

Considered: _____

WATER PERMIT NO. 1438-1

HAP No. Same 584-2010

Name of Applicant Golden Reward Mining Company

Post Office Address PO Box 888, Lead SD 57754

Amount of Water Claimed 0.67 cfs Total Acres NA

Source of Water Supply ground water 1 well

Water to be used for industrial & domestic use County Lawrence

About 1 1/2 miles SW of Lead

PROOF OF PUBLICATION: Received _____ Not Received _____

APPLICATION: Approved _____ Subject to _____

F.F. & C.L. Adopted _____ Not Approved _____ Deferred _____

PRIORITY _____ Date Received April 11, 1988 Fee \$300⁰⁰ Remarks _____

Corrected Application Received _____ Period of Annual Use Jan 1 - Dec 31

WATER QUALITY APPROVAL RECEIVED NA APPROVED/CONDITIONAL (Circle one)

WI-1 Description same as Application YES _____ NO _____ REMARKS _____

Diversion Point well: SW 1/4 SE 1/4 section 7 -
T4N-R3E

Land to be Irrigated NA

		7			
		well ⊗			

Well Log: Driller B & B Drilling Licensed YES ☒ NO ☐

Depth of Well 355 Feet REMARKS _____

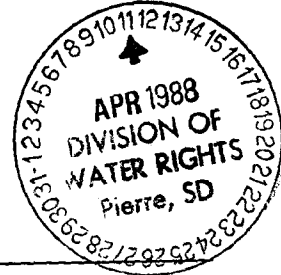
Type of Map plat PREPARED BY John M. Arleth Reviewed and the Number
assigned on April 21, 1988 By Ron Duvall

No. 1438-1 Hydrologic Unit 10120202
 Map No. same Basin Belle Fourche R.
 Newspaper Lead Daily Call, Box 876

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use of water: Industrial ☒ 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 ☒ Vested Right ☐ Future Use ☐ Change Use ☐☐ Amend Permit No. _____ with old priority date retainedChange 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 Golden Reward Mining Company Phone No. 605-584-2010Post Office Address PO Box 888 Lead State SD 57754
(Street, RR or Box) Zip Code2. Amount of water claimed (c.f.s) 0.67 CFS3. Source of water supply Dead Wood Formation 1 Well4. Location of point of diversion SW 1/4 of SE 1/4 of Sect. 7 T4N, R3E, BHM
E
1075 ft. N 44 deg 07 min 16 sec E of SW corner of SE 1/4 of section 7, T4N, R3E, BHMGolden Reward Reference No. PW-5 County Lawrence5. Counties where water will be used Lawrence6. Annual period during which water is to be used 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)

The water is required for the Golden Reward Heap Leach operation. Gold will be extracted from crushed auriferous rock utilizing a weak cyanide solution. The water will be used for: Leach solutions, spent ore washing, dust control, vehicle wash-down, and for portable water.

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction)

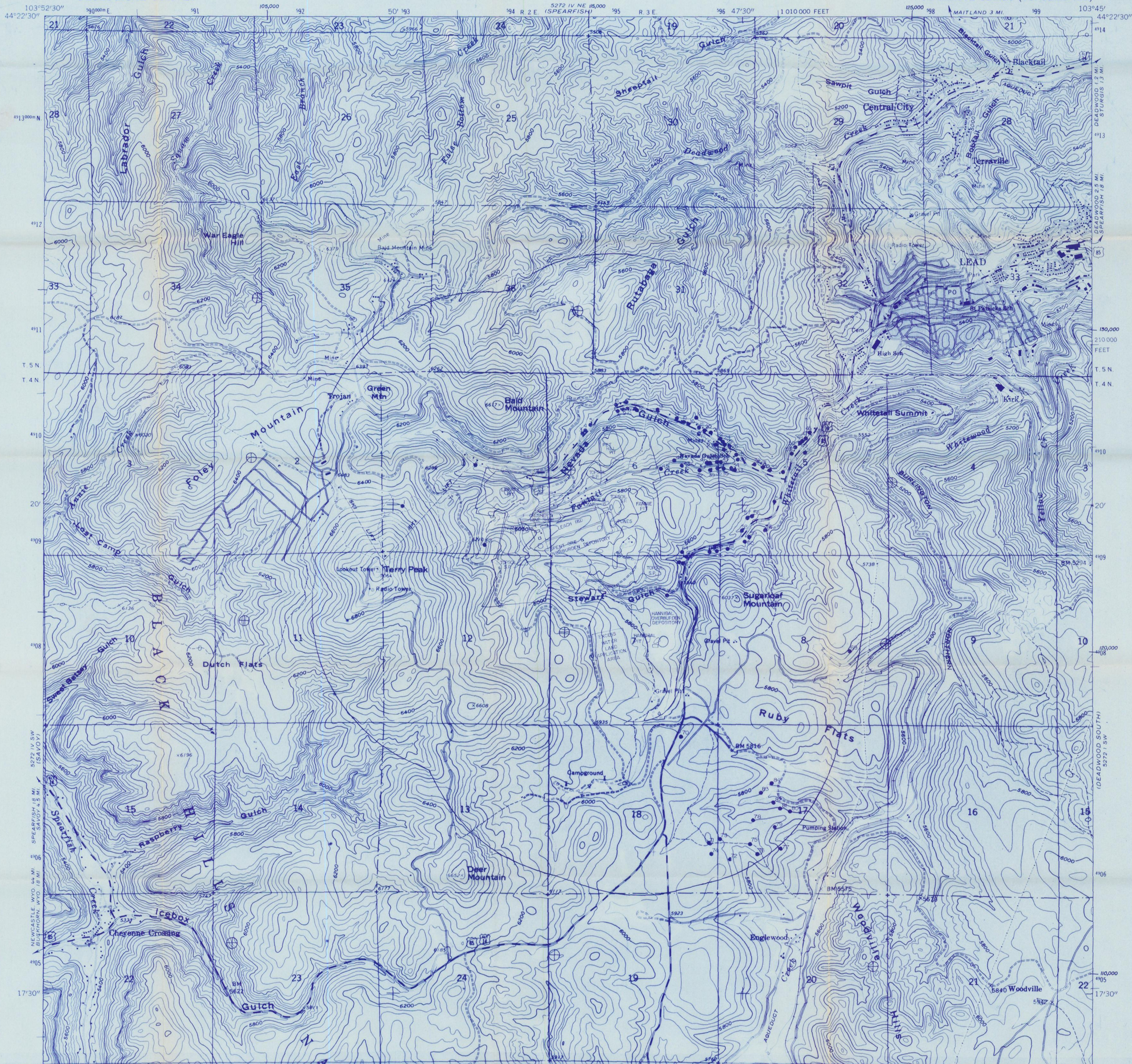
STATE OF SOUTH DAKOTA)
 County of _____)

I, Peter Erickson, General Manager 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 by [Signature] General Manager
Golden Reward Mining Company

Subscribed and sworn to before me this 11th day of April 1988

[Signature] Comm exp 08.24.95
 Notary Public (or other qualified officer)



EXPLANATION

NOTE Numbers correspond to names, mineral claims,
or legal descriptions listed in Text Appendix 3

THE GOLDEN REWARD MINING CO.

EXHIBIT 2-3

DOMESTIC AND COMMERCIAL WATER WELLS
WITHIN ONE MILE OF THE PERMIT AREA

Golden Reward Property
Lawrence County, S.D.

Scale: 1 inch = 1000 feet

Drafted by K. Martin

Prepared by J. Miller

Date 11-27-97

FIGURE

Revision dates 3/1/88

REFERENCES

SDCL 45-6B-7(9)

SDCL 45-6B-10, -41

QUALIFICATIONS FOR WATER PERMIT APPLICATION NO. 1438-1

1. Although the Board believes there is reasonable probability that there is unappropriated water available for the proposed use, since only limited flow data are available for Stewart Gulch and the impacts of proposed groundwater withdrawals on spring flows and stream flows under Permit Nos. 1438-1, 1439-1, and 1440-1 are uncertain, the Water Management Board is retaining jurisdiction of these Permits, which will be exercised prior to licensing. The Board may quantify and/or determine if minimum amounts of water must be present in Stewart Gulch, Whitetail Creek and Whitewood Creek to protect these streams as cold water permanent fish life propagation waters and to determine any impacts of Golden Reward Mining Company withdrawals on these streams.

This retained jurisdiction will be exercised pursuant to the public trust duties of the State and the Water Management Board as the Board vested with the authority of the State, to supervise the appropriation and distribution of water resources of the State.

2. That Golden Reward Mining Company install and operate a continuous recording flow gaging station on Stewart Gulch at a site below the Bertha Mine Workings outflow and above the confluence with Whitetail Creek.
3. The casing of the well to be constructed under Permit No. 1438-1 shall be pressure grouted with cement (bottom to top) from the producing formation to the surface, constructed by a licensed well driller and the well constructed in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.
4. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
5. Approval of Permit No. 1438-1 is subject to compliance with the following then existing and applicable Water Management Board rules:
 - a. Chapter 74:03:15 Ground Water Quality Standards,
 - b. Chapter 74:03:16 Ground Water Discharge Permit,
 - c. Chapter 74:03:02 Surface Water Quality Standards,
 - d. Chapter 74:03:04 Uses Assigned to Streams,
 - e. Chapter 74:03:17 Surface Water Discharge Permit - General Provisions,
 - f. Chapter 74:03:18 Surface Water Discharge Permit Application Requirements,
 - g. Chapter 74:03:19 Surface Water Discharge Permit Conditions,
 - h. Chapter 74:03:20 Transfer Modification, Revocation and Reissuance and Termination of Surface Water Discharge Permits,
 - i. Chapter 74:03:21 Procedure For Permit Processing,
 - j. Chapter 74:03:22 Secondary Treatment Standards,
 - k. Chapter 74:03:23 Criteria and Standards for Surface Water Discharge Permit,
 - l. Chapter 74:03:24 Toxic Pollutant Effluent Standards for Surface Water Discharge Permits,
 - m. Chapter 74:03:25 Effluent Guidelines and Standards for Surface Water Discharge Permits, and
 - n. Chapter 74:03:26 Pretreatment Regulations for Surface Water Discharge Permits.

**SOUTH DAKOTA
WATER PERMIT**

Date of first receipt of application April 11, 1988

Date of return to applicant for correction, amendments or changes required April 13, 1988

Date of receipt of corrected application April 22, 1988

The Water Management Board approved Water Permit Application No. 1438-1

on July 27, 1988 for Golden Reward Mining Company

(Applicant)

PO Box 888 Lead South Dakota 57754

(Street, RR or Box)

(City)

(State)

(Zip Code)

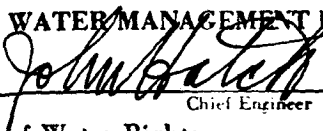
authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 1438-1 appropriates 0.67 cubic feet of water per second from one well 355 feet deep to be located in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 7-T4N-R3E
2. The water appropriated shall be used for the purpose of supplying a heap leach ore-processing facility and may not exceed the amount of water needed for beneficial use for industrial and domestic uses.
3. The water is to be used during the following described annual period: January 1 - December 31
4. The date from which applicant may claim the right is April 11, 1988
5. One-fifth of the construction is to be completed on or before January 27, 1991
6. All construction is to be completed on or before July 27, 1993
7. Water is to be put to beneficial use on or before July 27, 1997
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

SEE ATTACHED SHEET

WATER MANAGEMENT BOARD

By: 

Chief Engineer

NOV 23 1988

Division of Water Rights
Dept. of Water and Natural Resources

Supplemental Information

(type or print in ink)

1. Well Information - Proposed construction

- a) Drill Hole Diameter 12½ in. Depth 355
- b) Casing Type PVC Sched 40 Diameter 8 in Thickness 0.32
- c) Screen Type Perforated Pipe Diameter 8 in Thickness 0.32
- d) Gravel Pack Thickness None Length of Gravel Pack None
- e) Depth to Top of Water Bearing Material 205
- f) Depth of Water (ground surface to water level) 205
- g) Distance to nearest existing domestic well:
 On applicants property 1375 ft. On property owned by others 4350 ft.

2. Dugout Information Estimates

- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

3. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below. The locations of each dam should be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam please give their name and address

b) Freeboard _____

c) Crest Width _____

Crest Length _____

d) Height _____

e) Outlet Dimensions:
 Pipe diameter _____

Spillway width _____

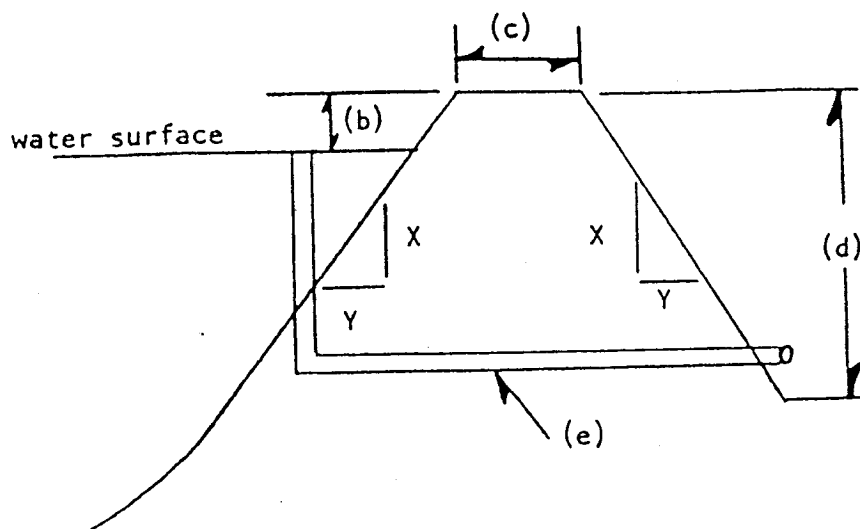
f) X & Y Slope
 Upstream _____

Downstream _____

Surface Area of Impoundment _____

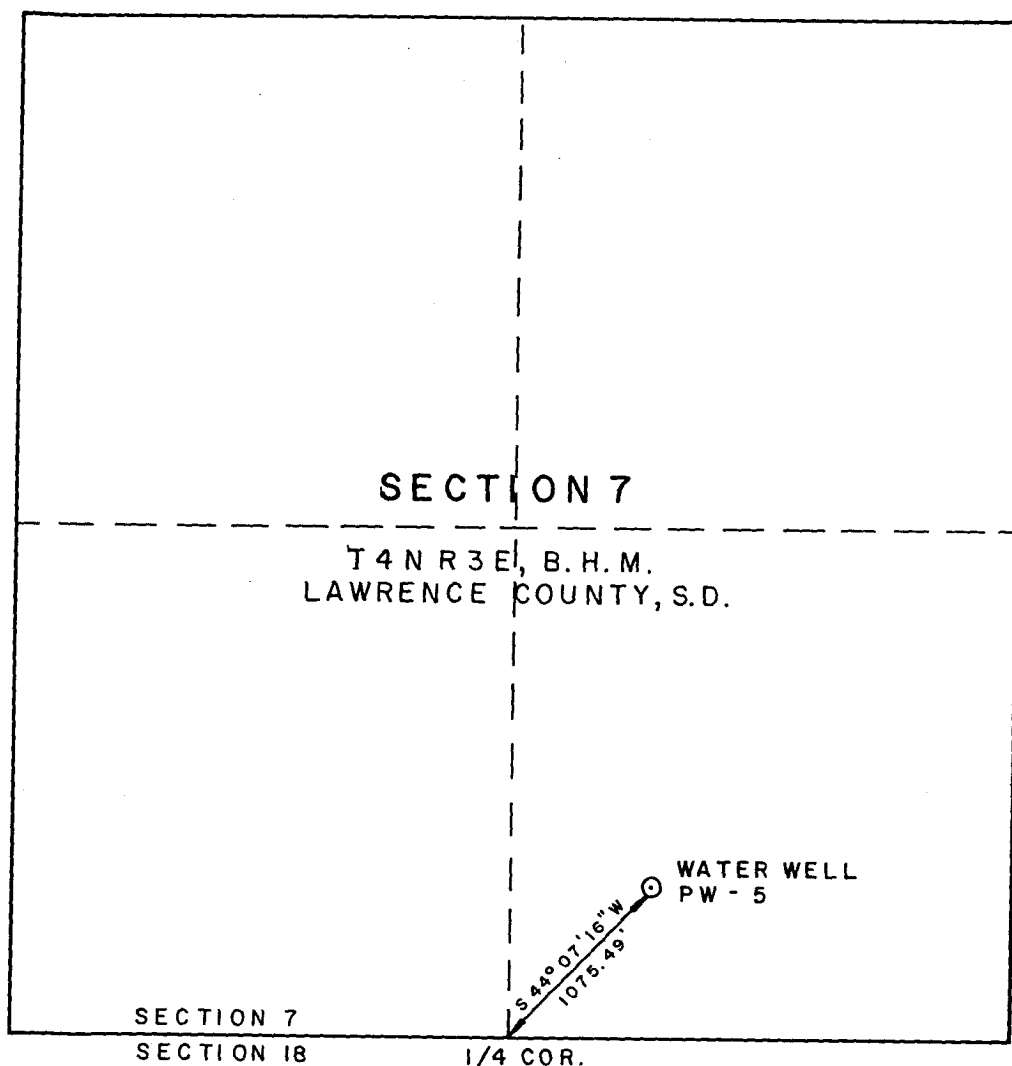
Storage _____ acre feet

Drainage area above dam _____



Signature of Applicant _____

WELL LOCATION MAP



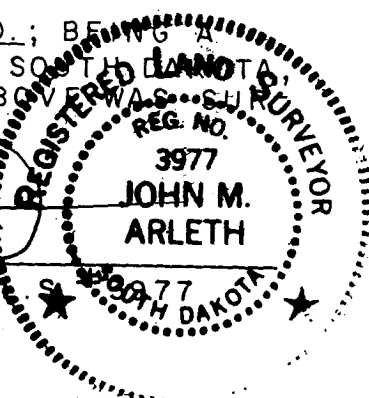
SCALE: 1" = 1000'

I, JOHN M. ARLETH, P.O. BOX 39, DEADWOOD, S.D.; BEING A
REGISTERED LAND SURVEYOR IN THE STATE OF SOUTH DAKOTA
DO HEREBY CERTIFY THAT THE WELL SHOWN ABOVE WAS SUR-
VEYED UNDER MY DIRECT SUPERVISION.

