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OUTGOING
C0070033

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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DIVISION OF OIL, GAS AND MINING
FACSIMILE COVER SHEET

DATE: July 18, 2003

FAX #: 435-636-3657

ATTN: Wayne Leddington

COMPANY: BLM

DEPARTMENT:

NUMBER OF PAGES: (INCLUDING THIS ONE) 34

FROM: A. Naruse

If you do not receive all of the pages, or if they are illegible, please call (801)538-5340. We are sending from a Sharp facsimile machine. Our telecopier number is (801)359-3940.

MESSAGE: Here is a copy of the Wildcat Stockpile Area Amendment.

Important: This message is intended for the use of the individual or entity of which it is addressed and may contain information that is privileged, confidential and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone and return this original message to us at the above address via regular postal service. Thank you.

0004

ANDALEX
RESOURCES, INC.

P.O. BOX 902
PRICE, UTAH 84501
PHONE (435) 637-5385
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007/033 Incoming
New Amendment.

Utah Division of Oil, Gas & Mining
Coal Program
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Mr. Daron Haddock Permit Supervisor

Re: Wildcat Loadout C/007/033, Stockpile Area Amendment

Dear Mr. Haddock:

Andalex Resources, Inc. is herein requesting approval of a 0.92 acre coal stockpile expansion area at the Wildcat Loadout.

Stockpile areas are presently reaching maximum capacity, and there is an immediate need for additional storage area. This proposal will provide some relief by providing additional space, and allowing for some reduction in pile height, with minimal additional disturbance.

The area in question has been reviewed by DOGM staff, and results of their field visit and recommendations are discussed in the 2/28/03 file memo from Pricilla Burton.

The proposed expansion area is within the present bonded area, in ASCA 3 and a small portion of ASCA 4. Runoff from the new disturbed area will be directed to existing Sediment Pond B. Sizing calculations show Pond B to be adequate to contain the additional runoff. The addition of this small area should not require a modification to the existing air quality permit, since the Wildcat Loadout is still well below the approved maximums for shipping and emissions.

Based on the Soil Survey and recommendations by Mt. Nebo Scientific, Inc., (Appendix D) it is proposed to scrape off the upper 2" - 6" of the surface, as needed, to remove the coal fines. This material will be placed in the refuse pile. The remaining soil will then be salvaged to a depth of 24" and placed on the existing Topsoil Pile "A", as shown on Plate 1. This will provide approximately

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3000 cubic yards of topsoil, or enough for nearly 4 acres, for final reclamation.

It is our hope this proposal will meet with your approval. A more substantial expansion will be proposed in the very near future; however, such expansion would be compatible with this proposal. Approval of this smaller proposal will provide some relief while the need for a larger expansion as well as required plans are evaluated.

Three copies of revised pages and plates, as well as a C1/C2 Form are enclosed. If you have any questions, or need additional information, please let me know.

Sincerely,

Michael W. Glasson
Manager of Operations

Enclosures

APPLICATION FOR PERMIT PROCESSING

Permit Change X	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: C/007/ 033
Title of Proposal: Stockpile Area Expansion						Mine: Wildcat Loadout
						Permittee: Andalex Resources, Inc.

Description, include reason for application and timing required to implement: Immediate Need for Additional Stockpile Area.

Instructions: *If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation*

☐ Yes	X No	1. Change in the size of the Permit Area? _____ acres Disturbed Area? _____ acres ☐ increase ☐ decrease.
☐ Yes	X No	2. Is the application submitted as a result of a Division Order? DO #
☐ Yes	X No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes	X No	4. Does application include operations in hydrologic basins other than as currently approved?
☐ Yes	X No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes	X No	6. Does the application require or include public notice/publication?
☐ Yes	X No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes	X No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes	X No	9. Is the application submitted as a result of a Violation? NOV #
☐ Yes	X No	10. Is the application submitted as a result of other laws or regulations or policies? Explain: DIVISION REQUEST
☐ Yes	X No	11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes	X No	12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)
☐ Yes	X No	13. Does the application require or include collection and reporting of any baseline information?
☐ Yes	X No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
X Yes	☐ No	15. Does application require or include soil removal, storage or placement?
☐ Yes	X No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
X Yes	☐ No	17. Does the application require or include construction, modification, or removal of surface facilities?
X Yes	☐ No	18. Does the application require or include water monitoring, sediment or drainage control measures?
X Yes	☐ No	19. Does the application require or include certified designs, maps, or calculations?
☐ Yes	X No	20. Does the application require or include subsidence control or monitoring?
☐ Yes	X No	21. Have reclamation costs for bonding been provided for?
☐ Yes	X No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes	X No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

X Attach 5 complete copies of the application.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

Michael Lunn Manager 05/08/03
Signed - Name - Position - Date

Subscribed and sworn to before me this 8th day of May, ~~19~~ 2003

Linda Kerns
Notary Public

My Commission Expires: May 08, ~~19~~ 2005
Attest: STATE OF Utah
COUNTY OF Carbon

NOTARY PUBLIC
LINDA KERNS
345 NORTH 700 EAST
PRICE, UT 84501
MY COMMISSION EXPIRES
MAY 08, 2005
STATE OF UTAH

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ASSIGNED TRACKING NUMBER

Application for Permit Processing
Detailed Schedule of Changes to the MRP

Title of Application:	Permit Number: C/007/033
Stockpile Area Expansion.	Mine: Wildcat Loadout
	Permittee: Andalex Resources, Inc.

