PART A

1. DOGM Permit
2. Utah Railway, Lease Agreement
3. Utah Railway, Amendment to Lease
4. Utah Railway, Amended Trackage Agreement
5. Agreement with Beaver Creek Coal Company
6. B.L.M. Right-of-Way Grant
7. B.L.M. Notice to Proceed with Construction
8. B.L.M. Access Road Right-of-Way
9. B.L.M. Right-of-Way, Amendment No. 1
10. B.L.M. Right-of-Way, Amendment No. 2
11. B.L.M. Right-of-Way, Amendment No. 3
12. B.L.M. Right-of-Way, Amendment No. 4
13. Utah Division of Air Quality - Approval Order
14. Utah Department of Transportation, Approval for Reduced Rail Clearances
15. Southeastern Utah District Health Department, Wastewater Disposal System Approval
16. State Division of History, Archaeological Clearance
17. State Division of History, Archaeological Survey
18. State Division of Water Rights, Approved Application
19. State Division of Wildlife Resources, Electric Transmission Poles Acceptable
20. U.S. Department of Interior, Powerline Approval
21. State Division of Environmental Protection, Renewal of Permit Discharge

PART B

History of Violations

PART C

Insurance

PART D

Bond Information

INTEGRATED
EFFECTIVE:

MAY 17, 2006

UTAH DIVISION OIL, GAS AND MINING
PRICE FIELD OFFICE
APPENDIX B
Part A-1
DOGM Permit
&
Affidavit of Publication
FEDERAL C/007/0033 November 9, 2018

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple, Suite 1210
P. O. Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340

This permit, C/007/0033, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (Division) to:

Coal Energy Group 2, LLC
6602 Ilex Circle
Naples, Florida 34109
(329) 825-2332

for the Wildcat Loadout Facility. Coal Energy Group 2, LLC is the lessee of Bureau of Land Management Rights of Way (ROW) No. U48027 and U52810. A surety bond is filed with the Division in the amount of $1,192,000, payable to the State of Utah, Division of Oil, Gas and Mining and the Office of Surface Mining, Reclamation and Enforcement (OSMRE). The Division must receive a copy of this permit signed and dated by the permittee.

Sec. 1 STATUTES AND REGULATIONS - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as the Act.

Sec. 2 PERMIT AREA - The permittee is authorized to conduct coal mining and reclamation operations on the following described lands within the permit area at the Wildcat Loadout Facility situated in the State of Utah, Carbon County, and located in:

Township 13 South, Range 9 East, Section 33, SLBM
NW1/4SE1/4, N1/2SW1/4SE1/4, E1/2E1/2NE1/4SW1/4, E1/2NE1/4SE1/4SW1/4, NE1/4SE1/4SE1/4SW1/4, NW1/4SW1/4SW1/4SE1/4, E1/2SE1/4SW1/4NE1/4 and portions of N1/2NW1/4NE1/4SE1/4, NE1/4SW1/4NE1/4, SW1/4SW1/4NE1/4, NW1/4SE1/4SW1/4NE1/4, W1/2NE1/4SW1/4, W1/2E1/2NE1/4SW1/4, W1/2E1/2SE1/4SW1/4.

INCORPORATED

MAR 05 2019
Div. of Oil, Gas & Mining
Township 13 South, Range 9 East, Section 33, SLBM

Beginning at a point 2,476.01 feet North and 546.66 feet West of the Southeast corner of Section 33, Township 13 South, Range 9 East, SLBM, then South 767.24 feet to the intersection of the Western edge of Trestle Road, then Southwesterly along said edge of road 1,169.87 feet to the intersection of the Eastern edge of the existing permit boundary, then North 1,588.74 feet along existing permit boundary, then Southeasterly 315.74 feet along existing permit boundary, then Northeasterly 522.25 feet along existing permit boundary to point of beginning. Contains 23.00 acres M/L.

This legal description is for the permit area of the Wildcat Loadout Facility. The permittee is authorized to conduct coal mining and reclamation operations and related surface activities on the foregoing described property subject to the conditions of the Bureau of Land Management rights-of-way and all other applicable conditions, laws and regulations.

Sec. 3 COMPLIANCE - The permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program.

Sec. 4 PERMIT TERM - This permit expires on May 5, 2019.

Sec. 5 ASSIGNMENT OF PERMIT RIGHTS - The permit rights may not be transferred, assigned or sold without the approval of the Division Director. Transfer, assignment or sale of permit rights must be done in accordance with applicable regulations, including but not limited to 30 CFR 740.13(e) and R645-303-300.

Sec. 6 RIGHT OF ENTRY - The permittee shall allow the authorized representative of the Division, including but not limited to inspectors, and representatives of the Office of Surface Mining Reclamation and Enforcement (OSM), without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:

(a) have the rights of entry provided for in 30 CFR 840.12, R645-400-220, 30 CFR 842.13 and R645-400-110;

(b) be accompanied by private persons for the purpose of conducting an inspection in accordance with R645-400-100 and R645-400-200 when the inspection is in response to an alleged violation reported to the Division by the private person.

Sec. 7 SCOPE OF OPERATIONS - The permittee shall conduct coal mining and reclamation operations only on those lands specifically designated as within the permit.
area on the maps submitted in the approved plan and approved for the term of the
permit and which are subject to the performance bond.

Sec. 8 ENVIRONMENTAL IMPACTS - The permittee shall take all possible steps to
minimize any adverse impact to the environment or public health and safety resulting
from noncompliance with any term or condition of the permit, including, but not
limited to:

(a) any accelerated or additional monitoring necessary to determine the nature of
noncompliance and the results of the noncompliance;

(b) immediate implementation of measures necessary to comply; and

(c) warning, as soon as possible after learning of such noncompliance, any person
whose health and safety is in imminent danger due to the noncompliance.

Sec. 9 CONDUCT OF OPERATIONS – The permittee shall conduct its operations:

(a) in accordance with the terms of the permit to prevent significant, imminent
environmental harm to the health and safety of the public; and

(b) utilizing methods specified as conditions of the permit by the Division in
approving alternative methods of compliance with the performance standards
of the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 10 DISPOSAL OF POLLUTANTS – The permittee shall dispose of solids, sludge,
filter backwash or pollutants in the course of treatment or control of waters or
emissions to the air in the manner required by the approved Utah State Program and
the Federal Lands Program which prevents violation of any applicable state or federal
law.

Sec. 11 EXISTING STRUCTURES - As applicable, the permittee will comply with R645-
301 and R645-302 for compliance, modification, or abandonment of existing
structures.

Sec. 12 RECLAMATION FEE PAYMENTS - The operator shall pay all reclamation fees
required by 30 CFR Part 870 for coal produced under the permit, for sale, transfer or
use.
Sec. 13 **AUTHORIZED AGENT** - The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.

Sec. 14 **COMPLIANCE WITH OTHER LAWS** - The permittee shall comply with the provisions of the Water Pollution Control Act (33 USC 1151 et seq.) and the Clean Air Act (42 USC 7401 et seq), UCA 26-11-1 et seq, and UCA 26-13-1 et seq.

Sec. 15 **PERMIT RENEWAL** - Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit in accordance with the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 16 **CULTURAL RESOURCES** - If, during the course of coal mining and reclamation operations, previously unidentified cultural resources are discovered, the permittee shall ensure that the site(s) is not disturbed and shall notify the Division. The Division, after coordination with OSM, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by the Division within the time frame specified by the Division.

Sec. 17 **APPEALS** - The permittee shall have the right to appeal as provided for under R645-300-200.

Sec. 18 **SPECIAL CONDITIONS** - There are special conditions associated with these permitting actions as described in Attachment A.
The above conditions (Secs. 1-18) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of the Division and the permittee at any time to adjust to changed conditions or to correct an oversight. The Division may amend these conditions at any time without the consent of the permittee in order to make them consistent with any federal or state statutes and any regulations.

THE STATE OF UTAH

By: _____________________________

Date: 11/13/18

I certify that I have read, understand and accept the requirements of this permit and any special conditions attached.

Authorized Representative of the Permittee

Date: 11/14/18

INCORPORATED

MAR 05 2019

Div. of Oil, Gas & Mining
Attachment A

SPECIAL CONDITION

PROOF OF PUBLICATION CUSTOMER'S COPY

CUSTOMER NAME AND ADDRESS ACCOUNT NUMBER
SNELL & WILMER, 9001342484
DEANNA GAUDREAU
15 W SOUTH TEMPLE STE 1200
SALT LAKE CITY UT 84101

DATE: 10/9/2018

ACCOUNT NAME
SNELL & WILMER,

TELEPHONE: 8012571900

ORDER # / INVOICE NUMBER 0001227700 /

PUBLIC NOTICE FOR PERMIT TRANSFER WILDCAT LOADOUT Coal Energy Group 2

SIZE: 52 LINES 2 COLUMN(S)
TIMES 2 TOTAL COST 135.00

AFFIDAVIT OF PUBLICATION

AS NEWSPAPER AGENCY COMPANY, LLC dba UTAH MEDIA GROUP LEGAL BOOKER, I CERTIFY THAT THE ATTACHED ADVERTISEMENT OF PUBLIC NOTICE FOR PERMIT TRANSFER WILDCAT LOADOUT Coal Energy Group 2, LLC (CEG), a Nevada limited liability company, having offices located at 6602 west cir w., Naples, Florida 34107, has filed with the Utah Division of Oil, Gas and Mining an application requesting the above named coal bed methane permit transfer for Lot 3 parcel located at 3 miles west of Highway 6 on Consultant Road, Helper, Utah. The application is for CEG the 100% unencumbered interest in the same permit held by Intercontinental Power Group. The permit area is located in Carbon County, Utah, depicted on the Standardville USGS topographic quadrangle map.

The existing permit area is described as follows:

Township 13 South, Range 9 East, Section 33.4-522-522.50 feet North and 446-546.54 feet West of the Southeast corner of Section 33, Township 13 South, Range 9 East, Utah, then South 297.34 feet to the intersection of the western edge of Treble Road, then Southwesterly along paid edge of road 1,497.96 feet to the intersection of the Eastern edge of the existing permit boundary, then North 3,057.74 feet along existing permit boundary, then Southwesterly 31,274.75 feet along existing permit boundary to point of beginning, Contains 2,300 acres.

A copy of this application is available for inspection at the Division of Oil, Gas and Mining, 1594 West North Temple, Suite 3110, Salt Lake City, Utah. Comments, objections or requests for informational conferences on the application should be submitted within 30 days to: Utah Oil and Gas Program, 1594 West North Temple, Suite 3110, Salt Lake City, Utah.

Published on Start 10/09/2018 End 10/09/2018

DATE 10/9/2018

STATE OF UTAH )
COUNTY OF SALT LAKE )

SUBSCRIBED AND SWORN TO BEFORE ME ON THIS 9TH DAY OF OCTOBER IN THE YEAR 2018

BY: LORAINA GUDMUNDSON.

JAE LEVI
NOTARY PUBLIC STATE OF UTAH
My Comm. Exp. 05/28/2022
Commission # 700608

Notary Public Signature
LEASE

THIS LEASE, made and entered into as of the 1st day of December, 1981 between UTAH RAILWAY COMPANY, a Utah corporation, mailing address: 1770 University Club Building, 136 East South Temple, Salt Lake City, Utah 84111 hereinafter called "Lessor," and TOWER RESOURCES, INC., a Delaware corporation, mailing address: P.O. Box 1027, Price, Utah 84501, hereinafter called "Lessee," WITNESSETH, that:

Section 1. Grant and Description. Lessor, in consideration of the rents to be paid and the agreements to be performed by Lessee, hereby leases to Lessee premises situate in the County of Carbon, State of Utah (hereinafter "leased premises") to-wit:

Two strips of land of the Lessor in the vicinity of Section 33, Township 13 South, Range 9 East, SLB&M in Carbon County, Utah, being 92.5 feet on each side of a strip of land which is 15 feet wide being 7-1/2 feet on either side of the centerline of Lessor's mainline track extending from a point opposite Mile Post 776 plus 47 feet to a point opposite Mile Post 829 plus 99 feet as shown on the map attached hereto as Exhibit "A" and containing approximately 22.73 acres, more or less. The leased premises does not include a strip of land 15 feet wide down the centerline of Lessor's mainline track.

Section 2. Term. To have and to hold the leased premises from December 1, 1981 to November 30, 1982, and so long thereafter as Lessee shall use the leased premises for the purposes hereinafter specified or until such time as this agreement shall be terminated as hereinafter provided; provided, however, that Lessee shall ship no less than 100,000 tons of coal per annum originating at Wildcat, Utah, over the Utah Railway.

Section 3. Rental. Lessee agrees to pay to Lessor a rental of Four Thousand and no/100 Dollars ($4,000.00) per annum, payable annually in advance.

Section 4. Purposes. Lessee's use of the leased premises shall be for the construction and maintenance of private trackage and coal loading facilities in order to ship coal over the Utah Railway, together with any and all other purposes related thereto. It is understood that Railroad may use the Leased Premises for any and all purposes when the Leased Premises is not required for use by Tower, provided that such use by Railroad will not interfere with or cause delay in the loading of coal by Tower at any time or in any manner.
Section 5. Improvements. Lessee may construct improvements upon the leased premises consistent with the purposes of this lease, provided, however, that prior to the construction of such improvements Lessee shall provide to Lessor a site plat depicting the nature of such improvements together with notice of the anticipated date of commencement of such construction, and provided further that Lessee shall not proceed with construction of such improvements until the site plan has been approved in writing by Lessor. All improvements constructed by Lessee on the leased premises shall, during the continuance of this lease, be maintained by the Lessee in a state of good repair and shall be deemed to be attached to the land. All improvements other than trackage hereafter constructed by Lessee upon the leased premises shall be deemed to be the property of the Lessor, subject to the condition hereinafter stated; provided, however, that if at the termination hereof Lessee shall have fully paid the rent herein reserved and shall in all other respects have faithfully kept, observed and performed the agreements hereof, then such improvements on said leased premises as may have been purchased by Lessee or erected or placed upon the leased premises by the Lessee, other than trackage hereafter constructed by Lessee, shall upon such termination become the property of the Lessee and said Lessee may, within sixty (60) days after termination of this lease, remove at Lessee's sole expense such improvements other than trackage on said leased premises as may have been purchased by Lessee or erected or placed upon said premises by said Lessee and restore said premises to substantially their former state in accordance with the provisions of Section 21 hereof, but if Lessee shall be in default upon the termination of this lease, then such improvements on said leased premises as may have been purchased by Lessee or erected or placed upon the leased premises by Lessee, shall remain the exclusive property of the Lessor.

Section 6. Charges and Taxes. Lessee shall pay all charges for electricity, gas and water used by Lessee on the leased premises. Lessee also agrees to pay, or cause to be paid, before the same shall become delinquent, all taxes and assessments of every nature that may be levied or assessed upon any buildings or improvements erected or placed on the leased premises by the Lessee. In the event the taxing authorities shall fail or refuse to assess such buildings or improvements in the name of the Lessee, or shall render tax statements for the land and the buildings and improvements in the name of the Lessor, then the Lessee may pay the said taxes and assessments before the same become delinquent, in which event the Lessee agrees to reimburse the Lessor for the full amount of such taxes and assessments levied and paid with respect to such buildings and improvements within thirty days after receipt of a bill therefor.
Section 7. Fire Insurance. During the continuance of this lease Lessee will cause any policies of fire insurance on the fixtures, structures and improvements upon the leased premises and the contents thereof to be so written that in the event of the loss thereof or damage thereto by fire, no insurance company shall be subrogated to the right of the Lessee or shall have recourse against Lessor for such loss or damage.

Section 8. Care of Premises. Lessee agrees at all times to keep the leased premises in a safe, clean and sanitary condition and free and clear of all debris and inflammable material which might tend to increase the risk of fire or give the premises an untidy appearance.

Section 9. Damage to Improvements. In the event any building or other improvements upon the leased premises purchased by the Lessee or constructed or erected by the Lessee on the leased premises is damaged or destroyed by fire, storm or other casualty the Lessee shall within thirty (30) days after such happening remove all debris and rubbish therefrom and if Lessee fails so to do, Lessor may enter the leased premises and remove such debris and rubbish and the Lessee agrees to reimburse the Lessor within thirty (30) days after bill rendered for the expense so incurred.

Section 10. Liens. The Lessee shall pay for all materials joined or affixed to the leased premises and shall pay in full all persons who perform labor upon said leased premises and shall not permit or suffer any mechanic's or materialman's lien of any kind or nature to be enforced against the leased premises for any work done or materials furnished thereon at the instance or request or on behalf of the Lessee, and the Lessee agrees to indemnify and hold harmless the Lessor from and against any and all liens, claims, demands, costs, court costs, attorney fees and expenses of whatsoever nature, in any way connected with or growing out of such work done, labor performed, or materials furnished.

Section 11. Laws and Regulations. Lessee agrees, without cost to Lessor, to comply with all laws, rules, regulations and ordinances affecting said premises.

Section 12. Clearances. Lessee covenants and agrees not to pile or permit any material whatsoever, or erect, or permit to be erected, any structure, appliance or obstacle nearer than six (6) feet to the nearest rail in any track, except by and with the written consent of the Lessor, except that Lessee may operate, at Lessee's sole risk, loading and unloading devices.
extending into cars adjacent to said premises, provided that said devices, when not in use, shall be removed from the cars to a location not nearer than six (6) feet to the nearest rail in any track. Notwithstanding the provisions of Section 17 hereof, Lessee shall and will at all times indemnify and save harmless the Lessor, of, from and against any and all damages, remote as well as proximate, in anywise resulting from any non-performance and non-observance of the covenant and agreement herein contained, for which the Lessor shall become, in whole or in part, liable to be charged, and neither the Lessor's knowledge or notice of any such non-performance and non-observance, nor its failure to notify its own employees thereof, nor its continued operation of any said track, shall be in anywise deemed a waiver of the foregoing covenant of indemnity or to relieve the Lessee therefrom.

Section 13. Inflammables. Except by and with the written consent of the Lessor, the premises shall not be used for loading, unloading or storage of explosive, dangerous or inflammable substances, oil, gasoline, volatile liquids, chlorine, or liquefied petroleum gas, and, when with the written consent of the Lessor, either under Section 4 hereof or otherwise the premises are so used, Lessee agrees to comply with all regulations and specifications prescribed in Association of American Railroad circulars respecting same.

Section 14. Artificial Lighting. Artificial lighting in pump houses, warehouses, or other enclosures where oil or other inflammable fluid supplies are handled or stored, except when in unbroken original containers, shall be by electricity, and all electrical installations on such premises shall conform to and be maintained in accordance with the "National Electrical Code," and in accordance with the recommendations for such locations as are embodied in the National Electrical Safety Code, and also in accordance with requirements of any local ordinance or state or federal laws which may be in effect during the term of this lease.

Section 15. Right of Inspection. The leased premises shall be open at all reasonable times for inspection by the Lessor's authorized representatives.

Section 16. Liability for Breach. The Lessee shall be liable for any and all injury or damage to persons or property of whatsoever nature or kind arising out of or contributed to by any breach, in whole or in part, of any covenant of this agreement by the Lessee.
Section 17. Indemnity. This Lessee shall indemnify and hold harmless the Lessor from and against any and all liability, loss, damage, claims, demands, actions, causes of action, costs and expense of whatsoever nature growing out of injury to or death of persons whomsoever including without limiting the generality of the foregoing, the officers, agents, servants and employees of the parties hereto, or the loss or destruction of or damage to property whatsoever of persons whomsoever, including the parties hereto, and their employees, when such injury, death, loss, destruction or damage occurs on the leased premises or results from or arises in any way in connection with, or incident to the occupation or use, including ingress and egress of the leased premises by, or the presence thereon of, the Lessee, the Lessee's officers, agents, servants, employees, patrons, licensees, or invitees, except when caused solely by the negligence of the Lessor.

Section 18. Termination. Notwithstanding anything to the contrary herein contained, it is further agreed that if Lessee shall no longer have need of the leased premises for the purposes herein provided, then, Lessee may terminate this lease at any time upon giving Lessor (30) days written notice of such termination. Notice of termination may be served in accordance with provisions of Section 20 hereof. Rent shall be paid by Lessee to date of termination fixed by said notice; and if rent has been paid in advance the proportionate amount for the unexpired term shall be returned to the Lessee. Lessor may terminate the lease upon giving Lessee (60) days written notice that breach and/or forfeiture has occurred as provided in Section 19 hereof.

Section 19. Default. It is further agreed that the breach of any covenants, stipulations or conditions herein contained to be kept and performed by the Lessee shall, at the option of the Lessor, upon sixty (60) days written notice to Lessee, forthwith cause a termination of this lease and all rights of the Lessee, hereunder unless prior to the end of such sixty (60) day period Lessee has corrected such breach to the satisfaction of Lessor, or if such breach cannot be cured within such time period Lessee has commenced diligent efforts to cure such breach and continues such efforts until the breach is cured, all to the satisfaction of Lessor. After lapse of the period following notification of termination, or declaration of forfeiture, the Lessor may at once re-enter upon the leased premises and repossess itself thereof and remove all persons therefrom or may pursue an action of forcible entry and detainer, or to pursue any and all other rights and remedies available at law to recover the premises. A waiver by the Lessor of the breach by the Lessee of any covenant or condition of this Lease shall not impair the

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MAY 17 2012
Div. of Oil, Gas & Mining

-5-
right of the Lessor to avail itself of any subsequent breach thereof.

Should default by either party in any of the conditions or covenants contained herein require legal action by the other party, the party ultimately found to be in default agrees to pay all cost and expense of said action including but not limited to court costs and attorneys fees.

Section 20. Notice. Any notice given hereunder shall be deemed to be properly served if the same shall be hand delivered, or if mailed postpaid, addressed to the party at the address specified herein or to such other address as may be established by written notice.

Section 21. Vacation of Premises. The Lessee covenants and agrees to vacate and surrender the quiet and peaceable possession of the leased premises upon the termination of this lease. Within sixty (60) days after such termination the Lessee, subject to the provisions of Section 5 hereof, shall (a) remove from the leased premises at the expense of the Lessee all improvements, structures and other property, not belonging to the Lessor, and (b) restore the surface of the ground to as good condition as the same was in before such structures were erected, including among other things the removal of foundations of such structures, the filling in of all excavations and pits, and the removal of all debris and rubbish, all at the Lessee's expense; failing in which the Lessor may perform the work and the Lessee shall reimburse the Lessor for the cost thereof within thirty (30) days after bill rendered.

In case of Lessee's failure to remove said improvements, structures and other property as provided for in this Section 21, the same shall upon the expiration of said sixty (60) days after the termination of this lease become and thereafter remain the property of the Lessor, and if after the expiration of such sixty-day period the Lessor elects to and does remove or cause to be removed said improvements, structures and other property from the leased premises and the market value thereof on removal or of the material therefrom does not equal the cost of such removal, plus the cost of restoring the surface of the ground as aforesaid, then the Lessee shall reimburse the Lessor for the deficit within thirty (30) days after bill rendered.

Whenever for any reason this lease shall be terminated, the Lessee shall have thirty (30) days after such termination to vacate the leased premises and to remove all property owned or in the possession or custody of the Lessee as provided in Section 5
hereof. Provided, however, that the Lessee shall continue to pay the rental heretofore specified, and all liability provisions shall remain in effect until such time as the Lessee actually vacates the leased premises and removes therefrom all of the Lessee's property including all property belonging to third persons within the custody or possession of the Lessee.

Section 22. Assignment and Subletting. The Lessee agrees not to sublet said premises or any part thereof, or assign this lease or any interest therein, except by and with the written consent of the Lessor which shall not be unreasonably withheld.

Section 23. Successors. Subject to the provisions of Section 22 hereof, this lease shall be binding upon the heirs, executors, administrators, successors and assigns of the parties hereto.

Section 24. Eminent Domain. If the premises hereby leased, in whole or such part as is necessary for continuation of Lessee's operations is taken under the power of eminent domain, then this lease shall terminate automatically at the instant of such taking, and the Lessor shall receive all compensation for such condemnation except for the contributory value of the improvements owned by the Lessee. Lessee agrees to hold harmless the Lessor, from and against any and all liability, loss, damages, claims, demands, action, causes of action, and expenses of whatsoever nature growing out of or incident to the termination of this lease.

Section 25. Waiver. Acceptance of rental payment by the Lessor from the Lessee after any default by the Lessee or after termination or expiration of the lease, or after the serving of any notice, or after the commencement of any suit or after final judgment for possession of said property, shall not waive such default or reinstate, continue or extend the terms of the lease or affect any such notice or suit, as the case may be.

Section 26. Other Agreements. Lessor represents that its rights with respect to the leased premises are adequate to allow it to convey the interest granted herein to Lessee. Except as provided in Section 27, this lease represents the entire agreement between the parties hereto and there are no collateral oral agreements or understandings. Any executory agreement hereafter made shall be ineffective to change, modify, or discharge this lease in whole or in part unless such executing agreement is in writing and signed by the parties hereto.
Section 27. Main Line Rail. The parties acknowledge that the centerline of Lessor's main line rail track runs within 7-1/2 feet on each side of the leased premises. Concurrently with the execution of this lease the parties have executed an Agreement with respect to the crossing of such main line track by Lessee with a 60-inch overhead conveyor system and appurtenances. Except as provided in such Agreement, Lessee shall not have the right pursuant to this lease to cross said main line track. In no event shall Lessee interfere with Lessor's operations thereon. Lessor hereby reserves unto itself the right to operate and maintain said main line track during the term of this lease together with the right to construct, operate and maintain such additions to said main line as Lessor, in its sole discretion deems necessary and/or appropriate; provided, however, that Lessor shall make payment to Lessee of the actual cost of repair to Lessee's improvements which may be caused by Lessor's actions with respect to such main line track.

IN WITNESS WHEREOF, the parties have executed this lease in duplicate the day and year first above written.

ATTEST:

[Signature]
Secretary

UTAH RAILWAY COMPANY

By [Signature]
Its: President

ATTEST:

[Signature]
Secretary

TOWER RESOURCES, INC.

By [Signature]
Its: President

STATE OF UTAH } ss.
COUNTY OF _________

On the 14th day of November, 1981, personally appeared before me, O.K. Cant, who, being by me duly sworn, did say that he is the President of UTAH RAILWAY COMPANY, a corporation, and that the foregoing instrument was signed on behalf of said corporation by authority of its
Bylaws or a resolution of its Board of Directors, and said
O. K. Curtis acknowledged to me that said corporation executed the same.

H. L. Lafever
NOTARY PUBLIC
Residing at: Salt Lake

My Commission Expires:

Nov. 1, 1983

STATE OF KENTUCKY
COUNTY OF Jefferson

On the 9th day of November, 1981, personally appeared
before me Robert Curciujo 11, who, being by me duly sworn,
did say that he is the President of TOWER
RESOURCES, INC., a corporation, and that the foregoing instrument
was signed on behalf of said corporation by authority of its
Bylaws or a resolution of its Board of Directors, and said
Robert Curciujo 11 and Frank E. Ragus acknowledged to me that said corporation executed the same.

Frank E. Ragus
NOTARY PUBLIC
Residing at: 100 Mission

My Commission Expires:

3-31-85
AMENDMENT TO LEASE

This Amendment to Lease, entered into and effective this 8th day of February, 1983, by and between UTAH RAILWAY COMPANY, a Utah corporation, mailing address: 1770 University Club Building, 136 East South Temple, Salt Lake City, Utah 84111, hereinafter called "Lessor", and TOWER RESOURCES, INC., a Delaware corporation, mailing address: P.O. Box 1027, Price, Utah 84501, hereinafter called "Lessee".

WITNESSETH:

In consideration of the sum of Ten Dollars ($10.00) and the mutual covenants and promises stated herein, the Railway and Tower agree as follows:

1. This Amendment to Lease hereby amends that certain lease dated December 1, 1981, between UTAH RAILWAY COMPANY, identified as "Lessor" and TOWER RESOURCES, INC., identified as "Lessee" covering certain premises in Carbon County, Utah.

The parties agree that Section 1 of said Lease shall be amended to read as follows:

Section 1: Grant and Description. Lessor, in consideration of the rents to be paid and the agreements to be performed by Lessee, hereby leases to Lessee premises situate in the County of Carbon, State of Utah (hereinafter "leased premises"), to wit:

Two strips of land of the Lessor in the vicinity of Sections 27, 28, and 33, Township 13 South, Range 9 East, SLB&M and Sections 4 and 5, Township 14 South, Range 9 East, SLB&M in Carbon County, Utah, being 92.5 feet on each side of a strip of land which is 15 feet wide being 7-1/2 feet on either side of the center line of Lessor's main line track extending from a point opposite Mile Post 7 plus 2444 feet (7.4629) to a point opposite Mile Post 5 plus 2114 feet (5.4004), but excluding a strip of land 50 feet wide on either side of...
Mile Post 5 plus 4575 feet (5.8665), such exclusion to be reserved for a possible future road crossing of the tracks. The lands affected are shown on the map attached hereto as Exhibit A-2 and contains approximately 45.83 acres, more or less. The leased premises does not include a strip of land 15 feet wide down the centerline of Lessor's main line track.

2. The lessor hereby ratifies and confirms the above described Lease as being in full force and effect in accordance with its terms and conditions.

3. Except as hereinabove specifically modified and changed, all of the terms and conditions of the subject Lease Agreement shall continue in full force and effect.

IN WITNESS WHEREOF, the parties have executed this Agreement to Lease the day and year first above written.

LENSOR

ATTEST:

By: Utah Railway Company
Executive Vice President

LESSEE

ATTEST:

By: Power Resources, Inc.
AMENDED TRACKAGE AGREEMENT

This Amended Trackage Agreement, made and entered into this 8th day of February, 1983 by and between UTAH RAILWAY COMPANY, a Utah corporation, mailing address: 1770 University Club Building, 136 East South Temple, Salt Lake City, Utah 84111, hereinafter called "Railroad", party of the first part, and TOWER RESOURCES, INC., a Delaware corporation, mailing address: P.O. Box 1027, Price, Utah 84501, hereinafter called "Tower".

WITNESSETH:

In consideration of the sum of Ten Dollars ($10.00) and the mutual covenants and promises stated herein, the "Railroad" and "Tower" agree as follows:

This Amended Trackage Agreement hereby amends that certain Trackage Agreement dated December 1, 1981, by and between UTAH RAILWAY COMPANY, herein identified as "Railroad" and TOWER RESOURCES, INC., herein identified as "Tower" covering certain proposed rehabilitation, refurbishing, and new construction of track at Wildcat Spur in Carbon County, Utah, State of Utah.

The parties agree that Trackage Agreement shall be amended to read as follows:

WHEREAS, Tower desires to rehabilitate and refurbish existing side trackage of Railroad, and to construct certain new trackage, hereinafter collectively called "Track" at Wildcat Spur in Carbon County, State of Utah, at the location shown on the map attached hereto as Exhibit A-2, and by this reference made a part hereof, and conduct operations thereupon, all in accordance with the terms and conditions hereinafter set forth;
NOW, THEREFORE, it is agreed by and between the parties hereto as follows:

1. Lands Affected. The lands on which the Track is to be constructed are situated in the County of Carbon, State of Utah and are more particularly described as follows:

(a) Two strips of land of the Lessor in the vicinity of Sections 27, 28, and 33, Township 13 South, Range 9 East, SLB&M and Sections 4 and 5, Township 14 South, Range 9 East, SLB&M in Carbon County, Utah, being 92.5 feet on each side of a strip of land which is 15 feet wide being 7-1/2 feet on either side of the center line of Lessor's main line track extending from a point opposite Mile Post 7 plus 2444 feet (7.4629) to a point opposite Mile Post 5 plus 2114 feet (5.4004), but excluding a strip of land 50 feet wide on either side of Mile Post 5 plus 4575 feet (5.8665), such exclusion to be reserved for a possible future road crossing of the tracks. The lands affected are shown on the map attached hereto as Exhibit A-2 and contains approximately 45.83 acres, more or less. The leased premises does not include a strip of land 15 feet wide down the centerline of Lessor's main line track.

Said lands (hereinafter "Leased Premises") are concurrently being leased to Tower pursuant to a Lease dated December 1, 1981, between the parties. This Trackage Agreement shall govern the ownership of a new side trackage constructed by Tower, and the Use of the Track on the Leased Premises other than Railroad Company's Main Line Track and the Lease shall govern the ownership and use of the Leased Premises.
2. **Track.** The Track to be rehabilitated, refurbished, constructed, operated and maintained pursuant to this Trackage Agreement is more particularly described as follows:

(a) All existing side trackage within the Leased Premises of Lessor including, but not limited to, the side track (approximately 3,000 feet long from point of switch to point of switch) and a secondary side track (approximately 1,190 feet long from point of switch to point of switch) both of which are located parallel to the main line track and are depicted on Exhibit A-2.

(b) Tower to furnish all materials and labor and construct an additional amount of new trackage consisting of approximately 10,890 feet of standard gauge railroad track including one turnout, to be constructed adjacent to, and compatible with the existing main line track.

3. **Construction and Division of Cost.** Tower shall rehabilitate and refurbish existing side trackage and furnish all materials and labor relating thereto. Tower shall construct, at the expense of Tower, subject to payment by Railroad as hereinafter provided, all of the additional 10,890 feet of new trackage to be located on the Leased Premises.

4. **Payment.** Upon completion of the rehabilitation, refurbishment and construction of the Track, Tower shall provide to Railroad a complete accounting of all costs incurred in connection with the rehabilitation, refurbishment and construction of the Track including but not limited to, all earth work, track rehabilitation, track con-
struction and switch construction. Upon receipt of such accounting, Railroad shall have a period of one hundred twenty (120) days to audit the records and accounts of Tower to verify the accuracy of the Tower accounting. Such audit shall be conducted upon reasonable notice to Tower during normal business hours.

Tower shall submit plans to Railroad for its approval as to proposed work to rehabilitate, refurbish and construct the Track. Upon written approval of such plans by Railroad, Tower shall commence construction. Upon completion of construction, Tower shall receive a payment of Twenty-Five Cents ($0.25) per ton of coal shipped from the Leased Premises via Railroad Company's main line rail track, commencing as of the first of the month next after completion of the construction. The total amount of such payments shall not exceed the actual cost of the rehabilitation, refurbishment and construction of the Track as shown by Tower's accounting. Said payments shall be accomplished by Railroad making checks payable to Tower each month. Railroad shall provide a monthly accounting to Tower showing the beginning balance in the Tower cost account, the tonnage shipped for the month, the total payment for the month and the balance at the end of the period.

5. Ownership of Trackage. Tower shall not receive any ownership in existing trackage by reason of rehabilitation of refurbishing each trackage. Tower will, however, be entitled to payment for cost of materials and labor expended in rehabilitating or refurbishing such existing trackage in the same manner as provided herein that it received payment for construction new trackage. Tower shall own all new trackage constructed pursuant to this Trackage Agreement so long.
as it has not been paid in full by Railroad for all costs incurred
in the construction of such Trackage. Upon the occurrence of full
payment of all such costs, Tower shall execute a bill of sale in
favor of Railroad transferring ownership of the trackage to Railroad.

6. The railroad hereby ratifies and confirms the above de-
scribed Trackage Agreement as being in full force and effect in
accordance with its terms and conditions.

7. Except as hereinabove specifically modified and changed,
all of the terms and conditions of the subject Trackage Agreement
shall continue in full force and effect.

IN WITNESS WHEREOF, the parties have executed this Amendment
to Trackage Agreement the day and year first above written.

LESSOR

ATTEST:

By: ____________________
Utah Railway Company
Executive Vice President

LESSEE

ATTEST:

By: ____________________
Tower Resources, Inc.

IN WITNESS WHEREOF, the parties have executed this Amendment
to Trackage Agreement the day and year first above written.

INCORPORATED
MAY 17 2006
Div. of Oil, Gas & Mining
July 28, 1988

Mr. Sam Quigley
General Manager
Andalex Resources, Inc.
P.O. Box
Price, Utah 84501

Re: Agreement on Beaver Creek Coal Company
Leased Land at Wildcat Loadout

Dear Mr. Quigley:

This letter will confirm Beaver Creek Coal Company’s permission for Andalex to use a portion of our leased land for the Wildcat Loadout operations. The area covered by this agreement is that to the east of our fence to the railroad right-of-way and south of the new gate.

As agreed, in exchange for this permission, Andalex has cleaned up the old truck dump area and installed a gate to restrict access.

Sincerely,

D.R. Meadors

cc: K.J. Brasher
    J.L. Coffey
    D.W. Guy

Nature of Interest:

a. By this instrument, the holder:

Intermountain Power Agency
10653 S River Front Parkway, Suite 120
South Jordan, UT 84095

receives a right to construct, operate, maintain, and terminate the Wildcat loadout on public lands described as follows.

T.13 S., R. 9 E., Salt Lake Meridian, Carbon County, Utah
Section 33; NE%4SW%4NE%4, S%4SW%4NE%4, E%4SW%4, SE%4.

b. The right-of-way or permit area granted herein contains 270 acres, more or less, as shown on the attached map. The right-of-way authorizes a coal storage and loadout facility on the east side and crude oil storage and loadout facility on the west side.

c. This instrument shall expire on December 31, 2034. This grant is authorized for 20 years unless, prior thereto, it is relinquished, abandoned, terminated, or modified pursuant to the terms and conditions of this instrument or of any applicable Federal law or regulation.

d. This instrument may be renewed. If renewed, the right-of-way or permit shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the Field Manager or other authorized officer deems necessary to protect the public interest.

e. Notwithstanding the expiration of this instrument or any renewal thereof, early relinquishment, abandonment, or termination, the provisions of this instrument, to the extent applicable, shall continue in effect and shall be binding on the holder, its successors, or assigns, until they have fully satisfied the obligations and/or liabilities accruing herein before or on account of the expiration, or prior termination, of the grant.

Rental:

For and in consideration of the rights granted, the holder agrees to pay the Bureau of Land Management fair market value rental as determined by the authorized officer unless specifically exempted from such payment by regulation. Provided, however, that the rental may be adjusted by the authorized officer, whenever necessary, to reflect changes in the fair market rental value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices.
Terms and Conditions:

4. Standard
   a. This grant is issued subject to the holder’s compliance with all applicable regulations contained in Title 43 Code of Federal Regulations part 2800.
   b. Each grant issued for a term of 10 years or more shall, at a minimum, be reviewed by the authorized officer at the end of the 10th year and at regular intervals thereafter not to exceed 10 years. Provided, however, that a right-of-way or permit granted herein may be reviewed at any time deemed necessary by the authorized officer.
   c. The stipulations, plans, maps, or designs set forth in Exhibits A (Plan of Development) and B (Maps), attached hereto, are incorporated into and made a part of this grant instrument as fully and effectually as if they were set forth herein in their entirety.
   d. In the event that the public land underlying the right-of-way (ROW) encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the right-of-way, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR Part 2800, including any right to have the holder apply to BLM for amendments, modifications, or assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the right-of-way, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any dispute concerning compliance with use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.

5. Applicable Laws
   a. The holder shall comply with all Federal, State, and local regulations whether or not specifically mentioned within this grant.
   b. Failure of the holder to comply with applicable law or any provision of this right-of-way grant shall constitute grounds for suspension or termination thereof.
   c. Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the holder shall obtain from the Field Manager or other authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer. Emergency use of pesticides shall be approved in writing by the authorized officer prior to such use.
   d. The holder of this right-of-way grant or the holder’s successor in interest shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of the Interior issued pursuant thereto.
   e. The holder shall meet Federal, State, and local emission standards for air quality.
   f. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release of spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
g. The holder shall comply with the construction practices and mitigating measures established by 33 CFR 323.4, which sets forth the parameters of the "nationwide permit" required by Section 404 of the Clean Water Act. If the proposed action exceeds the parameters of the nationwide permit, the holder shall obtain an individual permit from the appropriate office of the Army Corps of Engineers and provide the authorized officer with a copy of same. Failure to comply with this requirement shall be cause for suspension or termination of this right-of-way grant.

h. The holder of Right-of-Way No. UTU-48627 agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601 et seq., or the Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901 et seq.) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way holder's activity on the right-of-way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

i. The holder is prohibited from discharging oil or other pollutants into or upon the navigable waters of the United States, adjoining shorelines, or the waters of the contiguous zone in violation of Section 311 of the Clean Water Act as amended, 33 U.S.C. 1321. and the regulations issued there under, or applicable laws of the state and regulations issued there under. Holder shall give immediate notice of any such discharge to the authorized officer and such other Federal and State officials as are required by law to be given such notice.

6. Miscellaneous

a. The holder is authorized to load up to 20,000 BBL/day at this facility, any amount in excess of that is not authorized. The holder shall submit an annual report to the BLM, Price Field Office, showing the maximum daily loading rate for this site. This report shall be submitted in January of each year.

b. The current Spill Prevention Control and Countermeasure Plan and the Storm Water Pollution Prevention Plan will be followed. The plans will be made available for review at the load out site.

c. All new light structures west of the existing rail line will be designed to cast light downwards. The existing light structures to the east will have angled or hooded shields installed to direct the light toward the area requiring light.

d. The pond located south of the truck unloading lanes and the pond located near the existing refuse storage pile will be lined with either a clay base or high-density polyethylene membrane.

e. Yearly monitoring for vegetation success and periodic inspections for noxious weeds on reclaimed areas will be completed by the ROW holder. If noxious weeds are found, a licensed herbicide applicator will use herbicide or mechanical treatments to remove the noxious weeds. Mechanical methods, i.e., hand pulling and cutting plants at ground level may be necessary if the weed population is near desirable plant species or water bodies.

f. All vehicles and equipment will be power washed before transporting to the project area to prevent the spread of seed. Cleared vegetation and soil from an area known to have weeds will be stock piled in the immediate area and then replaced in the same area where the soils and vegetation were prior to disturbance. The ROW holder is responsible for weed control within the ROW throughout the life of the project.

g. An annual report showing the maximum daily loading rate for this facility will be submitted to the BLM in January of each year.

h. The holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and the health and safety of the public. All design, material, and construction, operation, maintenance, and termination practices shall be in accordance with safe and proven engineering practices.

i. The holder shall designate a representative who shall have the authority to act upon and to implement instructions from the authorized officer. The holder's representative shall be available for communication with the authorized officer within a reasonable time when construction or other surface disturbing activities are underway.
j. The holder shall permit free and unrestricted public access to and upon the right-of-way for all lawful purposes except for those specific areas designated as restricted by the Field Manager or other authorized officer to protect the public, wildlife, livestock or facilities constructed within the right-of-way.

k. The holder shall inform the Field Manager at (435) 636-3600 within 48 hours of any accidents on federal lands.

l. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

m. The holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the holder shall immediately report the incident, in writing, to the authorized officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the holder shall be responsible for the survey cost.

7. Construction / Maintenance
   
   a. The holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.
   
   b. The holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the plan of development which was approved and made part of this grant. Any relocation, additional construction, or use that is not in accord with the approved plan of development, shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way grant, including all stipulations and approved plan of development, shall be made available on the right-of-way area during construction, operation, and termination to the authorized officer. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.
   
   c. The map, site plan, building design, floor plan, tower design, and electrical drawings submitted with the original proposal shall be made a part of this right-of-way grant. All construction must conform to these drawings and maps.
   
   d. The holder shall provide for the safety of the public entering the right-of-way. This includes, but is not limited to barricades for open trenches, flagmen/women with communication systems for single-lane roads without intervisible turnouts, and attended gates for blasting operations.
   
   e. If any clearing is needed, the right-of-way will be brush-hogged to prevent unnecessary disturbance. Only those areas where safety, absolute need for construction or other regulations may warrant the use of topsoil removal by blading or scalping. This right-of-way clearing shall be limited to the limits of the right-of-way. Suitable topsoil material removed in conjunction with clearing and stripping shall be conserved in stockpiles within the right-of-way.
   
   f. Prior to fill construction, the existing surface shall be sloped to avoid sharp banks and allow equipment operations. No fills shall be made with frozen or water saturated soils. Construction equipment shall be routed evenly over the entire width of the fill to obtain a thorough compaction.
g. Construction holes left open overnight shall be covered. Covers shall be secured in place and shall be strong enough to prevent livestock or wildlife from falling through and into a hole.

h. Holder shall limit excavation to the areas of construction. No borrow areas for fill material will be permitted on the site. All off-site borrow areas must be approved in writing by the authorized officer in advance of excavation. All waste material resulting from construction or use of the site by holder shall be removed from the site. All waste disposal sites on public land must be approved in writing by the authorized officer in advance of use.

i. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptlyso at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.

j. If during any phase of the construction, operation, or termination any oil or other pollutant should be discharged from containers or vehicles and impact Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of holder to control, cleanup, or dispose of such discharge or on affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

k. Any impacted fences, gates, brace panels and/or any other range improvements shall be reconstructed to appropriate Bureau standards and/or specifications as determined by the authorized officer.

l. The holder shall furnish and apply water for dust control, or other means satisfactory to the authorized officer.

m. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of four inches deep, the soil shall be deemed too wet to adequately support construction equipment.

n. The holder shall construct waterbars on all disturbed areas as needed. Waterbars are to be constructed to: (1) simulate the imaginary contour lines of the slope (ideally with a grade of one or two percent); (2) drain away from the disturbed area; and (3) begin and end in vegetation or rock whenever possible.

o. A litter policing program shall be implemented by the holder, if requested and approved of in writing by the authorized officer, which covers all roads and sites associated with the right-of-way.

p. The holder shall be responsible for weed control on disturbed areas within the limits of the right-of-way. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations).

q. Holder shall maintain the right-of-way in a safe, usable condition, as directed by the authorized officer.

8. Reclamation / Rehabilitation / Termination

a. Ninety (90) days prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a pre-termination conference. This conference will be held to review the termination provisions of the grant.

b. Upon grant termination by the Field Manager or other authorized officer, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as provided in paragraph (4)(d) or as directed by the authorized officer.

c. The holder shall restore drainages, to the greatest extent possible, to the original bank configuration, stream bottom width, and channel gradient. Loose soil, fill, and culverts shall be removed from drainage channels as directed by the authorized officer.

d. The holder shall re-contour the disturbed area and obliterate all earthwork by removing embankments, backfilling excavations, and grading to re-establish the approximate original contours of the land in the right-of-way.
e. The holder shall prepare a seedbed by scarifying the disturbed area, distributing topsoil uniformly, or disk the topsoil.

f. The holder shall seed all disturbed areas that have been or are being reclaimed with a seed mixture(s) submitted to and approved by the authorized officer.

IN WITNESS WHEREOF, The undersigned agrees to the terms and conditions of this right-of-way grant or permit.

[Signatures and titles]

(Date)

(Effective Date of Grant)
INTERMOUNTAIN POWER AGENCY
WILDCAT LOADOUT OIL, LOADING AND STORAGE PROJECT
PLAN OF DEVELOPMENT

Intermountain Power Agency (IPA) currently maintains a ROW (UTU-48027) for the Wildcat Loadout on approximately 250 acres of land utilized as coal preparation and loadout facility for some of the mines located within Central Utah. The loadout facility is located on Federal land in Carbon County, Utah (Figure 1). The loadout facility is located in Section 33, Township 13 South, Range 9 East, SLBM. Approximately 12.5 of the 250 acres are under BLM ROW for the Utah Railway (UTSL-015794). The loadout site is permitted under DOGM permit number ACT C/07/0033. The facility has three truck dumps, a unit train loading track, and numerous conveyor belts, as well as numerous structures to facilitate reclaiming, crushing, storing, and loading coal. The facility is connected with electric power and phone lines. All coal operations on the west side of the railway tracks ceased several years ago and the equipment is inactive.

Associated Energy Services, LP/Marlin Logistics, LLC (Marlin) purchases and markets locally produced crude oil. Crude oil is purchased at a crude oil lease wellhead or pad, transported by trucking companies, and delivered to Marlin terminals where the oil is loaded into Marlin railcars and transported to crude oil markets. Marlin is currently utilizing a portion of the Utah Railway ROW for the transfer of crude oil from tank trucks to railroad tank cars. The transfer of crude oil is entirely within the railroad ROW. Approximately 80 percent of the crude oil transferred at the Wildcat Loadout is waxy crude that is semi-solid at temperatures below 160 degrees Fahrenheit. Approximately 20 percent of the crude oil transferred at the site is non-waxy light sweet crude. Eight mobile pumping stations are located along the ROW to facilitate the transfer of oil from the trucks to the railcars. Trained and certified individuals unload trucks and load railcars to reduce the chance of spills or leaks. The railcars loaded with crude oil are then shipped to terminal refineries along the Gulf Coast, West Coast, and other locations within the rail road system. Once the railcars are emptied, they are returned for reloading.

Proposed Action

IPA proposes to amend the use of a portion of the BLM ROW UTU-48027 to allow petroleum loading on the west portion of the loadout facility west of the centerline of the existing mainline railroad line. IPA has a long-term “landlord/tenant” lease with Marlin to operate crude oil transloading operations at the Wildcat Loadout Facility. The current IPA ROW expires in 2014 and would be renewed until 2027. The proposed use of the ROW would require the construction of permanent crude oil storage tanks, additional railroad tracks, and loading racks in order to increase the output and efficiency of crude oil transport. The transloading facilities and operation would last as long as economically feasible, which is expected to continue for 20 or more years. Marlin has an encroachment permit for the use of Consumers Road for trucking oil into the loadout site. All construction would take place on IPA leased property on the west side of the Utah Railway tracks.
Surface Water

The natural drainage to the west of the facility would be dammed upstream from the existing impound cells to capture precipitation runoff from undisturbed areas further up the drainage. A diversion ditch would be constructed from the dam then south along the west side of the facility and to the tributary of Garley Wash south of the facility (see Figure 2). The ditch would require approximately 0.5 acres of undisturbed ground. The drainage ditch would prevent water runoff from flowing into the facility area. The existing impoundment cell ponds, the proposed diversion ditch, and proposed dam would be designed to hold runoff from a 100-year-24-hour precipitation event. Two ponds would be constructed within the facility area to capture runoff from within the facility and prevent water and potential oil spills from flowing out of the facility. One pond would be located south of the proposed truck unloading lanes and would capture runoff from the northern area. The other pond would be located near the existing refuse and topsoil storage piles and would capture runoff from the southern area. Both ponds would be lined with either a clay base or high-density polyethylene membrane. In the event that a major storm fills the ponds, water would be tested for quality according to the UPDES permit and pumped into the proposed diversion ditch only if water meets the quality standards. The three existing culverts under the rail lines would be removed or plugged to prevent water from the west side of the facility from entering the east side. The existing ponds on the east side of the facility would remain and would be maintained according to standards outlined in the DOGM Mining and Reclamation Plan (MRP). The current Spill Prevention Control and Countermeasure Plan (SPCC plan) would be followed to protect the undisturbed areas from accidental spills. The plan would be available for review at the loadout site. Construction workers and employees of the operation would be instructed on the information in the SPCC plan. In the event of a spill or release of petroleum, procedures outlined in the SPCC Plan would be followed. The BLM, as well as the Utah Department of Environmental Quality, would be notified if the spill meets the definition of a hazardous waste as defined in 40 CFR 261. A Storm Water Pollution Prevention Plan has also been developed and all procedures for spill prevention and response within the plan would be followed.