3/31/88

DATE

JOHN M. ARLETH, R.



Appl. No. 1438-1

RECEIPT

Division of Water Rights

South Dakota Department of Water and Natural Resources

411214

Pierre, April 22, 19 88

RECEIVED OF Golden Reward Mining Co., PO Box 888, Lead, SD 57754

the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct works and to put water to beneficial use _____	300	00
Fee for Application for Permit No. _____ to Appropriate Water for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for Certified Copy of _____		
Fee for Print Copy of Map _____		
Fee for Certifying _____		
Fee for _____		
(Any Other Work Provided by Law)	Total	300 00

By John Hatch

STEWART
Gulch / FANTAIL
CREEK

METHODS

Stream Habitat Survey

STEWART
GULCH

One study section was established on each stream (Figure 1). Each study section consisted of ten habitat transects located at 10-meter intervals. The distance between transects was measured up the middle of the channel. Transects were established perpendicular to the stream flow. Water temperature, flow, and pH were measured at a suitable site within each study section. Table 1 describes the aquatic habitat variables that were measured along each transect. It is standard procedure to measure these variables at points corresponding to the 1/4, 1/2 and 3/4 water surface width (Platts et al. 1984). Both of these streams were too narrow to accomodate three measurements, consequently only one measurement, taken at mid-channel, was taken for each variable at each transect.

Fish Survey

A 100-meter section of each creek was electrofished. The 100-meter section corresponded to the stream habitat survey section. Electrofishing was accomplished using a Coffelt backpack shocker and a three-person crew. One person ran the electroshocker, another netted fish, while the third person weighed and measured the captured fish.

Electrofishing proceeded in an upstream direction. Trips through the study section were conducted until the catch for a given trip was equal to or less than 25 percent of the catch for the previous trip up to a maximum of three trips (B. Parrish, pers. comm.). Due to the small size of the streams a downstream blocking net was not considered necessary. All fish captured were identified, enumerated, and measured for length and weight, then returned live to Whitetail Creek. Condition factors were calculated for all captured fish using the formula (Everhardt et al. 1975): $C = W (10^5 / L^3)$; where W = weight (grams), L = length (millimeters), and C = coefficient of condition or condition factor. A population estimate was also calculated following the methods of Zippin (1958).

Table 1. Aquatic habitat transect parameters.

Parameter	Units	Description
Channel width	Meters	Includes water width, left and right banks
Water width	Meters	Width of the water surface
Depths	Meters	Taken at 1/4, 1/2, and 3/4 water width
Mean depth	Meters	Sum of depths at 1/4, 1/2, 3/4 divided by 3
Velocity	Ft/Sec	Taken at 0.6 of depth at 1/4, 1/2, 3/4 water width
Estimated Embeddedness	Percentage	Rates the degree that the larger particles (boulder, rubble, gravel) are surrounded or covered by sediment
Pool width	Meters	Water width with velocity less than 1 ft/sec
Riffle width	Meters	Water width with velocity greater than 1 ft/sec
Streambank alteration	Percentage	A measure of streambank stability and change caused by any source
Streambank vegetation	1-7/1-4	A measure of streambank stability provided principally by vegetation. The numerator is a code for vegetation type. The denominator rates bank stability.
Streambank angle	1-3	1 = undercut; 2 = sloping; 3 = vertical
Streambank undercut	Decimeters	Distance of undercut from streambank at water's edge
Canopy overhang	Decimeters	Vegetation overhanging water surface within 3 ft of water surface
Substrate Composition	Percentage	An estimate of percentage of boulder, rubble, gravel, coarse and fine sediment within a m ² at 1/4, 1/2, 3/4 of water width

Several fish were retained and frozen for later metals analysis of their tissue.

Aquatic Macroinvertebrates and Periphyton

The unit-effort traveling kick method was utilized for insect collections. Samples were collected by holding a dip net (30.5-cm x 28-cm mouth opening) in front of and downstream from the investigator while traveling slowly downstream and vigorously kicking the substrate. All samples were standardized by holding the net in the water for 30 seconds. An area approximately 0.5-m x 2-m (1 m²) was disturbed for each sample. In semi-arid areas of the West this technique has been found to yield more highly reproductive data than the more traditional Surber method (Hornig and Pollard 1978). The samples were preserved in ethanol and transported to the laboratory where invertebrates were sorted, counted, and identified to the family level.

Periphyton samples were collected by scraping algae from rocks collected from a variety of habitats within the study section. Samples were preserved in Lugol's solution and the algae identified in the laboratory.

RESULTS

Stream Habitat Survey

The aquatic habitat data collected along stream transects is summarized in Table 2. The values shown are the means of the values for all 10 transects. The original field sheets can be found in Appendix B with values for each of the transects.

Fantail Creek is a narrow, very shallow stream with very little pool structure. Due to the shallow nature of the stream it was not possible to take a flow measurement. Flow is estimated at less than 1 cubic foot per second (cfs).

The embeddedness value is high indicating that sedimentation is a problem. Most of the material contributing to embeddedness fell in the low end of the gravel size class. This is reflected in the high percentage of gravel making up the substrate.

Table 2. Stream habitat transect data summary*.

	Fantail Creek	Stewart Gulch
Mean Channel Width	0.98 m	1.51 m
Mean Water Width	0.58 m	1.51 m
Mean Depth	0.09 ft	0.53 ft
Mean Velocity	0.77 ft/sec	1.66 ft/sec
Mean Embeddedness	49.0%	34.0%
Mean Pool Width	0.20 m	0.21 m
Mean Riffle Width	0.38 m	1.20 m
Mean Streambank Alteration		
Left Bank	10.0%	0.0%
Right Bank	30.0%	0.0%
Mean Streambank Undercut		
Left Bank	0.00 m	0.01 m
Right Bank	0.03 m	0.05 m
Mean Canopy Overhang		
Left Bank	0.38 m	0.74 m
Right Bank	0.26 m	0.26 m
Mean Substrate Composition		
Boulder	4.0%	20.0%
Rubble	24.5%	37.0%
Gravel	44.0%	18.0%
Coarse Sediment	11.5%	14.5%
Fine Sediment	16.0%	10.5%

* Refer to Appendix B for complete data set.

There is very little undercut bank to provide cover for fish. The mean values for canopy cover are somewhat misleading. The right-hand downstream bank in the lower half of the study site (first six transects) was composed of unconsolidated fill material for about half of its length. There was no vegetation on this bank. This is also reflected in the streambank stability number for the right bank. Otherwise both banks had good riparian vegetation and overhanging canopy.

Stewart Gulch is also a narrow stream with little pool structure, however, its depth, substrate composition, overhanging vegetation, and temperature all indicate a stream more suitable than Fantail Creek for fish life. Stewart Gulch is considerably deeper than Fantail and has a flow rate of 2-3 cfs.

The mean embeddedness and substrate composition indicate that sedimentation is not a problem in this stream. Substrate conditions appear to be good for salmonids.

Streambank alteration and mean canopy overhang also indicate that aquatic habitat conditions are good. Most of the coverage included in the mean canopy overhang is provided by watercress which grows profusely in this creek.

Water temperature in Stewart Gulch at noon was 50°F compared to 58°F at 1000 hours for Fantail Creek. Fifty-eight degrees Fahrenheit is close to the optimal temperature for trout growth. However temperatures above 65°F, which Fantail would achieve later in the day, are detrimental to salmonid growth.

Hydrogen ion concentration (pH) was 7.97 in Stewart Gulch and 8.09 in Fantail Creek.

Fish Survey

A 100-meter section of each creek was electrofished as described under Methods. Data from the electrofishing effort is presented in Table 3. No fish were collected from Fantail Creek and all fish taken from Stewart Gulch were brook trout (Salvelinus fontinalis).

Table 3. Results of electrofishing efforts in Stewart Gulch.

Length (mm)	Weight (g)	Condition Factor
255	156	0.94
230	152	1.25
230	128	1.05
225	110	0.97
205	92	1.07
195	72	0.97
195	78	1.05
190	80	1.17
185	62	0.98
180	70	1.20
180	66	1.13
180	58	0.99
175	62	1.16
170	65	1.32
170	50	1.02
170	62	1.26
165	44	0.98
165	44	0.98
165	48	1.07
160	50	1.22
160	48	1.17
155	40	1.07
155	32	0.86
155	40	1.07
150	56	1.66
145	26	0.85
145	34	1.12
145	38	1.25
140	35	1.28
140	42	1.53
140	28	1.02
135	26	1.06
135	22	0.89
135	36	1.46
135	35	1.42
135	28	1.14
125	21	1.08
125	20	1.02
125	20	1.02
125	14	0.72
120	25	1.45
120	19	1.10
120	14	0.81
115	25	1.64
115	17	1.12
115	11	0.72
115	9	0.59
110	18	1.35
110	17	1.28
110	17	1.28

Table 3. Continued.

Length (mm)	Weight (g)	Condition Factor
110	16	1.20
110	14	1.05
110	13	0.98
105	6	0.52
105	20	1.73
105	13	1.12
105	6	0.52
105	12	1.04
100	14	1.40
100	10	1.00
100	13	1.30
100	13	1.30
100	5	0.50
95	25	2.92
95	19	2.22
90	4	0.55
80	12	2.34
70	1	0.29
70	3	0.87
65	2	0.73
65	2	0.73
60	2	0.93
60	2	0.93
60	2	0.93
60	3	1.39
60	3	1.39
55	2	0.90
50	2	1.60
50	2	1.60
50	4	3.20
Mean = 1.16		
Standard Deviation = 0.45		

A total of 80 brook trout were collected from Stewart Gulch in three passes yielding 53, 14, and 13 fish, respectively. Condition factors were calculated for all fish collected. The condition factor is a convenient way of comparing the relative well-being of fish populations. The larger the coefficient the heavier the fish for a given length. However there are many variables, such as sex, season of the year, stage of maturity, and size of fish that influence the condition factor. When comparing condition factors between populations or the same population in different years, these other variables should be equal. The mean of 1.16 is comparable to condition factors computed for brook trout collected in Squaw Creek during September 1985.

A fish population estimate was computed following the methods of Zippin (1958). The resulting number was 82 fish per 150-m² of water surface area.

Benthic Macroinvertebrates

Benthic macroinvertebrates were collected utilizing the unit-effort traveling kick technique described in the Methods section. Results are presented in Table 4.

The aquatic insect data shows that the community composition in both creeks is diverse. Representatives of the orders Plecoptera and Ephemeroptera, which are generally regarded as indicators of high quality waters, are found in both streams. The total numbers of insects at each station is low indicating low productivity in the streams. This is often true of headwater streams, particularly those draining igneous basins.

Periphyton

Periphyton samples were scanned to determine taxa present and relative abundance. Table 5 presents the results of these floristic scans. Stewart Gulch had a greater diversity of algal taxa than Fantail Creek. Additionally, the taxa present in Stewart Gulch were more abundant than those found in Fantail Creek. In both streams the diatoms (Bacillariophyta) and Nostoc sp. were the most abundant forms present.

Table 4. Aquatic macroinvertebrates from Stewart Gulch and Fantail Creek.

Samples:	----Stewart Gulch----			----Fantail Creek----		
	1	2	3	1	2	3
<u>Plecoptera</u>						
<u>Perlidae</u>						
Sp. 1	5	2	-	-	-	-
Sp. 2	3	4	-	-	-	-
<u>Chloroperlidae</u>						
Sp. 1	-	-	2	-	1	2
Sp. 2	-	-	-	-	-	2
<u>Peltoperlidae</u>						
Sp. 1	-	-	-	3	2	4
<u>Ephemeroptera</u>						
<u>Ameletus</u>	9	9	7	7	11	8
<u>Heptageniidae</u>						
Sp. 1	-	1	1	-	1	-
Sp. 2	-	-	-	-	1	-
<u>Trichoptera</u>						
<u>Leptoceridae</u>						
Sp. 1	2	2	1	-	2	2
<u>Hydropsychidae</u>						
Sp. 1	-	1	-	-	-	-
<u>Rhyacophilidae</u>						
Sp. 1	1	-	-	-	-	-
<u>Diptera</u>						
<u>Chironomidae</u>						
Sp. 1	42	80	98	-	-	-
Sp. 2	-	-	-	7	6	1
Sp. 3	-	-	-	4	1	-
<u>Empididae</u>						
Sp. 1	2	-	-	-	-	-
Sp. 2	-	-	1	-	-	-
<u>Syrphidae</u>						
Sp. 1	1	-	-	-	-	-
<u>Tipulidae</u>						
Sp. 1	-	1	-	1	1	2
Sp. 2	-	-	-	1	-	4
<u>Simuliidae</u>						
Sp. 1	-	-	3	2	6	2
Sp. 2	-	-	-	22	-	-
<u>Coleoptera</u>						
<u>Elmidae</u>						
Sp. 1	27	3	4	1	6	7
<u>Dytiscidae</u>						
Sp. 1	-	-	-	1	9	10
Total	92	103	117	49	47	44

Table 5. Abundance of soft-bodied algae and diatoms in Stewart Gulch and Fantail Creek.

R = 1 or less
 C = 2 - 4
 VC = 5 - 10
 A = 11 - 99
 VA = 100 or more

	Stewart Gulch Creek	Fantail Creek
<u>Chlorophyta</u>		
Cladophora sp.	-	R
Chlorococcum sp.	R	-
Cosmarium sp.	R	-
Microspora sp.	R	-
Rhizoclonium sp.	R	-
Ulothrix sp.	C	-
Zygnema sp.	C	
<u>Bacillariophyta</u>		
All genera	A	C
<u>Cyanobacteria</u>		
Anabaena sp.	R	-
Nostoc sp.	VA	VC
Phormidium sp.	C	-

A proportional count was made of diatoms from both study sections. To conduct a proportional count, the investigator counts and identifies 300 cells at random. This method gives the reader an idea of which of the diatom species present dominate the community structure. The results of the proportional count are presented in Table 6. The Stewart Gulch sample yielded 36 different species. In general, the same species dominated the diatom community in both streams. The most important species in both streams were Achnanthes minutissima, Cocconeis placentula, Cymbella affinis, Gomphonema olivaceum, Navicula adiosa, N. dissipata, and N. palea.

The diversity of algal forms as well as the habitat requirements of the species present indicate that the water quality in both streams is good.

CONCLUSIONS

Based upon the macroinvertebrate and periphyton sample analysis we conclude that the water quality in both streams is good. Both streams showed a diversity of life forms and contained species that are indicative of good quality waters.

The habitat requirements of fish species go beyond good water quality to include flow regime, cover, and substrate among others. Stewart Gulch has sufficient flow to harbor a population of brook trout. Fantail Creek does not have adequate flow to support a fish population. It is also our opinion that the substrate in Fantail Creek would be marginal for salmonid reproduction if these fish were present.

Table 6. Number of diatom frustules counted.