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. **Include page, section and drawing numbers as part of the description.**

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	X REPLACE	☐ REMOVE	Page 62, 63
☐ ADD	X REPLACE	☐ REMOVE	Page 100 (Table IV-2)
☐ ADD	X REPLACE	☐ REMOVE	Page 102 (Table IV-3)
☐ ADD	X REPLACE	☐ REMOVE	Page 104 (Table IV-4)
☐ ADD	X REPLACE	☐ REMOVE	Page 108 (Table IV-6)
☐ ADD	X REPLACE	☐ REMOVE	Page 110 (Table IV-7)
☐ ADD	X REPLACE	☐ REMOVE	Page 147 (Table IV-15)
☐ ADD	X REPLACE	☐ REMOVE	Plates 1 and 2
X ADD	☐ REPLACE	☐ REMOVE	Soil Survey - Supplement to Appendix D
☐ ADD	☐ REPLACE	☐ REMOVE	
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Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

4. Water

4.1 Tanks

2 ea., 10,000 gal., treated for culinary, 35 hp centrifugal pump, enclosed tankside pump houses

4.1-1 Tank Location

- At crusher building to serve crusher building and truck dump
- At office building (culinary usage)

5. Area of Operations

5.1 Proposed Permit Area

The proposed permit area consists of part of BLM right-of-way U-48027 and is shown on Plate 1 and revised Plate 22.

5.2 Surface Area to be Disturbed

The permit area has been previously impacted by mining and loading. The entire permit area at Wildcat has been used for loading and coal storage previously. The total existing surface area disturbed is 56.10 acres excluding the small area exemption. Facilities are indicated on Plates 1 & 22.

The existing West Ridge stockpile area will be expanded by approximately 0.92 acres to the southeast as shown on Plates 1 and 2, to provide additional storage area. The are of proposed expansion is within the bonded area of operations, in Alternate Sediment Control Areas (ASCA) 3 and 4. A soils survey has been conducted on this area and is included as a supplement to Appendix D. Based on results of this survey, the upper 2" - 6" of material will be scraped from the site to remove the majority of the coal fines. Scraping depth will vary according to depth of coal fines. This material will be removed and placed in the refuse pile. The remaining topsoil will be salvaged to a depth of at least 24". This material will be placed on the existing Topsoil Pile "A". This new material will be roughened and reseeded with a temporary seed mix in the late summer/early fall of 2003. Drainage from the stockpile expansion area will be redirected to Sediment Pond B by a surface ditch, as shown on Plate 2.

The disturbed area boundary has been modified to include additional area to the east of the main stockpile (radial

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stacker)(see Plate 22). This area has been lightly covered by wind-carried coal fines over the nine year history of Wildcat. Therefore, it is necessary to include this additional 3.7 acres as part of Andalex's disturbed area. It should be noted that this additional acreage does not constitute a significant revision (6%). Upon final reclamation this area will be cleaned of wind-carried coal fines and revegetated in a similar fashion to existing disturbed areas. Runoff from this area is currently passed through straw dikes. These dikes will be maintained on an annual basis as necessary.

Andalex has used, from time to time, a vacuuming system to pick up wind-carried coal fines at the minesite. Andalex proposes to clean as many coal fines as is practical at the Wildcat Loadout in the area east of the main stockpile. This vacuum system will be utilized in the Spring of 1994 and thereafter as necessary.