Construction

Phase 1 of the Proposed Action would be to create four permanent steel storage tanks, loading rail lines, truck unloading lanes, unloading racks and loading racks (see Figure 2). Inactive coal loading equipment at the facility would be removed to provide an area for crude oil loading equipment. All construction for loading equipment and tanks would be completed on previously disturbed ground, and no new disturbance areas would be required. Topsoil would not need to be salvaged as part of the construction activity. Topsoil was salvaged and stockpiled in association with the original construction under the DOGM MRP. Additional growth media was seeded and proved to be a suitable replacement for topsoil. The tank area would be graded with a rubber-tired class RG 50 grader, and a 225 class trackhoe, 560 class backhoe loader, or similar equipment to excavate the tank footings. Each individual tank location would be excavated to approximately five feet deep. An engineered concrete foundation would be constructed for each
tank. The reinforced one-foot high by three-foot wide footing below the frost line would support a nine-inch thick concrete wall that would contain compacted fill. A reinforced concrete pad would be poured on top of the wall with a rubber lining under the concrete pad and would have an early leak detection feature. The pad surface would have several open notches radiating from the center of the tank pad, each leading to the outside diameter of the tank. In the event the bottom of the tank leaks petroleum, the spill would be immediately noticeable at the outside diameter of the tanks on top of the concrete pad within the designed notches. The tank bottoms would be approximately 12 inches above ground level.

The tank construction would be completed on site using a 30 or 60-ton crane, portable welding equipment, and scaffolding. Construction of all four tanks by six workers is expected to last four to eight months. The tanks would be painted with a BLM approved color. An earthen berm would be constructed around the tanks to ensure adequate capacity to capture the content of 1.5 times the amount of the largest tank for a total containment volume of 150,000 barrels. Steps would be installed over the berm to provide access to the tanks and piping.

Two of the tanks would have a storage capacity of 100,000 barrels (4,200,000 gallons) and two tanks would have a storage capacity of 20,000 barrels (840,000 gallons). The total storage capacity of this system would be approximately 240,000 barrels (10,080,000 gallons). The 100,000 barrel tanks would have a diameter of 146 feet and would be approximately 40 feet in height. The 20,000 barrel tanks would have a diameter of 70 feet and would be approximately 32 feet in height. Each tank would have a sealed floating roof to prevent the escape of vapors. The tanks would contain coils for heating the oil during storage. The fluid within the coils would be heated by engineered electric heating elements.

A 5,000 gallon tank containing water with foam injection capabilities would be connected by pipe and pump to the tank roof to provide fire suppressant. The pipes will have a connecting valve outside of the berm to allow additional suppressant from truck tanks.

Four truck unloading lanes would be located within the site disturbance area on a 1.2-acre area that is currently in the reclamation process. Topsoil from the area of the unloading lanes would be salvaged, stored adjacent to the unloading lanes, and seeded with the seed mix listed in Table 1 or an adjusted seed mix approved by the BLM. An existing road crossing over the rail line would be designated as a topsoil access road to ensure topsoil availability to the eastern coal loading portion of the facility.

Truck unloading racks would be constructed adjacent to the unloading lanes. Four and six inch piping and fixed pumps would be installed to transfer oil from the tanker trucks to the storage tanks through a closed system to prevent vapors from escaping. The fixed pumps would be 50 to 100 horsepower motors that are approximately 20 inches wide and 48 inches tall and would be positioned near the tanks within the natural depression to increase pumping capability.
Up to four additional loading tracks would be constructed on the west side of the main rail line within the Utah Railway ROW and IPA ROW. One additional dual-sided railcar loading rack would be constructed adjacent to the loading tracks and would be connected to the tanks by four and six inch piping to create a closed system. All piping is steel construction and would be above ground, where feasible.

A smokeless, natural draft, air assisted and enclosed vapor combustor would be installed to combust any vapors generated during the loading process as required by the Utah Department of Environmental Quality. Two inch vapor vent manifold piping would be installed from each railcar station to the combustor where the vapors will be destroyed to a 98 percent destruction efficiency. The combustor would be approximately three feet in diameter and 20 feet tall utilizing propane for the pilot.

Approximately twelve new light posts would be installed at the truck unloading lanes, tank area, and railcar loading tracks. The lighting fixtures would be a cut-off design to cast light downward and minimize light pollution. All new light structures would be west of the existing rail line and would be pointed downward. On the existing facility east of the railroad tracks, angled or hooded shields would be installed on stacker walkways and all conveyor belt lights to direct the light toward the area requiring light and to prevent light emission in other directions.

Lights that cannot be shielded due to safety reasons, e.g. the truck dump and radial stacker flood lights, would not have additional shields added. The flood lights on the two radial stackers would be angled down as much as practical to light the required area and reduce side casted light. A manual switch would be installed so the flood lights on the radial stackers and truck dump could be turned off when not needed. Remaining lights that would not be shielded are relatively low and not visible from long distances.

A transformer substation would be installed adjacent to the southeast corner of the existing warehouse fence on the west side of the loadout facility. The substation would be located within the existing facility ROW. Two feeds would leave the substation. The first feed would be a pad mount transformer on the west side of the facility near the shop building. The two other buildings would be fed from the transformer by individual feeds. The second feed would be from a pad mount transformer near the tank area and future train loadout area. This transformer would feed to a proposed power controls building.

A 10,000 gallon self-contained diesel fuel tank would be installed adjacent to the truck unloading lanes. The tanks are designed and built with the fuel tank inside of a containment tank. The fuel would be used to fuel tanker trucks as well as coal-hauling trucks.

During construction and operations, the ground would be watered as necessary and vehicle speeds would be restricted to reduce fugitive dust. Marlin and IPA would abide by all applicable requirements for emission standards listed in Utah Administrative Code R307-205.

INTEGRATED
Wildcat Loadout Oil Loading and Storage Project
JAN 19 2015
Div. of Oil, Gas & Mining
Phase 2 of the proposed action would be the construction of additional tanks to bring the storage volume to 350,000 barrels. Additional tanks would be of the same design and size of the tanks constructed during Phase 1. Timing of phase 2 is not known at this time and would be determined by the amount of available trucks, railcars, and crude oil product.

Operation

The waxy and non-waxy crude oil comes from two producing regions in Utah (Figure 3). The first region is within the Uintah Basin near Roosevelt, Duchesne, Altamont, Vernal, etc. The waxy crude oil from the Uintah Basin would be hauled over a number of county, state, and Federal highways. The oil would be first picked up at the well head or lease and transported over county roads until reaching Highways 40, 191, and 6. Trucks then travel on Consumers Road until reaching the Wildcat Loadout and turn onto a gravel road.

The second region comprises several fields in Central Utah with the majority of fields being located in Sevier County. This light sweet crude oil contains only a small amount of waxy paraffins and would be first picked up at the well head or lease and transported over county and state roads until reaching I-70 and Highways 10 and 6 until reaching Consumers Road. Trucks would then travel on Consumers road until reaching the loadout facility.

Crude oil trucks would enter the Wildcat Loadout Facility from Consumers Road west of the facility and along the existing road in a southerly direction to a multiple lane truck unloading rack previously used as the coal truck unloading grizzly. Trucks at the unloading rack would be emptied into the storage tanks through a closed system of steel piping and fixed pumps. The empty trucks would then exit the facility back to Consumers Road. Oil from the storage tanks would be pumped to railcars spotted on tracks dedicated for loading and protected from main line train operations. Utah Railway would provide rail service to the facility.

Initial transloading output would be approximately 6,000 barrels per day and could potentially increase to 20,000 barrels per day after Phase 2 construction is completed. The number of trucks travelling along Consumers Road would increase from the current 22 trucks per day to 72 trucks per day. Approximately 12 locally hired workers would be required for operations at the facility and many local truck drivers would be employed for transportation of crude oil to the facility. The facility would be operational at all times (24 hours per day, seven days per week) with workers that have been trained to provide security.

Marlin would be responsible to take all reasonable precautions to avoid spills. The SPCC plan would incorporate procedures and precautions with additional equipment and tanks to prevent and clean spills. Tanks would be maintained in a manner that would preclude leakage and provide applicable safety measures. Leaks and drips would be caught and spills contained and cleaned promptly. If oil is present in a transfer hose, the oil will be captured in a metal bucket and emptied into the railcar. In the event of a breakdown and a spill occurs, the incident would be reported within 24 hours and any necessary repairs would be made as quickly as possible.
Emergency spill containment supply kits would be stored on site and on all oil transport trucks. Spill kits would include a containment drum, absorbent pads and booms, and a drip pan. Truckers would be trained on proper loading and unloading safety procedures of crude oil. Railroad tank cars would be inspected before loading operations begin and drip pans would be used during the filling operation to prevent crude oil from reaching the ground. All applicable federal and state regulations regarding oil pollution control would be strictly enforced.

Abandonment and Reclamation

The coal loading area of the Wildcat Loadout Facility would be reclaimed by the ROW holder according to the DOGM Mining and Reclamation Plan as stated in permit number ACT C/07/0033 once that area of the facility is no longer needed. The oil loading portion of the ROW would be reclaimed in accordance with the MRP until DOGM no longer retains jurisdiction over the oil loading facility, at which time reclamation would be reclaimed by the ROW holder according to the Green River District Reclamation Guidelines.

Reclamation of the oil loading portion of the facility would begin immediately after oil loading operations have ceased and the area is no longer needed. All areas except for the sediment ponds would be recontoured and revegetated. The sediment ponds and diversion ditch would remain until the reclaimed areas have been revegetated. The sediment pond would be left in place to capture precipitation runoff from the reclamation area and to prevent runoff from leaving the site. Once the area has been revegetated, the sediment ponds would be reclaimed using the same methodology.

The loading tracks, tanks, pumps, berms, piping and other oil loading equipment would be removed. The concrete pads that supported the tanks would be removed. The refuse pile would be flattened and buried with at least four feet of native fill. The area would then be contoured to approximate the pre-disturbance topography. The site was generally flat with a shallow slope to the east. The original drainage would not be restored because the railroad tracks would impede the drainage. The last few lifts during the grading and recontouring would not be compacted. This would be completed for the last four feet and would eliminate the need to rip the subsoil before spreading topsoil. The topsoil pile and alternative growth media would be divided between the west and east areas as described in the MRP to provide surface soil for each area. The allotted topsoil or alternative growth media would be spread over the area during the first fall season following the completion of recontouring. The topsoil would then be gouged with rippers or pockmarked. The area would then be seeded with the certified weed-free seed mix shown in Table 1, or by an adjusted mix approved by the BLM authorized officer by hand-broadcast methods or hydroseeded and hydromulched.
<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>PLS/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Amelanchier utahensis</em></td>
<td>Utah Serviceberry</td>
<td>2 to 3</td>
</tr>
<tr>
<td><em>Artemisia tridentata</em></td>
<td>Big Sagebrush</td>
<td>0.06</td>
</tr>
<tr>
<td><em>Krascheninnikovia lanata</em></td>
<td>Winterfat</td>
<td>2.00</td>
</tr>
<tr>
<td><em>Ericameria nauseosa</em></td>
<td>Rubber Rabbitbrush</td>
<td>0.30</td>
</tr>
<tr>
<td><em>Poastria tridentata</em></td>
<td>Bitterbrush</td>
<td>up to 6.00</td>
</tr>
<tr>
<td><em>Achillea millefolium</em></td>
<td>Yarrow</td>
<td>0.05</td>
</tr>
<tr>
<td><em>Hedysarum boreale</em></td>
<td>Utah Sweetetch</td>
<td>1.00</td>
</tr>
<tr>
<td><em>Linum lewisii</em></td>
<td>Lewis Flax</td>
<td>1.00</td>
</tr>
<tr>
<td><em>Penstemon palmeri</em></td>
<td>Palmer Penstemon</td>
<td>0.50</td>
</tr>
<tr>
<td><em>Helianthus multiforma</em></td>
<td>Showy Goldeneye</td>
<td>0.20</td>
</tr>
<tr>
<td><em>Benteloua gracilis</em></td>
<td>Blue Grama</td>
<td>0.60</td>
</tr>
<tr>
<td><em>Pseudoroegneria spicata</em></td>
<td>Bluebunch Wheatgrass</td>
<td>2.50</td>
</tr>
<tr>
<td><em>Elymus trachycaulus trachycaulus</em></td>
<td>Slender Wheatgrass</td>
<td>2.50</td>
</tr>
<tr>
<td><em>Plethris jamesii</em></td>
<td>Galleta</td>
<td>2.50</td>
</tr>
<tr>
<td><em>Hesperostipa comata</em></td>
<td>Needle and Thread Grass</td>
<td>3.00</td>
</tr>
<tr>
<td><em>Achtherntum hymenoides</em></td>
<td>Indian Ricegrass</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>21.21 to 27.21</strong></td>
</tr>
</tbody>
</table>

Until reclamation bonding is transferred to the BLM ROW, monitoring would be conducted according to the existing MRP. Once the bond is transferred, monitoring would be conducted according to the Green River District Reclamation Guidelines. Monitoring would consist of qualitative methods during the second and fourth growing season following seeding. Qualitative methods would include ocular estimates of vegetation success and slope stability as well as monitoring for noxious weeds. Quantitative methods would be used during the third, fifth, and final year that reclamation is deemed successful. Quantitative methods would include measurement of vegetative cover by line-point intercept method. A reference area has been established near the southeastern corner of the ROW and would be used for comparison of vegetation cover. Recommendations for further seeding or soil supplements can be suggested during the any of the monitoring years. If any part of reclamation is detrimental to success, corrective measures would be taken. Once the vegetation has established a desired, self-perpetuating, diverse plant community and reaches 75 percent basal cover compared to the cover on the reference area, reclamation would be deemed successful according to the Green River District Reclamation Guidelines.

In addition to yearly monitoring for vegetation success, periodic inspection for noxious weeds during periods of no snow cover on reclaimed areas would be completed. If noxious weeds are found, a licensed herbicide applicator would use herbicide or mechanical treatments to remove the noxious weeds. Weed control objectives would be to limit the spread of existing weeds and prevent the introduction of invasive species. With the BLM’s approval, IPA or EAS would conduct pre-construction weed control by spraying noxious species with BLM approved herbicide. Mechanical methods, i.e., hand pulling and cutting plants at ground level, may be necessary if the weed population is near desirable plant species or water bodies.

All vehicles and equipment would be power washed before transporting to the project area to prevent the spread of seed. Cleared vegetation and soil from an area known to have weeds
would be stock piled in the immediate area and then replaced in the same area where the soils and vegetation were prior to disturbance. IPA or ROW holders would be responsible for weed control within the ROW throughout the life of the project. Herbicide would be applied during appropriate growth stages of the specific species for better control and prevention of their spread.

Once the area has been successfully revegetated, the sediment pond would be reclaimed and monitored using the same methodology.
You are hereby notified to proceed with work associated with executed right-of-way grant U-48027.

For work described in this right-of-way, Mark Mackiewicz is designated as the authorized representative.

Grantee's Acknowledgement

Date

Signature of Recipient

Samuel C. Quigley, General Manager
(Name and Title)
CERTIFIED MAIL--RETURN RECEIPT REQUESTED
Certification No. P498 178 595

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Moab District
Price River Resource Area
P.O. Drawer AB
Price, Utah 84501

IN REPLY REFER TO:
U-48027
U-52065
2800
(U-066)

AUG 4 1983

DECISION

Tower Resources Inc. : Right-of-Way Applications
P.O. Box 1027 : Amendment to U-48027
Price, Utah 84501 : Access Road, U-52065

Amendment Approved
Access Road Approved

By application filed October 29, 1982, Tower Resources, Inc., requested
amendment to right-of-way U-48027. The amendment proposes relinquish-
ment of 2.5 acres in the SE SE-SE SW, Section 33, T. 13 S., R. 9 E.,
SLBM and inclusion of 2.5 acres in the NW NW SE SE, Section 33, T.
13 S., R. 9 E., SLBM.

Additionally, on January 9, 1983, Tower Resources, Inc., filed an
application, U-52065, for an access road to the site granted under right-
of-way U-48027. The access road is a linear portion 100 feet wide and
704.99 feet long across the NW NW SE SE, Section 33, T. 13 S., R. 9 E.,
containing 1.62 acres, more or less.

Therefore, under the authority of Section 502 of the Federal Land Policy
and Management Act of 1976 (90 STAT 2776; 43 U.S.C. 1761) and subject to
43 CFR 2800 the application U-52065 is hereby cancelled and both the site
relocation and access road to the site are approved as amendments to the
original right-of-way grant U-48027. Such approval is subject to the
following:

1. The term of the amendments coincides with the original grant and
will terminate January 11, 2012.

2. All terms and conditions of the original grant are in full force
and effect for the amendments. (Note Stipulation 18 for construction
of access road.)

Tower Resources Inc.
3. The amendment for the site relocation does not change the acreage and no additional rental will be required. However, the access road does increase the acreage of the grant by 1.62 acres. This acreage will be appraised and the Holder will be billed accordingly for the period from the date of this decision to January 11, 1954. At that time the annual rental will be adjusted to include both the site and the road.

If the applicant is adversely affected by this action, there is a right of appeal to the Board of Land Appeals, Office of the Secretary, in accordance with the regulations in 43 CFR, Part 4, Subpart E. If an appeal is taken, the notice of appeal must be filed in the office shown on enclosed form 1842-1 (not with the Board), so that the case file can be sent to the Board. A copy of the notice of appeal and of any statement of reasons, written arguments, or briefs must be served upon any adverse parties, and in addition, to the Regional Solicitor, U.S. Department of the Interior, Room 6201, Federal Building, 125 S. State, Salt Lake City, Utah 84111, within 15 days of the filing of any specific document. If the procedures set forth in the regulations are not followed, an appeal is subject to dismissal.

Area Manager

Enclosure

Form 1842-1
Moab District
P. O. Box 970
Moab, Utah 84532

MAR 24 1982

CERTIFIED--RETURN RECEIPT REQUESTED
Certification No. 4243987

Decision

Right-of-Way Amended
Details of Amendment

Serial Number:

Name of Holder:

Tower Resources Incorporated
P. O. Box 1027
Price, Utah 84501

Map showing the Location of Grant:

Legal Description:

Permitted Use:

Authority:

Effective Date:

Termination Date:

U-48027

Centennial Project - Wildcat Siding - Proposed Train Loadout
BLM Right-of-Way Amended
Application U-48027

SLB & M T. 13 S., R. 9 E.,
Section 33, E1/4NE1/4SW1/4,
W1/4NW1/4SE1/4, comprising 10 acres.

Construction, operation, and maintenance of a coal storage
and loadout facility

Federal Land Policy and
Management Act of 1976 (90
Stat. 2776; 43 U.S.C. 1761,
Sec. 501(a)(7))

Effective the date of this
decision

January 11, 2012

INTEGRATED
EFFECTIVE:

APR 26 1999

Amendment
Gas and Mining
CERTIFIED MAIL--RETURN RECEIPT REQUESTED
Certification No. P498 173 595

DECISION

Tower Resources Inc.
P.O. Box 1027
Price, Utah 84501

: Right-of-Way Applications
: Amendment to U-48027
: Access Road, U-52065

Amendment Approved

Access Road Approved

By application filed October 29, 1982, Tower Resources, Inc., requested amendment to right-of-way U-48027. The amendment proposes relinquishment of 2.5 acres in the SE$_2$SE$_1$SE$_2$SW$_4$, Section 33, T. 13 S., R. 9 E., SLBM and inclusion of 2.5 acres in the NW$_2$SW$_2$SE$_4$, Section 33, T. 13 S., R. 9 E., SLBM.

Additionally, on January 9, 1983, Tower Resources, Inc., filed an application, U-52065, for an access road to the site granted under right-of-way U-48027. The access road is a linear portion 100 feet wide and 704.99 feet long across the NW$_2$SW$_2$SE$_4$, Section 33, T. 13 S., R. 9 E., containing 1.52 acres, more or less.

Therefore, under the authority of Section 502 of the Federal Land Policy and Management Act of 1976 (90 STAT 2776; 43 U.S.C. 1761) and subject to 43 CFR 2800 the application U-52065 is hereby cancelled and both the site relocation and access road to the site are approved as amendments to the original right-of-way grant U-48027. Such approval is subject to the following:

1. The term of the amendments coincides with the original grant and will terminate January 11, 2012.

2. All terms and conditions of the original grant are in full force and effect for the amendments. (Note Stipulation 18 for construction of access road.)
On June 28, 1965, an application to amend right-of-way U-48027 was filed.

The right-of-way is hereby amended subject to the following terms and conditions:

1. A parcel described as Salt Lake Meridian, T. 13 S., R. 9 E., Section 33, E1/2SW1/4SW1/4NE1/4, W1/2SE1/4SW1/4NE1/4, encompassing 5.73 acres, more or less, is added to right-of-way U-48027.

2. Authorized uses on the site are:
   a. Placement of truck scales
   b. Location of an office trailer
   c. Conducting stoker coal sales
   d. All operations incident to conducting coal loading and storage currently authorized under right-of-way U-48027.

3. The holder shall pay the fair market rental value for the rights authorized in the grant. Additional rental charges will be included in the yearly rental fee for the right-of-way.

4. All other applicable terms and conditions of the original grant and subsequent amendments are in full force and effect.

If you are adversely affected by this action, there is a right of appeal to the Board of Land Appeals, Office of the Secretary, in accordance with the regulations in 43 CFR, Part 4, Subpart E. If an appeal is taken, the notice
On October 14, 1988, Andalex Resources Incorporated filed an application to amend right-of-way UTU-48027. The subject application was filed under authority of the Federal Land Policy and Management Act of 1976 (90 Stat. 2776, 43 U.S.C. 1761). The application requests an authorization to utilize approximately 8.0 acres of public lands currently occupied by facilities used in the operation of a coal loadout facility. The amendment is hereby approved subject to the following terms and conditions:

1. Authorization is given to use the following described public lands for all operations and facilities incident to the construction, operation and maintenance of a coal loadout facility:

   Salt Lake Base and Meridian
   T. 13 S., R. 9 E.,
   Section 33, NE4SW4NE4, W2SE4SW4NE4,
   SW4SW4NE4, W2E2E2SW4, W2NE4SW4,

   Comprising 8.0 acres more or less

2. The map entitled Amendment No. 4 attached hereto is incorporated into and made a part of this amendment.

3. The amendment is subject to all terms, conditions, and stipulations found in the original grant and subsequent amendments.

4. Rental in the amount of $684.00 is due within thirty (30) days from the date of receipt of this decision.
Andalex Resources, Inc.
Wildcat Loadout
TI3S, R9E, SLB&M

Amended Right-of-Way

Scale: 1" = 2,000'0"
1-24-89 JB

Original Right of Way
plus 4 Amendments

INTEGRATE EFFECTIVE:
APR 26 1999

UTAH DIVISION OIL, GAS AND MINING
May 10, 1999

Mike Glasson, Sr. Geologist
Andalex Resources, Inc.
6750 Airport Road
P. O. Box 902
Price, Utah 84501

Re: Revised Right of Entry, Andalex Resources Inc., Wildcat Loadout, ACT/007/033-99B,
Folder #3, Carbon County, Utah

Dear Mr. Glasson:

The referenced amendment is approved effective April 26, 1999. A stamped approved incorporated copy is enclosed for insertion in your Mining and Reclamation Plan. The supportive technical analysis prepared by Paul Baker is provided for your records.

TECHNICAL ANALYSIS:

ADMINISTRATIVE INFORMATION

RIGHT OF ENTRY

Regulatory Reference: R645-301-114

Analysis:

The applicant has proposed to update the text of the plan to match the legal description for BLM Right of Way U-48027. The right of way has been amended four times, and the legal descriptions in the original right of way and amendments match the description in the application. These descriptions also correspond with Plate 16, the Surface and Subsurface ownership map.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations.
RECOMMENDATIONS:

It is recommended the amendment be approved.

If you have any questions please call.

Sincerely,

Joseph C. Helfrich
Permit Supervisor

Enclosure

cc: Ranvir Singh, OSM
Richard Manus, BLM
Mark Page, Water Rights, w/o
Dave Ariotti, DEQ, w/o
Bill Bates, DWR, w/o
Price Field Office
O:\007033.WCL\FINAL\APP99B.LTR
December 3, 2004

Michael W. Glasson
Manager of Operations
Andalex Resources Inc.
P.O. Box 902
Price, Utah 54501

Dear Mr. Glasson:

Re: Approval Order: Modification to Increase Coal Storage Area, Throughput, and Diesel Fuel Usage at Wildcat Loadout, Carbon County - CDS B; ATT; NSPS, TITLE V MINOR
Project Code: N0113-007

The attached document is the Approval Order (AO) for the above-referenced project.

Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. Jon Black. He may be reached at (801) 536-4047.

Sincerely,

Richard W. Sprott, Executive Secretary
Utah Air Quality Board

RWS:JB:re

cc: Southeastern Utah District Health Department
STATE OF UTAH
Department of Environmental Quality
Division of Air Quality

APPROVAL ORDER: Modification to Increase Coal Storage Area, Coal Throughput, and Diesel Fuel Usage at Wildcat Loadout

Prepared By: Jon Black, Engineer
(801) 536-4047
jlblack@utah.gov

APPROVAL ORDER NUMBER

DAQE-AN0113007-04

Date: December 3, 2004

Andalex Resources Incorporated
Source Contact
Michael W. Glasson
(435) 637-5385

Richard W. Sprott
Executive Secretary
Utah Air Quality Board
Andalex Resources, Inc. (Andalex) submitted a Notice of Intent for a proposed increase in coal stockpile area, coal throughput, and diesel consumption at the Wildcat Loadout. Andalex currently operates this facility under Approval Order DAQE-005-00. This plant is located in Carbon County, which is an attainment area of the National Ambient Air Quality Standards (NAAQS) for all pollutants. New Source Performance Standards (NSPS) Subpart Y (Standards of Performance for Coal Preparation Plants) applies to this source. National Emission Standards for Hazardous Air Pollutants (NESHAP) and Maximum Available Control Technology (MACT) regulations do not apply to this source. Title V of the 1990 Clean Air Act applies to this source.

The emissions, in tons per year, will increase as follows: PM10 (+) 3.76, NOx (+) 3.68, SO2 (+) 0.32, CO (+) 1.54, VOC (+) 0.34, Aldehydes (+) 0.07. The changes in emissions will result in the following, in tons per year, controlled potential to emit totals: PM10 = 25.77, NOx = 18.40, SO2 = 1.56, CO = 7.68, VOC = 1.69, and Aldehydes = 0.34.

The project has been evaluated and found to be consistent with the requirements of the Utah Administrative Code Rule 307 (UAC R307). A public comment period was held in accordance with UAC R307-401-4 and no comments were received. This air quality Approval Order (AO) authorizes the project with the following conditions, and failure to comply with any of the conditions may constitute a violation of this order.

General Conditions:

1. This Approval Order (AO) applies to the following company:

   Site Office: Andalex Resources, Inc.
   Corporate Office Location: Andalex Resources, Inc.
   5496 West 3550 North
   P.O. Box 902
   Spring Glen, Utah 84526
   Price, Utah 84501

   Phone Number: (435) 637-5385
   Fax Number: (435) 637-8860

   The equipment listed in this AO shall be operated at the following location:

   The site is located approximately 10 miles north-northwest of Price, Utah. Travel on Highway 6 south from Helper 2.5 miles and turn right on to Consumers Road.

   Universal Transverse Mercator (UTM) Coordinate System: UTM Datum NAD27
   4,389 kilometers Northing; 507 kilometers Easting; Zone 12

2. All definitions, terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code (UAC) Rule 307 (R307) and Title 40 of the Code of Federal Regulations (40 CFR). Unless noted otherwise, references cited in these AO conditions refer to those rules.
3. The limits set forth in this AO shall not be exceeded without prior approval in accordance with R307-401.

4. Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved in accordance with R307-401-1.

5. All records referenced in this AO or in applicable NSPS and/or NESHAP and/or MACT standards, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary’s representative upon request, and the records shall include the two-year period prior to the date of the request. Records shall be kept for the following minimum periods:

A. Emission inventories Five years from the due date of each emission statement or until the next inventory is due, whichever is longer.

B. All other records Two years

6. Andalex Resources, Inc. (Andalex) shall conduct and operate its operations of the Wildcat coal loadout facility in accordance with the terms and conditions of this AO, which was written pursuant to Andalex’s Notice of Intent submitted to the Division of Air Quality (DAQ) on September 28, 2004.

7. This AO shall replace the AO (DAQE-005-00) dated January 5, 2000.

8. The approved installations shall consist of the following equipment or equivalent*:

A. Four (4) truck unloading facilities with below ground receiving hoppers and equipped with water sprays
B. Two coal crushers, each with a rated capacity of 250 tons per hour
C. Three sets of screens, each set of screens with a rated capacity of 500 tons per hour
D. Four (4) radial stackers
E. Underpile reclaim system
F. Railcar loadout consisting of a tower and an extendable chute for loading railcars
G. Associated stockpiles, conveyors, and mobile equipment

* Equivalency shall be determined by the Executive Secretary.

Limitations and Tests Procedures

9. Visible emissions from any stationary point or fugitive emission source associated with the source or with the control facilities shall not exceed 20% opacity. Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9.

For sources that are subject to New Source Performance Standards (NSPS), opacity shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9.
10. Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six-minute period, however, shall not apply. Six points, distributed along the length of the haul road or in the operational area, shall be chosen by the Executive Secretary or the Executive Secretary’s representative. An opacity reading shall be made at each point when a vehicle passes the selected points. Opacity readings shall be made 1/2 vehicle length or greater behind the vehicle and at approximately 1/2 the height of the vehicle or greater. The accumulated six readings shall be averaged for the compliance value.

11. The following production and consumption limit shall not be exceeded:

A. 5,500,000 tons coal throughput per rolling 12-month period

B. 100,000 gallons fuel consumption for on-site diesel equipment per rolling 12-month period

To determine compliance with a rolling 12-month total the owner/operator shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. Records of consumption/production shall be kept for all periods when the plant is in operation. Production shall be determined by records of coal received and fuel consumption shall be determined by fuel purchase invoices. The records of production shall be kept on a daily basis.

Roads and Fugitive Dust

12. The facility shall abide by all applicable requirements of R307-205 for Fugitive Emission and Fugitive Dust sources. The full text of R307-205, Emission Standards: Fugitive Emissions and Fugitive Dust is included as Appendix A. However, to be in compliance, this facility must operate in accordance with the most current version of R307-205.

13. All radial stackers shall stack at the highest point of the stockpile to minimize drop distances.

14. All conveyors shall be covered and all crushers shall be enclosed.

15. All unpaved roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. The application of water or chemical treatment shall be used. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition or unless it is below freezing. The opacity shall not exceed 20% during all times the areas are in use. If chemical treatment is to be used, the plan must be approved by the Executive Secretary. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:

A. Date
B. Number of treatments made, dilution ratio, and quantity
C. Rainfall received, if any, and approximate amount
D. Time of day treatments were made

16. The haul road limitations shall be:

A. 0.21 miles in length
B. 5 miles per hour

These limitations shall not be exceeded without prior approval in accordance with R307-401, UAC. The haul road speed shall be posted, at a minimum, on site at the beginning of the haul road so that it is clearly visible from the haul road.

17. Water sprays or chemical dust suppression sprays shall be installed at the following points to control fugitive emissions:

A. All truck unloading stations
B. All screens

The sprays shall operate whenever dry conditions warrant or as determined necessary by the Executive Secretary.

18. The moisture content of the material passing a #40 U.S. Standard Sieve shall be maintained at a minimum of 4.0% by weight. The moisture content shall be tested if directed by the Executive Secretary using the appropriate American Society of Testing and Methods (ASTM) method.

19. The storage piles shall be watered to minimize generation of fugitive dusts, as dry conditions warrant or as determined necessary by the Executive Secretary. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. The total combined area of all storage piles shall not exceed 20.0 acres.

Fuels

20. The owner/operator shall use #1, #2 or a combination of #1 and #2 diesel fuel in the on-site equipment.

Federal Limitations and Requirements

21. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, New Source Performance Standards (NSPS) Subpart A, 40 CFR 60.1 to 60.18 (General Provisions) and Subpart Y, 40 CFR 60.250 to 60.254 (Standards of Performance for Coal Preparation Plants) apply to this installation (See Appendix B).

Records & Miscellaneous

22. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this Approval Order including associated air pollution control equipment in a
manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Executive Secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded.


The Executive Secretary shall be notified in writing if the company is sold or changes its name.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including R307.

A copy of the rules, regulations and/or attachments addressed in this AO may be obtained by contacting the Division of Air Quality. The Utah Administrative Code R307 rules used by DAQ, the Notice of Intent (NOI) guide, and other air quality documents and forms may also be obtained on the Internet at the following web site:

http://www.airquality.utah.gov/

The annual emissions estimations below include point source, fugitive emissions, fugitive dust, road dust, and tail pipe emissions. These emissions are for the purpose of determining the applicability of Prevention of Significant Deterioration, non-attainment area, maintenance area, and Title V source requirements of the R307. They are not to be used for determining compliance.

The controlled Potential To Emit (PTE) emissions for this source (the entire plant) are currently calculated at the following values:

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Tons/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. PM$_{10}$</td>
<td>25.77</td>
</tr>
<tr>
<td>B. SO$_2$</td>
<td>1.56</td>
</tr>
<tr>
<td>C. NO$_x$</td>
<td>18.40</td>
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<tr>
<td>D. CO</td>
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</tr>
<tr>
<td>E. VOC</td>
<td>1.69</td>
</tr>
<tr>
<td>F. Aldehydes</td>
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</tr>
</tbody>
</table>

Approved By

Richard W. Shrott, Executive Secretary
Utah Air Quality Board
Appendix A

Andalex Resources - Wildcat Loadout

R307-205-1. Applicability.
   (1) Except where otherwise specified, R307-205 applies statewide.
   (2) The provisions of R307-205 shall not apply to any sources for which limitations for fugitive dust or fugitive emissions are assigned pursuant to R307-401, R307-305, or R307-307 nor shall they apply to agricultural or horticultural activities.
   (3) The following definitions apply throughout R307-205:
      "Material" means sand, gravel, soil, minerals or other matter which may create fugitive dust.
      "Road" means any public or private road.

   Fugitive emissions from sources in areas outside Davis, Salt Lake and Utah Counties, Ogden City and any nonattainment area for PM10 and which were constructed before April 25, 1971, shall not exceed 40% opacity. Fugitive emissions from sources constructed after April 25, 1971, shall not exceed 20% opacity.

R307-205-3. Fugitive Dust.
   (1) Storage and Handling of Aggregate Materials. Any person owning, operating or maintaining a new or existing material storage, handling or hauling operation shall minimize fugitive dust from such an operation. Such control may include the use of enclosures, covers, stabilization or other equivalent methods or techniques as approved by the Executive Secretary.
   (2) Construction and Demolition Activities.
      (a) Any person engaging in clearing or leveling of land greater than one-quarter acre in size, earthmoving, excavation, or movement of trucks or construction equipment over cleared land greater than one-quarter acre in size or access haul roads shall take steps to minimize fugitive dust from such activities. Such control may include watering and chemical stabilization of potential fugitive dust sources or other equivalent methods or techniques approved by the Executive Secretary.
      (b) The owner or operator of any land area greater than one-quarter acre in size that has been cleared or excavated shall take measures to prevent fugitive particulate matter from becoming airborne. Such measures may include:
         (i) planting vegetative cover,
         (ii) providing synthetic cover,
         (iii) watering,
         (iv) chemical stabilization,
         (v) wind breaks, or
         (vi) other equivalent methods or techniques approved by the Executive Secretary.
      (c) Any person engaging in demolition activities including razing homes, buildings, or other structures or removing paving material from roads or parking areas shall take steps to minimize fugitive dust from such activities. Such control may include watering and chemical stabilization or other equivalent methods or techniques approved by the Executive Secretary.

   (1) Any person planning to construct or operate a new unpaved road which is anticipated to have an average daily traffic volume of 150 vehicle trips per day or greater, averaged over a consecutive five day period, shall submit a notice of intent to construct or operate such a road to the Executive Secretary pursuant to R307-401. Such notice shall include proposed action to minimize fugitive dust emissions from the road.
   (2) The Executive Secretary may require persons owning, operating or maintaining any new or existing road, or having right-of-way easement or possessory right to use the same to supply traffic count information as determined necessary to ascertain whether or not control techniques are adequate or additional controls are necessary.
   (3) Any person who deposits materials which may create fugitive dust on a public or private paved road shall clean the road promptly.

R307-205-5. Mining Activities.
   (1) Fugitive dust, construction activities, and roadways associated with mining activities are regulated under the provisions of R307-205-5 and not by R307-205-3 and 4.
   (2) Any person who owns or operates a mining operation shall minimize fugitive dust as an integral part of site preparation, mining activities, and reclamation operations.
   (3) The fugitive dust control measures to be used may include:
      (a) periodic watering of unpaved roads.
(b) chemical stabilization of unpaved roads,
(c) paving of roads,
(d) prompt removal of coal, rock minerals, soil, and other dust-forming debris from roads and frequent scraping and compaction of unpaved roads to stabilize the road surface,
(e) restricting the speed of vehicles in and around the mining operation,
(f) revegetating, mulching, or otherwise stabilizing the surface of all areas adjoining roads that are a source of fugitive dust,
(g) restricting the travel of vehicles on other than established roads,
(h) enclosing, covering, watering, or otherwise treating loaded haul trucks and railroad cars, to minimize loss of material to wind and spillage,
(i) substitution of conveyor systems for haul trucks and covering of conveyor systems when conveyed loads are subject to wind erosion,
(j) minimizing the area of disturbed land,
(k) prompt revegetation of regraded lands,
(l) planting of special windbreak vegetation at critical points in the permit area,
(m) control of dust from drilling, using water sprays, hoods, dust collectors or other controls approved by the Executive Secretary.

Any person owning or operating an existing mining operation in an actual area of non-attainment for particulate or an existing mining operation outside an actual area of non-attainment from which fugitive dust impacts an actual area of non-attainment for particulate shall submit plans for control of fugitive dust from such operations to the Executive Secretary for approval no later than September 29, 1981, 180 days after the effective date of this regulation.

(1) Fugitive dust, construction activities, and roadways associated with tailings piles and ponds are regulated under the provisions of R307-205-6 and not by R307-205-3 and 4.

(2) Any person owning or operating an existing tailings operation where fugitive dust results from grading, excavating, depositing, or natural erosion or other causes in association with such operation shall take steps to minimize fugitive dust from such activities. Such controls may include:
(a) watering,
(b) chemical stabilization,
(c) synthetic covers,
(d) vegetative covers,
(e) wind breaks,
(f) minimizing the area of disturbed tailings,
(g) restricting the speed of vehicles in and around the tailings operation, or
(h) other equivalent methods or techniques which may be approvable by the Executive Secretary.

(3) Any person owning or operating an existing tailings operation in a non-attainment area for particulate or an existing mining operation outside an actual area of non-attainment from which fugitive dust impacts an actual area of non-attainment for particulate shall submit plans for control of fugitive dust from such operations to the Executive Secretary for approval no later than September 29, 1981, 180 days after the effective date of this regulation.
Appendix B

40 CFR 60 Subpart Y - Standards of Performance for Coal Preparation Plants

§ 60.250 Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to any of the following affected facilities in coal preparation plants which process more than 200 tons per day: Thermal dryers, pneumatic coal-cleaning equipment (air tables), coal processing and conveying equipment (including breakers and crushers), coal storage systems, and coal transfer and loading systems.
(b) Any facility under paragraph (a) of this section that commences construction or modification after October 24, 1974, is subject to the requirements of this subpart.


§ 60.251 Definitions.

As used in this subpart, all terms not defined herein have the meaning given them in the Act and in subpart A of this part.
(a) Coal preparation plant means any facility (excluding underground mining operations) which prepares coal by one or more of the following processes: breaking, crushing, screening, wet or dry cleaning, and thermal drying.
(b) Bituminous coal means solid fossil fuel classified as bituminous coal by ASTM Designation D388-77 (incorporated by reference-see § 60.17).
(c) Coal means all solid fossil fuels classified as anthracite, bituminous, subbituminous, or lignite by ASTM Designation D388-77 (incorporated by reference-see § 60.17).
(d) Cyclonic flow means a spiraling movement of exhaust gases within a duct or stack.
(e) Thermal dryer means any facility in which the moisture content of bituminous coal is reduced by contact with a heated gas stream which is exhausted to the atmosphere.
(f) Pneumatic coal-cleaning equipment means any facility which classifies bituminous coal by size or separates bituminous coal from refuse by application of air stream(s).
(g) Coal processing and conveying equipment means any machinery used to reduce the size of coal or to separate coal from refuse, and the equipment used to convey coal to or remove coal and refuse from the machinery. This includes, but is not limited to, breakers, crushers, screens, and conveyor belts.
(h) Coal storage system means any facility used to store coal except for open storage piles.
(i) Transfer and loading system means any facility used to transfer and load coal for shipment.


§ 60.252 Standards for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, an owner or operator subject to the provisions of this subpart shall not cause to be discharged into the atmosphere from any thermal dryer gases which:
1) Contain particulate matter in excess of 0.070 g/dscm (0.031 gr/dscf).
2) Exhibit 20 percent opacity or greater.
(b) On and after the date on which the performance test required to be conducted by § 60.8 is completed, an owner or operator subject to the provisions of this subpart shall not cause to be discharged into the atmosphere from any pneumatic coal cleaning equipment, gases which:
1) Contain particulate matter in excess of 0.040 g/dscm (0.018 gr/dscf).
2) Exhibit 10 percent opacity or greater.
(c) On and after the date on which the performance test required to be conducted by § 60.8 is completed, an owner or operator subject to the provisions of this subpart shall not cause to be discharged into the atmosphere from any coal processing and conveying equipment, coal storage system, or coal transfer and loading system processing coal, gases which exhibit 20 percent opacity or greater.

[41 FR 2234, Jan. 15, 1976]

§ 60.253 Monitoring of operations.

(a) The owner or operator of any thermal dryer shall install, calibrate, maintain, and continuously operate monitoring devices as follows:
(1) A monitoring device for the measurement of the temperature of the gas stream at the exit of the thermal dryer on a continuous basis. The monitoring device is to be certified by the manufacturer to be accurate within ±3° Fahrenheit.

(2) For affected facilities that use venturi scrubber emission control equipment:
   (i) A monitoring device for the continuous measurement of the pressure loss through the venturi constriction of the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within ±1 inch water gage.
   (ii) A monitoring device for the continuous measurement of the water supply pressure to the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within ±5 percent of design water supply pressure. The pressure sensor or tap must be located close to the water discharge point. The Administrator may be consulted for approval of alternative locations.

(b) All monitoring devices under paragraph (a) of this section are to be recalibrated annually in accordance with procedures under § 60.13(b).


§ 60.254 Test methods and procedures.

(a) In conducting the performance tests required in § 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b).

(b) The owner or operator shall determine compliance with the particular matter standards in § 60.252 as follows:
   (1) Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). Sampling shall begin no less than 30 minutes after startup and shall terminate before shutdown procedures begin.
   (2) Method 9 and the procedures in § 60.11 shall be used to determine opacity.

[54 FR 6671, Feb. 14, 1989]
January 5, 2000

Michael W. Glasson
Andalex Resources Incorporated
PO Box 902
Price, UT 84501

Dear Mr. Glasson:

Re: Approval Order Modification for DAQE-998-96 to Increase Stockpile Area and Diesel Consumption
Carbon County, CDS-B, ATT; NSPS, Title V

The attached document is an Approval Order for the above-referenced project.

Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. M. Mating. He may be reached at (801) 536-4153.

Sincerely,

Ursula Kramer, Executive Secretary
Utah Air Quality Board

cc: Southeastern Utah District Health Department
STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

APPROVAL ORDER MODIFICATION FOR DAQE-998-96 TO INCREASE STOCKPILE AREA AND DIESEL CONSUMPTION

Prepared By: M. Maung, Engineer
(801) 536-4153

APPROVAL NUMBER
DAQE--005-00

Date: January 5, 2000

Source Contact

Andalex Resources Incorporated
Michael W. Glasson
(435) 637-5385

Ursula Kramer
Executive Secretary
Utah Air Quality Board

INCORPORATED
JUN 01 2004
DIV OF OIL GAS & MINING
Abstract

Andalex Resources Incorporated has proposed to modify its active Approval Order DAQE-998-96, dated October 25, 1996. The company requests to increase the stockpile area from 12.5 acres to 16.5 acres and the projected diesel fuel usage from 60 million gallons to 80 million gallons at its Wildcat Loadout facility located in Carbon County. Carbon County is an attainment area of the National Ambient Air Quality Standards (NAAQS) for all pollutants. The emissions, in tons per year, will increase as follows: \( PM_{10} = 3.84, NO_x = 3.68, SO_x = 0.31, CO = 1.53, VOC = 0.34, \text{Aldehydes} = 0.07 \). National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations do not apply to this source. New Source Performance Standards (NSPS) Subpart \text{Y} (Standards of Performance for Coal Preparation Plants) applies to this source. Therefore, Title \text{V} of the 1990 Clean Air Act applies to this source. The annual emissions, in tons per year, from this facility will be as follows: \( PM_{10} = 22.01, NO_x = 14.72, SO_x = 1.24, CO = 6.14, VOC = 1.35, \text{Aldehydes} = 0.27 \).

It has been determined that the conditions of the Utah Administrative Code Rule R307-401-6 have been met and the executive secretary will issue an Approval Order. Because there was an emissions increase, there was a 30-day public comment period prior to issuance of this Approval Order.

General Conditions:

1. This Approval Order (AO) applies to the following company:

   \begin{center}
   \begin{tabular}{ll}
   \textbf{Shipping Address} & \textbf{Corporate Office Location} \\
   5496 West 3550 North & Andalex Resources, Inc. \\
   Spring Glen, Utah 84526 & PO Box 902 \\
   Phone: (435) 637-5385 & Price, Utah 84501 \\
   Fax: (435) 637-8860 & \\
   \end{tabular}
   \end{center}

The equipment listed in this AO shall be operated at the following location:

\begin{center}
\textbf{PLANT LOCATION:}
\end{center}

The site is located approximately 10 miles north-northwest of Price, Utah. Travel south from Helper 2.5 miles and turn right on to Consumers Road.

Universal Transverse Mercator (UTM) Coordinate System:

\[ 4,389 \text{ kilometers Northing}; \ 507 \text{ kilometers Easting}; \ \text{Zone 12} \]

2. Definitions of terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code Rule 307 (UAC R307), and Series 40 of the Code of Federal Regulations (40 CFR). These definitions take precedence, unless specifically defined otherwise herein.
3. Andalex Resources Incorporated, owner/operator, shall operate the Wildcat Loadout facility in accordance with the terms and conditions of this AO, which was written pursuant to the company's Notice of Intent submitted to the Division of Air Quality (DAQ) on May 14, 1999 and additional information submitted to the DAQ on October 22, 1999.

4. This AO shall replace the AO dated October 25, 1996 (DAQE-998-96).

5. The approved installations shall consist of the following equipment or their equivalent. Equivalency shall mean identical performance, including any emission discharge, if emissions are involved. It shall be verified and approved by the executive secretary before the equipment or the process is changed.

   A. Three truck unloading facilities with below ground receiving hoppers and equipped with water sprays
   B. Two coal crushers, each with a rated capacity of 250 tons per hour
   C. Three sets of screens, each set of screens with a rated capacity of 500 tons per hour
   D. Three radial stackers
   E. Underpile reclaim system
   F. Railcar loadout consisting of a tower and an extendable chute for loading railcars
   G. Associated stockpiles
   H. Associated conveyors
   I. Associated mobile equipment

   Any equipment change or process modification that may alter the requirements of this approval order shall be reviewed by the executive secretary and approved in accordance with R307-401-1, UAC.

6. Visible emissions from any emission point shall not exceed 20% opacity. Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

   Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity. Visible emissions determinations for traffic sources shall use procedures similar to Method 9. The normal requirement for observations to be made is at 15-second intervals over a six-minute period; however, shall not apply. Six points, distributed along the length of the haul road or in the operational area, shall be chosen by the executive secretary or the executive secretary's representative. An opacity reading shall be made at each point when a vehicle passes the selected points. Opacity readings shall be made ½ vehicle length or greater behind the vehicle and at approximately ½ the height of the vehicle or greater. The accumulated six readings shall be averaged for the compliance value.
7. The following production limit and fuel consumption limit shall not be exceeded without prior approval in accordance with R307-401, UAC:

A. 5,000,000 tons of coal production throughput per rolling 12-month period
B. 80,000 gallons fuel consumption for on-site diesel equipment per rolling 12-month period

Compliance with the annual limitations shall be determined on a rolling 12-month total. The owner/operator shall calculate a new 12-month total based on the first day of each month using data from the previous 12 months. Records of production and fuel consumption shall be kept for all periods when the plant is in operation. Records of production and fuel consumption, including rolling 12-month totals shall be made available to the executive secretary or a representative upon request and shall include a period of two years ending with the date of the request. Production shall be determined by records of coal received and fuel consumption shall be determined by fuel bills. The records shall be kept on a daily basis.

Roads and Fugitive Dust

8. All radial stackers shall stack at the highest point of the stockpile to minimize drop distances.

9. All conveyors shall be covered and all crushers shall be enclosed.

10. All unpaved roads and other unpaved operational areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. The application of water or chemical treatment shall be used. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition or unless it is below freezing. The opacity shall not exceed 20% during all times the areas are in use. If chemical treatment is to be used, the plan must be approved by the executive secretary. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:

   A. Date
   B. Number of treatments made, dilution ratio, and quantity
   C. Rainfall received, if any, and approximate amount
   D. Time of day treatments were made

Records of treatment shall be made available to the executive secretary or executive secretary's representative upon request and the records shall include the two-year period prior to the date of the request.

