 6 sample effluent composite meet the treatment standards designated in 74:29:05:08; and

c) The mean values for leachate from solids samples meet the treatment standards designated in 74:29:05:08, with no individual sample exceeding 2.5 times the mean.

d) Should sampling according to this schedule indicate that treatment standards have not been met, Brohm shall take measures to investigate the cause and reduce the levels to meet treatment standards prior to off-loading.

B) Operational monitoring of treatment following the intensive treatment characterization shall include the following:

1) Based on the results of the intensive treatment characterization, the Department will designate key operational monitoring parameters to be analyzed for during routine operations. WAD cyanide will be one of the key operational monitoring parameters;

2) Operational monitoring shall include collecting 3 individual effluent samples over a 24 hour period from each heap, if the intensive treatment characterization indicates extreme variablility or unpredictability in analytical results, more intensive sampling may be required;

3) Each heap shall be considered suitable for off-loading when the mean value for the designated operational monitoring parameters in the 3 individual effluent samples meet the treatment standards of 74:29:05:08, with no individual sample exceeding 2.5 times the mean;

4) During each seven-cell leaching cycle, one heap shall be sujected to the monitoring required under intensive treatment monitoring, (A-2) above. This monitoring will begin with heap cell #3 following its second use, and shall continue with heap cell #4 after its third use, #5 after its fourth use, and so on. Compliance for off-loading must be demonstrated in accordance with (A-3) above. If these intensive monitoring procedures clearly indicate that the reliability of the operational monitoring schedule or parameters is inadequate, the Department may revise the operational monitoring schedule to correct deficiencies.

C) Prior to off-loading, each heap Brohm shall submit copies of all sampling and analytical data required by the monitoring schedules indicated above.

D) Following cessation of ore leaching activities by Brohm, any spent ore left ~~(6 ft)~~ on the pad area shall be treated to meet the ~~treat~~ment standards of ARSD 74:29:05:08. Final monitoring shall be done in accordance with (B) above.

E) Upon final reclamation, all spent ore heaps not designated for retention of fluids, shall be free draining. Drainage from such areas shall not cause erosion, interfere with post-closure monitoring systems, cause water pollution, or limit necessary access to the site.

possible treatment methods;
(3) Preliminary plans and specifications for facilities associated with tailings treatment;
(4) Storage of the proposed treatment reagents at the site;
(5) A plan of operation for the treatment; and
(6) Plans for disposal of treatment solutions, if applicable.

In heap leach operations, the treated tailings must be used as backfill in the mine pits where compatible with the overall mine plan. If in-place tailings piles are approved by the board, physical reclamation must conform to the reclamation requirements for spoil in § 74:29:07:14.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-5, 45-6B-44, 45-6B-45.

74:29:05:06. Treatment of tailings -- Initial sampling and chemical characterization. Prior to the initiation of treatment, effluent or pore water from a tailings impoundment shall be sampled and chemically characterized for the following parameters:

(1) Chemical constituents which may be used in or are likely to result from the milling or treatment process;

(2) Aluminum, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silicon, silver, vanadium, and zinc;

(3) Major cations and anions, including ammonia, bicarbonate, calcium, carbonate, chloride, magnesium, nitrate, potassium, sodium, and sulfate;

(4) pH;

(5) Radon, uranium, radium 226, radium 228, total alpha radiation, total gamma radiation; and

(6) Total dissolved solids.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-44, 45-6B-45.

74:29:05:07. Treatment of tailings -- Monitoring during treatment process. Effluent or pore water from tailings impoundments shall be monitored for key parameters designated by the department to statistically characterize the treatment cycle. The monitoring shall be done throughout the duration of the treatment process.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-44, 45-6B-45.

74:29:05:08. Treatment of tailings. Treatment of the tailings shall continue until the effluent or pore water from the tailings impoundment

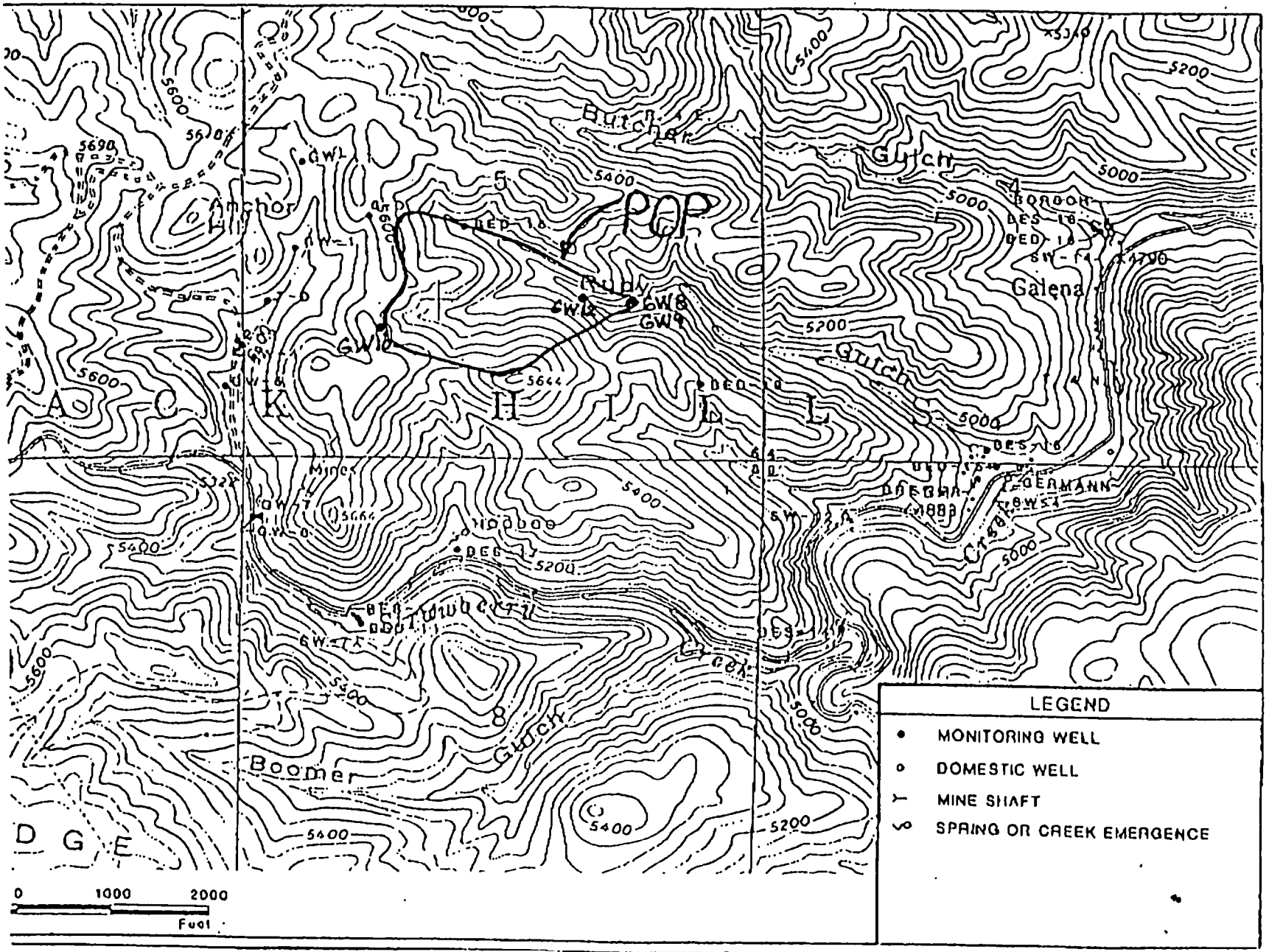

Figure 8
Groundwater Monitoring St[illegible] Location Map

MEMORANDUM

DATE: JULY 27, 1990
TO: MIKE ATTAWAY
MYRON ANDERSON
LANCE HUBBARD
FROM: PAT GOCHNOUR
SUBJECT: GROUNDWATER DISCHARGE PERMIT RENEWAL GWD 3-88

Attached for your records is a copy of the approved renewal of the above referenced permit. A clarification letter from the Department will be arriving shortly. This letter will clear up the problems we had with:

- Characterization
- Specification of the "unnamed spring"
- Dual reports and approval to offload

This will be subject to one more renewal in 1992!

/rrl

Plan No. GWD 3-88

South Dakota Department of Water and Natural Resources
Ground-Water Quality Program
523 East Capital Avenue, Joe Foss Building
Pierre, South Dakota 57501
Telephone: (605) 773-3296

GROUND-WATER DISCHARGE PLAN

A Ground-water Discharge Plan is hereby conditionally approved by the Board of Water Management pursuant to ARSD 74:03:16:09 for:

Applicant: Brohm Mining Corporation

Location: NW 1/4, SE 1/4, Section 5, T. 4N., R. 4E., Lawrence County

Description: See the attached fact statement and conditions.

This plan includes:

1. Water Quality Variance

   Approved 7/26/88 Amended 4/11/89 Reviewed 7/26/90

2. Construction Permit

   Approved 7/26/90

As stated in the attached fact statement and conditions. The plan is not transferable.

Signed this Twenty-sixth day of July, 1990.

Chairman, Board of Water Management

SOUTH DAKOTA Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

July 28, 1988

John Wilbanks
Brohm Mining Corp.
PO Box 485
Deadwood, SD 57732

Dear Mr. Wilbanks:

Please find enclosed a copy of the Ground-water Discharge Plan approval for Brohm's spent ore disposal in Ruby Gulch. The Water Quality Variance and the Construction Permit have been approved and signed as per the conditions. The Ground-water Discharge Permit is pending and will be based on two years of operational and background data.

Thank you for your cooperation in preparing this plan and for the presentation given to the Board of Water Management. If you have any questions, please let me know.

Sincerely,

Barbara K. Nielsen

Barbara K. Nielsen
Hydrologist
Ground-water Quality Program

Enclosures

CELEBRATE THE CENTURY
1889-1989
South Dakota

Plan No. GWD 3-88

South Dakota Department of Water and Natural Resources
Ground-water Quality Program
523 East Capitol Avenue, Joe Foss Building
Pierre, South Dakota 57501
Telephone: (605) 773-3351

GROUND-WATER DISCHARGE PLAN

A Ground-water Discharge Plan is hereby conditionally approved by the Board of Water Management pursuant to ARSD 74:03:16:09 for:

Applicant: Brohm Mining Corporation

Location: NW 1/4, SE 1/4, Section 5, T.4N., R 4E., Lawrence County, South Dakota

Description: Brohm Mining Corporation proposes to land apply spent ore from a heap leaching operation in Ruby Gulch, approximately 5 miles southeast of Lead, South Dakota. Approximately 6 million tons of washed and neutralized ore may be disposed of in Ruby Gulch over the 7 to 10 years of expected project life. The numeric ground water quality standards for metals will be met in the effluent prior to off-loading, except for arsenic. Brohm shall be required to monitor the effluent at the toe of the neutralized heap and maintain adequate monitoring and records to determine total mass loading of arsenic so as not to exceed the mass attenuation capacity of the subsurface materials in Ruby Gulch.

This plan includes:

1. Water Quality Variance Attachment 1 — Approved 7/27/88 — Expires 7/27/90
2. Construction Permit Attachment 2 — Approved 7/27/88
3. Discharge Permit Attachment 3 — Approved _____ — Expires _____

The Ground-water Discharge Plan becomes effective on 7/27/88, and is not transferable.

ATTACHMENT 1

Water Quality Variance

A Water Quality Variance is hereby granted by the Board of Water Management for a Perimeter of Operational Pollution (POP) pursuant to ARSD 74:03:16:11 and 74:03:16:16 for:

Applicant: Brohm Mining Corporation

Location: NW 1/4, SE 1/4, Section 5, T.4N., R. 4E., Lawrence County, South Dakota

Description: Brohm proposes to land apply approximately 6 million tons of spent ore into Ruby Gulch over a 7 to 10 year period. The perimeter of operational pollution (POP) includes the spent ore disposal area, waste rock disposal area, and undisturbed area downgradient from the disposal site within Ruby Gulch. The POP that is recommended by the Department is an area of limited extent and is an area which is practical to monitor.

Reason: Indirect discharge of leachate containing arsenic from natural infiltration of precipitation through the land applied spent ore.

The Water Quality Variance becomes effective on 7/27/88, and is not transferable. The Water Quality Variance is subject to biennial review on or before 7/27/90.

Signed this 27 day of July, 1988

Marian S. Sundeson

Chairman, Board of Water Management

ATTACHMENT 2

Construction Permit

A Construction Permit is hereby granted by the Board of Water Management pursuant to ARSD 74:03:16:12 for:

Applicant: Brohm Mining Corporation

Location: NW 1/4, SE 1/4, Section 5, T. 4N., R. 4E., Lawrence County, South Dakota

Monitoring Requirements:

Brohm shall be required to monitor the effluent at the toe of the neutralized heap and maintain adequate monitoring and records to determine the total mass loading of arsenic, so as not to exceed the mass attenuation capacity of the subsurface materials in Ruby Gulch. The spring in the unnamed gulch and five monitoring wells (BED-18, GW-8, GW-9, GW-10, and GW-12) shall be sampled quarterly for metals concentrations measured as "Total Dissolved" except for mercury which is "Total". The monitoring wells would include two compliance point monitoring wells, GW-8 (shallow) and GW-9 (bedrock).

Off-load Criteria:

Before Brohm can off-load the spent ore, the values of all the parameters measured in the effluent and the pore water are expected to be less than the South Dakota Ground-water Quality Standards, ARSD 74:03:15:03, with the exception of arsenic. Cyanide and pH concentrations have been set by the South Dakota Mining Permit #439.

Reporting Requirements:

Monitoring results shall be submitted to the Department of Water and Natural Resources within 10 days after Brohm's receipt from the laboratory. Brohm is also required to submit an annual report each year in January.

Schedule:

Brohm proposes to begin land applying the spent ore in October, 1988.

The construction permit becomes effective on 7/27/88, and is not transferable.

Signed this 27 day of July, 1988

Marian B. Gundersen

Chairman, Board of Water Management

ATTACHMENT 3

Ground-water Discharge Permit

A Ground-water Discharge Permit is hereby granted by the Secretary of the Department of Water and Natural Resources pursuant to ARSD 74:03:16:13 for:

Applicant: Brohm Mining Corporation

Location: NW 1/4, SE 1/4, Section 5, T. 4N., R. 4E., Lawrence County, South Dakota

Permitted Allowable Limits:

This Ground-water Discharge Permit becomes effective on _____, and is not transferable. The permit expires on _____. Application for permit renewal must be made at least 180 days prior to expiration.

Signed this ____ day of _____

_____

Secretary, Department of Water amd
Natural Resources

SOUTH DAKOTA Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

June 21, 1988

John Wilbanks
Brohm Mining Corporation
PO Box 485
Deadwood, South Dakota 57732

Dear Mr. Wilbanks:

Please find enclosed a copy of the Fact Statement, Conditions, and a Notice for a contested case for the Brohm Ground-water Discharge Plan, GWD 3-88.

If you should have any questions, please let me know.

Sincerely,

Barbara K. Nielsen

Barbara K. Nielsen
Hydrologist
Office of Water Quality
Phone: (605) 773-3296

Enclosures

cc: Marvin D. Truhe
Roxanne Giedd

CELEBRATE THE CENTURY
1889-1989
South Dakota

GROUND-WATER DISCHARGE PERMIT
FACT STATEMENT

APPLICANT: Brohm Mining Corporation, Deadwood, South Dakota

PERMIT NUMBER: GWD 3-88

PERMIT TYPE: Mining - Land application of neutralized ore

LOCAL CONTACT: John Wilbanks, Director Governmental and Environmental Affairs

LOCATION: NW 1/4,SE 1/4, Section 5, T.4N., R.4E., Lawrence County

TELEPHONE: (605) 578-2107

Description

Brohm Mining Corporation proposes to land apply spent ore in Ruby Gulch, approximately 5 miles southeast of Lead, South Dakota. Approximately 6 million tons of washed and neutralized ore may be placed in Ruby Gulch over the 7 to 10 years of expected project life. The permit involves management of the neutralized ore to protect ground and surface water quality.

Receiving Waters

Overland flow through Ruby Gulch occurs during wet periods with year-round flow at the mouth of the gulch, which discharges to Bear Butte Creek. A considerable amount of overland flow is lost to infiltration as the Ruby Gulch drainage serves as a source for ground water recharge to the shallow unconsolidated aquifer in the valley of Bear Butte Creek. The shallow aquifer in turn serves as a recharge for the bedrock aquifer via faults, fractures, and old mine workings.

The aquifers impacted in the area are a shallow unconsolidated aquifer and a bedrock aquifer. The shallow aquifer consists of unconsolidated alluvial and colluvial material and weathered bedrock. The water table is generally 5 to 15 feet below ground level. The bedrock aquifer consists of three basic rock groups:

1. Precambrian metamorphic rocks (schists, gneisses, cherts),
2. Cambrian Deadwood Formation (hornfels and quartzite) and,
3. Tertiary intrusives (primarily trachyte porphries).

Related studies show water levels in the bedrock are stratigraphically and structurally controlled and occur from 35 to 55 feet below ground level. Water-bearing zones in the bedrock aquifer are generally limited to areas where the bedrock permeability has been chemically or mechanically altered. This corresponds to the mineralized contact between the hornfels and quartzite members of the Deadwood Formation. Both aquifers have a relatively low permeability. The total dissolved solids concentration of less than 10,000 mg/L for both aquifers classify them as having a beneficial use for drinking water.

