

WATER PERMIT NO. 1880-1

Name of Applicant: **SD Science and Technology Authority**

Address: **630 E Summit St, Lead SD 57754** Phone: **605 722-8650**

Amount of Water Claimed: **7.78 cfs (3500 gpm)** Total Acres: **NA**

Source of Water Supply: **Homestake Mine**

Water to be used for: County: **Lawrence**

Type of Waste Disposal System:

Location:

PRIORITY Date Received: **2-26-07** Application/License Fee: **\$NA**

Corrected Application Received: Period of Annual Use: **January 1 – December 31**

Remarks: **Remove water from Homestake Mine**

Diversion Point:

Depth of Well:

Well Driller:

Remarks:

Type of Map: **plat**

Prepared by: **Robert A Reiling**

Reviewed and the Number Assigned on: **2-26-07**

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	(office use only) No. _____ Hydrologic Unit _____
	Basin _____
	Newspaper _____

RECEIVED
FEB 26 2007
WATER RIGHTS
PROGRAM

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

Check use(s) of water:

- | | | | |
|---|---|---|--|
| ☐ Municipal | ☐ Suburban Housing | ☐ Recreational | ☐ Institutional |
| ☐ Rural Water System | ☐ Commercial | ☐ Fish & Wildlife | ☐ Geothermal Heat |
| ☐ Domestic (over 18 gpm) | ☐ Industrial | ☒ Other | Remove water from Homestake mine |

Type of Application: (check one)

- ☒ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____
☐ Amendment/Correction to Permit No. _____

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.)

1. Name of Applicant South Dakota Science and Technology Authority Phone (605) 722-8650
(check one) ☐ Owner ☐ Tenant/lessee
Mailing Address 630 East Summit Street Lead _____ State SD 57754
(Street, RR, or Box and City) (Zip Code)
2. Amount of water claimed 7.78 *CFS or 3,500 **GPM ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)
3. Source of water supply pooled & inflow water in underground workings of the Homestake mine
4. Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) County Lawrence
Ross headframe SE1/4, NW1/4, SW1/4, SE1/4 Section 33, T5N, R3E, BHM
Diversion point is approximately 700' north & 800' west of the NE corner of Section 4, T4N, R3E, BHM
5. County or counties where water will be used Lawrence
6. Annual period during which water is to be used Continuous Jan 1 - Dec 31
7. Give a description of the 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)

See Attached

STATE OF SOUTH DAKOTA)

County of Lawrence) SS

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

I, David Snyder, the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Applicant's signature David Snyder

Subscribed and sworn to before me this 22nd day of February 20 07

Sileen J. Crossen
Notary Public signature

MY COMMISSION EXPIRES
JULY 3, 2009

7. Give a description of the project:

The purpose of the project is to remove accumulated and accumulating water from the underground portions of the former Homestake mine that is now owned by the South Dakota Science and Technology Authority. The property is being converted into an underground science laboratory.

Water will be discharged through a 12" pipe located in the Ross shaft. The water will be discharged into Gold Run Creek with a water discharge permit. Water will be pumped from the mine with a double series of 700hp 1,750 gpm pumps.

**SOUTH DAKOTA
WATER PERMIT NO. 1880-1**

Date of first receipt of application February 26, 2007.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 1880-1 to South Dakota Science & Technology Authority, 630 E Summit St, Lead SD 57754 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. 1880-1 appropriates 7.78 cubic feet of water per second from the underground portion of the former Homestake mine that is being converted into an underground science laboratory. The location of the point of diversion is the Ross headframe in the SW 1/4 SE 1/4 Section 33, T5N, R3E.
2. The water appropriated shall be used for the purpose of removing accumulated and accumulating water from the underground workings to allow lab activities to proceed and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 1880-1 is April 3, 2007.
5. The date from which applicant may claim right is February 26, 2007.
6. One-fifth of the construction is to be completed on or before October 3, 2009.
7. All construction is to be completed on or before April 3, 2012.
8. Water is to be put to beneficial use on or before April 3, 2016.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. South Dakota Science and Technology Authority shall report to the Chief Engineer annually the amount of water pumped.
2. Permit No. 1880-1 is subject to South Dakota Science and Technology Authority complying with a surface water discharge permit from the Department of Environment and Natural Resources.

WATER MANAGEMENT BOARD

By: Garland Erbele

Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

APR 04 2007

date



(type or print in ink)

1. Well Information - Proposed Construction

- a) Drill Hole Diameter N/A Depth _____
- b) Casing Type _____ Diameter _____ Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material _____
- f) Depth to Water (ground surface to water level) _____
- g) Distance to nearest existing domestic well:
On applicants property _____ On property owned by others _____

2. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System

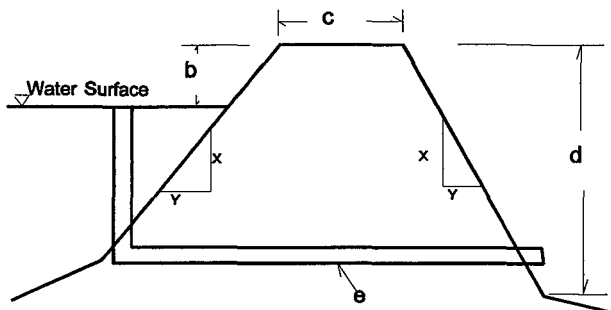
3. Dugout Information

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

4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to 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) Primary Outlet Capacity _____
If pipe, diameter _____
- f) Secondary Spillway Capacity _____
Spillway Width _____
- g) X & Y Slope _____
Upstream _____
Downstream _____
- h) Surface Area of Impoundment _____
- i) Storage _____ Acre Feet
- j) Drainage Area Above Dam _____ Acres



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 1880-1, South Dakota Science and Technology Authority**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 1880-1, South Dakota Science and Technology Authority, c/o David Snyder, 630 E. Summit Street, Lead SD 57754.

The Chief Engineer is recommending APPROVAL of Application No. 1880-1 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) it is in the public interest with the following qualifications:

1. South Dakota Science and Technology Authority shall report to the Chief Engineer annually the amount of water pumped.
2. Permit No. 1880-1 is subject to South Dakota Science and Technology Authority complying with a surface water discharge permit from the Department of Environment and Natural Resources.

See report on application for additional information.

Garland Erbele, Chief Engineer
March 8, 2007

WATER PERMIT APPLICATION NO. 1880-1
SD SCIENCE & TECHNOLOGY AUTHORITY
MARCH 5, 2007

Water Permit Application No. 1880-1 proposes to appropriate 7.78 cubic feet of water per second from the underground portion of the former Homestake mine that is now owned by the South Dakota Science and Technology Authority. The property is being converted into an underground science laboratory. The point of diversion water is the Ross headframe which is located in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 33, T5N-R3E, Lawrence County. The diversion is to remove accumulated and accumulating water from the underground workings to allow lab activities to proceed.

AQUIFER: Precambrian aged Crystalline Rock

GEOLOGY AND AQUIFER CHARACTERISTICS:

The Homestake Gold Mine is located in Precambrian rocks that are subdivided into three distinct units: Poorman, Homestake, and Ellison formations, listed from oldest to youngest. In general terms these formations represent a complex sequence of metamorphosed sedimentary rocks, Metaquartzite, metamorphosed carbonaceous shale and metamorphosed siltstone, (Redden, 1975). The rock underwent periods of deformation during the Precambrian age that resulted in complex fold patterns and developed shear zones. During the Tertiary period, the country rock in this area was intruded by igneous rock, which resulted in a brittle phase of deformation. The features this brittle deformation produced influence the infiltration of water into the crystalline rock aquifer. The workings associated with underground mining have intersected these fracture systems. The Homestake mine was mined for over 120 years with a large infrastructure. While the mine was active the workings required dewatering. The total groundwater inflow in the underground workings and the Open Cut from all levels is documented at 700 gallons per minute (gpm) (Knight Piesold, 2001). Upon cessation of dewatering of the underground workings, the mine began to flood. This application proposes to pump water from the flooded workings at a rate of 7.78 cfs (3,500 gpm). The water will be discharged into Gold Run Creek with a water discharge permit. Once the underground workings are dewatered to the desired extent, the pump rate will decrease.

WATER AVAILABILITY:

The Precambrian rock aquifer can be characterized as having low permeability and porosity therefore the amount of water in storage in the aquifer is relatively small and the aquifer has a limited ability to yield water. There probably are many unconnected series of fractures rather than a single connected series of fractures in this area. This is evident from the fact that shallow wells, (e.g. total depth less than 100 feet) are located in the immediate vicinity of underground workings that at one time was dewatered to 8,000 feet. Well Completion Reports on file with the Water Rights Program indicating that the wells in the area have depths ranging from 22' to over 1,000' (Water Rights, 2007b) provide additional support to the idea that the aquifer does not consist of a single fracture series. The Water Rights Program does not monitor any observation wells completed into the aquifer in this area and historic water levels are not available. Dewatering was a constant over a long enough time

period that the water levels with the mine dewatered can probably be considered the “norm” for the area.

Although the average annual recharge to the aquifer has not been quantified and the average water use has not been estimated; it is still possible to consider unappropriated water available for this appropriation. Water availability is obvious due to the simple fact that during the operation of the mine, dewatering was necessary, presumably at a rate of 700 gpm. The Water Rights Program has no record of problems with wells or other water users that can be attributed to the mine dewatering during the long history of the operation of the mine.

Cessation of mine dewatering at the Homestake mine is resulting in the flooding of the underground workings. It is estimated that the water level would reach the bottom of the Open Cut within 35-40 years, and the highest estimated level of flooding would be expected in 75-90 years if no dewatering occurred (Knight Piesold, 2001). The water level at its highest elevation probably represents pre-mining/dewatering water levels. It is possible that as the mine floods, fracture systems that have been dewatered for years may become available to supply water to future wells. This increased available/accessible water is likely to only occur only within a short distance from the dewatered workings.

