GENWAL Resources, Inc.

CRANDALL CANYON AND SOUTH CRANDALL MINES

2004 ANNUAL REPORT

Permit C/015/032

File in:
☐ Confidential
☐ Shelf
☒ Expandable
Refer to Record No 0039 Date 09092005
In C 0150032 Incoming 2004 Annual Report
For additional information

*To enter text, click in the box and type your response. If a box already contains an entry select the entry and type the replacement. You can use the **tab** key to move from one field to the next. To select a check box, click in the box or type an x.*

GENERAL INFORMATION

Permittee Name	GENWAL Resources, Inc.
Mine Name	Crandall Canyon
Operator Name (If other then permittee)	same
Permit Expiration Date	May 13, 2008
Permit Number	ACT/015/032
Authorized Representative Title	Gary E. Gray, Agent/Engineer
Phone Number	435 888 4000
Fax Number	435 888 4002
E-mail Address	ggray@andalex.com
Mailing Address	P.O. Box 1077 Price, UT 84501
Designated Representative	N/A
Resident Agent	Gary E Gray
Resident Agent Mailing Address	same
Number of Binders Submitted	2

IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-01715	Crandall Canyon Underground Mine	N/A
	42-02356	South Crandall Underground Mine	N/A
MSHA Impoundment(s)	N/A		
NPDES/UPDES Permit(s)	UT0024368		08/31/2005
PSD Permit(s) (Air)	DAQE-N0225003-03		

Other

CERTIFIED REPORTS

List the certified inspection reports as required by the rules and udder the approved plan that must be periodically submitted t the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On File	
Excess Spoil Piles	☐	☒	☐	☐	
Refuse Piles	☐	☒	☐	☐	
Impoundments	☐	☒	☐	☐	
Other					
Annual Pond	☒	☐	☒	☐	Annual
	☐	☐	☐	☐	

REPORTING OF OTHER TECHNICAL DATA

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

Technical Data:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On file	
Climatological	☒	☐	☒	☐	
Subsidence Monitoring	☒	☐	☒	☐	
Vegetation Monitoring	☒	☐	☒	☐	Report by Pat Collins
Raptor Survey	☐	☐	☐	☐	
Soils Monitoring	☐	☒	☐	☐	
Water Monitoring	☒	☐	☒	☐	Report by Eric Petersen
First quarter	☒	☐	☐	☒	
Second quarter	☒	☐	☐	☒	
Third quarter	☒	☐	☐	☒	
Fourth quarter	☒	☐	☐	☒	
Geological / Geophysical	☐	☒	☐	☐	
Engineering	☐	☒	☐	☐	
Non Coal Waste / Abandoned Underground Equipment*	☐	☒	☐	☐	None Abandoned
Other Data					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

*Reminder: If equipment has been abandoned during 2004, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there were any hazardous or toxic materials and any revision to the PHC as necessary.

LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Please provide the Department of Commerce, Annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other change as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include certified financial statements, audits or worksheets, which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

Legal / Financial Update	**Required**		**Included or on File with DOGM**		**Comments**
	Yes	No	Included	On file	
Department of Commerce, Annual Report Officers	☒	☐	☒	☐	
Other					
	☐	☐	☐	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

MINE MAPS

Copies of mine maps, current and up-to-date through at least December 31, 2004, are to be provided to the Division as Appendix D to this report in accordance with the requirements of R 645-301-525.240. These map copies shall be made in accordance with 30 CFR 75.1200 as required by MSHA. Upon request, the Division shall keep mine maps confidential. Please provide a CD.

Map Number(s)	**Map Title/ Description**	**Confidential** Yes	No
	Mine Production Areas 2004	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

OTHER INFORMATION

Please provide any comments of further information to be included as part of the Annual Report. Any other attachments are to be provided as Appendix E to this report. If information is submitted as a group rather then by individual mine, please identify each of the mine's data in the list below.

Additional attachment to this report? **Yes** ☐ **No** ☒

APPENDIX A

Certified Reports

Excess Spoil Piles
Refuse Piles
Impoundments

As required under R645-301-514

CONTENTS

Annual Pond Inspection

*To enter text, click in the box and type your response. If a box already contains an entry select the entry and type the replacement. You can use the **tab** key to move from one field to the next. To select a check box, click in the box or type an x.*

GENERAL INFORMATION

Report Date	March 30, 2005
Permit Number	ACT/014/032
Mine Name	Crandall Canyon
Company Name	GENWAL Resources, Inc.

SEDIMENT POND IDENTIFICATION

Sediment Pond Name	None
Sediment Pond Number	None
UPDES Permit Number	UT0024368
MSHA ID Number	42-01715

SEDIMENT POND INSPECTION

Inspection Date	December 20, 2004
Inspected by	Gary E. Gray and John C. Lewis
Reason for Inspection	Annual

(Annual, quarterly or other periodic inspections, critical installation , or completion of construction.)

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

No visible hazards, weaknesses or instability were observed.

Questions a and b are required for an sediment pond, which functions as a Sedimentation pond.

a. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and estimated average elevation of existing sediment.