Discharge Water

Any discharge will be leachate resulting from natural infiltration of precipitation through the spent ore. Annual precipitation in the area averages 29 inches, of which 5% is estimated to infiltrate.

Before the spent ore can be off-loaded, the values of all the parameters measured in the effluent and the pore water of the spent ore are expected to be less than the South Dakota ground water quality standards with the exception of arsenic. Subsoil attenuation is expected to remove arsenic from the leachate prior to reaching the ground water. Ground water degradation due to arsenic and other metals is not expected to occur.

Perimeter of Operational Pollution (POP)

Ground-water degradation within the POP is not expected, however, two years of monitoring are required to verify this. The POP includes the spent ore disposal area, waste rock disposal area, and undisturbed area downgradient from the disposal site within Ruby Gulch. The compliance monitoring point consists of two wells (one shallow and one bedrock) located at the farthest downgradient edge of the POP, approximately 800 feet from the edge of the nearest disposal area.

Monitoring and Reporting Requirements

Brohm would be required to monitor the effluent at the toe of the neutralized heap to determine suitability for disposal. Cyanide concentrations and pH levels are required through the South Dakota Mining Permit.

Brohm would also be required to maintain adequate monitoring to determine the total mass loading of arsenic in Ruby Gulch so as not to exceed the mass attenuation capacity of the subsurface materials for arsenic.

The spring in the unnamed gulch and five monitoring wells (BED-18, GW-8, GW-9, GW-10, and GW-12) required for the ground-water discharge permit would be sampled quarterly during operation for metals concentrations measured as "Total Dissolved" except for mercury which is "Total". The monitoring wells would include two compliance monitoring point wells Ashallow (GW-8) and bedrock (GW-9)U which would be monitored monthly prior to operation for the parameters listed in Attachment 1, the original mining permit conditions for water quality monitoring (No. 6 and Table 1), with the addition of barium, fluoride, nitrite, and once for gross alpha to include uranium. During operation, the compliance monitoring wells would be sampled quarterly for metals and other key monitoring parameters as determined by the Department.

Monitoring results would be submitted to the Department of Water and Natural Resources within 10 days after Brohm's receipt from the laboratory. If the results indicate probable out-of-compliance status, the Department will be notified within 24 hours, at which time required accelerated monitoring would be initiated. A contingency plan would be initiated if out-of-compliance status was determined. Brohm would also be required to submit annual reports each year in January.

Permit Review

The Water Quality Variance Permit is subject to a biennial review by the Board of Water Management.

Date Prepared: June 16, 1988

73-2

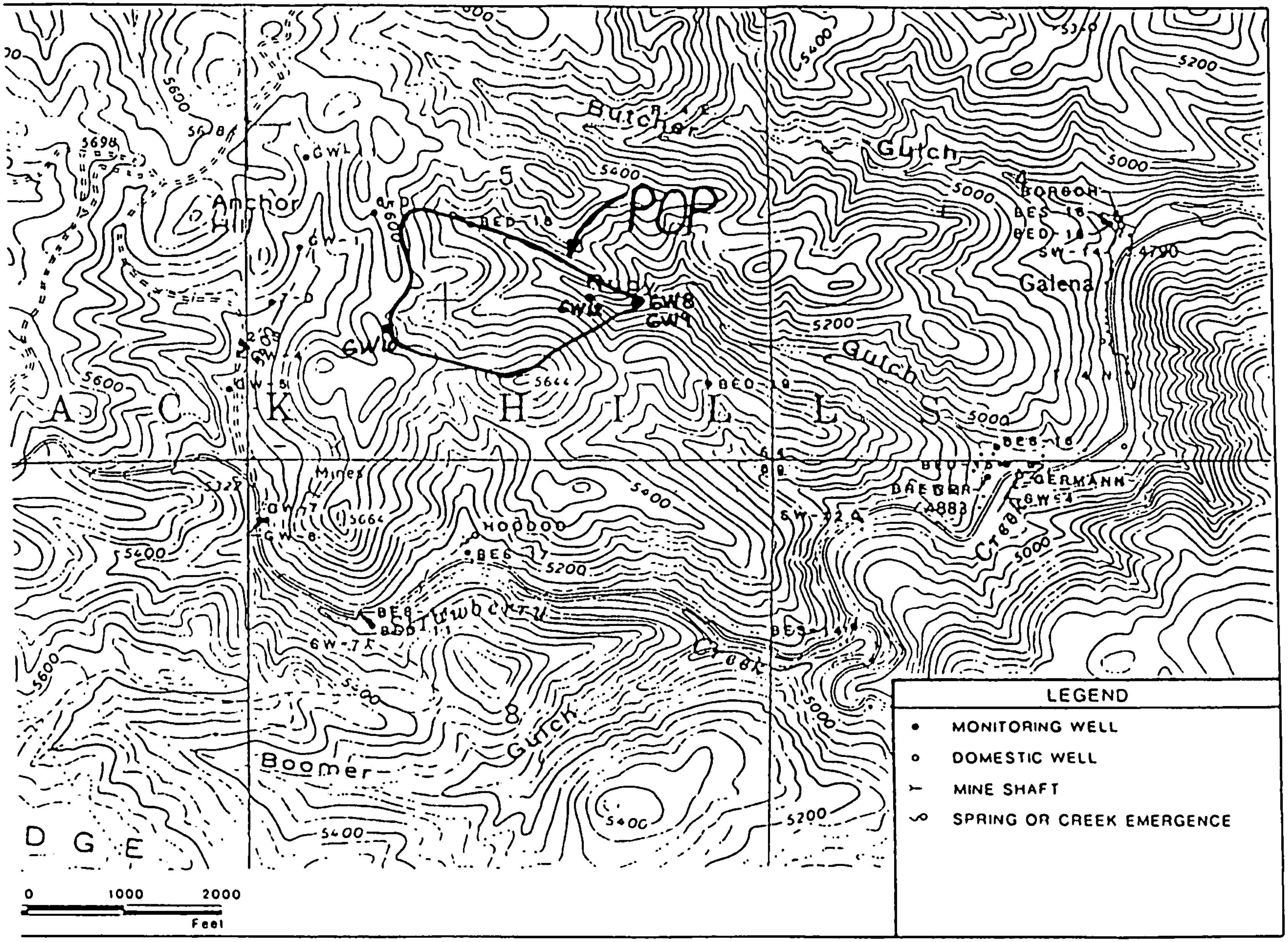

Figure 8

Groundwater Monitoring Station Loc--ion Map

CONDITIONS

1. Brohm Mining Corporation will submit, at the end of 5 years, a post-closure monitoring plan based on water quality monitoring during operation of the facility. The post-closure monitoring plan will include a contingency plan for clean-up of any ground-water contamination beyond the POP zone.

2. Brohm Mining Corporation shall submit a laboratory quality assurance/quality control plan(s).

3. Proposed monitoring wells (including the compliance monitoring wells) will be drilled and constructed in conformance with South Dakota Well Drilling Regulations and the following criteria:

a. All wells monitoring in an aquifer shall be screened to yield correlative water quality;

b. Wells shall be constructed to isolate the screen from all other aquifers other than the one being monitored;

c. Wells shall be clearly marked with an identification code that shall not be duplicated or changed and shall correspond to the code on the approved map of monitoring locations;

d. Wells shall be securely capped to prevent vandalism and contamination;

e. Well casing elevations and locations shall be accurately surveyed by a competent person and indicated on the monitoring point location map;

f. The surveyed elevation point shall be clearly and permanently marked on the casing;

g. Water levels shall be measured from the surveyed and marked measuring point to an accuracy within 0.01 foot; and

h. Concurrent surveys of all well casings shall be made annually to determine if movement has occurred. These surveys shall include the elevation and location of all wells.

4. Prior to the initiation of neutralization, fluoride, nitrite, and gross alpha to include uranium shall also be included and characterized with the parameters set forth in attachment 2, Heap Neutralization conditions for intensive treatment characterization.

5. Before the neutralized ore can be off-loaded for disposal in Ruby Gulch, the effluent or the pore water must meet the numeric ground water quality standards, with the exception of arsenic. Operational monitoring shall be consistent with the requirement set forth in Attachment 2, Heap Neutralization conditions for operational monitoring.

6. Brohm shall submit to the Department the calculated attenuation capacity of the subsurface materials in Ruby Gulch for arsenic. This submittal shall show all calculations and assumptions, and justify all assumptions. Brohm shall not exceed the accepted calculated attenuation capacity. If the accepted total mass loading capacity is reached, Brohm shall cease off-loading in Ruby Gulch and within the boundaries of the approved perimeter of operation pollution (POP).

7. Brohm will maintain adequate monitoring to determine the total mass loading in Ruby Gulch of the arsenic.

8. Brohm shall monitor the water quality of GW-8 and GW-9 monthly prior to operation and as necessary thereafter to determine the ambient water quality of Ruby Gulch pursuant to ARSD 74:03:16:17. GW-8 and GW-9 shall be monitored for the parameters listed in Attachment 1, the original mining permit conditions for water quality monitoring (No. 6 and Table 1), with the addition of barium, fluoride, nitrite, and once for gross alpha to include uranium. All metals are to be measured as "Total Dissolved" except for mercury which is "Total".

9. Brohm shall be required to maintain ambient water quality at the compliance points at all times for a minimum of 2 years subject to the Dept setting permitted allowable limit at that time.

10. Brohm shall sample quarterly the spring in the unnamed gulch, BED-18, GW-8, GW-9, GW-10, and GW-12, during operation for metals concentrations measured as "Total Dissolved" except for mercury which is "Total".

11. Brohm shall within submit monitoring results to the Department of Water and Natural Resources 10 days after Brohm's receipt from the laboratory. Brohm shall submit an annual report each year in January, which shall address the amount of spent ore disposed and the total mass loading of arsenic.

12. Brohm shall submit an operational contingency plan prior to off-loading. The plan shall include provisions for contaminant clean-up of ground-water beyond the POP zone.

ATTACHMENT 1

Water Quality Monitoring

1. Gilt Edge Inc. shall submit a yearly surface and groundwater characterization report beginning the year a mine permit is granted. This report shall include, but is not limited to all chemical, discharge, and water level data gathered and summary and analysis of this data.

2. Gilt Edge shall submit an operational groundwater and surface water monitoring plan including, at a minimum, ten groundwater monitoring stations and six surface water monitoring stations. The plan shall include the parameters to be monitored and frequency of monitoring. The monitoring plan shall be subject to DWNR review and approval prior to construction. The operational monitoring plan shall be continued until final bond release.

3. Gilt Edge shall measure water levels in all groundwater wells quarterly. Shallow well water level measurements shall be done in conjunction with surface water gauging and sampling.

4. Gilt Edge shall submit a land application site monitoring program including, but not limited to, monitoring methodology, number of monitoring stations, sampling parameters, and sampling frequency. The monitoring program shall be subject to DWNR review and approval prior to the commencement of construction of the land application system.

5. Requests to refine or modify water quality monitoring parameters or procedures must be accompanied by a rationale for the refinements and must be approved in writing by the Department.

6. Surface water, ground water, and land application monitoring sites shall be sampled once for Uranium, Radon, Radium 226, Radium 228, Total Alpha Radiation, and Total Camma Radiation prior to operation to determine their presence and background concentrations. Should the chemical characterization of the treated process water indicate above background concentrations of these parameters, they shall be included in the operational surface and ground water sampling programs. Results of this sampling and analysis shall be submitted to DWNR.

7. All surface and groundwater sampling data sheets shall be submitted to DWNR on a quarterly basis or as dictated by monitoring frequency.

8. All chemical analysis required for water quality monitoring shall be conducted by an EPA certified lab.

9. All water quality sample collection, preservation, and holding times shall be in accord with established QA/QC procedures. A QA/QC plan outlining the above shall be submitted to DWNR.

Table 1

s for Baseline Water Quality Monitoring

	Recommended
	Fecal coliform
›lids (surface water)	Dissolved oxygen
›lids	Total solids
	Ba
Carbonate)	Fluoride

ing:

74:29:05:05
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chemical
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r which may be
r pore water.

treatment
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for off-loading

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an 0.5 mg/l., with
ing 2.5 times the

rameters in the 6
eet the treatment
29:05:08; and

c) The mean values for leachate from solids samples meet the treatment standards designated in 74:29:05:08, with no individual sample exceeding 2.5 times the mean.

d) Should sampling according to this schedule indicate that treatment standards have not been met, Brohm shall take measures to investigate the cause and reduce the levels to meet treatment standards prior to off-loading.

B) Operational monitoring of treatment following the intensive treatment characterization shall include the following:

1) Based on the results of the intensive treatment characterization, the Department will designate key operational monitoring parameters to be analyzed for during routine operations. WAD cyanide will be one of the key operational monitoring parameters;

2) Operational monitoring shall include collecting 3 individual effluent samples over a 24 hour period from each heap, if the intensive treatment characterization indicates extreme variablility or unpredictability in analytical results, more intensive sampling may be required;

3) Each heap shall be considered suitable for off-loading when the mean value for the designated operational monitoring parameters in the 3 individual effluent samples meet the treatment standards of 74:29:05:08, with no individual sample exceeding 2.5 times the mean;

4) During each seven-cell leaching cycle, one heap shall be sujected to the monitoring required under intensive treatment monitoring, (A-2) above. This monitoring will begin with heap cell #3 following its second use, and shall continue with heap cell #4 after its third use, #5 after its fourth use, and so on. Compliance for off-loading must be demonstrated in accordance with (A-3) above. If these intensive monitoring procedures clearly indicate that the reliability of the operational monitoring schedule or parameters is inadequate, the Department may revise the operational monitoring schedule to correct deficiencies.

C) Prior to off-loading, each heap Brohm shall submit copies of all sampling and analytical data required by the monitoring schedules indicated above.

D) Following cessation of ~~ore~~ leaching activities by Brohm, any spent ore (6 ft.) on the pad area shall be treated to meet the ~~treat~~ment standards of ARSD 74:29:05:08. Final monitoring shall be done in accordance with (B) above.

E) Upon final reclamation, all spent ore heaps not designated for retention of fluids, shall be free draining. Drainage from such areas shall not cause erosion, interfere with post-closure monitoring systems, cause water pollution, or limit necessary access to the site.

possible treatment methods;
(3) Preliminary plans and specifications for facilities associated with tailings treatment;
(4) Storage of the proposed treatment reagents at the site;
(5) A plan of operation for the treatment; and
(6) Plans for disposal of treatment solutions, if applicable.

In heap leach operations, the treated tailings must be used as backfill in the mine pits where compatible with the overall mine plan. If in-place tailings piles are approved by the board, physical reclamation must conform to the reclamation requirements for spoil in § 74:29:07:14.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-5, 45-6B-44, 45-6B-45.

74:29:05:06. Treatment of tailings -- Initial sampling and chemical characterization. Prior to the initiation of treatment, effluent or pore water from a tailings impoundment shall be sampled and chemically characterized for the following parameters:

(1) Chemical constituents which may be used in or are likely to result from the milling or treatment process;

(2) Aluminum, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silicon, silver, vanadium, and zinc;

(3) Major cations and anions, including ammonia, bicarbonate, calcium, carbonate, chloride, magnesium, nitrate, potassium, sodium, and sulfate;

(4) pH;

(5) Radon, uranium, radium 226, radium 228, total alpha radiation, total gamma radiation; and

(6) Total dissolved solids.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-44, 45-6B-45.

74:29:05:07. Treatment of tailings -- Monitoring during treatment process. Effluent or pore water from tailings impoundments shall be monitored for key parameters designated by the department to statistically characterize the treatment cycle. The monitoring shall be done throughout the duration of the treatment process.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-44, 45-6B-45.

74:29:05:08. Treatment of tailings. Treatment of the tailings shall continue until the effluent or pore water from the tailings impoundment

ATTACHMENT 2a

onstruction Permit
emporary Amendment

RECEIVED
SOUTH DAKOTA DEPARTMENT OF WATER AND NATURAL RESOURCES OFFICE OF WATER QUALITY

shall be temporarily amended as follows:

-load the spent ore, the values of all
n the effluent and the pore water are
the South Dakota Ground-water Quality
with the exception of arsenic, nitrite,
trations have been set by the South
This temporary amendment shall
ecision of the Board of Water
ire July 31, 1990, unless earlier

o the construction permit becomes
89, and is not transferable.

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erson
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FINDINGS OF FACT,
CONCLUSIONS OF LAW AND
FINAL DECISION

ACT

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the [redacted] with [redacted] and other u[redacted] within the perimeter of pollution.

6. The proposed [redacted] significant [redacted] to [redacted]ish, [redacted]ldlife or the [redacted]vironment.

7. If the [redacted] it will effectively [redacted].

8. [redacted]

CONCLUSIONS OF LAW

1. This [redacted] of the matter.

2. [redacted] and the [redacted] followed is consistent with law, including ARSD 74:03:13:01.

3. [redacted] a significant [redacted] to the environment and [redacted] of water quality standards at the perimeter of pollution, and because [redacted] the [redacted] operation, the [redacted]

FINAL DECISION

The proposal set forth on page 4 of the document entitled "Ground-water Dischage Permit Fact Statement" is adopted. [redacted] unless earlier rescinded by the Board.