It should also be noted that due to the reoccurring situation regarding wind-carried coal fines, Andalex proposes to construct

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TABLE IV-2

Drainage Areas/Flow Calculations

Drainage Area	Area (acres)	Length (ft.)	Elev. Diff. (ft.)	Slope (%)	tc (hrs)	Q (cfs)
A	7.85	800	38	4.75	0.14	6.96
B	3.21	600	18	3.27	0.14	2.03
C	18.03	1200	52	4.33	0.21	15.31
D	6.61	400	18	4.50	0.08	6.45
E	7.69	1250	52	4.16	0.22	6.50
F	7.50	1200	38	3.17	0.24	6.26

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TABLE IV-3

Runoff Calculations

Area/Pond	A	B	C	D	E	F
Drainage Area (ac.)						
Precipitation						
10 yr.-24 hr. (in.)	7.85	3.21	18.03	6.61	7.69	7.50
25 yr.-24 hr. (in.)	1.85	1.85	1.85	1.85	1.85	1.85
100 yr.-24 hr. (in.)	2.15	2.15	2.15	2.15	2.15	2.15
Runoff CN	2.75	2.75	2.75	2.75	2.75	2.75
Runoff to Pond:	90	90	90	90	90	90
10 yr.-24 hr. (ac. ft.)	0.654	0.268	1.503	0.551	0.641	0.625
25 yr.-24 hr. (ac. ft.)	0.820	0.335	1.883	0.690	0.803	0.783
100 yr.-24 hr. (ac. ft.)	1.143	0.467	2.624	0.962	1.119	1.092
Peak Flow:						
10 yr.-24 hr. (cfs)	6.96	2.03	15.31	6.45	6.50	6.26
25 yr.-24 hr. (cfs)	8.72	2.54	19.29	8.04	8.20	7.90

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TABLE IV-4

Sediment Yield

Area/Pond	A	B	C	D	E	F
Area (ac.)	7.85	3.21	18.03	6.61	7.69	7.50
Length	800	600	1200	400	1250	1200
Slope (%)	4.75	3.27	4.33	4.50	4.16	3.17
LS Factor	1.30	0.56	1.30	0.85	1.30	0.60
Sed. Yield (tons/ac/yr.)	12.27	5.29	12.27	8.02	12.27	5.664
Unit Weight (lbs./ft.^{3})	100	100	100	100	100	100
Sed. Yield (ac. ft./yr.)	0.044	0.008	0.102	0.024	0.043	0.019
Sed. Yield (ac. ft./3 yrs.)	0.132	0.025	0.306	0.072	0.129	0.057

Note: Calculations based on Universal Soil Loss Equation

R = 18.88 inches

K = 0.5

CP = 1

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TABLE IV-6

Pond Volume Summary
(10 year - 24 hour event)

Pond	A	B	C	D	E	F
Runoff (ac. ft.)	0.654	0.268	1.503	0.551	0.641	0.625
Direct Precipitation	0.055	0.011	0.072	0.024	0.014	0.015
3 yr. Sed. Storage (ac. ft.)	0.132	0.025	0.306	0.072	0.129	0.057
Required Pond Vol. (ac. ft.)	0.841	0.304	1.881	0.647	0.784	0.697
Actual Pond Vol. (ac. ft.)	2.410	0.464	4.430	0.880	0.849	0.700
Excess Capacity (ac. ft.)	1.569	0.160	2.549	0.233	0.065	0.003

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TABLE IV-7

Pond Specification Summary
(10 year - 24 hour event)

Pond	A	B	C	D	E	F
Drainage Area (ac.)	7.85	3.21	18.03	6.61	7.69	7.50
Required Volume (ac. ft.)	0.841	0.304	1.881	0.647	0.784	0.697
Existing Volume (ac. ft.)	2.410	0.464	4.430	0.880	0.849	0.700
Excess Volume (ac. ft.)	1.569	0.160	2.549	0.233	0.065	0.003
*Sed. Cleanout Level (ft.)	2.50	2.40	3.50	1.25	0.50	0.50
Embankment Slopes (%):						
Inside	3:1	3:1	3:1	3:1	3:1	2:1
Outside	2:1	2:1	2:1	2:1	2:1	3:1
Overflow Structures:						
Principal	18"cmp	12"cmp	18"cmp	18"cmp	18"cmp	12" cmp
Emergency	1'x 4'	1'x 4'	18"cmp	18"cmp	1'x 4'	1'x 4'

* Sediment Cleanout Levels are based on 60% of sediment storage for 3 years plus excess pond volume

NOTE: In the event any of the ponds or the impoundment need to be decanted, Andalex will provide pumps.

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TABLE IV-15
ASCA

ASCA Area*	Area (Acres)	*Runoff Volume (ac. ft.)	Treatment Method
1	0.84	0.07	Vegetation
2	0.44	0.04	Vegetation
3	9.18	0.77	Straw Bales/Vegetation
4	3.30	0.28	Straw Bales/Vegetation
5	2.00	0.17	Straw Bales/Vegetation/Berm
6	0.57	0.05	Vegetation
7(F)	0.26	0.02	Vegetation/Berm
Totals	16.59	1.40	---

*Runoff Volumes are based on a 10 year - 24 hour event and a runoff CN of 90.

