SUMMARY OF
THE MINING INDUSTRY IN SOUTH DAKOTA

1996

Protecting South Dakota's Tomorrow… Today

PREPARED BY
THE MINERALS AND MINING PROGRAM
SD DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
MARCH 1997

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INTRODUCTION

The Department of Environment and Natural Resources is required by state law to prepare a "Summary of the Large Scale Gold Surface Mining Industry in the Black Hills" and a "Publication of Surface Mined Disturbed Land and Reclamation Acreages under Chapter 45-6B." These two reports have been combined into a single report entitled "Status of the Mining Industry in South Dakota." This report covers mining activities from January 1 to December 31, 1996. The information in this report is based on mine operators' annual reports and other information submitted by permitted large and small scale mine operators.

1996 Summary

The large scale gold mines continued to make progress in 1996 toward reclaiming 500 acres of surface mining disturbed land that must be completed by September 1, 1997. At years end, approximately 432 of the 1,623 acres of surface mining disturbed land have been reclaimed to date as defined in SDCL 45-6B-90. Also, about 487 of the 2,095 acres of affected land have been reclaimed and can be considered for reclamation credit as defined in SDCL 45-6B-97.

Current projections based on field reviews are that the large scale gold mines will reach the 500-acre reclamation requirement before the September 1, 1997 deadline. Several large reclamation projects should be completed by the end of summer 1997. LAC Minerals will complete reclamation on about 40 acres of the leach pad area. Golden Reward will reclaim about 27 acres of the Hannibal Pit area. Wharf Resources will reclaim about 12 acres of a recently completed buckwall in the Reliance Waste Rock Repository and the Ross Valley Spent Ore Dump.

The department approved a closure plan for the leach pad area at the Richmond Hill Mine in June 1996. Shortly after, LAC Minerals began placing a capping system over the three leach pads. The capping system will be completed in 1997. LAC also continued to treat acid runoff in the Spruce Gulch area. No problems were noted at the pit impoundment in its first full season of operation, and the cap appears to be performing better than expected.

Brohm Mining was issued a new mine permit on January 26, 1996 to mine the Anchor Hill area just north of the present Gilt Edge Mine. Shortly after the permit was issued, Brohm began Phase I of the operation. This phase will be completed in the early part of 1997. Phase II will begin after an environmental impact statement is issued by the US Forest Service. Meanwhile, acid rock drainage mitigation continues at the mine.

\S/

Nettie H. Myers
Secretary

SUMMARY OF THE LARGE SCALE GOLD MINING INDUSTRY IN THE BLACK HILLS

1996

Photo 1.1 - Reclaimed pit impoundment and Spruce Gulch area at Richmond Hill Mine

MAJOR EVENTS IN 1996

Gold Mines Near 500-Acre Reclamation Goal

The large scale gold mines made substantial progress in 1996 toward reclaiming 500 acres of surface mined disturbed land. In accordance with SDCL 45-6B-90, if 500 acres of surface mining disturbed land attributed to large scale gold surface mining are not reclaimed by September 1, 1997, no new permits or amendments to existing permits for any large scale gold mining operation can be issued. As of December 31, 1996, about 432 acres of surface mining disturbed land have been reclaimed. This is an increase of 129 acres over the 1995 total of 303 acres and leaves a total of 68 acres that need to be reclaimed by September 1, 1997.

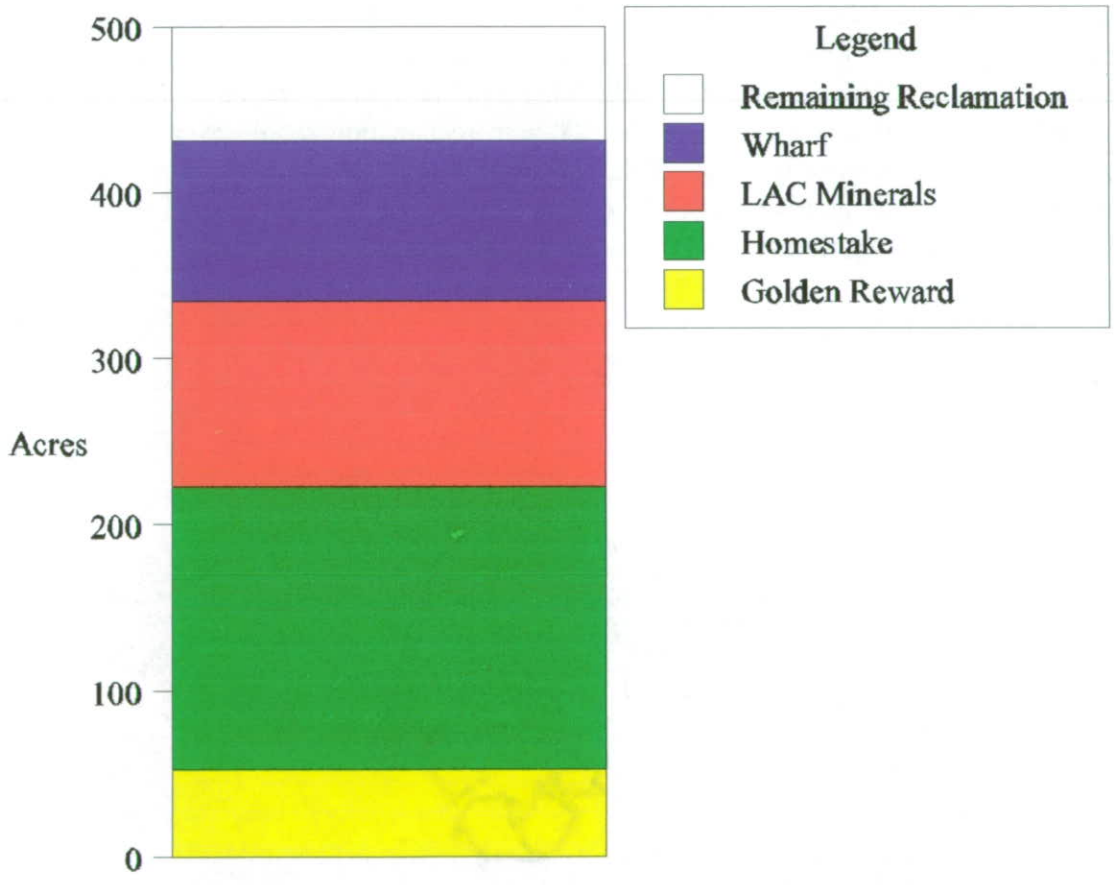

Figure 1.1 Status of 500-acre reclamation goal as of December 31, 1996

It appears that the gold mines will complete reclamation of the remaining 68 acres of surface mining disturbed land before September 1, 1997, based on field reviews and inspections. The following table lists reclaimed areas that will probably meet the 500-acre reclamation requirements by the summer of 1997:

Table 1.1 - Projected Reclamation Areas to be Completed by September 1, 1997

Mine	Area	Acres
Golden Reward	Hannibal Pit	27
	Other (Pit Benches, Waste Rock Depository Slopes)	19
LAC Minerals	Leach Pads	40
Wharf Resources	Reliance Waste Rock Depository & Ross Valley Spent Ore Dump	12
Total		98

In June 1997, the department will conduct an inspection to confirm the total amount of surface mining disturbed land that has been reclaimed. If the department finds that the reclamation requirements listed in SDCL 45-6B-90 have been met on 500 or more acres of surface mining disturbed land, a review of the existing standards will be conducted by the Board of Minerals and Environment. The board has tentatively scheduled a public hearing for July 1997, in the northern Black Hills to tour the areas that meet the 500-acre reclamation requirements and to conduct a reclamation standards review hearing. If the board finds that the current reclamation standards are inadequate, revisions to the rules and/or new legislation may be needed. Rules hearings would be conducted and/or new legislation would be drafted in the fall of 1997.

Photo 1.2 - Reclaimed top portion of Homestake's East Waste Rock Depository

Photo 1.3 - Transplanted shrubs in Golden Reward reclaimed area

Acid Mine Drainage Mitigation Update

LAC Minerals/Richmond Hill Mine

LAC Minerals nearly completed reclamation of the leach pad area at the Richmond Hill Mine in 1996. The department approved LAC's plan to cap the three leach pads in June 1996. The purpose of the caps is to reduce infiltration through the spent ore on the leach pads which will reduce the amount of runoff needing treatment. During the summer and fall of 1996, LAC began placing capping systems over the three leach pads. The cap design is similar to the cap placed over the pit impoundment. The only difference is that a 12-inch low permeable layer was used instead of an 18-inch layer. By the end of 1996, LAC completed most of the capping system in this area. The remainder of the capping systems, including final seeding, will be completed in 1997.

Non-acid generating material for the capping system was obtained from a v-notch cut to the west of Pad 3. The v-notch cut was constructed so that surface water could be diverted away from the French drain under Pad 3. Since the French drain was constructed from acid generating waste rock it also had to be sealed.

The pit impoundment performed well during its first full season of operation in 1996. No major problems were noted at the impoundment. LAC personnel monitored the pit impoundment throughout the year. All monitoring systems were in place and functional. No signs of settling or slumping were found during several department inspections of the impoundment. Only minor erosion was noted. Based on monitoring information submitted to the department in February 1997, it appears that the cap is working better than expected.

Photo 1.4 - Mountain goat on LAC Minerals' reclaimed pit impoundment (photo courtesy of Schafer & Associates)

Brohm Mining Company/Gilt Edge Mine

Brohm backfilled portions of the Sunday and Dakota Maid Pits in 1996. Non-acid generating waste rock was used to backfill the southwest corner of the Sunday Pit and the northwest corner of the Dakota Maid Pit. These backfilled areas were then topsoiled and seeded. Since these two areas had potential for acid generation before backfilling, the department will monitor these areas for signs of acid generation. Brohm will be required to submit a mitigation plan that may include capping if acid generation becomes a problem.

Brohm continued to collect and treat acidic water generated at the mine in 1996. The water treatment plant continued to treat water through most of the year, although the plant was shut down for maintenance from August through October. During this time, Brohm researched evaporating acidic water in the Sunday Pit in an effort to reduce the amount of acidic water in the pit. The Strawberry Acid Drainage Collection Pond and pump-back system was completed in the early part of 1996. Brohm also constructed the Ruby Seepage Collection Pond and pump-back system in the summer of 1996. These ponds collect acidic seepage from the mine which is pumped to the treatment plant.

There was a release of acidic water into Strawberry Creek on November 11, 1996. This discharge was caused by a pump that shorted out and a rubber seal in a pipe connection that failed. This allowed a collection pond to overflow into Strawberry Creek. Brohm discovered the release and took quick action to stop it and treat the water downstream in Strawberry Creek. The release may have resulted in a small fish kill in Bear Butte Creek downstream from the mine. Since the discharge, Brohm has taken several measures to prevent an recurrence. The rubber pipe seals have been replaced with stainless steel seals that are more resistant to acid water. New wiring has been

connected to the pump to prevent future shorting and to allow the pump to operate as the pond fills.

New Permits

The Board of Minerals and Environment unanimously approved Brohm Mining's application for the Anchor Hill Project (Mine Permit No. 462) on January 26, 1996. Brohm is conducting the project in two phases. Phase I, which is on private land, will be completed in the spring of 1997. Phase II, which includes US Forest Service lands, will begin in late spring 1997 after the final environmental impact statement is issued by the US Forest Service. Before the start of Phase II, the state permit will be reassessed to determine if any additional safeguards need to be applied to address any identified problems that may result from potential acid generating material from Phase II. About 145 acres will be disturbed during the life of the project.