Total sediment storage capacity = 0.437 acre feet.

60% sediment storage volume elevation = 7894.0 feet.

100% sediment storage volume elevation = 7895.0 feet.

Estimated existing average elevation of sediment = 7892.0 feet.

b. Principle and emergency spillway elevations.

Principal spillway elevation = 7905.81 feet.

Emergency spillway elevation = 7906.81 feet.

2. Field Information

Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/ instrumentation information, inlet/ outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/ repairs, monitoring information, vegetation on outslopes of embankments, etc.

Water Elevation = 7901.0 feet.
No discharge has occurred from the pond and therefore no samples have been taken.
No observable problems exist at the inlets or outlets.
No observable conditions were apparent that could affect the stability or function of the structure.

3. Field Evaluation.

Describe any changes in the geometry of the impounding structure, average and maximum depths and elevation of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period

No changes in geometry have occurred.
The pond is frozen over and covered with snow.
The estimated average sediment elevation is 2.0 feet below the 60% level. The remaining sediment storage capacity to the 60% level is approximately 0.2 acre-feet.
The water elevation is approximately 5 feet below the spillway. The remaining water storage capacity is approximately 1.77 acre-feet.
No observable conditions were apparent that could affect the stability or function of the structure.

QUALIFICATION STATEMENT:

I hereby certify that; this pond was constructed under the direction of a Registered Professional Engineer; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of sediment ponds in accordance with the certified and approved designs for this structure; that the sediment pond has been maintained in accordance with approved designs and meets or exceeds the minimum design requirements under all applicable federal, state and local regulations; and that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous condition of the structure affecting stability.

Signature: _____ Date: 3/30/05

CERTIFIED REPORT

SEDIMENT POND EVALUATION

If you answer NO to these questions, please explain under comments

		YES	NO
1.	Is sediment pond designed and constructed in accordance with the approved plan?	☒	☐
2.	Is sediment pond free of instability, structural weakness, or any other hazardous conditions?	☒	☐
3.	Has the sediment pond met all applicable performance standards and effluent limitations from the previous date of inspection?	☒	☐

COMMENTS/ OTHER INFORMATION

CERTIFICATION STATEMENT:

I hereby certify that; this sediment pond was constructed under the direction of a Registered Professional Engineer; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of sediment ponds in accordance with the certified and approved designs for this structure; that the sediment pond has been maintained in accordance with approved designs and meets or exceeds the minimum design requirements under all applicable federal, state and local regulations; and that inspections and inspection reports are made by myself or under my direction and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability in accordance with the Utah R645 Coal Mining Rules.

By: John C. Lewis

Full Name and Title

Signature: John C. Lewis Date 3-30-05

P.E. Number & State 191488 Utah

[P.E. Cert. Stamp]

LICENSED PROFESSIONAL ENGINEER
No. 191488
JOHN
CHRISTOPHER
LEWIS
3-30-05
STATE OF UTAH

APPENDIX B

Reporting of Technical Data

Including monitoring data, reports, maps, and other information
As required under the approved plan or as required by the Division

In accordance with the requirement of R645-310-130 and R645-301-140

CONTENTS

Precipitation Log

Subsidence Data

Water Data Analysis

Vegetation Monitoring

GENWAL Resources, Inc.

Precipitation Log -- 2004

Date	Amount (Inches)	Type		Date	Amount (Inches)	Type
1/02	4	snow				
				9/29	0.67	rain
2/03	2	snow				
2/21	1	snow		10/5	0.13	rain
2/22	5	snow		10/6	0.04	rain
2/23	3	snow		10/16	0.31	rain
2/24	4	snow		10/19	0.25	rain
2/25	6	snow		10/20	0.57	rain
2/26	3	snow		10/21	0.41	rain
2/27	3	snow		10/22	0.24	rain
2/28	10	snow		10/24	0.30	rain
				10/26	0.61	rain
3/03	5	snow		10/27	0.41	rain
3/04	3	snow		10/28	0.74	rain/snow
5/13	5	snow		11/02	0.84	rain
				11/03	0.61	rain
6/17	0.18	rain		11/04	0.23	rain
				11/09	0.31	rain
7/14	0.1	rain		11/10	0.21	rain/snow
7/15	0.24	rain		11/12	3.00	snow
7/16	0.33	rain				
7/22	0.03	rain				
7/29	0.07	rain				
7/31	0.12	rain				
8/02	0.12	rain				
8/03	0.26	rain				

Subsidence Data

The Subsidence Profile Drawing is included. The data shows that subsidence is still occurring over Panel 18. It is possible that the subsidence will be concluded by the 2005 survey.

Panels 19 and 20 were mined out in 2004. These are very short panels in widget areas of the reserve. Very little subsidence is expected in these areas based on previous surveys.

The aerial survey was not performed late in 2004 due to some communications misunderstanding between the engineer and Olympus Aerial Surveys. The survey will be done in 2005 and thereafter according to the permit.