Since there were no known cases of wells being affected by the dewatering of the Homestake Mine in the past, the dewatered state of the area can be considered the norm. Geographic areas that were naturally “dry” and areas that had been dewatered due to mining activities were/are indistinguishable. A limited number of wells have been completed in the vicinity of the underground workings since the cessation of mine dewatering. Although it is possible these wells may obtain water from fractures that would be dewatered as a result of this appropriation, it is unlikely.

EXISTING WATER RIGHTS:

There are only 11 Water Rights/Permits appropriating water from the crystalline rock within about a five mile radius of the Ross Shaft (Water Rights Program, 2007a), see table 1.

PERMIT NO	NAME	USE	CFS
301-1	BLACK HILLS CHAIR LIFT CO	COM	0.02
1648-1	LARRYJACOBS	COM	0.02
1675-1	BLACK HILLS GAME LODGE	COM	0.04
1366-1	WILD BILL'S CAMPGROUND	COM	0.07
1365-1	WHARF RESOURCES (USA) INC	IND	0.16
1848-1	MAITLAND PARTNERS	SHD	0.20
1421-1	BROHM MINING CORPORATION	IND	0.33
1372-1	BOND GOLD RICHMOND HILL	IND	0.89
565-1*	BLACK HILLS CORPORATION	IND	1.33
1666-1	GOLDEN REWARD MINING CO	IND	1.83
301A-1*	BLACK HILLS CHAIR LIFT CO	COM	2.13

* source of water is abandoned mine workings

Table 1. Water Rights/Permits within approximately five miles of the Ross Shaft.

The Homestake Mine has a footprint of approximately two miles by four miles (Mike Cepak, Per. Comm., March 7, 2007). Only two of these Water Rights (No. 565-1 and 1648-1) are within this area.

In addition to the appropriative rights listed above, there are a number of domestic wells in this area that are supplied by the Precambrian aged aquifer (Water Rights Program, 2007b). South Dakota Water Law provides protection to these wells through SDCL 46-6-24 which states:

“The failure of a well to meet standards established pursuant to § 46-6-6.1 is not a defense in any action or proceeding regarding damage, loss of water production or quality, replacement cost, or increased operating expenses incurred by a municipal or domestic use well located in a formation older than or stratigraphically lower than the greenhorn formation caused by any person using or withdrawing groundwater for mine dewatering in a formation older than or stratigraphically lower than the greenhorn formation.”

In other words, the liability for damages to domestic and municipal wells in the case of this mine dewatering, is without regard to the damaged wells being “adequate”. Pursuant to SDCL 46-6-25, Section 46-6-24 is enforceable in circuit court.

Since there were no known cases of wells being affected by the dewatering of the Homestake Mine in the past, the dewatered state of the area can be considered the norm. Geographic areas that were naturally “dry” and areas that had been dewatered due to mining activities were/are indistinguishable. A limited number of wells have been completed in the vicinity of the underground workings since the cessation of mine dewatering. Although it is possible they may obtain their water from fractures that would be dewatered as a result of this appropriation, it is unlikely.

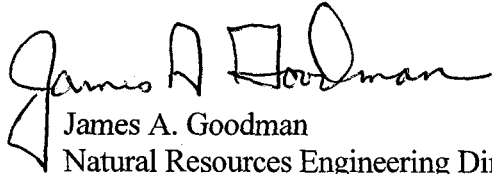
CONCLUSIONS:

1. This application proposes to appropriate 7.78 cfs from the underground portions of the Homestake mine. Once the underground workings are dewatered to the desired extent, the pump rate will decrease.
2. The Homestake mine is situated in the Precambrian aged crystalline rock aquifer.
3. Historically, Homestake dewatered the mine at a rate of 700 gpm. All Available data indicate this rate should serve to stabilize the groundwater levels in the mine.
4. Interference with wells is not expected to be an issue.
5. South Dakota Water Law provides protection to area domestic and municipal wells without requiring them to be “adequate wells”
6. The Water Rights Program is not aware of any damages to wells that were the result of mine dewatering that has historically taken place at the Homestake Mine.
7. The water will be discharged into Gold Run Creek with a water discharge permit.



Ken Buhler
Natural Resources Engineering Specialist

approved by



James A. Goodman
Natural Resources Engineering Director

REFERENCES:

Knight Piesold, 2001, Homestake Mine Evaluation of Closure of the Open Cut Final Report, Prepared for Homestake Mining Company, Project 1690E/A100, 36 p.

Redden, J.A., 1975, Precambrian Geology of the Black Hills, in Mineral and Water Resources of South Dakota, Committee of Interior and Insular Affairs, United States Senate, p.26

Water Rights Program, 2006a, Water Permit/Right Files, DENR-Water Rights Program, Joe Foss Building, Pierre, SD 57501

Water Rights Program, 2006b, Well Completion Report Files, DENR-Water Rights Program, Joe Foss Building, Pierre, SD 57501

AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA
COUNTY OF LAWRENCE

RECEIVED
MAR 30 2007
WATER RIGHTS
PROGRAM

Teri Adler, being duly sworn, says: That the *Lawrence County Journal* is, and during all times hereafter mentioned, was a legal newspaper as defined in SDCL 17-2-2, as amended, published at Spearfish, Lawrence County, South Dakota, by Lee Enterprises; that affidavit is and, during all of said times, was employed as Customer Service Representative by the publisher of such newspaper and has personal knowledge of the facts stated in the affidavit; that the notice, order or advertisement, a printed copy of which is attached, was published in said newspaper for successive issues, bearing the following dates:

March 17,	2007	200
March 24,	2007	200
	200	200
	200	200
	200	200

that the full amount of the fee charged for publishing the same, to-wit, the sum of \$ 41.60, insures solely to the benefit of the publisher of said newspaper: that no agreement or understanding for the division of the fee has been made with any person, and that no part of the fee has been agreed to be paid to any other person.