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Supplement
to
Appendix D

Soil Survey for the One-Acre Expansion at the Wildcat Loadout

March 2003

SOIL SURVEY FOR THE ONE-ACRE EXPANSION AT THE WILDCAT LOADOUT

Prepared by

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

by

Patrick D. Collins
&
James H. Nyenhuis

for

ANDALEX RESOURCES, INC
P.O. Box 902
Price, UT 84501

March 2003

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Laboratory Report . . . . . APPENDIX

INTRODUCTION

Andalex Resources plans to expand their coal storage area at the Wildcat Loadout facility located just off Consumers Road about four miles west of the city of Helper, in Carbon County, Utah. More specifically, the site is located in a portion of Section 33, T.14S., R.9E. as shown on the Standardville 7.5 minute USGS topographic quadrangle. A detailed Order 1-2 soil survey was conducted in March 2003 on approximately one acre of land immediately adjacent and to the east of the current coal storage piles. The one-acre study site was within the current Wildcat permit area, but was not included in the original proposed disturbance area. The one-acre soil survey is part of a larger survey being conducted on approximately twelve acres, all of which are located immediately adjacent to and east of the current coal piles. To date, preparation for the final report of the total twelve acres soil survey is still in progress. Following approval by the State of Utah, Division of Oil, Gas & Mining (DOGM), Andalex plans to utilize the one-acre site for coal storage immediately. Plans are to utilize the additional eleven acres in the near future.

The identification and proper management of topsoil resources on the study area is essential for the success of future reclamation and the achievement of the post-disturbance land use. The information presented in this report is designed to aid in formulating a practical and successful reclamation plan.

METHODS

Standard soil survey methods were used throughout the project. Andalex provided a site photo-map to Patrick Collins, who then conducted field work at the site on March 5, 2003. He designated three locations as representative of the soil on the one acre portion of the study area. A backhoe pit was then dug at each of the three sites. Examination of the soil profiles at the three pits were made and photographs were taken at that time. Soil sampling for analyses in two of the three pits (WC-1 and WC-2) was then conducted. The samples were subsequently delivered to Brigham Young University's soil testing laboratory for standard analysis as described in the "Guidelines for Management of Topsoil and Overburden (DOGM, 2002).

On the same date, Patrick Collins also investigated the extent of coal fines deposition on the one-acre site. This was accomplished by placing 5 regularly-spaced transect lines, 30 ft apart, beginning closest to the current coal pile and working eastward (away from the pile). On each transect line, spade holes at 15 ft intervals. The holes were dug deep enough to measure the depth of the coal fines.

The study site was visited again on March 11, 2003 by Patrick Collins and Jim Nyenhuis, a Certified Professional Soil Scientist. Dr. Collins described his sampling rationale and Mr. Nyenhuis concurred that it was appropriate for the Hernandez soil. The next day, March 12, seven additional backhoe pits were sited and dug on the larger twelve acre study area. Ms. Priscilla Burton (DOGM soil scientist and reclamation specialist) was present for the day,

observed all ten backhoe pits, and assisted in the description and sampling of several soil profiles. Ms. Burton also observed all three pits on the primary one-acre study area. Mr. Nyenhuis concluded the soils descriptions and sampling of the larger area on the following day, March 13, 2003 (as mentioned, the final report of the larger area is in progress).

RESULTS

Field Work

The Hernandez series is the primary soil on the one-acre study site. This conclusion is supported by the soil profile descriptions, soil laboratory data, and general site characteristics at each of the three backhoe pit sites. Although there are some differences among all three pits, each soil site classifies as the Hernandez soil series. The Hernandez family, map unit 55, was also mapped for the area by NRCS on Sheet 8 of its Soil Survey of Carbon Area, Utah (Jansen and Borchert, 1988). Hernandez family is a very deep, well-drained soil mapped on uplands in the general area. The soil is developing in local alluvium derived dominantly from sandstone and shale. Site vegetation includes Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*), Indian ricegrass (*Stipa hymenoides*), and needle-and-thread grass (*S. comata*). Elevation of the site was approximately 6,170 ft. MSL. Average annual precipitation is about 10 to 12 inches (ustic-aridic soil moisture regime). Average annual air temperature is about 47 to 49 degrees F. (mesic soil temperature regime). The average freeze-free period is 110 to 135 days per year (Jansen and Borchert, 1988).

Based on NRCS data, Hernandez has moderate permeability, high available water capacity (9.0 to 10.5 inches), slow runoff, and water supplying capacity of 5.5 to 6.5 inches. Effective rooting depth is 60 inches or more, the organic matter content of the surface layer is generally 1 to 3 percent, and the hazard of wind and water erosion is moderate (Jansen and Borchert, 1988). The Range Site for Hernandez is Semidesert Loam (Wyoming Big Sagebrush).