	Stewart Gulch Creek	Fantail Creek
<i>Achnanthes lanceolata</i>	4	6
<i>A. minutissima</i>	28	20
<i>Amphipleura pellucida</i>	-	9
<i>Amphora perpusilla</i>	1	1
<i>Cocconeis placentula</i>	38	16
<i>Cymbella affinis</i>	14	11
<i>Epithemia sorex</i>	2	-
<i>Fragilaria vaucheriae</i>	2	10
<i>F. sp.</i>	1	-
<i>Gomphonema angustatum</i>	-	1
<i>G. intricatum</i>	18	-
<i>G. olivaceum</i>	37	21
<i>G. tenellum</i>	3	-
<i>Melosira varians</i>	7	-
<i>Meridion circulare</i>	4	10
<i>Navicula cincta</i>	2	11
<i>N. cryptocephala</i>	15	-
<i>N. gregaria</i>	6	4
<i>N. odiosa</i>	10	23
<i>N. pavillardii</i>	-	1
<i>N. radiosa</i>	11	9
<i>N. rhynchocephala</i>	1	-
<i>N. salinarium</i>	7	5
<i>N. tripunctata</i>	7	-
<i>N. viridula</i>	4	5
<i>N. sp.</i>	3	-
<i>Nitzschia acicularis</i>	-	12
<i>N. communis</i>	2	17
<i>N. dissipata</i>	19	37
<i>N. frustulum</i>	9	41
<i>N. linearis</i>	2	-
<i>N. palea</i>	15	22
<i>N. sp.</i>	1	-
<i>Rhoicosphenia curvata</i>	16	7
<i>Surirella ovata</i>	14	-
<i>Synedra ulna</i>	3	6
Frustrules Counted	306	306
Species	32	24

REFERENCES

- Hornig, T. and M. Pollard. 1978. Macroinvertebrate sampling techniques for streams in semi-arid region. USEPA, EPA-600/ 4-78-040.
- Parrish, B. Fisheries biologist, South Dakota Department of Fish and Game. Personal communication, September, 1985.
- Platts, W. S., W. I. Megahan, G. W. Minshall. 1984. Methods for evaluating stream, riparian, and biotic conditions. Intermtn. For. and Range Exp. Sta. Gen. Tech. Rpt. INT-138.
- Zippin, C. 1958. The removal method of population estimation. J. Wildl. Manage. 22(1):82-90.

THE
GOLDEN REWARD
MINING COMPANY

April 11, 1988

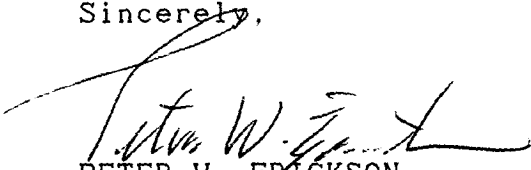
Mr. Ron Duvall
Water Rights Division
Joe Foss Building
Pierre, SD 57501

Dear Mr. Duvall:

Please find enclosed four Applications to Appropriate Water within the State of South Dakota, along with the appropriate application fees.

I trust that the information included with the applications is complete, but if you should have further questions or need more information, please contact our engineer, Mr. John Gould.

Sincerely,



PETER W. ERICKSON
General Manager

PWE:co
Enc.

GOLDEN REWARD WATER REQUIREMENTS

Golden Reward will be requiring 90 gpm of make up water during the non-operating months (winter months) and 495 gpm during the operating months for an annual average usage of 402 gpm (Table 1).

Although water needs are estimated at 402 gpm, the aggregate appropriation is for 675 gpm for several reasons. If we should have periods of dry weather, our water needs will be above average. If precipitation is low, the water wells will have to make up more, so the wells themselves are permitted such as to provide the total requirements. An extended operating season could increase the needs over and above the average, also.

Golden Reward proposes using the runoff from the depositories, precipitation collected within the pits and wells to supply this water.

Golden Reward proposes using three wells to partially supply this water. The first primary water well source is Well PW-5. This well is located at the southern end of the property and draws water from the historic Astoria underground mine some 300 feet below the surface. This well is being permitted for 300 gpm with an annual usage of 252 gpm.

The second primary well source is Well PW-1 located some 1,400 feet north of PW-5 and east of the Golden Reward Hannibal pit. This well is being permitted for 150 gpm, and average annual usage is anticipated to be 96 gpm.

The secondary well source is PW-4 which is located in the lower end of Stewart Gulch and draws water from the historic Bertha underground workings. PW-4 will supplement PW-1 and PW-5, supplying short term water needs over and above average requirements and will provide a short term back-up should there be a pump failure in PW-1 or PW-5. This well would be able to supply extra water if it were needed for fire fighting. This well is being permitted for 100 gpm, and average annual usage is anticipated at 54 gpm.

Since the drainage from the Bertha mine is a major contributor to the stream flow in Lower Stewart Gulch, Golden Reward proposes to limit its usage such that when the flow is equal to or less than 150% of the previously recorded minimum flows, Golden Reward will not utilize PW-4. The low flow rates in Stewart Gulch occur during Golden Reward's non-

operating period when Golden Reward's water requirements are low.

The minimum recorded flow rate in Stewart Gulch is 37 gpm, and 150% of that is 56 gpm. The average flow in Stewart Gulch during the non-operating season is 186.5 gpm, so even if Golden Reward pumped the proposed appropriation, the average winter flow would be 86 gpm, some 30 gpm above Golden Reward's proposed minimum flow.

In addition to the wells, GRMC will be utilizing two other water sources. These sources are an integral part of the site drainage and stream sedimentation control plan.

Golden Reward plans to retain runoff from the waste depositories and the pits, store the water in a completed pit and use this water for processing and road dust control.

The first collection area on the north fork of Stewart Gulch is normally a dry draw. Runoff from the depository located in the draw will be transferred via a channel to a pit in the Eastern Mining Area.

The second collection area is the runoff from the Sundance depository which will be stored in the same pit in the Eastern depository.

The third collection area is precipitation waters collected within the pits and stored at the pit at the Eastern Mine Area. The aggregate of the surface waters is expected to average 125 gpm and is being permitted for 125 gpm.

The normal priority of water usage would be:

1. Pit and Depository Runoff
2. PW-5
3. PW-1
4. PW-4

This water management scheme is designed to provide adequate water for GRMC's operation while conserving and using efficiently this resource.

Table 1

Golden Reward Water Requirements

	<u>Operating Season</u>	<u>Non-Operating Season</u>	<u>Annual Average</u>
Time (Weeks)	40	12	52
Process Water (gpm)	330	-	254
Pit (gpm)	150	75	133
<u>Miscellaneous (gpm)</u>	<u>15</u>	<u>15</u>	<u>15</u>
Total	495	90	402

Golden Reward Average Water Supply Sources

Pit Sumps	varies	varies	125
PW-1 (gpm)	125	-	96
PW-4 (gpm)	70	-	54
<u>PW-5 (gpm)</u>	<u>300</u>	<u>90</u>	<u>252</u>
	495	90	527

Golden Reward Average Available Water Supply (Permitted)

Pit Sumps	varies	varies	125
PW-1 (gpm)	150	150	150
PW-4 (gpm)	100	100	100
<u>PW-5 (gpm)</u>	<u>300</u>	<u>300</u>	<u>300</u>
	550	550	675

South Dakota Department of
Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

April 13, 1988

John Gould
Golden Reward Mining Co.
PO Box 888
Lead SD 57754

Dear Mr. Gould:

This letter is in response to the four water permit applications for Golden Reward submitted on April 11, 1988.

A separate application does not need to be submitted for each proposed diversion point. I can combine the information to make one application if Golden Reward is willing to proceed with one application instead of four applications. The application fee for one application with the combined diversion rates of 1.50 cfs is \$400.00 instead of the \$1050.00 (correct amount should be \$975.00) submitted for the four applications. Therefore, I will combine the applications with your written permission and enclosed are the checks totaling \$1050.00. Please remit a check for \$400.00 if you wish to combine the applications or return checks for \$225.00 (0.28 cfs), \$300.00 (0.67 cfs), \$225.00 (0.33 cfs) and \$225.00 (0.22 cfs) for the four applications totalling \$975.00.

The following additional information is also needed for review of the permit application:

- 1) The proposed operating capacity and maximum capacity of the solution ponds (including the PMP pond). Plans and specifications showing the proposed construction and size of the ponds.
- 2) The same information as requested in No. 1 is also needed for the sediment control traps plus the location of the traps (also see No. 4).
- 3) A copy of Exhibits 2-1, 2-3, 5-1, 5-3, 5-4; Appendix G, Figure 7, Figure 1, 5, and Figure 2.
- 4) The written description accompanying the applications made reference to runoff being collected from the waste depositories and from the pits. The references to the Sundance Depository, Eastern Depository, pits and so on are difficult to visualize without a map. The map submitted with this application locates the point of diversion as being in the NW 1/4 NE 1/4 section 7-T4N-R3E; however, no reference is made as to what this point locates. Please locate and name all the pits from which runoff is to be pumped and the proposed pumping locations from the waste depositories. Then locate the pit to which this water is to be pumped and specify the size of the pit. Enclosed is a copy of the map submitted with the application and a copy of the written description with the material in question highlighted in red.

April 13, 1988

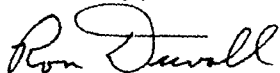
John Gould

Page 2

The permit application can not be processed for consideration by the Water Management Board until the application is complete. The above information is needed for completion of the report and recommendation. Completion of the report may also require obtaining additional information at a later date.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Ron Duvall".

Ron Duvall

Natural Resources Engineer

605 773-3352

enc.

THE
GOLDEN REWARD
MINING COMPANY



April 19, 1988

Mr. Ron Duvall
Water Rights Division
Joe Foss Building
Pierre, SD 57501

Dear Mr. Duvall:

Thank you for your timely response to our water permit application.

After due consideration, we prefer to have separate applications and appropriations for each of the diversions. I have enclosed the appropriate checks.

We would expect to handle all of the appropriations at a single hearing, which we are requesting as soon as possible but no later than July, 1988.

The enclosed attachment should provide the supplemental information you have requested. At this time, much of the information is conceptual. When the construction plans and specifications are available, we can provide your office with copies of them.

If you need further information, do not hesitate to call us.

Sincerely,

JOHN C. GOULD
Chief Engineer

JCG:co
Enc.

Golden Reward Mining Company
Application to Appropriate Water
Supplemental Information

RE: Mr. Ron Duvall's letter dated April 18, 1988

Q "1) The proposed operating capacity and maximum capacity of the solution ponds (including the PMP pond). Plans and specifications showing the proposed construction and size of the ponds."

A The pertinent information for the operating ponds is shown on Table 1.

TABLE 1 PRELIMINARY POND STATISTICS

	<u>Surge</u>	<u>Detox</u>	<u>PMP</u>
Length (ft.)	260	180	600
Width (ft.)	130	130	190
Depth (ft.)	25	25	25
Max. Water Surface* (acres)	0.8	0.5	2.6
Operating Freeboard	20	12	20

Pond Capacity (millions of gallons)	<u>Cont.</u>	<u>Avail.</u>	<u>Cont.</u>	<u>Avail.</u>	<u>Cont.</u>	<u>Avail.</u>
Freeboard-0 ft.	3.6	0	2.4	0	14.9	0
Freeboard-1 ft.	3.3	0.3	2.2	0.2	14.0	0.9
Freeboard-3 ft.	2.8	0.8	1.8	0.6	12.3	2.6
Normal Oper.	0.3	3.3	0.6	1.8	1.9	13.0

* Surface Area with 0 ft. of Freeboard

The proposed lining for the ponds is as follows from the top down:

60 Mill HDPE
GeoNet
60 Mill HDPE
Gravel Drain Layer
Compacted Clay

The gravel drain layer and clay layers will run up the 2:1 (H:V) pond slopes as high as can be practically placed and compacted.

Q "2) The same information as requested in No. 1 is also needed for the sediment control traps plus the location of the traps (also see No. 4)."

A The sediment control traps locations are shown on Exhibit 5-4. The traps will be designed for the 10 year, 24 hour precipitation event. The Hannibal trap will be 75 feet by 100 feet by 2 feet deep.

Q "3) A copy of Exhibits 2-1, 2-3, 5-1, 5-3, 5-4; Appendix G, Figure 7, Figure 1,5, and Figure 2."

The following are attached:

- Exhibit 2-1
- Exhibit 2-3
- Exhibit 5-1
- Exhibit 5-4
- Appendix G Figure 7
- Appendix G Figure 2

Appendix G, Figure 1, 5 is a duplicate of Exhibit 2-3, and I did not include it.

Q "4) The written description accompanying the applications made reference to runoff being collected from the waste depositories and from the pits. The references to the Sundance Depository, Eastern Depository, pits and so on are difficult to visualize without a map. The map submitted with this application locates the point of diversion as being in the NW 1/4 NE 1/4 section 7-T4N-R3E; however, no reference is made as to what this point locates. Please locate and name all the pits from which runoff is to be pumped and the proposed pumping locations from the waste depositories. Then locate the pit to which this water is to be pumped and specify the size of the pit. Enclosed is a copy of the map submitted with the application and a copy of the written description with the material in question highlighted in red."

The map enclosed with the permit applications depicted the location of the primary pit water storage area.

The attached pit map (Exhibit 2-6), along with Exhibits 2-1 and 3-4 should clarify the nomenclature. The overall site drainage plan follows.

Site Drainage Plan - General Description

During the operational phase of the Golden Reward project, surface water drainage will be controlled to minimize impacts

of erosion and sedimentation. The drainage and diversion plan to control runoff is designed so that it can easily be integrated into the final mine reclamation plan. Areas of primary concern are the Sundance, Stewart and Hannibal overburden depositories; four topsoil stockpiles; and haul roads.

Elements of the drainage and diversion plan are as follows:

1. Diversion of runoff waters from undisturbed areas away from or around the permit area.
2. A complete drainage and diversion system downstream of disturbed areas to contain runoff and prevent offsite sedimentation.

The general plan for surface water drainage and diversion is shown on Exhibit 5-4. A description of specific design criteria and engineering characteristics of each component of the site drainage plan follows the general drainage description.

Waters from undisturbed drainages will be transported around or away from the permit area. As shown on Exhibit 5-4, the Stewart Gulch diversion ditch will divert natural runoff water from the offsite undisturbed drainage above the Stewart overburden depository from the North Fork of Stewart Gulch to the South Fork of Stewart Gulch. Runoff from the offsite undisturbed drainage above the Liberty/Harmony pit will flow between these two pits along Fantail Ditch. This ditch will follow the existing stream channel. After leaving the pit area, runoff will continue to flow in the natural Fantail Stream Channel.

Runoff water from disturbed areas will be diverted to open mine pits or to sediment control traps. Drainage from the Hannibal overburden depository will be diverted into a small sediment control trap.

Drainage from the Stewart overburden depository will be diverted by ditch into the Isadorah pit. Runoff from the Sundance spent ore and overburden depository will flow naturally into the Sundance pit.

Runoff from the plant and main office area will either drain through the Sundance spent ore and overburden depository into Sundance pit, or through the Stewart Overburden Depository into Isadorah pit via the Stewart Overburden Diversion Ditch.

Sediment derived from topsoil stockpile runoff will be controlled by diversion ditches around the stockpiles which will direct runoff into drainage stabilization structures.

Typical structures include stormwater dispersion terraces, silt fences, Gabion sediment traps, grass filter waterways or sediment strawbale barriers. These structures will be maintained by periodically removing accumulated sediment deposits. Erosion from topsoil stockpiles will be minimized by seeding the soil soon after stockpiling.

Project roads will be designed and constructed to provide for proper drainage. Culverts for the access road, haul roads, and project service roads will be placed according to road grades and length of grades, road swales, watershed area draining to road surface, and road curves. Where culverts are installed to provide drainage for an existing channel, the culvert alignment and slope will maintain the existing characteristics of the channel.

Diversions will not be needed in the open-pit or the leach pad areas. Drainage into the mine pit areas will be allowed to flow directly into the pits. Since the majority of the pits are unsaturated, it is anticipated that this water will then percolate through the fractured rock of the mine pit. Runoff from the leach pad will be contained within the process water system by berms. Runoff control facilities will be constructed as required during the mining operation. The ditches and traps will be maintained throughout the life of the mine and will be modified as necessary as the mine expands. All drainage and diversion structures will be constructed to avoid the accumulation of stagnant water.

Engineering Designs

Peak runoff in the area results from snowmelt or intense spring or early summer rainfall events. Peak discharge events in both disturbed and undisturbed drainages were estimated using the U.S. Soil Conservation Service method (SCS, 1977) as summarized in Table 2. Locations of the design points and their associated drainage basins are on Exhibit 5-4. Runoff control structures are designed to transport the 25-year, 24-hour runoff event.