11. The haul road limitations shall be:

   A. 0.21 miles in length
   B. 5 miles per hour

These limitations shall not be exceeded without prior approval in accordance with R307-401, UAC. The haul road speed shall be posted, at a minimum, on site at the beginning of the haul road so that it is clearly visible from the haul road.
12. Control of disturbed or stripped areas shall be required at all times (24 hours per day every day) for the duration of the project/operation until the area is reclaimed per R307-205, UAC.

13. Water sprays or chemical dust suppression sprays shall be installed at the following points to control fugitive emissions:

A. All truck unloading stations
B. All screens

The sprays shall operate whenever dry conditions warrant or as determined necessary by the executive secretary.

14. The moisture content of the material passing a #40 U.S. Standard Sieve shall be maintained at a minimum of 4.0% by weight. The moisture content shall be tested if directed by the executive secretary using the appropriate American Society of Testing and Methods (ASTM) method.

15. The storage piles shall be watered to minimize generation of fugitive dusts, as dry conditions warrant or as determined necessary by the executive secretary. Records of water and/or chemical treatment shall be kept for all periods when the plant is in operation. Records of water and/or chemical treatment shall be made available to the executive secretary or executive secretary’s representative upon request and the records shall include the two-year period prior to the date of the request. The total combined area of all storage piles shall not exceed 16.5 acres. The area shall be measured if directed by the executive secretary.

**Fuels**

16. The owner/operator shall use only #1 or #2 diesel oil as fuel. If any other fuel is to be used, an AO shall be required in accordance with R307-401, UAC.

17. The sulfur content of any diesel fuel burned shall not exceed 0.5 percent by weight. Sulfur content shall be decided by ASTM Method D2880-71 or D-4294-89, or approved equivalent. The sulfur content shall be tested if directed by the executive secretary. The percent by weight of the sulfur contained in the fuel can be obtained from the fuel oil certifications. Certification of fuels shall be either by Andalex Resources's own testing or test reports from the fuel marketer. Records of fuel supplier’s test report on sulfur content shall be available on-site for each load delivered.
Federal Limitations and Requirements

18. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, New Source Performance Standards (NSPS) Subpart A, 40 CFR 60.1 to 60.18 and Subpart Y, 40 CFR 60.250 to 60.254 (Standards of Performance for Coal Preparation Plants) apply to this installation. A copy of the latest 40 CFR 60 Subparts Y (section 60.250-254) is attached to this document as Appendix A. However, to be in compliance, this facility must operate in accordance with the most current version of 40 CFR 60 applicable to this source.

Records & Miscellaneous

19. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this Approval Order including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the executive secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded, and the records shall be maintained for a period of two years. Maintenance records shall be made available to the executive secretary or executive secretary’s representative upon request, and the records shall include the two-year period prior to the date of the request.

20. The owner/operator shall comply with UAC, R307-150 Series. Inventories, Testing and Monitoring. This rule addresses regulated pollutant and hazardous air pollutant emission inventory reporting requirements, and emission statement inventory requirements. The full text of UAC R307-150 Series, Inventories, Testing and Monitoring is included as Appendix B. However, to be in compliance, this facility must operate in accordance with the most current version of the UAC, R307-150 series.

21. The owner/operator shall comply with R307-107, UAC. This rule addresses unavoidable breakdown reporting requirements. The full text of UAC R307-107 General Requirements, Unavoidable Breakdown, is included as Appendix C. However, to be in compliance, this facility must operate in accordance with the most current version of the UAC, R307-107.

All records referenced in this AO or in applicable NSPS which are required to be kept by the owner/operator shall be made available to the executive secretary or executive secretary’s representative upon request, and the records shall include the two-year period prior to the date of the request. All records shall be kept for a period of two years. Emission inventories shall be kept for a period of five years from the due date of each emission statement or until the next inventory is due, whichever is longer. A summary of those records that are required as part of this Approval Order is included herein. This
summary shall not be considered an additional requirement, but is included for informational purposes only. The condition that requires that these records be kept as part of the compliance with this AO is listed following the individual record. Examples of records to be kept at this source shall include the following as applicable:

- Production rate
- Fuel consumption
- Fugitive emission control
- Maintenance records
- Emission inventory report
- Upset, breakdown episodes

The list above may not be a complete list of all records that are required to be kept by Andalex Resources Incorporated. For a complete list of required records check all AO conditions, and all applicable Federal regulations, such as NSPS, that apply to this source.

Any future modifications to the equipment approved by this order must also be approved in accordance with R307-401, UAC.

The executive secretary shall be notified in writing if the company is sold or changes its name. The notification shall be submitted within 30 days of such action.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

A copy of the rules, regulations and/or attachments addressed in this AO may be obtained by contacting the Division of Air Quality. The Utah Administrative Code R307 rules used by DAQ, the Notice of Intent (NOI) guide, and other air quality documents and forms may also be obtained on the Internet at the following web site: http://www.eq.state.ut.us/eqair/aq_home.htm

Annual emissions for this source (the entire Wildcat Loadout facility) are currently calculated at the following values:

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Tons/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. $PM_{10}$</td>
<td>22.01</td>
</tr>
<tr>
<td>B. $SO_2$</td>
<td>1.24</td>
</tr>
<tr>
<td>C. $NO_x$</td>
<td>14.72</td>
</tr>
<tr>
<td>D. $CO$</td>
<td>6.14</td>
</tr>
<tr>
<td>E. $VOC$</td>
<td>1.35</td>
</tr>
<tr>
<td>F. Aldehydes</td>
<td>0.27</td>
</tr>
</tbody>
</table>

The annual emission estimations above are for the purpose of determining the applicability of Prevention of Significant Deterioration, nonattainment area, maintenance area, and Title V source requirements of the UAC R307. They are not to be used for determining compliance.

In accordance with the requirements of Title V of the 1990 Clean Air Act, the following pollutants may be subject to an operating permit fee. Emissions of the following pollutants from all sources, including pre-
November 29, 1969 sources, may be subject to the operating permit fee. Both the fees rate and the class of pollutants are subject to change by State, the federal agencies, or both.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Tons/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. PM$_{10}$</td>
<td>20.5</td>
</tr>
<tr>
<td>B. SO$_2$</td>
<td>1.24</td>
</tr>
<tr>
<td>C. NO$_x$</td>
<td>14.72</td>
</tr>
<tr>
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<td>1.35</td>
</tr>
<tr>
<td>E. Aldehydes</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Approved By:

Ursula Kramer, Executive Secretary
Utah Air Quality Board
Appendix A

Andalex Resources - Wildcat Loadout

40 CFR 60 Subpart Y - Standards of Performance for Coal Preparation Plants

Subpart Y - Standards of Performance for Coal Preparation Plants

§ 60.250 Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to any of the following affected facilities in coal preparation plants which process more than 200 tons per day: Thermal dryers, pneumatic coal-cleaning equipment (air tables), coal processing and conveying equipment (including breakers and crushers), coal storage systems, and coal transfer and loading systems.

(b) Any facility under paragraph (a) of this section that commences construction or modification after October 24, 1974, is subject to the requirements of this subpart.


§ 60.251 Definitions.

As used in this subpart, all terms not defined herein have the meaning given them in the Act and in subpart A of this part.

(a) Coal preparation plant means any facility (excluding underground mining operations) which prepares coal by one or more of the following processes: breaking, crushing, screening, wet or dry cleaning, and thermal drying.

(b) Bituminous coal means solid fossil fuel classified as bituminous coal by ASTM Designation D388-77 (incorporated by reference-see § 60.17).

(c) Coal means all solid fossil fuels classified as anthracite, bituminous, subbituminous, or lignite by ASTM Designation D388-77 (incorporated by reference-see § 60.17).

(d) Cyclonic flow means a spiraling movement of exhaust gases within a duct or stack.

(e) Thermal dryer means any facility in which the moisture content of bituminous coal is reduced by contact with a heated gas stream which is exhausted to the atmosphere.

(f) Pneumatic coal-cleaning equipment means any facility which classifies bituminous coal by size or separates bituminous coal from refuse by application of air stream(s).

(g) Coal processing and conveying equipment means any machinery used to reduce the size of coal or to separate coal from refuse, and the equipment used to convey coal to or remove coal and refuse from the machinery. This includes, but is not limited to, breakers, crushers, screens, and conveyor belts.

(h) Coal storage system means any facility used to store coal except for open storage piles.

(i) Transfer and loading system means any facility used to transfer and load coal for shipment.


§ 60.252 Standards for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, an owner or operator subject to the provisions of this subpart shall not cause to be discharged into the atmosphere from any thermal dryer gases which:

(1) Contain particulate matter in excess of 0.070 g/dscm (0.031 gr/dscf).

(2) Exhibit 20 percent opacity or greater.

(b) On and after the date on which the performance test required to be conducted by § 60.8 is completed, an owner or operator subject to the provisions of this subpart shall not cause to be discharged into the atmosphere from any pneumatic coal-cleaning equipment, gases which:

(1) Contain particulate matter in excess of 0.040 g/dscm (0.018 gr/dscf).

(2) Exhibit 10 percent opacity or greater.

(c) On and after the date on which the performance test required to be conducted by § 60.8 is completed, an owner or operator subject to the provisions of this subpart shall not cause to be discharged into the atmosphere from any coal processing and conveying equipment, coal storage system, or coal transfer and loading system processing coal, gases which exhibit 20 percent opacity or greater.
§ 60.253 Monitoring of operations.

(a) The owner or operator of any thermal dryer shall install, calibrate, maintain, and continuously operate monitoring devices as follows:

(1) A monitoring device for the measurement of the temperature of the gas stream at the exit of the thermal dryer on a continuous basis. The monitoring device is to be certified by the manufacturer to be accurate within ±3°F Fahrenheit.

(2) For affected facilities that use venturi scrubber emission control equipment:

(i) A monitoring device for the continuous measurement of the pressure loss through the venturi constriction of the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within ±1 inch water gage.

(ii) A monitoring device for the continuous measurement of the water supply pressure to the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within ±5 percent of design water supply pressure. The pressure sensor or tap must be located close to the water discharge point. The Administrator may be consulted for approval of alternative locations.

(b) All monitoring devices under paragraph (a) of this section are to be recalibrated annually in accordance with procedures under § 60.13(b).


§ 60.254 Test methods and procedures.

(a) In conducting the performance tests required in § 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b).

(b) The owner or operator shall determine compliance with the particular matter standards in § 60.252 as follows:

(1) Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). Sampling shall begin no less than 30 minutes after startup and shall terminate before shutdown procedures begin.

(2) Method 9 and the procedures in § 60.11 shall be used to determine opacity.

[54 FR 6671, Feb. 14, 1989]
Appendix B

Andalex Resources Incorporated - Wildcat Loadout facility

R307-150. Emission Inventories.

1. The following sources shall submit an emission inventory report:
   (a) any Part 70 source;
   (b) any source that emits or is allowed under R307 to emit 100 ton per year or more of any regulated air pollutant;
   (c) any source located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit 25 tons per year or more of a combination of PM10, sulfur oxides, or oxides of nitrogen;
   (d) any source located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit 10 tons per year or more of volatile organic compounds;
   (e) any source that emits or is allowed under R307 to emit 5 tons per year or more of lead;
   (f) any source that emits or is allowed under R307 to emit 10 tons or more per year of ammonia;
   (g) any source that is allowed under R307 to emit between 90 and 100 tons per year of any regulated air pollutant;
   (h) any source that the executive secretary requires to submit an inventory for any full or partial year on reasonable notice.

   The following additional definitions apply to R307-150:
   "Acute Contaminant" means any noncarcinogenic air contaminant for which a threshold limit value - ceiling (TLV-C) has been adopted by the American Conference of Governmental Industrial Hygienists in its "Threshold Limit Values for Chemical Substances and Physical Agents - Biological Exposure Indices, pages 15 - 40 (1997)."
   "Carcinogenic Contaminant" means any air contaminant that is classified as a known human carcinogen (A1) or suspected human carcinogen (A2) by the American Conference of Governmental Industrial Hygienists in its "Threshold Limit Values for Chemical Substances and Physical Agents - Biological Exposure Indices, pages 15 - 40 (1997)."
   "Chronic Contaminant" means any noncarcinogenic air contaminant for which a threshold limit value - time weighted average (TLV-TWA) having no threshold limit value - ceiling (TLV-C) has been adopted by the American Conference of Governmental Industrial Hygienists in its "Threshold Limit Values for Chemical Substances and Physical Agents - Biological Exposure Indices, pages 15 - 40 (1997)."
   "Dioxins" and "Furans" mean total tetra- through octachlorinated dibenzo-p-dioxins and dibenzofurans.

1. The requirements of R307-150 replace any annual inventory reporting requirements in approval orders issued prior to April 1, 1998.
2. The emission inventory report shall include the information the Board deems necessary to determine whether the source is in compliance with R307 and federal regulations and standards. The data shall include emissions of ammonia and all regulated air pollutants not exempted in (3) below that are not hazardous air pollutants that are emitted at a source. Data shall include the rate and period of emission, excess or breakdown emissions, startup and shut down emissions, specific installation which is the source of the air pollution, composition of air contaminant, type and efficiency of the air pollution control equipment and other information necessary to quantify operation and emissions, and to evaluate pollution control. The emissions of a pollutant shall be calculated using the source's actual operating hours, production rates, and types of materials processed, stored, or combusted during the inventory time period.
3. Regulated air pollutants that are not PM10, sulfur oxides, oxides of nitrogen, carbon monoxide, PM2.5, ozone, volatile organic compounds, dioxins, furans, or hazardous air pollutants are exempt from being reported if they are emitted in an amount less than the smaller of the following:
   (a) 500 pounds per year; or
   (b) an annual emission level calculated to be the applicable threshold limit value - time weighted average (TLV-TWA) or the threshold limit value - ceiling (TLV-C) multiplied by the appropriate emission threshold factor in cubic meter pounds per milligram year. For an acute contaminant, the factor is 15.81; for a chronic contaminant, the factor is 21.22; for a carcinogenic contaminant, the factor is 7.07.
4. In addition, any owner or operator of a source that is required by R307-150-1 to submit an inventory shall use appropriate emission factors and estimating techniques to estimate all emissions from each activity not required by R307-401 or R307-415 to be included in a notice of intent or operating permit application. The estimates shall be included in the inventory.

(1) A report is required for 1998, 1999, and for every third year after 1999 for any source which actually emits or is allowed under R307 to emit 10 tons or more per year of ammonia.

(2) Report Every Third Year. The owner or operator of each of the following sources is required to submit a report of emissions every third year. The first report shall be due in 2000 for calendar year 1999 for:
   (a) any Part 70 source located in Davis, Salt Lake, Utah or Weber Counties;
   (b) any Part 70 temporary source;
   (c) any Part 70 source located outside Davis, Salt Lake, Utah or Weber Counties with 25 tons per year or more of combined allowable emissions of PM10, sulfur oxides, oxides of nitrogen, volatile organic compounds or carbon monoxide; or
   (d) any stationary source:
      (i) located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit a combination of PM10, sulfur oxides, oxides of nitrogen of 25 tons per year or more;
      (ii) located in Davis, Salt Lake, Utah or Weber County that emits or is allowed under R307 to emit 10 tons per year or more of volatile organic compounds;
      (iii) located in Davis, Salt Lake, Weber, or Utah County that emits or is allowed under R307 to emit 100 tons per year or more of carbon monoxide;
      (iv) that emits 100 tons per year or more of any regulated air pollutant; or
      (v) that emits or is allowed to emit 5 tons per year or more of lead;
   (e) any source that is allowed under R307 to emit between 90 and 100 tons per year of any regulated air pollutant.

(3) Report Every Sixth Year. Any Part 70 source not included in R307-150-3(2) shall submit an emissions inventory every sixth year. The inventory for calendar year 1996 suffices as the first inventory.

(4) Additional Reports of Emissions Required Under Specified Circumstances. This subsection is applicable to all sources identified in R307-150-1.
   (a) A source that initially achieves compliance at any time with any requirement of an applicable state implementation plan shall submit an inventory for the calendar year in which compliance is achieved.
   (b) A source that emits or is allowed under R307 to emit 100 or more tons per year of any regulated air pollutant and whose emissions of any of these pollutants increase or decrease by five percent or more from the most recently submitted inventory shall submit an inventory for the calendar year in which the increase or decrease occurred.
   (c) A source operating temporarily shall submit an inventory for the calendar year in which the source operated.
   (d) A source that is not a temporary source, is required to submit an inventory, and ceases operations shall submit a report of emissions for the partial year and a report for the previous calendar year, if not already submitted.
   (e) A new or modified source that is not a temporary source, is required to submit an inventory, and receives approval to construct or begins operating shall submit a report for the initial partial year of operation and a report for the subsequent calendar year.
   (f) In addition to the required inventories, any source may choose to submit an inventory for any calendar year. The executive secretary may require at any time a full or partial year inventory on reasonable notice to affected sources.
   (g) Due Date. Emission inventories shall be submitted on or before April 15 of each calendar year following any calendar year in which an inventory is required.

R307-150-5. Recordkeeping Requirements.

(1) Each owner or operator of a stationary source subject to this rule shall maintain a copy of the emission inventory submitted to the Division of Air Quality and records indicating how the information submitted in the inventory was determined, including any calculations, data, measurements, and estimates used. The records shall be kept for a period of at least five years from the due date of each emission statement or until the next inventory is due, whichever is longer.

(2) Upon the request of the executive secretary, the owner or operator of the stationary source shall make these records available at the stationary source for inspection by any representative of the Division of Air Quality during normal business hours.


R307-155. Hazardous Air Pollutant Inventory.


(1) The owner or operator of a Part 70 stationary source, either "major source" or "area source" as defined in the Clean Air Act Section 112 (42 U.S.C. 7412), that emits one or more hazardous air pollutants shall submit a hazardous air pollutant inventory.
(2) The owner or operator of which is not a Part 70 stationary source or a "major source" as defined in the Clean Air Act Section 112 (42 U.S.C. 7412) that emits one or more hazardous air pollutants shall submit a hazardous air pollutant inventory at the request of the executive secretary but not more often than once per year.

(3) Inventory data is not required for each hazardous air pollutant that has a threshold limit value and is emitted in an amount less than the smaller of the following:
   (a) 500 pounds per year; or
(b) an annual emission level calculated to be the applicable threshold limit value - time weighted average (TLV-TWA) expressed in milligrams per cubic meter, or the threshold limit value - ceiling (TLV-C) expressed in milligrams per cubic meter multiplied by the appropriate emission threshold factor in cubic meter pounds per milligram year in Table 1 below.

### TABLE 1

<table>
<thead>
<tr>
<th>CONTAMINANT</th>
<th>FACTOR (in cubic meter pounds per milligram year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>21.22</td>
</tr>
<tr>
<td>Benzene</td>
<td>21.22</td>
</tr>
<tr>
<td>Beryllium</td>
<td>21.22</td>
</tr>
<tr>
<td>Ethylene oxide</td>
<td>21.22</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>15.81</td>
</tr>
<tr>
<td>All other acute hazardous air pollutants</td>
<td>15.81</td>
</tr>
<tr>
<td>All other chronic hazardous air pollutants</td>
<td>21.22</td>
</tr>
<tr>
<td>All other carcinogenic hazardous air pollutants</td>
<td>7.07</td>
</tr>
</tbody>
</table>
Appendix C

Andalex Resources Incorporated - Wildcat Loadout facility

R307-107 applies to all regulated pollutants including those for which there are National Ambient Air Quality Standards. Except as otherwise provided in R307-107, emissions resulting from an unavoidable breakdown will not be deemed a violation of these regulations. If excess emissions are predictable, they must be authorized under the variance procedure in R307-102-4. Breakdowns that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown shall not be considered unavoidable breakdown.

A breakdown for any period longer than 2 hours must be reported to the executive secretary within 3 hours of the beginning of the breakdown if reasonable, but in no case longer than 18 hours after the beginning of the breakdown. During times other than normal office hours, breakdowns for any period longer than 2 hours shall be initially reported to the Environmental Health Emergency Response Coordinator, Telephone (801) 536-4123. Within 7 calendar days of the beginning of any breakdown of longer than 2 hours, a written report shall be submitted to the executive secretary which shall include the cause and nature of the event, estimated quantity of pollutant (total and excess), time of emissions and steps taken to control the emissions and to prevent recurrence. The submittal of such information shall be used by the executive secretary in determining whether a violation has occurred and/or the need of further enforcement action.

Failure to comply with the reporting procedures of R307-107-2 will constitute a violation of these regulations.

The owner or operator of an installation suffering an unavoidable breakdown shall assure that emission limitations and visible emission limitations are exceeded for only as short a period of time as reasonable. The owner or operator shall take all reasonable measures which may include but are not limited to the immediate curtailment of production, operations, or activities at all installations of the source if necessary to limit the total aggregate emissions from the source to no greater than the aggregate allowable emissions averaged over the periods provided in the source's approval orders or R307. In the event that production, operations or activities cannot be curtailed so as to so limit the total aggregate emissions without jeopardizing equipment or safety or measures taken would result in even greater excess emissions, the owner or operator of the source shall use the most rapid, reasonable procedure to reduce emissions. The owner or operator of any installation subject to a SIP emission limitation pursuant to these rules shall be deemed to have complied with the provisions of R307-107 if the emission limitation has not been exceeded.
Dear Mr. Glasson:

On June 18, 1982, the Executive Secretary published a notice of intent to approve your air controls for coal crushing, storage, and loadout operation at Wildcat Junction/Consumer Wash, Carbon County. The 30 day public comment period expired July 17, 1982 and no comments were received.

This air quality approval order authorizes the operation as proposed in your notice of intent dated April 16, 1982, with the following operating conditions:

1. Coal throughput shall be limited to 960,000 TPY. Exceedance of this limit shall require a notice of intent to be submitted to the Executive Secretary in accordance with Section 3.1, UACR.

2. The gravel haul road shall be treated with magnesium chloride or equally effective chemical dust suppressant to minimize fugitive dust as dry conditions warrant or as determined necessary by the Executive Secretary.

3. The loadout operations shall be as proposed with an underground receiving hopper, covered conveyor to the crusher, and screening building with water washdown capabilities, and water sprays used on the material entering the crusher and exiting via the conveyor.

4. The rail mounted linear stacker shall be operated in a manner to minimize the drop point, free fall distance.
5. All conveyors shall be covered at a minimum on the top and two sides. Water sprays shall be used at drop points as dry conditions warrant.

6. The storage pile shall be chemically stabilized to minimize fugitive dust emissions as dry conditions warrant.

7. The draw-off tunnel conveyor belt shall be skirted, enclosed between individual feeders, and have high pressure sprays.

8. The 200 ton surge bin shall be enclosed. A retractable chute shall be used to minimize the coal's free fall drop distance to the railcar during loading.

9. Visible emissions from all point process and fugitive emission sources shall not exceed 20% opacity.

10. A construction/installation schedule shall be provided to the Executive Secretary when finalized.

11. The Executive Secretary shall be notified upon start-up/normal operations as an initial compliance inspection is required.

Sincerely,

Brent C. Bradford
Executive Secretary
Utah Air Conservation Committee

MRK:jw
cc: EPA Region VIII (D. Kircher)
Southeastern District Health Dept.
August 31, 1987

Allen D. Emmel
Tower Resources
P.O. Box 902
Price, Utah 84501

Dear Mr. Emmel:

Re: Report of Initial Compliance Inspection of Tower Resources, Inc.
Approval Order May 14, 1985 - Fees Payable, Carbon County

On July 31, 1987 an inspector from the Bureau of Air Quality performed an initial compliance inspection of the Tower Resources, Inc. railroad out facility. The source was found in compliance with the air quality approval order dated May 14, 1986.

The Bureau of Air Quality is authorized to charge a fee for the actual costs incurred in performing an initial compliance inspection.

The Bureau of Air Quality is presently considering your request to change condition number 5 of the January 23, 1987 approval order. However, until any change to condition number 5 is effective, your crusher if operated, must operate in compliance with all conditions of the January 23, 1987 approval order.

An itemized breakout of the costs is enclosed. The $57.93 is payable to the Utah State Department of Health (sent through the Executive Secretary, Utah Air Conservation Committee, P.O. Box 16690, Salt Lake City, Utah 84116-0690), within 30 days of receipt of this letter.

Please return payment in the enclosed self addressed envelope.

Sincerely,

Montie R. Keller
Environmental Health Manager
Compliance Section
Utah Bureau of Air Quality

Enclosure: (3)

CC: Southeastern District Health Department
EPA Region VIII (Marius Gedgaudas)
Dear Mr. Glasson:

On June 18, 1982, the Executive Secretary published a notice of intent to approve your air controls for coal crushing, storage, and loadout operation at Wildcat Junction/Consumer Wash, Carbon County. The 30 day public comment period expired July 17, 1982 and no comments were received.

This air quality approval order authorizes the operation as proposed in your notice of intent dated April 16, 1982, with the following operating conditions:

1. Coal throughput shall be limited to 960,000 TPY. Exceedance of this limit shall require a notice of intent to be submitted to the Executive Secretary in accordance with Section 3.1, UACR.

2. The gravel haul road shall be treated with magnesium chloride or equally effective chemical dust suppressant to minimize fugitive dust as dry conditions warrant or as determined necessary by the Executive Secretary.

3. The loadout operations shall be as proposed with an underground receiving hopper, covered conveyor to the crusher, and screening building with water washdown capabilities, and water sprays used on the material entering the crusher and exiting via the conveyor.

4. The rail mounted linear stacker shall be operated in a manner to minimize the drop point, free fall distance.
5. All conveyors shall be covered at a minimum on the top and two sides. Water sprays shall be used at drop points as dry conditions warrant.

6. The storage pile shall be chemically stabilized to minimize fugitive dust emissions as dry conditions warrant.

7. The draw-off tunnel conveyor belt shall be skirted, enclosed between individual feeders, and have high pressure sprays.

8. The 200 ton surge bin shall be enclosed. A retractable chute shall be used to minimize the coal's free fall drop distance to the railcar during loading.

9. Visible emissions from all point process and fugitive emission sources shall not exceed 20% opacity.

10. A construction/installation schedule shall be provided to the Executive Secretary when finalized.

11. The Executive Secretary shall be notified upon start-up/normal operations as an initial compliance inspection is required.

Sincerely,

Brent C. Bradford
Executive Secretary
Utah Air Conservation Committee

MRK:jw
cc: EPA Region VIII (D. Kircher)
Southeastern District Health Dept.
1324
June 1, 1982

Dave Shaver
Chief Engineer
Tower Resources, Inc.
P.O. Box 1027
Price, Utah 84501

Dear Mr. Shaver:

This is in response to your petition on March 8, 1982, requesting a waiver of the Utah State Regulations of Clearances for your unit coal train loadout facility at Wildcat Junction.

After reviewing the plans submitted with your petition, and proposed method of car loading and switching we see no serious safety concerns. The Utah Railway Company has also indicated their complete concurrence with this construction. A variance is therefore approved, provided that adequate signing be installed before operation begins, to warn of impaired overhead and side clearances.

Thank you for your cooperation. If you have further questions, please contact our office.

Sincerely,

LeGrand O. Jones
Safety Regulations Administrator

cc: Dan Martin, Superintendent, Utah Railway
APPENDIX B
Part A-14
CEG2 Right of Entry Documentation

INCORPORATED
MAR 05 2019
Div. of Oil, Gas & Mining
2018 11108 UTU-4827 Wildcat ROW Assignment Approval

2018 0910 Assignment & Assumption of ROW, Lease & Real Property Agreement

Quitclaim Deed Record 2018 0910 in Carbon County

Quitclaim Deed - Access Road Recorded 2018 0910 in Carbon County

INCORPORATED
MAR 05 2019
Div. of Oil, Gas & Mining
On September 14, 2018, Coal Energy Group 2, LLC, filed an application with the Bureau of Land Management (BLM) for approval of the assignment of the Wildcat Loadout right-of-way (ROW), serial number UTU-48027, from Intermountain Power Agency to Coal Energy Group 2, LLC. The subject application was filed under authority of the Federal Land Policy and Management Act of 1976.

BLM Categorical Exclusion E. (9) "Renewals and assignments of leases, permits, or rights-of-way where no additional rights are conveyed beyond those granted by the original authorizations” applies to this project. In accordance with BLM NEPA Handbook H-1790-7 section 4.2.2, we have reviewed the extraordinary circumstances listed in the Handbook Appendix 5 and have determined that none of
the circumstances apply to this application. Therefore, approval of this application is categorically
excluded from NEPA and no further NEPA review is required.

All conditions have been met to approve assignment of the subject ROW. Therefore, BLM hereby
approves the assignment of ROW UTU-48027 from Intermountain Power Agency to Coal Energy
Group 2, LLC. The assignment is subject to all terms, conditions, and stipulations found in the grant
and any subsequent amendments, which remain in full force and effect. As detailed in BLM’s Cost
Recovery Category Determined letter dated October 25, 2018, and relevant filings with the Interior
Board of Land Appeals (IBLA), the rental value of UTU-48027 is currently being disputed in IBLA
appeal No. 2016-222. The outcome of the appeal may result in back-rent responsibilities for Coal
Energy Group 2, LLC.

This decision may be appealed to the IBLA, Office of the Secretary, in accordance with the regulations
contained in 43 C.F.R., Part 4, and the enclosed Form 1842-1. If an appeal is taken, your notice of appeal
must be filed in this office (at the above address) within 30 days from receipt of this decision. The
appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition pursuant to regulation 43 C.F.R. § 4.21 or 43 C.F.R. § 2801.10 for a stay
of the effectiveness of this decision during the time that your appeal is being reviewed by the Board,
the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show
sufficient justification based on the standards listed below. Copies of the notice of appeal and petition
for stay must also be submitted to each party named in this decision, to the Interior Board of Land
Appeals and to the appropriate Office of the Solicitor (see 43 C.F.R. § 4.413) at the same time the
original documents are filed with this office. If you request a stay, you have the burden of proof to
demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision
pending appeal shall show sufficient justification based on the following standards:

(1) The relative harm to the parties if the stay is granted or denied;

(2) The likelihood of the appellant’s success on the merits;

(3) The likelihood of immediate and irreparable harm if the stay is not granted; and

(4) Whether the public interest favors granting the stay.

Please note that under the regulations in 43 C.F.R. Part 2800, this decision is effective even if an appeal
is filed. If you have any questions, please contact Connie Leschin, Realty Specialist, at the above
address, by e-mail cleschin@blm.gov, or by phone (435) 636-3610.

Sincerely,

Chris Conrad
Field Manager

Enclosure:
Appeals Information (Form #1842-1)
THIS RIGHT OF WAY, LEASE, REAL PROPERTY AGREEMENTS—
ASSIGNMENT AND ASSUMPTION AGREEMENT

THAT FOR AND IN CONSIDERATION OF the sum of Ten Dollars ($10.00), the mutual
promises and covenants contained herein and in the Purchase and Sale Agreement, and intending
to be legally bound hereby, the parties agree as follows:

1. Purchase and Sale Agreement. This Assignment is executed and delivered pursuant
to, and is subject to and governed by, the terms and provisions of that certain Purchase and Sale
Agreement regarding the Wildcat Loadout facility dated effective as of July 2, 2018, by and
between IPA and CEG2 (the “Purchase and Sale Agreement”), including without limitation the
representations and warranties contained therein. Any capitalized terms not defined herein shall
have the meaning ascribed to such terms in the Purchase and Sale Agreement. Notices to be given
hereunder shall be given to the parties at their respective addresses set forth above, and any such
notice(s) shall be given in accordance with the requirements and procedures set forth in the
Purchase and Sale Agreement. In the event of a conflict between the terms and conditions of this
Assignment and Assumption and the terms and conditions of the Purchase and Sale Agreement,
the terms and conditions of the Purchase and Sale Agreement shall govern and control.

2. Assignment by IPA. As of the Effective Date, and subject to the terms and
conditions of this Assignment and the Purchase and Sale Agreement, IPA hereby sells, assigns,
transfers, and sets over unto CEG2, all of its right, title and interest in and to the easements and
rights of way and real property agreements, together with all amendments and modifications
thereto, and located within those lands, more particularly described at Exhibit 1 attached hereto
and incorporated herein (collectively, the “Assigned Agreements”).

3. Assumption of Duties and Obligations by CEG2. As of the Effective Date, and
subject to the terms and conditions of this Assignment and the Purchase and Sale Agreement,
CEG2 hereby assumes and agrees to keep, perform, and fulfill the duties, covenants and obligations of IPA arising under the Assigned Agreements.

IN WITNESS WHEREOF, the parties, through their duly authorized representatives, have caused this Assignment to be executed as of the day and year first above written.

INTERMOUNTAIN POWER AGENCY

By: 

Name: R. Dan Eldredge

Title: General Manager

COAL ENERGY GROUP 2, LLC

By: 

Name: 

Title: 

INCORPORATED
MAR 05 2019
Div. of Oil, Gas & Mining
The foregoing instrument was acknowledged before me this \textit{4th} day of \textit{September}, 2018, by R. Dan Eldredge, as General Manager of Intermountain Power Agency, a political subdivision of the state of Utah, on behalf of the Intermountain Power Agency.

\begin{center}
\textbf{Notary Public}
\end{center}

\textbf{My Commission Expires:} \hfill \textbf{4-5-2021}

The foregoing instrument was acknowledged before me this \underline{\hspace{4cm}} day of \underline{\hspace{4cm}} 2018, by \underline{\hspace{4cm}}, as \underline{\hspace{4cm}} of Coal Energy Group 2, LLC, a Nevada limited liability company, on behalf of the corporation.

\begin{center}
\textbf{Notary Public}
\end{center}

\textbf{My Commission Expires:} \hfill \underline{\hspace{4cm}}
CEG2 hereby assumes and agrees to keep, perform, and fulfill the duties, covenants and obligations of IPA arising under the Assigned Agreements.

IN WITNESS WHEREOF, the parties, through their duly authorized representatives, have caused this Assignment to be executed as of the day and year first above written.

INTERMOUNTAIN POWER AGENCY

By: ____________________________
Name: R. Dan Eldredge
Title: General Manager

COAL ENERGY GROUP 2, LLC

By: ____________________________
Name: Robert Nelson
Title: Manager
The foregoing instrument was acknowledged before me this _______ day of _______, 2018, by R. Dan Eldredge, as General Manager of Intermountain Power Agency, a political subdivision of the state of Utah, on behalf of the Intermountain Power Agency.

My Commission Expires:

__________________________
Notary Public

The foregoing instrument was acknowledged before me this _______ day of _______, 2018, by Robert Nead, as Manager of Coal Energy Group 2, LLC, a Nevada limited liability company, on behalf of the corporation.

My Commission Expires:

10/31/20

MINDI MORDUE
Notary Public State of Utah
My Commission Expires on: October 31, 2020
Comm. Number: 691610

INCORPORATED
MAR 05 2019
Div. of Oil, Gas & Mining
Exhibit 1

The following described real property located in Carbon County, Utah:


   **Township 13 South, Range 9 East, SLBM**
   Section 33: NE1/4SW1/4NE1/4, S1/2SW1/4NE1/4, E1/2SW1/4, SE1/4
   (Containing 270 acres, more or less.)

2. **Beaver Creek Coal Company Letter Agreement**
   An unrecorded Agreement from Beaver Creek Coal Company to Andalex Resources, Inc. (“Andalex”), dated July 28, 1988, granting Andalex the right to use a small portion of land for the Wildcat Loadout operations. The area granted is located to the east of Beaver Creek Coal Company’s fence to the railroad right-of-way and south of the “new gate.”

3. **Utah Railway Company Lease**
   Lease dated December 1, 1981, as amended February 8, 1983, by and between Utah Railway Company, a Utah Corporation, Lessor, and Tower Resources, Inc. (successor in interest), a Delaware Corporation, Lessee, affecting the following described lands located in Carbon County, Utah:

   Two strips of land of the Lessor in the vicinity of Sections 27, 28, and 33, Township 13 South, Range 9 East, SLB&M and Sections 4 and 5, Township 14 South, Range 9 East, SLB&M in Carbon County, Utah, being 92.5 feet on each side of a strip of land which is 15 feet wide being 7½ feet on either side of the center line of Lessor’s main line track extending from a point opposite Mile Post 7 plus 2444 feet (7.4629) to a point opposite Mile Post 5 plus 2114 feet (5.4004), but excluding a strip of land 50 feet wide on either side of Mile Post 5 plus 4575 feet (5.8665), such exclusion to be reserved for a possible future road crossing of the tracks, containing approximately 45.83 acres, more or less. The leased premises does not include a strip of land 15 feet wide down the centerline of Lessor’s main line track.
QUITCLAIM DEED

IN CONSIDERATION OF Ten and 00/100 Dollars ($10.00) and other good and valuable consideration, INTERMOUNTAIN POWER AGENCY, a political subdivision of the State of Utah, having offices located at 10653 South River Front Parkway, Suite 120, South Jordan, Utah 84095 ("Grantor"), hereby quitclaims to the COAL ENERGY GROUP 2, LLC, a Nevada limited liability company, having offices located at 6602 Ilex Circle, Naples, Florida, 34109 ("Grantee"), all of Grantor’s right, title and interest in the improvements described in Exhibit A located on or under that certain real property located in Carbon County, Utah, more particularly described on the attached Exhibit B ("Wildcat Loadout Real Property"), which is incorporated herein by this reference.

SUBJECT TO taxes and assessments for the year 2018 and thereafter.

This Quitclaim Deed shall extend to and be binding upon, and every benefit hereof shall inure to, the parties hereto and their respective successors and assigns. This Quitclaim Deed shall be governed by the laws of the State of Utah.

IN WITNESS WHEREOF, Grantor has executed this Quitclaim Deed this 4th day of Sept., 2018 (the “Effective Date”).

GRANTOR:

INTERMOUNTAIN POWER AGENCY,
a political subdivision of the State of Utah

By: __________________________
      Print Name: __________________________
      Title: __________________________
The foregoing instrument was acknowledged before me this 4th day of Sept, 2018, by R. Dan Eldredge, the General Manager of INTERMOUNTAIN POWER AGENCY, a political subdivision of the State of Utah.

My Commission Expires: 4-5-2021
Exhibit A to Quitclaim Deed

Fixtures and Improvements

That portion of the following items that are real property. All fixtures and improvements are conveyed in As-Is condition:

1. Unit train coal loading facility
2. Conveyors (including any magnets and metal detectors situated on the Wildcat Loadout Real Property as of the Effective Date)
3. Stackers situated on the Wildcat Loadout Real Property as of the Effective Date
4. Office building
5. 8,000 gallon underground tank for stoker oil
6. Scalehouse trailer/entrance station
7. Truck scale
8. Crushing and screening facilities
9. Two truck dump/dozer traps
10. Power substation with transformers
11. Two water and coal spray tanks. (Note that the spraying systems associated with the tanks and any other property owned and supplied by vendors are specifically excluded from this Exhibit A.)
12. Small shop building (Note that the Safety-Kleen tank system and any other property owned and supplied by vendors are specifically excluded from this Exhibit A.)
13. Modular shower/change trailer
14. Truck dump (west of railroad track)
15. Train loading facilities including loading chutes (west of railroad track)
16. Thermo-Gammametrics Nuclear Coal Analyzer
17. Reclaim Tunnels and all improvements contained therein as of the Effective Date
18. Three control buildings
19. Roadway improvements situated on the Wildcat Loadout Real Property as of the Effective Date
20. Septic system and drainage field situated on the Wildcat Loadout Real Property as of the Effective Date
21. Any property owned or supplied by vendors are specifically excluded from this Quitclaim Deed.

INCORPORATED

MAR 05 2019

Div. of Oil, Gas & Mining

4851-0425-9184v2

Ent 842944 Bk 913 Pg 570
Exhibit B to Quitclaim Deed

Wildcat Loadout Real Property

The following described real property located in Carbon County, Utah:


   Township 13 South, Range 9 East, SLBM
   Section 33: NE1/4 SW1/4 NE1/4, SE1/4 SW1/4, SE1/4
   (Containing 270 acres, more or less.)

2. Beaver Creek Coal Company Letter Agreement

   An unrecorded Agreement from Beaver Creek Coal Company to Anda lex Resources, Inc. ("Andalex"), dated July 28, 1988, granting Andalex the right to use a small portion of land for the Wildcat Loadout operations. The area granted is located to the east of Beaver Creek Coal Company’s fence to the railroad right-of-way and south of the “new gate.”

3. Utah Railway Company Lease

   Lease dated December 1, 1981, as amended February 8, 1983, by and between Utah Railway Company, a Utah Corporation, Lessor, and Tower Resources, Inc. (successor in interest), a Delaware Corporation, Lessee, affecting the following described lands located in Carbon County, Utah:

   Two strips of land of the Lessor in the vicinity of Sections 27, 28, and 33, Township 13 South, Range 9 East, SLB&M and Sections 4 and 5, Township 14 South, Range 9 East, SLB&M in Carbon County, Utah, being 92.5 feet on each side of a strip of land which is 15 feet wide being 7½ feet on either side of the center line of Lessor’s main line track extending from a point opposite Mile Post 7 plus 2444 feet (7.4629) to a point opposite Mile Post 5 plus 2114 feet (5.4004), but excluding a strip of land 50 feet wide on either side of Mile Post 5 plus 4575 feet (5.8665), such exclusion to be reserved for a possible future road crossing of the tracks, containing approximately 45.83 acres, more or less. The leased premises do not include a strip of land 15 feet wide down the centerline of Lessor’s main line track.
IN CONSIDERATION OF Ten and 00/100 Dollars ($10.00) and other good and valuable consideration, INTERMOUNTAIN POWER AGENCY, a political subdivision of the State of Utah, having offices located at 10653 South River Front Parkway, Suite 120, South Jordan, Utah 84095 ("Grantor"), hereby quitclaims to the COAL ENERGY GROUP 2, LLC, a Nevada limited liability company, having offices located at 6602 Ilex Circle, Naples, Florida, 34109 ("Grantee"), all of Grantor’s right to use, as a public road, the roadway covered by BLM right-of-way grant number UTU-52810 (See Exhibit A, attached), as such right was reserved in that certain Assignment Consent and Request executed by Grantor June 24, 2013.

This Quitclaim Deed shall extend to and be binding upon, and every benefit hereof shall inure to, the parties hereto and their respective successors and assigns. This Quitclaim Deed shall be governed by the laws of the State of Utah.

IN WITNESS WHEREOF, Grantor has executed this Quitclaim Deed this 14th day of Sept., 2018 (the “Effective Date”).

GRANTOR:

INTERMOUNTAIN POWER AGENCY,
a political subdivision of the State of Utah

By: ____________________________
Print Name: R. Dan Eldredge
Title: General Manager

INcorporated
MAR 05 2019
Div. of Oil, Gas & Min.
The foregoing instrument was acknowledged before me this 4th day of Sept, 2018, by R. Dan Eldredge, the General Manager of INTERMOUNTAIN POWER AGENCY, a political subdivision of the State of Utah.

My Commission Expires: 4-5-2021
EXHIBIT A

BLM ROW UTU-52810 (Access Road)

Township 13 South, Range 9 East, SLBM
Section 33: Located within the W2NE
(Containing 7.805 acres, more or less)
November 23, 1982

Mr. Mike Glasson  
Tower Resources  
P. O. Box 1027  
Price, Utah 84501

Dear Mr. Glasson:

I have reviewed the plans for your proposed loadout facility. As drawn, the plans meet the requirements for onsite wastewater disposal systems.

The plans indicate that untreated building paper will be used as a barrier between the gravel bed and the earth backfill. While this is acceptable, we would recommend that straw be used instead of the paper. Because the paper must be untreated, it is very fragile and requires very careful backfilling to avoid injury to the paper. Straw is much easier to work with.

We only received one copy of the proposed plans and have retained that for our files. If you need additional copies stamped with our approval, we will be happy to stamp them.

When the work is completed, but before backfilling, please call me so that a final onsite inspection can be made.

Should there be any questions, please call me.

Sincerely,

Gerald C. Story, Environmental Health Director  
Southeastern Utah District Health Department

GCS/at
November 10, 1981

Mr. Michael W. Glasson
Senior Geologist
Towers Resources, Inc.
P.O. Box 1027
Price, Utah 84501

Dear Mr. Glasson:

I have forwarded the results of the inventory to the Bureau of Land Management, Moab District and Price Area Offices. I have recommended clearance of the Wildcat Unit, Coal Train Loading Facility area be granted.

Thank you for assisting our personnel in the field. Please find enclosed the billing for the amount discussed per our telephone conversation of last week.

Sincerely,

La Mar W. Lindsay
Assistant State Archeologist

Enclosure

NOV 13 1981

Towers Resources Inc.
MEMORANDUM

TO: LaMar Lindsay.
FROM: Lorraine Dobra
DATE: November 9, 1981
RE: Tower Resources, Inc. Wildcat Unit Coal Train Loading Facility Survey

On November 4 and 5, 1981, Lorraine Dobra and Jim Kirkman conducted an archaeological investigation on an 85-acre tract located in Carbon County (see map) for Tower Resources, Inc. Wildcat Unit Coal Train Loading Facility. The land is owned by the Bureau of Land Management.

The surveyors walked parallel east-west transects spaced 15 meters apart. The terrain sloped down to the east. It is flat, open and bisected by three easternward trending intermittent drainages. Vegetation consisted mostly of Atriplex ssp., Salsola kali, Artemisia tridentata, Bromus tectorum, Bouteloua Oryopsis hymenoides, and other grasses with sparse Juniperus osteosperma and Pinus edulis on the eastern and northern survey boundaries.

Soil was mostly a loosely consolidated tan sandy silt but a large portion of the western survey area was covered by coal slag near the railroad tracks.

Artifacts recovered within the survey area:

Isolated Artifact #1 - one metate fragment of medium grained yellow sandstone pecked on the used surface.

7 cm. thick
21 cm. wide
15 - 19 cm. long

This artifact was found on the top of a low east-west trending rise in the NE quarter, SW quarter, SE quarter of Section 33.
The vegetation was comprised principally of Oryopsis hymenoides with scattered juniper and pinyon trees. No other artifacts were found in the survey area.

Artifacts found outside the survey area:

700 feet east of the survey boundary was one isolated mano. It was of a fine grained red sandstone with use on the two flat sides. It measured 4 cm. thick, 12 cm. long, and 9.5 cm. wide. This artifact was found on the tip of the same east-west trending rise as the previous metate fragment.

Vegetation was the same.

Recommendations:

No sites eligible for nomination to the National Register of Historic Places were found. Therefore, a cultural resource clearance is recommended for the project.
September 28, 1984

Tower Resources Inc.
P.O. Box 902
Price, UT 84501

Dear Applicant:

RE: APPROVED APPLICATION
NUMBER 91-4303 (A59754)

Enclosed is a copy of the above-numbered approved Application. This is your authority to proceed with actual construction work which, under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion. The water must be put to beneficial use and proof of appropriation be made to the State Engineer on or before the proof due date shown below otherwise, the application will be lapsed.

*** PROOF DUE DATE: February 28, 1988 ***

Proof of Appropriation is evidence to the State Engineer that the water has been placed to its full intended beneficial use. By law, it must be prepared by a registered engineer or land surveyor, who will certify to the location and the uses for the water. Your proof of appropriation will become the basis for the extent of your water right.

Failure on your part to comply with the requirements of the statutes may result in the forfeiture of this application.

Yours truly,

Dee C. Hansen, P.E.
State Engineer

Enclosure: Copy of Approved Application

Received

OCT 1 1984

Tower Resources Inc.
September 24, 1984

Mr. Allen D. Emmel
Environmental Coordinator
Tower Resources, Inc.
P. O. Box 902
Price, UT 84501

Dear Allen:

In regard to the design that Tower Resources has proposed for the electric transmission poles to be placed at the Wildcat Junction, the following is offered for your consideration.

The flat, open terrain associated with the Wildcat siding is conducive to an abundant small mammal resource. As a result, numerous raptors are attracted to the area, particularly during the winter. It should be noted, however, that redtail hawks and golden eagles are year-long residents of that particular area. As a result, the raptor resource would certainly make use of power transmission poles. Therefore, the company's decision to construct poles that are designed to be as safe as practicable for raptors seems to be warranted.

In reviewing the design for the poles that you intend on placing, the Division finds that they are acceptable as safe raptor perching sites. I would recommend that you also have personnel from the U.S. Fish & Wildlife Service critique the plans as well.

Thank you for your consideration for Utah's wildlife resource.

Sincerely,

John Livesay, Supervisor
Southeastern Region

cc: Darrell Nish
    Clark Johnson, USFWS
Mr. Allen D. Emmel  
Environmental Coordinator  
Tower Resources, Inc.  
P.O. Box 612  
Price, Utah  84501

Dear Mr. Emmel,

We have reviewed the proposed design for your power transmission line at the Wildcat Junction railroad loadout and believe the design is generally satisfactory except for one needed modification.

We recommend that the ground wire have a 4 inch break 30-40 inches below the lowest conductor wire. As illustrated, some of the poles would have a close direct-line association between the conductor and a positive ground which could electrostatically attract lightning discharges. This modification would reduce this hazard and still protect the system from lightning damage.

Please don't hesitate to contact us if we can be of further assistance.

Sincerely yours,

[Signature]

[Name]

[Title]

[Incorporated]

[Date]
November 16, 2006

CERTIFIED MAIL
(Return Receipt Requested)

Mr. Mike Glasson
Utah-American Energy, Inc.
P.O. Box 1077
Price, UT 84501

Dear Mr. Glasson:

Subject: UPDES Permit Application Withdrawn - Wildcat Loadout.

On October 16, 2006, we received your application for an individual UPDES permit for the Wildcat Loadout. Pursuant to your telephone call and e-mail on November 15, 2006, you have requested to withdraw this application. The Wildcat Loadout will continue to be covered under the UPDES General Permit No. UTG040008. Your request has been acknowledged and we will consider this matter closed.

If you have any questions with regards to this matter, please contact Jeff Studenka of this office at (801) 538-6779 or by e-mail at jstudenka@utah.gov.

Sincerely,

Mike Herkimer, Manager
UPDES Permits Section

cc: Qian Zhang, EPA Region VIII
    Claron Bjork, Southeastern Utah District Health
    Dave Ariotti, SE District Engineer
    Pam Grubaugh-Littig, Division of Oil Gas & Mines
STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

AUTHORIZATION TO DISCHARGE UNDER THE
UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM
(UPDES)

GENERAL PERMIT FOR COAL MINING

In compliance with provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended (the "Act"),

Andelex Resources, Inc. - Wildcat Loadout

as identified in the application No. UTG040007 is authorized to discharge from all outfall(s) to receiving waters named:

Wildcat Wash

in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions as set forth herein.

This permit shall become effective on May 1, 2003.