Wharf Resources submitted a permit application for its proposed Clinton Project north and east of the present Annie Creek mine on November 6, 1996. Wharf will mine two pits in phases during the ten-year life of the project. By mining in phases, Wharf will be able to reclaim one pit while it is mining the other pit. The Portland Pit will be mined first and will be backfilled after mining is completed. The Trojan Pit will be mined in three phases and portions of the pit will be backfilled. Waste rock from the Trojan Pit will be used to encapsulate the historic Bald Mountain Tailings area. Ore from the Clinton Project will be processed at the existing facilities at the Wharf Mine covered under Permit Numbers 356, 434, and 435.

Permit Amendments

The department approved a permit amendment for Wharf Resources on March 4, 1996. This permit amendment allowed Wharf to stockpile and process ore and waste rock generated from the Terry Peak Road (State Highway 473) Improvement project near the Wharf Mine. The South Dakota Department of Transportation highway improvement project was located outside the Wharf permit boundary and was not considered a mining project. However, Wharf did most of the work under the Department of Transportation's direction due to safety concerns over underground workings in the project area. The project was started in the summer and was completed in the fall of 1996.

Golden Reward Mine Placed In Temporary Cessation

Mining operations at the Golden Reward Mine were placed under temporary cessation on December 15, 1996. Golden Reward was required by state law to place the operation under temporary cessation because mining and ore processing was temporarily halted. The temporary cessation designation will allow Mine Permit No. 450 to remain in effect while Golden Reward

resolves land ownership issues and completes permitting of additional reserves in the vicinity of the current mine. The period of temporary cessation will remain in effect until December 15, 2001 unless Golden Reward resumes operations. If operations do not resume by December 15, 2001 or, if the Board of Minerals and Environment does not grant a five-year extension, Golden Reward will be required to reclaim the mine site in accordance with its reclamation plan.

Notices of Violation

The department issued no Notices of Violation to large scale gold and silver mining operations in 1996.

Major Technical Revisions Conditionally Approved by The Department

March 19	LAC Minerals - Use the stormwater pond for the temporary storage of neutralized process solution and leach pad effluent.
April 4	Wharf Resources - Place mine related rubble material in the permitted waste rock disposal facilities.
April 24	Wharf Resources - Revise waste rock disposal area for DOT Highway 473 improvement project.
April 24	Brohm Mining - Expand the current leach pad an additional three acres over the five-acre expansion approved in Mine Permit No. 462.
June 7	Brohm Mining - Construct sludge dewatering test ponds.
June 17	LAC Minerals - Construct V-notch drainage ditch next to Leach Pad 3.
July 11	Wharf Resources - Place waste rock fill at toe of Ross Valley Spent Ore Repository to stabilize slope.
July 15	LAC Minerals - Reduce sampling requirements in light of reclamation and environmental improvements at the Richmond Hill Mine.
July 24	Golden Reward - Create a revised hydrologic monitoring plan for the period of temporary cessation of mining.
August 1	Brohm Mining - Modify reclamation requirements for two relic tailings depositories located in the Sunday and Dakota Maid pits.

August 13	LAC Minerals - Allow a permanent access road to, revise reclamation slopes in, and revise revegetation requirements for the fossil study area.
October 21	Brohm Mining - Allow the Neutralization Pond to be used as a process solution supply pond.
October 22	Brohm Mining - Abandon, replace, and revise certain hydrologic monitoring stations.

Special or Unique Land Determinations

The department did not receive any Requests for Determination of Special, Exceptional, Critical, or Unique Lands for potential large scale gold mines in 1996.

New Lift on Grizzly Gulch Tailings Dam

Homestake Mining began construction in 1996 on the third lift on the Grizzly Gulch Tailings Dam. This new lift will provide additional storage capacity for the dam until 2013, based on current production rates. The Grizzly Gulch Tailings Dam has been constructed in three stages, with the original dam constructed in 1976 and 1977. The first lift was constructed in 1984 and the second lift was constructed in 1989 to accommodate additional tailings. By the end of 1996, almost 31 million tons of tailings had been deposited behind the dam.

This project will also enable Homestake to reclaim the old Yates Waste Rock Depository located south of Homestake's Yates Shaft along Whitewood Creek. Waste rock from the depository will be used as fill for the next lift of the Grizzly Gulch Dam. Once the material is removed from the Yates area, the native soils and any remaining waste rock will be regraded and vegetated.

During 1997, Homestake will also place tailings from the relic Wasp No. 2 tailings pile into the Grizzly Gulch Dam. This will enable Homestake to reclaim the Wasp No. 2 area after the tailings are removed. The Wasp No. 2 tailings are located along Whitewood Creek about two miles south of Lead, South Dakota.

Homestake to Reclaim Dakota Placer Mine Site

Homestake Mining Company and Brightwater Inc., an affiliate of the Dunbar Resort, will voluntarily reclaim the Red Placer claim previously mined by Dakota Placers under Large Scale Mining Permit No. 208. Homestake and Brightwater jointly own and manage the Red Placer claim and have developed an extensive reclamation and stream rehabilitation plan for the former

mining site. Neither Homestake nor Brightwater have conducted mining at the site. They obtained the property in an unreclaimed state through foreclosure proceedings.

The reclamation and stream rehabilitation plan developed by Homestake and Brightwater significantly exceeds the reclamation standards and requirements in Dakota Placer's reclamation plan. The reclamation and stream rehabilitation plan calls for reconstruction of the stream channel, development of fish habitat and overbank grading, stabilization, and revegetation. The cost of implementation is expected to exceed one million dollars.

The voluntary reclamation and stream rehabilitation by Homestake and Brightwater was formalized in a stipulation before the Board of Minerals and Environment on July 17, 1996. The stipulation was issued after Homestake and Brightwater intervened in a request by Dakota Placers to place the Red Placer mine site in temporary cessation. Dakota Placers no longer owned or controlled the Red Placer Claim when the temporary cessation application was submitted. Homestake and Brightwater will complete the reclamation of the Red Placer claim. At the completion of reclamation, Large Scale Mine Permit No. 208, issued to Dakota Placers, will be closed and no additional mining will take place under the permit.