PETERSEN HYDROLOGIC

28 March 2005

Mr. Gary Gray
GENWAL Resources, Inc.
P.O. Box 1077
Price, Utah 84501

Dear Gary,

At your request, we have produced this Annual Hydrologic Monitoring Report for the Crandall Canyon #1 Mine for the year 2004. This report is based on hydrologic monitoring information collected during 2004 and submitted to the Utah Division of Oil, Gas and Mining.

Other than the permitted discharge of mine water to Crandall Creek, there are no indications that mining-related impacts to the hydrologic balance in the mine permit area have occurred.

If you have any questions in this regard, please feel free to contact me.

Sincerely,

Erik C. Petersen, P.G.
Principal Hydrogeologist
Utah PG No. 5373615-2250

2695 N. 600 E. LEHI, UTAH 84043 (801) 766-4006

Summary of Hydrologic Monitoring at the GENWAL Resources, Inc. Crandall Canyon #1 Mine During 2004

Introduction

Hydrologic monitoring at GENWAL Resources' Crandall Canyon #1 Mine was carried out in 2004 in accordance with the hydrologic monitoring plan as approved by the Utah Division of Oil, Gas and Mining (DOGM). Hydrologic monitoring locations are shown on Figure 1. All 2004 hydrologic monitoring data have been entered into the DOGM on-line electronic database. The purpose of this document is to present and summarize the results of the 2004 hydrologic monitoring.

Including this introduction, this report contains the following sections:

- Introduction
- Methods of Study
- Climate
- Presentation of Data
- Spring Monitoring Summary
- Stream Monitoring Summary
- In-Mine Monitoring Summary
- Mine Discharge Monitoring Summary
- Conclusions

Methods of Study

The specific methods of study used to collect the 2004 hydrologic monitoring data are described below.

Discharge Measurements

Discharge measurements for springs were performed using a calibrated container and a stopwatch. Generally, spring discharge measurements were performed by damming and diverting the spring discharge through a pipe. Using an appropriately sized container, time-to-fill measurements were typically performed at least 3 times at each location. An average time-to-fill value was used to calculate the reported discharge measurement. At some spring locations with large discharge rates, spring discharge measurements were performed using a 90° v-notch weir. Discharge measurements at Indian Creek, upper Crandall Creek, and lower Crandall Creek were performed using the existing, permanently installed 3-foot Parshall flumes, or using a current-velocity meter and wading rod. Discharge measurements during high-flow periods in Blind Canyon Creek were performed using the existing 12-inch Parshall Flume. Discharge measurements at Horse Canyon Creek and at Blind Canyon Creek during low-flow periods were performed using either a portable 3-inch Parshall flume, current-velocity meter and wading rod, portable 90-degree v-notch weir, or a stopwatch and calibrated container as appropriate. Discharge measurements and calculations were performed using standard U.S. Bureau of Reclamation methods.

Discharge Temperature Measurements

Temperature measurements were performed using a Taylor brand electronic digital thermometer. Discharge temperature measurements at springs were performed as close to the spring discharge locations as possible. Stream temperature measurements were performed, where possible, in a shaded, actively flowing portion of the stream.

Specific Conductance Measurements

Specific conductance (electrical conductivity) measurements were performed using an Oakton brand model 20 conductivity meter with automatic temperature compensation. The instrument was regularly calibrated using traceable ASTM conductivity standard solutions.

pH Measurements

pH Measurements were performed using an Oakton brand Acorn 6 model electronic pH meter with automatic temperature compensation. The instrument was regularly calibrated using traceable ASTM pH standard solutions.

Dissolved Oxygen Measurements

Dissolved oxygen measurements were performed using a YSI brand model 55 dissolved oxygen meter. The meter was routinely calibrated using atmospheric oxygen calibration methods.

Water Quality Laboratory Measurements

Water quality laboratory analyses were performed by SGS Mineral Services of Huntington, Utah. Documentation on laboratory standard analytical methods and procedures used and laboratory detection limits has been entered into the DOGM on-line database.

Climate

Although drought conditions persisted in the Crandall Canyon Mine area during most of 2004, the region was transitioning to wetter conditions from the recent period of prolonged drought that began in 2001 and continued through then end of 2003. A plot of the Palmer Hydrologic Drought Index for Utah Region 4 is presented in Figure 2. The PHDI is a monthly value generated by the National Climatic Data Center using a variety of hydrologic parameters that indicates wet and dry spells. The PHDI is calculated from several hydrologic parameters including precipitation, temperature, evapotranspiration, soil water recharge, soil water loss, and runoff. Consequently, it is a useful tool for evaluating the relationship between climate and groundwater and surface water discharge data. The PHDI is useful for determining whether variations in spring and stream discharge rates or well potentiometric levels are the result of climatic variability or whether they are the result of other factors. As indicated by the PHDI (Figure 2), during most of 2004 the region was in a period of mild to moderate drought. By December of 2004 the region had transitioned into a moderate to severe wet spell that continues to the present.

Presentation of Data

The results of the 2004 hydrologic monitoring, including discharge measurements, laboratory water quality parameters, and field water quality data are presented in tabular form in Table 1. Hydrologic monitoring locations are shown on Figure 1. A compilation of historic discharge and water quality data for springs, streams, and in-mine locations is presented in Table 2. A summary of the water quality and discharge rate data from the Crandall Canyon #1 Mine workings is presented in Table 3. Specific conductance, pH, and discharge data for each of the regular water-monitoring sites monitored during 2004 are graphed together with the PHDI on plots included at the end of this report.