This permit and the authorization to discharge shall expire at midnight, April 30, 2008

Signed this 24th day of April, 2003.

Don A. Ostler
Executive Secretary
Utah Water Quality Board
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<td>26</td>
</tr>
<tr>
<td>V.</td>
<td>GLOSSARY OF TERMS</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>A. Definitions</td>
<td>27</td>
</tr>
</tbody>
</table>
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I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Criteria for Inclusion in the General Permit for Coal Mining

This General permit shall apply only to the discharge of treated wastewater from:

Coal mining operations either new or existing in Utah which include or will include in part, or in whole, alkaline mine water drainage, storm water runoff from coal preparation plant associated areas, active mining areas, and post mining areas until the performance bond is released. The total dissolved solids (TDS) is limited to a concentration of 500 mg/L at all discharge points or one ton per day as a sum from all mine water or decant operations.

B. Notice of Intent for a General Permit for Coal Mining

Any facility which desires coverage under this general permit for coal mining and meets the requirements of Part I.A. can be issued general permit coverage by submitting a notice of intent (NOI) to the Division of Water Quality.

The NOI shall include:

1. A completed Environmental Protection Agency Application (EPA Form 3510-1) or equivalent information.

2. Location and identification number (such as 001, 002, etc.) of each existing discharge and/or proposed discharge point(s). This includes the latitude and longitude to the nearest 15 seconds and the name of the receiving water(s).

3. A description of the source of the wastewater for each discharge point.

4. A description of the treatment given or proposed for the wastewater at each discharge point and if necessary a justification of why no treatment is required.

5. Flow characteristics for each discharge point such as whether flow is or will be continuous or intermittent and indicate projected and/or actual average and maximum flows in gpd.

6. Data for each discharge point for the following parameters:
   a. Biochemical demand (BOD₅).
   b. Chemical oxygen demand (COD).
   c. Total organic carbon (TOC).
   d. Total suspended solids (TSS).
   e. Flow.
   f. Ammonia (as N).
   g. Oil and grease.
   h. Temperature.
   i. pH.
   j. Total dissolved solids (TDS).
   k. Total iron and metals, cyanide, phenols located in Table III UAC R317-8-3.12.
   l. For discharge(s) of mine water or mine water and mine water mixed with surface runoff one acute whole efficiency toxicity test using two species and full dilution series (five dilutions plus a control). Sediment pond discharges which have only surface runoff do not require WET tests.
   m. Date and time of sampling for each parameter.
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n. Date and time of analysis for each parameter.
o. Utah certified laboratory which has completed the analysis for each parameter.

For each discharge point the presence or absence of any toxic and/or priority pollutants as listed Table II, UAC R317-8-3.13.

C. Description of Discharge Point(s).

The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit is a violation of the Act and may be subject to penalties under the Act. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the Act.

<table>
<thead>
<tr>
<th>Outfall Number</th>
<th>Location of Discharge Point(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Sedimentation pond discharge to Wildcat Wash. Latitude 39°39'11&quot;, Longitude 110°54'56&quot;.</td>
</tr>
<tr>
<td>002</td>
<td>Sedimentation Pond discharge to Wildcat Wash. Latitude 39°39'16&quot;, Longitude 110°54'58&quot;.</td>
</tr>
<tr>
<td>003</td>
<td>Sedimentation pond discharge to Wildcat Wash. Latitude 39°39'21&quot;, Longitude 110°54'53&quot;.</td>
</tr>
<tr>
<td>004</td>
<td>Sedimentation pond discharge to Wildcat Wash. Latitude 39°39'28&quot;, Longitude 110°54'53&quot;.</td>
</tr>
<tr>
<td>005</td>
<td>Sedimentation pond discharge to Wildcat Wash. Latitude 39°39'34&quot;, Longitude 110°54'53&quot;.</td>
</tr>
<tr>
<td>006</td>
<td>Sedimentation pond discharge to Wildcat Wash. Latitude 39°39'14&quot;, Longitude 110°55'11&quot;.</td>
</tr>
</tbody>
</table>

D. Narrative Standard.

It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.

E. Specific Limitations and Self-monitoring Requirements.

1. Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall(s) 001 through 006. Such discharges shall be limited and monitored by the permittee as specified below:

<table>
<thead>
<tr>
<th>Effluent Characteristics</th>
<th>Discharge Limitations Average Daily</th>
<th>Monitoring Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30-Day 7-Day Maximum</td>
<td></td>
</tr>
<tr>
<td>Flow, MGD</td>
<td>N/A N/A NA</td>
<td>Measurement Frequency Type</td>
</tr>
<tr>
<td>Oil &amp; Grease, mg/L</td>
<td>N/A N/A 10</td>
<td>Monthly Measured by/</td>
</tr>
<tr>
<td>Total Iron, mg/L</td>
<td>N/A N/A 1.0</td>
<td>Monthly Grab</td>
</tr>
<tr>
<td>Total Suspended Solids, mg/L</td>
<td>25 35 70</td>
<td>Monthly Grab</td>
</tr>
<tr>
<td>Total Dissolved Solids, mg/L</td>
<td>500 d/ N/A NA</td>
<td>Monthly Grab</td>
</tr>
</tbody>
</table>
The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units in any sample and shall be monitored monthly by a grab sample.

There shall be no visible sheen or floating solids or visible foam in other than trace amounts.

There shall be no discharge of sanitary wastes or process water from coal preparation plants.

N.A. - Not Applicable.

2. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): in the final effluent before mixing with the receiving water.

3. Any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period less than or equal to the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) at outfall(s) 001 through 006 may comply with the following limitations instead of the otherwise applicable limitations for TSS and pH in Part I.E.1:

<table>
<thead>
<tr>
<th>Effluent Characteristics</th>
<th>Daily Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Settleable Solids</td>
<td>0.5 ml/L</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 to 9.0 S.U.</td>
</tr>
</tbody>
</table>

In addition to the monitoring requirements specified under Part I.E.1 all effluent samples collected during storm water discharge events shall also be analyzed for settleable solids. Such analyses shall be conducted monthly by grab samples.

4. Any discharge or increase in the volume of a discharge caused by precipitation within any 24-hour period greater than the 10-year, 24-hour precipitation event (or snowmelt of equivalent volume) at outfall(s) 001 through 006 may comply with the following limitations instead of the otherwise applicable limitations:

The pH shall not be less than 6.5 standard units nor greater than 9.0 standard units. However as stated in Part I.E.3, all effluent samples collected during storm-water discharge events shall be analyzed for settleable solids and parameters identified under Part I.E.1.

5. The operator shall have the burden of proof that the discharge or increase in discharge was caused by the applicable precipitation event described in Parts I.E.3 and 4. The alternate limitations in Parts I.E.3 and 4 shall not apply to treatment systems that treat underground mine water only.
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F. Storm Water Requirements. It has been determined that Wildcat Loadout has a regulated storm water discharge as per UAC R317-8-3.9., therefore, the following permit conditions governing storm water discharges apply.

1. Coverage of This Section.
   a. Discharges Covered Under This Section. The requirements listed under this section shall apply to storm water discharges from Wildcat Loadout, subject to effluent limitations listed in Part I.E. of this permit.

   1) Site Coverage. Storm water discharges from the following portions of Wildcat Loadout may be eligible for this permit: haul roads (nonpublic roads on which coal or coal refuse is conveyed), access roads (nonpublic roads providing light vehicular traffic within the facility property and to public roadways), railroad spurs, sidings, and internal haulage lines (rail lines used for hauling coal within the facility property and to offsite commercial railroad lines or loading areas), conveyor belts, chutes, and aerial tramway haulage areas (areas under and around coal or refuse conveyor areas, including transfer stations), equipment storage and maintenance yards, coal handling buildings and structures, and inactive coal mines and related areas (abandoned and other inactive mines; refuse disposal sites and other mining-related areas on private lands).

2. Prohibition of Non-storm Water Discharges.
   a. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharge is in compliance with this section; fire fighting activities; fire hydrant flushings; potable water sources including waterline flushings; drinking fountain water; irrigation drainage; lawn watering; routine external building washdown water where detergents or other compounds have not been used in the process; pavement washwaters where spills or leaks of toxic or hazardous materials (including oils and fuels) have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated compressor condensate; uncontaminated springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

3. Storm Water Pollution Prevention Plan Requirements. Most of the active coal mining-related areas, described in paragraph 1. above, are subject to sediment and erosion control regulations of the U.S. Office of Surface Mining (OSM) that enforces the Surface Mining Control and Reclamation Act (SMCRA). OSM has granted authority to the Utah Division of Oil Gas and Mining (DOGM) to implement SMCRA through State SMCRA regulations. All SMCRA requirements regarding control of erosion, siltation and other pollutants resulting from storm water runoff, including road dust resulting from erosion, shall be primary requirements of the pollution prevention plan and shall be included in the contents of the plan directly, or by reference. Where determined to be appropriate for protection of water quality, additional sedimentation and erosion controls may be warranted.

   a. Contents of Plan. The plan shall include at a minimum, the following items:

   1) Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water
Pollution Prevention Team that are responsible for developing the storm water pollution prevention plan and assisting the facility manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

2) Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources that may reasonably be expected to add significant amounts of pollutants to storm water discharges or that may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials that may potentially be significant pollutant sources. Each plan shall include, at a minimum:

a) Deadlines for Plan Preparation and Compliance
   Wildcat Loadout shall prepare and implement a plan in compliance with the provisions of this section within 270 days of the effective date of this permit.

b) Keeping Plans Current
   Wildcat Loadout shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified by the plan, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with the activities at the mine.

c) Drainage.

   (1) A site map, such as a drainage map required for SMCRA permit applications, that indicate drainage areas and storm water outfalls. These shall include but not be limited to the following:

   (a) Drainage direction and discharge points from all applicable mining-related areas described in paragraph I.a(1). (Site Coverage) above, including culvert and sump discharges from roads and rail beds and also from equipment and maintenance areas subject to storm runoff of fuel, lubricants and other potentially harmful liquids.

   (b) Location of each existing erosion and sedimentation control structure or other control measures for reducing pollutants in storm water runoff.

   (c) Receiving streams or other surface water bodies.

   (d) Locations exposed to precipitation that contain acidic spoil, refuse or unreclaimed disturbed areas.
(e) Locations where major spills or leaks of toxic or hazardous pollutants have occurred.

(f) Locations where liquid storage tanks containing potential pollutants, such as caustics, hydraulic fluids and lubricants, are exposed to precipitation.

(g) Locations where fueling stations, vehicle and equipment maintenance areas are exposed to precipitation.

(h) Locations of outfalls and the types of discharges contained in the drainage areas of the outfalls.

(2) For each area of the facility that generates storm water discharges associated with the mining-related activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow, and an identification of the types of pollutants that are likely to be present in storm water discharges associated with the activity. Factors to consider include the toxicity of the pollutant; quantity of chemicals used, produced or discharged; the likelihood of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified.

**d)** Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

**e)** Spills and Leaks. A list of significant spills and leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility beginning 3 years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

**f)** Sampling Data. A summary of any existing discharge sampling data describing pollutants in storm water discharges from the portions of Wildcat Loadout covered by this permit, including a summary of any sampling data collected during the term of this permit.

**g)** Risk Identification and Summary of Potential Pollutant Sources. A narrative description of the potential pollutant sources from the following activities: truck traffic on haul roads and resulting generation of sediment subject to runoff and dust generation; fuel or other liquid storage; pressure lines containing slurry, hydraulic fluid or other potential harmful liquids; and loading or temporary storage of acidic refuse or spoil. Specific potential pollutants shall be identified where
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3) **Measures and Controls.** Wildcat Loadout shall develop a description of storm water management controls appropriate for the facility and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at Wildcat Loadout. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls.

a) **Good Housekeeping.** Good housekeeping requires the maintenance of areas that may contribute pollutants to storm water discharges in a clean, orderly manner. These are practices that would minimize the generation of pollutants at the source or before it would be necessary to employ sediment ponds or other control measures at the discharge outlets. Where applicable, such measures or other equivalent measures would include the following: sweepers and covered storage to minimize dust generation and storm runoff; conservation of vegetation where possible to minimize erosion; watering of haul roads to minimize dust generation; collection, removal, and proper disposal of waste oils and other fluids resulting from vehicle and equipment maintenance; or other equivalent measures.

b) **Preventive Maintenance.** A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems. Where applicable, such measures would include the following: removal and proper disposal of settled solids in catch basins to allow sufficient retention capacity; periodic replacement of siltation control measures subject to deterioration such as straw bales; inspections of storage tanks and pressure lines for fuels, lubricants, hydraulic fluid or slurry to prevent leaks due to deterioration or faulty connections; or other equivalent measures.

c) **Spill Prevention and Response Procedures.** Areas where potential spills that can contribute pollutants to storm water discharges can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up shall be available to personnel.

d) **Inspections.** In addition to or as part of the comprehensive site evaluation required under paragraph 3.a.(4) of this section, qualified facility personnel shall be identified to inspect designated areas of the facility at appropriate intervals specified in the plan. The following shall be included in the plan:

1. **Active Mining-Related Areas and Those Inactive Areas Under**
SMCRA Bond Authority. The plan shall require quarterly inspections by the facility personnel for areas of the facility covered by pollution prevention plan requirements. This inspection interval corresponds with the quarterly inspections for the entire facility required to be provided by SMCRA authority inspectors for all mining-related areas under SMCRA authority, including sediment and erosion control measures. Inspections by the facility representative may be done at the same time as the mandatory inspections performed by SMCRA inspectors. Records of inspections of the SMCRA authority facility representative shall be maintained.

(2) Inactive Mining-Related Areas Not Under SMCRA Bond. The plan shall require annual inspections by the facility representative except in situations referred to in paragraph 3.a.(4)(d) below.

(3) Inspection Records. The plan shall require that inspection records of the facility representative and those of the SMCRA authority inspector shall be maintained. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections.

e) Employee Training. Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify periodic dates for such training.

f) Record keeping and Internal Reporting Procedures. A description of incidents (such as spills, or other discharges) along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

g) Non-storm Water Discharges.

(1) Certification. The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges such as drainage from underground portions of inactive mines or floor drains from maintenance or coal handling buildings. The certification shall include the identification of potential significant sources of non-storm water discharges at the site, a description of the results of any test and/or evaluation, a description of the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with Part IV.G.4. of this permit.
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(2) **Exceptions.** Except for flows from fire fighting activities, authorized sources of non-storm water listed in Part I.F.2.a. that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

(3) **Failure to Certify.** If Wildcat Loadout is unable to provide the certification required (testing or other evaluation for non-storm water discharges), the Executive Secretary must be notified within 180 days after the effective date of this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water to the storm discharge lines; and why adequate tests for such storm discharge lines were not feasible. Non-storm water discharges to waters of the State that are not authorized by a UPDES permit are unlawful, and must be terminated.

**h) Sediment and Erosion Control.** The plan shall identify areas that, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion and reduce sediment concentrations in storm water discharges. As indicated in paragraph I.F.3. above, SMCRA requirements regarding sediment and erosion control measures are primary requirements of the pollution prevention plan for mining-related areas subject to SMCRA authority. The following sediment and erosion control measures or other equivalent measures, should be included in the plan where reasonable and appropriate for all areas subject to storm water runoff:

(1) **Stabilization Measures.** Interim and permanent stabilization measures to minimize erosion and lessen amount of structural sediment control measures needed, including: mature vegetation preservation; temporary seeding; permanent seeding and planting; temporary mulching, matting, and netting; sod stabilization; vegetative buffer strips; temporary chemical mulch, soil binders, and soil palliatives; nonacidic road surfacing material; and protective trees.

(2) **Structural Measures.** Structural measures to lessen erosion and reduce sediment discharges, including: silt fences; earth dikes; straw dikes; gradient terraces; drainage swales; sediment traps; pipe slope drains; porous rock check dams; sedimentation ponds; riprap channel protection; capping of contaminated sources; and physical/chemical treatment of storm water.

**i) Management of Flow.** The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices...
4) **Comprehensive Site Compliance Evaluation.** Qualified personnel shall conduct site compliance evaluations at intervals specified in the plan, but in no case less than once a year. Such evaluations shall provide:

   a) Areas contributing to a storm water discharge associated with coal mining-related areas shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. These areas include haul and access roads; railroad spurs, sidings, and internal haulage lines; conveyor belts, chutes and aerial tramways; equipment storage and maintenance yards; coal handling buildings and structures; and inactive mines and related areas. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures, as indicated in paragraphs 3.a.(3)(h) and 3.a.(3)(i) above and where identified in the plan, shall be observed to ensure that they are operating correctly. A visual evaluation of any equipment needed to implement the plan, such as spill response equipment, shall be made.

   Based on the results of the evaluation, the description of potential pollutant sources identified in the plan, in accordance with paragraph 3.a.(2) of this section, and pollution prevention measures and controls identified in the plan, in accordance with paragraph 3.a.(3) of this section, shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner. For inactive mines, such revisions may be extended to a maximum of 12 weeks after the evaluation.

   A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph 3.a.(4)(b) above shall be made and retained as part of the storm water pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with Part IV.G.4. (Signatory Requirements) of this permit.

   d) Where compliance evaluation schedules overlap with inspections
required under 3.a.(3)(d), the compliance evaluation may be conducted in place of one such inspection. Where annual site compliance evaluations are shown in the plan to be impractical for inactive mining sites due to the remote location and inaccessibility of the site, site inspections required under this part shall be conducted at appropriate intervals specified in the plan, but, in no case less than once in 3 years.

4. **Numeric Effluent Limitations.** There are no additional numeric effluent limitations beyond those described in Part I.E. of this permit.

5. **Monitoring and Reporting Requirements.**

   a. **Benchmark Analytical Monitoring Requirements.** Wildcat Loadout must monitor their storm water discharges associated with industrial activity at least quarterly (4 times per year) during years 2 and 4 of the permit cycle except as provided in paragraphs 5.a.(3) (Sampling Waiver), 5.a.(4) (Representative Discharge), and 5.a.(5) (Alternative Certification). Wildcat Loadout is required to monitor their storm water discharges for the pollutants of concern listed in Table E. below. Reports must be made in accordance with 5.b. (Reporting). In addition to the parameters listed in Table E. below, Wildcat Loadout measurements or estimates (in inches) of the storm event that generated the sampled runoff; the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and an estimate of the total volume (in gallons) of the discharge sampled.

   The results of benchmark monitoring are primarily for Wildcat Loadout’s use to determine the overall effectiveness of the SWPPP in controlling the discharge of pollutants to receiving waters. Benchmark values are not viewed as permit limitations. An exceedance of a benchmark value does not, in and of itself, constitute a violation of this permit. While exceedance of a benchmark value does not automatically indicate a violation of a water quality standard has occurred, it does signal that modifications to the SWPPP or more specific pollution prevention controls may be necessary.

   **Table E. Monitoring Requirements for Coal Mining Facilities**

<table>
<thead>
<tr>
<th>Pollutants of Concern</th>
<th>Cut-Off Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Recoverable Aluminum</td>
<td>0.75 mg/L</td>
</tr>
<tr>
<td>Total Recoverable Iron</td>
<td>1.0 mg/L</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>100 mg/L</td>
</tr>
</tbody>
</table>

   **Monitoring Periods.** Wildcat Loadout shall monitor samples collected during the sampling periods of: January through March, April through June, July through September, and October through December during the second and fourth years of this permit cycle.

   **Sample Type.** A minimum of one grab sample shall be taken. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The required 72-hour storm event interval is waived where the preceding measurable storm event did not result in a measurable discharge from the facility. The required 72-hour storm event interval may also be waived where Wildcat Loadout documents that less than a 72-hour interval is representative for local storm events during the
season when sampling is being conducted. The grab sample shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first 30 minutes was impracticable. If storm water discharges associated with industrial activity commingle with process or nonprocess water, then where practicable permittees must attempt to sample the storm water discharge before it mixes with the nonstorm water discharge.

3) Sampling Waiver.

a) Adverse Conditions. If Wildcat Loadout is unable to collect samples within a specified sampling period due to adverse climatic conditions, thus a substitute sample shall be collected from a separate qualifying event in the next monitoring period and the data submitted along with the data for the routine sample in that period. Adverse weather conditions that may prohibit the collection of samples include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricanes, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

b) Low Concentration Waiver. When the average concentration for a pollutant calculated from all monitoring data collected from an outfall during the second year monitoring is less than the corresponding value for that pollutant listed in Table E. under the column Monitoring Cut-Off Concentration, Wildcat Loadout may waive monitoring and reporting requirements for the fourth year monitoring period. Wildcat Loadout must submit to the Executive Secretary, in lieu of the monitoring data, a certification that there has not been a significant change in industrial activity or the pollution prevention measures in area of the facility that drains to the outfall for which sampling was waived.

c) Inactive and Unstaffed Site. If Wildcat Loadout is unable to conduct quarterly chemical storm water sampling at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirements as long as the facility remains inactive and unstaffed monitoring data, a certification statement on the Storm Water Discharge Monitoring Report (SWDMR) stating that the site is inactive and unstaffed so that collecting a sample during a qualifying event is not possible.

4) Representative Discharge. If the facility has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, discharge substantially identical effluents, Wildcat Loadout may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfall(s) provided that Wildcat Loadout includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that Wildcat Loadout believes is representative, an estimate of the size of the drainage area (in square feet) and an
estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan. Wildcat Loadout shall include the description of the location of the outfalls, explanation of why outfalls are expected to discharge substantially identical effluents, and estimate of the size of the drainage area and runoff coefficient with the SWDMR.

5) Alternative Certification. Wildcat Loadout is not subject to the monitoring requirements of this section provided that certification is made for a given outfall or on a pollutant-by-pollutant basis in lieu of monitoring reports required under paragraph b. below, under penalty of law, signed in accordance with Part IV.G.4. (Signatory Requirements). The Certification shall state that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period. Such certification must be retained in the storm water pollution prevention plan, and submitted to DWQ in accordance with Part II.D. of this permit. In the case of certifying that a pollutant is not present, Wildcat Loadout must submit the certification along with the monitoring reports required under paragraph b. below. If Wildcat Loadout cannot certify for an entire period, they must submit the date exposure was eliminated and any monitoring required up until that date. This certification option is not applicable to compliance monitoring requirements associated with effluent limitations.

b. Reporting. Wildcat Loadout shall submit monitoring results for each outfall associated with industrial activity [or a certification in accordance with Sections (3), (4), or (5) above] obtained during the second year reporting period, on Storm Water Discharge Monitoring Report (SWDMR) form(s) postmarked no later than the 31st day of the following March. Monitoring results [or a certification in accordance with Sections (3), (4), or (5) above] obtained during the fourth year reporting period shall be submitted on SWDMR form(s) postmarked no later than the 31st day of the following March. For each outfall, one signed SWDMR form must be submitted to the Executive Secretary per storm event sampled. Signed copies of SWDMRs, or said certifications, shall be submitted to the Executive Secretary at the address listed in Part II.D. of the permit.

c. Visual Examination of Storm Water Quality. Wildcat Loadout shall perform and document a visual examination of a representative storm water discharge at the following frequencies: quarterly for active areas under SMCRA bond located in areas with average annual precipitation over 20 inches; semi-annually for inactive areas under SMCRA bond, and active areas under SMCRA bond located in areas with average annual precipitation of 20 inches or less; visual examinations are not required at inactive areas not under SMCRA bond.

1) Visual Monitoring Periods. Examinations shall be conducted in each of the following periods for the purposes of visually inspecting storm water runoff or snow melt: Quarterly-January through March; April through June; July through September; and October through December. Semi-annually—January through June and July through December.

2) Sample and Data Collection. Examinations shall be made of samples collected within the first 60 minutes (or as soon thereafter as practical, but not to exceed
two hours) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well-lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual will carry out the collection and examination of discharges for the life of the permit.

3) **Visual Storm Water Discharge Examination Reports.** Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.
MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under Part I shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under Utah Administrative Code ("UAC") R317-2-10, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. Reporting of Monitoring Results. Monitoring results obtained during the previous month shall be summarized for each month and reported monthly on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. The first report is due on June 28, 2003. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of Signatory Requirements (see Part IV.G), and submitted to the Director, Division of Water Quality:

original to: Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870

E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under UAC R317-2-10 or as otherwise specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

G. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.
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H. **Retention of Records.** The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location.

I. **Twenty-four Hour Notice of Noncompliance Reporting.**

1. The permittee shall (orally) report any noncompliance which may seriously endanger health or environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 538-6146, or 24 hour answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:
   a. Any noncompliance which may endanger health or the environment;
   b. Any unanticipated bypass which exceeds any effluent limitation in the permit (See Part III.G, Bypass of Treatment Facilities.);
   c. Any upset which exceeds any effluent limitation in the permit (See Part III.H, Upset Conditions.); or,
   d. Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit.

3. A written submission shall also be provided within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
   a. A description of the noncompliance and its cause;
   b. The period of noncompliance, including exact dates and times;
   c. The estimated time noncompliance is expected to continue if it has not been corrected; and,
   d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
   e. Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Executive Secretary may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 538-6146.

5. Reports shall be submitted to the addresses in Part II.D, Reporting of Monitoring Results.
J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for Part II.D are submitted. The reports shall contain the information listed in Part II.1.3.

K. Inspection and Entry. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee’s premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.
III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions of the Act is subject to a fine not exceeding $25,000 per day of violation; and any person convicted under UCA 19-5-115(2) a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at Part III.G, Bypass of Treatment Facilities and Part III.H, Upset Conditions, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

F. Removed Substances. Collected screening, grit, solids, sludges, or other pollutants removed in the course of treatment shall be buried or disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to 2. and 3. of this section.

2. Prohibition of Bypass.
   a. Bypass is prohibited, and the Executive Secretary may taken enforcement action against a permittee for bypass, unless:
      (1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;
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(2) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and

(3) The permittee submitted notices as required under section G.3.

b. The executive Secretary may approve an anticipated bypass, after considering its adverse effects, if the Executive Secretary determines that it will meet the three conditions listed in sections G.2a. (1), (2) and (3).

3. Notice.

a. Anticipated bypass. Except as provided above in section G.2. and below in section G. 3.b, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Executive Secretary:

(1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages:

(2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Executive Secretary in advance of any changes to the bypass schedule;

(3) Description of specific measures to be taken to minimize environmental and public health impacts;

(4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

(5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and

(6) Any additional information requested by the Executive Secretary.

b. Emergency Bypass. Where ninety days advance notice is not possible, the permittee must notify the Executive Secretary, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Executive Secretary the information in section G.3.a.(1) through (6i) to the extent practicable.

c. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass to the Executive Secretary as required under Part III., Twenty Four Hour Reporting. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.
H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph 2. of this section are met. Executive Secretary's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   a. An upset occurred and that the permittee can identify the cause(s) of the upset;
   b. The permitted facility was at the time being properly operated;
   c. The permittee submitted notice of the upset as required under Part II.I, Twenty-four Hour Notice of Noncompliance Reporting; and,
   d. The permittee complied with any remedial measures required under Part III.D, Duty to Mitigate.

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Toxic Pollutants. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of The Water Quality Act of 1987 for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

J. Changes in Discharge of Toxic Substances. Notification shall be provided to the Executive Secretary as soon as the permittee knows of, or has reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
   a. One hundred micrograms per liter (100 ug/L);
   b. Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
   c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with UAC R317-8-3.4(7) or (10); or,
   d. The level established by the Executive Secretary in accordance with UAC R317-8-4.2(6).

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

MAY 17 2006
a. Five hundred micrograms per liter (500 ug/L);

b. One milligram per liter (1 mg/L) for antimony:

c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with UAC R317-8-3.4(9); or,

d. The level established by the Executive Secretary in accordance with UAC R317-8-4.2(6).

K. Industrial Pretreatment. Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of The Water Quality Act of 1987, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at 40 CFR 403, the State Pretreatment Requirements at UAC R317-8-8, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with 40 CFR 403.12(p)(1), the permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge any substance into a POTW which if otherwise disposed of would be considered a hazardous waste under 40 CFR 261. This notification must include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).
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IV. GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Executive Secretary of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official

2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
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3. Changes to authorization. If an authorization under paragraph IV.G.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph IV.G.2 must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under UAC R317-8-3.2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Executive Secretary. As required by the Act, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the Act.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Executive Secretary at least 20 days in advance of the proposed transfer date;
2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

N. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by UCA 19-5-117.

O. Water Quality-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. A revision to the current Water Quality Management Plan is approved and adopted which calls for different effluent limitations than contained in this permit.

P. Toxicity Limitation-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include whole effluent toxicity (WET) testing, a WET limitation, a compliance schedule, a compliance date, additional or modified numerical limitations, or any other conditions related to the control of toxicants if toxicity is detected during the life of this permit.
V. GLOSSARY OF TERMS

A. Definitions.

1. The "30-day (and monthly) average" is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

2. The "7-day (and weekly) average" is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains the Saturday.

3. "Daily Maximum" ("Daily Max.") is the maximum value allowable in any single sample or instantaneous measurement.

4. "Composite samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the composite sample period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:
   a. Constant time interval between samples, sample volume proportional to flow rate at time of sampling;
   b. Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;
   c. Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,
   d. Continuous collection of sample, with sample collection rate proportional to flow rate.

5. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

6. An "instantaneous" measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

7. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
8. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

9. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. "Executive Secretary" means Executive Secretary of the Utah Water Quality Board.

11. "EPA" means the United States Environmental Protection Agency.

12. "Act" means the "Utah Water Quality Act".

13. "Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

14. "Coal pile runoff" means the rainfall runoff from or through any coal storage pile.


16. "Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agriculture storm water runoff.

17. "Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (see 40CFR 110.10 and 40 CFR 117.21) or Section 102 of the CERCLA (see 40 CFR 302.4).

18. "Storm water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

19. "Waste pile" means any noncontainerized accumulation of solid, nonflowing waste that is used for treatment or storage.

20. "10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in Weather Bureau Technical Paper no. 40, May 1961 and NOAA Atlas 2, 1973 for the 11 Western States, and may be obtained from the National Climatic center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

21. The term "coal preparation plant" means a facility where coal is crushed, screened, sized and cleaned, dried, or otherwise prepared and loaded for transit to a consuming facility.

22. The term "coal preparation plant associated areas" means the coal preparation plant yards, immediate access roads, coal refuse piles, and coal storage piles and facilities.
APPENDIX B
PART A-22

RIGHTS OF WAY, LEASES, REAL PROPERTY AGREEMENTS—ASSIGNMENT AND ASSUMPTION AGREEMENT
RIGHTS OF WAY, LEASES, REAL PROPERTY AGREEMENTS--
ASSIGNMENT AND ASSUMPTION AGREEMENT

THIS RIGHTS OF WAY, LEASES, REAL PROPERTY AGREEMENTS--
ASSIGNMENT AND ASSUMPTION AGREEMENT (the "Assignment") is made and
entered into this 10 day of May, 2011 (the "Effective Date") by and between
INTERMOUNTAIN POWER AGENCY, a political subdivision of the State of Utah, having
offices located at 10653 South River Front Parkway, Suite 120, South Jordan, Utah 84095
("IPA"); and ANDALEX RESOURCES, INC., a Delaware corporation having offices located
at 794 North "C" Canyon Road, P.O. Box 910, East Carbon, Utah 84520 ("ANDALEX"). Each
of IPA and ANDALEX may be hereinafter referred to individually as a "party" and collectively
as the "parties."

WITNESSETH:

THAT FOR AND IN CONSIDERATION OF the sum of Ten Dollars ($10.00), the
mutual promises and covenants contained herein and in the Transfer Agreement, and intending to
be legally bound hereby, the parties agree as follows:

1. Transfer Agreement. This Assignment is executed and delivered pursuant to, and
is subject to and governed by, the terms and provisions of that certain Transfer Agreement
regarding the Wildcat Loadout facility dated effective as of May 10, 2011, by and between IPA
and ANDALEX (the "Transfer Agreement"), including without limitation the representations
and warranties contained therein. Any capitalized terms not defined herein shall have the
meaning ascribed to such terms in the Transfer Agreement. Notices to be given hereunder shall
be given to the parties at their respective addresses set forth above, and any such notice(s) shall
be given in accordance with the requirements and procedures set forth in the Transfer
Agreement. In the event of a conflict between the terms and conditions of this Assignment and
Assumption and the terms and conditions of the Transfer Agreement, the terms and conditions of
the Transfer Agreement shall govern and control.

2. Assignment by ANDALEX. As of the Effective Date, and subject to the terms
and conditions of this Assignment and the Transfer Agreement, ANDALEX hereby sells,
assigns, transfers, and sets over unto IPA, all of its right, title and interest in and to the easements
and rights of way and real property agreements, together with all amendments and modifications
thereo, and located within those lands, more particularly described at Exhibit 1 attached hereto
and incorporated herein (collectively, the "Transferred Agreements").
3. Assumption of Duties and Obligations by IPA. As of the Effective Date, and subject to the terms and conditions of this Assignment and the Transfer Agreement, IPA hereby assumes and agrees to keep, perform, and fulfill the duties, covenants and obligations of ANDALEX arising under the Transferred Agreements.

IN WITNESS WHEREOF, the parties, through their duly authorized representatives, have caused this Assignment to be executed as of the day and year first above written.

INTERMOUNTAIN POWER AGENCY

By: [Signature]
Name: James A. Hewlett
Title: General Manager

ANDALEX RESOURCES, INC.

By: [Signature]
Name: David W. Hille
Title: President

INTEGRATED

DEC 13 2011
Div. of Oil, Gas & Mining
The foregoing instrument was acknowledged before me this 4th day of May, 2011, by James A. Hewlett, as General Manager of Intermountain Power Agency, a political subdivision of the state of Utah, on behalf of the Intermountain Power Agency.

My Commission Expires:

1/4/2011

STATE OF _____________ ss:
COUNTY OF _____________

The foregoing instrument was acknowledged before me this 4th day of May, 2011, by David W. Hibbs, as President of ANDALEX Resources, Inc., a Delaware corporation, on behalf of the corporation.

My Commission Expires:

1/4/2011

STATE OF _____________ ss:
COUNTY OF _____________

PENNY BERRY
NOTARY PUBLIC - STATE OF UTAH
My Comm. Exp. 01/04/2013
Commission # 604689

INTEGRATED
DEC 13 2011
Div. of Oil, Gas & Mining

Ent. 810646 Blk 0747 Pg 0095
STATE OF Utah
COUNTY OF Salt Lake ss:

The foregoing instrument was acknowledged before me this 10th day of May, 2011, by James A. Howlett, as General Manager of Intermountain Power Agency, a political subdivision of the state of Utah, on behalf of the Intermountain Power Agency.

My Commission Expires: 08/19/2013

STATE OF
COUNTY OF ss:

The foregoing instrument was acknowledged before me this _ day of _ 2011, by _ as _ of ANDALEX Resources, Inc., a Delaware corporation, on behalf of the corporation.

My Commission Expires:

Notary Public
Exhibit 1

The following described real property located in Carbon County, Utah:

1. **BLM ROW UTU-48027, dated January 1982 between Tower Resources, Inc. and BLM as amended February 5, 2007 (Coal and Storage Loadout Facility)**
   
   **Township 13 South, Range 9 East, SLBM**
   
   **Section 33:** SESWNE, E2SW, SE  
   (Containing 250 acres, more or less.)

2. **BLM ROW UTU-052810, dated May 1984 (Access Road)**
   
   **Township 13 South, Range 9 East, SLBM**
   
   **Section 33:** located within the W2NE  
   (Containing 7.805 acres, more or less.)
   
   **Tax Parcel No. 2A-1031-33F**

3. **Beaver Creek Coal Company Letter Agreement**
   
   An unrecorded Agreement from Beaver Creek Coal Company to Andalex Resources, Inc., dated July 28, 1988, granting Andalex the right to use a small portion of land for the Wildcat Loadout operations. The area granted is located to the east of Beaver Creek Coal Company’s fence to the railroad right-of-way and south of the “new gate.”

4. **Utah Railway Company Lease**
   
   Lease dated December 1, 1981, as amended February 8, 1983, by and between Utah Railway Company, a Utah Corporation, Lessor, and Tower Resources, Inc. (successor in interest), a Delaware Corporation, Lessee, affecting the following described lands located in Carbon County, Utah:

   Two strips of land of the Lessor in the vicinity of Sections 27, 28, and 33, Township 13 South, Range 9 East, SLB&M and Sections 4 and 5, Township 14 South, Range 9 East, SLB&M in Carbon County, Utah, being 92.5 feet on each side of a strip of land which is 15 feet wide being 7½ feet on either side of the center line of Lessor’s main line track extending from a point opposite Mile Post 7 plus 2444 feet (7.4629) to a point opposite Mile Post 5 plus 2114 feet (5.4004), but excluding a strip of land 50 feet wide on either side of Mile Post 5 plus 4575 feet (5.8665), such exclusion to be reserved for a possible future road crossing of the tracks, containing approximately 45.83 acres, more or less. The leased premises does not include a strip of land 15 feet wide down the centerline of Lessor’s main line track.

   **INTEGRATED**
   
   **Div. of Oil, Gas & Mining**
   
   **Ent 810646 Blk: 0747 Pg 0097**
APPENDIX B
PART A-23

QUITCLAIM DEED BETWEEN
ANDALEX RESOURCES, INC., GRANTOR
AND
INTERMOUNTAIN POWER AGENCY, GRANTEE

INCORPORATED
DEC. 13 2011
Div. of Oil, Gas & Mining
QUITCLAIM DEED

IN CONSIDERATION OF Ten and 00/100 Dollars ($10.00) and other good and valuable consideration, ANDALEX RESOURCES, INC., a Delaware corporation, having offices located at 794 North "C" Canyon Road, P.O. Box 910, East Carbon, Utah 84520 ("Grantor"), hereby quitclaims to the INTERMOUNTAIN POWER AGENCY, a political subdivision of the State of Utah, having offices located at 10653 South River Front Parkway, Suite 120, South Jordan, Utah 84095 ("Grantee"), all of Grantor's right, title and interest in the improvements described in Exhibit A located on or under that certain real property located in Carbon County, Utah, more particularly described on the attached Exhibit B ("Wildcat Loadout Real Property"), which is incorporated herein by this reference.

SUBJECT TO taxes and assessments for the year 2011 and thereafter.

This Quitclaim Deed shall extend to and be binding upon, and every benefit hereof shall inure to, the parties hereto and their respective successors and assigns. This Quitclaim Deed shall be governed by the laws of the State of Utah.

IN WITNESS WHEREOF, Grantor has executed this Quitclaim Deed this 4th day of May, 2011 (the "Effective Date").

GRANTOR:

ANDALEX RESOURCES, INC., a Delaware corporation

By: 
Print Name: David W. Hobbs
Title: President

INCORPORATED
DEC 13 2011
Div. of Oil, Gas & Mining
The foregoing instrument was acknowledged before me this 4th day of May, 2011, by David W. Hills, the President of ANDALEX RESOURCES, INC., a Delaware corporation.

NOTARY PUBLIC
Residing at: Salt Lake

My Commission Expires: 1/4/2015
Exhibit A to Quitclaim Deed

Fixtures and Improvements

That portion of the following items that are real property:

1. Unit train coal loading facility
2. Conveyors (including any magnets and metal detectors situated on the Wildcat Loadout Real Property as of the Effective Date)
3. Stackers situated on the Wildcat Loadout Real Property as of the Effective Date
4. Office building (including any building systems (HVAC, electrical, water) contained therein as of the Effective Date). (Note that any clothing lockers and any other property owned and supplied by vendors are specifically excluded from this Exhibit A.)
5. 8,000 gallon underground tank for stoker oil
6. Scalehouse trailer/entrance station
7. Truck scale
8. Crushing and screening facilities
9. Two truck dump/dozer traps
10. Power substation with transformers
11. Two water and coal spray tanks. (Note that the spraying systems associated with the tanks and any other property owned and supplied by vendors are specifically excluded from this Exhibit A.)
12. Small shop building (including any building systems (HVAC, electrical, water) contained therein as of the Effective Date). (Note that the Safety-Kleen tank system and any other property owned and supplied by vendors are specifically excluded from this Exhibit A.)
13. Modular shower/change trailer
14. Truck dump (west of railroad track)
15. Train loading facilities including loading chutes (west of railroad track)
16. Thermo-Gammametrics Nuclear Coal Analyzer
17. Reclaim Tunnels and all improvements contained therein as of the Effective Date
18. Three control buildings (including any building systems (HVAC, electrical, water) contained therein as of the Effective Date.)
19. Roadway improvements situated on the Wildcat Loadout Real Property as of the Effective Date
20. Septic system and drainage field situated on the Wildcat Loadout Real Property as of the Effective Date
21. Any property owned or supplied by vendors are specifically excluded from this Quitclaim Deed
Exhibit B to Quitclaim Deed

Wildcat Loadout Real Property

The following described real property located in Carbon County, Utah:

1. BLM ROW UTU-48027, dated January 1982 between Tower Resources, Inc. and BLM as amended February 5, 2007 (Coal and Storage Loadout Facility)

   Township 13 South, Range 9 East, SLBM
   Section 33: SESWNE, E2SW, SE
   (Containing 250 acres, more or less.)

2. BLM ROW UTU-052810, dated May 1984 (Access Road)

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APPENDIX B
PART B

HISTORY OF VIOLATIONS
VIOLATION INFORMATION

Information updated to January 17, 2019

INCORPORATED
MAR 05 2019
Div. of Oil, Gas & Mining
Coal Energy Group 2, LLC
Wildcat Loadout

<table>
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<th>Permit Number</th>
<th>MSHA Number</th>
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<th>State</th>
<th>Current Status of NOV</th>
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----------NO VIOLATIONS IN PRECEDING 3 YEARS----------

INCORPORATED

MAR 05 2019

Div. of Oil, Gas & Mining
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<th>Date of Issuance</th>
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<th>Issuing Agency</th>
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<th>Brief Description of NOV</th>
<th>Action taken to Abate NOV</th>
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<td>42-02519</td>
<td>21162</td>
<td>1/20/2016</td>
<td>K.Nicholes</td>
<td>UDOGM</td>
<td>Utah</td>
<td>Failed to install drainage from the sump in pit 10 to its discharge point in Pond 3 according to the design found in Appendix 5-13.</td>
<td>Installed two pipes from Pit 10 Sump to Pond 3, that terminate under water</td>
<td>Terminated</td>
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<td>C250005</td>
<td>42-02519</td>
<td>21163</td>
<td>1/20/2016</td>
<td>K.Nicholes</td>
<td>UDOGM</td>
<td>Utah</td>
<td>Failure to have rough backfilling and grading follow coal removal by not more than 60 days. Mining ceased in HWT 2 with Panel 4E in July 2015.</td>
<td>Submitted plans that were reviewed and approved May 27, 2016 to backfill HWT 2.</td>
<td>Terminated</td>
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<td>C250005</td>
<td>42-02519</td>
<td>21164</td>
<td>1/20/2016</td>
<td>K.Nicholes</td>
<td>UDOGM</td>
<td>Utah</td>
<td>Failure to provide a plan for reclamation of the final Pit 10.</td>
<td>Submitted an amendment for a plan to backfill Pit 10 utilizing material from a designated borrow area.</td>
<td>Terminated</td>
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<tr>
<td>C250005</td>
<td>42-02519</td>
<td>21165</td>
<td>3/9/2016</td>
<td>K.Nicholes</td>
<td>UDOGM</td>
<td>Utah</td>
<td>1. Failure to provide accurate, certified underground (UG) mine surface facilities map showing buildings; utility corridors; coal and non-coal waste disposal locations; and coal loading locations. 2. Failure to provide accurate certified map of UG mine water diversions, collection, conveyance and treatment structures.</td>
<td>Provided drawing 5-3B showing UG facilities. Made changes to Chapter 5 Text.</td>
<td>Terminated</td>
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<td>C250005</td>
<td>42-02519</td>
<td>21166</td>
<td>3/9/2016</td>
<td>K.Nicholes</td>
<td>UDOGM</td>
<td>Utah</td>
<td>Failure to correct structural weakness in pond 001 and 002</td>
<td>Replaced gaskets for oil skimmer on the primary discharge culvert.</td>
<td>Terminated</td>
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<td>21167</td>
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<td>UDOGM</td>
<td>Utah</td>
<td>1. Failure to install adequate sediment control measures on the fill slopes surrounding the underground mine (UG). 2. Failure to install adequate sediment control within Pit 10 for the UG mine surface facility</td>
<td>Provided drawings and supporting text for drainage in Pit 10.</td>
<td>Terminated</td>
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<td>21174</td>
<td>4/6/2016</td>
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<td>Utah</td>
<td>Failure to follow the approved plan in Area 1, MRP, Vol 3, Chapter 5, pages 5-13 and page 5-21. Page 5-13: County road to be completed prior to mining activity so that public is routed around the mine. Page 5-21: construction of haul roads, pond 5 and pond 6, subsoil pile, topsoil pile and spoil pile all ditches and culverts completed prior to mining in Pit 1 or development of pit 1.</td>
<td>Completed County bypass road.</td>
<td>Terminated</td>
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<td>21183</td>
<td>6/3/2016</td>
<td>K.Nicholes</td>
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<td>Utah</td>
<td>Over excavation of excess spoil pile area.</td>
<td>An amendment to the MRP to include reclamation of the highwall left from overexcavation of the excess spoil pile was submitted and approved.</td>
<td>Terminated</td>
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<td>Maintenance of ASCA-1 NPL.</td>
<td>Made repairs to ASCA-1</td>
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<td>Failure to protect topsoil NPL.</td>
<td>Removed topsoil from top of highwall and reestablished berm.</td>
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<td>C250005</td>
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<td>21193</td>
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<td>Utah</td>
<td>Failure to store oil &amp; grease in a controlled manner in a designated area of the permit area.</td>
<td>Removed unauthorized oil storage tank.</td>
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<td>C250005</td>
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<td>21194</td>
<td>3/15/2017</td>
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<td>UDOGM</td>
<td>Utah</td>
<td>Failure to maintain siltation structures and diversions at the underground facilities.</td>
<td>Submitted amendment to MRP to enlarge sump and dike in Pit 10.</td>
<td>Terminated</td>
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## Coal Energy Group 3, LLC
Kinney #2 Mine

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<tr>
<th>Permit Number</th>
<th>MSHA Number</th>
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<td>NO VIOLATIONS IN PRECEDING 3 YEARS</td>
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### Current Mine Information

- **Mine ID:** 4102639
- **Operator:** Allen Coal Development LLC
- **Operator History for Mine ID:** 4102639
- **Current Controller:** James J Wayland

### Mine Citations, Orders, and Safeguards

**Operator Name**: Allen Coal Development LLC  
**Date:** 11/25/2014

**Please Note:** The information provided by the Mine Data Retrieval System (MDRS) is based on data gathered from various MSHA systems. As there may be a lag time in data being entered into those systems, there will also be a lag in the reflection of that data on the MDRS.

Assessment data is not available prior to 1/1/1993.

### Citations, Orders, and Safeguards

The current operator, Allen Coal Development LLC, has been the operator since **11/25/2014**.

**Please Note:**
- Red indicates violations pending hearings, appeals, and/or other actions.
- Black indicates violations that have not yet been assessed.
- Gray are non-assessed.

**Assessment Process Overview**

*Note: Vacated Citations are not included in any reports on the MDRS.*

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[Mine Data Retrieval System](https://netweb.msha.gov/ASPD/MineAction.aspx)
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Return to DRS Home Page

INcorporated
MARCH 05, 2019
Div. of Oil, Gas & Mining

MSHA Violations - Coal Hollow Mine

Current Mine Information
Mine ID: 4202519
Operator: Alton Coal Development LLC
Mine Name: Coal Hollow Mine
Current Controller: James J. Wayland
Controller Start Date: 1/1/2009
Mine Status: Active
Status Date: 12/31/2015
Mined Material: Coal (Bituminous)
Type of Mine: Surface
Location: Kane County, UT
State: UT

PLEASE NOTE: The information provided by the Mine Data Retrieval System (MDRS) is based on data gathered from various MSHA systems. As there may be a lag time in data being entered into those systems, there will also be a lag in the reflection of that data on the MDRS.

Assessment data is not available prior to 1/1/1995.

Citations, Orders, and Safeguards
The current operator, Alton Coal Development LLC, has been the operator since 1/1/2009.
- Indicates violations pending hearings, appeals, and/or other actions.
- Indicates violations that have not yet been assessed.
- There are no assessable.

Assessment Process Overview
Note: Vacated citations are not included in any reports on the MDRS.

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https://www.msha.gov/dl/ASP/MineAction.asp

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https://archive.msha.gov/MineAction.asp

4850-3802-3278
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https://athweb.msha.gov/ASP/MineAction.asp

MSHA - Mine Violations

8/23/2014

Development LLC

Allon Coal Development LLC

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Allon Coal Development LLC

8482234 0000388786 6/25/2014 8/25/2015 104(a) 6/25/2014 C N 77,1100 100.00 Closed 100.00 100.00

Allon Coal Development LLC

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Allon Coal Development LLC

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8484397 4/16/2014 104(a) 4/21/2014 C N Non-Assemble

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8482983 0000354539 1/27/2014 8/25/2015 104(a) 1/27/2014 C N 77,1100 100.00 Closed 100.00 100.00

https://athweb.msha.gov/ASP/MineAction.asp

4850-3802-3278
| Date       | Company           | Address          | City, State | Violation Date | Violation Type | Violation Code | Description | Fine                  | Status     | Note | Non-Assessable
|------------|-------------------|------------------|-------------|----------------|----------------|----------------|-------------|----------------------|------------|------|---------------------|
| 1/7/2014   | 8482942           | 1008144599       | 1/7/2014    | 1/17/2014      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable
| 2/24/2014  | 8482943           | 1008144599       | 2/24/2014   | 2/25/2015      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable
| 4/16/2014  | 8482944           | 1008144599       | 4/16/2014   | 4/17/2015      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable
| 6/25/2014  | 8482945           | 1008144599       | 6/25/2015   | 6/25/2016      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable
| 9/17/2014  | 8482946           | 1008144599       | 9/17/2015   | 9/18/2016      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable
| 11/1/2014  | 8482947           | 1008144599       | 11/1/2015   | 11/1/2016      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable
| 1/29/2015  | 8482948           | 1008144599       | 1/29/2016   | 1/29/2017      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable
| 3/27/2015  | 8482949           | 1008144599       | 3/27/2016   | 3/27/2017      | C N 77100000   | 100.00         | Closed     | 180.00 | 180.00 | Non-Assessable


4850-3802-3278
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Return to DSS Home Page

INCORPORATED

MARC 05 2019

Div. of Oil, Gas & Mining


99

4850-3602-3278

21
CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Arthur J. Gallagher Risk Management Services, Inc.
1900 West Loop South, Suite 1600
Houston TX 77027

INSURED
Coal Energy Group 2 LLC
6602 Lllex Circle
Naples UT 34109

CONTACT NAME:

PHONE: (888) 809-1100
FAX: 713-622-5722
E-MAIL: archinsco@archinsurance.com

INSURER: Wildcat Loadout

COVERAGE:

COVERAGES CERTIFICATE NUMBER: 2055315833

REVISION NUMBER:

This is to certify that the policies of insurance listed below have been issued to the insured named above for the policy period indicated, notwithstanding any requirement, term or condition of any contract or other document with respect to which this certificate may be issued or may pertain, the insurance afforded by the policies described herein is subject to all the terms, exclusions and conditions of such policies. Limits shown may have been reduced by paid claims.