Hernandez is classified as a "Fine-loamy, mixed, superactive, mesic Ustic Haplocalcid". Hernandez is an established soil series of moderate extent. The most recent NRCS official soil series description, dated October 2002, is on file at *Mt. Nebo Scientific, Inc.* Hernandez was described and sampled at sites WC-1 and WC-2, and additionally described at site WC-3. Profile descriptions for these sites follow.

Hernandez Pedon WC-1 Profile Description

Map Unit A; 3% slope, east-southeast aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium, fan uplands, no erosion; soil slightly moist to 8 inches; 3 inches of coal fines deposition from the adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick)

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common coarse, medium and many fine and very fine roots to 13 inches; moderately effervescent, slightly alkaline (pH 7.7); gradual smooth boundary.

Bw (cambic) horizon – 3 to 13 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, slightly alkaline (pH 7.7); clear wavy boundary.

Bk (calcic) horizon – 13 to 23 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; few coarse, medium, fine and very fine roots; violently effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Ck horizon – 23 to 60 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.2); did not hit bedrock.

Hernandez Pedon WC-2 Profile Description

Map Unit A; 4% slope; east-southeast aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 3 inches; 3 inches of coal fines deposition from adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick)

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; strong, medium platy structure (mechanically compacted); hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; few to common coarse and medium and many fine and very fine roots to 10 inches; strongly effervescent, moderately alkaline (pH 7.8); gradual smooth boundary.

Bw (cambic) horizon – 3 to 10 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium platy structure (mechanically compacted); hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 7.8); clear wavy boundary.

Bk (calcic) horizon – 10 to 32 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive structure; extremely hard dry consistence; very firm moist consistence; sticky and slightly plastic wet consistence; few medium, fine, and very fine roots; violently effervescent, moderately alkaline (pH 7.8); gradual wavy boundary.

Ck horizon – 32 to 60 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; violently effervescent, strongly alkaline (pH 8.5); did not hit bedrock.

Hernandez Pedon WC-3 Profile Description

Map Unit A; 3% slope' east-southeast aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; soil slightly moist to 9 inches; no

erosion; 3 inches of coal fines deposition from adjacent wildcat Loadout facility; not sampled for laboratory characterization.

Coal Fines – 3 to 0 inches (3 inches thick).

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common medium, fine, and very fine and few coarse roots to 9 inches; strongly effervescent; gradual smooth boundary.

Bw (cambic) horizon – 3 to 9 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent; clear wavy boundary.

Bk1 (calcic) horizon – 9 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive structure parting to moderate medium subangular blocky; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; commmon fine and very fine and few coarse and medium roots; strongly effervescent; gradual wavy boundary.

Bk2 (calcic horizon) – 18 to 32 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; few medium, fine, and very fine roots; violently effervescent; gradual wavy boundary.

Ck horizon – 32 to 52 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; massive structure; very hard dry consistence, very firm moist consistence, sticky and slightly plastic wet consistence; violently effervescent; gradual wavy boundary.

C horizon – 52 to 64 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; massive structure; hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; did not hit bedrock

Hernandez Range of Characteristics

The described and sampled pedons WC-1, WC-2, and WC-3 are typical and within the range of characteristics for the Hernandez soil series (Hernandez official soil series description, October 2002).

Laboratory Analyses

The following parameters were analyzed at Brigham Young University's soil testing laboratory: pH, saturation percent, electrical conductivity, available NO_3-N, available phosphorus, organic matter, sodium adsorption ration, texture, percent saturation, and $CaCO_3$. Results for the analyses are shown on Table 1. Original laboratory results are also included in the Appendix of this report.

Table 1: Laboratory Results for the One-Acre Study Area at the Wildcat Loadout

Sample Number	P (ppm)	NO_3-N (ppm)	OM (%)	pH	Sand (%)	Clay (%)	Silt (%)	SAR	Moist. Sat. (%)	$CaCO_3$ (%)
WC-1 (0-13")	4.52	4.39	2.79	7.68	43.84	24.72	31.44	0.28	35.17	9.66
WC-1 (13-23")	0.03	5.23	0.56	7.83	47.84	16.72	35.44	0.38	33.50	18.68
WC-1 (23-54")	1.51	2.07	0.67	8.18	26.56	29.72	43.72	0.99	39.56	15.55
WC-2 (0-12")	3.77	4.13	3.64	7.81	38.56	24.72	36.72	0.36	36.60	10.77
WC-2 (12-32")	0.79	2.67	0.90	7.83	32.20	25.72	42.08	0.48	37.29	13.75
WC-2 (32-54")	4.99	1.23	0.48	8.46	32.56	23.72	43.72	6.46	34.70	15.11

Hernandez Soil Suitability and Salvage Depth Recommendation

Based on an evaluation of the field and laboratory data, the Hernandez soil is entirely suitable throughout its profile depth to 54 inches or more. Soil textures are good with loam dominating

the upper profile, and loam to clay loam in the lower profile. Soil salinity is low with electrical conductivity (EC) values less than 1 in the upper profile and 2 to 3 in the lower profile. Sodium Adsorption Ratio (SAR) is low throughout the profile with values less than 1 for all samples except the 32 to 54 inch depth interval of WC-2. Soil reaction (pH) is slightly to moderately alkaline with values in the high 7's and low 8's (range of pH 7.7 to 8.5). Calcium carbonate content ranges from 9.7 to 18.7 percent and averages 13.9 percent across all samples. Organic matter content is somewhat high in the upper profile (2.8 to 3.6 percent) and generally low in the lower profile (0.5 to 0.9 percent).