Dated this [redacted]

BY THE BOARD:

Marian B. Gunderson

GROUND-WATER DISCHARGE PERMIT
FACT STATEMENT

APPLICANT:	Brohm Mining Corporation, Deadwood, South Dakota
PERMIT NUMBER:	[redacted]
PERMIT TYPE:	Mining - Land Application of Neutralized Ore
LOCAL CONTACT:	Rex Outzen, General Manager
LOCATION:	NW 1/4, SE 1/4, Section 5, T.4N., R.4E., Lawrence County
TELEPHONE:	(605) 578-2107

DESCRIPTION

Brohm Mining Corporation proposes to land apply spent ore in Ruby Gulch, approximately 5 miles southeast of Lead, South Dakota. Approximately [redacted] and [redacted] in [redacted] over the 7 to 10 years of expected project life. The permit involves management of the neutralized ore to protect ground and surface water quality.

RECEIVING WATERS

Overland flow through Ruby Gulch occurs during wet periods with year-round flow at the mouth of the gulch, which discharges to Bear Butte Creek. A considerable amount of overland flow is lost to infiltration as the Ruby Gulch drainage serves as a source for ground water recharge to the shallow unconsolidated aquifer in the valley of Bear Butte Creek. The shallow aquifer in turn serves as a recharge for the bedrock aquifer via faults, fractures, and old mine workings.

The aquifers impacted in the area are a shallow unconsolidated aquifer and a bedrock aquifer. The shallow aquifer consists of unconsolidated alluvial and colluvial material and weathered bedrock. The water table is generally 5 to 15 feet below ground level. The bedrock aquifer consists of three basic rock groups:

1. Precambrian metamorphic rocks (schists, gneisses, cherts),
2. Cambrian Deadwood Formation (hornfels and quartzite) and
3. Tertiary intrusives (primarily trachyte porphries).

Related studies show water levels in the bedrock are stratigraphically and structurally controlled and occur from 35 to 55 feet below ground level. Water-bearing zones in the bedrock aquifer are generally limited to areas where the bedrock permeability has been chemically or mechanically altered. This corresponds to the mineralized contact between the hornfels and quartzite members of the Deadwood Formation. Both aquifers have a relatively low permeability. The total dissolved solids concentration of less than 10,000 mg/L for both aquifers classify them as having a beneficial use for drinking water.

DISCHARGE WATER

Any discharge will be leachate resulting from natural infiltration of precipitation through the spent ore. Annual precipitation in the area averages 29 inches, of which 5% is estimated to infiltrate.

Before the spent ore can be off-loaded, the [redacted] of [redacted] measured in the [redacted] and/or the [redacted] of the spent ore are expected to be [redacted] the South Dakota [redacted] with the exception of arsenic, nitrite, pH, and TDS. Subsoil attenuation is expected to remove arsenic from the leachate and to lower the pH and nitrite concentrations. Ground water degradation due to arsenic and other metals is not expected to occur. **Bacterial processes and dilution are expected to reduce the nitrite concentrations below the numeric ground water quality standard. Currently, the TDS does not exceed the numeric ground water quality standard in the effluent, but is expected to exceed the numeric standard in the future due to recirculation of the neutralization solution. Attenuation and dilution are expected to maintain a TDS concentration at or below the numeric ground water quality standard.**

Qualifica "Condition

PERIMETER OF OPERATIONAL POLLUTION (POP)

Limited ground-water degradation within the POP is expected, and two years of monitoring are required to verify this. The POP includes the spent ore disposal area, waste rock disposal area, and undisturbed area downgradient from the disposal site within Ruby Gulch. The compliance monitoring point consists of [redacted]s ([redacted]ow and [redacted]) located at the farthest downgradient edge of the POP, approximately 800 feet from the edge of the nearest disposal area.

GW-8 GW-9

MONITORING AND REPORTING REQUIREMENTS

Brohm would be required to monitor the effluent at the toe of the neutralized heap to determine suitability for disposal. [redacted] are [redacted]d through the South Dakota [redacted]. **TDS concentration and allowable pH are established in the construction permit conditions.**

2500 mg/L

6.5 → 10.0

.5 WAD-CN

Brohm would also be required to maintain adequate [redacted] to determine the [redacted] in Ruby Gulch so as [redacted] the [redacted] of the subsurface materials for arsenic. How

The spring in the unnamed gulch and five monitoring wells (BED-18, GW-8, GW-9, GW-10, and GW-12) required for the ground-water discharge plan would be sampled quarterly during operation for metals concentrations measured as "Total Dissolved" except for mercury which is "Total". The monitoring wells would include two compliance monitoring point wells (shallow (GW-8) and bedrock (GW-9)) which would be monitored monthly prior to operation for the parameters listed in Attachment 1, the original mining permit conditions for water quality monitoring (No. 6 and Table 1), with the addition of barium, fluoride, nitrite, and once for gross alpha to include uranium. During operation, the compliance monitoring wells would be sampled quarterly for metals and other key monitoring parameters as determined by the Department.

Monitoring results would be submitted to the Department of Water and Natural Resources within 10 days after Brohm's receipt from the laboratory. If the results indicate probable out-of-compliance status, the Department will be notified within 24 hours, at which time required accelerated monitoring would be initiated. A contingency plan would be initiated it out-of-compliance status was determined. [redacted] would also be [redacted] to [redacted] [redacted]. If out compliance

PERMIT REVIEW

The Water Quality Variance [redacted] is [redacted] to a [redacted] by the Board of Water Management.

Review due on ~~June~~ by July 31, 1990

Date Prepared: June 16, 1988
Date Amended: April 11, 1989

Barbara K. Niels
Jeanne Goodman

CONDITIONS
GWD 3-88 AMENDMENT

1. All conditions in the original permit shall become part of this amendment, with the exception of condition #5, which shall be amended as follows:

("5") Before the neutralized ore can be off-loaded for disposal in Ruby Gulch, the effluent or the pore water must meet the numeric ground-water quality standards, with the exception of arsenic, nitrite, pH, and TDS. Operational monitoring shall be consistent with the requirements set forth in Attachment 2, Heap Neutralization conditions for operational monitoring. The concentration of TDS in the effluent will be equal to or less than 2500 mg/L, and the pH of the effluent will be in the range of 6.5 to 10.0 prior to the ore being off-loaded.

Original No. 5

pH.

5. Before the neutralized ore can be off-loaded for disposal in Ruby Gulch, the effluent or the pore water must meet the numeric ground water quality standards, with the exception of arsenic. Operational monitoring shall be consistent with the requirement set forth in Attachment 2, Heap Neutralization conditions for operational monitoring.

ATTACHMENT 1

Water Quality Monitoring

1. Gilt Edge Inc. shall submit a yearly surface and groundwater characterization report beginning the year a mine permit is granted. This report shall include, but is not limited to all chemical, discharge, and water level data gathered and a summary and analysis of this data.

2. Gilt Edge shall submit an operational groundwater and surface water monitoring plan including, at a minimum, ten groundwater monitoring stations and six surface water monitoring stations. The plan shall include the parameters to be monitored and frequency of monitoring. The monitoring plan shall be subject to DWNR review and approval prior to construction. The operational monitoring plan shall be continued until final bond release.

3. Gilt Edge shall measure water levels in all groundwater wells quarterly. Shallow well water level measurements shall be done in conjunction with surface water gauging and sampling.

4. Gilt Edge shall submit a land application site monitoring program including, but not limited to, monitoring methodology, number of monitoring stations, sampling parameters, and sampling frequency. The monitoring program shall be subject to DWNR review and approval prior to the commencement of construction of the land application system.

5. Requests to refine or modify water quality monitoring parameters or procedures must be accompanied by a rationale for the refinements and must be approved in writing by the Department.

6. Surface water, ground water, and land application monitoring sites shall be sampled once for Uranium, Radon, Radium 226, Radium 228, Total Alpha Radiation, and Total Gamma Radiation prior to operation to determine their presence and background concentrations. Should the chemical characterization of the treated process water indicate above background concentrations of these parameters, they shall be included in the operational surface and ground water sampling programs. Results of this sampling and analysis shall be submitted to DWNR.

7. All surface and groundwater sampling data sheets shall be submitted to DWNR on a quarterly basis or as dictated by monitoring frequency.

8. All chemical analysis required for water quality monitoring shall be conducted by an EPA certified lab.

9. All water quality sample collection, preservation, and holding times shall be in accord with established QA/QC procedures. A QA/QC plan outlining the above shall be submitted to DWNR.

ORIGINAL

CONDITIONS

Due in 1993

1. Brohm Mining Corporation will submit, at the end of 5 years, a post-closure monitoring plan based on water quality monitoring during operation of the facility. The post-closure monitoring plan will include a contingency plan for clean-up of any ground-water contamination beyond the POP zone.

Provis

2. Brohm Mining Corporation shall submit a laboratory quality assurance/quality control plan(s).

omplete

3. Proposed monitoring wells (including the compliance monitoring wells) will be drilled and constructed in conformance with South Dakota Well Drilling Regulations and the following criteria:

a. All wells monitoring in an aquifer shall be screened to yield correlative water quality;

b. Wells shall be constructed to isolate the screen from all aquifers other than the one being monitored;

c. Wells shall be clearly marked with an identification code that shall not be duplicated or changed and shall correspond to the code on the approved map of monitoring locations;

d. Wells shall be securely capped to prevent vandalism and contamination;

e. Well casing elevations and locations shall be accurately surveyed by a competent person and indicated on the monitoring point location map;

f. The surveyed elevation point shall be clearly and permanently marked on the casing;

g. Water levels shall be measured from the surveyed and marked measuring point to an accuracy within 0.01 foot; and

h. Concurrent surveys of all well casings shall be made annually to determine if movement has occurred. These surveys shall include the elevation and location of all wells.

omplete

4. Prior to the initiation of neutralization, fluoride, nitrite, and gross alpha to include uranium shall also be included and characterized with the parameters set forth in attachment 2, Heap Neutralization conditions for intensive treatment characterization.

5. Before the neutralized ore can be off-loaded for disposal in Ruby Gulch, the effluent or the pore water must meet the numeric ground water quality standards, with the exception of arsenic. Operational monitoring shall be consistent with the requirement set forth in Attachment 2, Heap Neutralization conditions for operational monitoring.

Max'm

6. Brohm shall submit to the Department the calculated attenuation capacity of the subsurface materials in Ruby Gulch for arsenic. This submittal shall show all calculations and assumptions, and justify all assumptions. Brohm shall not off-load spent ore which will exceed the accepted calculated attenuation capacity. If the accepted total mass loading capacity is reached, Brohm shall cease off-loading in Ruby Gulch and within the boundaries of the approved perimeter of operation pollution (POP).

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7. Brohm will maintain adequate monitoring to determine the total mass loading in Ruby Gulch of the arsenic.

8. Brohm shall monitor the water quality of GW-8 and GW-9 monthly prior to operation and as necessary thereafter to determine the ambient water quality of Ruby Gulch pursuant to ARSD 74:03:16:17. GW-8 and GW-9 shall be monitored for the parameters listed in Attachment 1, the original mining permit conditions for water quality monitoring (No. 6 and Table 1), with the addition of barium, fluoride, nitrite, and once for gross alpha to include uranium. All metals are to be measured as "Total Dissolved" except for mercury which is "Total".

9. For a minimum of 2 years, Brohm shall be required to maintain ambient water quality at the compliance points at all times, subject to the Department setting permitted allowable limits after that period.

Yes

10. Brohm shall sample quarterly the spring in the unnamed gulch, BED-18, GW-8, GW-9, GW-10, and GW-12, during operation for metals concentrations measured as "Total Dissolved" except for mercury which is "Total".

11. Brohm shall submit monitoring results to the Department of Water and Natural Resources within 10 days of Brohm's receipt from the laboratory. Brohm shall submit an annual report each year in January, which shall address the amount of spent ore disposed and the total mass loading of arsenic.

CW

12. Brohm shall submit an operational contingency plan prior to off-loading. The plan shall include provisions for contaminant clean-up of ground-water beyond the POP zone.

Table 1

ameters for Baseline Water Quality Monitoring

	Recommended
	Fecal coliform
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TU)	Ba
lcium Carbonate)	Fluoride

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c) The mean values for leachate from solids samples meet the treatment standards designated in 74:29:05:08, with no individual sample exceeding 2.5 times the mean.

d) Should sampling according to this schedule indicate that treatment standards have not been met, Brohm shall take measures to investigate the cause and reduce the levels to meet treatment standards prior to off-loading.

B) Operational monitoring of treatment following the intensive treatment characterization shall include the following:

1) Based on the results of the intensive treatment characterization, the Department will designate key operational monitoring parameters to be analyzed for during routine operations. WAD cyanide will be one of the key operational monitoring parameters;

2) Operational monitoring shall include collecting 3 individual effluent samples over a 24 hour period from each heap, if the intensive treatment characterization indicates extreme variablility or unpredictability in analytical results, more intensive sampling may be required;

3) Each heap shall be considered suitable for off-loading when the mean value for the designated operational monitoring parameters in the 3 individual effluent samples meet the treatment standards of 74:29:05:08, with no individual sample exceeding 2.5 times the mean;

4) During each seven-cell leaching cycle, one heap shall be sujected to the monitoring required under intensive treatment monitoring, (A-2) above. This monitoring will begin with heap cell #3 following its second use, and shall continue with heap cell #4 after its third use, #5 after its fourth use, and so on. Compliance for off-loading must be demonstrated in accordance with (A-3) above. If these intensive monitoring procedures clearly indicate that the reliability of the operational monitoring schedule or parameters is inadequate, the Department may revise the operational monitoring schedule to correct deficiencies.

C) Prior to off-loading, each heap Brohm shall submit copies of all sampling and analytical data required by the monitoring schedules indicated above.

D) Following cessation of ~~ore~~ left leaching activities by Brohm, any spent ore ~~(6 ft.)~~ on the pad area shall be treated to meet the ~~treat~~ment standards of ARSD 74:29:05:08. Final monitoring shall be done in accordance with (B) above.

E) Upon final reclamation, all spent ore heaps not designated for retention of fluids, shall be free draining. Drainage from such areas shall not cause erosion, interfere with post-closure monitoring systems, cause water pollution, or limit necessary access to the site.

possible treatment methods;

(3) Preliminary plans and specifications for facilities associated with tailings treatment;

(4) Storage of the proposed treatment reagents at the site;

(5) A plan of operation for the treatment; and

(6) Plans for disposal of treatment solutions, if applicable.

In heap leach operations, the treated tailings must be used as backfill in the mine pits where compatible with the overall mine plan. If in-place tailings piles are approved by the board, physical reclamation must conform to the reclamation requirements for spoil in § 74:29:07:14.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-5, 45-6B-44, 45-6B-45.

74:29:05:06. Treatment of tailings -- Initial sampling and chemical characterization. Prior to the initiation of treatment, effluent or pore water from a tailings impoundment shall be sampled and chemically characterized for the following parameters:

(1) Chemical constituents which may be used in or are likely to result from the milling or treatment process;

(2) Aluminum, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silicon, silver, vanadium, and zinc;

(3) Major cations and anions, including ammonia, bicarbonate, calcium, carbonate, chloride, magnesium, nitrate, potassium, sodium, and sulfate;

(4) pH;

(5) Radon, uranium, radium 226, radium 228, total alpha radiation, total gamma radiation; and

(6) Total dissolved solids.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-44, 45-6B-45.

74:29:05:07. Treatment of tailings -- Monitoring during treatment process. Effluent or pore water from tailings impoundments shall be monitored for key parameters designated by the department to statistically characterize the treatment cycle. The monitoring shall be done throughout the duration of the treatment process.

Source: 14 SDR 111, effective March 3, 1988.
General Authority: SDCL 45-6B-81.
Law Implemented: SDCL 45-6B-44, 45-6B-45.