ACREAGE AND PRODUCTION TABLES

The following tables were developed by compiling information from annual reports and supplemental information submitted to the department by the large scale gold mines. The department also used inspection reports and other records in completing these tables.

Since the annual reports for these operations were required to be submitted by January 1, 1997, some production information in those reports was estimated for the month of December. This information has since been updated and is included in these tables.

The graph in Appendix 1 shows a comparison of reclaimed versus affected acreage for each large scale gold mine company.

TABLE 1.1 - AFFECTED MINED LAND ACREAGE				
Permit Number	**Operator**	**Permitted Affected Acres**	**Additional Acres Affected Past Year**	**Total Acres Affected as of Dec. 31, 1996**
439 & 462	Brohm Mining Corp.	551.00	21.60	206.50
208	Dakota Placers, Inc.	81.00	0.00	16.10
450	Golden Reward Mining Co., L.P.	493.62	0.00	397.00
332 & 456	Homestake Mining Company	665.40	0.00	532.80
445	LAC Minerals (USA), Inc.[1]	439.10	9.10	320.70
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	122.00	0.00	0.00
356, 434, & 435	Wharf Resources	685.62	8.95	622.24
TOTALS		3037.74	39.65	2095.34

[1] LAC affected 3 acres under Mine Permit No. 460. Since the material mined under the permit is limestone for acid rock drainage mitigation, the acreage is not included in this table.

Definitions:

Permitted Affected Acres - As defined in SDCL 45-6B-3(1), permitted affected land involves all lands permitted to be affected by a mining operation. This includes land from which overburden is to be or has been removed; land upon which overburden, waste rock, mine spoil, or mill tailings are to be or have been deposited; land disturbed by the building of access roads, railroad loops, warehouses, storage areas or other support facilities for the purpose of mining; and land affected by surface subsidence, unstable slopes, and other surface effects caused by underground mine workings.

Additional Acres Affected Past Year - Previously unaffected acres disturbed from January 1 to December 31, 1996. This acreage is also included in "Total Acres Affected as of Dec. 31, 1996."

Total Acres Affected as of Dec. 31, 1996 - All land currently affected by the large scale gold and silver operations under permit as of December 31, 1996. This includes all lands described above in "Permitted Affected Acres."

TABLE 1.2 - SURFACE MINING DISTURBED LAND ACREAGE			
Permit Number	**Operator**	**Additional Surface Mining Acres Disturbed Past Year**	**Total Surface Mining Disturbed Acres as of Dec. 31, 1996**
439 & 462	Brohm Mining Corp.	18.10	145.60
208	Dakota Placers, Inc.	0.00	15.90
450	Golden Reward Mining Co., L.P.	0.00	258.50
332 & 456	Homestake Mining Company	2.60	503.70
445	LAC Minerals (USA), Inc.[1]	9.10	202.00
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, & 435	Wharf Resources	8.95	496.82
TOTALS		38.75	1622.52

[1] LAC affected 2.8 acres of surface mined disturbed land under Mine Permit No. 460. Since the material mined under the permit is limestone for acid rock drainage mitigation, the acreage is not included in this table.

Definitions:

Additional Surface Mining Acres Disturbed Past Year - Previously unaffected surface mining land disturbed from January 1 to December 31, 1996. This acreage is also included in "Total Surface Mining Disturbed Acres as of Dec. 31, 1996."

Total Surface Mining Disturbed Acres as of Dec. 31, 1996 - As defined in SDCL 45-6B-3(15), surface mining disturbed land is land from which overburden has been removed; land upon which overburden, waste rock, mine spoil, or mill tailings have been deposited; land mined which has no overburden; heap leach pads; and process ponds. Surface Mining Disturbed Lands include overburden and waste rock dumps, spent ore dumps, tailings impoundments, heap leach pads, open pits, process ponds, and haul roads in pit areas or constructed largely of waste rock, spent ore, or overburden. Surface Mining Disturbed Lands **do not** include access roads, haul roads constructed from normal cut and fill methods, railroad loops, utility corridors, buildings including process plants, land application areas, topsoil stockpiles, ore stockpiles, crusher areas, storage areas, sediment and erosion control structures, and land affected by surface subsidence, unstable slopes, and other surface effects caused by underground mine workings.

TABLE 1.3 - INTERIM RECLAIMED ACREAGE			
Permit Number	**Operator**	**Additional Interim Reclaimed Acres Past Year**	**Total Interim Reclaimed Acres as of Dec. 31, 1996**
439 & 462	Brohm Mining Corp.	0.00	0.55
208	Dakota Placers, Inc.	0.00	0.00
450	Golden Reward Mining Co., L.P.	4.80	9.67
332 & 456	Homestake Mining Company	0.00	67.60
445	LAC Minerals (USA), Inc.	0.00	32.30
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, & 435	Wharf Resources	0.00	30.20
TOTALS		4.80	140.32

Definitions:

Interim Reclamation - As defined in ARSD 74:29:01:01(17), interim reclamation is reclamation performed during a mining operation or between mining phases to stabilize affected land by regrading and revegetating to control erosion, improve aesthetics and minimize hazards. It can be construed to be temporary reclamation or soil stabilization for affected land that will be disturbed again.

Additional Interim Reclaimed Acres Past Year - Acres under interim reclamation from January 1 to December 31, 1996. These acres are also included in "Total Interim Reclaimed Acres."

Total Interim Reclaimed Acres as of Dec. 31, 1996 - The total number of acres under interim reclamation as of December 31, 1996. This is only a cumulative total of interim reclaimed acres since the permits were issued. Some of these acres have already been redisturbed or have been counted as final reclamation.