Teri Adler
Customer Service Rep

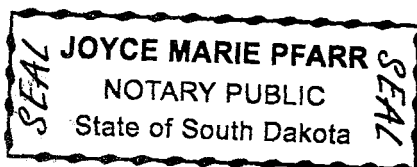
Subscribed and sworn to before me this

28th day of March, 2007

Joyce Marie Pfarr

My commission expires. 08/14/2012

Notary Public, South Dakota



Account No. 6009800

Total Amount \$41.60

**NOTICE OF APPLICATION NO.
1880-1 to Appropriate Water**

Notice is given that South Dakota Science and Technology Authority, c/o David Shyder, 630 E Summit St., Lead SD 57754 has filed an application for a water permit to appropriate 7.78 cubic feet of water per second from the underground portion of the former Homestake mine that is being converted into an underground science laboratory. The location of the point of diversion is the Ross headframe in the SW 1/4 SE 1/4 Section 33, T5N, R3E. The diversion is to remove accumulated and accumulating water from the underground working to allow lab activities to proceed. Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1880-1 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on these applications, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition. Any person interested in opposing or supporting this application or recommendations must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by April 3, 2007. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



March 9, 2007

Lawrence County Journal
376 Main St Suite A
Deadwood, SD 57732

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application No. 1880-1 to Appropriate Water to be published twice. Please publish the first notice on March 17, 2007 with the second publication 7 days later. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

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 South Dakota Science and Technology Authority, 630 E Summit St, Lead, SD 57754 (Ph # 605-722-8650).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

No. 1880-1

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

Date _____

We are in receipt of your letter of March 9, 2007 enclosing Notice to Appropriate Water by Application No. 1880-1 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

PMB 2020
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523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

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

March 9, 2007

DAVID SNYDER
SOUTH DAKOTA SCIENCE AND TECHNOLOGY AUTHORITY
630 E SUMMIT ST
LEAD SD 57754

Dear Mr. Snyder:

Water Permit Application No. 1880-1 for removal accumulated and accumulating water from the former Homestake mine has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Publisher of the Lawrence County Journal printed at Deadwood, SD (Ph # 605-578-3305). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendations of the Chief Engineer and reports on the applications are enclosed. 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 Notices and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization, the publisher has been instructed to publish your notice once each week for two consecutive weeks. The newspaper has also been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the applications.

Sincerely,

Eric Gronlund
Natural Resources Engineer
(605) 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.

Instruction to Newspaper - Publish first Notice on March 17, 2007 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 1880-1 to Appropriate Water

Notice is given that South Dakota Science and Technology Authority, c/o David Snyder, 630 E Summit St., Lead SD 57754 has filed an application for a water permit to appropriate 7.78 cubic feet of water per second from the underground portion of the former Homestake mine that is being converted into an underground science laboratory. The location of the point of diversion is the Ross headframe in the SW ¼ SE ¼ Section 33, T5N, R3E. The diversion is to remove accumulated and accumulating water from the underground working to allow lab activities to proceed.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 1880-1 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on these applications, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider this application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendations must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by April 3, 2007.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.



DEPARTMENT of ENVIRONMENT
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APR 04 2007

SOUTH DAKOTA SCIENCE & TECHNOLOGY AUTHORITY
630 E SUMMIT ST
LEAD SD 57754

Dear Sirs:

Enclosed is Water Permit No. 1880-1 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 1880-1

I have this day, September 5, 2017 made a thorough examination of the water use system constructed by SD Science and Technology Authority, 630 East Summit St., Lead, SD 57754 of Permit No. 1880-1, bearing the priority of 2/26/2007 authorizing 7.78 cu. ft. per second water from the underground portion of the former Homestake mine for industrial purposes in Lawrence County.