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<th>POLICY EXP (MM/DD/YYYY)</th>
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WORKERS COMPENSATION AND EMPLOYERS' LIABILITY:
ANY/PROPRIETOR/SHAREHOLDER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N
(Mandatory in NH)
If yes, describe under DESCRIPTION OF OPERATIONS below.

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 161, Additional Remarks Schedule, may be attached if more space is required)
Waiver of Subrogation is included on an Blanket basis on all policies as required by written contract. General Liability policy includes Blanket Additional Insured Status as required by written contract. Insurance is Primary and Noncontributory.

RE: Wildcat Loadout C/007/0033

CERTIFICATE HOLDER:

Utah Division of Oil, Gas and Mining
1594 W. North Temple, Suite 1210
PO Box 148801
Salt Lake City UT 84114-5801

CANCELLATION:

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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## Wildcat Loadout

**ACT 007/0033**

<table>
<thead>
<tr>
<th>Description</th>
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<td>Subtotal Backfilling and Grading</td>
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### Escalation Factor

- **Escalation Factor**: 0.007
- **Number of Years**: 4
- **Escalation**: $32,795

### Reclamation Cost

- **Reclamation Cost**: $1,191,819

**Bond Amount (round to nearest $1,000)**

- **in 2021 dollars**: $1,192,000
## Cost Factors

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<tr>
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<td>31 23 16 42 1300</td>
<td>Front End Loader 3 CY</td>
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<td>31 23 16 42 0250</td>
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### Note:

- 01 54 33 20 0346
- Work a 8 Hr./Day
- 328LCR, Prod. Rate 6 CY/HR
- $312.40/day + 8 Hr./Day = $39.05/HR

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**INCORPORATED**

**JAN 09 2018**

**Div. of Oil, Gas & Mining**
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**Total:**

- Steel Rod Single: 2016
- Steel Tube Double: 2017
- Steel Pipe Triple: 2018
- Steel Frame Quadruple: 2019
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**Total:** 36 ID's

**Notes:**
- All materials are provided in kg unless otherwise specified.
- All dimensions are in millimeters.
- Finish: All components are finished with a standard polish.
- Notes: All necessary tooling is included with each ID.
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**Incorporated**

**Jan 9 2018**

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- **Percent:**
- **Factor:**
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**Grand Total:**

**Grand Total:**

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**Notes:**

- Area: 1000 sq ft
- Length: 50 ft
- Width: 10 ft
- Height: 10 ft

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**INCORPORATED**

**JAN 09 2018**

Div. of Oil, Gas & Mining
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**Notes:**
- Task z1f is a bulk load entry.
- Task z1g involves data entry.
- Task z1h requires system testing.

**Contact:**
- 123-456-7890
- support@example.com

**Date:**
- 09/09/2008

**Division:**
- Div. of Oil, Gas & Mining
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**Total**

1000

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**Incorporated**

**Jan 01 2018**

Div. of Oil, Gas & Mining
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**Total**

**Note:**

- **Incorporated**
- **Jan 9 2018**
- **Div. of Oil, Gas & Mining**
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**Total**

INCORPORATED

JAN 09 2018

Div. of Oil, Gas & Mining
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**Grand Total**

**Note:**

- The table above represents a summary of various items, with columns for Ref, From, Description, Volume, Weight, Unit, Number, and related metrics.
- Each row details specific data points, including volume in cubic feet, weight, and other units.

**Incorporated**

**JAN 9 2018**

**Div. of Oil, Gas & Mining**
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- JAN 09 2018
- Div. of Oil, Gas & Mining
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<td>2</td>
<td>Engine Type T2</td>
<td>Steel &amp; Large</td>
<td>DEF Inc.</td>
<td>87654321</td>
<td>$987.65</td>
<td>10</td>
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<td>3</td>
<td>Engine Type T3</td>
<td>Steel &amp; Large</td>
<td>GHI Ltd.</td>
<td>78901234</td>
<td>$321.00</td>
<td>50</td>
<td>Item 3</td>
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**Total**

INCORPORATED

JAN 9 2018

Div. of Oil, Gas & Mining
<table>
<thead>
<tr>
<th>Ref</th>
<th>Ptn</th>
<th>Description</th>
<th>Grade</th>
<th>Form Factor</th>
<th>Btu</th>
<th>Motor Grt</th>
<th>Weight</th>
<th>Height</th>
<th>Spacing</th>
<th>Fuel</th>
<th>Length</th>
<th>Width</th>
<th>Unit</th>
<th>Min</th>
<th>Max</th>
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</tbody>
</table>

**Note:**

- Btu: British Thermal Unit
- Motor Grt: Motor Gross Tons
- Weight: Weight in Tons
- Height: Height in Feet
- Spacing: Spacing in Feet
- Fuel: Fuel Type
- Length: Length in Feet
- Width: Width in Feet
- Unit: Unit of Measurement
- Min: Minimum Value
- Max: Maximum Value

**Date:** 1 September 2017

**Incorporated:**

**Jan 9, 2018**

Div. of Oil, Gas & Mining
<table>
<thead>
<tr>
<th>Ref</th>
<th>Vane</th>
<th>Description</th>
<th>Height Reference Number</th>
<th>Pitch</th>
<th>Cost</th>
<th>Length</th>
<th>Pitch</th>
<th>Diameter</th>
<th>Weight</th>
<th>Surface</th>
<th>Finish</th>
<th>Finish Factor</th>
<th>Quantity</th>
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</tr>
</tbody>
</table>

**Note:** The table above contains data related to various vane specifications including height, cost, length, diameter, weight, surface, finish, and finish factor. Each row represents a different vane type or specification with associated details.
<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
<th>Line</th>
<th>Length</th>
<th>Width</th>
<th>Height</th>
<th>Grade/Type</th>
<th>Base</th>
<th>Volume</th>
<th>Weight</th>
<th>Density</th>
<th>Date</th>
<th>Source</th>
<th>Quantity</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line 1</td>
<td>Description of Material</td>
<td>Date</td>
<td>Line 2</td>
<td>Length</td>
<td>Width</td>
<td>Height</td>
<td>Grade/Type</td>
<td>Base</td>
<td>Volume</td>
<td>Weight</td>
<td>Density</td>
<td>Date</td>
<td>Source</td>
<td>Quantity</td>
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<tr>
<td>Line 2</td>
<td>Description of Material</td>
<td>Date</td>
<td>Line 3</td>
<td>Length</td>
<td>Width</td>
<td>Height</td>
<td>Grade/Type</td>
<td>Base</td>
<td>Volume</td>
<td>Weight</td>
<td>Density</td>
<td>Date</td>
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<tr>
<td>Line 3</td>
<td>Description of Material</td>
<td>Date</td>
<td>Line 4</td>
<td>Length</td>
<td>Width</td>
<td>Height</td>
<td>Grade/Type</td>
<td>Base</td>
<td>Volume</td>
<td>Weight</td>
<td>Density</td>
<td>Date</td>
<td>Source</td>
<td>Quantity</td>
</tr>
</tbody>
</table>

**Footnotes:**
- Line 1, Line 2, Line 3, Line 4, etc.
- Description of Material: Detailed description of the material used.
- Line: Sequential line number.
- Length, Width, Height: Measurements of the material.
- Grade/Type: Specifications of the material.
- Base: Base material used.
- Volume, Weight: Calculated values based on measurements.
- Density: Calculated density based on Weight and Volume.
- Date: Date of measurement or material specification.
- Source: Source of the material information.
| S. No | Description | Material | Material Reference Number | Total Cost | Turn | Length | Width | Thickness | Production | Product | Grade | Parcel | Quantity | Meter | Lady | Price | Total |
|-------|-------------|----------|---------------------------|------------|------|--------|-------|-----------|------------|---------|-------|--------|---------|--------|------|-------|--------|-------|
| 1     | Fresh Water 3/8" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 2     | Fresh Water 1/2" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 3     | Fresh Water 3/4" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 4     | Fresh Water 1" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 5     | Fresh Water 1.25" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 6     | Fresh Water 1.5" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 7     | Fresh Water 2" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 8     | Fresh Water 2.5" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 9     | Fresh Water 3" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 10    | Fresh Water 3.5" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |
| 11    | Fresh Water 4" | Steel | ST14314115 | 53,466 | 3D1 | 58.00 | 1.00 | 0.06 | FL | | 5D1 | 2500 |

**Note:** The table above lists the sizes and quantities of fresh water pipes along with their material and reference numbers.
<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Material</th>
<th>Waste Management</th>
<th>Total Cost</th>
<th>Total Length</th>
<th>Total Disposal</th>
<th>Volume</th>
<th>Weight</th>
<th>Density</th>
<th>Yearly</th>
<th>Total</th>
<th>Unit</th>
<th>Unit Factor</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

**Incorporated**

**JAN 09 2018**

Div. of Oil, Gas & Mining
<table>
<thead>
<tr>
<th>Column</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column 1</td>
<td>Data 1</td>
</tr>
<tr>
<td>Column 2</td>
<td>Data 2</td>
</tr>
<tr>
<td>Column 3</td>
<td>Data 3</td>
</tr>
</tbody>
</table>

**Note:**
This data is proposed and subject to change based on further analysis and feedback.
| Ref | Description | Subdivision | Area | Processing Facility | Left | Centre | Right | Target | Minimum | Maximum | Pressure | Diameter | Depth | Density | Jewellery | Facility | Potential | Final | Pressure | Green | Fuel | Cost |
|----|-------------|-------------|------|---------------------|------|--------|-------|-------|--------|--------|---------|---------|--------|-------|--------|-----------|----------|------------|-------|---------|-------|-----|-----|
| 1   | Aisle A     |             |      |                     |      |        |       |       |         |        |         |         |        |        |          |           |            |          |         |         |      |      |      |
| 2   | Storage     |             |      |                     |      |        |       |       |         |        |         |         |        |        |          |           |            |          |         |         |      |      |      |
| 3   | Kiosk       |             |      |                     |      |        |       |       |         |        |         |         |        |        |          |           |            |          |         |         |      |      |      |
| 4   | Counter     |             |      |                     |      |        |       |       |         |        |         |         |        |        |          |           |            |          |         |         |      |      |      |
| 5   | Restroom    |             |      |                     |      |        |       |       |         |        |         |         |        |        |          |           |            |          |         |         |      |      |      |

Note:
This is a proposed outline of warehouse, storage system, and loading stations. These facilities will be located before any construction is started.

INCORPORATED
JAN 9 2018
Div. of Oil, Gas & Mining
<table>
<thead>
<tr>
<th>Ref</th>
<th>Description</th>
<th>Office</th>
<th>Reference Number</th>
<th>Roll Code</th>
<th>Cell</th>
<th>Height (mm)</th>
<th>Weight (kg)</th>
<th>Material</th>
<th>Finish</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Example 1</td>
<td>Office 1</td>
<td>Ref1</td>
<td>Roll1</td>
<td>Cell1</td>
<td>Height1</td>
<td>Weight1</td>
<td>Material1</td>
<td>Finish1</td>
<td>Colour1</td>
</tr>
<tr>
<td>2</td>
<td>Example 2</td>
<td>Office 2</td>
<td>Ref2</td>
<td>Roll2</td>
<td>Cell2</td>
<td>Height2</td>
<td>Weight2</td>
<td>Material2</td>
<td>Finish2</td>
<td>Colour2</td>
</tr>
</tbody>
</table>

Note: This is a proposed order of numbering, selection, change system, and loading system. These facilities will be located behind any construction at already.
<table>
<thead>
<tr>
<th>Ref</th>
<th>Description</th>
<th>Quantity</th>
<th>Reference</th>
<th>Unit</th>
<th>Grade</th>
<th>Source</th>
<th>Grade</th>
<th>Source</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

*Note: This is a projected schedule sheet including facilities, storage systems, and leading sections. These facilities will be located before any construction is started.*

7 September 2019

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INCORPORATED

Jan 9, 2018

Div. of Oil, Gas & Mining
<table>
<thead>
<tr>
<th>Description</th>
<th>Bond Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanup 01</td>
<td>20514</td>
</tr>
<tr>
<td>Regrading 02</td>
<td>248001</td>
</tr>
<tr>
<td>Topsoil 03</td>
<td>33868</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>302382</strong></td>
</tr>
</tbody>
</table>

7 September 2017
<table>
<thead>
<tr>
<th>Task</th>
<th>Equipment Cost</th>
<th>HNVY Operating Rate</th>
<th>Equipment Overhead</th>
<th>Operator's Hourly Rate</th>
<th>Hourly Cost</th>
<th>Number of Men or Eq</th>
<th>Eq &amp; Labor Costs</th>
<th>Units</th>
<th>Difficulty</th>
<th>Units</th>
<th>Production Rate</th>
<th>Units</th>
<th>Equipment + Labor Total</th>
<th>Units</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
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<td>Brushup ST</td>
<td>Nil</td>
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<tr>
<td>Cloud Source Delivery (2017)</td>
<td>01/44.33-20-0400</td>
<td>2388.00</td>
<td>197.33</td>
<td>0.1</td>
<td>68.00</td>
<td>30.00</td>
<td>1</td>
<td>150.00 240.00</td>
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<tr>
<td>BHP 3500 Ejector (2017)</td>
<td>01/44.33-20-0800</td>
<td>3200.00</td>
<td>88.87</td>
<td>0.1</td>
<td>68.00</td>
<td>30.00</td>
<td>1</td>
<td>150.00 240.00</td>
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<td>Labor</td>
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<tr>
<td>Track &amp; Drag Entry (2017)</td>
<td>Stack Pipe Rig/MAC 10.00</td>
<td>50.00</td>
<td>50.00</td>
<td>1</td>
<td>60.00 240.00</td>
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<tr>
<td>8,000 Cub Yard Track &amp; 1 Ton Diesel (2017)</td>
<td>Stack Pipe St,$50,000</td>
<td>30.00</td>
<td>30.00</td>
<td>1</td>
<td>60.00 240.00</td>
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<tr>
<td>Pick-up Tract &amp; 1 Ton (2017)</td>
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<td>169.00</td>
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<td>60.00 240.00</td>
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<tr>
<td>Note: The hourly cost is figured as follows: Equipment Cost is = 12 hours per day</td>
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</tbody>
</table>

**Example:**

2388 = 12 Working hours per day = 187.33 $/HR

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**INCORPORATED**

**JAN 09 2018**

Div. of Oil, Gas & Mining
### Table

<table>
<thead>
<tr>
<th>Machine</th>
<th>Year</th>
<th>Equipment Cost</th>
<th>Hourly Operating Cost</th>
<th>Equipment Overhead</th>
<th>Overhead</th>
<th>Hourly Cost</th>
<th># of Man</th>
<th>Total</th>
<th>Equipment Hours</th>
<th>Total</th>
<th>Total</th>
<th>Total</th>
<th>Total</th>
<th>Total</th>
<th>Total</th>
<th>Total</th>
<th>Total</th>
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<th>Total</th>
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</thead>
<tbody>
<tr>
<td>B-708</td>
<td>1971-72</td>
<td>60-31-25-20-12</td>
<td>225.89</td>
<td>261.72</td>
<td>30.72</td>
<td>3.3</td>
<td>390.50</td>
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<td>390.50</td>
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</tr>
<tr>
<td>B-708</td>
<td>1972-73</td>
<td>60-31-25-20-12</td>
<td>225.89</td>
<td>261.72</td>
<td>30.72</td>
<td>3.3</td>
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<td>B-708</td>
<td>1973-74</td>
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<td>261.72</td>
<td>30.72</td>
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<td>60-31-25-20-12</td>
<td>225.89</td>
<td>261.72</td>
<td>30.72</td>
<td>3.3</td>
<td>390.50</td>
<td>1</td>
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</tr>
<tr>
<td>B-708</td>
<td>1975-76</td>
<td>60-31-25-20-12</td>
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<td>30.72</td>
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</tr>
</tbody>
</table>

### Note

The hourly cost is figured as follows: The Equipment Cost is x 12 hours per day.

Example:

225.89 x 12 = 2702.68

12 Working Hours per Day = 2702.68
### Bond Amount

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Hourly Operating Rate</th>
<th>Equipment Overhead</th>
<th>Hourly Rate</th>
<th>Number of Men or Eq.</th>
<th>Total Eq. &amp; Lab Costs</th>
<th>Units</th>
<th>Quantity</th>
<th>Units</th>
<th>Production Rate</th>
<th>Units</th>
<th>Equipment Overhead Cost</th>
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<tr>
<td>Topped 0J</td>
<td>252.60</td>
<td>292.42</td>
<td>0.1</td>
<td>34.25</td>
<td>363.31</td>
<td>CY</td>
<td>1</td>
<td>SHR</td>
<td>15549</td>
<td>CY</td>
<td>566.62</td>
</tr>
<tr>
<td>E745 Scraper</td>
<td>230.60</td>
<td>268.60</td>
<td>0.1</td>
<td>34.28</td>
<td>365.28</td>
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<td>CY</td>
<td>567.10</td>
</tr>
<tr>
<td>Crawler</td>
<td>88.20</td>
<td>90.00</td>
<td>0.1</td>
<td>34.26</td>
<td>362.86</td>
<td>CY</td>
<td>1</td>
<td>SHR</td>
<td>15549</td>
<td>CY</td>
<td>566.62</td>
</tr>
<tr>
<td>Komatsu A1000</td>
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<td>0.1</td>
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<td>362.86</td>
<td>CY</td>
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<td>SHR</td>
<td>15549</td>
<td>CY</td>
<td>566.62</td>
</tr>
<tr>
<td>Allonge</td>
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<td>180.00</td>
<td>0.1</td>
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<td>365.28</td>
<td>CY</td>
<td>1</td>
<td>SHR</td>
<td>15559</td>
<td>CY</td>
<td>567.10</td>
</tr>
<tr>
<td>Pick-up Truck 6x4</td>
<td>140.00</td>
<td>140.00</td>
<td>0.1</td>
<td>34.26</td>
<td>362.86</td>
<td>CY</td>
<td>1</td>
<td>SHR</td>
<td>15549</td>
<td>CY</td>
<td>566.62</td>
</tr>
</tbody>
</table>

**Note:**
The hourly cost is figured as follows: The Equipment Cost = 12 hours per day

**Example:**

\[ \text{2566 + 12 Working Hours per Day} = 197.33 \text{ SHR} \]
| Part | Description | Material | Brand Reference Number | Unit Cost | Unit Cost | Length | Width | Height | Tonnage | Volume | Weight | Density | Unit | Unit Price | Unit Cost | Quantity | Total Cost |
|------|-------------|----------|-------------------------|-----------|-----------|--------|-------|--------|---------|---------|--------|---------|--------|-------|------------|-----------|----------|------------|
| 1    | Waste Paper |           |                         | 2.50 / Tonne | 2.50 / Tonne | 3.00   | 4.00  | 5.00   | 2.50    | 2.50    | 5.00   | 0.90   | Tonne | 3.50 / Tonne | 5.50 / Tonne | 20.00   | 110.00 |
| 2    | Wire       |           |                         | 3.50 / Tonne | 3.50 / Tonne | 3.00   | 4.00  | 5.00   | 3.50    | 3.50    | 5.00   | 0.90   | Tonne | 3.50 / Tonne | 5.50 / Tonne | 20.00   | 110.00 |
| 3    | Glass      |           |                         | 4.00 / Tonne | 4.00 / Tonne | 3.00   | 4.00  | 5.00   | 4.00    | 4.00    | 5.00   | 0.90   | Tonne | 3.50 / Tonne | 5.50 / Tonne | 20.00   | 110.00 |
| 4    | Plastic     |           |                         | 5.00 / Tonne | 5.00 / Tonne | 3.00   | 4.00  | 5.00   | 5.00    | 5.00    | 5.00   | 0.90   | Tonne | 3.50 / Tonne | 5.50 / Tonne | 20.00   | 110.00 |
| 5    | Metal       |           |                         | 6.00 / Tonne | 6.00 / Tonne | 3.00   | 4.00  | 5.00   | 6.00    | 6.00    | 5.00   | 0.90   | Tonne | 3.50 / Tonne | 5.50 / Tonne | 20.00   | 110.00 |

**Note:**
The hourly cost is calculated as follows: The Equipment Cost $ = 12 hours per day x Operator's Hourly Rate

Example: 2019 = 17 Working Hours per Day = 197.35 BHR x 6.04 = 509.74 BHR

**INCORPORATED**

**Div. of Oil, Gas & Mining**

**JAN 9 2018**
APPENDIX C
SOIL AND FOUNDATION INVESTIGATION
SOIL AND FOUNDATION INVESTIGATION
TOWER RESOURCES
COAL HANDLING FACILITIES
HELPER, UTAH

April 1982
SOIL AND FOUNDATION INVESTIGATION

TOWER RESOURCES
COAL HANDLING FACILITIES

HELPER, UTAH

April 1982

ROLLINS, BROWN AND GUNNELL, INC.
Professional Engineers
1435 West 820 North, P.O. Box 711
Provo, Utah 84603
April 2, 1982

Tower Resources, Inc.
P.O. Box 1027
Price, UT  84501

ATTN: Mike Glasson

Gentlemen:

A soil and foundation investigation has been completed at the proposed site for the Tower Resources, Inc. coal handling facilities near Helper, Utah. The investigation was performed to define the characteristics of the subsurface material throughout the soil profile so that satisfactory substructures could be designed to support the facilities contemplated in this area. The work has been performed in a manner to accomplish the basic objective, and the results of the investigation, along with pertinent recommendations for foundation design, are outlined in the following sections of this report.

The information contained in the report is discussed under the following headings: (1) Existing Site Conditions, (2) Subsurface Soil and Water Conditions, (3) Foundation Considerations and Recommendations, (4) Site Preparation, Compacted Fill Requirements and Lateral Earth Pressures, and (5) Results of Field and Laboratory Tests.

1. EXISTING SITE CONDITIONS

The proposed site is located approximately 3.8 miles west of U.S. Highway 50 near Helper, Utah. The general layout of the facilities contemplated throughout the site is presented in Figure No. 1. The subsurface materials throughout this area are alluvial deposits laid down by streamflow through the area.

The topography of the site slopes to the east and south, and the area is dissected by a number of small drainage channels. Except for a substantial amount of coal fill which has been placed in the vicinity of Sites 1, 2 and 3, no man-made fill appears to exist throughout the area.
No major structures are located in the immediate vicinity of the proposed site from which foundation performance in this area can be inferred.

No water conveyance facilities or other water bodies are located in the immediate vicinity of the site which would affect the groundwater level in this area.

Other than the information provided above, no environmental factors appear to exist at this site which would adversely affect foundation performance.

2. SUBSURFACE SOIL AND WATER CONDITIONS

The characteristics of the subsurface material throughout the area were defined by drilling eight test borings to depths of between 20 and 45 feet below the existing ground surface. The logs for the eight test holes are presented in Figures 2 through 5, and it will be observed that the subsurface material generally consists of cohesive soils underlain by a gray shale. In the vicinity of Test Holes 1 and 2, coal fill exists for a depth of between 9 and 12 feet below the existing ground surface.

During the subsurface investigation, sampling was performed at 3-foot intervals throughout the upper 15 feet of the soil profile and at 5-foot intervals thereafter. Both disturbed and undisturbed samples were obtained during the field investigations. Disturbed samples were obtained by driving a 2-inch, split-spoon sampling tube through a distance of 18 inches, using a 140-pound weight dropped from a distance of 30 inches. The number of blows to drive the sampling spoon through each 6 inches of penetration is shown on the boring logs. The sum of the last two blow counts, which represents the number of blows to drive the sampling spoon through 12 inches, is defined as the standard penetration value.

The standard penetration value provides a reasonable indication of the in-place density of sandy-type materials; however, the standard penetration value only provides an indication of the relative stiffness of cohesive soils, since the penetration resistance of this material is a function of the moisture content.

Undisturbed samples were obtained at various locations throughout the soil profile at the site by pushing a 2.5-inch, thin-walled Shelby tube into the subsurface material using the hydraulic pressure on the drill rig. The locations at which undisturbed samples were obtained are presented on the boring logs.
Each test hole was extended until shale was encountered, and the hole was advanced in the shale for several feet using a rock bit or by coring. An attempt was made to sample the shale using the standard split spoon sampler. However, at essentially all locations refusal was encountered when an attempt to sample was performed.

Each sample obtained in the field was classified in the laboratory according to the Unified Soil Classification System. The symbol designating the soil type according to this system is presented on the boring logs. A description of the Unified Soil Classification System is presented in Figure No. 6, and it will be noted that the cohesive material throughout the soil profile generally classifies as an ML or a CL-ML type soil. A few areas were encountered, however, where CL-1 type material exists. It is concluded, therefore, that all of the overburden materials throughout the proposed site are low plasticity silts and clays.

In penetrating the shale layer throughout the subsurface profile at this site, it was necessary to use water as the drilling fluid. The use of the water makes an accurate determination of the groundwater level in this area uncertain during the period of time when the drilling was performed. It is our opinion, however, that the groundwater level throughout the site is at a substantial distance below the existing ground surface and groundwater will not be a problem throughout the area.

In order to determine if groundwater actually exists throughout the site, observation wells extending to a depth of 50 feet below the ground surface were installed at the locations shown in Figure No. 1. It is recommended that these wells be monitored at frequent intervals to determine if a static groundwater level exists at an elevation which would influence foundation performance and construction throughout the site.

3. FOUNDATION CONSIDERATIONS AND RECOMMENDATIONS

As of the preparation of this report, no details are available on any of the structures contemplated throughout the area, and recommendations outlined below for foundation design must be considered of a preliminary nature. The following recommendations will be expanded when more information is available as to the type of facility, the size of the structures and the anticipated structural loads.
A. Truck Dump Facilities

It is anticipated that the truck dump facilities will include an earth fill ramp and a truck dump hopper. The characteristics of the subsurface material in the vicinity of the truck dump facilities is defined by Test Hole 1, and it will be observed that the subsurface material throughout the profile consists of a surface coal layer underlain by approximately 20 feet of brown sandy silt. The subsurface silts throughout the general area do not appear to be highly compressible; however, it can be expected that several inches of settlement will occur due to the fill loads.

Since the subsurface soils are silty-type materials, it is expected that the time delay associated with the consolidation of these materials will be relatively small and that consolidation will be essentially complete by the time the fill has been placed.

It will be noted from Test Hole 1 that coal exists in the upper 9 feet of the soil profile at this location. Coal is not capable of supporting the truck dump hopper, and we recommend that the coal be excavated and replaced with compacted fill material. If a source of granular material is available, we recommend that the granular material be used as compacted fill to support the truck dump hopper. If a source of granular material is not readily available, the on-site sandy silt can be used as compacted fill in this area. If the sandy silt is densified in accordance with recommendations outlined in the subsequent section of this report, we recommend that the foundations for the truck dump hopper be proportioned using an allowable soil bearing pressure of 2,500 pounds per square foot, provided the major portion of the zone of significant stress for the foundations is in the fill material.

The exact elevation of the foundations for the truck dump hopper is not known as of the preparation of this report. If the elevation of the foundations for the truck dump hopper is located such that a significant portion of the zone of significant stress for the foundations exists within the natural material, we recommend that the foundations be proportioned using an allowable soil bearing pressure of 1,500 pounds per square foot.

In order for compacted fill beneath structural foundations to be effective, the width of the compacted fill should be at least equal to twice the width of the footing.
B. Crusher and Screening Building

As indicated earlier in this report, the size of the building contemplated for this area and the characteristics of the crusher are not known as of the preparation of this report. It is assumed, however, that the structural loads for the building will be relatively small, and that column loads will not likely exceed 75 kips and wall loads will not likely exceed 3 to 4 kips per lineal foot.

Test Hole 2 defines the characteristics of the subsurface material in the vicinity of the crusher and screening building. It is apparent from the log for Test Hole 2 that coal fill extending to a depth of approximately 13 feet exists at this location. The coal is not capable of supporting structural foundations, and either the coal should be removed and replaced with compacted fill, or drilled caissons extending to the gray shale layer in the vicinity of 20 feet below the ground surface should be used to support the structures for this facility.

The on-site sandy silt may be used as compacted fill to support the structures for the building throughout this area provided it is densified in accordance with recommendations outlined in a subsequent section of this report. If compacted fill is used to support the crusher building, we recommend that the foundations be proportioned using an allowable soil bearing pressure not exceeding 2,500 pounds per square foot.

Since the crusher and screening facilities will transmit vibratory loads to the subsurface material, it may desirable to support the foundations for these facilities on drilled caissons extending to the gray shale. Recommended caisson capacities for caissons extending to the gray shale are tabulated below:

<table>
<thead>
<tr>
<th>Caisson Tip Diameter (feet)</th>
<th>Caisson Capacity (kips)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>122</td>
</tr>
<tr>
<td>3</td>
<td>183</td>
</tr>
<tr>
<td>4</td>
<td>244</td>
</tr>
</tbody>
</table>

If the foundations for the facilities at this location are provided in accordance with the above recommendations, the maximum settlement of any footing should not exceed 1 inch and differential settlement throughout the structure should not exceed 0.5 inches, which in our opinion will be satisfactory for the proposed facilities.
C. Train Load-Out Facilities

It is anticipated that the facilities at this location will consist of elevated bins equipped to discharge coal into the freight cars. The detailed nature of these facilities, along with the structural loads, is not known as of the preparation of this report.

The characteristics of the subsurface material in the vicinity of the load-out facility is defined by Test Hole 3, and it will be observed that the subsurface material in this area consists of a 6-foot layer of coal fill underlain by a brown sandy silt and silty clay extending to a depth of about 41 feet below the existing ground surface, at which point shale was encountered. The coal fill located in the upper 6 feet of the soil profile at this site is not capable of supporting structural foundations and should be replaced with compacted fill material.

The allowable soil bearing pressure of the natural brown sandy silt is about 1,500 pounds per square foot at this location, and if the structural loads for the proposed facility are relatively small, it may be possible to support the proposed facility using spread foundations on the natural material. It is our opinion, however, that since the coal fill must be removed the most desirable foundation type for this structure will be to use spread foundations on compacted fill.

The natural sandy silt existing throughout the area can be used as compacted fill provided it is densified in accordance with recommendations outlined in the following sections of this report.

If the depth of the compacted fill beneath the structural foundations at this location is at least equal to the width of the footing, the foundations for the proposed facilities may be proportioned using an allowable soil bearing pressure of 2,500 pounds per square foot.

An alternate to supporting the proposed facility using spread foundations on compacted fill would be to use drilled caissons extending to the shale layer. Since the depth to the shale layer is over 40 feet, foundations of this type will likely be considerably more expensive than spread foundations on compacted fill. If, however, the structural loads for the proposed facility are of such a magnitude that drilled caissons will be required, we are prepared to provide allowable caisson capacities at this location.
D. Facilities in the Vicinity of Test Hole 4

The type of facility contemplated in the vicinity of Test Hole 4 is not known as of the preparation of this report. It appears as if the facility at this location will be some component of a conveyor system. The subsurface material at this location is defined by the log associated with Test Hole 4, and it will be observed that the subsurface material consists of approximately 20 feet of silt and clay overlying the shale.

The results of laboratory tests performed on the subsurface material at this location indicates that the cohesive materials are in a medium-dense state and are capable of supporting 1,500 to 2,000 pounds per square foot, and we recommend that spread foundations on the natural material be used to support any structure located at this site.

E. Clean Coal Pile

It will be noted that the characteristics of the subsurface material throughout the alignment of the clean storage pile is defined by Test Holes 5, 6, 7 and 8. It will be noted from the boring logs for these test holes that the overburden material consists predominantly of silty-type soil and that shale was encountered at depths of between 15 and 35 feet below the existing ground surface. The bottom of the shale appears to dip in a southerly direction.

We understand that either a concrete tunnel or a steel multi-plate tunnel accommodating transfer facilities will be located beneath the clean coal pile. The size of the underground structure at this location is not known; however, it is possible that the bottom of the tunnel in the northerly end of the pile may be relatively close to the shale surface, while a substantial amount of overburden material will be located beneath the bottom of the tunnel and the top of the shale towards the southerly end of the tunnel. This situation could lead to several inches of differential settlement between the north and south ends of the tunnel under the loads associated with the clean coal pile.

If differential settlement is not a problem, the tunnel may be located directly on the existing silt and clay material. If differential settlement throughout the area is critical, excavation and replacement of a portion of the natural overburden material in the southerly end of the site may be required to reduce the magnitude of the differential settlement.
It is recommended that further consideration be given to foundation performance in this area when the exact details of the proposed facility at this location are known.

4. SITE PREPARATION, COMPACTED FILL REQUIREMENTS AND FLEXIBLE PAVEMENT DESIGN

As indicated earlier in this report, a substantial amount of excavation, backfilling and grading will likely be required throughout the site to accommodate the proposed facilities. The coal fill in the vicinity of Test Holes 1, 2 and 3 is not capable of supporting structural foundations and should be replaced with compacted fill. If possible, the compacted fill placed throughout the area should be a well-graded granular material with a maximum size less than 4 inches and with not more than 10 to 15 percent passing a No. 200 sieve.

It is recognized that granular fill is relatively scarce in the Price-Helper area, and the existing site material may be used as compacted fill to support structural foundations provided it is densified to an in-place unit weight equal to 95 percent of the maximum laboratory density as determined by ASTM D 1557-78.

If embankments are contemplated in the area where the truck dump facilities will be located, we recommend that all material placed within the dump embankments be densified to an in-place unit weight equal to 95 percent of the maximum laboratory density as indicated above. The on-site sandy silt or silty clay can be used in the truck dump embankments.

It is recommended that either a tamping-type roller or rubber-tired rollers be used to densify the sandy silts or silty clays used for compacted fill throughout the site. Since the compacted fill will support structural foundations, it is imperative that appropriate quality control be performed to insure that the compacted fill is densified in accordance with the specifications indicated above.

It is anticipated that an excavation 10 to 12 feet deep will be required in the area where the clean coal pile will be located. Since the subsurface materials in this area are cohesive-type soils and since no groundwater table was encountered in the area, it is not anticipated that any difficult excavation problems will be encountered.
If a portion of the subsurface material in the southern end of this facility is excavated and replaced with compacted fill to reduce the likelihood of differential settlement for structures in this area, we recommend that the compacted fill be densified in accordance with the recommendations outlined above.

In areas where driveways or haul roads are located, we recommend that the upper 3 to 4 inches of the natural material be stripped to remove any organic matter which may exist in the soil profile at this location. Following the stripping operations, we recommend that the upper 10 inches of the natural material be scarified and redensified to an in-place unit weight equal to 90 percent of the maximum laboratory density specified herein.

The thickness of flexible pavement recommended for driveways and haul roads has been calculated using the following equation developed by the Corps of Engineers:

\[ t = (23.1 \log C + 14.4) \sqrt{P \left( \frac{1}{8.1 \text{CBR}} - \frac{1}{p^2} \right)} \]

Where:
- \( C \) = Number of coverages
- \( P \) = Wheel load
- \( p \) = Tire pressure
- \( \text{CBR} \) = California Bearing Ratio

It will be noted from the above equation that the thickness of the flexible pavement is a function of the wheel load, the number of coverages, the tire pressure and the CBR value. No CBR tests were performed during this investigation; however, based upon the results of tests performed on similar materials, it is not anticipated that the CBR value of these materials will exceed 3 to 5 percent.

The number of coverages and the wheel loads contemplated on haul roads and driveways are also not known as of the preparation of this report, and certain assumptions have been made relative to these parameters. The recommended thickness of flexible pavement is based upon the following assumptions:

A. Number of coverages = 50,000
B. Wheel load = 14,000 pounds
C. CBR value = 3 percent
D. Tire pressure = 70 psi
Substituting the above parameters into the flexible pavement equation indicates a total flexible pavement thickness of 28 inches. Fifteen inches of the flexible pavement may consist of bankrun sand and gravel, while the remainder of the pavement should consist of untreated granular base, unless an asphalt surface course is contemplated.

All base material should be densified to an in-place unit weight equal to 90 percent of the maximum laboratory density indicated above, and the gradation of the untreated granular base should conform to the following specifications:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>100</td>
</tr>
<tr>
<td>.5&quot;</td>
<td>70 - 100</td>
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<tr>
<td>No. 4</td>
<td>41 - 68</td>
</tr>
<tr>
<td>No. 16</td>
<td>21 - 41</td>
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<tr>
<td>No. 50</td>
<td>10 - 27</td>
</tr>
<tr>
<td>No. 200</td>
<td>4 - 13</td>
</tr>
</tbody>
</table>

If an asphalt surface course is contemplated for any of the driveways or haul roads, we recommend that it have a minimum thickness of 3 inches and that the flexible pavement under these conditions consist of 3 inches of an asphalt surface course plus 10 inches of untreated granular base and 15 inches of bankrun sand and gravel. The mineral aggregates in the untreated granular base should conform to Section 402 of the standard specifications of the Utah State Department of Transportation. Mixing, placing and densification of all asphalt materials should also conform to State standards.

5. RESULTS OF FIELD AND LABORATORY TESTS

Field and laboratory tests performed during this investigation included standard penetration tests, in-place unit weight, natural moisture content, Atterberg limits, mechanical analyses and consolidation tests. A summary of all tests performed during the investigation, with exception of the consolidation tests, is presented in Table No. 1, Summary of Test Data.

It will be observed from Table No. 1 that the natural moisture content of the subsurface material is very dry and is generally several percentage points below the plastic limit. It will also be noted that most of the materials throughout the profile at this site classify as ML or CL-ML type materials. With exception of one or two tests, the in-place unit weight of the subsurface material is generally in excess of 95 pounds per cubic foot.
Cores obtained from the shale in Test Holes 5 and 6 indicate that the shale material has a high unit weight. It will also be noted from the results of the Atterberg limits that the plastic index is generally less than 6 percent, and in some cases, the silty material is nearly non-plastic.

The compressibility characteristics of the overburden material throughout the site were evaluated by performing ten consolidation tests on representative samples obtained from Test Holes 1, 2, 4, 6 and 8; while the compressibility characteristics of the shale material were evaluated by performing two consolidation tests on representative samples obtained from Test Holes 5 and 6. The results of the consolidation tests are presented in Figures 7 through 18. It will be observed that most of the consolidation tests performed on the overburden material indicate that this material is quite highly overconsolidated, and settlement will be relatively small for load intensities less than 1,500 to 2,000 pounds per square foot.

It should be noted that during the consolidation tests, each sample was permitted to absorb water during the loading sequence, in order to determine the affect of moisture on the compressibility characteristics of the subsurface material. It should be noted from the consolidation tests performed on samples of the shale material that the sample obtained at a depth of 19 feet below the existing ground surface in Test Hole 5 indicated some swell potential, while the sample obtained at a depth of 20 feet below the existing ground surface in Test Hole 6 did not swell on the addition of water. The rebound portion of the consolidation curve on this sample, however, indicates that some swell potential may exist.

The conclusions and recommendations presented in this report are based upon the results of the field and laboratory tests which, in our opinion, define the characteristics of the subsurface material throughout the site in a satisfactory manner. If during construction conditions are encountered which appear to be different than those presented herein, it is requested that we be advised in order that appropriate action may be taken.

Very truly yours,

ROLLINS, BROWN AND GUNNELL, INC.

Ralph L. Rollins

lw

enc.
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>undisturbed sample</td>
</tr>
<tr>
<td>5-10</td>
<td>brown sandy silt</td>
</tr>
<tr>
<td>10-20</td>
<td>brown sandy clayey silt</td>
</tr>
<tr>
<td>20-25</td>
<td>gray brown silt</td>
</tr>
<tr>
<td>25-30</td>
<td>clayey silt</td>
</tr>
<tr>
<td>30-35</td>
<td>gray brown silty clay</td>
</tr>
<tr>
<td>35-40</td>
<td>gray brown silty clay</td>
</tr>
<tr>
<td>40-45</td>
<td>gray brown shale</td>
</tr>
<tr>
<td>45-50</td>
<td>refusal</td>
</tr>
</tbody>
</table>

**Legend**
- sample location
- torvane value
- undisturbed sample
- 5,6,6 no. of blows per 6" with std. spoon
- groundwater elevation

**Log of Borings for:**
ROLLINS, BROWN AND GUNNELL, INC.
PROFESSIONAL ENGINEERS

**Tower Resources**
Figure No. 3
Hole 7

<table>
<thead>
<tr>
<th>Depth</th>
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<tbody>
<tr>
<td>0</td>
<td>3,4,5 gray brown</td>
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<tr>
<td>1</td>
<td>ML sandy silt</td>
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<td>14,15,12</td>
<td>dry brown</td>
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<tr>
<td>ML</td>
<td>silt</td>
</tr>
<tr>
<td>14,15,18</td>
<td>dry brown</td>
</tr>
<tr>
<td>CL-ML</td>
<td>clayey silt</td>
</tr>
<tr>
<td>17,33,44</td>
<td>dry brown</td>
</tr>
<tr>
<td>ML</td>
<td>silt</td>
</tr>
<tr>
<td>7,24,33</td>
<td>dry brown</td>
</tr>
<tr>
<td>ML</td>
<td>silt</td>
</tr>
<tr>
<td>24,28,37</td>
<td>sandy silt</td>
</tr>
<tr>
<td>ML</td>
<td></td>
</tr>
</tbody>
</table>

Hole 8

<table>
<thead>
<tr>
<th>Depth</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5,3,4 brown</td>
</tr>
<tr>
<td>1</td>
<td>ML sandy silt</td>
</tr>
<tr>
<td>11,14,20</td>
<td>brown</td>
</tr>
<tr>
<td>ML</td>
<td>silt</td>
</tr>
<tr>
<td>12,14,15</td>
<td>sandy silt</td>
</tr>
<tr>
<td>ML</td>
<td>silt</td>
</tr>
<tr>
<td>14,16,17</td>
<td>brown</td>
</tr>
<tr>
<td>ML</td>
<td>silt</td>
</tr>
</tbody>
</table>

Legend

- Sample location
- Torvane value
- Undisturbed sample
- No. of blows per 6" with std. spoon
- Groundwater elevation

Log of Borings for:
Tower Resources

Figure No. 5
**Figure No. 6**

**Unified Soil Classification System**

<table>
<thead>
<tr>
<th>Major divisions</th>
<th>Group symbols</th>
<th>Typical names</th>
<th>Laboratory classification criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravels</td>
<td>GW</td>
<td>Well-graded gravels, gravel-sand mixtures, little or no fines</td>
<td>[ \frac{D_{10}}{D_{60}} ] greater than 4, ( \frac{D_{10}}{D_{60}} ) between 1 and 3</td>
</tr>
<tr>
<td>Gravels</td>
<td>GP</td>
<td>Poorly graded gravels, gravel-sand mixtures, little or no fines</td>
<td>Not meeting all gradation requirements for GW</td>
</tr>
<tr>
<td>Sands</td>
<td>GM</td>
<td>Silty gravels, gravel-sand-silt mixtures</td>
<td>Above “A” line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.</td>
</tr>
<tr>
<td>Sands</td>
<td>GC</td>
<td>Clayey gravels, gravel-sand-clay mixtures</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Sands</td>
<td>SW</td>
<td>Well-graded sands, gravelly sands, little or no fines</td>
<td>Not meeting all gradation requirements for SW</td>
</tr>
<tr>
<td>Sands</td>
<td>SP</td>
<td>Poorly graded sands, gravelly sands, little or no lines</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Sands</td>
<td>SM</td>
<td>Silty sands, sand-silt mixtures</td>
<td>Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.</td>
</tr>
<tr>
<td>Sands</td>
<td>SC</td>
<td>Clayey sands, sand-clay mixtures</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Silts and clays</td>
<td>ML</td>
<td>Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Silts and clays</td>
<td>CL</td>
<td>Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Silts and clays</td>
<td>OL</td>
<td>Organic silts and organic silty clays of low plasticity</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Silts and clays</td>
<td>MH</td>
<td>Inorganic silts, micaceous or diatomaceous fine sandy or silt soils, elastic silts</td>
<td>Above “A” line with P.I. greater than 7</td>
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<tr>
<td>Silts and clays</td>
<td>CH</td>
<td>Inorganic clays of high plasticity, fat clays</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Silts and clays</td>
<td>OH</td>
<td>Organic clays of medium to high plasticity, organic silts</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
<tr>
<td>Highly organic soils</td>
<td>PI</td>
<td>Peat and other highly organic soils</td>
<td>Above “A” line with P.I. greater than 7</td>
</tr>
</tbody>
</table>

---

*Division of GM and SM groups into subdivisions of d and u for loams and silt loams only. Subdivision is based on Atterberg limits, suffix d used when L.L. is 28 or less and the suffix u used when L.L. is greater than 28.

**Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.
CONSOLIDATION TEST RESULTS

Figure No. 7  Boring No. 1
Surface Elev. ______ Depth Interval 9-10 1/2'
LL 21.1 % PL 18.8 % PI 2.3 % W 12.9 %
Date Test ______ Dry Unit Wt. 100.9 pcf
Project Tower Resources

PRESSURE IN TONS PER SQUARE FOOT
CONSOLIDATION TEST RESULTS

Figure No. 8  Boring No. 2
Surface Elev.  Depth Interval 12-13'
LL 23.8  PL 22.1  PI 1.7  W 14.3
Date Test  Dry Unit Wt. 87.8 pcf
Project Tower Resources
CONSOLIDATION TEST RESULTS

Figure No. 9  Boring No. 4
Surface Elev.  Depth Interval 3-4½'
LL 21.7%  PL 20.1%  PI 1.6%  W 5.3%
Date Test  Dry Unit Wt. 101.7 pcf
Project  Tower Resources

PRESSURE IN TONS PER SQUARE FOOT

VOID RATIO

0.01  0.1  1.0  10

0.70  0.65  0.60  0.55  0.50  0.45  0.40
CONSOLIDATION TEST RESULTS
Figure No. 11  Boring No. 4
Surface Elev.   Depth Interval 9-10 1/2'
LL 26.5%  PL 18.2%  PI 8.3%  W 5.9%
Date Test       Dry Unit Wt. 99.1 pcf
Tower Resources
CONSOLIDATION TEST RESULTS

Figure No. 12  Boring No. 4
Surface Elev.  Depth Interval 12-13½'
LL 28.7 %  PL 18.3 %  PI 10.4 %  W 8.8 %
Date Test  Dry Unit Wt. 96.0 pcf
Project  Tower Resources

PRESSURE IN TONS PER SQUARE FOOT

VOID RATIO

0.01  0.1  1.0  10
CONSORTIATION TEST RESULTS

Figure No. 13  Boring No. 5
Surface Elev.   Depth Interval 19'
LL _____ % PL _____ % PI _____ % W 2.6 %
Date Test _____ Dry Unit Wt. 165.1 pcf
Project Tower Resources

VOID RATIO

0.01  0.1  1.0  10

PRESSURE IN TONS PER SQUARE FOOT
CONSOLIDATION TEST RESULTS

Figure No. 14  Boring No. 6
Surface Elev.  Depth Interval 3-3½'
LL 25.5%  PL 19.3%  PI 6.2%  W 4.8%
Date Test  Dry Unit Wt. 104.3 pcf
Project  Tower Resources

PRESSURE IN TONS PER SQUARE FOOT

VOID RATIO
CONSOLIDATION TEST RESULTS

Figure No. 15  Boring No. 6
Surface Elev. ______  Depth Interval ______ 24'
LL ______ % PL ______ % PI ______ % W ______ 2.6 %
Date Test ______  Dry Unit Wt. ______ 163.9 pcf
Project ______ Tower Resources

PRESSURE IN TONS PER SQUARE FOOT
CONSOLIDATION TEST RESULTS

Figure No. 16  Boring No. 8
Surface Elev.  Depth Interval  3-4'
LL 19.1%  PL 18.1%  PI 1.0%  W 16.9%
Date Test  Dry Unit Wt.  98.2 pcf
Project  Tower Resources
CONSOLIDATION TEST RESULTS

Figure No. 17  Boring No. 8
Surface Elev.  Depth Interval 6-7'
LL  % PL  % PI  % W  10.0%
Date Test  Dry Unit Wt.  103.4pcf
Project  Tower Resources
CONSOLIDATION TEST RESULTS
Figure No. 18  Boring No. 8
Surface Elev.  Depth Interval 9-10'
LL 21.2%  PL 19.4%  PI 1.8%  W 16.0%
Date Test  Dry Unit Wt. 106.8pcf
Project  Tower Resources

PRESsURE IN TONS PER SQUARE FOOT

VOID RATIO

0.60
0.55
0.50
0.45
0.40
0.35
0.30

0.01  0.1  1.0  10

PRESSURE IN TONS PER SQUARE FOOT
## TABLE NO. 1 SUMMARY OF TEST DATA

**PROJECT** Tower Resources  
**FEATURE** Foundations  
**LOCATION** Helper, Utah

<table>
<thead>
<tr>
<th>HOLE NO.</th>
<th>DEPTH BELOW GROUND SURFACE</th>
<th>STANDARD PENETRATION BLOWS PER FOOT</th>
<th>IN-PLACE</th>
<th>UNIT WEIGHT LB/FT²</th>
<th>MOISTURE PERCENT</th>
<th>VOID RATIO</th>
<th>UNCONFINED COMPRESSIVE STRENGTH LB/FT²</th>
<th>FRICTION ANGLE φ</th>
<th>CONSISTENCY LIMITS</th>
<th>MECHANICAL ANALYSIS</th>
<th>UNIFIED SOIL CLASSIFICATION SYSTEM</th>
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<tr>
<td>1</td>
<td>9-10½'</td>
<td>shelby</td>
<td>100.9</td>
<td>12.9</td>
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<td></td>
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<td>2.3</td>
<td>ML</td>
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<td>25-26'</td>
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<tr>
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<tr>
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<tr>
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</tr>
<tr>
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<td>9-10'</td>
<td>shelby</td>
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<td>3-3½'</td>
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<tr>
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<td>6-7½'</td>
<td>46</td>
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<td>19.9</td>
<td>4.0</td>
<td>CL-ML</td>
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</tbody>
</table>
### TABLE NO. 1 SUMMARY OF TEST DATA

**PROJECT**  
Tower Resources  
**FEATURE**  
Foundations  
**LOCATION**  
Helper, Utah

<table>
<thead>
<tr>
<th>HOLE NO.</th>
<th>DEPTH BELOW GROUND SURFACE</th>
<th>STANDARD PENETRATION BLOWS PER FOOT</th>
<th>UNIT WEIGHT LB/FT³</th>
<th>MOISTURE PERCENT</th>
<th>VOID RATIO</th>
<th>UNCONFINED COMPRESSIVE STRENGTH LB/FT²</th>
<th>CONSISTENCY LIMITS</th>
<th>MECHANICAL ANALYSIS</th>
<th>UNIFIED SOIL CLASSIFICATION SYSTEM</th>
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<td>1.0</td>
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<td>NON-PLASTIC</td>
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<tr>
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<td>shelby</td>
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<td>21.2</td>
<td>19.4</td>
<td>1.8</td>
</tr>
</tbody>
</table>
December 31, 1981

Tower Resources, Inc.
P.O. Box 1027
Price, UT 84501

ATTN: Mike Glasson

Gentlemen:

In accordance with your request, we have examined the depth of topsoil in the area where the proposed coal handling facilities will be located near Helper, Utah. The soil profile in this area is poorly developed and the depth of the topsoil is very thin. The depth of topsoil has been determined for Test Holes 1 through 8, as shown on the attached figure.