74:29:05:08. Treatment of tailings. Treatment of the tailings shall continue until the effluent or pore water from the tailings impoundment

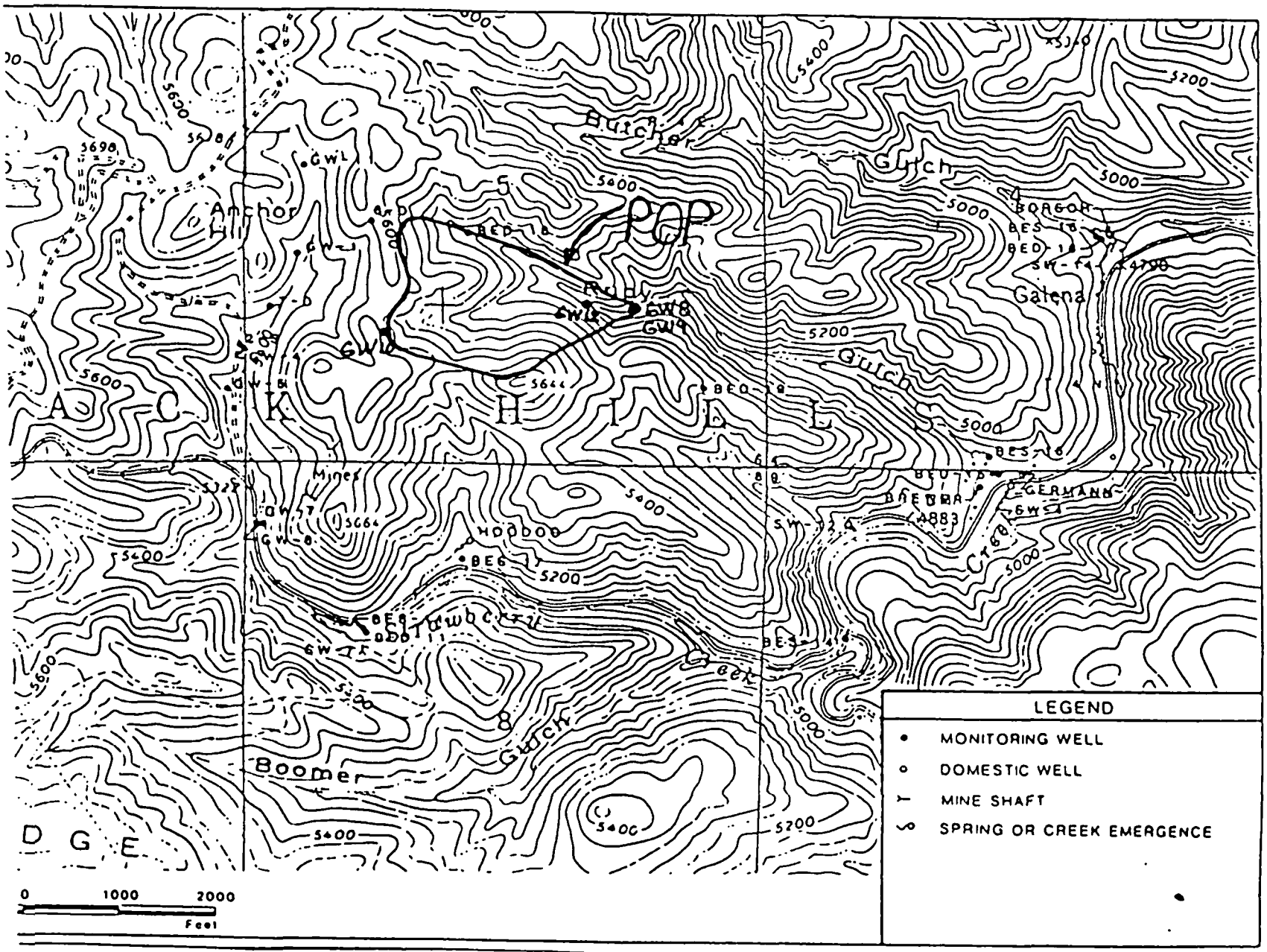

Figure 8
Groundwater Monitoring Station Location Map

12

SOUTH DAKOTA Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

July 20, 1988

Mr. J.C. Wilbanks
Director - Environmental Affairs
P.O. Box 485
Deadwood, SD 57732

Dear Mr. Wilbanks:

The forty-five day public comment period required by law before a solid waste permit can be granted has now passed without contest. Therefore, a one (1) year permit to operate has been issued for the Brohm Mining Rubbish Disposal site.

Pay particular attention to the attached conditions which have been added to insure that the site is operated and maintained in accordance with the South Dakota Solid Waste Rules and Regulations. The site will be inspected periodically to verify compliance. In the event that these conditions are repeatedly violated, the permit may be withdrawn.

Should you have any questions regarding the permit or stated conditions, please feel free to contact this Office at (605) 773-3153.

Sincerely,

Joel C. Smith, Director
Division of Air Quality and Solid Waste

Enclosure

cc: Board of Minerals and Environment
Rapid City Regional Office

S324.AQ

CELEBRATE THE CENTURY
1889-1989
South Dakota

PERMIT TO OPERATE
Under the South Dakota Solid Waste Regulations

PERMIT TO OPERATE NO. 88-11 is hereby granted by the South Dakota Board of Minerals and Environment to Brohm Mining Corporation

South Dakota, for the operation of A Rubbish Disposal Facility

CONDITIONED THAT:

This permit was granted by the South Dakota Board of Minerals and Environment on July 11, 1988 and expires on July 11, 1989. Renewal of this permit shall be applied for within 30 days of its expiration date.

The Board of Minerals and Environment reserve the right to revoke this permit at any time there is found to be just cause or violations of the South Dakota Solid Waste Regulations.

Richard P. Swartman

Chairman, Board of Minerals and Environment

Date: July 11, 1988

SOLID WASTE PERMIT TO OPERATE
PERMIT NO. 88-11
Deadwood, South Dakota

PERMIT CONDITIONS

1. Only "rubbish" (ARSD 74:27:01:01) with its origin limited to Brohm's office and mining operation shall be disposed of at this site.

2. A minimum soil cover of 6" shall be applied in the working trench area at least once per week.

3. Closure and reclamation of each completed trench shall be in accordance with mining permit no. 439 and ARSD 74:27:03:09-11.

4. The facility shall be operated and maintained in accordance with the South Dakota Solid Waste Rules and Regulations: SDCL 34A-6 and ARSD 74:27.

South Dakota Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

August 29, 1988

John Wilbanks, Director
Environmental Affairs
P.O. Box 485
Deadwood, SD 57732

Dear Mr. Wilbanks:

This letter shall serve as notice of the Department of Water and Natural Resources' tentative decision that a permit should be approved for Brohm Mining Corporation.

Enclosed please find a copy of the tentative decision and proposed permit, in accordance with Section 74:27:04:05 of the South Dakota Solid Waste Regulations. The site has met the location criteria and application requirements for a neutralized ore and waste rock disposal permit.

According to Section 74:27:04:05 of the Solid Waste Regulations, forty-five days after publication of this notice, the tentative decision will become the Board's final decision and this permit will be considered a permit duly issued by the Board of Minerals and Environment unless a person adversely affected or having an interest adversely affected petitions the Board for a contested case hearing. A formal permit will be issued at that time if petitions for such a hearing are not filed.

Sincerely,

John J. Smith, Secretary
Department of Water and Natural Resources

Enclosure

cc: Board of Minerals and Environment
Gary Stephenson, Black Hills Regional Office
Solid Waste File, Brohm Mining Ore Disposal

s321.aq

CELEBRATE THE CENTURY
1889-1989
South Dakota

Pub. date:

PROPOSED PERMIT TO
OPERATE A SOLID WASTE DISPOSAL FACILITY

Issued by the South Dakota Department of Water and Natural Resources

Date Issued: August 29, 1988 Permit Number 88-19

Site Location: 4 1/2 miles SE of Deadwood, South Dakota

Type of Disposal Facility:

Neutralized ore and waste rock disposal

Legal Description of the Site:
T4N, R4E, W1/2 of SE1/4, E1/2 of SW1/4, Sec. 5, BHM

Person Responsible for Operation of the Site:

Name: John Wilbanks

Title: Director - Environmental Affairs

Telephone Number: Home (605) 642-2483 Office: (605) 578-2107

Population Served by Site:
Brohm Mining Corporation

Conditions:

1. This permit is for neutralized ore/waste rock disposal in Ruby Gulch (59 acres) and for waste rock disposal in Hoodoo Gulch (21 acres).

2. Design parameters for the disposal area shall be in accordance with material submitted for Brohm Mining Permit No. 439.

3. Neutralization of the ore shall meet the criteria for WAD cyanide (0.5 mg/l) and other parameters outlined in Brohm's Mining Permit No. 439 and the Ground-water Discharge Permit No. 3-88 prior to placement in the disposal area.

4. Deposition of the neutralized ore shall be by end dumping in 2' to 4' layers with an exposure time between layers of at least 3 days to promote natural attenuation.

5. Records shall be kept for neutralized ore disposal and shall include (but not be limited to) dates of disposal, amount of ore, neutralization analysis, layer depth, and exposure times.

6. Land application of process waters may require a conditional solid waste disposal permit.

7 A solid waste disposal permit may be required for ultimate disposal of the heap leach pads prior to final reclamation.

8. Pond sludges and salts that remain upon closure shall be disposed of according to existing regulations and may require a solid waste disposal permit.

9. Reclamation shall be in accordance with Brohm Mining Permit No. 439 and ARSD 74:27:03:11.

10. Monitoring wells shall be maintained and sampled as outlined in Ground-water Discharge Permit No. 3-88 with a copy of the analysis results provided to the Division of Air Quality and Solid Waste.

11. The facility shall be operated and maintained in accordance with the South Dakota Solid Waste Rules and Regulations: SDCL 34A-6 and ARSD 74:27.

S370.AQ

TENTATIVE DECISION

By the Department of Water and Natural Resources

The South Dakota Department of Water and Natural Resources, Division of Air Quality and Solid Waste, has reached a tentative decision that a permit for neutralized ore and waste rock disposal should be issued to Brohm Mining Corporation. This decision shall be considered the Department's recommendation to the Board of Minerals and Environment. The staff has reviewed the submitted plans and specifications, and determined that the applicant has met the minimum requirements for approval of a solid waste disposal permit. The staff believes that if operated in accordance with the plans as submitted, and the conditions specified in the enclosed draft permit, the site will meet the requirements specified in South Dakota Solid Waste Rules and Regulations.

John J. Smith, Secretary
Department of Water and Natural Resources

S322.aq

SOUTH DAKOTA Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

November 7, 1988

John Wilbanks, Director
Environmental Affairs
P.O. Box 485
Deadwood, SD 57732

Dear Mr. Wilbanks:

The forty-five day public comment period required by law before a solid waste permit can be granted has now passed without contest. Therefore, a one (1) year permit to operate has been issued for a Neutralized Ore and Waste Rock Disposal Site.

Pay particular attention to the attached conditions which have been added to insure that the site is operated and maintained in accordance with the South Dakota Solid Waste Rules and Regulations. The site will be inspected periodically to verify compliance. In the event that these conditions are repeatedly violated, the permit may be withdrawn.

Should you have any questions regarding the permit or stated conditions, please feel free to contact this Office at (605) 773-3153.

Sincerely,

Clark G. Haberman

Clark G. Haberman, Director
Division of Air Quality and Solid Waste

under - existing 88 rg - statutes changed - takes precedence over rgs. send letter to confirm

Enclosure

cc: Gary Stephenson, Black Hills Regional Office
Brohm Ore SW File, Lawrence Co.

S324.AQ

SDCL - 34A - 6 - 1.3 sub para (17)
Solid waste - does not include mining waste in connection with a m permitted under Title 45.

Mine Waste (10) - waste rock, rubble, or tailings produced as a result of mining ore or .....

CELEBRATE THE CENTURY 1889 1989 South Dakota

CONDITIONS
SOLID WASTE PERMIT NO. 88-19
BROHM MINING
DEADWOOD, SOUTH DAKOTA

1. This permit is for neutralized ore/waste rock disposal in Ruby Gulch (59 acres) and for waste rock disposal in Hoodoo Gulch (21 acres).
2. Design parameters for the disposal area shall be in accordance with material submitted for Brohm Mining Permit No. 439.
3. Neutralization of the ore shall meet the criteria for WAD cyanide (0.5 mg/l) and other parameters outlined in Brohm's Mining Permit No. 439 and the Ground-water Discharge Permit No. 3-88 prior to placement in the disposal area.
4. Deposition of the neutralized ore shall be by end dumping in 2' to 4' layers with an exposure time between layers of at least 3 days to promote natural attenuation.
5. Records shall be kept for neutralized ore disposal and shall include (but not be limited to) dates of disposal, amount of ore, neutralization analysis, layer depth, and exposure times.
6. Land application of process waters may require a conditional solid waste disposal permit.
7. A solid waste disposal permit may be required for ultimate disposal of the heap leach pads prior to final reclamation.
8. Pond sludges and salts that remain upon closure shall be disposed of according to existing regulations and may require a solid waste disposal permit.
9. Reclamation shall be in accordance with Brohm Mining Permit No. 439 and ARSD 74:27:03:11.
10. Monitoring wells shall be maintained and sampled as outlined in Ground-water Discharge Permit No. 3-88 with a copy of the analysis results provided to the Division of Air Quality and Solid Waste.
11. The facility shall be operated and maintained in accordance with the South Dakota Solid Waste Rules and Regulations: SDCL 34A-6 and ARSD 74:27.

PERMIT TO OPERATE
Under the South Dakota Solid Waste Regulations

PERMIT TO OPERATE NO. 88-19 is hereby granted by the South Dakota Board of Minerals and Environment to Brohm Mining

South Dakota, for the operation of A Neutralized Ore and Waste Rock Disposal Site

CONDITIONED THAT:

This permit was granted by the South Dakota Board of Minerals and Environment on October 31, 1988 and expires on October 31, 1989. Renewal of this permit shall be applied for within 30 days of its expiration date.

The Board of Minerals and Environment reserve the right to revoke this permit at any time there is found to be just cause or violations of the South Dakota Solid Waste Regulations.

Richard C Swintman

Chairman, Board of Minerals and Environment

Date: November 4, 1988

Federal Communications Commission
Gettysburg, PA 17326

RADIO STATION LICENSE

Name: BROHM MINING

Radio Service: IB BUSINESS
Call Sign: WNLR229
File Number: 8804116349
License Issue Date: 880523
License Expiration Date: 930523
Frequency Advisory Number: 880630048
Number of Mobiles by Category: Vehicular **30** Portable **30** Aircraft ****** Marine ****** Pager *****

Station Technical Specifications

FCC I.D.	Frequencies (MHz)	Station Class	No. of Units	Emission Designator	Output Power (Watts)	E.R.P. (Watts)	Ground Elevation	Ant. Hgt. To Tip	Antenna Latitude	Antenna Longitude
1:	463.70000	FB2	1	20K0F3E	100.000	160.000	5720	48	44-20-07	103-40-33
	468.45000	MO	60	20K0F3E	100.000	115.000				
	468.70000	MO	60	20K0F3E	100.000	115.000				
2:	463.70000	FB	1	20K0F3E	100.000	145.000	5420	51	44-19-57	103-40-32
3:	463.45000	FB	1	20K0F3E	100.000	148.000	5320	44	44-19-41	103-40-28

	TRANSMITTER STREET ADDRESS	CITY	COUNTY	STAT
1:	ANCHOR HILL	GALENA	LAWRENCE	S
2:	STRAWBERRY CREEK GULCH	GALENA	LAWRENCE	S
3:	STRAWBERRY CREEK GULCH	GALENA	LAWRENCE	S

AREA OF OPERATION
SITE 1: 50 MIRA 44-20-07N 103-40-33W GALENA LAWRENCE SD

CONTROL POINTS: 20 CLIFF ST DEADWOOD SD
CONTROL POINT PHONE: 605-578-2107

FB2
Repeat
MO
mobile
FB
fixed
base

EMISSION DESIGNATOR(S) CONVERTI GNATOR(S)
SET OUT IN PART 2 OF

F B = Base
Need - Licen
3
from 2

880523N 38 1 12
CLIFF ST
SD 57

FEDERAL
COMMUNICAT
COMMISSION

becomes invalid and must be returned to the Commission if the
iced in operation within eight months. Unless extension of
ted EXCEPTION: 800 MHz trunked and certain MHz station
licenses can... omatically if not constructed within one year.

PAGE 1 OF 1

FCC 57-
AUGUST

Federal Communications Commission
Gettysburg, PA 17326

RADIO STATION LICENSE

Licensee Name: BROHM MINING CORP

Radio Service: IB BUSINESS
Call Sign: WNLR229
File Number: 8910173464
License Issue Date: 891206
License Expiration Date: 941206
Frequency Advisory Number: 891000302
Number of Mobiles by Category: Vehicular - **30** Portable - **30** Aircraft - ****** Marine - ****** Pagers****

Station Technical Specifications

FCC I.D.	Frequencies (MHz)	Station Class	No. of Units	Emission Designator	Output Power (Watts)	E.R.P. (Watts)	Ground Elevation	Ant. Hgt. To Tip	Antenna Latitude	Antenna Longitude
1:	463.70000	FB2	1	20K0F3E	100.000	160.000	5720	48	44-20-07	103-40-3
	461.12500	MO	60	20K0F3E	100.000					
	461.55000	MO	60	20K0F3E	100.000					
	463.45000	MO	60	20K0F3E	100.000					
	463.70000	MO	60	20K0F3E	100.000					
	466.25000	MO	60	20K0F3E	100.000					
	468.70000	MO	60	20K0F3E	100.000					
2:	461.25000	FB	1	20K0F3E	100.000	148.000	5320	44	44-19-41	103-40-2
	461.55000	FB	1	20K0F3E	100.000	148.000				
	463.45000	FB	1	20K0F3E	100.000	148.000				
	463.70000	FB	1	20K0F3E	100.000	148.000				
	461.12500	FX1	1	20K0F3E	100.000	148.000				
	468.70000	FX1	1	20K0F3E	100.000	148.000				
3:	461.12500	FB	1	20K0F3E	100.000	145.000	5420	51	44-19-57	103-40-3
	461.55000	FB	1	20K0F3E	100.000	145.000				
	463.45000	FB	1	20K0F3E	100.000	145.000				
	463.70000	FB	1	20K0F3E	100.000	145.000				
	461.25000	FX1	1	20K0F3E	100.000	145.000				
	468.70000	FX1	1	20K0F3E	100.000	145.000				
4:	461.12500	FB	1	20K0F3E	100.000	148.000	5560	44	44-19-52	103-40-0
	461.25000	FB	1	20K0F3E	100.000	148.000				
	463.45000	FB	1	20K0F3E	100.000	148.000				
	463.70000	FB	1	20K0F3E	100.000	148.000				
	461.55000	FX1	1	20K0F3E	100.000	148.000				
	468.70000	FX1	1	20K0F3E	100.000	148.000				

	TRANSMITTER STREET ADDRESS	CITY	COUNTY	STAT
1:	ANCHOR HILL	GALENA	LAWRENCE	S
2:	STRAWBERRY CREEK GULCH OFC	GALENA	LAWRENCE	S
3:	STRAWBERRY CREEK GULCH PROCESS PLANT	GALENA	LAWRENCE	S
4:	STRAWBERRY CREEK GULCH CRUSHER	GALENA	LAWRENCE	S

AREA OF OPERATION
SITE 1: 5C MIRA 44-20-07N 103-40-33W GALENA LAWRENCE SD

891206M 20 1 22
BROHM MINING CORP
POE 485
DEADWOOD SD 57732

FEDERAL COMMUNICATIONS COMMISSION

This authorization becomes invalid and must be returned to the Commission if the stations are not placed in operation within eight months, unless an extension of time has been granted. EXCEPTION: 800 MHz trunked and certain 900 MHz station licenses cancel automatically if not constructed within one year.