Inspection contact & relationship to permit holder, if applicable:

Tim Baumgartner, Facility Infrastructure Director
John Scheetz, Environmental Manager
Ken Noren, Water Treatment Plant Director
605-722-6042

A. Works used to divert water and transport to beneficial use:

A series of pumps located in the underground portion of the former Homestake mine are used to maintain water levels at or below the 5900 ft. level to provide effective dewatering for the Sanford Underground Laboratory. A Centrilift 500 hp submersible pump is located in the #6 Winze at the 6700 ft. level and pumps to a sump located at the 5000 ft. level. A series of four Ingersoll Rand 700 hp pumps then pump from sumps located at the 5000 ft., 3650 ft., 2450 ft. and 1250 ft. levels and discharge at the surface in the Ross Shaft headframe. **The pumps have a 1,500 gpm capacity.** From the Ross Shaft headframe the water is transported to the Mill Reservoir Surge Tank where it is mixed with surface water from the Grizzly Gulch tailing impoundment. Combined flows from the Mill Reservoir gravity feed to the water treatment plant and are subsequently discharged to Gold Run Creek after treatment. The pumps used for dewatering pump intermittently and typically operate during electrical off-peak hours (evenings, weekends and holidays). Dewatering of the mine began in July 2008 and volume pumped annually has ranged from 819 acre-feet in 2016 to 1,735 acre-feet in 2009. Discharge to Gold Run Creek has ranged between 850 gpm and 1,250 gpm (monthly ave.) over the last 5 years. Average inflow to the mine varies with precipitation and pool level. The average inflow between 2008 and 2015 was 663 gpm. Initially the dewatering operation involved two 700 hp pumps at each of the four sump locations, but over time pumps were removed and used as replacements in order to maintain a single operating pump at each level.

B. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Yes
list any extended period of nonuse: none
- 2) Exceptions to compliance are: none

C. Condition and Location:

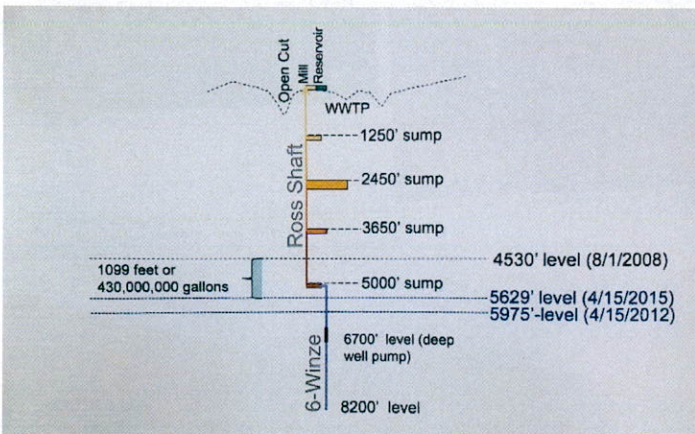
1. The system is in good condition. Diversion point is located as follows:
Ross Shaft headframe
735' N and 2,165' W of SE corner Section 33 T5N R3E (44.346417, -103.757636).
2. The works are capable of diverting and conveying to the place of use **3.34** cu. ft. per second (**1,500 gpm**) of water which is used for **industrial** use and the license should be issued for **3.34 cfs**.
3. All structures, wells and lands on map Yes

D. Comments or other permit(s) associated with the project: none



Steven Quissell
Water Rights Inspector
DENR Water Rights Program

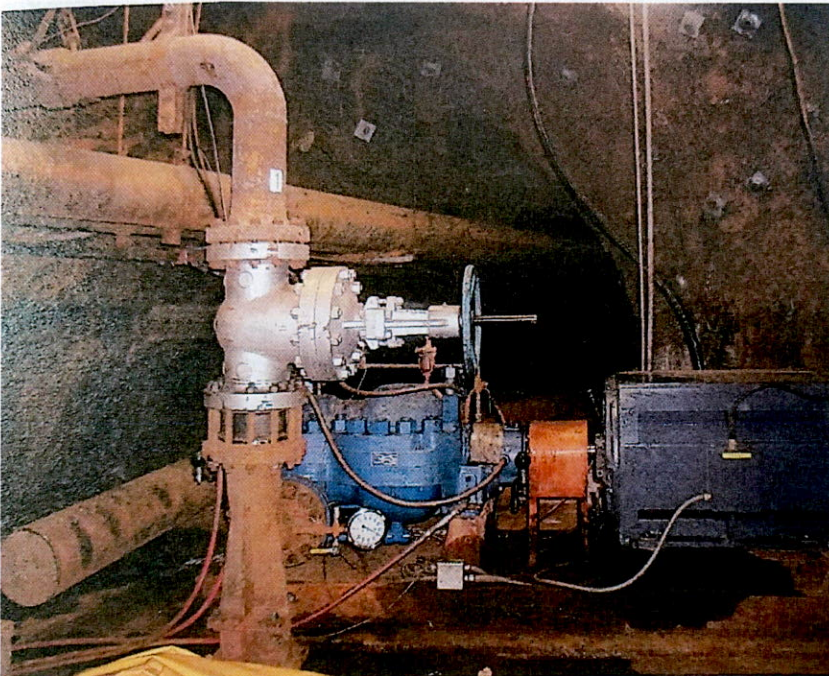
Date Report Completed: September 13, 2017



Dewatering schematic



Discharge to Gold Run Creek



700 horsepower Ingersoll Rand pump

Sec 29
T005N
R03E

Sec 28
T005N
R03E

Water Right No. 1880-1
South Dakota Science and Technology Authority
September 5, 2017