During the 2nd and 3rd quarters of 2004, all of the regular above-ground hydrologic monitoring sites were accessed and monitored. With the exception of site UPDES 001 (sedimentation pond discharge) which had no discharge during the year, measurable flow was observed and monitored at each of the surface monitoring locations. During the 1st quarter, despite several monitoring attempts, the springs and steam in upper Joes Valley and on East Mountain could not be accessed. This was due to continuous snow cover (several feet) in these areas during the 1st quarter. Springs SP-30 and SP-36 were able to be monitored during at the end of the 1st quarter of 2004, when snow cover on the south facing hillsides had melted. The stream monitoring sites in Crandall Canyon, Blind Canyon, and Horse Canyon were also monitored during the 1st quarter of 2004. During the 4th quarter of 2004, most of the regular above-ground hydrologic monitoring sites were accessed and monitored. However, as a result of the early onset of winter snow pack on East Mountain during October

2004, some sites on East Mountain (SP47A, SP1-19, SP1-22, SP1-24, and SP2-24) could not be accessed during the 4th quarter. (A significant snowstorm occurred on 17 October 2004 while monitoring personnel were on top of East Mountain performing hydrologic monitoring. The monitoring personnel were forced off the mountain by the snowstorm. The winter snow persisted continuously on East Mountain from 18 October 2004 through the end of the quarter, and monitoring of the remaining springs on top of East Mountain could not occur.)

In-mine monitoring sites MW-1 and DH-1 were monitored during 2004. All other in-mine sites are either located in portions of the mine that were not accessible during 2004, or have been rendered unable to be monitored as a result of mining operations.

Spring Monitoring Summary

In accordance with the approved monitoring plan, 14 springs were monitored for flow and water quality during 2004. A summary of the 2004 monitoring results for springs in the mine permit area and adjacent is presented below.

East Mountain Springs

As specified in the water monitoring plan, eight springs on East Mountain were monitored during 2004. These include SP2-24, SP2-9, SP47A, SP1-3, SP1-19, SP1-22, SP1-9, and SP1-24.

The water quality at these springs, as indicated by field measurements of specific conductance and pH, is similar to that monitored during previous years (see attached plots). The solute compositions of springs SP1-9, SP2-9, and SP2-24, which are monitored for laboratory water quality parameters as specified in the MRP, likewise are similar to previous years (Tables 1 and 2).

Discharges measured at the eight springs on East Mountain during the high-flow season (2nd quarter) were generally similar or somewhat greater than those measured during previous years (Table 2). Discharge rates measured at springs SP1-9, SP2-9, SP1-22, SP1-24, and SP2-24 appear to show the effects of the region's transitioning from the recent period of prolonged drought to the current wetter climatic cycle. Baseflow spring discharge rates measured during the 3rd and 4th quarters of 2004 were generally similar to those measured in previous years (Table 2). However, it should be noted that, as described above, 4th quarter monitoring data for springs SP47A, SP1-19, SP1-22, SP1-24, and SP2-24 were not collected during 2004.

There is no indication that mining-related activities have had any detrimental effects on discharge rates or water quality of groundwater systems that support springs on East Mountain.

Upper Joes Valley Springs

As specified in the monitoring plan, three springs in Upper Joes Valley were monitored during 2004. These include SP1-33, SP1-47, and SP2-1. These springs were all monitored during the 2nd, 3rd, and 4th quarters of 2004.

Water quality at the Upper Joes Valley springs, as indicated by field measurements of specific conductance and pH, was similar to that monitored during previous years (see attached plots). The solute composition of spring SP1-33, which is monitored quarterly for laboratory water quality parameters as specified in the MRP, is likewise similar to that of previous years (Tables 1 and 2).

Discharge rates measured at springs in Upper Joes Valley during 2004 were similar to those measured in previous years (Tables 1 and 2). The current period of wetness in the region is reflected in increased discharges from springs SP1-33 and SP1-47 during 2004. There is no indication that mining-related activities have had any detrimental impacts to the water quality or water quantity of groundwater systems that support springs in Upper Joes Valley.

Crandall Canyon Springs

As specified in the water monitoring plan, three springs were monitored in Crandall Canyon during 2004. These include SP-30, SP-36, and SP-58.

Discharge rates measured at springs SP-30, SP-36, and SP-58 during 2004 were similar to those measured in previous years. Discharge rates at some springs in Crandall Canyon have responded somewhat to the gradual drying-out the region has experienced over the past several years (see attached plots). During 2004, discharge from SP-30 and SP-36 continued to show the effects of the recent period of prolonged drought. Although discharges from these springs during 2004 are similar to those of previous years, is apparent that the groundwater systems that support these springs have not yet responded to the recent trend toward wetter climatic conditions in the region. Discharge from spring SP-58 in upper Crandall Canyon during 2004 shows a slight increasing trend, likely in response to the end of the previous regional drought.