FCC 574
JULY 19

Federal Communications Commission
Gettysburg, PA 17326

RADIO STATION LICENSE

L Name: BROHM MINING CORP

Radio Service: IB BUSINESS
Call Sign: WNLR229
File Number: 8910173464
License Issue Date: 891206
License Expiration Date: 941206
Frequency Advisory Number: 891000302
Number of Mobiles by Category: Vehicular - ** 30 ** Portable - ** 30 ** Aircraft - ***** Marine - ***** Pagers ****

Station Technical Specifications

FCC I.D.	Frequencies (MHz)	Station Class	No. of Units	Emission Designator	Output Power (Watts)	E.R.P. (Watts)	Ground Elevation	Ant. Hgt. To Tip	Antenna Latitude	Antenna Longitude

CONTROL POINTS: MINE SITE OFC GITL EDGE RD FOR 170 DEADWOOD SD
CONTROL POINT PHONE: 605-578-2107

EMISSION DESIGNATOR(S) CONVERTED TO CONFORM TO DESIGNATOR(S) SET OUT IN PART 2 OF THE COMMISSION'S RULES.

891206M 20 2 22
BROHM MINING CORP
POB 485
DEADWOOD SD 57732

FEDERAL COMMUNICATIONS COMMISSION

PAGE 2 OF

This authorization becomes invalid and must be returned to the Commission if the stations are not placed in operation within eight months, unless an extension of time has been granted. EXCEPTION: 800 MHz trunked and certain 900 MHz station licenses cancel automatically if not constructed within one year.

FCC
JULY

BOARD OF MINERALS AND ENVIRONMENT

DEPARTMENT OF WATER AND NATURAL RESOURCES

STATE OF SOUTH DAKOTA

IN THE MATTER OF BROHM MINING CORPORATION'S DISCHARGE OF PROCESS SOLUTION TO THE ALLUVIAL AQUIFER, DECEMBER, 1989	))))	DEPARTMENT'S ANSWER TO REQUEST FOR HEARING

The Exploration and Mining Program of the South Dakota Department of Water and Natural Resources, hereinafter "Department", hereby Answers the Request for Hearing filed by Brohm Mining Corporation, hereinafter "Brohm," in the above-entitled matter, as follows:

1. That the Request for Hearing fails to comply with the provisions of ARSD 74:09:01:01.

2. That the Department hereby realleges each and every averment in it's Notice of Violation and Order, issued on December 29, 1989.

3. That, pursuant to Brohm's request by letter of January 26, 1990, the Department hereby agrees and stipulates to continue this matter until April 1, 1990, during which time the Department and Brohm will discuss settlement of the civil penalty liability resulting from the alleged violations.

Dated and signed this 5th day of February, 1990.

Roxanne Giedd
Assistant Attorney General
Counsel for Department of
Water and Natural Resources
State Capitol
Pierre, South Dakota 57501-5090
Telephone: (605) 773-3215

bn

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the Department's Answer to Request for Hearing in the matter of In the Matter of Brohm Mining Corporation's Discharge of Process Solution to the Alluvial Aquifer, December 1989 was served by United States mail, certified, return receipt requested, postage prepaid, upon Marvin D. Truhe, Attorney at Law, P.O. Box 8106, Rapid City, South Dakota 57709; and Lance J. Hubbard, Brohm Mining Corporation, P.O. Box 485, Deadwood, South Dakota 57732 on this 5th day of February, 1990.

Roxanne Giedd
Assistant Attorney General

bn

BROHM MINING CORP.

January 26, 1990

TELECOPIED

Mr. Mike Cepak
Program Chief
Department of Water and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, South Dakota 57701

RE: In the Matter of the Discharge of Process Solution to the Alluvial Aquifer/Brohm Mining Corp.

Dear Mr. Cepak:

Enclosed is Brohm Mining Corp.'s Request for Hearing in the above-referenced matter. You have indicated to us that the Department's recommended penalty amount for the alleged violation may not be determined for several weeks. Accordingly, we would ask that the requested Board hearing not be scheduled until the Department notifies us of its recommendation as to any penalty amount.

Sincerely,
Brohm Mining Corporation

Lance J. Hubbard
Safety/Security Supervisor

LJH/rrl
enc:

cc: Rex Outzen
Jim Anderson
Dick Langford
Marve Truhe
Jerry Boyer

South Dakota Office: P.O. Box 485, Deadwood, South Dakota 57732
Telephone: (605) 578-2107 Telecopier: (605) 578-1709

Brohm Mining Corp. is a wholly owned affiliate of Homestake Mining Corporation

BOARD OF MINERALS AND ENVIRONMENT

DEPARTMENT OF WATER AND NATURAL RESOURCES

STATE OF SOUTH DAKOTA

IN THE MATTER OF THE DISCHARGE OF PROCESS SOLUTION TO THE ALLUVIAL AQUIFER	)))	REQUEST FOR HEARING

Comes now Brohm Mining Corp., hereinafter Brohm, and submits the following request for a hearing before the South Dakota Board of Minerals and Environment in response to the Notice of Violation and Order dated December 29, 1989, issued in the above-referenced matter. At the hearing, Brohm will respond to the alleged violations stated in the Notice of Violation and Order, which alleged violations are not admitted and are contested.

Dated this 26 day of January, 1990.

BROHM MINING CORP.

By: James P. Hubbard

Its: Safety/Security/Supervisor

BOARD OF MINERALS AND ENVIRONMENT

DEPARTMENT OF WATER AND NATURAL RESOURCES

STATE OF SOUTH DAKOTA

IN THE MATTER OF DISCHARGE OF PROCESS SOLUTION TO THE ALLUVIAL AQUIFER	)))	NOTICE OF VIOLATION AND ORDER

TO: Rex L. Outzen, General Manager
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

Notice is hereby given that Brohm Mining Corp. hereinafter "Brohm", P.O. Box 485, Deadwood, South Dakota 57732, has violated the conditions of Mine Permit 439, and the conditions of the April 21, 1988 Amendment to Mine Permit 439.

THE FACTS alleged to constitute this violation are as follows:

1. That results from groundwater samples taken by Brohm from groundwater well GW-2, which is a shallow alluvial groundwater monitoring well located approximately 100 feet from the toe of the leach pad fill material, on December 12, 14, and 21, 1989 and a verification sample taken by the Department on December 27, 1989 indicate that trace amounts of cyanide and gold were detected.

2. That the December 12, 1989 sample indicated .026 ppm WAD cyanide and .015 ppm gold in the groundwater, the December 14, 1989 sample indicated .026 ppm WAD cyanide and .032 ppm gold in the groundwater, the December 21, 1989 sample indicated .034 ppm WAD cyanide and .067 ppm gold in the groundwater, and the December 27, 1989 sample indicated .015 ppm WAD cyanide, .220 ppm total cyanide and .038 ppm gold in the groundwater taken from GW-2.

3. That ambient baseline groundwater data for GW-2 indicated that cyanide and gold were undetectable.

4. That condition 1 of "General" of the April 21, 1988 Amendment to Mine Permit 439 states:

The leach pad and process ponds shall be designed and constructed for total containment of all process fluids. The leach pad and process ponds shall permit zero detectable discharge of process fluids from the bottom of the soil liner. If leakage from the bottom of the soil liner is detected, remedial action shall be required.

5. That condition 2 of "Spill Contingency Plan" of Mine Permit 439 states:

There shall not be any loss or release of cyanide or any other hazardous material, "special waste", oil, or toxic element associated with the gold recovery process to the surface environment outside the project boundary or to any surface or subsurface waters of the State.

6. That Brohm is, therefore, operating in violation of Mine Permit 439.

WHEREFORE, as a result of this violation and pursuant to SDCL 45-6B-48 the Department of Water and Natural Resources proposes the following order and corrective action to be taken by Brohm:

1. Brohm Mining Corporation shall initiate the following activities:

   a. Take immediate measures to stop any further release of process solution from the facility; and

   b. Begin a site investigation to determine the complete vertical and horizontal extent of contamination.

Shallow [illegible] by GW-1 & -4 - used to prove upward gradient & vertical extent.

12-29-89 - due 1-18-90

2. Within twenty (20) days of the receipt of this notice and order Brohm shall deliver a written notice to the Department on the actions taken to abate any further contaminant release, along with plans for further site assessment. Items to be addressed in the site investigation include:

a. A determination of the complete vertical and horizontal extent of contamination;

b. Identification of any wells or structures that may be impacted;

c. A description of the hydrogeological conditions that are present in the release area, including the depth and movement of groundwater and a description on the influence of any nearby wells, with details on how these conditions influence the movement of the contamination;

d. A list of alternatives for recovery and prevention of the further spread of the contamination, and the preferred course of action with justifications supporting that particular course of action;

e. The amount and concentration of product that was released; and

f. A description of any other factors which may influence the rate and method of recovery.

A report on the site assessment results together with any necessary remedial options shall be submitted to the Department for review and approval. This report shall be submitted within sixty (60) days of the receipt of this notice. Following Departmental approval of the remedial options, Brohm shall initiate remediation actions.

3. Brohm shall not load nor leach Cell #1 prior to installing the VLDPE liner, as conditionally approved under the September 12, 1989, Technical Revision.

4. Brohm shall monitor deep bedrock wells GW-1, GW-4, GW-5, and GW-10, shallow alluvial monitoring wells GW-2 and GW-3, and surface monitoring station SW-2 once per week for the following parameters:

cyanide - WAD and Total

pH

NO_3

Au

Na

This monitoring shall continue until the Department deems it unnecessary.

5. Brohm Mining Corporation shall pump the LDCRS detection pipes to the maximum extent possible to minimize hydraulic head on the secondary liner until further notice by the Department/Board.

NOTICE IS HEREBY GIVEN that Brohm Mining Corp. may request a hearing before the Board of Minerals and Environment regarding the allegations and Order contained herein, by submitting a written request <u>within</u> 30 days of service of this Notice and Order. Should Brohm fail to request a hearing within that time, the allegations stated herein shall be deemed fact, and the Order proposed above shall automatically become effective as an Order of the Board.

NOTICE IS ALSO HEREBY GIVEN that the Department of Water and Natural Resources may be initiating a civil penalty against Brohm Mining Corporation for violating permit provisions pursuant to the provisions of SDCL 45-6B-70.

CERTIFICATE OF SERVICE

I, Steve Pirner, the Director of the Division of Land and Water Quality of the South Dakota Department of Water and Natural Resources hereby certify that on the 29th day of December, 1989, I personally served the attached Notice of Violation upon Brohm Mining Corporation of Deadwood, South Dakota by personally delivering the same to Rex L. Outzen, General Manager, at the offices of the South Dakota Department of Water and Natural Resources in Pierre, South Dakota.

Dated this 29th day of December, 1989.

Steve Pirner, Director
Division of Land and
Water Quality

South Dakota Department of
Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

February 1, 1990

Mr. Lance Hubbard
Safety/Security Supervisor
Brohm Mining Corp.
P.O. Box 485
Deadwood, SD 57732

RE: October 24, 1988 Compliance Order and March 10, 1989 Amended Compliance Order

Dear Mr. Hubbard:

We are in receipt of your letter submitted January 18, 1990, regarding completion of repairs to the leach pad lining system. As the leach pad lining system is now repaired and the action leakage rate (ALR) for the pad is below 20 gallons per acre per day (gpad), terms of the October 24, 1988 Compliance Order and the March 10, 1989 Amended Compliance Order have now been met. Please see the enclosed Acknowledgement of Compliance with Order document.

With this satisfactory compliance with the terms of the Compliance Orders, Brohm Mining is still required to operate in compliance with their mine permit and all permit conditions, including the LDCRS schedule in Mining Permit No. 439. Also, Brohm Mining is still required to follow the approved Leakage Response Action Plan for the facility and the December 29, 1989 Compliance Order.

If you have any questions on this matter, please feel free to contact me.

Sincerely,

Michael Cepak

Michael Cepak
Program Chief
Exploration and Mining Program
Telephone: (605) 773-4201

Enclosure

Celebrate the Century
1889 - 1989
South Dakota

Dated and signed this 29th day of December, 1989.

FOR THE BOARD OF MINERALS & ENVIRONMENT

Russ Peck for

Floyd Matthew, Secretary
Department of Water & Natural Resources

BOARD OF MINERALS AND ENVIRONMENT

DEPARTMENT OF WATER AND NATURAL RESOURCES

STATE OF SOUTH DAKOTA

IN THE MATTER OF THE LDCRS FLOW FROM BROHM LEACH PAD, BROHM MINING CORP. MINING PERMIT N. 439	)))	ACKNOWLEDGEMENT OF COMPLIANCE WITH ORDER

TO: Rex L. Outzen, General Manager
Brohm Mining Corporation
P.O. Box 485
Deadwood, SD 57732

Whereas a Compliance Order having been issued by the South Dakota Department of Water and Natural Resources ("DWNR") to Brohm Mining Corp. ("Brohm") on October 24, 1988; and

Whereas, an Amended Compliance Order having been issued by the DWNR to Brohm on March 10, 1989; and

Whereas, Brohm has completed repairs to the leach pad, including relining the pad with an additional geosynthetic liner; and

Whereas, the flows in the leach pad leak detection, collection, and recovery system (LDCRS) have decreased below twenty gallons per acre per day;

NOW THEREFORE, THE DEPARTMENT OF WATER AND NATURAL RESOURCES acknowledges Brohm's compliance with the October 24, 1988 Order and March 10, 1989 Amended Order.

Brohm is still required to continue to operate in compliance with their mine permit, permit conditions, and with the December 29, 1989 Compliance Order.

Dated and signed this 15th day of February, 1990.

FOR THE BOARD OF MINERALS & ENVIRONMENT

Floyd Matthew, Secretary
Department of Water & Natural Resources

STATE OF SOUTH DAKOTA
)EPARTMENT OF WATER AND NATURAL RESOURCES
BOARD OF MINERALS AND ENVIRONMENT

:ER OF THE FROM BROHM BROHM MINING I, MINING 439	)))))	AMENDED COMPLIANCE ORDER

Outzen, General Manager, Brohm Mining
ation, P.O. Box 485, Deadwood, South Dakota

liance Order having been issued by the South
rtment of Water and Natural Resources ("DWNR") to
g Corporation ("Brohm") on October 24, 1988; and

tu ion regarding the testing and repair of the
aving significantly changed;

HEREFORE, THE DWNR amends the Compliance Order to
lows:

yanide leach solution may only be applied to
hose cells of the leach pad that have undergone
epair and have been approved for leaching by the
VNR. Approval is hereby granted to leach Cell #5
th cyanide solution. Requests to leach other
ells, after repair, must first be approved by
VNR.

lditional ore may only be loaded on those cells
the leach pad that have undergone repair and
ive been approved for loading by the DWNR.

ohm Mining Corporation shall pump the LDCRS
tection pipes to the maximum extent possible to
nimize hydraulic head on the secondary liner
itil further order of the Department/Board.

ohm Mining Corporation shall at all times
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BOARD OF MINERALS AND ENVIRONMENT

DEPARTMENT OF WATER AND NATURAL RESOURCES

STATE OF SOUTH DAKOTA

IN THE MATTER OF THE OPERATION VIOLATION OF BROHM MINING CORPORATION, MINING PERMIT NO. 439	))))	NOTICE OF VIOLATION AND ORDER

The South Dakota Board of Minerals and Environment, through its administrative staff of the Department of Water and Natural Resources, hereby gives NOTICE that Brohm Mining Corporation has acted in violation of the following conditions of Mining Permit No. 439:

Mining Permit No. 439 includes conditions entitled "Leak Detection, Collection, and Recovery System (LDCRS)". Condition No. 2 thereof requires that the leach pad be shut down when the action leakage rate (ALR) exceeds 500 gallons per acre per day (gpad). Condition No. 4 thereof requires that Brohm notify the Department within 24 hours of exceeding an ALR threshold.