The approximate depth of the topsoil for Test Holes 4 through 8 are tabulated below as follows:

<table>
<thead>
<tr>
<th>Hole No.</th>
<th>Depth of Topsoil (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
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<td>7</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
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</table>

Refuse from a coal washing operation has been deposited in the area where Test Holes 1 and 2 are located, and no topsoil exists in this area. Test Hole 3 is located along the tracks where coal has been deposited for shipping purposes during past periods of time. Approximately 2 feet of fine coal exists in this area, and no topsoil is in evidence.

The topsoil in the vicinity of Test Holes 4 through 8 is generally a silty sand to sandy silt.
We anticipate moving into the area to complete the foundation investigation for the drill holes during the middle of next week. Please advise us if we can be further assistance to you on this project.

Yours truly,

ROLLINS, BROWN AND GUNNELL, INC.

Ralph L. Rollins

lw

enc.
APPENDIX D

SOIL SURVEY
April 27, 1988

Mr. Michael W. Glasson  
Senior Geologist  
Western Operations  
Andalex Resources, Inc.  
P. O. Box 902  
Price, Utah 84501

Dear Mr. Glasson:

We have completed our review of the project area, Wildcat Loadout Facility (Township 13 South, Range 9 East, Section 33), described in your letter to George Cook dated March 29, 1988.

According to the field review the project area does not contain any Important Farmland.

The completed Form AD-1006 is enclosed. If I can be of further assistance to you please contact me at the address above or on (801) 524-5064.

Sincerely,

FERRIS P. ALLGOOD  
State Soil Scientist

Enclosure

cc: w/o Enclosure  
Keith Beardall, DC, SCS, Price, Utah
FARMLAND CONVERSION IMPACT RATING

**PART I (To be completed by Federal Agency)**

- **Name Of Project**: Wildcat Loadout Facility (Township 13 South, Range 9 East, Section 33)
- **Proposed Land Use**

**PART II (To be completed by SCS)**

- **Date of Land Evaluation Request**: March 29, 1988
- **Federal Agency Involved**

**PART III (To be completed by Federal Agency)**

- **Relative Value Of Farmland (From Part V)**
  - **Site Selected**
  - **Reason For Selection**
  - **Date Of Selection**

**PART IV (To be completed by SCS) Land Evaluation Information**

- **Major Crop(s)**
- **Farmland Land In Govt. Jurisdiction**
- **Amount Of Farming As Defined In FPPA**

**PART V (To be completed by SCS) Land Evaluation Criterion**

- **Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)**

**PART VI (To be completed by Federal Agency)**

- **Assessment Criteria (These criteria are explained in 7 CFR 658.5(a))**

<table>
<thead>
<tr>
<th>Minimum Points</th>
<th>Maximum Points</th>
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</thead>
<tbody>
<tr>
<td>1. Area In Nonurban Use</td>
<td>160</td>
</tr>
<tr>
<td>2. Perimeter In Nonurban Use</td>
<td>160</td>
</tr>
<tr>
<td>3. Percent Of Site Being Farmed</td>
<td>160</td>
</tr>
<tr>
<td>4. Protection Provided By State And Local Government</td>
<td>160</td>
</tr>
<tr>
<td>5. Distance From Urban Builtup Area</td>
<td>160</td>
</tr>
<tr>
<td>6. Distance To Urban Support Services</td>
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</tr>
<tr>
<td>7. Size Of Present Farm Unit Compared To Average</td>
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<tr>
<td>8. Creation Of Nonfarmable Farmland</td>
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<tr>
<td>9. Availability Of Farm Support Services</td>
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</tr>
<tr>
<td>10. On-Farm Investments</td>
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</tr>
<tr>
<td>11. Effects Of Conversion On Farm Support Services</td>
<td>160</td>
</tr>
<tr>
<td>12. Compatibility With Existing Agricultural Use</td>
<td>160</td>
</tr>
</tbody>
</table>

**TOTAL SITE ASSESSMENT POINTS**

- **160**

**PART VII (To be completed by Federal Agency)**

- **Relative Value Of Farmland (From Part V)**
- **Total Site Assessment (From Part VI above or a local site assessment)**

**TOTAL POINTS (Total of above 2 lines)**

- **260**

**Was A Local Site Assessment Used?**

- **Yes □**
- **No □**

**Reason For Selection:**

No Important Farmland determination. Area involved does not qualify for any of the categories for Important Farmland (prime, unique, or state-wide importance).

Primary reason this area does not qualify for important farmland is because there is no irrigation water.

(See Instructions on reverse side)
Wildcat Loadout

T13S R9E Section 33

29 Pump Mine
48 Wounded Arrow, 1-8% slopes
52 Kernandy Family, 3-8% slopes

SHEET NO. 8 OF 30
Dear Mr. Glasson:

Attached is a mapping unit description of the soils of the proposed right-of-way area. It is located in section T.13S., R.9E., at the coal loading site at the Utah Railroad and the Gordon Creek road. This mapping unit description includes a soil profile description, topographic information and some other characteristics of the soils in the area.

This soil is rated good for use as topsoil to a depth of 60 inches or more.

The A horizon (upper 9 inches) of the soil is slightly higher in organic matter and lower in carbonate content. If sufficient quantity of this soil is available, it would be slightly better for topsoil than the material below this depth.

The north part of the area has small patches with 2 to 8 inches of coal waste over the surface. This coal waste should be removed before the soil is stored for topsoil.

The thickness of topsoil to be applied to reclaim the area will depend on the amount of coal waste left on the surface. If all of this waste material is removed, a thin layer will be needed. If the waste material left is thick, more will be needed. If the soil material on the area is compacted ripping will help with revegetation of the area.

Rating and interpretation are made using U.S. Soil Conservation Service criteria and reference material.

Sincerely,

Earl Jensen

Soil Scientist - Retired
MAPPING UNIT DESCRIPTION

Series Classification: Fine-loamy, mixed, meric (Subgroup)
Ustallic Calciorthids (Family)

Mapping Unit Name: Abra loam, 3 to 6 percent slopes

This Abra soil is very deep and well drained. It occurs on alluvial fans at elevations of 6,100 to 6,200 feet. This soil formed in alluvium derived mainly from sandstone and shale. The average annual precipitation is estimated to be 12 to 13 inches. Slopes are 3 to 6 percent and east facing. They are 100 to 200 feet in length and concave-convex in shape. Vegetation is dominantly Indian Ricegrass, Russian Thistle, Cheatgrass & big Sagebrush.

In disturbed areas it is mostly Rochia and Russian Thistle. Included in mapping are small areas of a similar soil to Abra except lacking a Ca horizon. Also included is a small area of coal waste dumps. These are both located in the drainage area that dissects the area near the center.
In a typical profile the surface layer is pale brown, loam about 9 inches thick. The underlying layer is light yellowish brown and pale brown, loam about 46 inches thick. The next layer is pale brown, very fine sandy loam to a depth 60 inches or more. (Texture)

Other Characteristics: a layer of carbonate is at a depth of 9 to 12 inches. Permeability is .6 to 2 inches per hour to a depth of 60 inches or more. Available water capacity is 1.7 to 2 inches per foot of soil. Organic matter content in the surface layer is about 1 percent. The estimated moist bulk density (1/3 bar) is 1.20 to 1.30 in the surface 9 inches and 1.30 to 1.40 below this depth. Effective rooting depth is about 60 inches. Surface runoff is slow and erosion hazard is slight under potential native revegetation and moderate if vegetation is removed and the soil is left bare. Erodibility is high (K value .46) and wind erodibility is moderate (L4) to a depth of 60 inches.

range, wildlife habitat, woodland, recreation, urban, others
A typical pedon of Abra loam was described near the center of the area. Soil unless otherwise noted:

All--0 to 1 inches; light brownish gray (10 YR 6/2)

(Color Name) (Coord.)

loam, very dark gray (10 YR 3/1) when moist; weak medium platy structure that parts to weak very fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 16 percent clay (estimated); moderately calcareous; moderately alkaline (pH 8.0), clear smooth boundary.
A12 — 1 to 9 inches; pale brown (10 YR 6/3) loam, brown (horizon)
(10 YR 5/3) when moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine, few (Abundance - Size)
medium roots, 16 percent clay (estimated); moderately calcareous; moderately alkaline (pH 8.0); gradual smooth boundary.

C cal— 9 to 25 inches; light yellowish gray (10 YR 6/2) loam, grayish brown (10 YR 5/2) when moist; moderate coarse (Texture)
subangular blocky structure; that parts to moderate medium

subangular; hard, firm, slightly sticky and slightly plastic;
common very fine to medium, few coarse roots, common fine pores;
22 percent clay (estimated); moderately calcareous. Carbonater are massive and veined; strongly alkaline (pH 8.6); clear smooth boundary.
C ca 2  25 to 40 inches; pale brown (10 YR 6/3) loam, grayish brown (10 YR 5/2) when moist; strong coarse subangular blocky structure that parts to moderate medium subangular blocky; hard, firm, slightly sticky and slightly plastic; few very fine to medium roots, common fine and medium, few coarse pores; 30 percent clay (estimated); strongly calcareous, carbonates are massive and veined; strongly alkaline (pH 8.6); clear smooth boundary.

C ca 3  40 to 55 inches; pale brown (10 YR 6/3) loam, (Texture) grayish brown (10 YR 5/2) when moist; strong coarse subangular blocky structure that parts to moderate medium subangular blocky; very hard, very firm, slightly sticky and slightly plastic; few very fine roots; common fine and medium; few coarse pores; 20 percent clay (estimated); strongly calcareous, carbonates are massive and fine modular; strongly alkaline (pH 8.8); clear smooth boundary.
C -- 55 to 72 inches; pale brown (10 YR 6/3) very fine sandy loam, brown (10 YR 5/3) when moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots, moderately calcareous; strongly alkaline (pH 8.8).
Please find attached the soil mapping unit descriptions and a map of the area near Wildcat Loadout. The loadout is unit 29. The pertinent units are outlined in red on the map. The units are:
29--Dumps, mine
33--Gerst-Badland-Rubbleland complex, 15-50% slopes
34--Gerst-Badland-Rubbleland complex, 50-70% slopes
52--Hernandez family, 3-8% slopes
119--Travessilla sandy loam, 1-8% slopes.

Please feel free to contact me if you have any questions or need any additional information.

Carol D. Franks
Soil Scientist
Price, Utah
637-0041
29--Dumps, mine

These are piles of waste rock and coal from coal mines. This material consists mostly of coal, hard shale, and sandstone fragments. The fragments are about .5 to 7 inches in size and angular in shape.

Most of this material is not vegetated at the present time. Some areas have a 6 or 8 inch surface layer of mixed soil and fragments. These areas have sparse vegetation of snowberry, Salina wildrye, rabbitbrush, and some annuals.

This map unit is in capability subclass VIIIa, nonirrigated and is not placed in a range site.
This map unit is on mesa and fan terrace sideslopes located near Mohrland, northeast of Wellington, and northwest of East Carbon City. Elevation is 6,000 to 8,000 feet. The average annual precipitation is 12 to 14 inches, the mean annual air temperature is 45 to 47 degrees F. and the average freeze-free period is 100 to 120 days.

This unit is 40 percent Gerst extremely stony loam, 15 to 50 percent slopes, 25 percent Badland; 20 percent Rubble land; and 15 percent other soils and miscellaneous areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit is about 12 percent Strych very stony loam and small areas of Rock outcrop.

The Gerst soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone and shale. Slopes are 100 to 200 feet in length, and concave-convex.

Typically the surface layer is light brownish gray extremely stony loam about 7 inches thick. The underlying material is gray and light brownish gray channery silt loam over weathered shale at a depth of 19 inches. Depth to
Permeability of the Gerst soil is moderately slow. Available water capacity is about 2 to \( \frac{3}{4} \) inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is 1 to 3. Runoff is rapid and the hazard of water erosion is high.

Badland is steep or very steep, nearly barren areas of shale that are dissected by many intermittent drainage channels; some areas are interbedded with sandstone. Runoff is rapid to very high and geologic erosion is active.

Rubble land consists of areas covered by stones and boulders to the point that practically no soil is exposed. Rubble land supports only sparse vegetation except for lichens.

This unit is used for wildlife habitat and rangeland.

The potential vegetation on the Gerst soil is an overstory of pinyon and Utah juniper with a canopy of 15 percent. The understory vegetation is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important plants are Salina wildrye, Indian ricegrass, birchleaf mountainmahogany, and Utah serviceberry.

The site index for Utah juniper and pinyon is 15 to 25. The average productivity is low. Average yields are 1 to 2 cords of wood per acre. The potential is very poor for post or Christmas tree production. Suitability of harvesting wood products on slopes 15 to 30 percent is fair.
Management practices that maintain or improve the rangeland vegetation include proper grazing use, planned grazing system and proper location of water developments. For critical erosion control, small areas may be mechanically treated and seeded. It is very hazardous or impractical to attempt range re-vegetation practices on large areas because of shallow soils and moderate water erosion. Plants that may be suitable for critical area seedings are plants native to the unit.

The Gerst soil is in capability subclass VIIa and is in the Upland Shallow Clay Loam (Utah Juniper-Pinyon) woodland site. The Badland and Rubble land are not placed in a range site.
This map unit is on bench and mountain sideslopes. It is located north of Wattis and southeast of Mohrland. Slopes are 100 to 300 feet in length and concave-convex. The present vegetation is mainly Salina wildrye, Indian ricegrass, daisy, skeleton locoweed, shadscale, black sagebrush, and birchleaf mountainmahogany. Elevation is 6,200 to 7,200 feet. The average annual precipitation is about 12 to 14 inches, the mean annual air temperature is 45 to 47 degrees F, and the average freeze-free period is 100 to 120 days.

This unit is 45 percent Gerst extremely stony loam, 50 to 70 percent slopes, eroded; 25 percent Badland; 20 percent Rubbleland; and 10 percent other soils. There is no definite pattern of soil occurrence on the landscape.

Included in this unit is 5 percent Strych very stony loam, and 5 percent Rock outcrop.

The Gerst soil is shallow and well drained. It formed in colluvium or residuum, derived dominantly from sandstone and shale.

Typically, the surface layer is light brownish gray extremely stony
loam about 7 inches thick. The underlying material is gray and light brownish gray channery silt loam over weathered shale at a depth of 19 inches. Depth to weathered shale ranges from 10 to 20 inches.

Permeability of the Gerst soil is moderately slow. Available water capacity is about 2 to 3 inches. Water supplying capacity is 3 to 5 inches. Effective rooting depth is 10 to 20 inches. The organic matter content of the surface layer is 1 to 3 percent. Runoff is rapid and the hazard of water erosion is high.

Badland consists of steep and very steep nearly barren beds of actively eroding shale, shale interbedded with gypsum, and occasionally small areas of shale capped by sandstone.

Rubble land consists of areas covered by stones and boulders to the point that practically no soil is exposed. Rubble land supports very little vegetation.

This unit is used for wildlife habitat.

The potential vegetation on the Gerst soil is an overstory of pinyon and Utah juniper with a canopy of 15 percent. The understory vegetation is 40 percent grasses, 20 percent forbs, and 40 percent shrubs. Important plants are Salina wildrye, Indian ricegrass, birchleaf mountainmahogany, and Utah serviceberry.
The site index for Utah juniper and pinyon is 15 to 25. The average productivity is low. Average yields are 1 to 2 cords of wood per acre. The potential is very poor for post or Christmas tree production. Suitability of harvesting wood products is poor because of hazard of soil erosion.

The suitability for grazing use is poor. For critical erosion control, small areas may be mechanically treated and seeded. It is very hazardous or impractical to attempt range re-vegetation practices on large areas because of shallow soils and possible severe water erosion. Plants that may be suitable for critical area seedings are plants native to the unit.

This unit is in capability subclass VIIe, nonirrigated. The Gerst soil is in the Upland Very Steep Shallow Clay Loam (Utah Juniper-Pinyon) woodland site. The Badland and Rubble land are not placed in a range site.
This very deep, well drained soil is on fan terraces. It is located in Clark Valley, near Sunnyside and Helper. It formed in alluvium derived dominantly from sandstone and shale. Slopes are 300 to 400 feet in length and dominantly single but includes concave-convex. The present vegetation in most areas is mainly Wyoming big sagebrush, yellowbrush, galleta, Indian ricegrass and blue grama. Elevation is 5,600 to 6,500 feet. The average annual precipitation is 10 to 12 inches, the mean annual air temperature is 47 to 49 degrees F. and the average freeze-free period is 110 to 135 days.

Typically the surface layer is brown loam 3 inches thick. The subsoil is brown loam 11 inches thick. The substratum to a depth of 60 inches or more is light brown or pink loam.

Included in this unit is about 10 percent Strych very stony loam, dry, on erratically located stony bars; 5 percent of a soil similar to Hernandez except moderately deep, on sideslopes; and 5 percent Haverdad loam, along the drainages.

Permeability of this Hernandez family soil is moderate. Available water capacity is about 0.5 to 1.0 inches. Water supplying capacity is 5.5
to 6.5 inches. Effective rooting depth is 60 inches or more. The organic matter content of the surface layer is 1 to 3 percent. Runoff is slow and the hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used mainly for rangeland and wildlife habitat. A few areas are used for irrigated crops.

The potential plant community on the Hernandez family soil is 50 percent grasses, 10 percent forbs, and 40 percent shrubs. Important plants are Indian ricegrass, galleta, Wyoming big sagebrush, and winterfat. When a large percentage of the potential plant community has been removed, Utah juniper and pinyon may invade.

When the desirable forage plants are mostly depleted, brush management and rangeland seeding may be used to improve the rangeland vegetation.

Suitable brush management practices include prescribed burning, chemical spraying and mechanical treatment. Suitability for rangeland seeding is fair. The main limitation for rangeland seeding is low annual precipitation. Plants suitable for rangeland seeding include adapted native plants, Russian wildrye, crested wheatgrass, and prostrate kochia.
Under irrigation the management practices used to maintain or improve these areas include conservation cropping systems with alfalfa-grass, hay or pasture and small grain. Crop residues should be kept on the surface of the soil. Pasture management that incorporates use of rotation grazing system is best.

Sprinkler irrigation systems gives the best erosion control and the ability to apply irrigation water evenly to the fields. Flood irrigation can also be used with system modifications to control erosion.

This map unit is in capability unit IIIe-2, irrigated and capability subclass VIe, nonirrigated. The Hernandez family soil is in the Semidesert Loam (Wyoming Big Sagebrush) range site.
119-.Travessilla sandy loam, 1 to 8 percent slopes

This shallow well drained soil is on benches and mesas located between Helper and Haviwatha. It formed in residuum derived dominantly from sandstone. Slopes are 300 to 400 feet in length and concave-convex. The present vegetation in most areas is mainly pinyon, juniper, Salina wildrye, Indian ricegrass and birchleaf mountainmahogany. Elevation is 6,000 to 8,700 feet. The average annual precipitation is 12 to 14 inches, the mean annual air temperature is 45 to 47 degrees F. and the average freeze-free period is 80 to 120 days.

Typically the surface layer is brown sandy loam about 3 inches thick. The upper 6 inches of the underlying material is brown loam. The lower part to a depth of 17 inches is light brown loam. Depth to sandstone ranges from 7 to 20 inches.

Included in this unit is about 5 percent Rock outcrop on ridges and 5 percent Chupedera fine sandy loam in concave areas.

Permeability of this Travessilla soil is moderately rapid. Available water capacity is about \( \frac{2}{3} \) to \( \frac{3}{4} \) inches. Water supplying capacity is 3 to 4 inches. Effective rooting depth is 7 to 20 inches. The organic matter content of the surface layer is 1 to 2 percent. Runoff is slow and the
The hazard of water erosion is moderate. The hazard of soil blowing is moderate.

This unit is used for rangeland and wildlife habitat.

The potential vegetation on the Travessilla soil is an overstory of pinyon and Utah juniper with a canopy of 60 percent. The understory vegetation is 15 percent grasses, 10 percent forbs, and 75 percent shrubs. Important plants are pinyon, Utah juniper, birchleaf mountainmahogany, and Mexican cliffrose.

The site index for pinyon and Utah juniper is 32. The average productivity is low. Average yields are 4 cords of wood per acre. The potential is poor for post or Christmas tree production.

Suitability of harvesting wood products on slopes 30 to 40 percent is poor because of steep slopes that will cause the equipment to move the soil downhill increasing the possibility of soil erosion.

Management practices that maintain or improve the rangeland vegetation include proper grazing use, planned grazing system and proper location of water developments. When pinyon and Utah juniper are thinned, desirable plant species present can be expected to increase for a short period of time. Then pinyon and Utah juniper can be expected to re-occupy the unit.
Suitability for rangeland seeding is very poor because of shallow soils. It is very hazardous or impractical to attempt range re-vegetation practices on large areas because of shallow soils. For critical erosion control, small areas may be mechanically treated and seeded.

This map unit is in capability subclass VIIa, nonirrigated and in the Upland Shallow Loam (Pinyon-Utah Juniper) woodland site.
## Topsoil Pile Summary, Existing

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<td>Topsoil Pile B</td>
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<td>Topsoil Pile E</td>
<td>122,176</td>
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<td><strong>Total</strong></td>
<td><strong>419,823</strong></td>
</tr>
</tbody>
</table>
Utah State University  
Logan, Utah  84322-4830

Attn.: Mr. Karl Topper, Soils Plant and Water Laboratory

Dear Mr. Topper:

Enclosed please find samples taken from Andalex Resources' Topsoil Storage Piles located at the Wildcat Loadout Facility. The Division of Oil, Gas, and Mining is requiring these samples be tested for reclamation suitability. The tests which they require include:

pH
Eh
Saturation Percent
Texture
Organic C
SAR
Total N
Available P
Percent CaCO₃
Selenium
Boron

The samples are labeled A through E with two samples from Piles C and E. Please advise me by telephone at 637-5385 if pre-payment for this analysis is required.

Thank you very much.

Sincerely,

Michael W. Glasson
Senior Geologist
Western Division

MWG/as
Enclosures

cc: File
Andalex Resources, Inc.
Michael W. Glasson
P.O. Box 902
Price, UT 84501

Soil samples received May 5, 1988.

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<th>% ECE</th>
<th>% SP</th>
<th>% O.C.</th>
<th>SAR</th>
<th>% T.N.</th>
<th>ppm</th>
<th>% CaCO₃</th>
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</table>

Texture:  
L = Loam  
CL = Clay Loam  
SiCL = Silty Clay Loam

Please give me a call if you have any questions.
K. Torrey
Revegetation Testing and Monitoring

Regarding Andalex Resource's vegetation test plots, the following measures will be taken in an effort to establish the viability of using this soil material as substitute to make up for the deficit which exists at the loadout. These methods will also be used in an attempt to establish good vegetative cover on the existing topsoil piles, with some options.

The test plots will be approximately 1600 square feet each. Their locations are shown on plate 1. This work will take place as late as possible in the fall of 1989, from early September to mid - October.

First of all the material will be ripped to a depth of 6 inches after which it will be mulched with alfalfa hay to the same depth. It is expected this will be accomplished with a tractor type tiller or disc. The hay which Andalex will use has been sampled by Mr. Carl Bott of the Utah State University extension office in Price. He observed it to be weed free. However, should weeds be observed within 30 days of mulching they will be treated with a contact herbicide with low residual and not a sterilant.

Areas will be left pitted to facilitate water entrapment. Areas will be fertilized this fall at the following per acre rate:

40 lbs K₂O
60 lbs P₂O₅
60 lbs N¹ (as Ureah; 1/2 this fall, 1/2 next spring)

A rangeland drill will be used to plant the seed mixture to a depth of 1/2 inch.

Andalex will observe rodent behavior inside the test areas and if they become a problem, measures will be taken to keep them out.

The monitoring program will be set up as outlined in the Division's guidelines. Four separate measurements will be taken on 20 separate and random 1/4 meter areas on each of the 4 test plots. The four measurements will be:

1. Ground cover by species. Appendix A in the guidelines different options for measuring such as ocular estimates.

2. Total cover.
3. Shrub Density. Each plot will have 4 each 20' x 2' transects picked randomly.

4. Production (Years 9 and 10 only).

The monitoring will begin the first year after planting. The first-year will be strictly a qualitative in nature and percentages of cover and etcetera will be approximated. This information will be strictly for our own use. After the first year, quantitative monitoring will take over as described above. Quantitative monitoring for both the test plots and years 2, 3, 5, 9, and 10 in accordance with the Division's guidelines.

The success standards will be based on 90% of the reference area and 90% statistical adequacy with respect to cover, woody plant density and production (the reference area will be sampled concurrently).

Essentially the same methods and techniques will be used on the existing topsoil piles however different options may be applied such as broadcast seeding versus drilling, mulching versus not mulching, pitting versus smooth surfaces or weed controlling versus no weed controlling. Various combinations will be tried.
2003 Supplement to App. D
Supplement to Appendix D
SOIL SURVEY FOR THE
TWELVE-ACRE EXPANSION AREA
AT THE
WILDCAT LOADOUT
Prepared by

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

James H. Nyenhuis
Certified Professional Soil Scientist
(ARCPACS #2753)

for

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

July 2003
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INTRODUCTION

Andalex Resources needs to expand their coal storage area at the Wildcat Loadout facility located just south of Consumers Road about four miles west of Helper in Carbon County. 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 12 acres of land immediately adjacent to the east of the current coal storage piles. A one acre site within the current Wildcat permit area but not part of the original to-be-affected disturbance area was previously mapped, sampled, and reported in April, 2003. The current report includes the one acre but expands to include a total of approximately 12 acres all located immediately adjacent to the east of the current coal piles.

Andalex wants to utilize the one acre site for coal storage immediately and the additional eleven acres at a later time. 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 photomap to Patrick Collins. Dr. Collins conducted field work at the site on March 5 and designated three locations as representative of the soil on the one acre study area. A backhoe pit was dug at each of the three sites. Dr. Collins examined the three soil profiles and sampled two of them, WC1 and WC2. 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” (State of Utah, 2002). Dr. Collins also investigated the extent of coal fines deposition on the one acre site by means of numerous spade holes dug on a grid transect basis.

The site was then visited on March 11 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 (UDOGM soil scientist and reclamation specialist) was present for the day and observed all ten backhoe pits and assisted in the description and sampling of several soil profiles. She observed all three pits on the primary one acre study area. Mr. Nyenhuis concluded the soils description and sampling of the larger area on the following day, March 13, 2003.

The twenty-three soil samples collected from the additional seven soil backhoe pits were delivered to Colorado State University’s Soil Testing Laboratory for analysis. The following parameters
were analyzed: pH; electrical conductivity (EC); saturation percent; percent calcium carbonate equivalent; organic matter percent; texture (sand, silt, clay, and very fine sand as a part of total sand); meq/L of Ca, Mg, Na, and K; SAR; and AB-DTPA extractable nitrate nitrogen (NO₃-N), P, K, Zn, Fe, Mn, and Cu.

RESULTS

Ten backhoe pits were dug in representative locations across the 12 acre study area (see “Soil Survey Map” included with this report). Soils were described at each of the pits, and eight of the ten pits were sampled for laboratory analysis. Sample sites WC1 and WC2 were sampled as part of the one acre study, and samples sites WC4, WC6, WC7, WC8, WC9, and WC10 were sampled as part of the larger 12 acre study. The soil laboratory data is attached to this report. Three soil map units were delineated across the 12 acre study area: (A) Hernandez loam, 1 to 6 percent slopes, (B) Haverdad loam, 2 to 8% slopes, and (C) Strych Variant, shallow to moderately deep, 2 to 6% slopes.

Average elevation of the study area is about 6,100 to 6,155 feet 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).
Map Unit A: Hernandez loam, 1 to 6% slopes

Hernandez loam was described and sampled at five representative locations (WC1, WC2, WC6, WC7, and WC10). Hernandez was also described but not sampled at WC3. Although there are some differences among the six sites, each soil classifies as the Hernandez series. The Hernandez family, Map Unit 52, 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 and mixed grasses. 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. Hernandez sites WC1, WC2, and WC3 were previously described in the one acre study area report, and are also included in the current report.
Hernandez Pedon WC1 Site and 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, firm moist consistence, 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 WC2 Site and 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 WC3 Site and 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 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 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; common fine and very fine and few coarse and medium roots; strongly effervescent; gradual wavy boundary.

Bk2 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 Pedon WC6 Site and Profile Description:

Map Unit A: 4% slope; east aspect; mixed grasses, dead Wyoming big sagebrush vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 18 inches at time of sampling, 3-12-03; 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 3.5 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium granular structure; soft dry consistence, very friable moist, slightly sticky and slightly plastic wet consistence; common medium, fine, very fine, and few coarse roots to 13 inches; moderately effervescent, moderately alkaline (pH 7.9); gradual smooth boundary.

Bw horizon – 3.5 to 13 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/40 moist; moderate medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, sticky and slightly plastic wet consistence; moderately effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk horizon – 13 to 25 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, friable moist consistence; slightly sticky and slightly plastic wet consistence; common fine and very fine, and few coarse and medium roots 13 to 18 inches, few coarse, medium, fine, and very fine roots 18 to 25 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

Ck horizon – 25 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; very hard to extremely hard dry consistence; firm moist consistence, sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.4); gradual wavy boundary.

C horizon – 38 to 64 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish
brown (10YR 4/4) moist; massive structure; hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; moderately effervescent, strongly alkaline (pH 8.5); did not hit bedrock.

Hernandez Pedon WC7 Site and Profile Description:

Map Unit A; 4% slope; east aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 10 inches at time of sampling, 3-13-03; 2 inches of coal fines deposition from adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 2 to 0 inches (2 inches thick)

A horizon – 0 to 3 inches; brown (10YR 5/3) loam with some areas with coal fines mixed in, brown (10YR 4/3) moist; weak medium granular structure; soft dry consistence, very friable moist consistence, sticky and slightly plastic wet consistence; many fine and very fine, and few coarse and medium roots to 10 inches; moderately effervescent, moderately alkaline (pH 7.9); gradual smooth boundary.

Bw horizon – 3 to 10 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; moderate to strongly effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk1 horizon – 10 to 22 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive structure; hard-very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; common fine and very fine, and few medium and coarse roots 10 to 22 inches; strongly effervescent, moderately alkaline (pH 7.9); common krotovinas from 10 to 38 inches; gradual wavy boundary.

Bk2 horizon – 22 to 38 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive structure; extremely hard dry consistence, very firm moist consistence, slightly sticky and nonplastic wet consistence; few fine and very fine roots 22 to 38 inches; violently effervescent, moderately alkaline (pH 8.3); gradual wavy boundary.

C horizon – 38 to 56 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, strongly alkaline (pH 8.6); did not hit bedrock.
Hernandez Pedon WC10 Site and Profile Description:

Map Unit A; 6% slope; east aspect; rabbitbrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 12 inches at time of sampling, 3-13-03; 1.5 inches of coal fines deposition from the adjacent Wildcat Loadout facility; sampled for laboratory characterization; sample site is just outside of the 12 acre study area but in an area for a future sedimentation pond.

Coal Fines – 1.5 to 0 inches (1.5 inches thick)

A horizon - 0 to 3 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) loam, weak medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common few and very few, and few coarse and medium roots to 12 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual smooth boundary.

Bw horizon – 3 to 12 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard dry consistence; friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

Bky horizon – 12 to 30 inches; very pale brown (10YR 7/4) clay loam, light yellowish brown (10YR 6/4) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and plastic wet consistence; few medium, fine, and very fine roots 12 to 24 inches; violently effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

C horizon – 30 to 62 inches; light yellowish brown (10YR 6/4) loam/sandy loam, pale brown (10YR 6/3) moist; massive structure; hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.0); did not hit bedrock.

Hernandez Range of Characteristics:

The described and sampled pedons WC-1, WC-2, WC-3, WC-6, WC-7, and WC-10 are typical of Hernandez, and are within the range of characteristics for the Hernandez official soil series description (NRCS, October 2002).
Hernandez Soil Suitability and Salvage Depth Recommendation:

Initial One-Acre Study Area

Based on an evaluation of the field and laboratory data (see Appendix), 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 (SAR=6.5). 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.
Larger Eleven-Acre Study Area

Soil description and sample sites WC6, WC7, and WC10 were evaluated for suitability and salvage depth recommendation for the remaining 11 acre study area. WC10 is located in a proposed sedimentation pond area just outside the 11 acre study area but was included in the evaluation of Hernández. The upper 25 inches of WC6 is good rated. The depth between 25 and 38 inches is good rated except both EC (5.5) and SAR (9.1) are fair rated. The lower zone between 38 and 64 inches has poor EC (10.1) and unacceptable SAR (16.7). The upper 38 inches of WC7 is good rated; between 38 and 56 inches is good rated except for fair rated SAR (6.8). The upper 12 inches of WC10 is good rated; between 12 and 30 inches has fair to poor EC (8.5) and fair SAR (8.4). Both EC (12) and SAR (10.4) are poor rated for the zone between 30 and 62 inches. For laboratory reports, refer to the Appendix of this document.

Given that WC10 is located outside the 11 acre study area, it is recommended that the upper 38 inches of Map Unit A be salvaged as Topsoil. The underlying material has good to poor rated EC and fair to unacceptable SAR. If additional material is needed and can be somewhat mixed during salvage, it is possible to salvage this lower material between 38 and about 62 inches as Subsoil.

Map Unit B: Haverdad loam, 2 to 8% slopes

Haverdad loam was described and sampled at two representative locations, WC4 and WC8. Haverdad loam was previously mapped by NRCS as a soil inclusion along drainageways in Map
Unit 52 of the Soil Survey of Carbon Area, Utah (Jansen and Borchert, 1988). Haverdad loam is a very deep, well drained soil mapped in small upland drainageways in the general area. The soil is developing in local alluvium derived dominantly from sandstone and shale. Site vegetation includes mixed grasses, sagebrush, and occasional scattered greasewood.

Permeability of Haverdad is moderate. Available water capacity is about 10 inches. Effective rooting depth is 40 inches or more. Runoff is slow, and the hazard of wind and water erosion is moderate (Jansen and Borchert, 1988). The Range Site for Borchert is Semidesert Loam (Wyoming Big Sagebrush).

Haverdad is classified as a “Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvent”. Haverdad is an established soil series of moderate extent. The most recent NRCS official soil series description, dated June 2002, is on file at Mt. Nebo Scientific. Haverdad site and profile descriptions for WC4 and WC8 follow.

**Haverdad Pedon WC4 Site and Profile Description:**

Map Unit B; 3% slope; east aspect; mixed grasses and few scattered greasewood vegetation; fine-loamy local alluvium with <1% coarse fragments; small fan on side of small upland drainage; no erosion; soil slightly moist to 14 inches at time of sampling, 3-12-03; 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 4 inches; yellowish brown (10YR 5/6) loam, dark yellowish brown (10YR 4/6) moist; moderate medium granular structure; slightly hard dry consistence,
friable moist consistence, slightly sticky and slightly plastic wet consistence; many medium, fine, and very fine, and few coarse roots to 14 inches; strongly effervescent, moderately alkaline (pH 8.3); gradual smooth boundary.

Bw horizon – 4 to 14 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, strongly alkaline (pH 8.5); gradual wavy boundary.

Bk horizon – 14 to 28 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; common fine and very fine and few medium roots; strongly effervescent, moderately alkaline (pH 8.3); gradual wavy boundary.

C horizon – 28 to 58 inches; yellowish brown (10YR 5/4) loam to sandy loam, brown (10YR 4/3) moist; massive structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; few fine and very fine roots 28 to 44 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

2C “red” horizon – 58 to 70+ inches; brown (7.5YR 5/4) gravelly loam, dark brown (7.5YR 4/4) moist; massive structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; slightly effervescent; this horizon not sampled.

Haverdad Pedon WC8 Site and Profile Description:

Map Unit B; 2% slope; east aspect; big sagebrush and mixed grasses (mostly dead) vegetation; fine-loamy local alluvium with < 2% sandstone gravels; small upland drainage; no erosion; 3 inches of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist to 26 inches at time of sampling, 3-13-03; sampled for laboratory characterization.

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

A horizon – 0 to 4 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium platy structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common coarse, medium, fine, and very fine roots to 12 inches; moderately effervescent, slightly alkaline (pH 7.7); gradual smooth boundary.

Bw horizon – 4 to 12 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet
consistence; moderately effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk horizon – 12 to 26 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; common fine and very fine, and few coarse and medium roots; strongly effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Ck horizon – 26 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistency, firm moist consistence, slightly sticky and slightly plastic wet consistence; few coarse, medium, fine, and very fine roots; krotovinas present; moderately effervescent, moderately alkaline (pH 7.9); gradual wavy boundary.

C horizon – 38 to 64 inches; yellowish brown (10YR 5/4) loam-sandy loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; moderately effervescent, moderately alkaline (pH 7.9); did not hit bedrock.

**Haverdad Range of Characteristics:**

The described and sampled pedons WC4 and WC8 are typical of Haverdad and are within the range of characteristics for the Haverdad official soil series description (NRCS, June 2002).

**Haverdad Soil Suitability and Salvage Depth Recommendations:**

Based on an evaluation of the field and laboratory data (see Appendix), Haverdad loam is entirely suitable throughout its profile depth to 54 inches or more. Soil textures are good with loam dominating the upper profile to about 38 inches, and loam to sandy loam to gravelly loam present in the lower substratum. Soil salinity is low with electrical conductivity (EC) values about 0.5 to 2 in the upper profile, and about 0.5 to 4 in the lower “C” horizon. Sodium Adsorption Ratio (SAR) is generally less than 1.0 but can range up to about 4.5 to 6.0 below 14 inches in some
pedons. Soil reaction (pH) is slightly to strongly alkaline with values between 7.7 and 8.5. Calcium carbonate content ranges from about 6 to 11 percent. Organic matter content ranges from about 1.2 to 1.9 percent in the surface layer, to about 0.9 to 1.5 percent at depth in the profile.

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 28 inches. Soil texture is loam and organic matter is about 1 to almost 2 percent. EC and SAR are generally 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 28 inches can be salvaged as Topsoil. Additional underlying material could be salvaged, as needed, for use as Subsoil.

Map Unit C: Strych Variant, shallow to moderately deep, 2 to 6% slopes

Strych Variant was described and sampled at two representative locations (WC5 and WC9). Strych (deep) was previously mapped in the area as a 10% soil inclusion in NRCS Map Unit 52 (Jansen and Borchert, 1988). Although the official Strych soil series is deep to very deep, the site-specific Strych Variant soil on the Wildcat study area is shallow to moderately deep (10 inches to slightly greater than 20 inches to sandstone bedrock). Strych Variant is developing in thin slopewash alluvium and residuum from calcareous sandstone. Vegetation is open, scattered Pinyon-Juniper woodland with a mixed grass understory.
Strych Variant is shallow to moderately deep and well drained. Strych Variant typically has a pale brown to yellowish brown gravelly to very gravelly loam surface layer about 3 inches thick. The “Bw” cambic upper subsoil layer is a pale brown to light yellowish brown gravelly to very gravelly loam to a depth of about 8 or 9 inches. The underlying “Bk” calcic horizon is a pale to very pale brown very to extremely gravelly loam to sandy loam to a depth of about 15 or 16 inches. The substratum is a mixture of “C” horizon and paralithic “Cr” extremely gravelly loam to bedrock encountered at about 20 to 23 inches in depth.

Strych Variant has moderately rapid permeability, low available water capacity, and an effective rooting depth equal to the depth to bedrock. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is medium, and the water erosion hazard is moderate. The Range Site is Semidesert Bouldery Loam (Jansen and Borchert, 1988). Strych Variant is classified as a “Loamy-skeletal, mixed, superactive, mesic, shallow Ustic Haplocalcid”. The most recent NRCS official soil series description for Strych, dated October 2002, is on file at Mt. Nebo Scientific.

Strych Variant Pedon WC5 Site and Profile Description:

Map Unit C; 8% slope; south aspect; Pinyon-Juniper and scattered mixed grasses vegetation; thin residuum from sandstone; upland low ridge; slight erosion; 2 inches of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist at time of sampling, 3-12-03; not sampled for laboratory analysis.

Coal Fines – 2 to 0 inches (2 inches thick, varies up to 6 inches thick)

A horizon – 0 to 3 inches; pale brown (10YR 6/3) gravelly loam with about 20% sandstone gravels, brown (10YR 5/3) moist; moderate medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet
consistence; many fine and very fine, common medium and coarse roots to 8 inches; strongly effervescent; gradual smooth boundary.

Bw horizon – 3 to 8 inches; pale brown (10YR 6/3) gravelly loam with about 25% sandstone gravels, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard dry consistence; friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent; gradual wavy boundary.

Bk horizon – 8 to 15 inches; very pale brown (10YR 7/30) very gravelly silt loam to light silty clay loam with about 45% sandstone gravels; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; few coarse, medium, fine, and very fine roots; violently effervescent; gradual wavy boundary.

C/Cr mixed horizon (weathered, fractured sandstone with calcium carbonate and soil fines in cracks and beneath rock fragments) – 15 to 20 inches; pale brown (10YR 6/3) extremely gravelly loam with about 65% sandstone gravels, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few roots in cracks and beneath rock fragments; violently effervescent.

### Strych Variant Pedon WC9 Site and Profile Description:

Map Unit C; 8% slope; south aspect; Pinyon-Juniper and mixed grasses vegetation; thin eolian over thin residuum from sandstone; low weathered ridge; slight erosion; 1 inch of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist to 9 inches at time of sampling, 3-12-03; sampled for laboratory analysis.

Coal Fines – 1 to 0 inches (1 inch thick)

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) very gravelly loam with about 25% gravel size sandstone chips, dark yellowish brown (10YR 4/4) moist; weak medium granular structure; slightly hard dry consistence, friable moist consistence; slightly sticky and slightly plastic wet consistence; many medium, fine, and very fine roots to 9 inches; strongly effervescent, slightly alkaline (pH 7/6); clear smooth boundary.

Bw horizon – 3 to 9 inches; light yellowish brown (10YR 6/4) very gravelly loam with about 55% gravel size sandstone chips, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard-hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, slightly alkaline (pH 7.5); gradual wavy boundary.

Bk horizon – 9 to 16 inches; pale brown (10YR 6/3) extremely gravelly loam-sandy loam with about 75% gravel size sandstone chips, brown (10YR 5/3) moist; massive structure; hard-very hard dry consistence, friable moist consistence, slightly sticky and slightly plastic
wet consistency; common to few medium, fine and very fine roots; violently effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

C/Cr mixed horizon (weathered, fractured sandstone with calcium carbonate and soil fines in cracks and beneath rock fragments) – 16 to 23 inches; pale brown (10YR 6/3) extremely gravelly sandy loam with over 75% gravel and cobble size sandstone chips, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few roots in cracks and beneath rock fragments; violently effervescent; horizon not sampled for laboratory analysis.

Strych Variant Range of Characteristics:

Depth to the weathered sandstone contact ranges from about 15 to 16 inches. Coarse fragment content ranges from 20 to 25% for the surface layer, from 25 to 55% for the upper subsoil layer (Bw), from 45 to 75% for the lower subsoil layer (Bk), and over 65% for the weathered substratum. Reaction (pH) is typically slightly alkaline (pH from 7.5 to 7.8). Soil fines are typically loam to sandy loam.

Strych Variant Soil Suitability and Salvage Depth Recommendation:

Strych Variant is entirely suitable for salvage. EC and SAR are very low, organic matter content ranges from 2.6% in the surface layer, to 2.3% in the upper subsoil, to 0.9% in the lower subsoil. Calcium carbonate content is fair rated with values ranging from 21 to 27 percent. Soil texture (fines) are loam to sandy loam. Coarse fragment content can be moderate to very high. The upper 12 inches can be salvaged as Topsoil, with the underlying material left in place to aid reclamation after mining activities are completed. For laboratory reports, refer to the Appendix
Map Unit DL: Disturbed Land

One sedimentation pond is present in the study area, and it is mapped as Disturbed Land. It is immediately adjacent to the current Wildcat Loadout facility. Soil salvage was not evaluated and is not recommended due to the amount of coal fines deposition in the pond. In addition, there is another Disturbed Land delineation in the study area – a recent oil and gas drilling pad. This bladed and highly compacted pad area is in the south-central to south-east portion of the study area, and has no soil available for salvage. It appears that topsoil was not salvaged during the construction of the pad because no soil stockpile was evident near the pad during the current soil survey.

REFERENCES


APPENDIX
(Laboratory Data)
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  

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**RESEARCH SOIL ANALYSIS**

**ANDALEX RESOURCES, WILDCAT LOADOUT, HELPER, UTAH**

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**APPROVED**

**Title**

Extension Soil Testing Specialist

Page 2 of 2
APPENDIX D
(Supplement)

SOILS REPORT
(JAMES NYENHUIS)
SOIL SURVEY FOR THE
TWELVE-ACRE EXPANSION AREA
AT THE
WILDCAT LOADOUT

INCORPORATED
OCT 18 2010
Div. of Oil, Gas & Mining

INCORPORATED
MAY 17 2006
Div. of Oil, Gas & Mining
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OCT 1 8 2010
Div. of Oil, Gas & Mining
INTEGRATED
MAY 1 7 2003
Div. of Oil, Gas & Mining
INTRODUCTION

Andalex Resources needs to expand their coal storage area at the Wildcat Loadout facility located just south of Consumers Road about four miles west of Helper in Carbon County. 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 12 acres of land immediately adjacent to the east of the current coal storage piles. A one acre site within the current Wildcat permit area but not part of the original to-be-affected disturbance area was previously mapped, sampled, and reported in April, 2003. The current report includes the one acre but expands to include a total of approximately 12 acres all located immediately adjacent to the east of the current coal piles.

Andalex wants to utilize the one acre site for coal storage immediately and the additional eleven acres at a later time. 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 photomap to Patrick Collins. Dr. Collins conducted field work at the site on March 5 and designated three locations as representative of the soil on the one acre study area. A backhoe pit was dug at each of the three sites. Dr. Collins examined the three soil profiles and sampled two of them, WC1 and WC2. 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" (State of Utah, 2002). Dr. Collins also investigated the extent of coal fines deposition on the one acre site by means of numerous spade holes dug on a grid transect basis.

The site was then visited on March 11 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 (UDOGM soil scientist and reclamation specialist) was present for the day and observed all ten backhoe pits and assisted in the description and sampling of several soil profiles. She observed all three pits on the primary one acre study area. Mr. Nyenhuis concluded the soils description and sampling of the larger area on the following day, March 13, 2003.

The twenty-three soil samples collected from the additional seven soil backhoe pits were delivered to Colorado State University's Soil Testing Laboratory for analysis. The following parameters...
were analyzed: pH; electrical conductivity (EC); saturation percent; percent calcium carbonate equivalent; organic matter percent; texture (sand, silt, clay, and very fine sand as a part of total sand); meq/L of Ca, Mg, Na, and K; SAR; and AB-DTPA extractable nitrate nitrogen (NO3-N), P, K, Zn, Fe, Mn, and Cu.

RESULTS

Ten backhoe pits were dug in representative locations across the 12 acre study area (see “Soil Survey Map” included with this report). Soils were described at each of the pits, and eight of the ten pits were sampled for laboratory analysis. Sample sites WC1 and WC2 were sampled as part of the one acre study, and samples sites WC4, WC6, WC7, WC8, WC9, and WC10 were sampled as part of the larger 12 acre study. The soil laboratory data is attached to this report. Three soil map units were delineated across the 12 acre study area: (A) Hernandez loam, 1 to 6 percent slopes, (B) Haverdad loam, 2 to 8% slopes, and (C) Strych Variant, shallow to moderately deep, 2 to 6% slopes.

Average elevation of the study area is about 6,100 to 6,155 feet 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).
Hernandez loam was described and sampled at five representative locations (WC1, WC2, WC6, WC7, and WC10). Hernandez was also described but not sampled at WC3. Although there are some differences among the six sites, each soil classifies as the Hernandez series. The Hernandez family, Map Unit 52, 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 and mixed grasses. 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. Hernandez sites WC1, WC2, and WC3 were previously described in the one acre study area report, and are also included in the current report.
Hernandez Pedon WC1 Site and 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 consistency, very friable moist consistency, slightly sticky and slightly plastic wet consistency; 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 consistency, friable moist consistency, slightly sticky and slightly plastic wet consistency; 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 consistency, friable moist consistency, slightly sticky and slightly plastic wet consistency; 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 consistency, firm moist consistency, sticky and slightly plastic wet consistency; strongly effervescent, moderately alkaline (pH 8.2); did not hit bedrock.

Hernandez Pedon WC2 Site and 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 consistency, friable moist consistency, slightly sticky and slightly plastic wet consistency; 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.

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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, friable moist consistence, sticky and slightly plastic wet consistence; violently effervescent, strongly alkaline (pH 8.5); did not hit bedrock.

Hernandez Pedon WC3 Site and 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 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 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; common fine and very fine and few coarse and medium roots; strongly effervescent; gradual wavy boundary.