TABLE 2 PEAK FLOW CALCULATIONS
FOR SITE DRAINAGE PLAN

Design Point	Area of Drainage (acres)	Discharge (cfs)				Runoff Control
		Recurrence Interval				
		10-yr	25-yr	50-yr	100-yr	
1	138	22.2	40.1	59.4	81.4	Stewart Gulch Diversion Ditch.
2	48.5	48.2	64.1	78.8	93.8	Sundance pit
3	48.9	19.0	28.6	38.0	48.2	(1) Stewart Overburden Ditch (2) Isadorah pit
4	11.3	6.3	9.2	12.2	15.3	Sediment trap for Hannibal Overburden Depository.
5	192	42	75	112	151	(1) Berm along SW edge of Liberty pit. (2) Fantail Ditch

Source: U.S. Soil Conservation Service (1977) method.

The Mannings equation for calculating open channel flow was used to determine engineering characteristics of the three sediment control ditches (Table 3). All ditches were sized using a Mannings "n" equal to 0.035. Stewart Gulch Diversion Ditch and Stewart Overburden Ditch will be V-ditches with maximum channel slopes of 1.0%, side slopes of 2.5(h):1(v), and depths of 2 1/2 feet. Fantail Ditch will be a trapezoidal ditch with a maximum slope of 7.77% (present topographic slope), side slopes of 2.5(h):1(v), bottom width of eight feet, and depth of 2 1/2 feet. Fantail Ditch will be rip-rapped with 18 inch d₅₀ rip-rap (EPA, 1976, Figures I-18 and I-19) to prevent erosion.

TABLE 3 SEDIMENT CONTROL DITCH CHARACTERISTICS

<u>Ditch Name</u>	<u>Type of Ditch</u>	<u>Length (feet)</u>	<u>Depth of Flow¹ (ft)</u>	<u>Top Width of Flow (ft)</u>	<u>Maximum Channel Slope</u>	<u>Velo-city (ft/s)</u>	<u>Dis-charge² (cfs)</u>	<u>Flow Type</u>
Stewart Gulch Diversion	V	950	1.99	9.97	.01	4	40.1	Sub-critical
Stewart Overburden	V	1950	1.76	8.78	.01	3.7	28.6	Sub-critical
Fantail	Trap ³	1350	0.83	12.14	.077	9	75	Super-critical

NOTES: ¹ Channel will be constructed with minimum of .5 feet of freeboard.

² Design discharge is the 25-year, 24-hour event (SCS, 1977).

³ Trapezoidal ditch bottom width is 8 feet wide.

The capacities of pit storage ponds are shown on Table 4 and are illustrated in Figure 1.

TABLE 4 PIT WATER STORAGE

Site	Depth Ft.	CF 1,000's	Volume Gal. Millions	Acre Ft.	Surf. Area Acre
Isadorah 1	40	824	6.2	18.9	1.0
Isadorah 2	15	408	3.1	9.4	0.6
Isadorah 3	30	852	6.4	19.6	0.9
Sundance	<u>30</u>	<u>540</u>	<u>4.0</u>	<u>12.4</u>	<u>0.7</u>
Total		2,624	19.7	60.3	3.2

THE
GOLDEN REWARD
MINING COMPANY

Mr. Ron Duvall
Water Rights Division
Joe Foss Building
Pierre, SD 57501



Dear Mr. Duvall:

Enclosed are the checks and Exhibit 2-1 which I omitted in the supplemental package which I mailed to you earlier in the week.

I apologize for any inconvenience which this omission may have caused you.

Sincerely,

JOHN C. GOULD
Chief Engineer

JCG:co
Enc.



Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

REVIEW OF THE GOLDEN REWARD MINING COMPANY WATER RIGHT APPLICATION FOR THE BERTHA WORKINGS

Prepared by Joe Bowar
Office of Water Quality
May, 1988

INTRODUCTION

Golden Reward Mining Company (GRMC) has applied for a water right of 100 gpm (0.223 cfs) from the Bertha underground workings in lower Stewart Gulch. The water right for the Bertha workings is one of four sources for which applications have been submitted.

The Office of Water Quality is very concerned about the withdrawal of water from the Bertha workings and the resultant affect on Stewart Gulch, Whitetail Creek and Whitewood Creek. A large percentage of the flow in Stewart Gluch is derived from the Bertha workings. Groundwater from the workings is drained or "surfaces" in lower Stewart Gluch via some type of pipe network. Our concerns involve the public interest aspect of the appropriation. They are as follows:

1. The detrimental impacts to the fisheries in Stewart Gulch, Whitetail Creek and Whitewood Creek;
2. Economic impact to BHP&L, Kirk Power Plant, due to noncompliance with their NPDES permit and the Surface Water Quality Standards (SWQS); and
3. Economic impact to Homestake Mining Company due to noncompliance with their NPDES permit and the SWQS.

BACKGROUND

Stewart Gulch is a relatively unknown creek that flows into Whitetail Creek approximately 2 miles southwest of Lead; Whitetail Creek then flows into Whitewood Creek below the BHP&L, Kirk Power Plant (See map). All three streams are classified according to the South Dakota Surface Water Quality Standards as cold water permanent fish life propagation waters. The



definition of such a fishery is as follows: "a beneficial use assigned to streams which are capable of supporting aquatic life and are suitable for a permanent population of coldwater fish from natural reproduction and to lakes capable of supporting a permanent population of coldwater fish from natural reproduction or fingerling stocking. Warmwater fish may also be present."

Stewart Gulch was classified as a coldwater permanent fishery by the Board of Water Management on October 8, 1987, and the classification was legally effective on December 24, 1987. The basis for the classification of Stewart Gulch as a coldwater permanent fishery was a stream habitat, fish, aquatic macroinvertebrate, and periphyton survey conducted by OEA Research, a consultant for Golden Reward Mining Company. The survey was part of the base line data required for a mining permit. A copy of the survey is attached.

FLOW DATA

GRMC monitors the flow in Stewart Gulch at a site below the Bertha workings output and above the confluence with Whitetail Creek. The flow in Stewart Gulch is measured manually, once-a-month utilizing a V-notch weir; the once-a-month readings began in November, 1986, and are ongoing. The data is summarized in the attached Table 1.

Homestake Mining Company (HMC) maintains a flow gaging station on Whitetail Creek immediately above the Kirk Power Plant wastewater discharge. Flow is monitored 24 hours per day via a Leupold and Stevens chart recorder. The station is operational from late April/early May until November as weather permits. HMC has operated this station since 1982. The Whitetail Creek gaging station is approximately 2.7 miles downstream of the Stewart Gulch confluence and 4.9 miles downstream of its headwaters. Fantail Creek and Nevada Gulch flow into Whitetail Creek between Stewart Gulch and the HMC gaging station.

Review of the GRMC and HMC flow data indicated there are seven points where flow data for Stewart Gulch and Whitetail Creek correspond to the same day. Those flows are summarized below:

<u>DATE</u>	<u>Whitetail Creek(GPM)</u>	<u>Stewart Gulch(GPM)</u>	<u>% of Total</u>
05/14/87	2500	720	29
06/24/87	1440	630	44
07/15/87	880	420	48
08/04/87	800	360	45
09/15/87	680	180	26
10/14/87	600	220	37
11/17/87	<u>600</u>	<u>220</u>	<u>37</u>
Average	1070	390	36

The flow data on Stewart Gulch is very limited but the chart above is important as it shows during May through November of 1987 that Stewart Gulch made up an average of 36 percent of the flow in Whitetail Creek with a range of 26 to 48 percent. GRMC has measured a low flow in Stewart Gulch of 37 gpm in November 1986. There is no flow data on Whitetail Creek for the winter and early spring seasons.

NPDES PERMITS

1. Black Hills Power and Light - Kirk Power Plant

The current permit for Kirk contains numeric limits for total recoverable cadmium, copper, mercury, zinc and silver. They also have a temperature limit. All of these parameters are flow weighted based on the 25-year, 7-day low flow of Whitetail Creek above the Kirk discharge. The current permit limits were determined using a 1.08 cfs (485 gpm) low flow. This number is very realistic as it is documented by the records provided by HMC for the period 1982-1987.

Kirk Power Plant has been under an Administrative Order (issued by the EPA) to achieve compliance with their permit limits. Recently, Kirk has spent \$500,000 to upgrade their facility and develop site-specific criteria for metals. Their NPDES permit is going through the renewal process at this time.

2. Homestake Mining Company - wastewater treatment plant

DWNR has developed site-specific criteria for Whitewood Creek in a cooperative effort with HMC. Research has been ongoing since 1984 to develop numeric in-stream criteria for total copper, arsenic, cadmium, lead, zinc, mercury, nickel, chromium, silver, and total cyanide. These in-stream values are flow-weighted to derive end-of-pipe discharge limits. HMC also has a discharge temperature limit. Back in 1976 a NPDES permit was drafted for discharge limitations - a result of consent decrees ordering HMC to cleanup their discharge. This first permit was used a design basis for the wastewater treatment facility (\$14 million to build). With no flow data available, a 25-year, 7-day low flow of 4.5 cfs above the Gold Run Creek confluence was estimated and agreed on by DWNR, EPA and HMC. This number has remained as the dilution water flow for their permit.

SUMMARY AND RECOMMENDATION

The Office of Water Quality recommends denial of the Bertha workings water right as it is not in the public interest. The two main reasons for denial of the water right are the immediate fishery impacts and potential NPDES permit noncompliance. If NPDES noncompliance occurs at Kirk and/or HMC, toxicity problems may develop in Whitetail Creek and Whitewood Creek. The limited flow data available indicates that Stewart Gulch is a critical source of flow for Whitetail Creek (and in turn, Whitewood

Creek). Stewart Gulch, Whitetail Creek and Whitewood Creek (until the Gold Run Creek confluence) are all classified as coldwater permanent fisheries (as defined earlier). Numeric criteria for maintenance and protection of this beneficial use specify a maximum in-stream temperature of 65°F. Temperatures above 65°F are detrimental to the growth of cold water fish species and temperatures above 75°F are lethal.

Whitetail Creek and Whitewood Creek are both impacted by natural temperature increases above 65°F due to lack of a tree canopy, over hanging vegetation and deeper pools. Both streams have been straightened due to road and human encroachment which results in fewer natural pools, cutbanks and shading. During low flow periods the temperatures in both creeks may rise above 65°F during the afternoon. The duration and frequency of these >65°F periods are critical to fish survival. The consultants for Golden Reward Mining Company found that since Stewart Gulch flow is nearly 100% derived from an underground source, it has very cool temperatures during the summer and stays cool as it is well shaded with water cress. With Stewart Gulch providing an average of one-third of the flow in Whitetail Creek, the cooling effect of Stewart Gulch becomes very critical in the summer and fall seasons.

In addition to the critical water temperatures, flows in Stewart Gulch, Whitetail Creek and Whitewood Creek (above the Gold Run Creek confluence) approach critically low volumes during the winter and dry years. It has been documented in the Herricks Report (study done for HMC) that the upper Whitewood Creek (above Whitetail Creek confluence) fishery is naturally impacted by low flows. This results in stunted trout (large heads - short bodies) due to the small pools and riffle areas but reproduction still occurs. Upper Whitewood Creek is very similar to Whitetail Creek in flow. Thus, all flow is critical to the fishery in each stream. GRMC is proposing to pump, at the most, 100 gpm from the Bertha workings unless their pumping would diminish the flows in Stewart Gulch to 56 gpm or less. As an example, if Stewart Gulch is flowing at 160 gpm then GRMC could pump their full appropriation (100 gpm) and that would leave only 60 gpm for the fishery in Stewart Gulch. As currently proposed, to recommend approval of the water right would not be in the public interest as the fisheries in Stewart Gulch, Whitetail Creek and Whitewood Creek are not protected.

The random pumping of water from Stewart Gulch also poses a problem for Kirk Power Plant. The flows in Whitetail Creek are critical to Kirk meeting their NPDES limitations as discussed earlier. Whenever flows in Whitetail Creek fall near or below 485 gpm (1.08 cfs), Kirk must operate their wastewater treatment plant at an optimum level to avoid potential adverse impacts to the fishery and to avoid NPDES noncompliance. If noncompliance or instream toxicity problems occur, Kirk will need to construct additional treatment facilities.

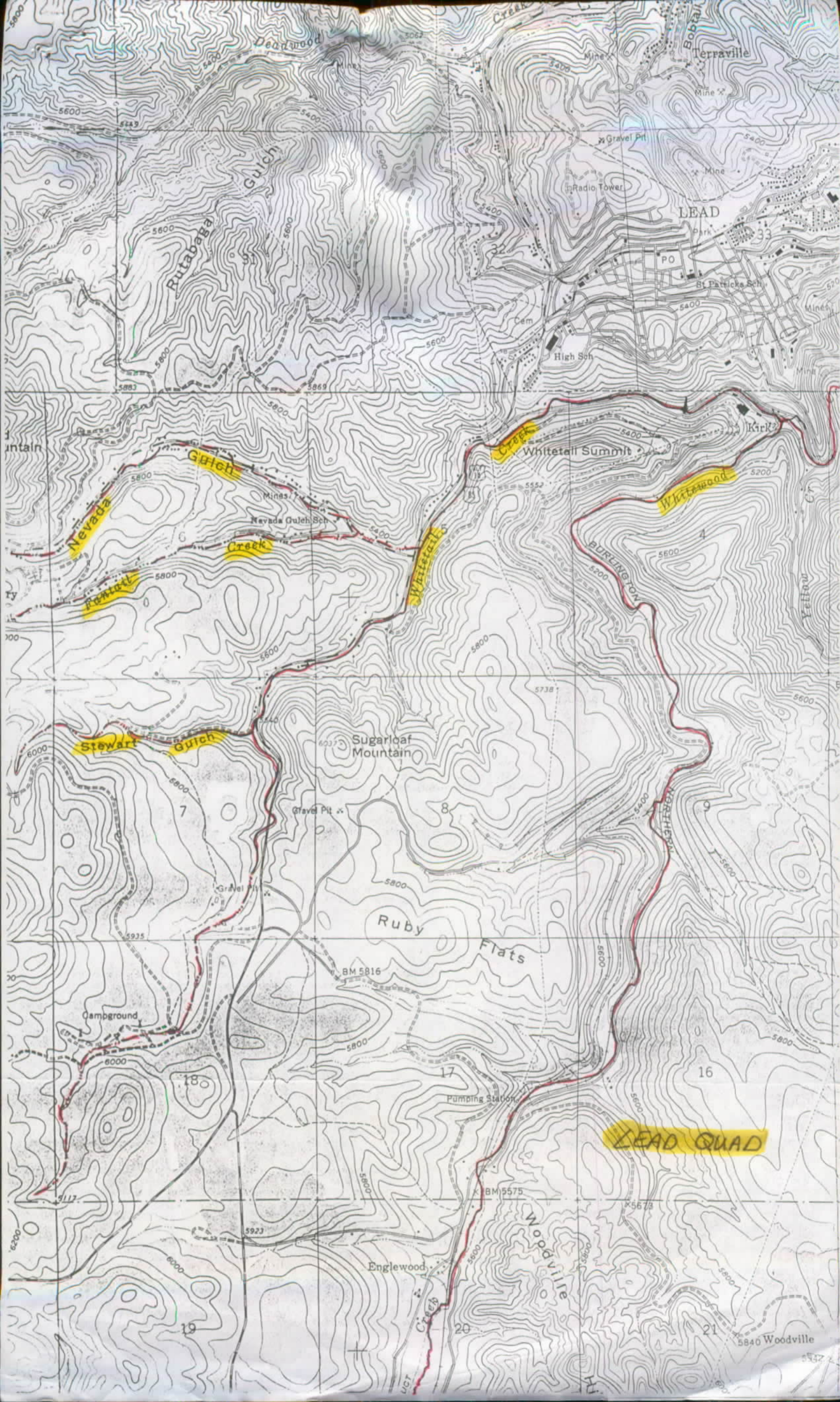
The same situation potentially affects HMC in relation to their wastewater treatment facility discharge to Whitewood Creek. Their NPDES limits are flow weighted with a 4.5 cfs low flow. Stream monitoring in 1987 showed flows in Whitewood Creek, above their discharge, of 3-4 cfs thus any further loss in base flow again is critical. Again, if noncompliance or instream toxicity problems occur, HMC will need to construct additional treatment facilities.

The Office of Water Quality is of the opinion that denying the water right for the Bertha workings is the more prudent decision at this time. To condition the water right to protect the public interest would be a regulatory nightmare. The importance of the surfacing flow from the Bertha workings, which has been occurring for 70-80 years, to Stewart Gulch, Whitetail Creek and Whitewood Creek is made up of many intricacies. To put a single number or an equation to the minimum flow necessary to protect the fisheries, the Kirk Power Plant and HMC is not simple. The extremely limited data on the flows in Stewart Gulch and their correlation to those flows in Whitetail Creek prevent a quantifiable answer. The only sure answer is that the environmental impacts to all three streams by increased stress - from warmer temperatures, from shallower pools and riffle areas, from higher percentages of toxic metals and cyanide can only be detrimental. Stewart Gulch appears to be the major spawning and rearing area for brook trout in Whitetail Creek due to the habitat and flows. Stewart Gulch is also extremely critical to Whitetail Creek for the cooling effect in the summer and fall. Again, the water right for a 100 gpm as a back-up source does not out weigh the impacts - both environmentally and economically. From all available data and technical knowledge of the stream, the Office of Water Quality has concluded that Golden Reward Mining Company should consider another groundwater source as the appropriation of water from the Bertha workings is not in the public interest.

d42702jb.wq

TABLE I

[illegible]



LEAD

PO

St. Patrick's Sch.