The actions which constitute violation of the above cited permit conditions are:

1. Brohm Mining Corporation detected a LDCRS flow of 555 gpad on Saturday, October 22, 1988, and a LDCRS flow of 572 gpad on Sunday, October 23, 1988, both of which exceeded the 500 gpad ALR threshold requiring leach pad shutdown. Brohm continued to operate the leach pad until the

Department verbally ordered it to cease operational leach through the application of cyanide solution on Monday, October 24, 1988, and therefore failed to comply with th leach pad shut down requirement of Condition No. 2.

2. Brohm Mining Corporation detected a LDCRS flow 555 gpad on Saturday, October 22, 1988, which exceeds th 500 gpad ALR threshold. Brohm did not report exceeding t threshold until the morning of Monday, October 24, 1988, therefore failed to comply with the 24 hour notificatio requirement of Condition No. 4.

WHEREFORE, based upon the above violation, it is her ORDERED that:

1. Brohm pay to the Department of Water and Natural Resources for deposit in the regulated substance response fund, a penalty in the amount of $1,000 (one thousand dollars) for the above-cited violations of Mining Permit N 439.

Dated and signed this 1st day of November, 1988.

FOR THE BOARD OF MINERALS
AND ENVIRONMENT

Secretary John J. Smith
Department of Water and
Natural Resources

BOARD OF MINERALS AND ENVIRONMENT

DEPARTMENT OF WATER AND NATURAL RESOURCES

STATE OF SOUTH DAKOTA

IN THE MATTER OF THE LDCRS FLOW FROM BROHM LEACH PAD, BROHM MINING CORPORATION, MINING PERMIT NO. 439	)))))	COMPLIANCE ORDER

Whereas, Brohm Mining Corporation obtained an amendment to Mining Permit No. 439 on April 21, 1988, which included conditions entitled "Leak Detection, Collection, Recovery System" (LDCRS); and

Whereas, certain specified actions are required by the LDCRS conditions when LDCRS flow is found in the leak detection system; and

Whereas, Brohm Mining Corporation has discovered in excess of 500 gallons per acre per day (gpad) of LDCRS flow in the leak detection system;

Now, therefore, the Board of Minerals and Environment, through its administrative staff of the Department of Water and Natural Resources, hereby issues the following COMPLIANCE ORDER:

1. Brohm Mining Corporation shall immediately cease all application of cyanide leach solution to the leach pad.

2. Brohm Mining Corporation shall, by October 27, 1988, submit a detailed report to the Department of Water

and Natural Resources for review and approval, which shall include a [redacted] with all [redacted], and a [redacted] locating those areas of excessive seepage through the primary liner. This plan shall include the [redacted] and a [redacted] performance. A follow-up report presenting the plans for repair or replacement of the primary liner, with a proposed time schedule, shall be provided in accordance with further orders of the Department/Board.

3. Brohm Mining Corporation shall [redacted] to minimize hydraulic head on the secondary liner until further order of the Department/Board.

4. Brohm Mining Corporation shall at all times operate in compliance with all permit conditions, including the LDCRS schedule in Mining Permit #439, attached hereto and incorporated herein.

5. [redacted] except for Department approved testing, until the overall leakage rate for the pad is mitigated.

6. Brohm Mining Corporation shall monitor and sample groundwater wells [redacted], [redacted], and [redacted] on a [redacted] for, at a minimum, [redacted], [redacted], [redacted], [redacted], and [redacted] [redacted]s of this monitoring shall be t[redacted] the Department immediately upon lab turn around. Brohm Mining Corporation shall field test the wells for [redacted] and [redacted] on a [redacted] basis. Results of the field

monitoring shall be [redacted] to the Department [redacted]ly following testing.

7. Brohm Mining Corporation shall monitor the LDCRS pipes of the leach pad a minimum of twice daily. The LDCRS pipes shall also be sampled [redacted] for WAD cyanide, pH, and arsenic. Results of the monitoring shall be submitted to the Department on a weekly basis.

Dated and signed this 24th day of October, 1988.

FOR THE BOARD OF MINERALS
AND ENVIRONMENT

Russ Peck for
Secretary John J. Smith
Department of Water and
Natural Resources

Leak Detection, Collection and Recovery System (LDCRS)

1. Brohm Mining shall establish a monitoring program for all LDCRS and shall report findings and flow data to the Department on a quarterly basis.

2. For the pad and pond liner systems, leakage through a primary liner shall have the following Action Leakage Rate (ALR) schedule:

(1) Heap leach pad:

0 to 20 gals/acre/day (gpad)	No response required
20 to 100 gpad	Initiate response action, additional monitoring and reporting required, and areas of leakage located
100 to 300 gpad	Change pad loading/spraying sequence to reduce leakage
300 to 500 gpad	Repair leaks
> 500 gpad	Shutdown of section contributing to leakage, replace primary liner as necessary

(2) Surge pond and neutralization pond:

0 to 20 gpad	No response required
20 to 200 gpad	Initiate response action, additional monitoring and reporting required, and areas of leakage located
200 to 500 gpad	Repair leaks
>500 gpad	Unit shut down, replace primary liner as necessary

Brohm Mining shall in the framework of the ALR schedule develop a detailed leakage response action plan. The plan shall be submitted to and approved by the Department prior to operational leaching. If Brohm Mining can demonstrate that the ALR schedule is unattainable w th present technology, the Department may revise the ALR requirements.

3. Prior to operational leaching, the leach pad and process ponds shall be tested for leakage by methods approved by the Department. If testing reveals leakage through the primary liner, the appropriate action as defined by the ALR schedule shall be taken and the liner retested for suitability for use. The leach pad and process ponds shall not operate in excess of the ALR scheduled leakage of 500 gpad except during Department approved testing.

4. LDCRS receptacles for both the leach pad and process ponds shall be formally observed on a weekly basis when the ALR is less than 20 gpad. LDCRS receptacles shall be observed on a daily basis or as necessary when the ALR is 20 gpad or more. If an ALR threshold is exceeded, Brohm Mining shall notify the Department within 24 hours of detection.

BROHM MINING CORP.

January 25, 1990

RECEIVED
JAN 29 1990
MINERALS & MINING

Mr. Mike Cepak
Department of Water and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, South Dakota 57501

Dear Mike:

Brohm Mining Corporation wishes to make a revision to their Technical Revision document submitted to your department on January 19, 1990. In this document, the caustic soda storage shed was to be placed on a sheet of 60 mil HDPE sloped towards the surge pond. After further viewing the area where the storage shed is to be placed, Brohm would rather install an 80 mil VLDPE sheet with berms on all four sides creating a passive total containment facility. Excluding a 6" block (shed floor), the containment facility will hold approximately 800 gallons of solution. It is the intent of Brohm operations to at no time keep more than four 55-gallon barrels in the storage shed.

Included also with this document is a product specification sheet showing chemical compatibilities for 80 mil VLDPE, as requested by Eric Holmes.

If you have any questions, please call me at 578-2107.

Sincerely,
Brohm Mining Corp.

Lance Hubbard
Safety/Security Supervisor

LJH/rrl
enc:
cc: Dick Langford
Rex Outzen
Jim Thompson
Marve Truhe
Ron Seig

South Dakota Office: P.O. Box 485, Deadwood, South Dakota 57732
Telephone: (605) 578-2107 Telecopier: (605) 578-1709

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JAN 23 1990
MINERALS & MINING

January 19, 1990

Mr. Mike Cepak
Department of Water and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, South Dakota 57501

Dear Mike:

Brohm Mining Corporation is requesting a Technical Revision for their Mining Permit No. 439 citing No. 2, "Plans and Specifications" and No. 14, "Modifying the gold...maximum performance" under the technical revision conditions given to them and ARSD 74:29:03.

The technical revision being requested will allow Brohm to install a 10' X 12' pre-fabricated building to provide environmental protection for the caustic soda pumping system necessary to the efficient operation of the barren solution heater. The building will be placed on a layer of 60 mil HDPE contoured towards the surge pond. Any spillage or leakage of caustic soda would therefore be routed into the containment facility. Attachment 1 shows the G.A. of 10' X 12' building. Attachment 2 is the MSDS for caustic soda.

If you have any questions, please call me at 578-2107.

Sincerely,
Brohm Mining Corp.

Lance Hubbard
Safety/Security Supervisor

LJH/rrl
enc:
cc: Dick Langford
Rex Outzen
Jim Thompson
Marve Truhe
Ron Seig

South Dakota Office: P.O. Box 455, Deadwood, South Dakota 57732
Telephone: (605) 578-2107 Telecopier (605) 578-1729

Brohm Mining Corp. is a subsidiary of Mineral Corporation

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MINERALS & MINING

TECHNICAL REVISION

Addition of Caustic Soda Pump House

DATE: January 19, 1990

1. The operator's name:

   Brohm Mining Corporation

2. The permit number:

   Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

   Addition of 10' X 12' caustic soda pump house to provide environmental protection for pumping facilities. Caustic soda needs a minimum 55 degrees F + temperature to remain fluid. This building will be heated to that level so that caustic soda may be pumped into the barren solution heater. The caustic soda is needed to prevent scale buildup in the solution heater and heat exchanger. The 10' X 12' pre-fabricated building will be placed on a sheet of 60 mil HDPE contoured towards the surge pond.

4. The legal description of land affected by the revision:

   See Volume I and II Application for Permit Amendments - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

   See Volume I and II Application for Permit Amendments - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

   No land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

   Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

   See Volume I and II Application for Permit Amendments - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-6B-7(8).

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

This revision will allow more efficient cold weather operations.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: January 19, 1990

Nature of Request: Installing a storage building for the caustic soda pumping facility.

Date of Approval or Denial: Conditionally approved January 31, 1990

Conditions:

1. Brohm Mining shall notify the Department immediately upon caustic soda spillage. This notification shall follow procedures set forth in the spill contingency plan.

BROHM MINING CORP.

RECEIVED
NOV 01 1989
MINERALS & MINING

October 26, 1989

Mr. Michael D. Cepak
S.D. Dept. of Water and Natural Resources
Joe Foss Building
Pierre, SD 57501

Dear Mike:

Brohm Mining Corporation is requesting a Technical Revision for their Mining Permit #439 citing #1 "Monitoring Plans and Parameters" and #5 "Compliance Limits for Chemical Parameters" under the technical revision conditions given to them under ARSD 74:29:03. Approval for this technical revision procedure has been approved by the Office of the Attorney General of South Dakota. (Roxanne Giedd letter to Bob Townsend dated August 17, 1989.)

The technical revision being requested involves an interim modification of the DWNR imposed effluent sampling to meet CN off-load criteria for neutralized ore at the Gilt Edge Mine heap leach operation.

Conversations with the DWNR on this matter began in June of 1989. Following a conference with the DWNR on August 10, 1989 in Pierre, attended by Rex Outzen, Pete Goodwin, Lance Hubbard, Marv Truhe (Brohm), Stever Pirner, Bob Townsend, Floyd Matthew, Reese Peck (DWNR), a schedule of events was proposed. A brief summary of those scheduled events follows:

1. Because of questions regarding the accuracy of the "pore-water" sampling technique versus that of the "effluent" sampling technique, the DWNR proposed to submit the matter to a third party for review and consultation.

2. The DWNR would choose a reputable independent third party consultant to review the available data and testing procedures for accuracy and reliability.

3. Based upon review of the existing data, the third-party consultants would make a recommendation whether or not using the solids-sampling or "pore water" test procedure for WAD cyanide could adversely affect the environment during an interim testing period.

   The number of tons which could be safely off-loaded using their recommendations could be used to determine the length of the interim test period.

South Dakota Office: P.O. Box 485, Deadwood, South Dakota 57732
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4. The third party consultants would also propose a series of tests for development of an acceptable test method for meeting long term off-load criteria.

5. After the third party consultants' report was complete, and the proposed testing program designed, Brohm and the DWNR would meet to reach further agreement.

As of this date the third party consultants (ASCI) have been chosen, their report written and received, calculations have been made concerning the off-loading of spent ore using the "worst case" scenario, the scope-of-work outlined for various testing methods completed, and the technical revision authority approved.

Brohm Mining Corporation hereby requests a one year interim testing period during which the "pore-water" sampling method may be used to meet off-load criteria for all parameters or chemical standards required by law. Brohm does not ask for relaxation of any of the chemical standards or parameters now in effect. Brohm reserves the right to achieve compliance with off-load criteria using the previously approved effluent testing if it would prove to be more expedient. With the modifications that have been made to the neutralization circuit, the effluent testing may prove to be in Brohm's best interest. If a combination of the "pore-water" testing and the "effluent" testing are used to achieve compliance, only those tons of spent ore off loaded into the spent ore repository using the "pore-water" test would count towards the accrued additional CN mentioned in the ASCI report dated October 6, 1989. Since it has been agreed that off-loading spent ore with an effluent concentration of 0.5 ppm WAD cyanide or less should not be included in calculating the allowed additional cyanide loading in the disposal area, the additional cyanide which may be off-loaded during the interim period is 221 lb. calculated as follows:

$$(650{,}000 \text{ tons spent ore})\left(\frac{8.5\% \text{ moist}}{100}\right)\left(\frac{2 \text{ PPM}}{1{,}000{,}000}\right)\left(\frac{2000 \text{ lb}}{\text{ton}}\right) = 221 \text{ lb WAD CN}$$

A similar calculation would be performed for each heap off-loaded using the actual dry tons, moisture content and effluent WAD cyanide concentration. A log will be kept on all spent ore off-loaded during the interim period to keep track of the total mass of additional cyanide off-loaded. During the interim test period Brohm would, in conjunction with the DWNR and ASCI, continue to conduct various test methods and test work to determine an environmentally safe and accurate test procedure to be used to meet long term off-load criteria. An on-site review and meeting to finalize the testing program has been tentatively scheduled for November 17, 1989.

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If you have any questions or need additional information, please call me at 578-2107.

Thank you.

Sincerely,
Brohm Mining Corporation

Lance J. Hubbard
Safety/Security Supervisor

LJH/dvl

cc: Dan Blakeman
Rex Outzen
Marv Truhe
Scott Wanstedt

TECHNICAL REVISION

Interim Testing Program

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NOV 01 1989
MINERALS & MINING

DATE: October 30, 1989

1. The operator's name:

   Brohm Mining Corp.

2. The permit number:

   Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

   Brohm Mining Corporation requests an interim modification of the DWNR imposed effluent sampling to meet CN off-load criteria for neutralized ore at the Gilt Edge Mine heap leach operation. (See attached letter.)

4. The legal description of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

   No land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

   Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

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Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-6B-7(8):

See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corporation

Date of Technical Revision Request: October 27 and 30, 1989

Nature of Request: Approval of a one-year interim testing period during which approved pore-water/solid sampling method may be used to determine off-load criteria for WAD cyanide (WAD CN).

Date of Approval or Denial: Conditionally approved November 3, 1989

Conditions:

1. Heaps may not be off-loaded until the pore water test results show compliance with ARSD 74:29:05:08 and the effluent collected from the toe of the heap exhibits a concentration of 2.0 ppm WAD CN or less. This is required because the tonnage calculation included in the October 6, 1989 ASCI report are based on 2.0 ppm WAD CN concentrations.

2. Brohm shall submit a cumulative log of all spent ore off-loaded during the interim period each time a heap is off-loaded and within one week of off-loading. The log shall include the tonnages off-loaded. It shall also include a calculation of the total mass of additional WAD CN deposited in Ruby Gulch based on spent ore off-loaded in which the pore water test was used and the effluent was greater than 0.5 ppm but less than or equal to 2.0 ppm WAD CN. The WAD CN calculation shall be as follows:

   (Tons of spent ore off-loaded) (% moisture/100) (effluent concentration in ppm/1,000,000)(2,000 lb/ton) = lbs of WAD CN.

   Percent moisture shall be calculated from samples taken at the toe of the heap. In no case shall the off-loaded mass of additional WAD CN exceed 221 lbs.

   Be aware that any spent ore off-loaded using the currently approved effluent test that meets 0.5 ppm WAD CN need not be included in the mass of additional WAD CN calculation. Please keep the log simple and to the point.

3) The following groundwater monitoring schedule shall be incorporated into Brohm's current operational hydrologic monitoring plan:

Monitoring Station	Sampling Frequency	Parameters to be Tested
GW-12	Monthly	pH, Conductivity, TDS, NO3, Total & WAD CN, Water level.
GW-13	Monthly	pH, Conductivity, TDS, HCO3, SO4, Total & WAD CN, Na, As, Cd, Cu, Se, Zn, NO3, Water level.

In addition to WAD CN, be aware that the DWNR will be monitoring effluent concentrations of other key parameters that are above standards in a typical pregnant solution (i.e., Cl, SO4, pH, TDS, As, Cu, Ag, Zn, Cd, NO3, NO2, & NH3) to determine what these concentrations are when effluent WAD CN concentrations are between 0.5 and 2.0 ppm. This information will be used in the future by the DWNR to assess the potential impacts these parameters may have on the environment when off-loading at higher effluent WAD CN concentrations.

Based on the ASCI testing program results, it should be understood that DWNR reserves the right to make the final decision on approving alternative neutralization testing methods.

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corporation

Date of Technical Revision Request: September 28, 1989

Nature of Request: Installing a neutralization solution heating system and a carbon adsorption system

Date of Approval or Denial: Conditionally approved October 5, 1989

Conditions:

1. Since there may be sharp aggregates in the concrete mix, Brohm Mining shall take steps to prevent damage to the 80 mil VLDPE liner during the pouring of concrete.