Water quality at the Crandall Canyon springs, as indicated by field measurements of specific conductance and pH, was similar to that monitored during previous years (see attached plots). The solute compositions of springs SP-36 and SP-58, which are monitored quarterly for laboratory water quality parameters as specified in the MRP, likewise are generally similar to previous years (Tables 1 and 2). During 2003 it was noted that the concentration of sulfate in discharge from spring SP-58 had increased somewhat relative to that of previous years (Table 2). Sulfate concentrations measured at SP-58 during 2004 were similar to those measured during 2003. The modest increases in sulfate concentration are most likely attributable to the recent drought the region has experienced (i.e., the decrease in the annual input of low TDS snowmelt recharge to the groundwater system that supports SP-58). Accordingly, sulfate

concentrations measured at SP-58 during wetter climatic conditions in the future will likely be lower.

There are no indications that mining-related activities have had any detrimental impacts to the water quality or water quantity of springs discharging in Crandall Canyon.

Stream Monitoring Summary

In accordance with the approved hydrologic monitoring plan, five stream sites were monitored for flow and water quality during 2004. These include Indian Creek in Upper Joes Valley, Horse Canyon Creek, Blind Canyon Creek, and two sites on Crandall Creek (above and below the mine site).

Indian Creek

Discharge rate and field water quality measurements were performed on Indian Creek during the 2nd, 3rd, and 4th quarters of 2004. Located in Upper Joes Valley, the site was not accessible during the 1st quarter because of the heavy snowpack. Discharge measured at Indian Creek during 2004 ranged from 753 gpm in June to 320 gpm in October (Table 1). Discharge in Indian Creek during 2004 was similar to that of previous years, although the baseflow discharge measured in 2004 (320 gpm) was 57 gpm greater than that measured during 2003, likely a reflection of the regions transitioning to a period of increased wetness.

Water quality in Indian Creek during 2004, as indicated by field measurements of specific conductance and pH, was generally similar to that monitored during previous years (see attached plots). The solute composition of Indian Creek monitored during 2004 was similar to that measured in previous years (Table 2). There are no changes in discharge rates or to water quality that would suggest that any mining-related impacts have occurred in Indian Creek.

Horse Canyon Creek

Horse Canyon Creek, which is monitored near the confluence with Huntington Creek (Figure 1), was monitored during the 1st, 2nd, 3rd, and 4th quarters of 2004. Discharge in Horse Canyon Creek monitored during 2004 was similar to that measured in previous years, ranging from 218 gpm during March to 39 gpm in September (Table 1).

Water quality in Horse Canyon Creek during 2004, as indicated by field measurements of specific conductance and pH, was similar to that monitored during previous years (see attached plots). The solute composition of Horse Canyon Creek monitored during 2004 was also generally similar to that measured in previous years (Table 2). It was noted in 2003 that the sulfate concentrations measured in Horse Canyon Creek had increased somewhat, likely in response to the prolonged period of drought (i.e., resulting from a smaller input of low-TDS snowmelt water relative to the drought-resistant baseflow component). During 2004 the sulfate concentrations measured in Horse Canyon Creek were slightly lower than in 2003, perhaps reflecting the trend toward wetter climatic conditions in the region.

There are no changes in discharge rate or to water quality that would suggest that any mining related impacts have occurred in Horse Canyon Creek.

Blind Canyon Creek

Blind Canyon Creek, which is monitored near the confluence with Huntington Creek (Figure 1), was monitored during the 1st, 2nd, 3rd, and 4th quarters of 2004. Discharge in Blind Canyon Creek monitored during 2004 ranged from 280 gpm during June to 26.1 gpm in September (Table 1). These discharge rates are similar to those measured at Blind Canyon Creek in previous years and slightly greater than those measured in 2003, likely reflecting the regional transition toward wetter climatic conditions.

Water quality in Blind Canyon Creek, as indicated by field measurements of specific conductance and pH, was similar to that monitored during previous years (see attached plots). The solute composition of Blind Canyon Creek monitored during 2004 was likewise similar to that measured in previous years (Table 2).

There are no changes in discharge rate or water quality that would suggest that any mining related impacts have occurred in Blind Canyon Creek.

Crandall Canyon Creek Upper Flume

The upper flume in Crandall Canyon Creek is located above the mine surface facilities in Crandall Canyon. This station was monitored during all four quarters of 2004. The

discharge measured at the upper flume ranged from 1,010 gpm in June to 117 gpm in March. The discharge rates at the upper flume in Crandall Canyon Creek were similar to those measured in previous years. The baseflow measurement in 2004 (134 gpm measured in November) is 48 gpm greater than that measured in 2003, likely a reflection of the transitioning of the region to a period of increased wetness.

Water quality at the upper flume in Crandall Creek, as indicated by field measurements of specific conductance and pH, was generally similar to that monitored during previous years (see Table 2 and attached plots). It was observed in 2003 that sulfate concentrations measured at the upper flume were somewhat elevated relative to previous years. Sulfate concentrations measured during 2004 were similar to those of 2003. As discussed previously, this is believed to likely be a temporary condition related to the recent period of extreme drought and is not believed to be in any way related to mining activities at the Crandall Canyon Mine.