High Sch.

Whitetail Summit

Whitehead

BURLINGAME

Sugarloaf Mountain

Ruby

Flats

Campground

Pumping Station

Englewood

Woodville

5840 Woodville

LEAD QUAD

REPORT ON PERMIT APPLICATION Nos. 1438-1, 1439-1 and 1441-1
GOLDEN REWARD MINING COMPANY
JUNE 6, 1988

Permit application No. 1438-1 proposes to appropriate 0.67 cubic feet of water per second (300 gpm) from one well 355 feet deep located in the SW⁴SE⁴ Sec. 7, T4N-R3E. The well that is to supply water for Permit application No. 1438-1 will penetrate the flooded underground workings of the Astoria Mine. The average annual usage under Application No. 1438-1 is estimated to be 252 gpm.

Permit application No. 1439-1 proposes to appropriate 0.33 cubic feet of water per second (150 gpm) from one well 300 feet deep located in the NW⁴SE⁴ Sec. 7, T4N-R3E. The average annual usage under No. 1439-1 is estimated to be 96 gpm.

Permit application No. 1441-1 proposes to appropriate 0.22 cubic feet of water per second (100 gpm) from one well approximately 100 feet deep to be located in the NW⁴NE⁴ Sec. 7, T4N-R3E. The well that is to supply water for Permit application No. 1441-1 will penetrate the flooded underground workings of the Bertha Mine. The Bertha Mine workings contribute directly to the base flow in Stewart Gulch. Application No. 1441-1 proposes that no water will be diverted from the well when the flow in Stewart Gulch is equal to or less than 150% of the recorded minimum flow. The previously recorded minimum flow is 37 gallons per minute (gpm); therefore, a flow greater than 56 gpm would be necessary before the well would be operated. This well would be used to supplement the wells specified on Application No.'s 1438-1, and 1439-1 to meet short term water demands that exceed average requirements and will be a back-up well in event of a pump failure in the other two wells. The average annual usage under Application No. 1441-1 is estimated to be 54 gpm.

Water is to be used for industrial and domestic purposes in a heap leach ore-processing facility operated by Golden Reward Mining Company in portions of Sec. 6 and Sec. 7, T4N-R3E; and Sec. 1 and Sec. 12, T4N-R2E. Golden Reward Mining Co. is proposing to develop a heap leach ore-processing facility approximately two miles southwest of Lead in Lawrence County. The planned operation will require an annual average water use of 402 gpm with maximum short term usage of up to 675 gpm, over the 6 to 7 year life of the mine. The normal priority of operation for water usage proposes to first use runoff water and groundwater accumulated in the pits, then when needed use water from the three wells. In terms of Water Permits; 1st use - No. 1440-1, 2nd use - No. 1438-1, 3rd use - No. 1439-1, 4th use - No. 1441-1.

Aquifer: Pre-Cambrian Rock, Deadwood Formation, and Tertiary Intrusives

Geology and Aquifer Characteristics:

A review of the areal geology (Darton, 1925), and the logs from test wells and monitor wells submitted with this application and the applicant's mining permit application indicate ground water in the area is encountered in Pre-Cambrian Rock, the Deadwood Formation, Tertiary aged intrusives, and colluvium/alluvium which is restricted to the area stream beds. Because the extent of the "shallow aquifer" consisting of colluvium and alluvium is very limited it cannot be considered a viable aquifer. The Pre-Cambrian rock of this area consists primarily of mica schist, although metasediments and phyllites are also present. Schist is a strongly foliated rock formed by dynamic metamorphism. The total porosity of the rock is assumed to be 3% and the effective porosity containing the recoverable water in storage is estimated to be 1% (Rahn, 1979). Permeability of the Pre-Cambrian rock is low and water is transmitted through fractures, joints and bedding planes. In this area, the Deadwood formation consists of dolomite, quartzite, and a basal conglomerate. The total porosity of the Deadwood is estimated to be 10% and the effective porosity is estimated to be 50% of the total porosity. The Deadwood has moderately low permeability and has been described as the "Relatively, impermeable Deadwood. ..aquitard" (Rahn, 1979). Intrusives in the area are predominately Phonolite Porphyry sills. Porphyries typically have very low porosity and permeability and except where fractured, are generally considered to be a confining unit. The geologic formations representing the "Bed rock" aquifer, the Pre-Cambrian, the Deadwood, and the Tertiary intrusives are not generally considered significant aquifers. However, the intrusion and/or intrusives have altered the constitution of the Pre-Cambrian rock and the Deadwood Formation. Redden (1975) states that contact metamorphism was very limited during emplacement of the intrusives, that assimilation of country rock was extremely limited and that the intrusions were forcibly injected. Stress on the country rock as a result of the intrusion have undoubtedly increased the density of joints, fractures and faults in the Pre-Cambrian and the Deadwood.

The three rock types present in this area; sedimentary-Deadwood Formation, metamorphic- Pre-Cambrian, and igneous- intrusives, are probably hydrologically connected and represent a single hydrologic unit basically under unconfined condition. Locally confining conditions do exist where less permeable material overlies more permeable strata, and perched aquifers are present where a more permeable material overlies a less permeable strata. The groundwater flow system is dominated by fracture flow. Pump

tests conducted by the applicant indicate the transmissivity of the aquifer ranges from 5 ft²/d in a Porphyry to a high of 4159 ft²/d in highly fractured Pre-Cambrian schist. The potentiometric surface of this "Bed rock aquifer" generally follows the topography, groundwater flows away from topographic highs toward topographic lows. The general trend of the water table is from west to east, however, locally the groundwater flow is obstructed by faults and underground mine workings. Discharge from the "bedrock aquifer" within the project area may occur in the form of springs and seeps. The "spring inventory" included with the Golden Reward Mining Co.'s mining permit application identifies several springs, seeps and boggy areas within the project area. Most of these are at elevations above the elevation of the potentiometric surface of nearby "Deep Monitor" wells. For example, spring SP-2 is located approximately 250 feet from the proposed diversion point for Application No. 1439-1, and two seeps or boggy areas (LI1 and LI2) within approximately 500 feet of the well site for application No. 1439-1. The water levels of the spring and the seeps are approximately 180 to 200 feet higher than the water level of the test well drilled for Application No. 1439-1, and it can be assumed the spring and seeps are the result of dewatering of a perched aquifer in the area.

Underground mine workings are extensive in this area (see figure 1). Maps provided by the applicant are inconclusive in determining the extent of interconnection between the various workings, to what degree the workings are flooded, and where the underground workings dewater and contribute to the area streamflow. The Golden Reward mining permit application indicates the deeper levels of the workings opened via the Astoria, Union and Lucille shafts are probably fully flooded. Correspondence with the Golden Reward Mining Co. indicates the Bertha workings are also probably flooded. The proposed diversion point for Application No. 1438-1 is a well which penetrates the underground workings of the Astoria Mine. The volume of water in storage in the Astoria mine can be estimated using the past production from the mine (26,000 oz. of gold), and the average ore grade for the Astoria of 0.3 oz./ton (Allsman 1940). Assuming a volume of 15 ft³/ton, and assuming the mine is completely flooded, and there are no dams within the mine caused by cave-ins, etc., the volume of water in storage in the Astoria Mine alone is approximately 29.54 ac-ft, or sufficient water to pump continuously for 22 days at 0.67 cfs to dewater the mine assuming no recharge. It is not known if the Astoria Mine directly discharges via adits to contribute to the local streamflow in the area. The Astoria may be interconnected with the Union Workings. Evidence suggests that the Union Workings discharge water to Whitetail Creek via the Union Drainage Tunnel (see Appendix 1). The proposed diversion point for Application No. 1439-1 is a well which does not appear

to penetrate underground workings. The proposed diversion point for Application No. 1441-1 is a well which is completed into the underground workings of the Bertha Mine. The volume of water in storage in the Bertha mine can also be estimated using the past production from the mine (41,000 oz. of gold). Using the same assumptions as were used above, the volume of water in storage in the Bertha Mine alone is approximately 47 ac-ft, or sufficient water to pump continuously for approximately 108 days at 0.22 cfs to dewater the mine assuming no recharge. The Bertha Mine dewaterers to Stewart Gulch, and contributes significantly to the base flow in the gulch.

This project area is located near the headwaters of several small drainages which flow into Whitetail Creek and ultimately into Whitewood Creek. The drainages include: Nevada Gulch, Fantail Creek, Unnamed Gulch, Stewart Gulch, and Whitetail/Astoria Gulch. Fantail Creek and Stewart Gulch have been classified by the Water Management Board as "cold water permanent fish life propagation waters" and "limited contact recreation waters", Whitetail Creek has been classified as "cold water permanent fish life propagation waters", "limited contact recreation waters", and "immersion recreation waters". Nevada, Fantail, Stewart and Whitetail streams originate from springs. The source of these springs may be perched aquifers or discharge from the "Bedrock Aquifer". For example, the springs in the center of Fantail Gulch are located on faults and may be discharging from the "bedrock aquifer". Base flows to the area streams are increased where underground workings discharge directly to the streams and are probably increased in areas of faults crossing stream beds and in areas where shallow underground workings are located underneath stream beds.

The DWNR-Office of Water Quality has prepared a report reviewing the interconnection between flows from the Bertha workings and flows in Stewart Gulch and ultimately Whitewood Creek (see Appendix 2). The limited period of record (May 14, 1987 to November 17, 1987) indicate that 26 to 48 % of the flow in Whitetail Creek can be attributed to water from Stewart Gulch. A large percentage of the flow in Stewart Gulch is derived from the Bertha workings. Although the report specifically deals with dewatering of the Bertha workings, it may have been appropriate to discuss the groundwater-surface water interaction in general over the entire project area. The Office of Water Quality has recommended denial of the Golden Reward Mining Co. Application to appropriate water from the Bertha workings (Application No. 1441-1) because of possible detrimental impacts to the fisheries in Stewart Gulch, Whitetail Creek and Whitewood Creek; and possible economic impact to BHP&L and Homestake Mining Co. due to non compliance with their NPDES permits and Surface Water Quality Standards. It is not possible to quantify any potential impact to area springs, seeps and ultimately the area stream flow.

The hydrologic properties of a fracture flow dominated system make the potential as a water source very difficult to assess, highly variable, and quite site-specific. Few wells in this type of geohydrologic setting are capable of a sustained yield of 0.22 cubic feet per second or greater because of the limited porosity and permeability. It is possible this proposed wells may not produce the amount of water requested by each application. Although, Terry Peak Ski Area, which is located approximately 4000 feet from the Golden Reward Mining Co.'s project area has a well which penetrates the Ben Hur Mine, that is capable of producing 960 gpm. The 1987 usage from the well was 58.5 acre-feet. The underground workings of the Ben Hur Mine do not appear to be directly connected to the underground workings in the Golden Reward Mining Co. project area. The well proposed to supply application No. 1438-1 will penetrate the flooded underground workings of the Astoria Mine, and the well proposed to supply Application No. 1441-1 will penetrate the flooded underground workings of the Bertha Mine. The storage of the mine workings will have a significant impact on the productivity of these wells. However, long term pumping would be necessary to confirm the production potential at these well sites, as is always the case when dealing with fracture flow, because of the properties inherent to the system.

Recharge to the bedrock aquifer in this area occurs through infiltration of precipitation, runoff over the surface of the aquifer, and recharge from local streams through the shallow alluvium/colluvium aquifer where it is hydrologically connected to the bedrock aquifer. The Golden Reward project area is located on a recharge area for the bedrock aquifer.

The Division of Water Rights does not monitor any observation wells in this area and there is no historic data (water level records) available for this aquifer.

Review of Existing Water Rights:

The Division of Water Rights has record of several domestic wells completed into the bedrock aquifer in this area. Existing Water Permits in the area include: (see enclosed map for locations)

Permit No.	Owner	Source
301-1	Black Hills Chairlift Co.	groundwater
301A-1	Black Hills Chairlift Co.	groundwater
1335-1	Whitetail Court	groundwater
1168-1	Milton Morris	groundwater
1202-1	Roy M. Dungey	Sue Spring
1346-1	Wharf Resources	groundwater
1173-1	Warbonnet Inc.	Ross Spring

1288-1	Wharf Resources	groundwater
1278-1	Wharf Resources	groundwater
1247-1	Warbonnet Inc.	groundwater
1406-1	Wharf Resources	Spearfish Creek
1174-1	Warbonnet Inc.	Ross Spring
1365-1	Wharf Resources	groundwater
565-1	Black Hills Power and Light	groundwater
1322-1	Strawberry Hill Mining Co.	groundwater
1372-1	St. Joe Mining Co.	groundwater
0425-1	Golden Reward Mining Co (different Golden Reward Mining Co.)	Whitetail Creek
0431-1	Henry R. Locke	Whitewood Creek
912-1	W. Gilbert Alan	Whitewood Creek
921-1	Wendelyn Richter	Whitewood Creek
928-1	Charles Wennberg	Whitewood Creek
1285-1	Tom Lein-Sand & Gravel	Whitewood Creek

The nearest groundwater permit is Permit No. 1335-1. The point of diversion is located approximately 1 mile northeast of this project area. Permit No. 301A-1 diverts water from underground mine workings located approximately 4000 feet from the Golden Reward Mining Co. project area. The nearest surface water permit to the Golden Reward Mining Co. project area is located nearly 15 miles downstream along Whitewood Creek. The diversion point for Water Right Filing No. 0425-1 is located on Golden Reward Mining Co. project area. The filing claims all of the flow in Whitetail creek. The diversion point for Water Right Filing No. 0431 is located just down stream of the confluence of Whitetail Creek and Whitewood Creek. The filing claims 10.00 cfs. These filings have not been validated and it is likely they can both be cancelled due to forfeiture.

Conclusions:

1. Permit application No. 1438-1 proposes to appropriate 0.67 cubic feet of water per second from one 355 feet deep well completed into the "Bedrock Aquifer". The "Bedrock Aquifer" consists of Pre-Cambrian Rock, the Deadwood Formation, and Tertiary aged intrusives. The proposed well is to penetrate the flooded underground workings of the Astoria Mine.
2. Permit application No. 1439-1 proposes to appropriate 0.33 cubic feet of water per second from one well 300 feet deep completed into the "Bedrock Aquifer".
3. Permit application No. 1441-1 proposes to appropriate 0.22 cubic feet of water per second from one well approximately 100 feet deep, completed into the "Bedrock Aquifer". The proposed well is to penetrate the flooded underground workings of the Bertha Mine. No water is to be diverted from the well when the flow in Stewart Gulch is equal to or less than 150 % of the previously recorded minimum flow.

4. The bedrock aquifer is basically under water-table conditions, although confined conditions and perched conditions exist. Primary (intergranular) porosity and permeability of this aquifer are low. Most of the water in storage in the aquifer is contained in the secondary porosity (i.e. bedding planes, faults, joints and fractures). Flooded underground workings do increase the recoverable water in storage in the aquifer.
5. The bedrock aquifer is a viable aquifer in this area, and there is a reasonable probability unappropriated water is available in this area.
6. Well interference should not be a problem between this proposed well and other adequate wells in the area.
7. The proposed diversion points for these applications are located near the headwaters of several small drainages which flow into Whitetail Creek, and ultimately into Whitewood Creek. Nevada, Fantail, Stewart and Whitewood Creek originate as springs which may originate from the bedrock aquifer.
8. Groundwater withdrawals in this area may affect spring flow in this area. It is not possible to quantify the potential impact, if any, on streamflow in the area.
9. There are no existing water rights along Nevada Gulch, Fantail creek, Stewart Gulch, or Whitetail Creek.
10. The nearest downstream water right from this diversion point is nearly 15 miles downstream, along Whitewood Creek.
11. Decrease in stream flow in area streams may result in noncompliance with Black Hills Power & Light (BHP&L), and Homestake Mining Co.'s NPDES permits and the Surface Water Quality Standards. Streamflow used for dilution water by BHP&L and Homestake has not been appropriated.