Sec 27
T005N
R03E

Sec 26
T005N
R03E

Sec 32
T005N
R03E

Sec 33
T005N
R03E

Mill Reservoir Surge Tank

Gold Run Creek

Discharge to Gold Run Creek
Lat: 44.354668 Lon: -103.743454

Water Treatment Plant

Sec 34
T005N
R03E

Sec 35
T005N
R03E

Ross headframe
Lat: 44.346417 Lon: -103.757636

Ross headframe
735'

2,165'

Steven Quissell
Water Rights Inspector
DENR Water Rights Program



Sec 4
T004N
R03E

Sec 3
T004N
R03E

Sec 2
T004N
R03E

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroX, GeoEye, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

NOV 08 2017

1880-1

Tim Baumgartner
Facility Infrastructure Director
SD Science & Technology Authority
630 E. Summit St
Lead SD 57754

Dear Mr. Baumgartner:

Enclosed is Water License No. 1880-1. This is the final water right document completing your process of obtaining a Water Right. Included with your license is a map prepared by the staff engineer who conducted the field investigation.

As long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeanne Goodman', is written over a horizontal line.

Jeanne Goodman, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 1880-1

(1) SD Science and Technology Authority, 630 E Summit Street, Lead SD 57754 made Application No. 1880-1, February 26, 2007 for a water permit to divert 7.78 cubic feet of water per second from the underground portion of the former Homestake Mine, Lawrence County, South Dakota for industrial purposes. Permit No. 1880-1, with a priority date of February 26, 2007 was approved April 3, 2007 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before April 3, 2012 and for the application to beneficial use of said water on or before April 3, 2016.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the water supply system and is entitled to divert 3.34 cubic feet of water per second for beneficial use. The location of the diversion point is:

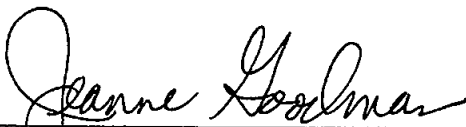
- **Ross Shaft headframe** located in the SW $\frac{1}{4}$ SE $1\frac{1}{4}$, 735' N and 2,165' W of the SE corner of Section 33, T5N, R3E (44.346417, -103.757636).

(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use. A series of pumps located in the underground portion of the former Homestake mine are used to maintain water levels at or below the 5900 ft. level to provide effective dewatering for the Sanford Underground Laboratory.

(4) Pursuant to South Dakota Water Law 46-5-30.1 SD Science and Technology Authority, 630 E Summit Street, Lead SD 57754 the holder and/or owner of Water Right No. 1880-1 is issued a license to appropriate water, the right to use 3.34 cubic feet of water per second from the underground portion of the former Homestake Mine with a priority date of February 26, 2007 from the location specified in (2) of this license for industrial purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 1880-1 and subject to the following qualifications:

- South Dakota Science and Technology Authority shall report to the Chief Engineer annually the amount of water pumped.
- Water Right No. 1880-1 is subject to South Dakota Science and Technology Authority complying with a surface water discharge permit from the Department of Environment and Natural Resources.



Jeanne Goodman, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

NOV 08 2017
date



LINE TABLE

LINE	BEARING	DISTANCE
L1	N22°52'52"W	83.77
L2	N88°37'55"E	202.92
L3	S27°08'05"W	364.97
L4	N17°07'03"E	71.25
L5	N41°20'52"W	5.87
L6	N31°08'40"W	42.86
L7	S78°21'50"E	247.19
L8	N39°25'34"E	529.51
L9	S87°19'14"W	347.44
L10	N64°53'07"E	641.11
L11	S64°53'07"W	669.16
L12	N67°19'14"W	247.44
L13	S39°25'34"W	529.51
L14	N78°21'50"E	247.19
L15	S31°08'40"E	42.86
L16	S41°20'52"E	254.45
L17	S88°37'55"E	202.92
L18	S27°08'05"E	369.77
L19	N00°51'02"W	106.93
L20	S17°07'03"E	903.99
L21	S34°07'28"E	172.10
L22	N07°59'01"W	754.88
L23	N83°09'35"E	254.16
L24	S22°09'41"E	397.00
L25	S13°02'19"W	36.35
L26	S15°32'05"E	202.35
L27	S04°11'57"W	12.92
L28	S11°03'58"W	64.23
L29	N55°15'31"W	71.78
L30	N54°46'51"E	24.01
L31	N55°04'32"E	285.79
L32	N55°28'10"E	25.27
L33	N55°28'10"E	25.27
L34	N55°15'31"W	71.61
L35	N34°46'51"E	24.01
L36	N15°14'52"E	26.35
L37	N68°51'08"W	0.86
L38	N68°51'08"W	0.86
L39	N61°51'18"E	86.00
L40	N19°35'08"E	136.57
L41	N10°00'00"E	265.91
L42	N39°13'00"W	765.17
L43	S63°13'39"W	14.89
L44	N85°57'13"E	9.45
L45	N17°18'09"W	234.83
L46	N86°57'05"E	16.92
L47	N15°00'00"E	36.09
L48	N85°59'23"E	202.37
L49	N85°22'53"E	80.90
L50	N05°36'09"W	106.07
L51	N19°10'07"W	19.13
L52	N01°15'45"E	133.33
L53	S05°58'30"W	86.55
L54	N04°07'11"E	20.00
L55	S85°59'30"W	85.87
L56	N04°54'14"E	19.46
L57	N88°38'50"E	8.85
L58	N21°43'00"E	200.34
L59	N01°36'18"E	74.76
L60	S01°37'24"E	78.44
L61	S21°41'14"E	123.10
L62	N70°38'49"E	48.35
L63	S21°41'29"E	97.82
L64	S31°47'32"E	31.36
L65	S03°13'44"E	36.97
L66	S06°16'42"E	111.68
L67	S21°30'00"E	171.68
L68	S66°30'34"W	223.71
L69	N88°08'24"E	118.24
L70	N18°58'44"W	118.24
L71	S04°01'01"W	91.83