There are no changes in discharge rate or water quality in upper Crandall Canyon Creek that would suggest that any mining-related impacts have occurred.

Crandall Canyon Creek Lower Flume

The lower flume in Crandall Canyon Creek is located immediately below the Crandall Canyon #1 Mine discharge. The lower flume site was monitored during all four quarters of

2004. Stream flow measured at the lower flume is a composite of Crandall Canyon Creek water and mine discharge water. The discharge measured at the lower flume during 2004 was similar to that measured during previous years.

The solute composition of stream waters at the lower flume during 2004 was similar to that measured in previous years. The permitted discharge of mine water into Crandall Canyon Creek results in significantly increased discharge rates in Crandall Creek relative to the non-mining condition. This is particularly evident during drought periods when the relative contribution of water in Crandall Creek above the mine discharge point is small. Because of the relatively good quality of the water discharged from the mine, impacts to water quality in Crandall Creek below the mine are typically small. During 2004, the average TDS concentrations in Crandall Creek above and below the mine were 520 and 573 mg/l, respectively. This represents an increase in TDS of only about 10%.

In-Mine monitoring Summary

In-mine monitoring sites MW-1, and DH-1 were monitored during 2004. All other in-mine monitoring sites are either in portions of the mine that are not accessible or were rendered inoperable as a result of mining activities. In-mine monitoring well MW-2 was previously flooded with mine water and could not be monitored during 2004. During previous years, sites DH-2, MW-3, MW-4, and MW-5 became permanently inaccessible or destroyed and are not available for monitoring.

DH-1

DH-1, which is an in-mine drill hole located near the mine portals continued to be dry during all of 2004 (Table 1). This site has been dry since early 1990 and conditions at the site were unchanged during 2004.

MW-1

MW-1 did not produce sufficient water to monitor during 2004. This condition is unchanged from 2003. The water production from MW-1 had been meager and declining for several years (see Table 2 and attached plots). This condition is not related to mining activities (other than pumping the well). Rather it is a consequence of the poor groundwater production potential of the Star Point Sandstone groundwater system in which the well is completed.

Mine Discharge Monitoring Summary

UPDES 002

Discharge from UPDES 002 (Crandall Canyon #1 discharge) during 2004 was similar to that measured in recent years. The mine discharge averaged 900 gpm during 2004 (see Table 3 and attached plots).

TDS concentrations measured during 2004 were similar to those measured during previous years. Total iron and dissolved iron concentrations were low during 2004 (Table 3). Total iron concentrations were consistently below 1.1 mg/l, while dissolved iron concentrations were all lower than 0.03 mg/l. Suspended solids were usually below laboratory detection limits, with minimal detections occurring on only two occasions (5 and 12 mg/l; Table 3).

UPDES 001

There was no discharge from UPDES 001 (sediment pond discharge) during 2004.

Conclusions

- Discharge rates measured at streams and springs in the mine permit area were similar to those measured in previous years. The transitioning of the region from the recent period of prolonged drought to the current period of wetness is reflected in discharge rates from many springs and streams in the permit and adjacent area during late 2004.

- No major changes to important water quality parameters were observed in springs, streams, or in-mine locations during 2004. Several locations continued to experienced modestly elevated sulfate concentrations that are likely attributable to the recent period of prolonged drought conditions.

- Other than the permitted increase in the discharge rate to Crandall Canyon Creek resulting from the addition of mine discharge water, there is no indication that any mining-related impacts to the hydrologic balance occurred during 2004.

VEGETATION MONITORING
AT TOPSOIL PILE NO. 4
IN CRANDALL CANYON
2004

FOR THE
CRANDALL CANYON MINE

Prepared by

MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
Springville, Utah 84663
(801) 489-6937

Patrick D. Collins, Ph.D.

for

ANDALEX RESOURCES
P.O. Box 1077
Price, Utah 84501

January 2005

TABLE OF CONTENTS

INTRODUCTION 1

METHODS 1

RESULTS 2

DISCUSSION 3

RAW DATA . . . . . Appendix

VEGETATION MONITORING AT TOPSOIL PILE NO. 4 IN CRANDALL CANYON 2004

INTRODUCTION

Crandall Canyon is a tributary of Huntington Canyon and is located approximately 15 miles west of the town of Huntington, in Emery County, Utah. The mine has salvaged topsoil from areas that had been previously disturbed by mine-related activities. These piles had been seeded previously with a seed mix that was prepared to stabilize the piles and protect them from wind and water erosion, as well as use in monitoring the establishment of the prescribed species.

Topsoil Pile No. 4, located in close proximity to the confluence of Crandall and Huntington Canyons, was quantitatively sampled in the growing season of 2004 as a means to monitor the current vegetation becoming established on the pile. This document summarizes the results from this sample period.

METHODS

Quantitative and qualitative data were taken on the Topsoil Pile No. 4 on September 9, 2004. Cover estimates were made using ocular methods with meter square quadrats. Species composition and relative frequencies were also assessed from the quadrats. Additional

information recorded on the raw data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows "A Utah Flora" (Welsh et al., 2003).