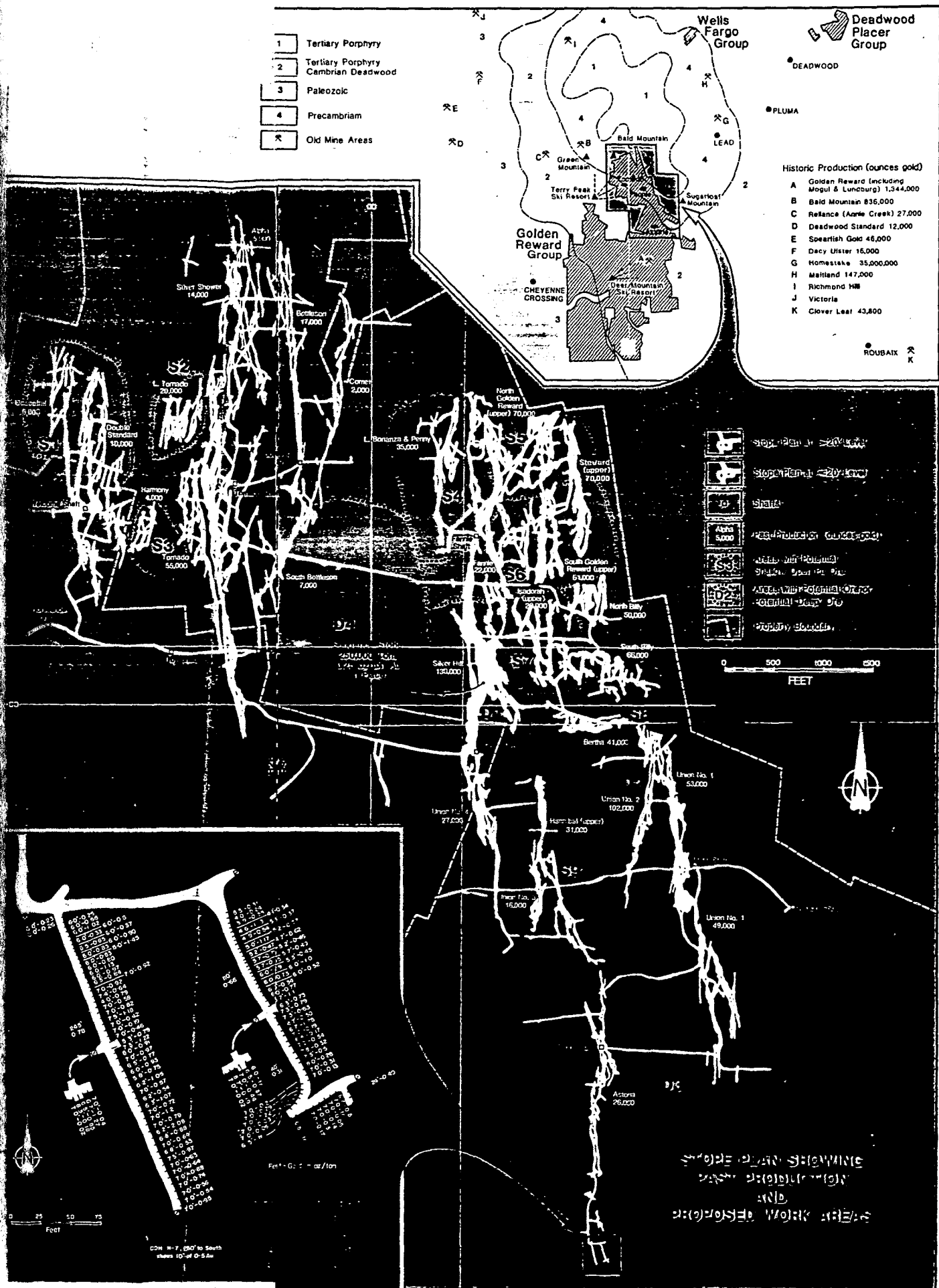
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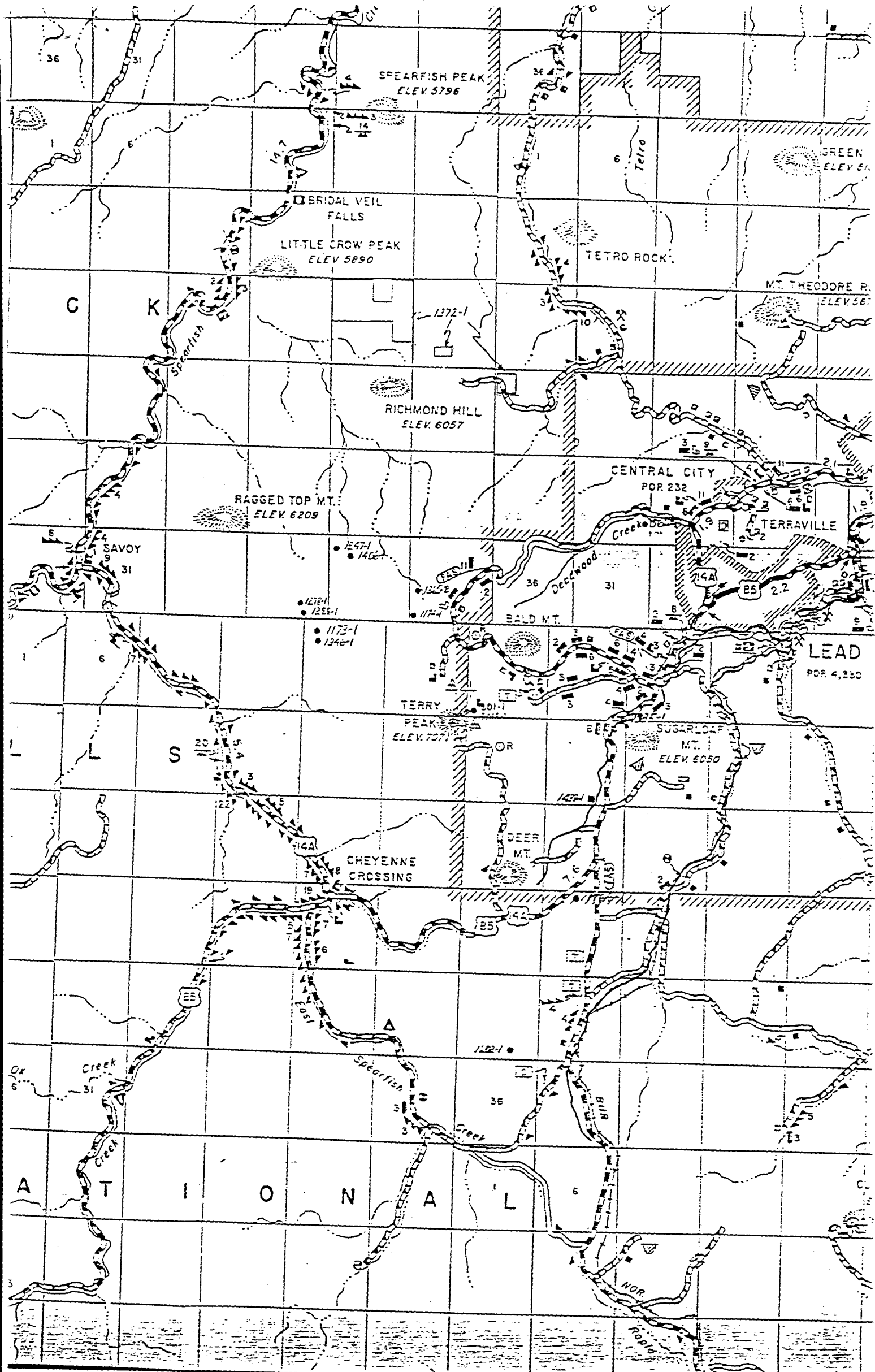
KENT BUHLER
Natural Resources Engineer

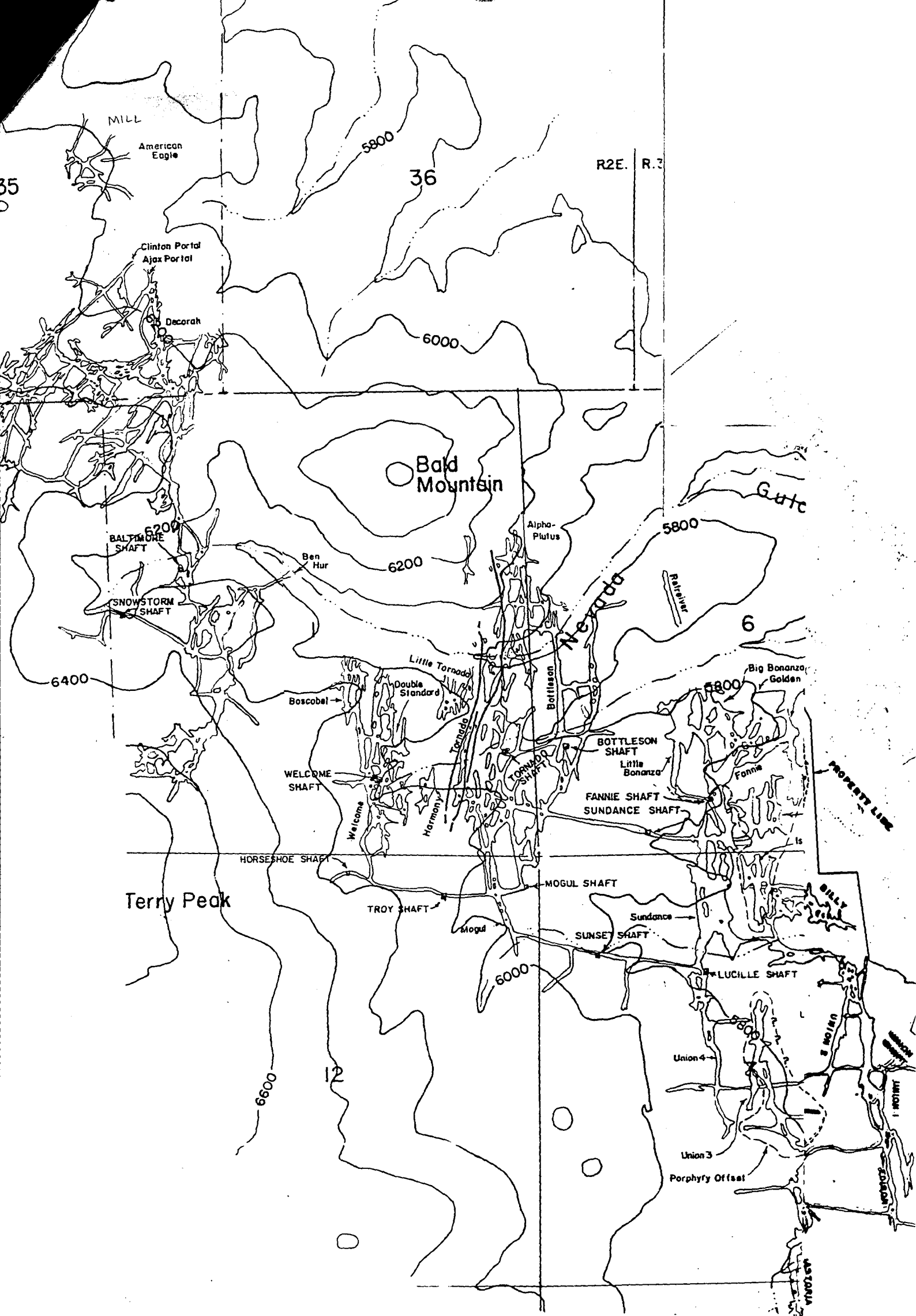
References:

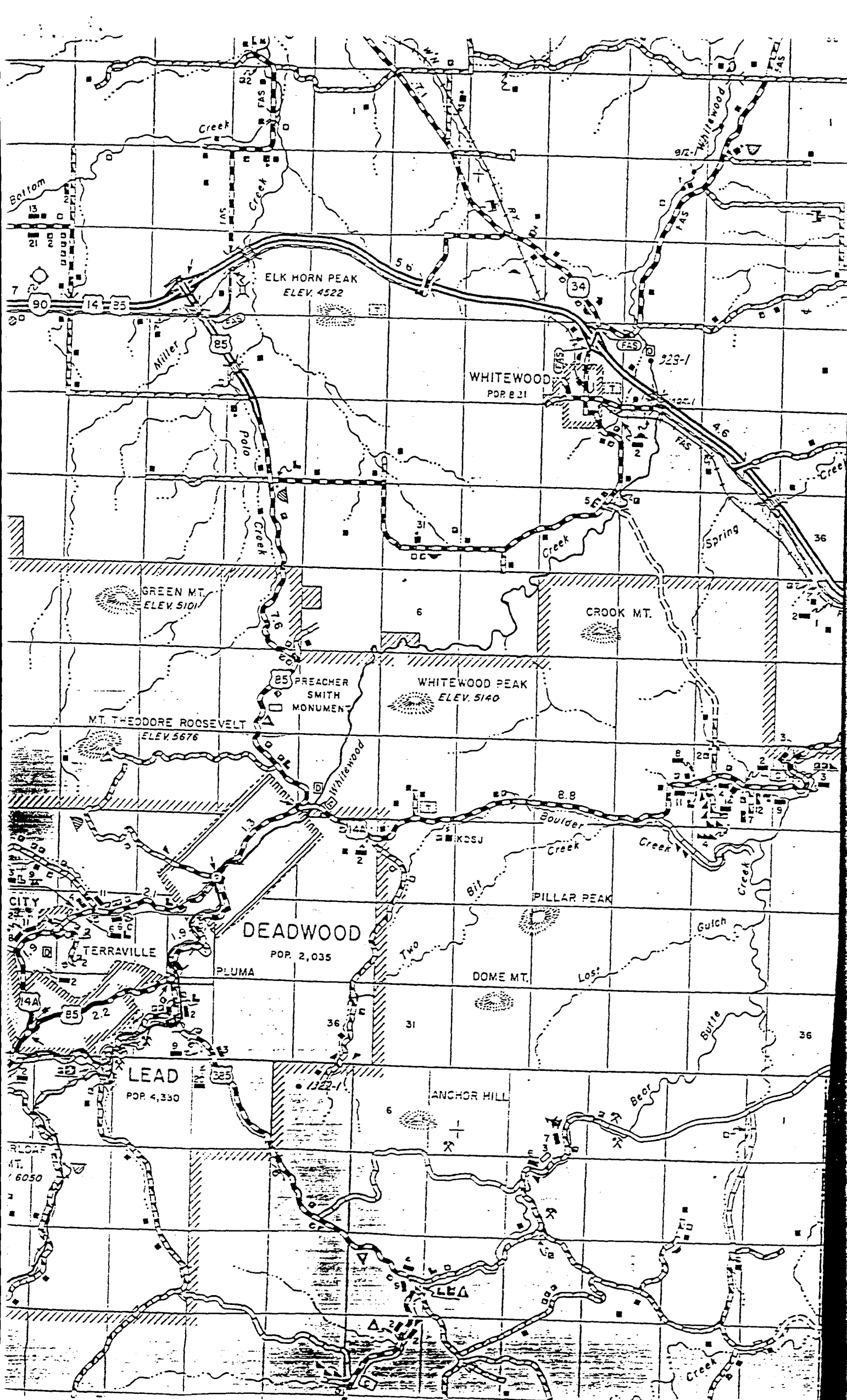
- Allsman, T.P., 1940, Reconnaissance of Gold-Mining Districts in the Black Hills, S. Dak., United States Government Printing Office, Washington DC
- Darton, N.H., Paige, S., 1925, Geologic Atlas of the United States, Central Black Hills Folio, South Dakota, USGS, Folio No. 219,
- DWNR - Division of Water Rights, "Domestic Well Log Files, Water Permit Files, DWNR, Joe Foss Building, Pierre SD
- Rahn, P.H., 1979, Groundwater Resources of Western South Dakota, US Army Corps of Engineers, Draft-Final Report
- Redden, J.A., 1975, "Precambrian Geology of The Black Hills", Mineral and Water Resources of South Dakota, USGS, US Government Printing Office, Washington DC

FIGURE 1









No. 0425-1

Office of State Engineer
DOCUMENT FILE

Name: Golden Howard
Mining Co.

By: Blakford, John

County: Lawrence "1567"

Date: July 20, 1906

Filed: July 23, 1906

Location: Greenwood
Creek area

REPRODUCTION OF
ORIGINAL DOCUMENT
FILED IN A
MICROFILMED

No. 1167

Water Right

TO

Edmund Howard Mining Co.,
Filed for record July 23rd
1906, at 2 o'clock P. M.,
Book 186, Page 357
Edmund Trevaickie
Register of Deeds.

Water Right Location

The Golden Howard Consolidation with
and "Hilling Company", a corporation
organized under the laws of the State
of South Dakota, does hereby claim by
right of location and appropriation
all the waters flowing from the so-
called Union Drainage Tunnel on the
Ruby Hall Fraction Mining Claim or lode

N. S. 1167, where this notice is posted, in Whitewood Mining District
Lawrence County, South Dakota.

The said water to be used for Mining, Milling, Domestic,
Power, and other purposes, and to be conveyed by ditch, flume, pipe,
or other means, to the point where used.