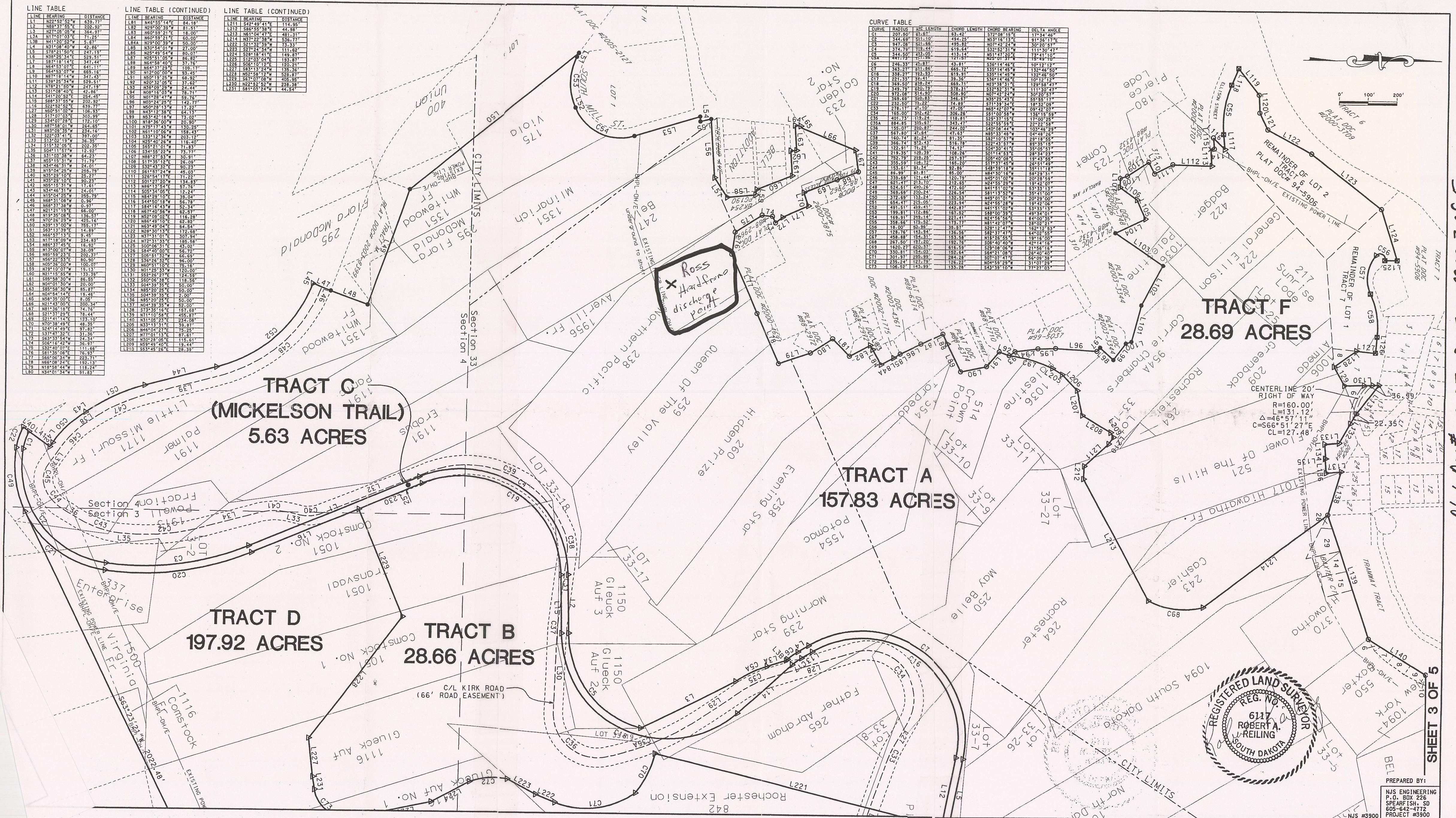
LINE TABLE (CONTINUED)