Raw data for the cover estimates have been summarized on a spreadsheet and has been included in this report. A color photograph of the sample area was taken at the time of sampling and has been submitted with this report.

RESULTS

The total living cover for Topsoil Pile No. 4 was estimated at 55.67% (Table 1-A). The composition of the pile was dominated by grasses that comprised over 80% of the total living cover (Table 1-B). Forbs made up 15.37% and shrubs 3.82% of the living cover.

Table 1 - Crandall Canyon Topsoil Pile No. 4
Total Cover and Composition

A. COVER	Cover (%)	Std.Dev.
Total Living Cover	55.67	18.70
Litter	9.00	5.54
Bareground	19.33	15.80
Rock	16.00	11.28
B. COMPOSITION		
Shrubs	3.82	6.41
Forbs	15.37	19.17
Grasses	80.80	17.91

As suggested by the composition results above, the dominant plant species of the pile were grass species including Great Basin wildrye (*Elymus cinereus*), bluebunch wheatgrass (*Elymus spicatus*), and western wheatgrass (*Elymus smithii*). All species present in

the sample quadrats are shown on Table 2.

Table 2 - Crandall Canyon Topsoil Pile No. 4
Cover and Frequency by Species

	Mean	Std.Dev.	Freq.
SHRUBS			
Artemisia tridentata	0.47	1.20	13.33
Chrysothamnus nauseosus	1.00	3.74	6.67
Ribes aureum	0.13	0.50	6.67
Rosa woodsii	0.33	1.25	6.67
Symphoricarpos oreophilus	0.40	1.25	13.33
FORBS			
Achillea millefolium	1.13	2.31	20.00
Chenopodium fremontii	3.87	6.16	33.33
Cynoglossum officinale	0.33	1.25	6.67
Linum lewisii	0.87	2.28	13.33
GRASSES			
Agropyron cristatum	3.67	11.32	13.33
Bromus inermis	2.67	5.44	26.67
Elymus cinereus	19.80	29.29	46.67
Elymus smithii	9.33	12.89	46.67
Elymus spicatus	11.67	19.38	46.67

DISCUSSION

Vegetation on the pile looked good. Although the piles were dominated by grass species, the other lifeforms were also represented. Two desirable forb species and five shrubs were present in the samples making species diversity quite respectable for this reseeded topsoil pile. Although

present in the samples, "weedy" species were not a problem judging from their cover and frequency values.

As one note of interest, additional topsoil material had been added to the pile as recently as 2003. The new material was seeded after it was placed on the existing pile. Although the sample transects dissected both the previously seeded and recently seeded areas, and the data were combined for the summary tables, it is possible to differentiate between these two areas by reviewing the raw data sheets included in this report. Accordingly, the previously seeded quadrats were numbered 1-9 and the recently seeded areas were numbered 10-15 on the spreadsheet. This distinction can also be observed on the color photograph included with this report (Figure 1); the more recent material was placed on the right side of the photograph.

Figure 1: Crandall Canyon Topsoil Pile No. 4

APPENDIX

Raw Data

ANDALEX - GENWAL
Crandall Canyon
Topsoil Pile #4
Revegetated
Slope: Variable
Exposure: Variable
Sample Date: 9 Sept 2004

Transects 1 thru 9 (In old pile area)

	1.00	2.00	3.00	4.00	5.00	6.00
SHRUBS						
Artemisia tridentata	3.00	0.00	4.00	0.00	0.00	0.00
Chrysothamnus nauseosus	0.00	0.00	0.00	0.00	0.00	0.00
Ribes aureum	2.00	0.00	0.00	0.00	0.00	0.00
Rosa woodsii	0.00	0.00	0.00	0.00	0.00	0.00
Symphoricarpos oreophilus	0.00	0.00	1.00	5.00	0.00	0.00
FORBS						
Achillea millefolium	0.00	0.00	0.00	0.00	0.00	0.00
Chenopodium fremontii	0.00	0.00	0.00	0.00	0.00	0.00
Cynoglossum officinale	5.00	0.00	0.00	0.00	0.00	0.00
Linum lewisii	8.00	0.00	0.00	5.00	0.00	0.00
GRASSES						
Agropyron cristatum	0.00	0.00	0.00	0.00	0.00	0.00
Bromus inermis	0.00	0.00	0.00	0.00	0.00	5.00
Elymus cinereus	7.00	45.00	0.00	0.00	85.00	20.00
Elymus smithii	20.00	40.00	0.00	0.00	0.00	0.00
Elymus spicatus	20.00	0.00	65.00	50.00	0.00	20.00
COVER						
Total Living Cover	65.00	85.00	70.00	60.00	85.00	45.00
Litter	15.00	5.00	5.00	10.00	5.00	5.00
Bareground	10.00	5.00	5.00	10.00	5.00	20.00
Rock	10.00	5.00	20.00	20.00	5.00	30.00
% COMPOSITION						
Shrubs	7.69	0.00	7.14	8.33	0.00	0.00
Forbs	20.00	0.00	0.00	8.33	0.00	0.00
Grasses	72.31	100.00	92.86	83.33	100.00	100.00