This notice is posted at the head of the proposed point of diversion
viz, the mouth of the said Union Drainage Tunnel, Ruby Hall Fraction
Lode N. S. 1167

Located and dated this 20 day of July 1906,

Golden Howard Jan S, M. H. Co.,

Locators,

by John Blatchford
Supt.

Thos G. Houston

J. D. Brew,

Witnesses.

STATE of SOUTH DAKOTA, ss.
County of Lawrence

I, *Edmund Trevaickie*, Register of Deeds, in and for the County of Lawrence, and State
of South Dakota, do hereby certify that the above and foregoing instrument to which this is attached,
is a true, correct and complete transcript of the instrument recorded in my office and that the same
was filed on the *23* day of *July*, 1906, at *2* o'clock and *00* minutes *P*. M.
Book *186*, Page *357*.

WITNESS my hand and official seal, done at my office in Deadwood, State of South
Dakota, this *21st* day of *July*, 1906.

By

Deputy.

Edmund Trevaickie
Register of Deeds.

THE RECORD WAS IN A FUGITIVE
STATEMENT RECORDED IN C

RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1438-1, Golden Reward Mining Company

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Division, Department of Water and Natural Resources concerning Water Permit Application No. 1438-1, Golden Reward Mining Company, PO Box 888, Lead SD.

The Chief Engineer is recommending APPROVAL of Application No. 1438-1 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) in the public interest with the following qualifications:

1. Although the Board believes there is reasonable probability that there is unappropriated water available for the proposed use, since only limited flow data are available for Stewart Gulch and the impacts of proposed groundwater withdrawals on spring flows and stream flows under Permit Nos. 1438-1, 1439-1, 1440-1 and ~~1441-1~~ are uncertain, the Water Management Board is retaining jurisdiction of these Permits, which will be exercised prior to licensing. The Board may quantify and/or determine if minimum amounts of water must be present in Stewart Gulch, Whitetail Creek and Whitewood Creek to protect these streams as cold water permanent fish life propagation waters and to determine any impacts of Golden Reward Mining Company withdrawals on these streams.

This retained jurisdiction will be exercised pursuant to the public trust duties of the State and the Water Management Board as the Board vested with the authority of the State, to supervise the appropriation and distribution of water resources of the State.

2. That Golden Reward Mining Company install and operate a continuous recording flow gaging station on Stewart Gulch at a site below the Bertha Mine Workings outflow and above the confluence with Whitetail Creek.
3. The casing of the well to be constructed under Permit No. 1438-1 shall be pressure grouted with cement (bottom to top) from the producing formation to the surface, constructed by a licensed well driller and the well constructed in compliance with Water Management Board Well Construction Rules, Chapter 74:02:04.

1441-1 denied
by Board 7-27-88
JH

4. The well approved under this Permit will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner under this Permit shall control his withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
5. Approval of Permit No. 1438-1 is subject to compliance with the following then existing and applicable Water Management Board rules:
- a. Chapter 74:03:15 Ground Water Quality Standards,
 - b. Chapter 74:03:16 Ground Water Discharge Permit,
 - c. Chapter 74:03:30 Heap Leach Design and Construction,
 - d. Chapter 74:03:02 Surface Water Quality Standards,
 - e. Chapter 74:03:04 Uses Assigned to Streams,
 - f. Chapter 74:03:17 Surface Water Discharge Permit - General Provisions,
 - g. Chapter 74:03:18 Surface Water Discharge Permit Application Requirements,
 - h. Chapter 74:03:19 Surface Water Discharge Permit Conditions,
 - i. Chapter 74:03:20 Transfer Modification, Revocation and Reissuance and Termination of Surface Water Discharge Permits,
 - j. Chapter 74:03:21 Procedure For Permit Processing,
 - k. Chapter 74:03:22 Secondary Treatment Standards,
 - l. Chapter 74:03:23 Criteria and Standards for Surface Water Discharge Permit,
 - m. Chapter 74:03:24 Toxic Pollutant Effluent Standards for Surface Water Discharge Permits,
 - n. Chapter 74:03:25 Effluent Guidelines and Standards for Surface Water Discharge Permits, and
 - o. Chapter 74:03:26 Pretreatment Regulations for Surface Water Discharge Permits.

*not enacted
by Board*

See the attached report for additional information.


JOHN HATCH, Chief Engineer
June 7, 1988

 **Department of
Water & Natural Resources**

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

June 23, 1988

**NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPER RIGHT AWAY.**

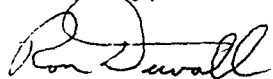
Peter Erickson, General Manager
Golden Reward Mining Company
PO Box 888
Lead SD 57754

Dear Mr. Erickson:

Your Application Nos. 1438-1 1439-1, 1440-1 and 1441-1 for permits to appropriate water for industrial and domestic use have been examined and found to comply with the South Dakota Water Laws and applicable rules. Notice of your intent to appropriate water has been sent to the Publisher of the Lead Daily Call printed at Lead SD. For your information, a copy of the notice is enclosed. Copies of the recommendation of the Chief Engineer and a report on the applications will be sent later. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

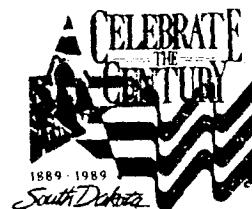
Be sure to contact the above newspaper to authorize publication of your Notice of Intent to Appropriate Water and to arrange for payment. Early contact with the paper can eliminate delays. The publisher has been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. We must receive Proof of Publication before the application can be considered by the Water Management Board.

Sincerely,



Ron Duvall
Natural Resources Engineer
605 773-3352

enclosures





Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

June 23, 1988

Lead Daily Call
Box 876
Lead SD 57754

Dear Sir:

Enclosed is a Notice of Hearing on Application Nos. 1438-1, 1439-1, 1440-1 and 1441-1 to be published twice. Please publish the first notice on or before June 30, 1988 with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is Golden Reward Mining Company, PO Box 888, Lead SD 57754.

A copy of BOTH publications must be SENT to the WATER RIGHTS DIVISION. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. The permit application cannot be considered by the Water Management Board until proof of publication has been received.

Sincerely,

Ron Duvall
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE
No. _____

TO: Water Rights Division
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of _____ enclosing Notice of Hearing to Appropriate Water by Application No. _____ which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper



Instruction to Newspaper - Publish first Notice on or before June 30, 1988 with 2nd publication 7 days later. The applicant is responsible for payment.

NOTICE OF HEARINGS on Application Nos. 1438-1, 1439-1, 1440-1 and 1441-1
to Appropriate Water

Notice is given that Golden Reward Mining Company, PO Box 888, Lead SD 57754 has filed Application No. 1438-1 for a water permit to appropriate 0.67 cubic feet of water per second from one well 355 feet deep to be located in the SW 1/4 SE 1/4 Section 7-T4N-R3E. The well is to be completed into the old flooded underground workings of the Astoria Mine. Water is to be used for industrial and domestic purposes in a heap leach ore-processing facility operated by Golden Reward Mining Company in portions of Sections 6, 7-T4N-R3E; Sections 1, 12-T4N-R2E.

Application No. 1439-1 is to appropriate 0.33 cubic feet of water per second from one well 300 feet deep to be located in the NW 1/4 SE 1/4 Section 7-T4N-R3E. Water is to be used for industrial and domestic purposes in a heap leach ore-processing facility operated by Golden Reward Mining Company in portions of Section 6, 7-T4N-R3E; Sections 1, 12-T4N-R2E.

Application No. 1440-1 is to appropriate 0.28 cubic feet of water per second of impounded ground water from the dewatering of mine pits and impounded runoff water from precipitation falling on a proposed mine site in sections 6, 7-T4N-R3E; sections 1, 12-T4N-R2E. Runoff water from areas disturbed by mining operations is to be impounded by sediment control traps (each capable of impounding a 10 year, 24 hour precipitation event) and by the primary pit water storage area in the NW 1/4 NE 1/4, NE 1/4 NW 1/4 section 7; SE 1/4 SW 1/4 section 6; all in T4N-R3E. Sediment control traps are to be located within the proposed mine site as needed to control sedimentation. Ground water seeping into mine pits located within the proposed mine site is also to be diverted to the primary pit storage area. The primary pit storage area is to consist of 4 pits including Isadorah 1 (18.9 acre-feet storage capacity), Isadorah 2 (9.4 acre-feet storage capacity), Isadorah 3 (19.6 acre-feet storage capacity) and Sundance (12.4 acre-feet storage capacity) for a total storage capacity of 60.3 acre-feet. The impounded surface and ground water is to be used for industrial purposes, including dust control, in a heap leach ore-processing facility operated by Golden Reward Mining Company.

Runoff water from areas undisturbed by mining operations is to be diverted via ditch to avoid areas disturbed by mining operations. Runoff water from an undisturbed area on the North Fork of Stewart Gulch is to be diverted via ditch to the South Fork of Stewart Gulch at a point in the NE 1/4 NE 1/4 section 12-T4N-R2E. A portion of the Fantail Creek drainage area that is undisturbed by mining is also to be diverted via ditch between two mining pits in the SE 1/4 section 1-T4N-R2E. The ditch is to follow the existing creek channel and water will then flow in the natural Fantail Creek channel below the pit sites.

Application No. 1441-1 is to appropriate 0.22 cubic feet of water per second from one well approximately 100 feet deep to be located in the NW 1/4 NE 1/4 Section 7-T4N-R3E. The well is to be completed into the old Bertha mine workings which contribute to the water flow in Stewart Gulch. The application proposes that no water will be diverted from the well when the flow in Stewart Gulch is equal to or less than 150% of the previously recorded minimum flow. The previously recorded minimum flow is 37 gallons per minute (gpm); therefore, the flow in Stewart Gulch would be greater than 56 gpm before the well would be operated. The well is to supplement the wells specified on Application Nos. 1438-1 and 1439-1 to meet short term water demands that exceed average requirements and will be a back-up well in event of pump failure in the other two wells. Water is to be used for industrial and domestic purposes in a heap leach ore-processing facility operated by Golden Reward Mining Company in portions of Sections 6, 7-T4N-R3E; Sections 1, 12-T4N-R2E.

The total water appropriation requested by Application Nos. 1438-1, 1439-1, 1440-1 and 1441-1 is 1.50 cubic feet of water per second. The normal priority for water use from the sources specified on the four applications is: 1) Application No. 1440-1, 2) Application No. 1438-1, 3) Application No. 1439-1 and 4) Application No. 1441-1. Water is also to be used for fire protection purposes in addition to industrial and domestic uses.

Pursuant to SDCL 46-2A-2, the Chief Engineer of the Water Rights Division recommends APPROVAL of Application Nos. 1438-1, 1439-1, 1440-1, and 1441-1 with qualifications because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water and 4) it is in the public interest. These applications will be considered by the Water Management Board in Room 216, Joe Foss Building, 523 E Capitol, Pierre SD on July 27, 1988 at 10:00 am. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer or 4) deny these applications based on the facts presented at the public hearing.

Any interested person that intends to participate in the hearings before the Board by presenting evidence or cross-examining witnesses according to SDCL 1-26, must file a written petition with BOTH the applicant and Chief Engineer by July 15, 1988. The Chief Engineer's address is "Water Rights Division, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)". The petition may be informal, but must include a statement describing the petitioner's interest in an application, the petitioner's reasons for opposing or supporting an application and the signature and mailing address of the petitioner or legal counsel if legal counsel is obtained. The applicant need not file a petition. Contact the Water Rights Division to request information on these applications or to assure access to the hearing by the handicapped.

These hearings are adversary proceedings. Any person filing a petition and/or the applicant have the right to be represented by a lawyer. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. The time of the hearings will also be automatically delayed for at least twenty days upon written request to the Chief Engineer from the applicant or a petitioner. The request for a delay must be received by July 15, 1988.

These applications are made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-15; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.

Affidavit of Publication

STATE OF SOUTH DAKOTA }
COUNTY OF LAWRENCE } SS.

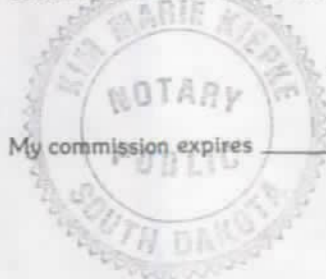


Bill T. Masterson, Jr. of said County and State being first duly sworn, on his oath says: That The QUEEN CITY MAIL is a legal daily newspaper of general circulation, printed and published in the City of Spearfish, in said County and State by Bill Kunerth, and has been such a newspaper during the times hereinafter mentioned; and that said newspaper has a bonafide circulation of at least 200 copies weekly, and has been published within said County in the English language for at least one year prior to the first publication of the notice herein mentioned, and is printed in whole or in part in an office maintained at the place of publication; and That I Bill T. Masterson, Jr., the undersigned, am the Publisher of said newspaper and have personal knowledge of all the facts stated in this affidavit; and that the advertisement headed:

Notice of Hearings

a printed copy of which is hereto attached, was printed and published in said newspaper for Two (2) successive and consecutive weeks, the first publication being made on the 30th day of June, 1988, and the last publication on the 7th day of July, 1988, that the full amount of fees charged for publishing same, to-wit: The sum of \$ 93.67, inures solely to the benefit of the publisher of the QUEEN CITY MAIL, that no agreement or understanding for a division thereof has been made with any person and that no part thereof has been agreed to be paid to any other person whomsoever.

Subscribed and sworn to before me this 7th day of July, 19 88



Kim Marie Kiepe
NOTARY PUBLIC, LAWRENCE COUNTY, SOUTH DAKOTA
My Commission
Expires 3-24-96

My commission expires

NOTICE OF HEARINGS on Application Nos. 1438-1, 1439-1, 1440-1 and 1441-1 to Appropriate Water

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Capitol, Pierre SD 57501 (605 773-3352)". The petition may be informal, but must include a statement describing the petitioner's interest in an application, the petitioner's reasons for opposing or supporting an application and the signature and mailing address of the petitioner or legal counsel if legal counsel is obtained. The applicant need not file a petition. Contact the Water Rights Division to request information on these applications or to assure access to the hearing by the handicapped.

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B-142

June 30

July 7

July 19, 1988
(date)

page 1

Parties of Record before Water Management Board regarding Water Permit
Application No. 1438-1, Golden Reward Mining Company

For:

Peter Erickson, Manager
Golden Reward Mining Company
PO Box 888
Lead SD 57754
represented by:
Max Main, attorney
618 State Street
Belle Fourche SD 57717

Interested:

Richard Beringson, Secretary
SD Dept. of Game, Fish + Parks
445 East Capitol
Anderson Building
Pierre SD 57501

THE
GOLDEN REWARD
MINING COMPANY

June 2, 1988

Mr. Ken Bueller
SD Department of Water & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501



Dear Mr. Bueller:

We have enclosed a modified version of Exhibit 3-1 (Plan Map Showing Previously Mined Land) for your review. We have included spot elevations of workings where known and have indicated the flooded workings.

Only two of the underground mines are known to be flooded, but the extent of flooding cannot be ascertained due to a lack of grade and elevation data. The Bertha workings on the south side of Stewart gulch shows flooded conditions at PW-4 but a nearby partially collapsed portal shows no standing water so the extent of flooding is unknown.

PW-5 shows water in the Astoria workings. This is the only point we have drilled into, so again the extent of the flooding is unknown.

A summary of water level monitoring for the month of May is as follows:

<u>Site</u>	<u>Water Elev.</u>	<u>Comment</u>
MM 1	5,563.7	Non-flooded Union workings
MM 4	5,588.9	Non-flooded GRMC workings western area of project
DM 15	5,612.2	Non-flooded GRMC workings western area of project
PW 4	5,581.7	Production Well into Bertha workings
PW 5	5,583.7	Production well into Astoria workings

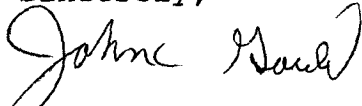
Based on historical data, the Terry Peak well has a water elevation of about 5,840.

The Terry Peak water elevation is some 253 feet higher than the water level at MM-4 and 230 feet higher than the water level at DM-15. With these differences in water elevations, it can clearly be concluded that there are no open workings connecting the Terry Peak well and the Golden Reward workings.

Page two, Mr. Bueller

Well MM-1 intersects the Union workings and has a water level 18 to 20 feet lower than water in workings penetrated by wells PW-4 and PW-5. We therefore conclude there is no direct connection between the Union workings and Bertha and Astoria workings.

Sincerely,

A handwritten signature in cursive script, appearing to read "John C. Gould".

JOHN C. GOULD
Mine Engineer

JG:je
Enc.