TABLE 1.4 - FINAL RECLAIMED ACREAGE FOR PAST YEAR

Permit Number	Operator	Final Reclaimed Acres Past Year that Meet Post-Mine Land Use	Final Reclaimed Acres Past Year that Do Not Meet Post-Mine Land Use
439 & 462	Brohm Mining Corp.	0.00	10.40
208	Dakota Placers, Inc.	0.00	0.00
450	Golden Reward Mining Co., L.P.	0.00	55.14
332 & 456	Homestake Mining Company	0.00	110.54
445	LAC Minerals (USA), Inc.[1]	0.00	55.40
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, & 435	Wharf Resources	0.00	30.34
TOTALS		0.00	261.82

[1] LAC reclaimed 2.4 acres during the past year under Mine Permit No. 460 that do not meet the post mining land use. Since the material mined under the permit is limestone for acid rock drainage mitigation, the acreage is not included in this table.

Definitions:

Final Reclaimed Acres Past Year That Meet Post-Mine Land Use - Affected land under final reclamation from January 1 to December 31, 1996, that has a permanent, self-sustaining vegetative cover which meets the requirements of the approved reclamation plan and meets the reclamation requirements of SDCL 45-6B and ARSD 74:29. These acres can be considered for bond release.

Final Reclaimed Acres Past Year That Do Not Meet Post-Mine Land Use - Affected land under final reclamation from January 1 to December 31, 1996, that may have a permanent, self-sustaining vegetative cover which does not meet the requirements of the approved reclamation plan and does not meet the reclamation requirements of SDCL 45-6B and ARSD 74:29.

TABLE 1.5 - TOTAL FINAL RECLAIMED ACREAGE
As of December 31, 1996

Permit Number	Operator	Final Reclaimed Acres that Meet Post-Mine Land Use	Final Reclaimed Acres that Do Not Meet Post-Mine Land Use
439 & 462	Brohm Mining Corp.	0.00	14.90
208	Dakota Placers, Inc.	0.00	0.00
450	Golden Reward Mining Co., L.P.	50.21	84.20
332 & 456	Homestake Mining Company	71.12	118.01
445	LAC Minerals (USA), Inc.[1]	14.90	133.80
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, & 435	Wharf Resources	40.32	61.74
TOTALS		176.55	412.65

[1] LAC reclaimed 2.4 acres under Mine Permit No. 460 that do not meet the post mining land use. Since the material mined under the permit is limestone for acid rock drainage mitigation, the acreage is not included in this table.

Definitions:

Final Reclaimed Acres That Meet Post-Mine Land Use - Affected land under final reclamation as of December 31, 1996, that has a permanent, self-sustaining vegetative cover which meets the requirements of the approved reclamation plan and meets the reclamation requirements of SDCL 45-6B and ARSD 74:29. These acres can be considered for bond release.

Final Reclaimed Acres That Do Not Meet Post-Mine Land Use - Affected land under final reclamation as of December 31, 1996, that does not meet the requirements of the approved reclamation plan and the reclamation requirements of SDCL 45-6B and ARSD 74:29. These acres also include areas graded and seeded that may or may not have a vegetative cover.

TABLE 1.6 - RECLAMATION ACREAGE GOAL AND CREDITS
As of December 31, 1996

Permit Number	Operator	Surface Mined Acres Reclaimed that Apply Toward Sept. 1, 1997, 500-Acre Reclamation Goal (SDCL 45-6B-90)	Total Affected Acres Reclaimed that Apply as Reclamation Credit in 1992 Mining Initiative (SDCL 45-6B-97)
439 & 462	Brohm Mining Corp.	0.00	0.00
208	Dakota Placers, Inc.	0.00	0.00
450	Golden Reward Mining Co., L.P.	52.69	55.11
332 & 456	Homestake Mining Company	169.85	180.64
445	LAC Minerals (USA), Inc.	112.20	148.70
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00
356, 434, & 435	Wharf Resources	96.98	102.06
TOTALS		431.72	486.51

Definitions:

Surface Mined Acres Reclaimed That Apply Toward Sept. 1, 1997, 500-Acre Reclamation Goal - Total amount of surface mining disturbed acres under final reclamation as of December 31, 1996. These acres can be counted toward the 500 acres required under SDCL 45-6B-90 to be reclaimed by September 1, 1997. Final grading, topsoil replacement, erosion and drainage control, and seeding and planting have been conducted on these acres.

Total Affected Acres Reclaimed That Apply as Reclamation Credit in 1992 Mining Initiative - Affected land under final reclamation as of December 31, 1996, that does and does not meet the requirements of the approved reclamation plan and the reclamation requirements of SDCL 45-6B and ARSD 74:29. These acres can be considered for reclaimed acreage credit as provided under SDCL 45-6B-97. Final grading, topsoil placement, erosion and drainage control, and seeding and planting have been conducted on these acres.

TABLE 1.7 - ORE AND WASTE ROCK PRODUCTION FIGURES January 1 to December 31, 1996				
Permit Number	**Operator**	**Tons of Ore Mined Past Year**	**Tons of Ore Processed Past Year**	**Tons of Waste Rock and Overburden Mined Past Year**
439 & 462	Brohm Mining Corp.	1,603,211.00	1,603,211.00	3,335,467.00
208	Dakota Placers, Inc.	0.00	0.00	0.00
450	Golden Reward Mining Co., L.P.	664,929.00	745,294.00	2,703,272.00
332 & 456	Homestake Mining Company	1,682,910.00	1,198,094.00	8,158,403.00
445	LAC Minerals (USA), Inc.[1]	0.00	0.00	0.00
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00	0.00
356, 434, & 435	Wharf Resources	4,306,111.00	4,581,344.00	7,384,844.00
TOTALS		8,257,161.00	8,127,943.00	21,581,986.00

[1] 724,680 tons of construction rock was mined under Permit No. 445 and 45,548 tons of construction rock was mined under Permit No. 460 in 1996 for reclamation and acid rock drainage mitigation work.

Definitions:

Tons of Ore Mined Past Year - Tons of ore mined at each operation from January 1 to December 31, 1996.

Tons of Ore Processed Past Year - Tons of ore processed at each operation from January 1 to December 31, 1996.

Tons of Waste Rock and Overburden Mined Past Year - Tons of waste rock and overburden mined at each operation from January 1 to December 31, 1996.