LINE	BEARING	DISTANCE
L72	N42°52'44"E	84.15
L73	N29°00'59"E	81.51
L74	N60°59'21"E	18.00
L75	N00°59'11"E	44.88
L76	N29°00'59"E	50.00
L77	N30°54'01"W	27.00
L78	N58°09'41"E	80.71
L79	N25°51'08"E	86.82
L80	N58°40'40"E	37.76
L81	N04°19'23"E	109.17
L82	N12°00'00"W	93.45
L83	N58°09'28"E	24.44
L84	N20°32'05"E	37.62
L85	N58°09'28"E	24.44
L86	N01°16'03"W	78.71
L87	N01°28'47"W	59.78
L88	N51°27'25"E	142.77
L89	N50°28'15"E	17.22
L90	N43°12'36"E	64.13
L91	N51°42'13"E	71.02
L92	N18°36'00"W	20.90
L93	N75°17'43"W	130.25
L94	N61°10'09"W	158.43
L95	S33°12'36"E	203.12
L96	N23°40'28"W	116.40
L97	S65°21'01"W	71.83
L98	S34°58'28"W	73.77
L99	S61°15'25"E	90.23
L100	S11°35'32"E	124.03
L101	S11°35'32"E	26.02
L102	S34°32'32"E	90.23
L103	S61°15'25"E	90.23
L104	S11°35'32"E	124.03
L105	S65°21'01"W	71.82
L106	S11°35'32"E	134.83
L107	N81°15'45"E	57.10
L108	N14°50'34"E	12.24
L109	N61°10'09"W	158.43
L110	S44°50'10"W	86.78
L111	S84°10'43"E	52.34
L112	N61°10'09"E	158.43
L113	N52°09'02"E	116.28
L114	N68°51'08"E	86.00
L115	N68°51'08"E	86.00
L116	N61°51'18"E	86.00
L117	N19°35'08"E	136.57
L118	N10°00'00"E	265.91
L119	N39°13'00"W	765.17
L120	S63°13'39"W	14.89
L121	N85°57'13"E	9.45
L122	N17°18'09"W	234.83
L123	N86°57'05"E	16.92
L124	N15°00'00"E	36.09
L125	N85°59'23"E	202.37
L126	N85°22'53"E	80.90
L127	N05°36'09"W	106.07
L128	N19°10'07"W	19.13
L129	N01°15'45"E	133.33
L130	S05°58'30"W	86.55
L131	N04°07'11"E	20.00
L132	S85°59'30"W	85.87
L133	N04°54'14"E	19.46
L134	N88°38'50"E	8.85
L135	N21°43'00"E	200.34
L136	N01°36'18"E	74.76
L137	S01°37'24"E	78.44
L138	S21°41'14"E	123.10
L139	N70°38'49"E	48.35
L140	S21°41'29"E	97.82
L141	S31°47'32"E	31.36
L142	S03°13'44"E	36.97
L143	S06°16'42"E	111.68
L144	S21°30'00"E	171.68
L145	S66°30'34"W	223.71
L146	N88°08'24"E	118.24
L147	N18°58'44"W	118.24
L148	S04°01'01"W	91.83

LINE TABLE (CONTINUED)

LINE	BEARING	DISTANCE
L149	S42°49'41"E	114.95
L150	S48°55'38"E	44.88
L151	N61°04'47"E	481.31
L152	N31°22'38"W	536.77
L153	S21°42'24"W	73.33
L154	S27°24'54"W	111.62
L155	S28°18'41"E	149.87
L156	S12°03'04"E	193.87
L157	S06°10'12"E	120.21
L158	S81°15'24"W	135.36
L159	N52°58'12"W	528.87
L160	S87°07'08"W	405.95
L161	N22°42'52"W	338.38
L162	S81°03'24"W	44.84

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	207.80	61.87	63.42	S72°08'15"E	17°34'46"
C2	344.69	511.10	494.25	N53°16'13"E	81°36'17"
C3	347.08	501.66	493.82	N07°42'24"W	30°20'51"
C4	374.79	728.44	619.64	S32°52'31"W	111°30'47"
C5	368.50	818.24	688.71	N63°38'31"E	19°58'27"
C6	246.33	42.87	43.81	S36°14'46"E	10°12'12"
C7	338.27	733.93	668.12	S35°14'45"W	13°24'50"
C8	338.27	733.93	668.12	S35°14'45"W	13°24'50"
C9	221.35	394.47	39.36	S36°14'46"E	10°12'12"
C10	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C11	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C12	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C13	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C14	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C15	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C16	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C17	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C18	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C19	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C20	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C21	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C22	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C23	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C24	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C25	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C26	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C27	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C28	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C29	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C30	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C31	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C32	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C33	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C34	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C35	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C36	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C37	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C38	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C39	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C40	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C41	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C42	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C43	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C44	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C45	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C46	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C47	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C48	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C49	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C50	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C51	349.78	610.78	578.31	S32°52'31"W	111°30'47"
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C57	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C58	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C59	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C60	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C61	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C62	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C63	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C64	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C65	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C66	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C67	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C68	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C69	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C70	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C71	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C72	349.78	610.78	578.31	S32°52'31"W	111°30'47"
C73	349.78	610.78	578.31	S32°52'31"W	111°30'47"



Plat Doc# 2005-8217 page 3 of 5

SHEET 3 OF 5

1880-1