Department of Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

July 7, 1988

NOTICE

Max Main, Attorney
618 State Street
Belle Fourche, SD 57717

Dear Mr. Main:

This Notice is in response to your July 6, 1988 telephone application for a temporary use permit for road construction purposes on the Golden Reward project.

Pursuant to Water Management Board Rules 74:02:01:34, the application for a temporary use permit will be presented to the Water Management Board for action. The application is being deferred to allow the Board to decide if construction of project works should be allowed prior to hearings on the Golden Reward Mining Company Water Permit Applications Nos. 1438-1, 1439-1, 1440-1 and 1441-1. The Board will consider the application for a temporary use permit at 10:00 am on July 27, 1988 in Room 216, Joe Foss Building, 523 E Capitol, Pierre SD. The agenda time is an estimate. The actual time of hearing may be later than 10:00 am due to prior agenda items.

Please contact us if you have any questions.

Very truly yours,

John Hatch, Chief Engineer
Water Rights Division
605 773-3352

cc: John Gould, Engineer
Dan Doyle, Assistant Attorney General



CERTIFICATION

I hereby certify that on July 7, 1988 I have personally deposited with the U.S. Mail, postage prepaid envelopes containing Notice regarding a temporary use permit for Golden Reward Project addressed as:

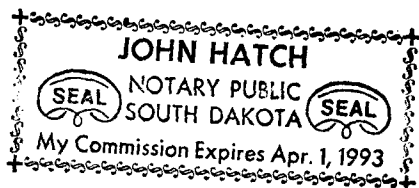
Max Main, Attorney, 618 State Street, Belle Fourche SD 57717
John Gould, Engineer, PO Box 888, Lead SD 57754

Maren Schlaak

KAREN SCHLAAK
Senior Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 8th day of July, 1988.



John Hatch
Notary Public

THE
GOLDEN REWARD
MINING COMPANY

July 14, 1988

Mr. Ron Duvall
Natural Resources Engineer
Water Rights Division
Dept. of Water and Natural Resources
Joe Foss Building
Pierre, SD 57501-3181



Dear Mr. Duvall:

I have enclosed the results of the pump tests that were performed on our production wells PW 1 (Permit Application No. 1439-1) and PW 5 (Permit Application No. 1438-1).

Production Well No. 1 was pumped for 24 hours at 153 gpm, and after an immediate draw down of 46.7 feet, it drew down only an additional 2.4 feet. Immediately upon cessation of pumping, the water level returned to nearly the original level.

Production Well No. 5 was pumped for 48 hours with a total draw down of 2.04 feet, and within 24 hours after cessation of pumping, the level was above the original level.

The pump test was performed with a multiple stage 30 H.P. submersible pump discharging through a four inch line. The pump was powered by a 75 K.W. diesel generator. Flow was measured by pumping into a calibrated container.

I believe the tests indicate that the recharge on these wells is greater than the withdrawal applied for.

If you should have further questions, please contact me.

Sincerely,

JOHN C. GOULD
Chief Mine Engineer

JCG:co
Attachment

cc: Max Main
Max Botz
Jean Miller
Ben Sheppard

5.20.88, 9:00 AM

CWM

TIME	WATER LEVEL	GPM	RECH
0	264'11"	340	
1.5	—		
2	264'11½"		
3	264'11½"		
4	264'11¾"		
5	264'11¾"		
6	264'11¾"		
7	264'11¾"		
8	—		
9	—		
10	264'11¾"		
15	265'	340	
20	265'		
35	265'½"		
45	265'1"		
60	265'1½"		
120	265'1¾"	340	
3 hr	265'2½"	340	
6	265'4"		
9	265'6"		
21	265'8"		
25	265'11"	340	
36	266'6"		

TIME	WATER LEVEL	GPM	RECH
44	266'8"		
48	266'11½"	340	

TEST STOPPED

RECHARGE

2 min 266'10"

6 266'6"

10 266'3"

15 266'2"

20 266'1"

30 265'10½"

90 265'6"

120 265'3"

24 hr 263'8"

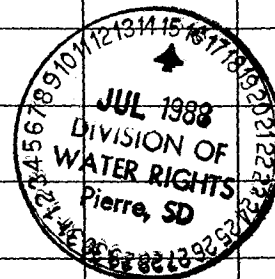


PW. 1

5.23.88, 9:30 AM

CWM

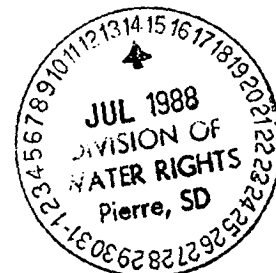
TIME	WATER LEVEL	GPM	RECH	TIME	WATER LEVEL	GPM	RECH	TIME	WATER LEVEL	GPM	RECH
0	208'3"	0		24 HR	258'1"	CHK 153					
1	254'11"	153		36 HR	256'10"	CHK 153					
1.5	252'0"			48 HR	255'4"	CHK 153					
2	252'1"			RECHARGE							
3	252'4"			END OF TEST							X
4	253'9"			1 MIN	208'10"						X
5	254'0"			1 HR	208'7"						X
6	254'3"			24 HR	207'11 1/2"						X
7	254'4"										
8	254'4"										
9	254'2"										
10	254'										
14	254'4"										
20	254'5"										
40	254'6 1/2"										
60	254'8"										
90	254'11"										
120	254'11"										
3 HR	256'										
5 HR	256'11"										
7 HR	258'1 1/2"										
8 HR	259'										
12 HR	259'										



South Dakota
Department of
Game, Fish and Parks

Office of the Secretary
Sigurd Anderson Building
445 East Capitol
Pierre, South Dakota 57501
(605) 773-3387

July 14, 1988



Mr. John Hatch, Chief Engineer
Division of Water Rights
S.D. Department of Water & Natural Resources
Joe Foss Building
Pierre, SD 57501

Dear Mr. Hatch:

Pursuant to the notice provided by the Chief Engineer, the South Dakota Department of Game, Fish and Parks intends to be a party to water right claims 1438-1, 1439-1, 1440-1, and 1441-1, Golden Reward Mining Co.

GF&P is an interested and potentially affected party by virtue of statutory authority to manage fish and wildlife resources of the state (SDCL Chapter 41). The pending water right claim could affect the quantity of water available for natural resource management.

Thank you for the opportunity to comment on this pending water right application.

Sincerely,

Richard Beringson
Secretary

RB/RK/ld

cc: Golden Reward Mining Co.

July 18, 1988



Enclosed find the affidavits you requested per
our phone conversation of 7-18-88.

I hope this helps clear up any confusion.
If there are any further questions, please
don't hesitate to call me.

Sincerely,

Andy Johnson

EXHIBIT B
FLUME INSTALLATION - CONCEPTUAL LAYOUT

Drawing showing conceptual installation in plan and section
view at a scale of 1 inch = 1 foot.

EXHIBIT C

GOLDEN REWARD SEED MIX
PERMANENT RECLAMATION

<u>Species</u>	<u>lbs. pls/acre</u>	<u>% By Weight</u>
Little bluestem	6	15
Western wheatgrass	8	20
Sideoats grama	4	10
Green needlegrass	4	10
Durar hard fescue	2	5
Mountain brome	2	5
Kentucky bluegrass	4	10
White Dutch clover	4	10
Cereal rye - Balboa	<u>6</u>	<u>15</u>
Total	40	100

(The legume is to be inoculated using the Rhizo-kote method.)

SOUTH DAKOTA
Department of
Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

August 23, 1988

1438-1
1439-1

John C. Gould
Chief Mine Engineer
Golden Reward Mining Company
P.O. Box 888
Lead, SD 57754

Dear Mr. Gould:

We have reviewed your design for the Parshall Flume, the bypass weir (for measurement of higher flows) and continuous recorder to measure the flows on Stewart Gulch. The design of the structure is acceptable to us. The installation of the structure as designed will meet the flow measurement condition required in the qualifications adopted by the Water Management Board for Water Permit Nos. 1438-1 and 1439-1.

Thank you for providing us with this information.

Very truly yours,

John Hatch
JOHN HATCH, Chief Engineer
Water Rights Division
605 773-3352





NOTICE OF COMPLETION OF WORKS AND
APPLICATION OF WATER TO BENEFICIAL USE

Date September 7, 1989

TO: Water Rights Division, DWNH
Joe Foss Building
Pierre SD 57501-3181

FROM: The Golden Reward Mining Co. P.O. Box 888 Lead, SD 57754
name address city

I have completed the construction of the water diversion system and I have put the water to beneficial use to the maximum extent it is going to be used.* I have not exceeded the amounts specified in Water Permit No. 1438-1.

Water Permit No. 1438-1 states that the diversion system is to be constructed by July 27, 1993, and that the water it put to beneficial use by July 27, 1997.

The diversion system was completed on August 8, 1989.
Applying the water to beneficial use was completed on August 8, 1989.

You may schedule an inspection so that the Water License may be issued.

E. J. Polak
signature

* The well has been put to beneficial use; however, it is not at maximum extent.

BENNETT & MAIN

A PROFESSIONAL CORPORATION

ATTORNEYS AT LAW

DONN BENNETT
MAX MAIN
JOHN R. FREDERICKSON



618 STATE STREET
BELLE FOURCHE, SOUTH DAKOTA 57717-1489
TELEPHONE (605) 892-2011
FAX (605) 892-4084

July 28, 1992

Chief Engineer
Water Rights Division, DENR
523 East Capitol
Pierre, SD 57501-3181

RE: Water Permits 1438-1, 1439-1, 1440-1, and 1447-1.

Dear Chief Engineer:

Enclosed are NOTICES OF TRANSFER OF OWNERSHIP for each of the above-referenced Water Permits. Also enclosed is a check in the amount of \$10 as payment of the \$2.50 filing fee for each of the four notices.

The Water Permits are being transferred from The Golden Reward Mining Company to The Golden Reward Mining Company, L.P. However, please note, as stated in the Exhibit A attached to each Notice, that the transfer shall only be effective upon completion of Closing of the purchase and sale transaction between MinVen Gold Corporation/Matrix Financial Inc. and Wharf Resources Ltd. You will receive joint written confirmation of that Closing.

Should you have any questions, please do not hesitate to contact me.

Sincerely yours,

BENNETT & MAIN, P.C.

Max Main
Max Main

MM/ra

Encs.

pc w/encs.: Carol Koerner
Richard F. Mauro, Esq.
James S. Nelson, Esq.
John A. Lawson

RECEIPT

Division of Water Rights

413357

South Dakota Department of Environment and Natural Resources

July 29, 19 92

RECEIVED OF The Golden Reward Mining Company, P.O. Box 888, Lead, SD 57754-0888

the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct and to put water to beneficial use _____

Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____

Fee to retain Future Use Permit No. _____ after period of seven years.

Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____

Fee for Filing Transfer Form Permit No. 1447-1

Fee for Filing Extension Request _____

Fee for _____

(Any Other Work Provided by Law)

Total

2 50

By John Hatch
Chief Engineer

JOHN HATCH

gm



NOTICE OF TRANSFER OF OWNERSHIP

No. _____

TO: Chief Engineer
Water Rights Division
523 East Capitol
Pierre, SD 57501-8181

Date: July 13, 1992

I/We request that Water Permit/Right No. 1438-1

formerly owned by: The Golden Reward Mining Company

be transferred to: (name & address) The Golden Reward Mining Company, L.P.

P.O. Box 888, Lead, South Dakota 57754 (telephone No.) (605) 584-2010

Title to the following described land(s)/property has been transferred as described above:

SEE ATTACHED EXHIBIT A: Transferor's property located in SW 1/4 SE 1/4 Section 7,

T4N, R3E, BHM

I/We understand that the validity of Water Permit/Right No. 1438-1 has not been determined by this transfer action. If I/We have any questions on validity, I/We understand that only the Water Management Board has the authority to determine if a water permit/right is valid (see note).

You are requested to file this "Notice of Transfer" in the appropriate file at the Division of Water Rights, as evidence of the change of ownership.

A fee of Two Dollars and Fifty Cents (\$2.50) is attached to cover the filing fees as required under SDCL 46-2-13.

CANADA)
Province of Ontario)
Judicial District of York) ss.
City of Toronto)

I/We Rolando Francisco being first duly sworn on my oath depose and say that my relation to the above described undertaking is that of Owner, that I have read the above foregoing statement, and that I know of my own personal knowledge that the information herein stated is true.

Rolando Francisco
(Signed)

Subscribed and sworn to before me this 21st day of July, 19 92.

[Signature]
(Notary Public)

In and for the Province of Ontario
My Commission does not expire

NOTE: Water permits may be cancelled for nonconstruction within the five year construction period. Once a water permit is developed and the water used, the permit becomes a water right. A water right may be lost for three reasons:

1. Abandonment - no intent to use water and use is abandoned.
2. Forfeiture - no use of water for three year period without legal excuse.
3. For a third violation of a condition of a water permit/right.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

September 15, 1992

Max Main
BENNETT & MAIN, P.C.
Attorneys At Law
618 State Street
Belle Fourche, SD 57717-1489

RE: Transfer of Ownership on Water Permit Nos. 1438-1, 1439-1,
1440-1 and 1447-1

Dear Mr. Main:

The transfer of ownership forms for the above named permits were received July 29, 1992.

The transfer of ownership forms were completed properly and the permits can now be transferred. As your letter stated, the transfers will not be finalized until closing of the purchase and sale transaction between MinVen Gold Corporation/Matrix Financial Inc. and Wharf Resources, Ltd. Upon joint written confirmation, the transfers will be processed.

If you have any questions, please contact me.

Sincerely,

Genny McMath
Natural Resources Analyst
(605) 773-3352

BENNETT & MAIN
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW

DONN BENNETT
MAX MAIN
JOHN R. FREDERICKSON



618 STATE STREET
BELLE FOURCHE, SOUTH DAKOTA 57717-1489
TELEPHONE (605) 892-2011
FAX (605) 892-4084

October 8, 1992

Genny McMath, Natural Resources Analyst
c/o Office of the Chief Engineer
Water Rights Division
Department of Environment and Natural Resources
Joe Foss Bldg., 523 East Capitol
Pierre, SD 57501-3181

RE: Notice of Closing; Our File 2011.128092.

Dear Ms. McMath:

Please be advised that the Closing of the purchase and sale transaction between MinVen Gold Corporation/Matrix Financial Inc. and Wharf Resources Ltd. was completed October 8, 1992.

Pursuant to our prior communications, would you please acknowledge receipt of this notice and advise that Water Permits 1438-1, 1439-1, 1440-1, and 1447-1 are now transferred from **GOLDEN REWARD MINING COMPANY** to **GOLDEN REWARD MINING COMPANY LIMITED PARTNERSHIP** on the appropriate records of your Department.

In order to expedite matters, we are sending a duplicate copy of this letter to you for your acknowledgment, and we ask you to date and sign it and return to the undersigned in the enclosed self-addressed stamped envelope.

Sincerely yours,

BENNETT & MAIN, P.C.
Attorneys for Golden Reward Mining Company

Max Main

Max Main

GUNDERSON, PALMER, GOODSELL & NELSON
Attorneys for Golden Reward Mining Company
Limited Partnership

James S. Nelson

James S. Nelson

RECEIPT

Receipt of the above Notice of Closing is hereby acknowledged, and Water Permits 1438-1, 1439-1, 1440-1, and 1447-1 are now transferred from **GOLDEN REWARD MINING COMPANY** to **GOLDEN REWARD MINING COMPANY LIMITED PARTNERSHIP** on the appropriate records of the Department of Environment and Natural Resources.

Dated this 9th day of October, 1992.

MM/ra
Encs. (2)

cc: Carol Koerner

John A. Lawson

James S. Nelson

Roxanne Giedd

Genny McMath
GENNY McMATH, Natural Resources Analyst



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

SEP 23 1998

1666-1

Golden Reward Mining Company, L.P.
%Tim Thomure
HC 37, Box 1020
Lead, SD 57754

Dear Mr. Thomure:

Enclosed is Water License No. 1666-1. This is the final water right document completing your process of obtaining a Water Right. Enclosed is Receipt No. 415861 in the amount of \$50.00 which you paid for the investigation and issuance of the Water License.

For your information SDCL 46-6-27 requires that if the owner of an existing well, such as the well authorized by Water Right No. 1666-1, constructs a replacement well and does not plan to use the old well, the old well is considered abandoned and must be plugged. Also, any well that is being used or is not considered abandoned must be valved and controlled, if flowing, or sealed and capped so that no leaking occurs either underground or at the surface.

As long as you use the water beneficially, as stated in the Water License, the State Water Laws provide that you have a continuing right to use the water. If you have any questions, please contact our office.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Program
(605) 773-3352

ks
enclosures

NOTE: The applicable portions of No. 1440-1, 1439-1 and 1438-1 have been incorporated into this Water License No. 1666-1.