TABLE 1.8 - GOLD AND SILVER PRODUCTION
January 1 to December 31, 1996

Permit Number	Operator	Ounces of Gold Produced Past Year	Ounces of Silver Produced Past Year
439 & 462	Brohm Mining Corp.	23,748	38,222
208	Dakota Placers, Inc.	0	0
450	Golden Reward Mining Co., L.P.	21,430	20,353
332 & 456	Homestake Mining Company[1]	123,198	37,262
445	LAC Minerals (USA), Inc.	0	0
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0	0
356, 434, & 435	Wharf Resources	106,394	23,618
SUBTOTAL		274,770	119,455
N.A.	Homestake Underground	284,126	68,320
TOTALS		558,896	187,775
ESTIMATED VALUE[2]		$216,717,513	$976,430

[1] Reflects production from the Open Cut only and does not include production from underground operation which is listed below

[2] Based on 1996 estimated average gold price of $387.76 and 1996 estimated average silver price of $5.20

Definitions:

Ounces of Gold Produced - Ounces of gold produced at each operation from January 1 to December 31, 1996.

Ounces of Silver Produced - Ounces of silver produced at each operation from January 1 to December 31, 1996.

TABLE 1.9 - WATER AND CYANIDE USE January 1 to December 31, 1996				
Permit Number	**Operator**	**Gallons Ground Water Withdrawn Past Year**	**Gallons Surface Water Withdrawn Past Year**	**Pounds of Cyanide Used Past Year**
439 & 462	Brohm Mining Corp.	2,197,520.00	0.00	410,000.00
208	Dakota Placers, Inc.	0.00	0.00	0.00
450	Golden Reward Mining Co., L.P.	24,322,000.00	0.00	315,790.00
332 & 456	Homestake Mining Company[1]	0.00	44,239,000.00[2]	1,617,426.00
445	LAC Minerals (USA), Inc.	4,171,000.00	25,800,000.00	0.00
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	0.00	0.00	0.00
356, 434, & 435	Wharf Resources	32,618,600.00	0.00	680,634.00
TOTALS		63,309,120.00	70,039,000.00	3,023,850.00

[1] Water and cyanide use by Homestake's underground mine is not included in this table.
[2] Homestake used 286,000 gallons of fresh water and 43,953,000 gallons of recycled treated water from its waste water treatment plant for its Open Cut operations in 1996.

Definitions:

Gallons Ground Water Withdrawn - The amount of ground water withdrawn by each operation from January 1 to December 31, 1996.

Gallons Surface Water Withdrawn - The amount of surface water withdrawn by each operation from January 1 to December 31, 1996.

Pounds of Cyanide Used - The amount of cyanide used at each operation from January 1 to December 31, 1996.

TABLE 1.10 - RECLAMATION BOND AMOUNTS FOR LARGE SCALE GOLD MINES				
Permit Number	**Operator**	**Original Bond Amount**	**Current Bond Amount**	**Type of Bond**
439 & 462	Brohm Mining Corp.	$672,376	$8,892,876[1] (estimated)	See Note 1
208	Dakota Placers, Inc.	$32,715	$27,000	Certificate of Deposit
450	Golden Reward Mining Co., L.P.	$954,384	$1,405,035	Certificates of Deposit
332 & 456	Homestake Mining Company	$928,790	$1,737,000	Surety Bond
445	LAC Minerals (USA), Inc.	$656,000	$10,700,000	Irrevocable Letter of Credit
416	Naneco Minerals, Inc. (formerly Minerva Explorations)	$661,800	$0[2]	See Note 2
356, 434, & 435	Wharf Resources	$732,800	$1,686,000	Certificates of Deposit

[1] As of December 31, 1996, the $8,892,876 bond for Mine Permit No. 439 and 462 consists of the following:

Reclamation Surety:	$2,431,876 certificate of deposit
Environmental Surety:	$1,307,000 certificate of deposit (estimated)
	$5,154,000 demand note based on net worth

The reclamation surety covers basic site reclamation costs. The environmental surety covers costs of the acid rock drainage mitigation plan. Interest from the two certificates of deposit is applied toward the cash portion of the environmental bond. The demand note amount will decrease over time as the cash portion of the environmental bond increases.

[2] Naneco Minerals is required to submit a reclamation bond in the amount of $661,800 before the commencement of mining

OPERATIONAL PLANS FOR 1997

Brohm Mining Corporation

Brohm will continue mining operations at the Anchor Hill Pit in 1997. Phase I mining will be completed around the end of February. Phase II operations will begin sometime in the spring after the US Forest Service issues the environmental impact statement. The current leach pad will be expanded to handle an additional 1.8 million tons of ore. Brohm will also construct the Phase II leach pad and a new surge pond in 1997.

In order to fill an expected halt in production between Phases I and II of the Anchor Hill Project, Brohm submitted a technical revision in January 1996 to mine the Langley area to the south of the Sunday Pit. The Langley Project will involve about 10 acres and will produce approximately 7500 ounces of gold from 400,000 tons of ore.

Initial construction of the Ruby Waste Repository capping system will begin in 1997. Brohm plans to place a cap over and revegetate the lower slopes of the repository. They will also continue backfilling the Sunday and Dakota Maid pits. Treatment of acid rock drainage from the mine will also continue in 1997.

Dakota Placers, Inc.

Homestake Mining, in cooperation with Brightwater Inc., an affiliate of the Dunbar Resort, will reclaim the Red Placer Claim previously mined by Dakota Placers under Mine Permit No. 208. Once the reclamation is completed, the permit will be closed. Dakota Placers proposes to submit a small scale mine permit application in 1997 for the Excelsior Claims which are adjacent to the Red Placer Claim.

Golden Reward Mining Company, L.P.

Golden Reward plans to remain under temporary cessation in 1997. No mining or ore processing is expected to be conducted in 1997. However, Golden Reward plans to conduct some exploration drilling on its properties to identify new reserves or better define known reserves.