If needed, the entire profile to 54 inches or more could be salvaged for use in reclamation activities. The better soil material is in the approximate upper 24 inches. Soil texture is loam and organic matter content is somewhat high in this upper 2 feet. EC and SAR values are low. Soil texture is good and the soil material can be easily handled. If a more limited amount of soil material is needed, the upper 24 inches can be salvaged as "Topsoil". Additional underlying material could be salvaged, as needed, for use as "Subsoil".

Surface Coal Depths

Coal fines from the adjacent coal pile has been blown onto the one-acre study area. Transects were placed in a regular fashion. These transect lines were placed from west to east, or near the coal pile and moving further away from it, in a attempt to ascertain whether or not this made a difference in the depths observed. Sample holes to measure coal depths were placed along each

transect line from south to north. There were five (5) transect lines, each with sixteen (16) sample locations, producing a total of eighty (80) samples.

Results from measuring coal depths demonstrated that the mean depth from all samples combined was 2.33 inches (Table 2). Although the transect samples nearest to the pile had the greatest depth (3.22 inches), there did not appear to be a strong correlation between coal depth and proximity to the pile after that (Table 2).

Table 2: Surface coal depths (inches) of the one-acre soil survey area at the Wildcat Loadout. Table shows sample sizes (*n*), means ($\bar{x}$), and standard deviations (*s*) for each transect and the total values for all transects.

T1* Sample Number	T2* Sample Depth	T2* Sample Number	T2* Sample Depth	T3* Sample Number	T3* Sample Depth	T4* Sample Number	T4* Sample Depth	T5* Sample Number	T5* Sample Depth
1**	3.00	17**	2.00	33**	0.25	49**	1.00	65**	0.50
2	2.00	18	1.00	34	0.50	50	2.00	66	0.50
3	4.00	19	1.50	35	0.75	51	0.50	67	1.50
4	3.50	20	2.50	36	0.25	52	2.50	68	1.50
5	4.00	21	2.00	37	0.50	53	2.50	69	1.75
6	5.00	22	1.50	38	2.00	54	3.00	70	2.00
7	2.50	23	2.00	39	0.25	55	3.25	71	2.50
8	3.00	24	0.50	40	0.50	56	0.50	72	2.00
9	5.50	25	3.00	41	3.50	57	2.50	73	3.50
10	4.50	26	1.00	42	3.00	58	3.00	74	6.00
11	1.00	27	2.50	43	2.50	59	6.00	75	3.75
12	2.00	28	3.00	44	0.50	60	4.00	76	1.00
13	4.00	29	7.75	45	0.50	61	2.50	77	3.50
14	2.00	30	3.00	46	1.25	62	4.00	78	3.00
15	2.50	31	2.75	47	2.00	63	0.50	79	3.25
16	3.00	32	2.00	48	0.75	64	0.75	80	3.50
n	16		16		16		16		16
$\bar{x}$	3.22		2.38		1.19		2.41		2.48
S	1.19		1.57		1.03		1.48		1.39