Transects 10 thru 15 (In new cover area)

7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	7.00	0.00	0.00	5.00	0.00	5.00
0.00	0.00	0.00	13.00	5.00	10.00	0.00	20.00	10.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	45.00	0.00	10.00
0.00	0.00	0.00	5.00	20.00	10.00	0.00	0.00	0.00
15.00	85.00	40.00	0.00	0.00	0.00	0.00	0.00	0.00
35.00	0.00	0.00	10.00	5.00	0.00	0.00	15.00	15.00
0.00	0.00	0.00	5.00	5.00	10.00	0.00	0.00	0.00
65.00	85.00	45.00	40.00	35.00	30.00	50.00	35.00	40.00
25.00	5.00	5.00	5.00	5.00	15.00	10.00	10.00	10.00
5.00	5.00	5.00	50.00	35.00	45.00	25.00	40.00	25.00
5.00	5.00	45.00	5.00	25.00	10.00	15.00	15.00	25.00
23.08	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	50.00	14.29	33.33	10.00	57.14	37.50
76.92	100.00	88.89	50.00	85.71	66.67	90.00	42.86	62.50

ANDALEX - GENWAL
Crandall Canyon
Topsoil Pile #4
Revegetated
Slope: Variable
Exposure: Variable
Sample Date: 9 Sept 2004

Mean	SDev	Freq	
			SHRUBS
0.47	1.20	13.33	*Artemisia tridentata*
1.00	3.74	6.67	*Chrysothamnus nauseosus*
0.13	0.50	6.67	*Ribes aureum*
0.33	1.25	6.67	*Rosa woodsii*
0.40	1.25	13.33	*Symphoricarpos oreophilus*
			FORBS
1.13	2.31	20.00	*Achillea millefolium*
3.87	6.16	33.33	*Chenopodium fremontii*
0.33	1.25	6.67	*Cynoglossum officinale*
0.87	2.28	13.33	*Linum lewisii*
			GRASSES
3.67	11.32	13.33	*Agropyron cristatum*
2.67	5.44	26.67	*Bromus inermis*
19.80	29.29	46.67	*Elymus cinereus*
9.33	12.89	46.67	*Elymus smithii*
11.67	19.38	46.67	*Elymus spicatus*
			COVER
55.67	18.70		Total Living Cover
9.00	5.54		Litter
19.33	15.80		Bareground
16.00	11.28		Rock
			% COMPOSITION
3.82	6.41		Shrubs
15.37	19.17		Forbs
80.80	17.91		Grasses

APPENDIX C

Legal Financial, Compliance and Related Information

Annual Report of Officers
As submitted to the Utah Department of Commerce

Other change in ownership and control information
As required under R645-301-110

CONTENTS

Utah Department of Commerce

Utah Department of Commerce

Business Entity Search

Help

Name	Type	City	Status	Detail
GENWAL RESOURCES, INC.	Corporation	SALT LAKE CITY	Active	Detail

Total Results: 1

Do Another Se

Copyright © 2004 State of Utah - All rights reserved.

utah gov | State Online Services | Agency List | Business.utah.gov | Search Uta

Utah Department of Commerce

Business Entity Search

Help

Name	Type	City	Status
GENWAL RESOURCES, INC.	Corporation	SALT LAKE CITY	Active

Business Name:	GENWAL RESOURCES, INC.
Entity Number:	1208426-0142
Registration Date:	12/12/1994
State of Origin:	UT
Address	
	201 S MAIN STE 1100 SALT LAKE CITY, UT 841114904
Status	
Status:	Active
Status Description:	Good Standing
This Status Date:	11/30/0002
Last Renewed:	11/09/2004
License Type:	Corporation - Domestic - Profit
Delinquent Date:	12/12/2005
Registered Agent	
Registered Agent:	JOHN S KIRKHAM
Address Line 1:	201 S MAIN STE 1100
Address Line 2:	
City:	SALT LAKE CITY
State:	UT
Zip:	841114904
Additional Information	
Additional Principals:	N
NAICS Code:	9999
NAICS Title:	9999-Nonclassifiable Establishment
Stock Class 1 Amount:	0000001000
Stock Class 1 Type:	COMMON
Stock Class 2 Amount:	0000000000
Stock Class 3 Amount:	0000000000
Stock Class 4 Amount:	0000000000

With this information, you can...

Purchase Certificate of Existence

If you would like to purchase a Certificate of Existence for this business the button to the left. You will be assessed a **$ 12.00 fee** for this service. need Adobe Reader to view this certificate. If you do not have Adobe Re on the button below and download it.

Get Adobe Reader

Access Principal Information

If you would like to receive information on the principal individuals assoc this entity, click the button on the left. You will be assessed a **$ 1.00 fee** information.

APPENDIX D

Mine Maps

As required under R645-302-525-270

CONTENTS

2004 Mine Map showing Production Areas

APPENDIX E

Other Information

In accordance with the requirements of R645-301 and R645-302

CONTENTS

None