Golden Reward plans to reclaim about 24 acres in 1997 that do not impact any future mining plans. These acres will be reclaimed to final reclamation status, and a portion of these acres may be eligible for the 500-acre reclamation requirement.

Homestake Mining Company

Homestake plans to continue mining the Open Cut in 1997. The bulk of the ore will come from the bottom of the pit. Waste rock will be placed in the Sawpit Waste Rock Disposal Facility. Homestake is examining the feasibility of developing a portal and underground decline in the Open Cut to access some of the deeper portions of the ore body in the pit.

Reclamation activities will be on-going at the East Waste Rock Disposal Facility in 1997. Homestake will complete repairs started in 1996 on several topsoil slumps along the slopes of the facility. These areas were damaged during the October 1994 and May 1995 storms. Once these repairs are completed, these acres may be applied toward the 500-acre reclamation requirement. Homestake will also transplant trees and control weeds on the facility.

Homestake will reclaim portions of the Sawpit Waste Rock Disposal Facility. A buckwall completed during the winter will be topsoiled, seeded, fertilized and mulched. Homestake will plant trees and shrubs on the buckwall slopes in the spring and summer of 1997.

LAC Minerals (USA), Inc./Richmond Hill Mine

LAC Minerals will work to complete mine closure activities in 1997. LAC plans to complete the remaining components of the leach pad closure plan. Once these components have been completed, these acres can be applied toward the 500-acre reclamation requirement. LAC will also continue water treatment and environmental monitoring as part of the ongoing acid rock drainage mitigation plan.

Naneco Minerals, Inc.

Naneco Minerals LTD. will be seeking a joint venture partner and a processing facility for the Ragged Top project in 1997. The company will also investigate the possibilities of obtaining a conditional use permit from the Lawrence County Commission. Until a joint venture partner, a processing facility, and a conditional use permit are obtained, no mining will be conducted at the site.

Wharf Resources

Wharf Resources plans to mine the North Foley, 33 Vertical, Vulcan, East Foley 4A, and Maria pits in 1997. Wharf will also begin mining the Portland Pit in the Clinton expansion area if the permit application is approved in 1997. A hearing on the application is tentatively scheduled for May 1997. Plans are to remove about 4.88 million tons of ore and 7.18 million

tons of waste rock in 1997. About 4.6 million tons of ore will be moved to the leach pads, and about 4.34 million tons will be offloaded from the pads.

Photo 1.5 - Reclaimed Reliance Waste Rock Repository buckwall at Wharf Mine

Reclamation activities in 1997 will consist of new reclamation on the south face of the Whiteside backfill, the upper face of the Ross Valley spent ore depository, and a buckwall face above the Reliance waste rock depository slope. Wharf will also repair an area on the lower face of the Ross Valley depository and reclaim several other smaller areas. It is estimated that about 30 acres will be reclaimed in 1997. A portion of these acres should be eligible for the 500 acre reclamation requirement.

SUMMARY OF SURFACE MINE DISTURBED AND RECLAMATION ACRES UNDER SDCL 45-6B-86

1996

Photo 2.1 - Reclaimed portion of limestone quarry operated by Pete Lien & Sons

SUMMARY OF ALL MINE PERMITS

In accordance with SDCL 45-6B-86, the Department of Environment and Natural Resources has compiled information regarding the number of acres of surface mining disturbed land and the amount of such land that has undergone reclamation as defined in Chapter 45-6B and in section 45-6B-83.1 for the period January 1 to December 31, 1996. This does not include acreages for mining operations regulated under SDCL Chapter 45-6 (406 active licensed mine operators, 1,910 active licensed sites), mineral exploration regulated under SDCL Chapter 45-6C (14 operators, 118 permits, excluding oil and gas), or uranium exploration regulated under SDCL Chapter 45-6D (no current operators or permits.) Sources for these statistics are permit applications, operating and reclamation plans, annual reports, departmental inspections, and operator information.

New Permit Applications

American Colloid plans to submit a large scale permit application in 1997 for a new bentonite mining area near Belle Fourche. The new area is just to the south of an active mine area covered under Mine Permit No. 461. A small scale mine permit application was received by Lew and April Wight for a placer mining operation near Rochford along Rapid Creek. This application is currently incomplete.

Photo 2.2 - Bentonite mining area reclaimed by American Colloid

Table 2.1 - Number of Mine Permits and Permitted Affected, Affected, and Surface Mined Disturbed Acreage				
	All Small Scale Permits	All Large Scale Permits	Large Scale Gold Permits[1]	All Mine Permits
Number of Permits	23	29	11	52
Permitted Affected Acres	922	5,981	3,037	6,903
Total Affected Acres	73	3,637	2,095	3,710
Surface Mining Disturbed Land Acres	66	2,828	1,623	2,894

[1] The acreage figures for large scale gold mines are separated for clarification purposes. The large scale gold mine statistics are included in the figures for all large scale permits.

Definitions:

Small Scale Mining Permit - Permit for operations that extract less than 25,000 tons of ore or overburden per calendar year and disturb less than 10 acres of land.

Large Scale Mining Permit - Permit for operations that extract more than 25,000 tons of ore or overburden per calendar year and disturb more than 10 acres.

Permitted Affected Acres - Pursuant to SDCL 45-6B-3(1), this involves all lands permitted to be disturbed by a mining operation, including land from which overburden is to be or has been removed and land upon which overburden, waste rock, mine spoil, or mill tailings is to be or has been deposited; land which is disturbed by the building of access roads, railroad loops, warehouses, storage areas or other support facilities for the purpose of mining; and land affected by surface subsidence, unstable slopes, and other surface effects caused by underground mine workings.

Total Affected Acres - This includes all the land currently affected by the mining operations under permit. The total affected acres statistics are included in the figures for permitted affected acres.

Surface Mining Disturbed Land Acres - Pursuant to SDCL 45-6B-3(15), this includes all the land from which overburden has been removed, land upon which overburden, waste rock, mine spoil or mill tailings have been deposited, land mined which has no overburden, heap leach pads, and process ponds. The surface mining disturbed land statistics are included in the figures for total affected acres.