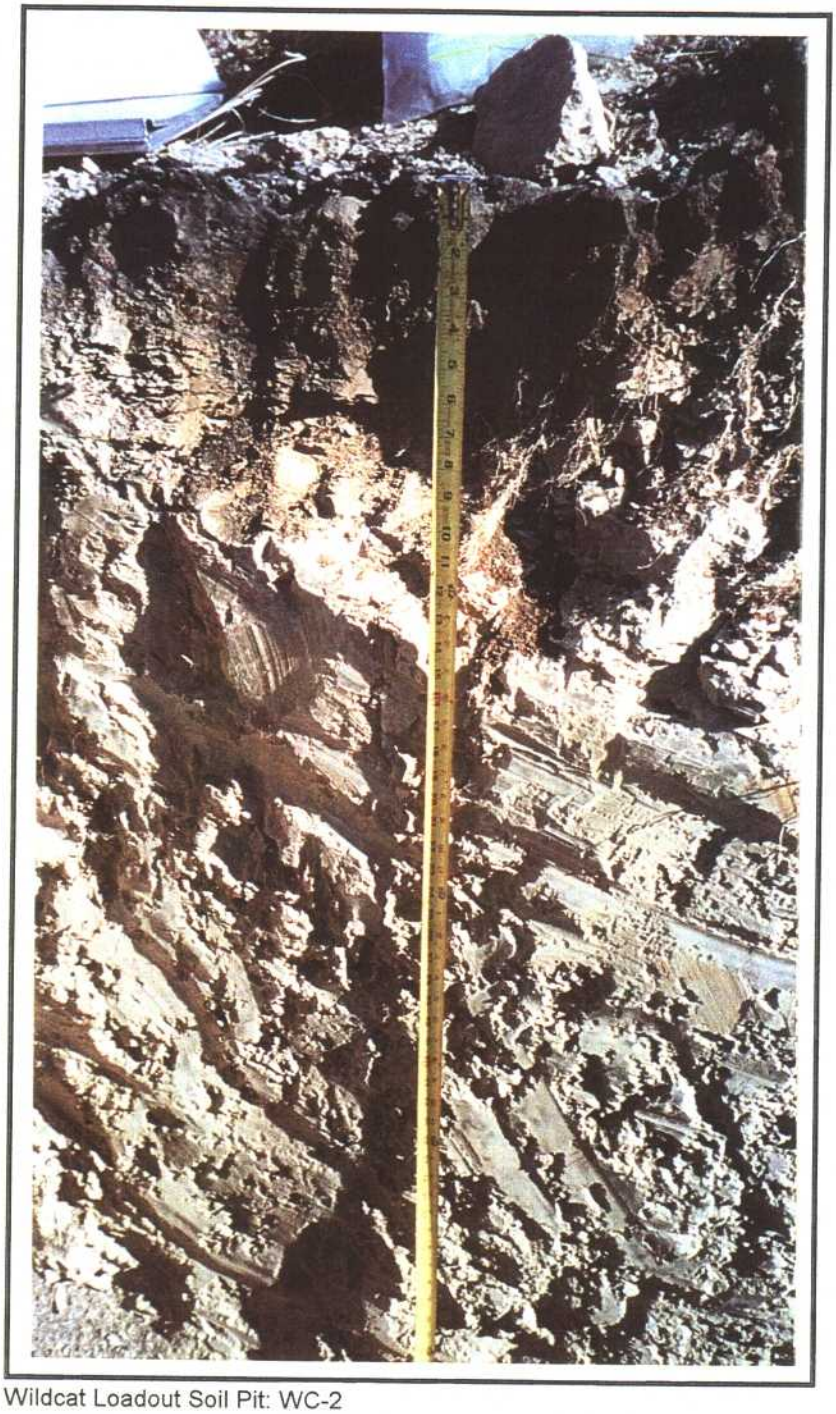
* Transects placed from west to east
** Column sampled from south to north