2. The thickness of the VLDPE shall be plus or minus 10 percent of 80 mil. This thickness shall be measured at minimum frequency of 1 measurement per 100 feet of VLDPE.

3. All holes greater than one-sixteenth inch (1/16") diameter shall be patched using a piece of VLDPE membrane. Holes smaller than one-sixteenth inch (1/16") may be repaired using an extrusion weld bead. Vacuum testing procedures for extrusion welds described in previously approved plans and specifications shall apply.

4. Brohm Mining shall submit the resumes and qualifications of personnel involved in the construction quality assurance (CQA) of the lining system by October 10, 1989. Brohm Mining shall notify the Department of CQA personnel changes prior to their commencement of work.

5. Brohm Mining shall notify the Department of liner completion and request Departmental approval prior to the pouring of concrete.

6. Brohm Mining shall follow all other applicable liner installation specifications approved for the leach pad reline project.

BROHM MINING CORP.

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OCT 2 1989

EXPLORATION AND MINING PROGRAM

September 28, 1989

Mr. Mike Cepak
SD Dept. of Water & Natural Resources
Joe Foss Building, 4th Floor
520 East Capitol Avenue
Pierre, SD 57501

Dear Mike:

Brohm Mining Corporation, in accordance with the technical revision authority given to them in their Amended Mining Permit #439 requests a technical revision citing... "Modifying the gold recovery process within the process facility for maximum performance," (14). The proposed change to the neutralization area consists of two separate systems. These systems are the neutralization solution heating system and the carbon adsorption system.

The two systems will be installed on a concrete slab to be located directly adjacent to the existing neutralization facility at the neutralization pond. Plans and specifications for the concrete slab are included in Attachment 1. The existing neutralization system, excluding the hydrogen peroxide storage tank, will be included under the pole barn type structure to be erected over the new system.

Production specification sheets for the Sioux Model D-3000 propane fired water heaters are included in Attachment 2.

Attachment 3 is the test results of neutralization solution characterization.

As built drawings of piping and electrical layouts will be submitted at the DWNR discretion.

If you have any questions or need further information, please call me at 578-2107.

Thank you.

Sincerely,
Brohm Mining Corporation

Lance J. Hubbard
Safety/Security Supervisor

cc: Dan Blakeman, Rex Dutzer, Jim Thompson, Marv Truhe, Scott Wanstedt

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EXPLORATION AND
MINING ENGINEER

9. The name and address of the mineral owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

    Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

    To be submitted directly to DWNR by these agencies when applicable.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

    Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-6B-7 (8):

    See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

    There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requriements of ARSD 74:29:03:07:

    Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.

BROHM MINING CORP.

RECEIVED
JUL 10 1989
EXPLORATION AND MINING PROGRAM

July 7, 1989

Mr. John Kirk
S.D. Dept. of Game, Fish & Parks
445 East Capitol
Pierre, SD 57501

Dear John:

Brohm Mining Corp. is requesting a technical revision to Mining/Milling Permit No. 439. This revision will in no way negatively impact the environment or change the reclamation plan. The proposed revision will revise the "Heap Neutralization" sampling procedure to accurately reflect the intent of and be consistent with ARSD 74:29:05:05 through ARSD 74:29:05:11. A copy of the letter from Lance Hubbard to Mike Cepak further explaining this revision is attached.

Prompt response to Mike Cepak would be greatly appreciated as process scheduling is highly dependent upon this revision.

If you have any questions, please give me a call at 578-2107.

Thank you.

Sincerely,
Brohm Mining Corporation

Lance J. Hubbard
Safety/Security Supervisor

LJH/dvl

enc:

South Dakota Office: P.O. Box 485, Deadwood, South Dakota 57732
Telephone: (605) 578-2107 Telecopier: (605) 578-1709

Brohm Mining Corp. is a wholly-owned affiliate of Minera Gold Corporation

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: July 10, 1989

Nature of Request: Allow Pore Water Test for Cyanide Compliance Monitoring

Date of Approval or Denial: Disapproved August 3, 1989 (Note: Technical Revision Request was withdrawn August 9, 1989.)

Reasons for Disapproval:

1. The level of treatment (0.5 mg/l WAD cyanide) required has been demonstrated to be achievable using the effluent monitoring technique, not only at your operation but also at another operating mine. Additionally, all other mining operations in South Dakota are subject to the same level of treatment and compliance monitoring requirements for cyanide.

2. There are a number of inherent unknowns related to the reliability of the "pore water" test that affect our confidence in its ability to adequately predict the long-term disposition of the spent ore dumps. Those unknowns include questions of scale, time, sampling technique, and analytical interferences.

3. No reliable data has been submitted to adequately demonstrate what effect the "pore water" test will have on the duration and level of treatment so that comparisons can be made with "effluent" test results.

4. The requested change is not appropriate to process as a Technical Revision because, if approved, it may adversely affect surface water or groundwater. ARSD 74:29:03:02 clearly requires that a new permit is required for a change in a permit which may adversely affect surface water or groundwater.

BROHM MINING CORP.

RECEIVED
JUN 5 1989
BROHM MINING CORP.

May 30, 1989

Mr. Mike Cepak
S.D. Dept. of Water and Natural Resources
Joe Foss Building, 4th Floor
523 East Capitol Avenue
Pierre, South Dakota 57501

Dear Mike:

Per our telephone conversation, Brohm Mining Corporation is requesting a technical revision for the following item:

1) Permission to install half inch drip tubing around the inside of the surge pond. The drip tubing will be placed one foot down slope on the HDPE liner of the surge pond. This drip system will help control solution balance. There will be no impact on the environment. (See attached drawing.)

If there are any questions or you need additional information, please call me at 578-2107.

Sincerely,
Brohm Mining Corporation

Jim Thompson
Plant Superintendent

JT/dvl

cc: Lance Hubbard
Carl Seward
John Kirk

Attachment:

South Dakota Office: P.O. Box 485, Deadwood, South Dakota 57732
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TECHNICAL REVISION

Modification of Water Quality Sampling Program

RECEIVED
JUN 5 1989
EXPLORATION AND
MINING DIVISION

DATE: May 30, 1989

1. The operator's name:

   Brohm Mining Corporation

2. The permit number:

   Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

   Put half inch drip tubing around inside of surge pond to help evaporate solution from surge pond.

4. The legal description of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

   No additional land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

   Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

Delivered to DWNR as part of a permit amendment March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

Letter from Lawrence County covering revisions of this type previously submitted to DWNR.

13. A postmining reclamation map as required by SDCL 45-6B-7 (8):

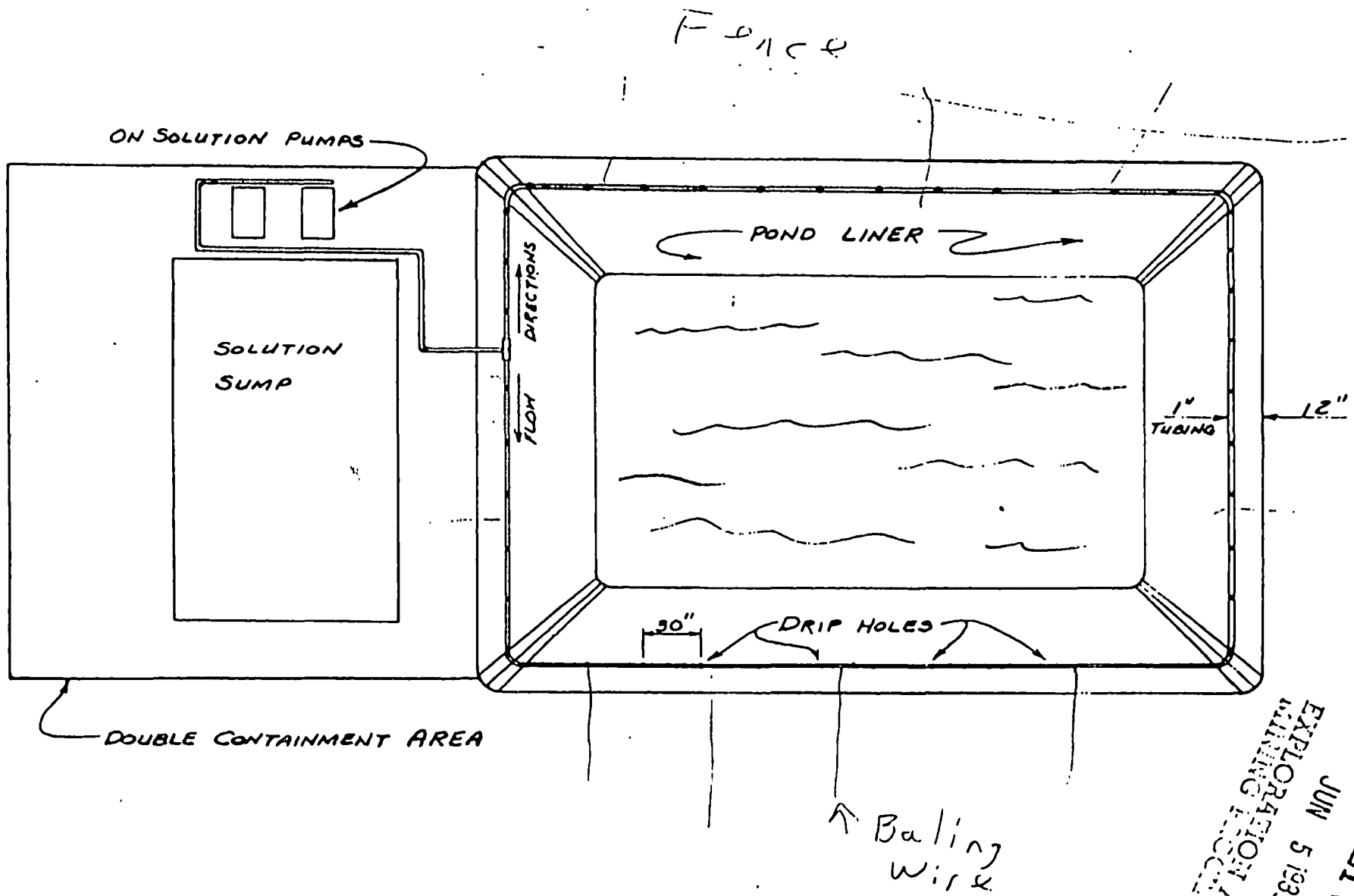
See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.



RECEIVED
JUN 5 1989
EXPLORATION & MINING DIVISION

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: May 30, 1989

Nature of Request: Installing half-inch drip tubing around the inside of the surge pond to help control solution balance.

Date of Approval or Denial: Conditionally Approved June 14, 1989

Conditions:

1. Brohm Mining shall ensure that the surge pond liner is protected from punctures and other such damage during the installation of the tubing. Nylon rope, plastic coated wire, or other such protective material shall be used to attach the tubing to the points discussed in our June 8, 1989 phone conversation.

BROHM MINING CORP.

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MAY 19 1989
EXPLORATION & MINING PROGRAM

May 16, 1989

Mr. Mike Cepak
SD Dept. of Water & Natural Resources
Joe Foss Building, 4th Floor
523 East Capitol Avenue
Pierre, SD 57501

Dear Mike:

Brohm Mining Corporation is requesting a technical revision for the following item:

1) Permission to add another pump and more piping to the neutralization area. The new pump and piping will be placed on the same containment area as the other pumps and pipes. This will enable Brohm to put more neutralized solution onto the heaps, thereby making the process more efficient. There will be no impact on the environment. See attached drawings.

If there are any questions or you need additional information, please call me at 578-2107.

Sincerely,
Brohm Mining Corporation

Jim Thompson

Jim Thompson
Plant Supervisor

JT/dvl

cc: Lance Hubbard
Carl Seward

enc:

South Dakota Office: P.O. Box 483, Deadwood, South Dakota 57732
Telephone: (605) 578-2107 Telecopier: (605) 578-1709

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EXPLORATION AND
MINING PROGRAM

TECHNICAL REVISION

Modification of the "Heap Neutralization" Sampling Procedure

DATE: July 7, 1989

1. The operator's name:

   Brohm Mining Corporation

2. The permit number:

   Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

   The proposed change would revise the "Heap Neutralization" sampling procedure to accurately reflect the intent of and be consistent with ARSD 74:29:05:05 through ARSD 74:29:05:11. Each of these regulations state that... "tailings impoundments shall be monitored for key parameters..." using "...effluent <u>or</u> pore water..." Brohm Mining Corp. does not ask for relaxation of any of the chemical standards or parameters now in effect.

4. The legal description of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

   No land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

   Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

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OCT 2 1989

EXPLORATION AND
MINING PROGRAM

TECHNICAL REVISION

Modification of the neutralization facility to allow the addition of 1) solution heaters and 2) carbon columns.

DATE: September 26, 1989

1. **The operator's name:**

   Brohm Mining Corporation

2. **The permit number:**

   Mining/Milling Permit No. 439 as amended.

3. **A narrative description of the revision being proposed:**

   Process Description : The proposed changes to the neutralization area consists of two separate systems. These systems are the neutralization solution heating system and the carbon adsorption system. These two systems are described below.

   Neutralization Solution Heating System: The solution heating system consists of three model D-3000 Sioux water heaters which are propane fired and have a combined output of 9,000,000 BTU per hour. These heaters are in closed circuit with two plate type heat exchangers, a circulating pump and a circulating solution tank. The fluid that is circulated in this system will be fresh water with additions of various reagents to control pH and prevent scale formation. Neutralization solution from the neutralization pond will be pumped by one of the existing submersible pumps which supply the rinse water booster pumps. A bleed stream from the submersible pump will be routed through the heat exchangers and be heated by the circulating solution. This heated solution will then be routed back to the suction of the rinse water booster pumps and be pumped up to the heaps under neutralization. This system will be able to heat a total of 1000 GPM of neutralization solution 15 to 20 degrees Fahrenheit.

   Carbon Adsorption System: The carbon adsorption system is to be installed to recover the gold remaining in the neutralization solution. Neutralization solution will be pumped from the neutralization pond with the existing standby submersible pump in the neutralization pond. The solution will be pumped through an in-line strainer, flow control valve, a totalizing flowmeter and through the carbon columns. The carbon columns are of the sealed pump-through type and will consist of three or four columns with each having a capacity of 1000 pounds of activated carbon. The barren solution from the carbon columns will flow over a

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EXPLORATION AND MINING PROGRAM

carbon safety screen and into a sump which overflows back into the neutralization pond. This sump will be used as the pump sump for the land application system when it is installed.

Loaded carbon from the columns will be transferred into a specially designed carbon transport trailer to be hauled offsite for stripping at a neighboring mine or commercial stripping facility. If this option proves to be unworkable, the columns containing the loaded carbon will be transported by forklift to the Process Plant where a small skid-mounted stripping/electrowinning circuit will be installed.

4. **The legal description of land affected by the revision:**

   See Volume I and II Application for Permit Amendment - January 1988.

5. **A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:**

   See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. **The estimated cost of implementing and completing the reclamation of land affected by the revision:**

   No land will be affected by this revision.

7. **A description of the reclamation being proposed for the land affected by the revision:**

   Since no land is affected by this technical revision no modifications to the current reclamation plan are necessary.

8. **The name and address of the surface owner of land affected by the revision:**

   See Volume I and II Application for Permit Amendment - January 1988.

9. **The name and address of the mineral owner of land affected by the revision:**

   See Volume I and II Application for Permit Amendment - January 1988.

10. **An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:**

    Delivered to DWNR March 15, 1988.

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EXPLORATION AND MINING PROGRAM

11. **Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:**

    To be submitted directly to DWNR by these agencies.

12. **Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:**

    Letter from Lawrence County covering revisions of this type previously submitted.

13. **A postmining reclamation map as required by SDCL 45-6B-7(8):**

    See Brohm's Permit Amendment Application - Exhibit 2-6.

14. **The effect the revision has on the timetable and duration of the mining operation:**

    There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. **Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:**

    Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.

BROHM MINING CORP.

September 8, 1989

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SEP 8 1989
EXPLORATION & MINING DIVISION

Mr. Mike Cepak
SD Dept. of Water & Natural Resources
Joe Foss Building, 4th Floor
520 East Capitol Avenue
Pierre, SD 57501

Dear Mike:

Brohm Mining Corporation is requesting a Technical Revision for the following items:

1. The addition of an 80 mil thick cover liner over the entire surface of the asphaltic concrete primary liner of the Gilt Edge leach pad. The cover liner system consists of five system components (from bottom to top): tack coating of the existing AC primary liner; secondary leachate collection system between the primary and cover liners; an 80 mil thick very low density polyethylene (VLDPE) cover liner; a protective cover layer consisting of geotextile and fine gravel; and a drainage layer consisting of coarse gravel. Each of the components is discussed in detail in the attached report: TECHNICAL SUPPORT DOCUMENT for the PROPOSED TECHNICAL REVISION to the GILT EDGE LEACH PAD, Attachment I.

2. Replacement of the existing single 8-inch diameter outlet pipes from each cell with one 10-inch diameter outlet pipe. This will allow for more efficient removal of solution from the cells during the leach/neutralization cycles. The detail drawings, etc. are included in the attached report, Attachment I.