Table 2.2 - Reclaimed and Released Reclaimed Acres				
	All Small Scale Permits	All Large Scale Permits	Large Scale Gold Permits[1]	All Mine Permits
Total Reclaimed Acres	41	1,451	626	1,492
Reclaimed Surface Mining Disturbed Acres	31	1,178	429	1,209
Releasable Reclaimed Acres	20	248	209	268
Released Reclaimed Acres	1	0	0	1

[1] The acreage figures for large scale gold mines are separated for clarification purposes. The large scale gold mine statistics are included in the figures for all large scale permits.

Definitions:

Total Reclaimed Acres - This includes all the land for which the operator completes required grading, topsoil replacement, erosion and drainage control and any required planting and seeding that the department finds has resulted or will later result in final reclamation. For large scale gold mines, these acres can be applied toward reclamation acreage credit as provided under SDCL 45-6B-97.

Reclaimed Surface Mining Disturbed Acres - Pursuant to SDCL 45-6B-86, this includes all surface mining disturbed lands for which the operator has completed required grading, topsoil replacement, erosion and drainage control and any required planting and seeding that the department finds will later result in final reclamation.

Releasable Reclaimed Acres - This includes all the reclaimed land for which reclamation surety and liability can be released as determined by the department. Such land must meet the minimum reclamation standards pursuant to ARSD 74:29:07. These figures do not include any acreage for which release of surety or liability has been granted by the Board of Minerals and Environment. The releasable reclaimed acres statistics are included in the figures for total reclaimed acres.

Released Reclaimed Acres - This includes all the reclaimed land for which reclamation surety and liability has been released by the Board of Minerals and Environment in 1996. This land has met the minimum reclamation standards pursuant to ARSD 74:29:07. The released reclaimed acres statistics are included in the figures for total reclaimed acres.

APPENDIX 1

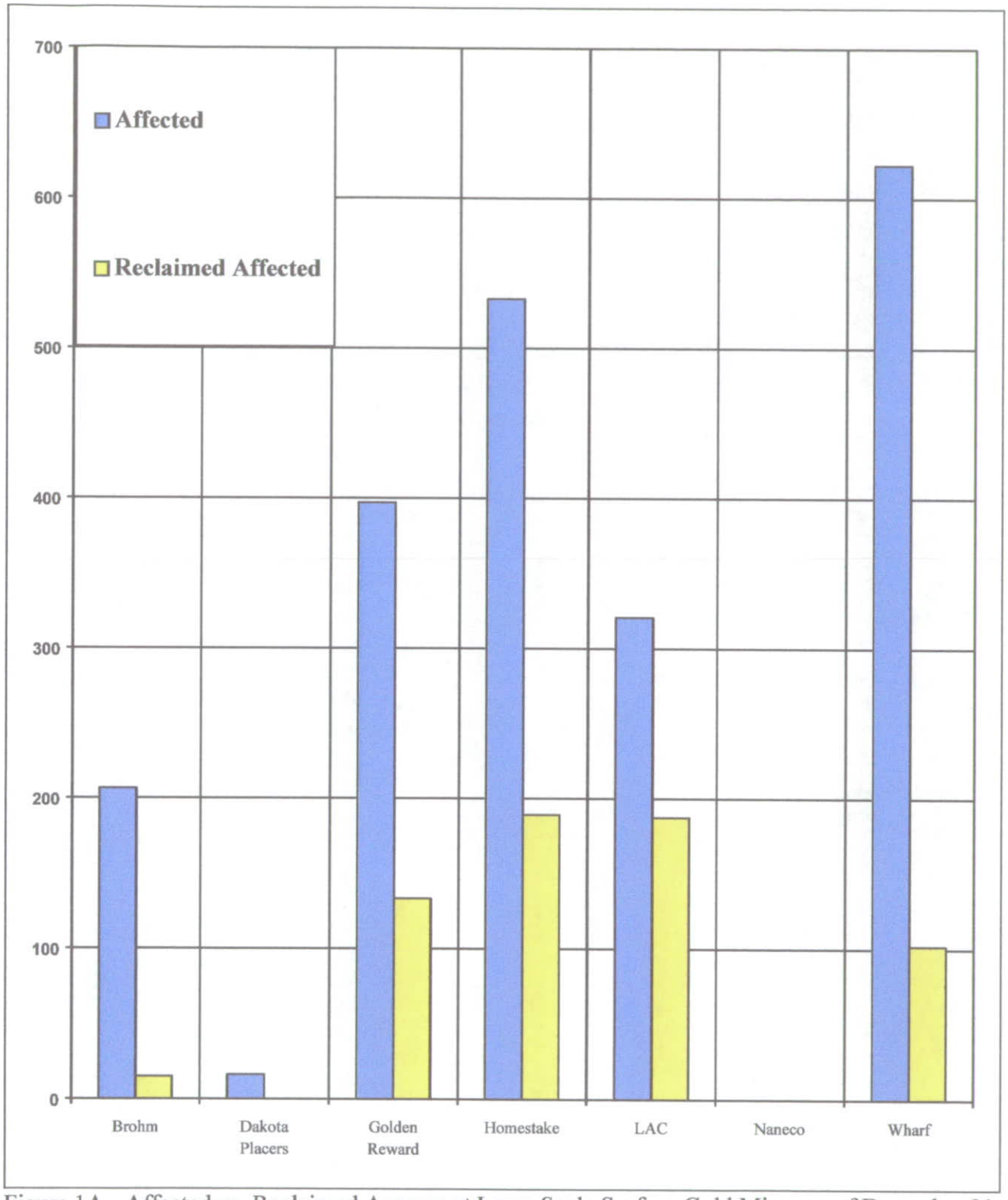

Figure 1A - Affected vs. Reclaimed Acreage at Large Scale Surface Gold Mines as of December 31, 1996