Bk2 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 Pedon WC6 Site and Profile Description:

Map Unit A; 4% slope; east aspect; mixed grasses, dead Wyoming big sagebrush vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 18 inches at time of sampling, 3-12-03; 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 3.5 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium granular structure; soft dry consistence, very friable moist, slightly sticky and slightly plastic wet consistence; common medium, fine, very fine, and few coarse roots to 13 inches; moderately effervescent, moderately alkaline (pH 7.9); gradual smooth boundary.

Bw horizon - 3.5 to 13 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium sub angular blocky structure; slightly hard dry consistence, friable moist consistence, sticky and slightly plastic wet consistence; moderately effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk horizon - 13 to 25 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, friable moist consistence; slightly sticky and slightly plastic wet consistence; common fine and very fine, and few coarse and medium roots 13 to 18 inches, few coarse, medium, fine, and very fine roots 18 to 25 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

Ck horizon - 25 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; very hard to extremely hard dry consistence; firm moist consistence, sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.4); gradual wavy boundary.

C horizon - 38 to 64 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish
brown (10YR 4/4) moist; massive structure; hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; moderately effervescent, strongly alkaline (pH 8.5); did not hit bedrock.

Hernandez Pedon WC7 Site and Profile Description:

Map Unit A; 4% slope; east aspect; Wyoming big sagebrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 10 inches at time of sampling, 3-13-03; 2 inches of coal fines deposition from adjacent Wildcat Loadout facility; sampled for laboratory characterization.

Coal Fines – 2 to 0 inches (2 inches thick)

A horizon – 0 to 3 inches; brown (10YR 5/3) loam with some areas with coal fines mixed in, brown (10YR 4/3) moist; weak medium granular structure; soft dry consistence, very friable moist consistence, sticky and slightly plastic wet consistence; many fine and very fine, and few coarse and medium roots to 10 inches; moderately effervescent, moderately alkaline (pH 7.9); gradual smooth boundary.

Bw horizon – 3 to 10 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; moderate to strongly effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk1 horizon – 10 to 22 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive structure; hard-very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; common fine and very fine, and few medium and coarse roots 10 to 22 inches; strongly effervescent, moderately alkaline (pH 7.9); common krotovinas from 10 to 38 inches; gradual wavy boundary.

Bk2 horizon – 22 to 38 inches; very pale brown (10YR 7/3) clay loam, brown (10YR 5/3) moist; massive structure; extremely hard dry consistence, very firm moist consistence, slightly sticky and nonplastic wet consistence; few fine and very fine roots 22 to 38 inches; violently effervescent, moderately alkaline (pH 8.3); gradual wavy boundary.

C horizon – 38 to 56 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, strongly alkaline (pH 8.6); did not hit bedrock.
Hernandez Pedon WC10 Site and Profile Description:

Map Unit A; 6% slope; east aspect; rabbitbrush and mixed grasses vegetation; local alluvium; fan uplands; no erosion; soil slightly moist to 12 inches at time of sampling, 3-13-03; 1.5 inches of coal fines deposition from the adjacent Wildcat Loadout facility; sampled for laboratory characterization; sample site is just outside of the 12 acre study area but in an area for a future sedimentation pond.

Coal Fines – 1.5 to 0 inches (1.5 inches thick)

A horizon - 0 to 3 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) loam, weak medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common few and very few, and few coarse and medium roots to 12 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual smooth boundary.

Bw horizon – 3 to 12 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard dry consistence; friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

Bky horizon – 12 to 30 inches; very pale brown (10YR 7/4) clay loam, light yellowish brown (10YR 6/4) moist; massive structure; very hard dry consistence, firm moist consistence, sticky and plastic wet consistence; few medium, fine, and very fine roots 12 to 24 inches; violently effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

C horizon – 30 to 62 inches; light yellowish brown (10YR 6/4) loam/sandy loam, pale brown (10YR 6/3) moist; massive structure; hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, moderately alkaline (pH 8.0); did not hit bedrock.

Hernandez Range of Characteristics:

The described and sampled pedons WC-1, WC-2, WC-3, WC-6, WC-7, and WC-10 are typical of Hernandez, and are within the range of characteristics for the Hernandez official soil series description (NRCS, October 2002).
Hernandez Soil Suitability and Salvage Depth Recommendation:

Initial One-Acre Study Area

Based on an evaluation of the field and laboratory data (see Appendix), 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 (SAR=6.5). 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.
Larger Eleven-Acre Study Area

Soil description and sample sites WC6, WC7, and WC10 were evaluated for suitability and salvage depth recommendation for the remaining 11 acre study area. WC10 is located in a proposed sedimentation pond area just outside the 11 acre study area but was included in the evaluation of Hernandez. The upper 25 inches of WC6 is good rated. The depth between 25 and 38 inches is good rated except both EC (5.5) and SAR (9.1) are fair rated. The lower zone between 38 and 64 inches has poor EC (10.1) and unacceptable SAR (16.7). The upper 38 inches of WC7 is good rated; between 38 and 56 inches is good rated except for fair rated SAR (6.8). The upper 12 inches of WC10 is good rated; between 12 and 30 inches has fair to poor EC (8.5) and fair SAR (8.4). Both EC (12) and SAR (10.4) are poor rated for the zone between 30 and 62 inches. For laboratory reports, refer to the Appendix of this document.

Given that WC10 is located outside the 11 acre study area, it is recommended that the upper 38 inches of Map Unit A be salvaged as Topsoil. The underlying material has good to poor rated EC and fair to unacceptable SAR. If additional material is needed and can be somewhat mixed during salvage, it is possible to salvage this lower material between 38 and about 62 inches as Subsoil.

Map Unit B: Haverdad loam, 2 to 8% slopes

Haverdad loam was described and sampled at two representative locations, WC4 and WC8. Haverdad loam was previously mapped by NRCS as a soil inclusion along drainageways in Map...
Unit 52 of the Soil Survey of Carbon Area, Utah (Jansen and Borchert, 1988). Haverdad loam is a very deep, well drained soil mapped in small upland drainageways in the general area. The soil is developing in local alluvium derived dominantly from sandstone and shale. Site vegetation includes mixed grasses, sagebrush, and occasional scattered greasewood.

Permeability of Haverdad is moderate. Available water capacity is about 10 inches. Effective rooting depth is 40 inches or more. Runoff is slow, and the hazard of wind and water erosion is moderate (Jansen and Borchert, 1988). The Range Site for Borchert is Semidesert Loam (Wyoming Big Sagebrush).

Haverdad is classified as a “Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torrifuvent”. Haverdad is an established soil series of moderate extent. The most recent NRCS official soil series description, dated June 2002, is on file at Mt. Nebo Scientific. Haverdad site and profile descriptions for WC4 and WC8 follow.

Haverdad Pedon WC4 Site and Profile Description:

Map Unit B; 3% slope; east aspect; mixed grasses and few scattered greasewood vegetation; fine-loamy local alluvium with <1% coarse fragments; small fan on side of small upland drainage; no erosion; soil slightly moist to 14 inches at time of sampling, 3-12-03; 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 4 inches; yellowish brown (10YR 5/6) loam, dark yellowish brown (10YR 4/6) moist; moderate medium granular structure; slightly hard dry consistency.
friable moist consistence, slightly sticky and slightly plastic wet consistence; many medium, fine, and very fine, and few coarse roots to 14 inches; strongly effervescent, moderately alkaline (pH 8.3); gradual smooth boundary.

Bw horizon - 4 to 14 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, strongly alkaline (pH 8.5); gradual wavy boundary.

Bk horizon - 14 to 28 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; common fine and very fine and few medium roots; strongly effervescent, moderately alkaline (pH 8.3); gradual wavy boundary.

C horizon - 28 to 58 inches; yellowish brown (10YR 5/4) loam to sandy loam, brown (10YR 4/3) moist; massive structure; slightly hard dry consistence, fiable moist consistence, slightly sticky and slightly plastic wet consistence; few fine and very fine roots 28 to 44 inches; strongly effervescent, moderately alkaline (pH 8.0); gradual wavy boundary.

2C “red” horizon - 58 to 70+ inches; brown (7.5YR 5/4) gravelly loam, dark brown (7.5YR 4/4) moist; massive structure; slightly hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; slightly effervescent; this horizon not sampled.

Haverdad Pedon WC8 Site and Profile Description:

Map Unit B; 2% slope; east aspect; big sagebrush and mixed grasses (mostly dead) vegetation; fine-loamy local alluvium with < 2% sandstone gravels; small upland drainage; no erosion; 3 inches of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist to 26 inches at time of sampling, 3-13-03; sampled for laboratory characterization.

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

A horizon - 0 to 4 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium platy structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; common coarse, medium, fine, and very fine roots to 12 inches; moderately effervescent, slightly alkaline (pH 7.7); gradual smooth boundary.

Bw horizon - 4 to 12 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, strongly alkaline (pH 8.5); gradual wavy boundary.
consistence; moderately effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Bk horizon – 12 to 26 inches; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; common fine and very fine, and few coarse and medium roots; strongly effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

Ck horizon – 26 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive structure; hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few coarse, medium, fine, and very fine roots; krotovinas present; moderately effervescent, moderately alkaline (pH 7.9); gradual wavy boundary.

C horizon – 38 to 64 inches; yellowish brown (10YR 5/4) loam-sandy loam, brown (10YR 4/3) moist; massive structure; hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; moderately effervescent, moderately alkaline (pH 7.9); did not hit bedrock.

Haverdad Range of Characteristics:

The described and sampled pedons WC4 and WC8 are typical of Haverdad and are within the range of characteristics for the Haverdad official soil series description (NRCS, June 2002).

Haverdad Soil Suitability and Salvage Depth Recommendations:

Based on an evaluation of the field and laboratory data (see Appendix), Haverdad loam is entirely suitable throughout its profile depth to 54 inches or more. Soil textures are good with loam dominating the upper profile to about 38 inches, and loam to sandy loam to gravelly loam present in the lower substratum. Soil salinity is low with electrical conductivity (EC) values about 0.5 to 2 in the upper profile, and about 0.5 to 4 in the lower “C” horizon. Sodium Adsorption Ratio (SAR) is generally less than 1.0 but can range up to about 4.5 to 6.0 below 14 inches in some
pedons. Soil reaction (pH) is slightly to strongly alkaline with values between 7.7 and 8.5. Calcium carbonate content ranges from about 6 to 11 percent. Organic matter content ranges from about 1.2 to 1.9 percent in the surface layer, to about 0.9 to 1.5 percent at depth in the profile.

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 28 inches. Soil texture is loam and organic matter is about 1 to almost 2 percent. EC and SAR are generally 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 28 inches can be salvaged as Topsoil. Additional underlying material could be salvaged, as needed, for use as Subsoil.

Map Unit C: Strych Variant, shallow to moderately deep, 2 to 6% slopes

Strych Variant was described and sampled at two representative locations (WC5 and WC9). Strych (deep) was previously mapped in the area as a 10% soil inclusion in NRCS Map Unit 52 (Jansen and Borchert, 1988). Although the official Strych soil series is deep to very deep, the site-specific Strych Variant soil on the Wildcat study area is shallow to moderately deep (10 inches to slightly greater than 20 inches to sandstone bedrock). Strych Variant is developing in thin slopewash alluvium and residuum from calcareous sandstone. Vegetation is open, scattered Pinyon-Juniper woodland with a mixed grass understory.
Strych Variant is shallow to moderately deep and well drained. Strych Variant typically has a pale brown to yellowish brown gravelly to very gravelly loam surface layer about 3 inches thick. The "Bw" cambic upper subsoil layer is a pale brown to light yellowish brown gravelly to very gravelly loam to a depth of about 8 or 9 inches. The underlying "Bk" calcic horizon is a pale to very pale brown very to extremely gravelly loam to sandy loam to a depth of about 15 or 16 inches. The substratum is a mixture of "C" horizon and paralithic "Cr" extremely gravelly loam to bedrock encountered at about 20 to 23 inches in depth.

Strych Variant has moderately rapid permeability, low available water capacity, and an effective rooting depth equal to the depth to bedrock. The organic matter content of the surface layer is about 1 to 3 percent. Runoff is medium, and the water erosion hazard is moderate. The Range Site is Semidesert Bouldery Loam (Jansen and Borchert, 1988). Strych Variant is classified as a "Loamy-skeletal, mixed, superactive, mesic, shallow Ustic Haplocalcid". The most recent NRCS official soil series description for Strych, dated October 2002, is on file at Mt. Nebo Scientific.

Strych Variant Pedon WC5 Site and Profile Description:

Map Unit C; 8% slope; south aspect; Pinyon-Juniper and scattered mixed grasses vegetation; thin residuum from sandstone; upland low ridge; slight erosion; 2 inches of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist at time of sampling, 3-12-03; not sampled for laboratory analysis.

Coal Fines – 2 to 0 inches (2 inches thick, varies up to 6 inches thick)

A horizon – 0 to 3 inches; pale brown (10YR 6/3) gravelly loam with about 20% sandstone gravels, brown (10YR 5/3) moist; moderate medium granular structure; soft dry consistence, very friable moist consistence, slightly sticky and slightly plastic wet
consistence; many fine and very fine, common medium and coarse roots to 8 inches; strongly effervescent; gradual smooth boundary.

Bw horizon – 3 to 8 inches; pale brown (10YR 6/3) gravelly loam with about 25% sandstone gravels, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard dry consistence; friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent; gradual smooth boundary.

Bk horizon – 8 to 15 inches; very pale brown (10YR 7/30 very gravelly silt loam to light silty clay loam with about 45% sandstone gravels; massive structure; very hard dry consistence, firm moist consistence, sticky and slightly plastic wet consistence; few coarse, medium, fine, and very fine roots; violently effervescent; gradual wavy boundary.

C/Cr mixed horizon (weathered, fractured sandstone with calcium carbonate and soil fines in cracks and beneath rock fragments) – 15 to 20 inches; pale brown (10YR 6/3) extremely gravelly loam with about 65% sandstone gravels, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few roots in cracks and beneath rock fragments; violently effervescent.

Strych Variant Pedon WC9 Site and Profile Description:

Map Unit C; 8% slope; south aspect; Pinyon-Juniper and mixed grasses vegetation; thin eolian over thin residuum from sandstone; low weathered ridge; slight erosion; 1 inch of coal fines deposition from adjacent Wildcat Loadout facility; soil slightly moist to 9 inches at time of sampling, 3-12-03; sampled for laboratory analysis.

Coal Fines – 1 to 0 inches (1 inch thick)

A horizon – 0 to 3 inches; yellowish brown (10YR 5/4) very gravelly loam with about 25% gravel size sandstone chips, dark yellowish brown (10YR 4/4) moist; weak medium granular structure; slightly hard dry consistence, friable moist consistence; slightly sticky and slightly plastic wet consistence; many medium, fine, and very fine roots to 9 inches; strongly effervescent, slightly alkaline (pH 7/6); clear smooth boundary.

Bw horizon – 3 to 9 inches; light yellowish brown (10YR 6/4) very gravelly loam with about 55% gravel size sandstone chips, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard-hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, slightly alkaline (pH 7.5); gradual wavy boundary.

Bk horizon – 9 to 16 inches; pale brown (10YR 6/3) extremely gravelly loam-sandy loam with about 75% gravel size sandstone chips, brown (10YR 5/3) moist; massive structure; hard-very hard dry consistence, friable moist consistence, slightly sticky and slightly plastic wet consistence; strongly effervescent, slightly alkaline (pH 7/6).
wet consistence; common to few medium, fine and very fine roots; violently effervescent, slightly alkaline (pH 7.8); gradual wavy boundary.

C/Cr mixed horizon (weathered, fractured sandstone with calcium carbonate and soil fines in cracks and beneath rock fragments) – 16 to 23 inches; pale brown (10YR 6/3) extremely gravelly sandy loam with over 75% gravel and cobble size sandstone chips, brown (10YR 5/3) moist; massive structure; very hard dry consistence, firm moist consistence, slightly sticky and slightly plastic wet consistence; few roots in cracks and beneath rock fragments; violently effervescent; horizon not sampled for laboratory analysis.

Strych Variant Range of Characteristics:

Depth to the weathered sandstone contact ranges from about 15 to 16 inches. Coarse fragment content ranges from 20 to 25% for the surface layer, from 25 to 55% for the upper subsoil layer (Bw), from 45 to 75% for the lower subsoil layer (Bk), and over 65% for the weathered substratum. Reaction (pH) is typically slightly alkaline (pH from 7.5 to 7.8). Soil fines are typically loam to sandy loam.

Strych Variant Soil Suitability and Salvage Depth Recommendation:

Strych Variant is entirely suitable for salvage. EC and SAR are very low, organic matter content ranges from 2.6% in the surface layer, to 2.3% in the upper subsoil, to 0.9% in the lower subsoil. Calcium carbonate content is fair rated with values ranging from 21 to 27 percent. Soil texture (fines) are loam to sandy loam. Coarse fragment content can be moderate to very high. The upper 12 inches can be salvaged as Topsoil, with the underlying material left in place to aid reclamation after mining activities are completed. For laboratory reports, refer to the Appendix.
Map Unit DL: Disturbed Land

One sedimentation pond is present in the study area, and it is mapped as Disturbed Land. It is immediately adjacent to the current Wildcat Loadout facility. Soil salvage was not evaluated and is not recommended due to the amount of coal fines deposition in the pond. In addition, there is another Disturbed Land delineation in the study area—a recent oil and gas drilling pad. This bladed and highly compacted pad area is in the south-central to south-east portion of the study area, and has no soil available for salvage. It appears that topsoil was not salvaged during the construction of the pad because no soil stockpile was evident near the pad during the current soil survey.

REFERENCES


LEGEND

A  MAP UNIT A
HERNANDEZ LOAM, 1 TO 6% SLOPES
B  MAP UNIT B
HAYWARD LOAM, 2 TO 8% SLOPES
C  MAP UNIT C
STRYDA VARIANT, SHALLOW TO MODERATELY DEEP, 2 TO 8% SLOPES
DL MAP UNIT D
DISTURBED LAND

SOIL SAMPLE LOCATIONS

SOIL SURVEY MAP
12 ACRE STUDY AREA

ANDALEX RESOURCES, INC.
WILDCAT LOADOUT

MT NEBO SCIENTIFIC, INC

DATE: OCT 18 2010
APPENDIX
(Laboratory Data)
Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 84663
Date: 3/14/03

SOIL ID: Wildcat

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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 8466  
Date: 3/14/03

SOIL ID: Wildcat

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INTEGRATED  
OCT 18 2010  
Div. of Oil, Gas & Mining

INTEGRATED  
MAY 17 2008  
Div. of Oil, Gas & Mining
Name: Rick Collins/Mt. Nebo
Address: P.O. Box 337
City, ST, ZIP: Springville, UT 84666
Date: 3/14/03

SOIL ID: Wildcat

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## RESEARCH SOIL ANALYSIS

### ANDALEX RESOURCES, WILDCAT LOADOUT, HELPER, UTAH

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## RESEARCH SOIL ANALYSIS

**ANDALEX RESOURCES, WILDCAT LOADOUT, HELPER, UTAH**

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APPENDIX E
WILDLIFE ENHANCEMENT PROJECT
 PROJECT DESIGN PACKAGE FOR MITIGATION OF IMPACTS TO MULE DEER CRITICAL WINTER RANGE
TOWER RESOURCES COAL LOADOUT FACILITY

The following mitigation package is provided to Tower Resources in accordance with the following stipulation (attached to rights-of-way U-52810, Temporary Use Permit U-48027, and mineral sale borrow area) associated with the Tower Resource Coal Loadout Facility Development Project).

The holder shall mitigate impacts to mule deer critical winter range through enhancement of adjacent habitats. For every acre of surface disturbed habitat associated with the project under permit, the holder shall enhance one acre of adjacent critical winter range. Enhancement method shall be interseeding with browse and forb seed. Enhancement area, plant species and application rates shall be determined by the Authorized Officer. The project design shall be supplied to the holder 60 days prior to initiation of project work (October 15 through December 15). Expenses for enhancement need not exceed $250 per acre.

Project Objective: Improve winter and spring forage for mule deer on critical winter range in close proximity to surface disturbance associated with the loadout facility.

Project Description: Treat identified areas (existing PJ chainings) on Map 1 as follows:

1. Remove all marked mature pinyon and juniper growing within delineated areas and hand seed disturbed basin.

2. Seed a total of thirteen acres (approximately 50 percent) of the treatment area with the forb-browse seed mixture listed below.

Treatment should be accomplished during the period from October 1 until October 30 or as otherwise mutually agreed on by operator and Authorized Officer. It is recommended that all work cease and equipment be removed October 20, the beginning of the regular deer hunt. The regular rifle deer hunt is October 20 to October 30.

Detailed Project Description and Methods

Equipment needed:

1 - D4 or similar size Crawler Tractor
1 - D7 or other 60-70 Drawbar horsepower Crawler Tractor
1 - Rangeland Drill equipped with depth bands (provided by BLM)*
1 - Brushland Plow (provided by BLM)*
2 - Track mounted seed Dribblers

*See terms for equipment loan.
MAP 1  Tower Resources Mitigation
Project Area
Project Outline:

1. Using D7 Crawler tractor equipped with dozer blade and two track mounted seed dribblers, push down a limited number (less than 25) of marked mature pinyon and juniper trees within treatment areas. Hand seed each disturbed basin created by uprooting mature trees.

2. Using D7 Crawler tractor, pull brushland plow across treatment areas, strictly along the contour, to prepare suitable seed bed in which to drill seed. Adjust the pull angle of the plow to ensure all sodded grasses are turned over. The entire treatment area will be worked in a contour strip pattern in which 50 percent will be prepared for seeding while 50 percent is left undisturbed. The strip pattern should approximate 6 feet scalps separated by 6 feet strips of undisturbed ground.

3. Following seed bed preparation, use D4 Crawler tractor to pull rangeland drill along seed bed.

4. Hand seed all other disturbed sites associated with enhancement project (i.e., equipment load and unload sites).

   Note: All hand seeding will include hand raking following application of seed.

5. Use the following listed species and application rates for seeding within the treatment area. All seed must meet or exceed specifications listed below or otherwise be approved by the Authorized Officer prior to use in the enhancement project. Special attention should be given to the requirement for germination and purity tests. Seed should be mixed by the supplier after seed samples have been drawn for testing.

SEED SPECIFICATIONS

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<th>Species</th>
<th>Lbs/Acre (PLS)</th>
<th>Minimum PLS</th>
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<td>Antelope Bitterbrush</td>
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<td>Fourwing Saltbush</td>
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<td>Prostrate Kochia</td>
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<td>True Mountain Mahogany</td>
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<td>Small Burnet</td>
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<td>Common Sainfoin</td>
<td>2.0</td>
<td>.8</td>
</tr>
<tr>
<td>Alfalfa (Nomad/Ladak, Ranger)</td>
<td>2.0</td>
<td>.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12.0</strong></td>
<td></td>
</tr>
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</table>

1 Germination and Purity Tests conducted by Utah State Seed Lab are required on each lot of seed used. Provide copies of test results to Authorized Officer within 60 days following project completion date, October 20, 1984.
Seed Source Requirement

Antelope Bitterbrush: Maybell variety or Utah seed collected at elevation between 6,000 and 6,800 feet and collected within 200 airline miles of project area.

Fourwing Saltbush, Serviceberry, feet and collected within 200 airline miles of True Mountain Mahogany: project area.

Terms For Use of Government Equipment

Tower Resources Coal Company agrees to hold the Bureau of Land Management free from liability for any claims against them for damages caused during the use of the government equipment.

Tower Resources Coal Company agrees to repair or replace damaged, lost, or stolen equipment while in his custody. Replacement will be made at fair market value of the equipment at the time of destruction or loss.

Tower Resources Coal Company agrees to do routine periodic maintenance on government equipment while in custody.

Tower Resources Coal Company accepts responsibility for transporting government equipment from Price BLM wareyard and returning it to the Price BLM wareyard by November 1, 1984.

The Bureau of Land Management does not make any warranties regarding the condition of equipment provided to Tower Resources Coal Company.

The Bureau of Land Management does not assume liability for damages of any kind resulting from the use of the equipment provided to Tower Resources Coal Company.

The Authorized Officer shall have a representative present during all phases of enhancement work. The representative, experienced with the use of these specialized pieces of equipment and this seeding method, will provide direction and guidance onsite for any problems that may occur.

The Tower Resources Mitigation Project was reviewed by the Utah Division of Wildlife resources. They approved of the project areas selected and strongly supported the project description and methods and provided input for the species selected for seeding.
Tower Resources Coal Company acknowledges, by signing below, that he/she
knows, understands and accepts the terms and conditions set forth in this
mitigation plan and that the implementation of the plan will satisfy the
stipulation (as written on page 1) for rights-of-way U-52810, temporary use
permit U-48027 and mineral sale borrow area.

[Signature]
Tower Resources Company Representative

[Signature]
Date
Oct 60, 1984
III. DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. Area Description

The proposal area is located approximately 7 miles northwest of Price, Utah adjacent to state highway U-139.

B. Environmental Elements

The area has a semiarid climate with precipitation averaging 12 to 14 inches per year. The average annual temperature is 46°F.

The proposal area is located at an elevation of 6100 feet in a gently sloping (3-7%) sagebrush flat.

Two soils were identified in the proposal area through an order III soil survey conducted by the Soil Conservation Service in 1978. The predominant soil type is a very deep well drained sandy loam. Topsoil depth (A11 and A12 horizons) is approximately 7 inches. Organic matter content is low in the surface layer and the erosion hazard is low for the undisturbed site. The other soil identified in the proposal area is a very deep well drained loam. Topsoil depth (A1 horizon) is approximately 3 inches. Less than 10 acres of this soil type is present.

Air quality in the area is good within fugitive dust being the major contributor to air quality degradation. No live water is present in the proposal area.

Vegetation consists mainly of sagebrush with a few miscellaneous grasses including Indian ricegrass and curly grass. This is considered critical deer winter habitat.

The major wildlife species that inhabit the area include mule deer, elk, coyotes, cottontail, rabbits, gray fox, bald eagles, golden eagles, small rodents and reptiles.

The proposal area is located in VRM Class IV. Management guidelines for this class state changes in form, line, color and texture may subordinate the original composition and character of the landscape, but must reflect what could be a natural occurrence.
1. Mandatory Elements

a. Threatened or Endangered Plants and Animals

There are no known threatened or endangered plants that inhabit the area. Two species of birds, the endangered bald eagle and protected golden eagle are known to use this area; however, no known nesting sites have been identified in the proposal area.

b. Wetlands

The proposal area has not been designated a wetland.

c. Prime or Unique Farmland

The proposal area has not been designated prime or unique farmland.

d. Alluvial Valley Floors

The proposal area has not been designated an alluvial valley floor.

e. Wilderness

No public land adjacent or near the proposed right-of-way is subject to Wilderness Interim Management Policy.

f. Areas of Critical Environmental Concern

The proposal area has not been designated an area of critical environmental concern nor have any areas in the vicinity of the proposal.

g. Cultural Resources

A cultural resource inventory was conducted for the proposal area. There were no significant findings (See attached report).

C. Land Use Elements

1. Site Data

a. Land Ownership

Master title plats disclose that both the surface and mineral estates are owned by the Federal Government and managed by the BLM.
b. Rights Granted in the Immediate Area

U-32293 - 10 foot wide telephone right-of-way.

U-20384 - 50 foot wide powerline right-of-way.

SL-015794 - 200 foot wide railroad right-of-way.

U-29170 - SLUP, SLB&M T.13 S., R. 9 E., Section 33, E½E¼SE¼NW¼, W½SW¼NE¼, W½SE¼SW¼NE¼, NE¼NE¼SW¼, W½NW¼NW¼SE¼.

c. Pending Applications

U-49754 - Right-of-way, SLB&M, T. 13 S., R. 9 E., Section 33, E½E¼SE¼NW¼, W½SW¼NE¼, W½SE¼SW¼NE¼.

U-33746 - State exchange application, W½ Section 33.

d. Land Classification

Subject land has been classified for multiple use management under serial number U-4096 dated March 5, 1988.

e. Access

Both legal and physical access are via State Highway 139, also known as county road number 6573.

2. Existing Land Uses

Land adjacent to the proposed coal loadout and storage facility is being used for coal storage, weighing and loading and a training center and warehouse in connection with the Beaver Creek Coal Mine. Other land adjacent to the site is being used for wildlife habitat, grazing and incidental recreational purposes. The proposal area is located within the Consumers Sheep Allotment. Mr. Steve Stamatakis is authorized to graze 510 AUMs on the allotment.

3. Planning Recommendations, Consultations and Other Considerations

a. BLM-MFP Planning Recommendations

The proposal is located in the Wattis Planning Unit for which an approved URA-MFP has been written. The planning recommendations made in this document support the proposed land use.

b. Other Federal Agency Plans for the Proposal Area

None are known.
c. State Plans

The state of Utah has applied to exchange the W½ of Section 33 T. 13 S., R. 9 E., as part of the Arches State Exchange (U-33746). The application was filed on June 17, 1976. Opposition to this exchange has been voiced by the Carbon County board of Commissioners and the Utah Division of Wildlife Resources.

d. Local Plans

Carbon County has placed this area in a mining and grazing zone (M&G-1) in their revised zoning resolution. The proposed use would be compatible with zoning objectives.

IV. ENVIRONMENTAL CONSEQUENCES

A. Alternative No. 1

1. Anticipated Impacts

a. Air Quality

Impacts to air quality would be an increase in particulate emissions from stockpiled topsoil and coal. Increased emission levels from stockpiled topsoil should be low and for a short duration. Blowing dust from stockpiled coal could cause a significant increase in particulate emissions if not adequately controlled.

b. Soils

Soil productivity would be lost on approximately 73 acres for at least 30 years or until the areas were successfully reclaimed. An increase in wind and water erosion would occur on those areas where vegetation is removed during construction and prior to having an adequate cover of gravel or other surface material.

Concentrations of suspended sediments would increase temporarily severalfold if high intensity rainfall occurs causing sediment retaining structures to fail.

c. Vegetation

Vegetation would be removed and destroyed on approximately 73 acres. Vegetation productivity would be lost for the life of the project. If reclamation were successful, vegetative productivity could be greatly improved.
d. **Wildlife**

The proposed project would significantly impact wintering deer on and adjacent to the project area. Impacts, direct and indirect, would be associated with both construction and operation of the facility. Direct impacts are those resulting from physical loss of critical winter habitat, and would completely displace current deer use. Seventy-three acres would be impacted in this way and would displace approximately 7 deer each year for the life of the facility. Indirect impacts are those resulting from disturbance to adjacent critical winter habitat caused by construction and operation of the facility. An estimated 80% of current deer use (8 deer) would be displaced from 79 acres adjacent to the proposed facility each year of operation.

e. **Grazing**

The permittee would lose approximately 8 AUMs of grazing capacity due to a decrease in public land acreage available for livestock grazing within the allotment.

f. **Landscape Character**

Landscape character would be altered due to removal of vegetation, leveling of this area and placement of coal piles and loading equipment. However, this impact would not be significant in light of coal loadout equipment and piles presently onsite. There is also a warehouse, training center, fuel tanks, scalehouse and miscellaneous equipment located on public land adjacent to the proposal area, under Special Land Use Permit U-29170.

2. **Possible Mitigating Measures**

a. **Air Quality**

Measures to control fugitive dust including watering and the use of chemical suppressants should be employed to keep particulate emission levels down. Also all disturbed areas not required for operation or maintenance of the facility should be seeded.

b. **Soils**

Before the site is constructed a plan to protect the hydrologic balance including sedimentation ponds, dams, diversion ditches, etc. should be designed. Also, all topsoil should be removed, stockpiled and protected for later use when reclamation operations begin. Stockpiled topsoil should be protected by seeding with a quick growing cover plant and a permanent perennial plant.
c. **Vegetation**

By seeding all areas not required for operation or maintenance of the facility and seeding the entire site when the right-of-way terminates, loss of vegetation would almost totally be mitigated. Also use of the recommended species over the present sagebrush cover would greatly improve the productivity and habitat.

d. **Landscape Character**

All structures located on the right-of-way could be painted a nonstructive color to help blend in with the existing landscape.

e. **Other Mitigating Measures**

Appendix A lists the terms and conditions developed from the above mentioned measures in addition to others. This will be attached to the right-of-way grant to help mitigate environmental impacts.

3. **Unavoidable Adverse Impacts**

Loss of critical deer winter habitat and the displacement of approximately 8 deer cannot be avoided if the facility is built where proposed. Also the reduction in grazing capacity for the permittee of approximately 8 AUMs cannot be avoided.

4. **Irretrievable or Irreversible Commitment of Resources**

None
The following off-site mitigation package was provided to Andalex Resources by the BLM in coordination with the Utah Division of Wildlife Resources to meet a mitigation requirement of the Utah Division of Oil, Gas and Mining for the permitting of the Wildcat loadout facility. Two options are presented. Either option will meet the requirement to: mitigate impacts to 15 acres of critical winter range which has been taken out of production as mule deer critical winter range.

**OPTION 1 - BROWSE INTERSEEDING**

Project Objective: Improve winter and spring forage for mule deer on critical winter range in close proximity to surface disturbance associated with the loadout facility.

Project Description: Treat identified area (existing PJ chainings) on Map 1 as follows:

- Seed a total of fifteen acres (approximately 50 percent) of the treatment area with the forb-browse seed mixture listed below. Treatment should be accomplished during the period from October 15 until November 15 or as otherwise mutually agreed on by operator and authorized officer.

Project Outline:

1. Complete an archaeological clearance on 30-acre project area.

2. Using D7 Crawler tractor with dozer blade, pull brushland plow across treatment areas, strictly along the contour, to prepare suitable seed bed in which to drill seed. Adjust the pull angle of the plow to ensure all sodded grasses are turned over. The entire treatment area will be worked in a contour strip pattern in which 50 percent will be prepared for seeding while 50 percent is left undisturbed. The strip pattern should approximate 6 feet scalps separated by 6 feet strips of undisturbed ground.

3. Following seed bed preparation, use D4 Crawler tractor or suitable rubber-tired implement to pull rangeland drill along seed bed.

4. Hand seed all other disturbed sites associated with enhancement project (i.e., equipment load and unload sites).
Note: All hand seeding will include hand raking following application of seed.

5. Use the following listed species and application rates for seeding within the treatment area. All seed must meet or exceed specifications listed below or otherwise be approved by the authorized officer prior to use in the enhancement project. Special attention should be given to the seed source requirement.

**SEED SPECIFICATIONS**

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<th>Species</th>
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<td>Antelope bitterbrush</td>
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<td>Fourwing saltbush</td>
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</tr>
<tr>
<td>Prostrate Kochia</td>
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<td>Utah serviceberry</td>
<td>.5</td>
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<tr>
<td>True mountain mahogany</td>
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<td>Whitestem rubber rabbitbrush</td>
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<td>Common sainfoin</td>
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<td>Alfalfa (Nomad/Ladak, Ranger)</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12.0</strong></td>
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</tbody>
</table>

Seed source requirement:

Antelope bitterbrush: Maybell variety or Utah seed collected at elevation between 6,000 and 6,800 feet.

Fourwing saltbush: Rincon variety or seed collected at elevation between 5,500 and 6,800 and collected within 200 airline miles of project area.

Utah serviceberry, True mtn. mahogany: Collected at elevation between 5,500 and 6,800 feet and collected within 200 airline miles of project area.

*See terms for equipment loan.*

**Equipment needed:**

1 - D4 or similar size Crawler tractor
1 - D7 or other 60-70 Drawbar powerhouse Crawler tractor
1 - Rangeland drill, equipped with depth bands (provided by BLM)*
1 - Brushland plow (provided by BLM)*
2 - Track-mounted seed dribblers

*See terms for equipment loan.*
Terms for Use of Government Equipment

Andalex Resources Coal Company agrees to hold the Bureau of Land Management free from liability for any claims against them for damages caused during the use of the government equipment.

Andalex Resources Coal Company agrees to repair or replace damaged, lost, or stolen equipment while in their custody. Replacement will be made at fair market value of the equipment at the time of destruction or loss.

Andalex Resources Coal Company agrees to do routine periodic maintenance on government equipment while in custody.

Andalex Resources Coal Company accepts responsibility for transporting government equipment from Price BLM wareyard and returning it to the Price BLM wareyard within 10 days following project completion.

The Bureau of Land Management does not make any warranties regarding the condition of equipment provided to Andalex Resources Coal Company.

The Bureau of Land Management does not assume liability for damages of any kind resulting from the use of the equipment provided to Andalex Resources Coal Company.

The authorized officer shall have a representative present during all phases of enhancement work. The representative, experienced with the use of these specialized pieces of equipment and this seeding method, will provide direction and guidance onsite for any problems that may occur.

**OPTION 2 - WATER CATCHMENT INSTALLATION**

**Project Objective:** Improve distribution of mule deer and elk on critical winter range and thereby reduce pressure on browse in highly concentrated use areas. The guzzler will serve to increase use in the area of the catchment in fall, winter and spring and reduce use on the adjacent critical winter range.

This mitigation project will also benefit a large diversity of other game and nongame wildlife species dependant on free water.

**Project Description:** Place water catchment device in location shown on Map 1. Recommended catchment design is included as Attachment 1. Minimum specifications for catchment design are listed below.
Catchment Specifications

2,100 gallon storage capacity, heavy construction top exterior drinking ramp, top and ramp black (for greater solar radiation).

Project Outline:

1. Excavate a circular basin 16 inches deep and 16 feet in diameter.
2. Assemble 4 quarter panels to make basin or storage tank, position and level.
3. Assemble 4 quarter panels to make top and set in place.
4. Excavate an area about 4 feet from catchment to set trough and connect to catchment with 1 1/2-inch insulated PVC pipe.
5. Bolt rib caps on top, fill in around catchment and hand seed disturbed soil.

Installation requires about 34 work hours to complete. The archaeological clearance for this project can be completed by the BLM.

Equipment and manpower needed:

Hand tools (shovels, breaker bar, 2 - 1/2 inch ratchet sets)
1 - caulking gun
1 - full size pickup - 1/2 or 3/4 ton
3 - laborers

For specific installation instructions, see attached brochure.
(Note: Installation instructions are for a 1,000-gallon unit, but installation for the 2,100-gallon unit is very similar.)

The authorized officer shall have a representative present during project construction. The representative will select the exact site location and assist in the construction.

A representative of Andalex Resources acknowledges, by signing below, that he/she understands and accepts the terms and conditions set forth in this mitigation plan and that the implementation of the plan will satisfy the offsite mitigation stipulation for the permitting of the loadout facility.

M. C. Wilson
Andalex Resources Company Representative

Date: 4/20/89

Wang 0202G
MAP 1 ANDALEX RESOURCES MITIGATION PROJECT AREA

- Option 1 Project Area (Browse Interseeding)
- Option 2 Project Area (Catchment)
APPENDIX F

WILDLIFE RESOURCES INFORMATION
FISH AND WILDLIFE RESOURCE INFORMATION
Andalex Resources, Inc. - Tower Division
(Wildcat Coal Loadout)

General Wildlife Information

Wildlife Diversity and Status

The coal loadout area (Section 33, T13S, R9E) encompasses sagebrush/grass and pinion/juniper ecosystems adjacent to the Gordon Creek Wildlife Management Area. These ecosystems lie along the base of the east side of the Wasatch Plateau in Carbon County, Utah. The Wasatch Plateau is an expansive and diverse biogeographic area (Area A identified in Appendix A) that could be inhabited on occasion or during different seasons of the year by 364 species of vertebrate wildlife. From this assemblage, 168 species (no picinian, no amphibian, 16 reptilian, 101 avian and 51 mammalian species) are likely inhabitants of the coal loadout area. It is interesting to note that 98% of the species associated with the project are protected -- of these 34 species are of high interest to the state of Utah.

The Division Publication No. 78-16 "Species List of Vertebrate Wildlife That Inhabit Southeastern Utah" is appended (Appendix A) to this report. It identifies those species having potential to inhabit Southeastern Utah and the Biogeographic Area (Area A), that surrounds the project. Those that are believed to inhabit the environs of the loadout area are denoted in Appendix A with an explanation mark (~). Appendix A also identifies individual species that are protected and/or considered to be of high interest (*) as well as
their relative abundance, population trend and generalizations concerning habitat use areas.

Ecosystems and Their Relative Biological Value

Ecosystems

The coal loadout facility lies within a submontane setting adjacent to the Gordon Creek Wildlife Management Area. The project site is comprised of pinion/juniper and sagebrush/grass ecosystems lying between an elevation of 6,120 feet and 6,240 feet.

Qualitative Ranking

A map-overlay (1:250,000 scale) denoting rankings of use areas for individual high interest species is not necessary, since all of the projects surface facilities lie within critical valued deer and elk winter range. The legal section of land (Section 33, T13S, R9E) associated with the loadout project has been ranked as being of critical biological value to the local areas total wildlife resource.

Critical valued ecosystems or wildlife use areas are followed in respective importance by high-priority, substantial and limited valued areas. Without question, man and his facilities can co-exist with most wildlife as long as sufficient water, food, cover and space are provided for the animals. This can be accomplished through development and implementation of a wildlife mitigation plan.

Critical valued wildlife use areas routinely evidence unusually high concentrations of wildlife. Such areas are deemed to be "sensitive" and necessary to sustain the existence and perpetuations of one or more species during crucial time periods in their life cycles. Biological intricacies dictate that significant disturbances cannot be tolerated by the members of an
ecological assemblage on critical valued sites. Professional opinion is that disturbance to critical use areas or habitats will result in unacceptable changes in biota and/or biological productivity of an area. All stream sections, lakes, reservoirs or ponds identified by Utah Division of Wildlife Resources as Class 1 or 2 are ranked as being of critical value. One for one in kind mitigation is expected for impacts in critical areas.

High priority valued wildlife use areas often times experience "intensive use" by one or more species of wildlife. This may occur during crucial time periods in their life cycles. All stream sections, lakes, reservoirs or ponds identified by Utah Division of Wildlife Resources as Class 3 are ranked as being of high priority value. Disturbance to high priority use areas is unreasonable without acceptable mitigation.

Substantial valued wildlife use areas are an "existence" or distribution area for one or more species of wildlife. All stream sections, lakes, reservoirs or ponds identified by Utah Division of Wildlife Resources as Class 4 are ranked as being of substantial value. Disturbance to such areas may require mitigation beyond the mere obligation of reclamation.

Limited valued wildlife use areas are "inhabited occasionally" by one or more species of wildlife. All stream sections, lakes, reservoirs or ponds identified by Utah Division of Wildlife Resources as Class 5 or 6 are ranked as being of limited value. Disturbance to these areas seldom require mitigation beyond reclamation.

Wildlife Use Area
Aquatic Use Areas and High Interest Species

Drainages on the project area are all intermittent. It is only after 8 miles of dry wash that they would reach the perennial flow of the Price River. The Price River, after flowing over 90 miles, discharges into the
Green River. It is important to note that no species of fish inhabit the mine plan or adjacent areas. The endangered humpback chub, bonytail chub and Colorado squawfish inhabit the Green River. Additionally, the razorback sucker, a rare species that may someday be listed as threatened, also inhabits the Green River.

Terrestrial Use Areas and High Interest Species

Seeps and springs, natural water tanks, stock ponds or other manmade watering facilities are not known to exist on the project area. Regardless, all environmentally free water represents a critical valued resource for most wildlife associated with the area.

Five species of amphibians, all of which are protected, are believed to inhabit the environs that surround the project area (Appendix A). Due to the arid nature of the loadout area, none are expected to inhabit it. Note that no amphibians in Utah have relative abundances so low as to have caused them to be federally listed as threatened or endangered.

Sixteen species of reptiles, all of which are protected, are believed to inhabit the project area (Appendix A). The following synopsis portrays the life requisites of just high interest reptiles. No reptiles have relative abundance so low as to have caused them to be federally listed as threatened or endangered.

The milk snake is a yearlong resident of the project area. Its substantial valued use area encompasses all ecosystems except the alpine. The milk snake is primarily subterranean and extremely secretive. When active it is mostly nocturnal. The milk snake feeds on small rodents, lizards and other small snakes. Occasionally, the milk snake may take small birds or bird eggs.

The milk snake may live beyond twenty years and it becomes sexually mature during its third spring season. After mating, which occurs during spring or early summer when they are leaving the den, female milk snakes produce clutches
which average seven eggs. The eggs are secreted in a moist warm environ and then abandoned; incubation lasts 65 to 85 days. The site where an individual snake has deposited its clutch of eggs is of critical value to maintenance of the species.

The Utah mountain kingsnake is a yearlong resident of the project area. Its substantial valued use area encompasses all of the projects ecosystems. Little is known concerning this animal except that it frequents areas of dense vegetation and that it is often found near water. Its life history and food habits parallel that described for the Utah milk snake.

To date snake dens, which are protected and of critical value to snake populations, have not been identified on or adjacent to the project area. It is important to note that inventory for such has not been attempted.

One hundred one species of birds, all of which are protected, are believed to inhabit the project area. All avifauna are protected. The following synopsis portrays life requisites for just high interest birds (Appendix A). Two species (bald eagle and peregrine falcon) are federally listed as endangered and are specifically discussed.

The project and adjacent areas provides substantial valued habitat for a multitude of raptors--turkey vulture, bald and golden eagles, four species of falcons (prairie, American peregrine, Merlin and American kestrel), five species of hawks (red-tailed, Swainson's, rough-legged, Ferruginous and marsh hawks) and four species of owls (screech, great horned, pygmy, and long-eared owls).

Nesting habitat does not exist on the project area for some of these species. However, if a species were to nest, a crucial time period is when the aerie (nest) is occupied. This varies per species but lies between February and mid-August. Generally speaking, aeries represent a critical valued site and need protection from disturbance within a one-half mile
radius. Species specific protective stipulations for aeries are available from the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

Golden eagles are a common yearlong resident of the project area. An aerie territory is utilized by one pair of eagles but may contain several nest sites. No eagle aerie territories are known on the project area.

An active golden eagle nest site is sensitive to disturbance within a one-half mile radius. This buffer zone is ranked as being of critical value to maintenance of the eagle population. Occupancy by the birds is normally between February 1 and July 15. The radius for a buffer zone may need to be increased to one mile if a disturbance were to originate from above and within direct line of sight to the eagle aerie.

The bald eagle is endangered and a winter resident (October through April) of the local area--bald eagles do not nest within the biogeographic area that encompasses the project. To date there are no known high-priority concentration areas or critical valued roost trees for this species on or adjacent to the project. The project area, due to annual use by bald eagles, has been ranked as being of substantial value.

Peregrine falcons (federally listed as endangered) and the prairie falcon (relative abundance is common) are yearlong residents of the project and adjacent areas. The American peregrine nests in southeastern Utah where as the Arctic peregrine is only a winter resident. Peregrine and prairie falcons utilize cliff nesting sites. There are no known aerie sites for peregrines or prairie falcons on the project site.

For each falcon their aerie site while being utilized and a one-half mile radius would be ranked as being of critical value to maintenance of their populations. The falcon's period of use at the aerie site spans the spring
and early summer period--prairie falcon, April 15 to June 30; peregrine falcon, March 1 to June 30.

Mourning doves inhabit the project and adjacent areas between May and mid-September each year. They nest throughout most of this period and each pair produces two clutches. The pinion-juniper and riparian ecosystems are ranked as being of high-priority value for nesting. Locally, mourning doves show two peaks in on-nest activity--early July and early August. Successful nesting activities and any water sources are critical to maintenance of the mourning dove population.

The western bluebird is an uncommon summer resident known to inhabit the environs of the biogeographic area that surrounds the project site. It is a cavity nesting specie and nests from the pinion-juniper up into the lower forest habitats of the montane. During winter western bluebirds show elevational and longitudinal migrations; they then utilize all ecosystems associated with the project. It is important to note that trees with cavities located on the project area can be of critical value when utilized by bluebirds.

Fifty-one species of mammals, of which 90 percent are protected, are believed to inhabit the project area (Appendix A). The following synopsis portrays life requisites for just high interest mammals. Only the black-footed ferret has been federally listed as endangered. It will be specifically discussed.

The red bat is a summer resident having a limited distribution within the biogeographic area that surrounds the project site. The animal roosts in riparian and pinion-juniper ecosystems. Such areas represent this animals substantial valued use area. An occasional individual has been known to utilize caves; those individuals could hibernate and remain over winter.
The spotted bat may inhabit the environs of the project area but little is known concerning this specie.

The cottontail rabbit (mountain cottontail inhabits sites lying between 7,000 and 9,000 feet in elevation and the desert cottontail inhabits sites lower than 7,000 feet in elevation) is a yearlong resident of the biogeographic area that surrounds the project site. The entire project area represents a substantial valued use area for cottontails. Their young are born between April and July. This is a crucial period for maintenance of the cottontail population.

The red and gray fox are yearlong inhabitants of the biogeographic area that surrounds the project site. They are pursued due to their fur value. The substantial valued use area for fox would include all ecosystems associated with the project. Locally, almost nothing is known of foxes population dynamics. Without doubt a crucial period for the fox is when they are caring for young in the den. Dens, while being inhabited, are a critical use area.

Many of the members of the family mustelidae are known to inhabit the biogeographic area that surrounds the project site. They are all protected and classified as furbearers--badger, striped and spotted skunks. All of these species are pursued by sportsmen due to their value in the fur market.

The substantial valued use area for badger and skunks spans all ecosystems other than dense forests. Skunks show some affinity for habitats proximal to water, and both species are dependent upon a suitable prey source.

A crucial period for maintenance of all furbearers populations is when they have young in a nest or den. Such sites are critical for reproductive success.

Bobcat, Canada lynx and cougar are known to inhabit the biogeographic area that surrounds the project site. For all of these species a crucial
period for maintenance of their population is when the female has her young secreted at a den site. Such sites are of critical value when being utilized. It is also important that a female accompanied by young not be killed or harassed.

The substantial valued use area for bobcats extends from the cold desert through the submontane and into the montane. The bobcat is normally associated with precipitous terrain, but has been observed in every ecosystem within the aforementioned ecological settings. Their primary prey source is represented by small mammals and birds or any other animal they can catch. It is important to note that bobcats occasionally do kill the young of big game animals.

The substantial valued use area for the Canada lynx is restricted to the montane. Normally, this cat would be expected to only utilize riparian and forested ecosystems. The lynx is similar in predation habits to the bobcat.

The substantial valued use area for the cougar (locally known as mountain lion) generally extends from the submontane into the montane. Due to the dependency of the cougar upon mule deer as a prey source, a ranking of the lion's seasonal distribution parallels that of the deer. This predator/prey relationship results in cougar utilizing environs of the cold desert, also.