Values for All Samples Combined	
n	80
$\bar{x}$	2.33
s	1.50

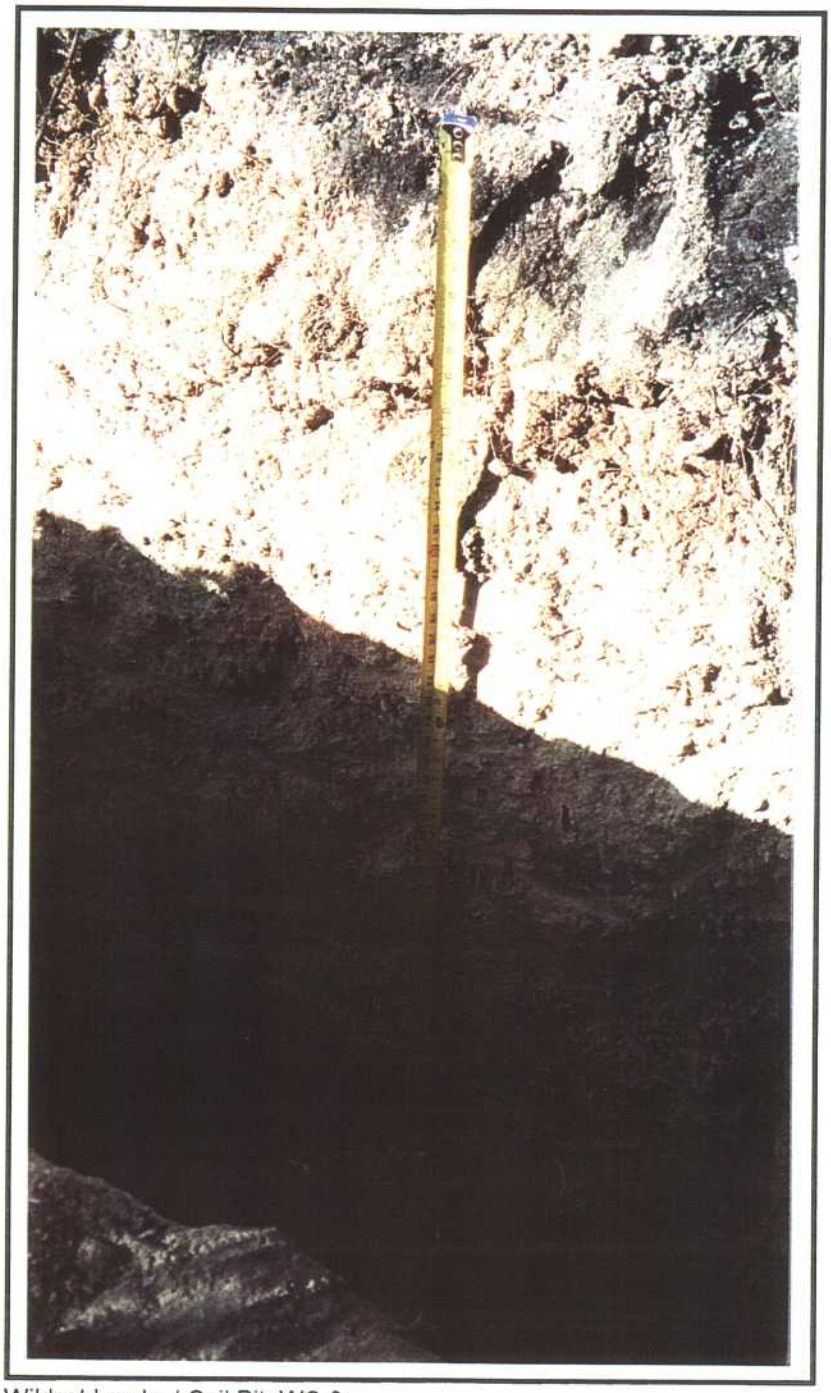
General View of the One-Acre Soil Study Area at the Wildcat Loadout (1 of 2)

General View of the One-Acre Soil Study Area at the Wildcat Loadout (2 of 2)

Wildcat Loadout Soil Pit: WC-1



Wildcat Loadout Soil Pit: WC-2



Wildcat Loadout Soil Pit: WC-3

APPENDIX

Soil and Plant Analysis Lab
255 WIDB
Brigham Young University
Provo, Utah 84602
801-378-2147

Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 84663
Date: 3/14/03

SOIL ID: Wildcat

Customer Sample ID	ppm P	ppm NO3-N	%OM	pH	EC dS\M	%Sand	%Clay
Wildcat 1 East 0-13"	4.52	4.39	2.79	7.68	0.65	43.84	24.72
Wildcat 1 East 13-23"	0.03	5.32	0.56	7.83	0.58	47.84	16.72
Wildcat 1 East 23-54"	1.51	2.07	0.67	8.18	2.00	26.56	29.72
Wildcat 2 North 0-12"	3.77	4.13	3.64	7.81	0.62	38.56	24.72
Wildcat 2 North 12-32"	0.79	2.67	0.90	7.83	0.60	32.20	25.72
Wildcat 2 North 32-54"	4.99	1.23	0.48	8.46	3.00	32.56	23.72

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Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 8466
Date: 3/14/03

SOIL ID: Wildcat

Customer Sample ID	%Silt	ppm Ca-SAR	ppm Mg-SAR	ppm K-SAR	ppm Na-SAR	SAR
Wildcat 1 East 0-13"	31.44	129.20	29.44	40.65	13.51	0.28
Wildcat 1 East 13-23"	35.44	97.56	36.75	6.90	17.34	0.38
Wildcat 1 East 23-54"	43.72	49.15	142.00	6.10	60.82	0.99
Wildcat 2 North 0-12"	36.72	115.10	21.62	10.87	16.31	0.36
Wildcat 2 North 12-32"	42.08	92.96	30.80	9.29	21.07	0.48
Wildcat 2 North 32-54"	43.72	32.78	220.40	22.23	469.70	6.46

Soil and Plant Analysis Lab
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Brigham Young University
Provo, Utah 84602
801-378-2147

Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 8466
Date: 3/14/03

SOIL ID: Wildcat

Customer Sample ID	%Moisture Sat.	%CaCO3	ppm HCO3
Wildcat 1 East 0-13"	35.17	9.66	270.25
Wildcat 1 East 13-23"	33.50	18.68	181.90
Wildcat 1 East 23-54"	39.56	15.55	161.11
Wildcat 2 North 0-12"	36.60	10.77	187.10
Wildcat 2 North 12-32"	37.29	13.75	174.11
Wildcat 2 North 32-54"	34.70	15.11	166.31

SEE INCOMING, C/007/0033,
DATE FOLDER: 05082003
FOR COPIES OF MAPS