3. The addition of a 10 inch neutralization return line to the neutralization pond. In addition, the 6-inch neutralization on-solution line will be replaced with an 8-inch on-solution line. This will allow a higher return flow rate to and from the leach pad during the neutralization cycle, thus improving neutralization cycle time. The piping will be commensurate with that being used throughout the Gilt Edge Project.

The cover liner will be placed initially over Cells #4, #3 and #2. The cover liner on Cells #5, #7 and #1 will be sequentially placed as the ore on them has been neutralized and may be off loaded. The ore on Cell #6 will be removed to Cell #2 for neutralization as soon as the cover liner work on Cell #2 has been completed and approved. The cover liner can then be placed on Cell #6.

South Dakota Office: P.O. Box 485, Deadwood, South Dakota 57732
Telephone: (605) 578-2107 Telecopier: (605) 578-1709

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EXPLORATION

TECHNICAL REVISION

1. **Addition of 80 mil VLDPE cover liner over the entire surface of the asphaltic concrete primary liner of the leach pad.**

2. **Replacement of the existing single 8-inch diameter outlet pipes from each cell with one 10-inch diameter outlet pipe.**

3. **Addition of a 10-inch neutralization return line and replacement of the existing 6-inch on-solution line with an 8-inch line between the neutralization pond and the leach pad cells.**

DATE: **September 8, 1989**

1. **The operator's name:**

   Brohm Mining Corporation

2. **The permit number:**

   Mining/Milling Permit No. 439 as amended.

3. **A narrative description of the revision being proposed:**

   The items being revised (listed above) are further discussed within the attached supporting documents.

4. **The legal description of land affected by the revision:**

   See Volume I and II Application for Permit Amendment - January 1988.

5. **A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:**

   See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. **The estimated cost of implementing and completing the reclamation of land affected by the revision:**

   No land will be affected by this revision.

7. **A description of the reclamation being proposed for the land affected by the revision:**

   Since no land is affected by this technical revision no modifications to the current reclamation plan are necessary.

8. **The name and address of the surface owner of land affected by the revision:**

   See Volume I and II Application for Permit Amendment - January 1988.

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SEP 8 1989

9. **The name and address of the mineral owner of land affected by the revision:**

   See Volume I and II Application for Permit Amendment January 1988.

10. **An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:**

    Delivered to DWNR March 15, 1988.

11. **Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:**

    To be submitted directly to DWNR by these agencies.

12. **Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:**

    Letter from Lawrence County covering revisions of this type previously submitted.

13. **A postmining reclamation map as required by SDCL 45-6B-7(8):**

    See Brohm's Permit Amendment Application - Exhibit 2-6.

14. **The effect the revision has on the timetable and duration of the mining operation:**

    There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. **Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:**

    Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.

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DIVISION OF OIL, GAS & MINING

If you have any questions or need additional information, please call me at 578-2107.

Thank you.

Sincerely,
Brohm Mining Corporation

Lance J. Hubbard
Safety/Security Supervisor

LJH/dvl

cc: Dan Blakeman
Rex Outzen
Ron Sieg
Mark Smith
Jim Thompson
Scott Wanstedt

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corporation

Date of Technical Revision Request: September 8, 1989

Nature of Request: Plans and Specifications changes regarding the relining of the leach pad; the replacement of the 8-inch diameter outlet pipes with 10-inch diameter pipes; and the addition of a 10-inch diameter neutralization return line to the neutralization pond, and the replacement of the 6-inch diameter neutralization on-solution line with a 8-inch diameter line.

Date of Approval or Denial: Conditionally Approved September 12, 1989

Conditions:

1. Brohm Mining shall submit details of the anchor trenches for the VLDPE liner as soon as practicable.

2. Referring to the drawings entitled "Concrete Transition Berm" and "Liner System Transition at Concrete Berm" in the Technical Support Document for the Proposed Technical Revision to the Gilt Edge Leach Pad, Brohm Mining shall use fill material (sand, polyethylene foam, or other material) to reduce the 90 degree bends on the concrete curbs to 45 degrees, to facilitate laying of, and to reduce stress points on, the VLDPE liner. Brohm Mining need not install the fill at pipe outlet sections of the curbs.

3. The details of the geotechnical stability study (STABL4 program) shall be submitted as soon as practicable.

4. For testing welded seams, 100 percent of the wedge welded seam shall be air pressure tested. The allowable pressure drop for the compressed air test shall be 2 pounds per square inch (psi) over a 5-minute interval at a pressure of 30 to 40 psi. Otherwise, the leak shall be located and the area repaired. For seams that are extrusion welded, the vacuum testing procedures described in the approved plans and specifications shall apply.

5. The thickness of the VLDPE shall be plus or minus 10 percent of 80 mil. This thickness shall be measured at minimum frequency of 1 measurement per 10 feet of VLDPE.

6. All holes greater than one-sixteenth inch (1/16") diameter shall be patched using a piece of VLDPE membrane. Holes smaller then one-sixteenth inch (1/16") may be repaired using an extrusion weld bead.

7. Brohm Mining shall check the condition of existing exposed HDPE liner prior to placement of the VLDPE liner. The HDPE shall be repaired as necessary.

8. Brohm Mining shall submit the resumes and qualifications of personnel involved in the construction quality assurance (CQA) of the lining system by September 15, 1989. Brohm Mining shall notify the Department of CQA personnel changes and shall submit resumes for new CQA personnel prior to their commencement of work.

9. Brohm Mining shall notify the Department of completion of repair to each cell and request Departmental approval prior to loading of the cell.

10. Brohm Mining shall submit a plan for Departmental approval regarding hydrostatic testing of the repaired cells. The plan shall be submitted prior to loading the repaired cells.

11. Brohm Mining shall provide the Department's field inspector or representative a copy of the VLDPE panel layout plan when it is available.

BROHM MINING CORP.

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JUL 10 1989
EXPLORATION AND MINING SECTION

July 7, 1989

Mr. Mike Cepak
Department of Water and Natural Resources
Joe Foss Building, 4th Floor
523 East Capitol
Pierre, SD 57501

Dear Mike:

Per our conversations during recent weeks Brohm Mining Corp. hereby requests that the "Heap Neutralization" sampling procedure be revised to accurately reflect the intent of and be consistent with ARSD 74:29:05:05, through ARSD 74:29:05:11, inclusive. Each of these regulations state that the "tailings impoundments shall be monitored for key parameters" using "effluent or pore water." Brohm Mining Corp. does not ask for relaxation of any of the chemical standards or parameters now in effect.

Sincerely,
Brohm Mining Corp.

Lance J. Hubbard

Lance J. Hubbard
Security/ Safety Supervisor

LJH/st

South Dakota Office: P.O. Box 487 Deadwood, South Dakota 57732
Telephone: (605) 578-1207 Telecopier: (605) 578-1709

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TECHNICAL REVISION

Modification of Neutralization Pump Circuit

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MAY 19 1989
EXPLORATION AND
MINING DIVISION

DATE: May 16, 1989

1. The operator's name:

   Brohm Mining Corp.

2. The permit number:

   Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

   Add one pump to neutralization area, and pipe from the pump to existing piping. This will help us send more neutralization solution to heap.

4. The legal description of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

   No land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

   Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

9. The name and address of the mineral owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

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10. An instrument of consultation with the surface owner as required by SDCL 45-6B-12 and proof of consultation with adjacent landowners as required by SDCL 45-6B-44 for the land affected by the revision:

    Delivered to DWNR March 15, 1988.

11. Proof of consultation with the Department of Game, Fish and Parks and the local conservation district, including any additional surveys and requirements considered necessary by those agencies:

    To be submitted directly to DWNR by these agencies.

12. Proof of compliance with all county or city zoning ordinances and requirements or proof that the revision is in substantial compliance with the procedure for obtaining any necessary county or city permits:

    Letter from Lawrence County covering revisions of this type previously submitted.

13. A postmining reclamation map as required by SDCL 45-6B-7(8):

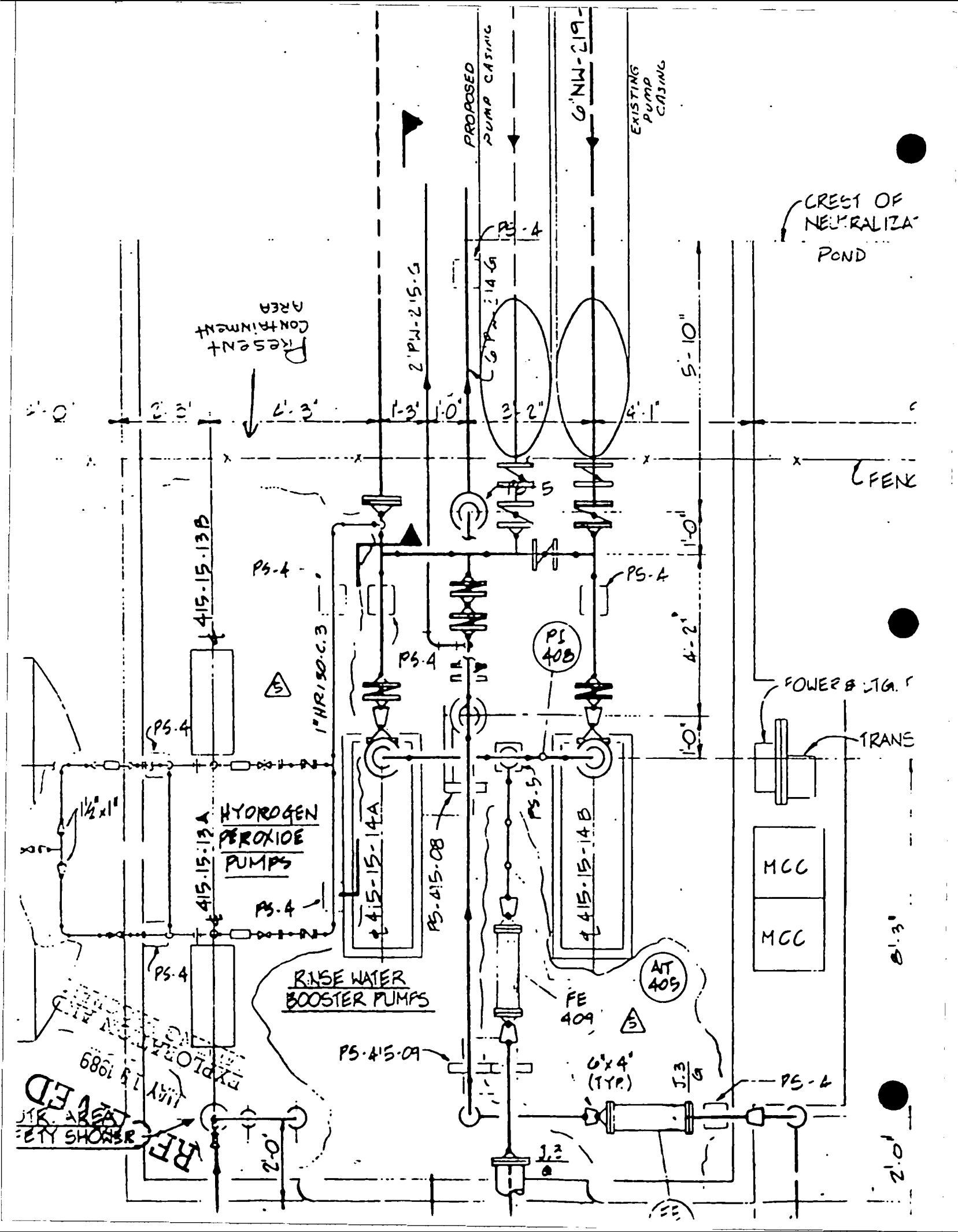
    See Brohm's Permit Amendment Application - Exhibit 2-6.

14. The effect the revision has on the timetable and duration of the mining operation:

    There will be no effect on the timetable or duration of the mining operation as a result of these revisions.

15. Baseline data and maps pursuant to the requirements of ARSD 74:29:03:07:

    Please refer to Brohm's Permit Amendment Application for baseline data and maps for these areas.


PROPOSED PUMP CASING
EXISTING PUMP CASING
CREST OF NEUTRALIZATION POND
FENCE
PRESENT CONTAINMENT AREA
HYDROGEN PEROXIDE PUMPS
RINSE WATER BOOSTER PUMPS
415-15-13A
415-15-13B
415-15-14A
415-15-14B
PS-415-08
PS-415-09
PS-4
PS-5
PS 408
AIT 405
FE 409
MCC
MCC
POWER & LIGHT
TRANS
1" HR150.C.3
2" PW-215-G
6" NW-219-G
1½"x1"
6"x4" (TYP.)
5'-10"
4'-2"
1'-0"
2'-0"
8'-3"
REFERENCED
EXPLOSION MAY 19 1989
SAFETY SHOWER

TECHNICAL REVISION DOCUMENT

Applicant: Brohm Mining Corp.

Date of Technical Revision Request: May 19, 1989

Nature of Request: Plans and Specifications change regarding the addition of another pump and additional piping at the neutralization area to enable Brohm to place more neutralized solution onto the heaps. Modification falls under Technical Revision No. 2 (Plans and Specifications) or Technical Revision No. 9 (adopting new processes for cyanide destruction) of the conditions attached to the April 21, 1988 Amendment to Mining Permit No. 439.

Date of Approval or Denial: Approved June 9, 1989

Conditions:

BROHM MINING CORP.

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EXPLORATION AND MINING PROGRAM

March 14, 1989

Mr. Mike Cepak
S.D. Dept. of Water and Natural Resources
Joe Foss Building, 4th Floor
523 East Capitol Avenue
Pierre, South Dakota 57501

RE: Request for Technical Revision of Mining and Milling Permit No. 439, Gilt Edge Project, Lawrence County, South Dakota

Dear Mike:

Brohm Mining Corp. (BMC) hereby requests the Department of Water and Natural Resources (Department) approve a technical revision to BMC's Mining and Milling Permit No. 439. This request is made pursuant to the technical revision authority of the Department under BMC's permit amendment Technical Revision Condition, subsection 5 (Compliance Limits for Chemical Parameters) and A.R.S.D. 74:29:03:16(7). BMC requests that it be granted a variance for the following parameters: TDS, nitrite and pH, and that BMC's heap neutralization treatment standards be revised accordingly as set forth in paragraph 3 of the Heap Neutralization section of BMC's Permit Amendment Conditions and pursuant to the Department's further authority under A.R.S.D. 74:29:05:08.

BMC has completed neutralization of spent ore on Cell #6. Compliance limits were met for all major chemicals including cyanide. The value for pH was just over the alkaline end of the acceptable pH range and nitrite slightly exceeded the allowable levels in the pore water on the pad (see sampling and testing results conducted on neutralized spent ore). Efforts to reduce these levels would not be environmentally prudent, as it would likely upset the project acid-base balance and produce increased levels of other elements. The attached documentation demonstrates that unloading the spent ore with leach pad pore water slightly higher in pH, nitrite and TDS would not negatively impact the environment. The documentation further demonstrates that slightly increased pH, nitrite and TDS levels are quickly attenuated by soils in the spent ore disposal site and further reduced by dilution from precipitation in the area.

Attached in support of this request, and incorporated herein by reference, are the sampling and testing results conducted on the neutralized spent ore which is proposed to be off-loaded; a copy of the Waste Rock and Spent Ore Characterization Study prepared by Hydrometrics, Inc. in March,

South Dakota Office: P.O. Box 483 Deadwood, South Dakota 57732
Telephone: (605) 578-2307 Telecopier: (605) 578-1709

1988; and the March, 1989, Hydrometrics' Report on Pathway and Fate Analysis of pH and nitrite in spent ore pore water. Also enclosed is a Technical Revision Fact Sheet.

This request for a technical revision is being submitted simultaneously with an Application for Amendment of BMC's Groundwater Discharge Plan No. GWD-3-88. It is anticipated that the Application will be heard by the South Dakota Board of Water Management at a special meeting in early April, 1989. Since BMC is currently making repairs to its heap leach pad, which repairs cannot continue unless and until BMC is allowed to off-load its neutralized spent ore, it is respectfully requested that this technical revision be processed such that it will authorize BMC to off-load its spent ore on or before the date scheduled for the Board of Water Management hearing referred to above.

Sincerely,
Brohm Mining Corporation

Rex L. Outzen
General Manager

RLO/dvl

enc:

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TECHNICAL REVISION FACT SHEET

Compliance Limits for Chemical Parameters

DATE: March 14, 1989

1. The operator's name:

   Brohm Mining Corporation

2. The permit number:

   Mining/Milling Permit No. 439 as amended.

3. A narrative description of the revision being proposed:

   The technical revision would grant a variance to Brohm for the parameters of total dissolved solids, nitrite and pH thereby modifying the heap neutralization standards for Brohm's off-loading of spent ore from its heap leach pads.

4. The legal description of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988.

5. A map in compliance with SDCL 45-6B-10 and ARSD 74:29:02:12, showing the land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988, Exhibits 2-2 and 2-3. No additional land will be affected.

6. The estimated cost of implementing and completing the reclamation of land affected by the revision:

   No land will be affected by this revision.

7. A description of the reclamation being proposed for the land affected by the revision:

   Since no land is affected by this technical revision no modifications to the current reclamation plan is necessary.

8. The name and address of the surface owner of land affected by the revision:

   See Volume I and II Application for Permit Amendment - January 1988, Sections 2.2, Exhibit 2-4, and Appendix A.