Mule deer are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area spans all ecosystems extending from the cold desert through the submontane and montane. In some situations deer show altitudinal migrations in response to winter conditions. There are, however, habitats where deer reside on a yearlong basis.

Migration of mule deer from summer range to winter range is initiated during late October. Probably, the annual disturbance of the fall hunting season coupled with changing weather conditions is the initial stimulus. The onset of winter weather reinforces the deer's urge to migrate and continued adverse weather keeps the deer on the winter range.

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These areas are usually inhabited from December through April each year and during years with severe snow conditions portions of the winter range becomes unavailable to deer due to snow depth. On an annual basis, some restricted portions of the winter range have shown concentrated use by the deer; these areas are ranked as being of critical value. Critical valued sites must be protected from man's disturbance when the deer are physically present on the range.

Deer begin their migration back to summer range by May and remain there throughout summer and fall. Summer ranges are ranked as being of high-priority value to mule deer.

Mule deer fawn during the month of June--peak fawning occurs around June 20. The continuum of wildlife ecosystems extending from the pinion-juniper through the shrubland and into the aspen type probably represents the fawning area. All riparian areas are of critical value for fawning and maintenance of the deer population. To date specific areas showing annual use for fawning have not been inventoried. It is probable that such areas exist; they would be ranked as being of critical value to deer. It is important to note that June 15 through July 5 represents a crucial period for parturition.

Rocky mountain elk are inhabitants of the biogeographic area that surrounds the project site. Their substantial valued use area spans all ecosystems extending from the submontane through the montane. Elk do not show as strong altitudinal migration as mule deer do in response to winter conditions, but they do migrate to wintering areas.

Migration of elk from summer range to winter range is initiated during late October. Probably, the annual disturbance of the fall hunting seasons coupled with changing weather conditions is the initial stimulus. The onset of winter weather reinforces the elk's urge to migrate and continued adverse
coupled with changing weather conditions is the initial stimulus. The onset of winter weather reinforces the elk's urge to migrate and continued adverse weather keeps elk on the winter range.

A portion of the project site represents winter range for the Manti elk herd. Winter ranges for elk are all ranked as being of high-priority value to the animal. These areas are usually inhabited from December through April each year. During winters with severe conditions, some portions of the winter range becomes unavailable to elk due to snow depth. Traditionally, some restricted portions of the winter range have shown concentrated use by the elk; these sites are ranked as being of critical value. Critical valued sites must be protected from man's disturbance when the elk are physically present on the range.

Elk begin their migration back to summer range by May and remain there throughout summer and fall. Summer ranges are ranked as being of high-priority value.

Currently, there are no other known high interest wildlife species or their habitat use areas on or adjacent to the project area. It is not unreasonable to suspect that in the future, some additional species of wildlife may become of high interest to the local area, Utah or the Nation. If such is the case, the required periodic updates of project permits and reclamation plans can be adjusted and appropriate recommendations made.
RECOMMENDED FISH AND WILDLIFE MITIGATION PLAN
Andalex Resources Inc. - Tower Division
(Wildcat Coal Loadout)

Mitigation and Impact Avoidance Procedures General to All Wildlife

Wildlife use areas have been ranked into four levels of biological importance. The most valued are the critical areas followed in respective importance by high-priority, substantial and limited valued areas. Impacts to any of these areas requires various levels of mitigation. At a minimum, any project resulting in disturbance to wildland habitats must provide interim revegetation and plans for final reclamation/revegetation. Interim revegetation should target stabilization of top soil storage sties and other raw soil areas. Forage values to wildlife of the seed prescription should be an important issue where wildlife can utilize interim plantings. Final reclamation must consider life requisites (food, water, cover and space) of high interest wildlife that would utilize the area.

Where practicable disturbances to vegetation communities should be kept to a minimum and planned to create irregular edges rather than long smooth edges. Facility placement must incorporate cluster designs and safe corridors for large animal movement. Mining operations should develop as much facility area underground as reasonable.

During the interim of project activities, all hazards to wildlife (i.e., vertical vent shafts, hazardous chemicals, liquid hydrocarbons, etc.) need to
be modified to preclude animal use. Persistent pesticides should not be used.

It is recommended that the company make significant efforts to educate all employees associated with the project of intrinsic values of the wildlife resource. The company has legal and moral obligations to protect the environment; the employee must share in this responsibility.

In order to meet this objective the Division of Wildlife Resources has developed a "Coal Mining and Wildlife" training program that is available for company use. Personnel associated with the project should be advised not to unnecessarily or without proper permits harass or take any wildlife. Young animals or females with young are frequently victims of accidental discovery and harassment or capture. Additionally, personnel traveling to and from the project should not stop their vehicles for purposes of viewing wildlife at short distances. Moving traffic is less disturbing to the animals than traffic that stops and/or results in out-of-the-vehicle activity. When the viewing of wildlife is desirable, vehicles should only be slowed, but not stopped. It is especially important that wildlife not be harassed during winter periods, breeding seasons and early in the rearing process.

Exploratory drilling should be limited as much as possible during crucial periods. During winter wildlife are always in a depleted condition. Unnecessary disturbance by man causes them to use up valuable and limited energy reserves which, often times, results in mortality. In less severe cases, the fetus being carried by females may be aborted or absorbed by the animal, thus reducing reproductive success of a population. During breeding seasons, disturbance by man can negatively affect the number of breeding territories for some species of wildlife. Disturbance can also interrupt courtship displays and preclude timely interactions between breeding animals. This could result in reduced reproductive success and ultimate reductions in population levels. And, early in the rearing process, young animals need the
peace and tranquility normally afforded by remote or secluded wildfire. It is also during this crucial period that young animals gain the strength and ability to elude man and other predators. This allows the young animal to develop in relatively unstressed situations and to utilize habitats that are secure from predators. Disturbance by man can compromise this situation and result in abandonment of the young by the female, increased accidents that result in mortality to young animals or increased natural predation.

Hunting and other state and federal wildlife regulations must be adhered to by sportsmen utilizing the project area. Apprehension of wildlife violators has increased by nearly 250 percent during recent years in southeastern Utah.

Mitigation and Impact Avoidance Procedures for Aquatic Wildlife

If ultimate operations are planned or occur that could physically or chemically impact any drainage channel or marshland, detailed reclamation plans along with appropriate state ("Application to Alter a Natural Stream" administered by the Division of Water Rights) and/or federal ("404 permit" administered by Army Corps of Engineers) permits will be required. Where flows will be altered, instream flow needs of fisheries, benthos and channel/habitat maintenance needs to be determined through an acceptable methodology. Also, consumptive uses of water resulting in depleted flows within the Colorado River basin will impact endangered fish species necessitating consultation with the U.S. Fish and Wildlife Service.

Crossing culverts must be installed with gradients less than 0.5 percent and must have a natural bottom and/or devices for reducing stream velocity so that fish migration is not inhibited. Bridge design must consider fish passage needs and riparian habitat protection--clear span bridges are recommended. A reclamation plan for a stream or lake would necessitate high level studies providing for measurement of the physical and chemical characters of the water
channel morphology or lake bottom/shoreline characteristics prior to disturbance.

Adequate precautions must be taken to keep all forms of coal or other sediments contained. They must not be inadvertently deposited in locations where the material could be transported during a precipitation event into a perennial stream. This would include "blow-coal" as fugitive dust from conveyance systems, haulage trucks, railroads or storage piles. Control of larger coal particles from the above sources is equally important. If needed, haulage vessels or storage sites should be covered, or the surface of the coal appropriately sprayed in order to solidify it against wind movement. The impacts of coal or other sediments on aquatic ecosystems are many and varied. Therefore, sediments must be kept out of those systems.

Mitigation and Impact Avoidance Procedures for Terrestrial Habitats

It is recommended that all marshland and riparian ecosystems be maintained or enhanced. A State goal is avoidance of a net loss of these highly productive and unique habitats. All impacts will require mitigation that results in replacement by creation of new habitat. Roads crossing through those areas should do so in a manner that is least damaging to the habitat. Marshlands and riparian ecosystems are ranked as being of critical value and are the most productive sites in terms of herbage and biota produced as compared to other local habitat types. It is probable that a majority of the vertebrate wildlife that inhabit the project area make some use of riparian or marshland areas.

It is important to note that roads and other surface facilities to be constructed should as far as practicable be sited where they will not compromise wildlife or their use areas. Also, surface facilities, including
roads, should be screened if possible from wildlife use areas by vegetation or terrain.

In situations where wildland habitats have been or will be disturbed, reclamation is required. Also, there are sites where development or enhancement of wildland habitats through vegetation treatments and/or seedings or transplants of seedlings could benefit wildlife. Seedings should take place in the fall after a permanent killing frost has occurred. Seedling transplants should occur in the spring just after snow melt in order to best advantage local soil moisture conditions.

Temporary control of rodents may be required to ensure a successful rangeland treatment. It is recommended that the State Department of Agriculture be consulted in this area of concern. Poisoned oats are the most common and acceptable method for rodent control; however, only licensed persons may apply the treatment.

Currently, there are some new concepts in methodology for revegetation that are being successfully implemented in other parts of the nation and world. One promising method is a procedure where a large scoop removes, from a natural and stabilized site, a small area of earth intact with vegetation and subsurface soils for placement on a site to be restored. This same procedure can be utilized when disturbing pristine sites, except that the native vegetation is stored for use in latent reclamation. Another meritorious method for stimulating natural revegetation, in combination with other reclamation techniques, is to plan facility developments so that islands of natural, native vegetation remain. This will allow for natural vegetation to spread from the islands. These techniques can also be useful for enhancement of poor quality sites that currently exist on the mine plan area.

There are also new specialized techniques coming to the forefront for stabilization of problem sites such as roadbanks and steep slopes. It is
important that these sites be promptly and permanently revegetated in order to reduce siltation into local hydric ecosystems. This will lessen damage to aquatic wildlife populations and habitats from siltation.

As a service and also to ensure that the needs of wildlife are met, the various expertism within the Division of Wildlife Resources are available to the company for consultation. For the most part, Larry Dalton, Resource Analyst, for the Southeastern Regional office at 455 West Railroad Avenue in Price, Utah 84501 (phone 801-637-3310) will coordinate any needed contacts. Richard Stevens, Wildlife Biologist, at the Great Basin Research Center, Box 704, in Ephraim, Utah 84627 (phone 801-283-4441) is available for consultation and site specific analysis concerning species for vegetation plantings, timing and technique to achieve the best results.

In instances where revegetation projects are to be planned over refuse areas, heavy metal uptake by the plants must be evaluated. It is recommended that the company initiate an appropriate long-term monitoring program to determine the magnitude and resolutions, if needed, for this problem.

Mitigation and Impact Avoidance Procedures for Amphibians and Reptiles

Enhancement or development of habitats that provides a diversity of vegetation will benefit amphibians and reptiles. It is important to note that all of these species are protected by Utah law. Due to the myriad of myths that surround these animals, it is urged that individual specimens not be destroyed. This is especially true for snakes since they are a valuable component of the ecosystem.

Snake dens are ranked as being of critical value to the population and are protected by law. If a den is located, it should be reported to the Utah Division of Wildlife Resources. Snake dens can be moved, but only with intensive efforts that may take a year or more (snakes are caught and removed...
in the spring and fall). Thus, construction of facility developments may take place in denning locations if there is sufficient lead time to relocate the occupants.

Mitigation and Impact Avoidance Procedures for Avifauna

It is recognizable that development and operation of a mining project will in some cases negatively impact many avian species. Physical destruction of habitats and continual disturbance that makes other habitats unavailable or less desirable to an individual bird are typical. It is also true that impacts that are negative to one specie may be beneficial to another specie. It is recommended that the Company plant native and/or exotic (ornamental species are acceptable) berry producing shrubs and other desirable seed producing plants around surface facilities. This will provide food and cover for many of the smaller species of birds, resulting in enhancement of their substantial and high-priority valued habitats. This action would also mitigate for disturbances and destruction of avifauna habitats at other sites associated with project operations.

It is important to note that the nests of all avifauna when active and their eggs are protected by federal (Federal Migratory Bird Treat Act) or state laws (Utah Code 23-17-1 and 23-17-2). Note that raptor stick nests are protected regardless of being actively occupied or not. All avifauna utilize a nest during their reproductive process. Dependent upon the species, some nests are well developed while others may be represented by only a scrape on the ground. These sites when being utilized are critical to maintenance of individual bird populations. Each of the species has a specific crucial time period in which their nest would be occupied. It is during this crucial period that the nest must be protected from disturbance.

Riparian and marshland areas need to have complete protection from
disturbance between mid-March and mid-June due to the crucial spring migration and nesting season of waterfowl. Disturbance should be significantly limited from mid-June through mid-October in order to protect the high-priority habitat values for brooding, moulting and fall migration of waterfowl.

Several species of raptors frequent the project area. Their nests when active should not be disturbed, and abandoned stick nests are never to be damaged. Every effort should be made to eliminate man's disturbance within visual sight or one-half mile radius of an active raptor nest. Termination of man's use of a site would not be required where eagles or falcons constructed their nest after mining had been initiated. This would demonstrate an individual bird's willingness to tolerate mining activities and the associated disturbance by man.

Roost trees for bald eagles, if located, must not be disturbed or destroyed. Similarly, activities planned for high-priority concentration areas of bald eagles must be designed and implemented so that they are not of significant disturbance to the birds.

As a general comment, whenever active raptor nests are observed or roost trees for bald eagles located, they need to be reported to the Utah Division of Wildlife Resources and the U.S. Fish and Wildlife Service.

All electrical power line support towers and other transmission facilities must be designed to safeguard birds. The guidelines set forth in "Environmental Criteria for Electric Transmission System" published by the USDA and USDI in 1970 and/or the REA Bulletin 61-10 "Powerline Contacts by Eagles and Other Large Birds" are available for company review. It is also recommended that placement of utility poles over flat or rolling terrain be planned so that they are out of view of roads or at least one-quarter mile away from any roads. This will lessen opportunity for illegal killing ("plinking") of these valuable birds. Note that the poles can serve as
suitable hunting perches for raptors. In some instances poles can result in an extension of raptor hunting territories, which would represent a beneficial impact.

During the crucial period of December through February, spruce-fir forests and aspen forests need to be protected from man's disturbance so that blue grouse and ruffed grouse will not be impacted. Destruction of these wildlife habitats at any time of the year need be minimized due to their value to wildlife.

During the spring period (mid-March through mid-June) care needs to be taken that male blue grouse are not disturbed or precluded from establishing breeding territories. Similar precautions need be taken for male ruffed grouse (March through May) in the area of drumming logs.

Mature trees with natural cavities and dead snags need to be protected for use by cavity nesting birds. Trees with such a character are ranked as being of critical value to cavity nesting birds. The project should be planned so that along lake and stream margins or within 500 feet of forest openings three cavity/snag trees per acre are left standing. In dense forested areas two cavity/snag trees per acre must be retained.

Mitigation and Impact Avoidance Procedures for Mammals

The lodges, nests and dens of all mammals or roosts in the instance of bat-like mammals must be protected and represent a critical use area. A crucial period for the aforementioned sites is when they are occupied. Additionally, many species of mammals develop food caches in order to carry individual animals or family groups through periods when they cannot forage. Such sites are of critical value to maintenance of their populations and if located should not be destroyed or subjected to regular disturbance by man.

It is important to realize that within natural ecosystems there exists a
predator-prey relationship. One species of animal may represent a prey source for other species. Therefore, it is important that project operations be designed and implemented so as to not unnecessarily disturb wildlife. Special attention needs to be made to minimize destruction of their habitats.

Haulage of coal between the various mine projects and distribution points should be planned so that impacts to wildlife are lessened. Special concern is elicited by haulage of coal through wintering or other concentration areas for big game. It is recommended that the Company cause coal haulage personnel to use extreme caution so that accidental collisions between motor vehicles and big game are reduced. Without doubt, a reduction in speed would alleviate this problem.

At present the most successful and cost effective technique for reducing deer-highway mortality is a system of warning reflectors. This system (manufactured by Strieter Corporation, 2100 Eighteenth Avenue, Rock Island, Illinois 61201 and known as "Swareflex") is only of value at night time. But, it is during darkness that 90% of deer-highway mortality occurs. Strieter Corporation describes the effect of the reflector system as follows:

"The headlights of approaching vehicles strike the wildlife reflectors which are installed on both sides of the road. Unnoticeable to the driver, these reflect red lights into the adjoining terrain and an optical warning fence is produced. Any approaching wildlife is alerted and stops or returns to the safety of the countryside. Immediately after the vehicle has passed, the reflectors become inactive, thereby permitting the animals to cross safely".

Installation of a wildlife warning reflector system, a reduction in speed of coal-haulage trucks or other mine related traffic, and increased awareness of wildlife values by mine associated employees should result in a reduction of deer-highway mortality problems.

In instances where conveyors, slurry lines or other linear, above-ground structures having potential to be a barrier to big game
movement are to be developed, uninhibited passage opportunity must be provided. Passage opportunity must be provided within reasonable distance of any point where animals encounter the structure. A combination of passage modes is most practicable. A majority length of the structure should be either sufficiently elevated for underpassage or lowered so that animals can jump over. Then strategically located passage structures (sags represented by buried segments, humps represented by elevated segments or overpass ramps) should be placed in areas that remain a barrier.

Underpassage opportunities for animals, including humps, must consider behavior of the target animal species, snow accumulation and vegetation growth as it may influence the passage window. Suggested clearances are as follows (Note, that the greatest clearance is recommended where snow accumulation is a factor): elk, 5.9 to 9.8 feet; deer, 1.6 to 3.3 feet; moose, heights exceeding 5.9 feet; wild sheep, (*Ovis* spp.), 4.9 to 7.8 feet; bison, heights exceeding 6.8 feet.

Humps or sags should extend along the structure as far as possible and overpass ramps should be designed as circular natural appearing mounds bisected by the structure. Width requirements probably vary with species, but 10 feet is recommended and side slopes could vary from 20% to 80%, since big game typically negotiate similar natural conditions.

Regardless of passage mode, consideration must be given to development of acceptable habitat on either side of the structure. This will enhance the probability that animals will make use of the crossing opportunity.
APPENDIX G

GARLEY CANYON SPRING

WATER RIGHTS/ANALYSES
September 28, 1984

Tower Resources Inc.
P.O. Box 902
Price, UT 84501

Dear Applicant:

RE: APPROVED APPLICATION
NUMBER 91-4303 (A59754)

Enclosed is a copy of the above-numbered approved Application. This is your authority to proceed with actual construction work which, under Sections 73-3-10 and 73-3-12, Utah Code Annotated, 1953, as amended, must be diligently prosecuted to completion. The water must be put to beneficial use and proof of appropriation be made to the State Engineer on or before the proof due date shown below otherwise, the application will be lapsed.

*** PROOF DUE DATE: February 28, 1988 ***

Proof of Appropriation is evidence to the State Engineer that the water has been placed to its full intended beneficial use. By law, it must be prepared by a registered engineer or land surveyor, who will certify to the location and the uses for the water. Your proof of appropriation will become the basis for the extent of your water right.

Failure on your part to comply with the requirements of the statutes may result in the forfeiture of this application.

Yours truly,

Dee C. Hansen, P.E.
State Engineer

Enclosure: Copy of Approved Application

Received
OCT 1 1984

Tower Resources Inc.
APPLICATION TO APPROPRIATE WATER
STATE OF UTAH

NOTE: The information given in the following blanks should be free from explanatory matter, but when necessary, a complete supplementary statement should be made on the following page under the heading "Explanations."

For the purpose of acquiring the right to use a portion of the unappropriated water of the State of Utah, for uses indicated by (X) in the proper box or boxes, application is hereby made to the State Engineer, based upon the following showing of facts, submitted in accordance with the requirements of the Laws of Utah:

1. Irrigation (X) Domestic (X) Stockwatering (X) Municipal (X) Power (X) Mining (X) Other Uses (X)
2. The name of the applicant is Tower Resources, Inc.
3. The Post Office address of the applicant is P.O. Box 902, Price, Utah, 84501
4. The quantity of water to be appropriated is 0.1 second-feet and/or 0.1 acre-feet
5. The water is to be used for Dust Suppression from Jan. 1 to Dec. 31
   (Major Purpose) (Month) (Day) (Month) (Day)
   (Minor Purpose) (Month) (Day) (Month) (Day)
   (If Use Period) (Month) (Day) (Month) (Day)
   and stored each year (if stored) from
   (Month) (Day) (Month) (Day)

6. The drainage area to which the direct source of supply belongs is ____________

7. The direct source of supply is a spring in Carbon County, situated at a point
   48° 10' 00" north, and 110° 14' 00" east, south of the Northeast Corner of Section 4, Township 14 South, Range 9 East, SLBM. See Map
   (31/2 miles NW of Price)

8. The point of diversion from the source is in Carbon County, situated at a point
   48° 10' 00" north, and 110° 14' 00" east, south of the Northeast Corner of Section 4, Township 14 South, Range 9 East, SLBM. See Map
   (31/2 miles NW of Price)

9. The diverting and carrying works will consist of a catch basin and a 2" pipeline for
   approximately .1 mile (with pump)

10. If water is to be stored, give capacity of reservoir in acre-feet ____________ height of dam ____________
    Water may be stored in a steel or fiberglass tank (5000 gal.)

11. If application is for irrigation purposes, the legal subdivisions of the area irrigated are as follows:
    Total Acres

12. Is the land owned by the applicant? Yes (X) No ( ). If "No," explain on page 2.

13. Is this water to be used supplementally with other water rights? Yes (X) No ( ).
    If "yes," identify other water rights on page 2.

14. If application is for power purposes, describe type of plant, size and rated capacity, N/A.

15. If application is for mining, the water will be used in ____________ Mining District at

16. If application is for stockwatering purposes, number and kind of stock watered ____________

17. If application is for domestic purposes, number of persons ____________ or families ____________

18. If application is for municipal purposes, name of municipality, N/A.

19. If application is for other uses, include general description of proposed use of water: ____________

20. Give place of use by legal subdivision of the United States Land Survey for all uses described in paragraphs 14 to 19, inc. ____________ Township ____________ Section ____________ Range ____________

21. The use of water at point forth in this application will resume 0.1 second-feet and/or 0.1 acre-feet from the water and all unused water, and feet and, acre feet will be returned to the natural stream or source at a point described as follows: ____________

__________________________
Application Made To

__________________________
(Official Use Only)

__________________________
Applicant Signature

__________________________
Attorney Signature

__________________________
Applicant Name

__________________________
Attorney Name

__________________________
Address

__________________________
City, State, Zip
EXPLANATORY

The following additional facts are set forth in order to define more clearly the full purpose of the proposed application:

Regarding question 12, the land is not owned by Tower Resources. It is owned by the Bureau of Land Management. However, this diversion point is located within a lease on this land controlled by Tower.

(Use page 4 if additional explanatory is needed.)

The quantity of water sought to be appropriated is limited to that which can be beneficially used for the purpose herein described.

Signature of Applicant

*If applicant is a corporation or other organization, signature must be the name of such corporation or organization by its proper officer, or in the name of the partnership by one of the partners, and the names of the other partners shall be listed. If a corporation or partnership, the affidavit below need not be filled in. If there is more than one applicant, a power of attorney, authorizing one to act for all, should accompany the Application.

DECLARATION OF CITIZENSHIP

STATE OF UTAH, County of

On the day of, 19, personally appeared before me, a notary public for the State of Utah, the above applicant who, on oath, declared that he is a citizen of the United States, or has declared his intention to become such a citizen.

My commission expires:

(SEAL)

Notary Public
FEES FOR APPLICATIONS TO APPROPRIATE WATER IN UTAH

Flow rate — c.f.s. | Cost
--- | ---
0.0 to 0.1 | $15.00
over 0.1 to 0.5 | 30.00
over 0.5 to 1.0 | 45.00
over 1.0 to 15.0 | 45.00 plus $7.50 for each cfs above the first cubic foot per second.
over 15.0 | 150.00

Storage — acre-feet

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<tr>
<td>over 20 to 500</td>
<td>45.00</td>
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<tr>
<td>over 500 to 7500</td>
<td>45.00 plus $7.50 for each 500 a.f. above the first</td>
</tr>
<tr>
<td>over 7500</td>
<td>150.00</td>
</tr>
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</table>

(This section is not to be filled in by applicant)

STATE ENGINEER'S ENDORSEMENTS

1. MAR 9, 1984 Application received by mail in State Engineer's office by...
2. Priority of Application brought down to, on account of...
3. MAR 12, 1984 Application fee, $15.00, received by Rec. No. 0126-3
4. MAR 22, 1984 Application microfilmed by M. Roll No. 026-3
5. MAR 22, 1984 Indexed by Platted by...
6. JUN 28, 1984 Application examined by...
7. Application returned, or corrected by office...
8. Corrected Application resubmitted by mail over counter to State Engineer's office...
9. JUN 29, 1984 Application approved for advertisement by...
10. MAR 30, 1984 Notice to water users prepared by...
11. APR 1, 1984 Publication began; was completed APR 2, 1984
12. APR 2, 1984 Notice published in Utah Adv...
13. JUN 2, 1984 Proof slips checked by...
14. JUN 4, 1984 Publisher paid by M.E.V. No...
15. Hearing held by...
16. Field examination by...
17. JUN 14, 1984 Application designated for rejection...
18. JUN 28, 1984 Application copied or photostated by.... proofread by...
19. JUN 28, 1984 Application approved
20. Conditions:
   a. Actual construction work shall be diligently prosecuted to completion.
   b. Proof of Appropriation shall be submitted to the State Engineer's office by...
   c. 

   Dee C. Hansen, P.E., State Engineer

21. Time for making Proof of Appropriation extended to...
23. Certificate of Appropriation, No... issued
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<td>Zinc</td>
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APPENDIX H

SEDIMENT POND CERTIFICATIONS AND R-69 FORMS
Certification of Sediment Pond "A"
Wildcat Loadout

I, Dan W. Guy, a registered professional engineer, State of Utah No. 4548, do hereby certify that the Sediment Control Pond "A" at the Wildcat Loadout has been constructed in accordance with the plan and design criteria set forth in the Permit Application Package and meets the required performance standards outlined in UMC 817.46.
Certification of Sediment Pond "B"
Wildcat Loadout

I, Dan W. Guy, a registered professional engineer, State of Utah No. 4548, do hereby certify that the Sediment Control Pond "B" at the Wildcat Loadout has been constructed in accordance with the plan and design criteria set forth in the Permit Application Package and meets the required performance standards outlined in UMC 817.46.
Certification of Sediment Pond "C"  
Wildcat Loadout

I, Dan W. Guy, a registered professional engineer, State of Utah No. 4548, do hereby certify that the Sediment Control Pond "C" at the Wildcat Loadout has been constructed in accordance with the plan and design criteria set forth in the Permit Application Package and meets the required performance standards outlined in UMC 817.46.
Certification of Sediment Pond "D"
Wildcat Loadout

I, Dan W. Guy, a registered professional engineer, State of Utah No. 4548, do hereby certify that the Sediment Control Pond "D" at the Wildcat Loadout has been constructed in accordance with the plan and design criteria set forth in the Permit Application Package and meets the required performance standards outlined in UMC 817.46.
Certification of Sediment Pond "E"
Wildcat Loadout

I, Dan W. Guy, a registered professional engineer, State of Utah No. 4548, do hereby certify that the Sediment Control Pond "E" at the Wildcat Loadout has been constructed in accordance with the plan and design criteria set forth in the Permit Application Package and meets the required performance standards outlined in UMC 817.46, with the exception that the pond, as presently constructed, is of insufficient size to contain the calculated volume of runoff and sediment from the drainage area to the Pond from a 10 year - 24 hour storm event. The pond is therefore scheduled to be enlarged to accommodate the required volume of runoff.
Certification of Sediment Pond "F"
Wildcat Loadout

I, Dan W. Guy, a registered professional engineer, State of Utah No. 4548, do hereby certify that the Sediment Control Pond "F" at the Wildcat Loadout has been constructed in accordance with the plan and design criteria set forth in the Permit Application Package and meets the required performance standards outlined in UMC 817.46.
April 27, 1988

Mr. Robert L. Morgan, P.E.
State Engineer
Utah Division of Water Rights
1636 West North Temple
Suite 220
Salt Lake City, Utah 84116-3156

Re: Andalex Resources, Inc.
Wildcat Loadout
PRO/007/033, #2
Carbon County, Utah

Dear Mr. Morgan:

Enclosed are R-69 forms for each of our six sediment ponds at the Wildcat Loadout Facility, along with maps and a Pond Specification Summary.

The Wildcat Loadout Facility was constructed in 1985 and all ponds were placed at that time. Recent changes in the Surface Mining Regulations have brought this facility under the permitting requirements of the Division of Oil, Gas, and Mining.

The site is relatively flat, with an average slope of approximately 5%. As a result, the sediment ponds are mostly incised, with little (if any) of the "dam" above natural ground level.

The ponds are used only for sediment control for disturbed area runoff, and do not involve storage of water for any use other than settling and discharge, in accordance with an approved NPDES Discharge Permit. No water rights are involved or impacted by these ponds.
I hope this information is satisfactory. If you have any questions or need any further information, please let me know.

Sincerely,

Michael W. Glasson
Senior Geologist

MWG/as

Enclosures

cc: Mark Page, Price Area Engineer
File
APPLICATION TO CONSTRUCT
A DAM IMPOUNDING LESS
THAN 20 ACRE-FEET

STATE OF UTAH

Application No._____
Received ________
Entered ________

The following application is submitted, pursuant to Section 73-5-12
of the Utah Code Annotated 1953, to obtain the authority to build a
dam which will create a reservoir impounding less than 20 acre-feet

1. APPLICANT INFORMATION

<table>
<thead>
<tr>
<th>NAME</th>
<th>Andalex Resources, Inc. Wildcat Loadout</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS</td>
<td>P.O. Box 902</td>
</tr>
<tr>
<td>CITY</td>
<td>Price</td>
</tr>
<tr>
<td>STATE</td>
<td>Utah</td>
</tr>
<tr>
<td>ZIP</td>
<td>84501</td>
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2. PURPOSE OF DAM

<table>
<thead>
<tr>
<th></th>
<th>STOCK POND</th>
<th>REGULATING RES.</th>
<th>DIVERSION DAM</th>
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<tbody>
<tr>
<td></td>
<td>IRRIGATION</td>
<td>DEBRIS BASIN</td>
<td>FLOOD CONTROL</td>
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<td></td>
<td>SEDIMENTATION</td>
<td>TAILINGS POND</td>
<td>RECREATION</td>
</tr>
<tr>
<td></td>
<td>OTER (describe)</td>
<td>(Sediment Pond &quot;A&quot;)</td>
<td></td>
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3. LOCATION OF DAM

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<th>NWSE</th>
<th>SECTION</th>
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<tr>
<td>TOWNSHIP</td>
<td>13 S.</td>
<td>RANGE</td>
<td>9 E.</td>
</tr>
<tr>
<td>BASE &amp; MERIDIAN</td>
<td></td>
<td></td>
<td>S.L.B.&amp;M.</td>
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4. PROPOSED DAM

<table>
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<th></th>
<th>DAM HEIGHT (vertical distance)</th>
<th>9.5 FEET</th>
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<td></td>
<td>CREST LENGTH (length of top of dam)</td>
<td>150 FEET</td>
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<tr>
<td></td>
<td>CREST WIDTH (width of top of dam)</td>
<td>15 FEET</td>
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<tr>
<td></td>
<td>UPSTREAM SLOPE</td>
<td>VERTICAL ON</td>
</tr>
<tr>
<td></td>
<td>DOWNSTREAM SLOPE</td>
<td>VERTICAL ON</td>
</tr>
<tr>
<td></td>
<td>WATER SURFACE AREA AT SPILLWAY CREST</td>
<td>0.66 ACRES</td>
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<tr>
<td></td>
<td>RESERVOIR CAPACITY AT SPILLWAY CREST</td>
<td>2.410 AC.PT.</td>
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<tr>
<td></td>
<td>TYPE OF DAM (i.e. earthfill, concrete, etc.,)</td>
<td>Earthfill (Pond mostly incised)</td>
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5. PROPOSED OUTLET

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<th>18 INCHES</th>
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<td>60 FEET</td>
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<tr>
<td>TYPE OF PIPE</td>
<td>Steel</td>
</tr>
<tr>
<td>TYPE OF GATE OR VALVE</td>
<td>None (Inverted inlet)</td>
</tr>
<tr>
<td>LOCATION OF GATE (upstream, downstream, center, etc.,)</td>
<td>None</td>
</tr>
</tbody>
</table>

(OVER)
6. PROPOSED SPILLWAY

| CREST LENGTH (width of bottom of spillway) | 4 FEET |
| DEPTH (from bottom of spillway to top of dam) | 1 FEET |
| TYPE (i.e. earth channel, pipe, etc.) | Earth channel |
| CONTROL (i.e. gates, flashboards, etc.) | None |

7. WATER RIGHTS

DESCRIBE (See Instructions) N/A

8. COMMENTS

This is a sediment control structure only. Runoff water is only stored for settling purposes and then may be discharged per an NPDES Permit.

9. PLANS

Attach any plans sketches or diagrams which will clarify the information given on this application. (See Attached Plate 3)

The undersigned acknowledge they have read the instructions included with this application, and are aware no construction is to begin until this application has been approved by the Utah State Engineer.

4/27/88
Date

Signature of Applicant

Water Rights in Order By _____ Date ______
Area Engineer's Hazard Rating By ______ Date ______
Reviewed by Dam Safety By _____ Date ______
Comments ________________

Date of Approval __________
Robert L. Morgan, P.E.
State Engineer
APPLICATION TO CONSTRUCT
A DAM IMPOUNDING LESS
THAN 20 ACRE-FEET

STATE OF UTAH

The following application is submitted, pursuant to Section 73-5-12
of the Utah Code Annotated 1953, to obtain the authority to build a
dam which will create a reservoir impounding less than 20 acre-feet

1. APPLICANT INFORMATION

NAME Andalex Resources, Inc.—Wildcat Loadout
ADDRESS P.O. Box 902
CITY Price
STATE Utah
COUNTY OF DAM Carbon
ZIP 84501

2. PURPOSE OF DAM

STOCK POND REGULATING RES. DIVERSION DAM
IRRIGATION DEBRIS BASIN FLOOD CONTROL
SEDIMENTATION TAILINGS POND RECREATION
OTHER (describe) (Sediment Pond "B")

3. LOCATION OF DAM

QUARTER/QUARTER (i.e. NESW) NWSE SECTION 33
TOWNSHIP 13 S. RANGE 9 E. BASE & MERIDIAN S.L.B.6M.

4. PROPOSED DAM

DAM HEIGHT (vertical distance) 6.0 FEET
CREST LENGTH (length of top of dam) 80 FEET
CREST WIDTH (width of top of dam) 13 FEET
UPSTREAM SLOPE 1 VERTICAL ON 5 HORIZONTAL
DOWNSTREAM SLOPE 1 VERTICAL ON 2 HORIZONTAL
WATER SURFACE AREA AT SPILLWAY CREST 0.13 ACRES
RESERVOIR CAPACITY AT SPILLWAY CREST 0.310 AC.FT.
TYPE OF DAM (i.e. earthfill, concrete, etc.) Earthfill (Pond mostly incised)

5. PROPOSED OUTLET

INSIDE DIAMETER 12 INCHES LENGTH 40 FEET
TYPE OF PIPE (i.e. concrete, steel, etc.) Steel
TYPE OF GATE OR VALVE None (Inverted Inlet)
LOCATION OF GATE (upstream, downstream, center, etc.) None

(OVER)
6. PROPOSED SPILLWAY

| CREST LENGTH (width of bottom of spillway) | 4.0 FEET |
| DEPTH (from bottom of spillway to top of dam)  | 1.0 FEET |
| TYPE (i.e. earth channel, pipe, etc.)  | Earth Channel |
| CONTROL (i.e. gates, flashboards, etc.)  | None |

7. WATER RIGHTS

DESCRIBE (See Instructions)  N/A

8. COMMENTS

This is a sediment control structure only. Runoff water is only stored for settling purposes and then may be discharged per an NPDES Permit.

9. PLANS

Attach any plans sketches or diagrams which will clarify the information given on this application. (See Attached Plate 4)

The undersigned acknowledge they have read the instructions included with this application, and are aware no construction is to begin until this application has been approved by the Utah State Engineer

Robert L. Morgan, P. E.
State Engineer
APPLICATION TO CONSTRUCT
A DAM IMPounding LESS
THAN 20 ACRE-FEET

STATE OF UTAH

The following application is submitted, pursuant to Section 73-5-12
of the Utah Code Annotated 1953, to obtain the authority to build a
dam which will create a reservoir impounding less than 20 acre-feet

1. APPLICANT INFORMATION

NAME Andalex Resources, Inc. - Wildcat Loadout
ADDRESS P.O. Box 902
CITY Price COUNTY OF DAM Carbon
STATE Utah ZIP 84501

2. PURPOSE OF DAM

STOCK POND ______ REGULATING RES. ______ DIVERSION DAM ______
IRRIGATION ______ DEBRIS BASIN ______ FLOOD CONTROL ______
SEDIMENTATION _____ TAILINGS POND _____ RECREATION _____
OTHER (describe) (Sediment Pond "C") ______

3. LOCATION OF DAM

QUARTER/QUARTER (i.e. NESW) NWSE SECTION 33
TOWNSHIP 13 S. RANGE 9 E. BASE & MERIDIAN S.L.B.M.

4. PROPOSED DAM

DAM HEIGHT (vertical distance) 13 FEET
CREST LENGTH (length of top of dam) 280 FEET
CREST WIDTH (width of top of dam) 26 FEET
UPSTREAM SLOPE 1 VERTICAL ON 3 HORIZONTAL
DOWNSTREAM SLOPE 1 VERTICAL ON 2 HORIZONTAL
WATER SURFACE AREA AT SPILLWAY CREST 0.86 ACRES
RESERVOIR CAPACITY AT SPILLWAY CREST 4,430 AC.FT.
TYPE OF DAM (i.e. earthfill, concrete, etc.) Earthfill (Pond mostly incised)

5. PROPOSED OUTLET

INSIDE DIAMETER 18 INCHES LENGTH 60 FEET
TYPE OF PIPE (i.e. concrete, steel, etc.) Steel
TYPE OF GATE OR VALVE None (Inverted Inlet)
LOCATION OF GATE (upstream, downstream, center, etc.) None

(OVER)
6. PROPOSED SPILLWAY

- CREST LENGTH (width of bottom of spillway) 18" Dia. FEET
- DEPTH (from bottom of spillway to top of dam) 2.0 FEET
- TYPE (i.e. earth channel, pipe, etc.) Pipe

CONTROL (i.e. gates, flashboards, etc.) None
(Emergency Spillway Only)

7. WATER RIGHTS

DESCRIBE (See Instructions) N/A

8. COMMENTS

This is a sediment control structure only. Runoff water is only stored for settling purposes and then may be discharged per an NPDES Permit.

9. PLANS

Attach any plans sketches or diagrams which will clarify the information given on this application. (See Attached Plate 5)

The undersigned acknowledge they have read the instructions included with this application, and are aware no construction is to begin until this application has been approved by the Utah State Engineer.

4-27-88 Date

Signature of Applicant

Water Rights in Order By ___ Date ___

Area Engineer's Hazard Rating By ___ Date ___

Reviewed by Dam Safety By ___ Date ___

Comments __________________________

Date of Approval __________________

Robert L. Morgan, P.E.
State Engineer
APPLICATION TO CONSTRUCT
A DAM IMPOUNDING LESS THAN 20 ACRE-FEET

STATE OF UTAH

The following application is submitted, pursuant to Section 73-5-12 of the Utah Code Annotated 1953, to obtain the authority to build a dam which will create a reservoir impounding less than 20 acre-feet.

1. APPLICANT INFORMATION

NAME: Andalex Resources, Inc. - Wildcat Loadout
ADDRESS: P.O. Box 902
CITY: Price
COUNTY OF DAM: Carbon
STATE: Utah
ZIP: 84501

2. PURPOSE OF DAM

STOCK POND
IRRIGATION
SEDIMENTATION
OTHER (describe)

REGULATING RES.
DEBRIS BASIN
TAILINGS POND
(Sediment Pond "p")

DIVERSION DAM
FLOOD CONTROL
RECREATION

3. LOCATION OF DAM

QUARTER/QUARTER (i.e. NESW)
TOWNSHIP 13 S.
RANGE 9 E.
BASE & MERIDIAN S.L.B.&M.

4. PROPOSED DAM

DAM HEIGHT (vertical distance): 9.0 FEET
CREST LENGTH (length of top of dam): 100 FEET
CREST WIDTH (width of top of dam): 15 FEET
UPSTREAM SLOPE: 1 VERTICAL ON 3 HORIZONTAL
DOWNSTREAM SLOPE: 1 VERTICAL ON 2 HORIZONTAL
WATER SURFACE AREA AT SPILLWAY CREST: 0.29 ACRES
RESERVOIR CAPACITY AT SPILLWAY CREST: 0.880 AC.FT.
TYPE OF DAM (i.e. earthfill, concrete, etc.): Earthfill (Pond Mostly Incised)

5. PROPOSED OUTLET

INSIDE DIAMETER: 18 INCHES
LENGTH: 80 FEET
TYPE OF PIPE: Steel
TYPE OF GATE OR VALVE: None (Inverted Inlet)
LOCATION OF GATE: None

(OVER)
6. PROPOSED SPILLWAY

<table>
<thead>
<tr>
<th>Feature</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREST LENGTH (width of bottom of spillway)</td>
<td>18&quot; Dia. FEET</td>
</tr>
<tr>
<td>DEPTH (from bottom of spillway to top of dam)</td>
<td>2.8 FEET</td>
</tr>
<tr>
<td>TYPE (i.e. earth channel, pipe, etc.)</td>
<td>Pipe</td>
</tr>
<tr>
<td>CONTROL (i.e. gates, flashboards, etc.)</td>
<td>None</td>
</tr>
</tbody>
</table>

(Emergency Spillway Only)

7. WATER RIGHTS

<table>
<thead>
<tr>
<th>Describe (See Instructions)</th>
<th>N/A</th>
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8. COMMENTS

This is a sediment control structure only. Runoff water is only stored for settling purposes and then may be discharged per an NPDES Permit.

9. PLANS

Attach any plans sketches or diagrams which will clarify the information given on this application. (See Attached Plate 4)

The undersigned acknowledge they have read the instructions included with this application, and are aware no construction is to begin until this application has been approved by the Utah State Engineer.

Robert L. Morgan, P.E.
State Engineer

Date
Signature of Applicant

Water Rights in Order
Area Engineer's Hazard Rating
Reviewed by Dam Safety
Comments

Date

Date

Date

Date

Date of Approval

Robert L. Morgan, P.E.
State Engineer
APPLICATION TO CONSTRUCT
A DAM IMPOUNDING LESS
THAN 20 ACRE-FEET

STATE OF UTAH

Application No. _____
Received _____
Entered ______

The following application is submitted, pursuant to Section 73-5-12 of the Utah Code Annotated 1953, to obtain the authority to build a dam which will create a reservoir impounding less than 20 acre-feet

1. APPLICANT INFORMATION

NAME Andalex Resources, Inc. - Wildcat Loadout
ADDRESS P.O. Box 902
CITY Price
STATE Utah
COUNTY OF DAM Carbon
ZIP 84501

2. PURPOSE OF DAM

STOCK POND REGULATING RES. DIVERSION DAM
IRRIGATION DEBRIS BASIN FLOOD CONTROL
SEDIMENTATION TAILINGS POND RECREATION
OTHER (describe) (Sediment Pond "E")

3. LOCATION OF DAM

QUARTER/QUARTER (i.e. NESW) NWSE SECTION 33
TOWNSHIP 13 S. RANGE 9 E. BASE & MERIDIAN S.L.B.&M.

4. PROPOSED DAM

DAM HEIGHT (vertical distance) 6 FEET
CREST LENGTH (length of top of dam) 150 FEET
CREST WIDTH (width of top of dam) 22 FEET
UPSTREAM SLOPE 1 VERTICAL ON 3 HORIZONTAL
DOWNSTREAM SLOPE 1 VERTICAL ON 2 HORIZONTAL
WATER SURFACE AREA AT SPILLWAY CREST 0.17 ACRES
RESERVOIR CAPACITY AT SPILLWAY CREST 0.849 AC. FT.
TYPE OF DAM (i.e. earthfill, concrete, etc.,) Earthfill (Pond Mostly Incised)

5. PROPOSED OUTLET

INSIDE DIAMETER 18 INCHES LENGTH 45 FEET
TYPE OF PIPE (i.e. concrete, steel, etc.,) Steel
TYPE OF GATE OR VALVE None (Inverted Inlet)
LOCATION OF GATE (upstream, downstream, center, etc.,) None

(OVER)
6. PROPOSED SPILLWAY

CREST LENGTH (width of bottom of spillway) 4 FEET
DEPTH (from bottom of spillway to top of dam) 1 FEET
TYPE (i.e. earth channel, pipe, etc.) Earth Channel

CONTROL (i.e. gates, flashboards, etc.) None
(Emergency Spillway Only)

7. WATER RIGHTS

DESCRIBE (See Instructions) N/A

8. COMMENTS

This is a sediment control structure only. Runoff water is only stored for settling purposes, and then may be discharged per an NPDES Permit.

9. PLANS

Attach any plans sketches or diagrams which will clarify the information given on this application. (See Attached Plate 6)

The undersigned acknowledge they have read the instructions included with this application, and are aware no construction is to begin until this application has been approved by the Utah State Engineer.

[Signature]
Date

Water Rights in Order By Date
Area Engineer's Hazard Rating By Date
Reviewed by Dam Safety By Date
Comments

Date of Approval

Robert L. Morgan, P.E.
State Engineer
APPLICATION TO CONSTRUCT
A DAM IMPOUNDING LESS THAN 20 ACRE-FEET

STATE OF UTAH

Application No.
Received
Entered

The following application is submitted, pursuant to Section 73-5-12 of the Utah Code Annotated 1953, to obtain the authority to build a dam which will create a reservoir impounding less than 20 acre-feet.

1. APPLICANT INFORMATION

NAME Andalex Resources, Inc. Wildcat Loadout
ADDRESS P.O. Box 902
CITY Price
STATE Utah
COUNTY OF DAM Carbon
ZIP 84501

2. PURPOSE OF DAM

STOCK POND REGULATING RES. DIVERSION DAM
IRRIGATION DEBRIS BASIN FLOOD CONTROL
SEDIMENTATION TAILINGS POND RECREATION
OTHER (describe) (Sediment Pond "F")

3. LOCATION OF DAM

QUARTER/QUARTER (i.e. N.E.S.W.) NWSE SECTION 33
TOWNSHIP 13 S. RANGE 9 E. BASE & MERIDIAN S.L.B.&M.

4. PROPOSED DAM

DAM HEIGHT (vertical distance") 7.0 FEET
CREST LENGTH (length of top of dam) 100 FEET
CREST WIDTH (width of top of dam) 20 FEET
UPSTREAM SLOPE 1 VERTICAL ON 2 HORIZONTAL
DOWNSTREAM SLOPE 1 VERTICAL ON 3 HORIZONTAL
WATER SURFACE AREA AT SPILLWAY CREST 0.18 ACRES
RESERVOIR CAPACITY AT SPILLWAY CREST 0.700 AC.FT.
TYPE OF DAM (i.e. earthfill, concrete, etc.,) Earthfill (Pond Mostly Incised)

5. PROPOSED OUTLET

INSIDE DIAMETER 12 INCHES LENGTH 35 FEET
TYPE OF PIPE (i.e. concrete, steel, etc.,) Steel
TYPE OF GATE OR VALVE None (Inverted Inlet)
LOCATION OF GATE (upstream, downstream, center, etc.,) None

(OVER)
6. PROPOSED SPILLWAY

| CREST LENGTH (width of bottom of spillway) | 4 FEET |
| DEPTH (from bottom of spillway to top of dam) | 1 FEET |
| TYPE (i.e. earth channel, pipe, etc.) | Earth Channel |
| CONTROL (i.e. gates, flashboards, etc.) (Emergency Spillway Only) | None |

7. WATER RIGHTS

DESCRIBE (See Instructions) | N/A

8. COMMENTS

This is a sediment control structure only. Runoff water is only stored for settling purposes and may be discharged per an NPDES Permit.

9. PLANS

Attach any plans sketches or diagrams which will clarify the information given on this application. (See Attached Plate 7)

The undersigned acknowledge they have read the instructions included with this application, and are aware no construction is to begin until this application has been approved by the Utah State Engineer.

Date: April 27, 1988
Signature of Applicant: [Signature]

Water Rights in Order By: [Signature] Date: [Date]
Area Engineer's Hazard Rating: [Signature] Date: [Date]
Reviewed by Dam Safety By: [Signature] Date: [Date]
Comments: [Comments]

Date of Approval: [Date]

Robert L. Morgan, P.E.
State Engineer
APPENDIX I

VEGETATION SURVEY
Baseline Description of

a

Native Sagebrush/Grass Reference Area

at

Wildcat Loadout
(PR 007/033)
NW 1/4 SE 1/4, T. 13 S., R. 9 E.
Carbon County, Utah

for

Andalex Resources, Inc.
P.O. Box 902
Price, Utah 84501

by

Nicholas S. Van Pelt*

August 16, 1988

*Currently temporary research assistant, Dept. of Range Science, Utah State University, Logan 84322-5230; (301) 750-2100, 750-2471. He holds a doctoral degree (1988) in range ecology from the same institution, and specializes in inventory and management problems of pinyon pine-juniper woodlands. His dissertation research was conducted at sites 4 miles west of the location reported herein, and at additional, long-term sites elsewhere in Carbon County.

All fieldwork and analysis was performed by the author. No work connected with this report was done on Utah State University time, nor with USU vehicles.
Introduction

This report is based on a one-day (August 15, 1988) visit to a reference area identified by Andalex and the Division of Oil, Gas, and Mining (hereinafter DOGM) on public (BLM) land 100 yards west of the southern coal stockpile. Work consisted of establishing a measured area perimeter marked at four corners, qualitatively describing the features of the site, obtaining voucher plant specimens, and estimating plant and surficial cover, shrub density, and mean shrub height. Since the area is for reference purposes, no productivity estimates were required from this initial description (DOGM, 1982). However, the recently-published soil survey for the area (Jensen and Borchert 1988) was consulted to learn the range of productivity to be expected for this SCS range site in a relatively dry year.

Location, Soils, and Range Site

The reference area occupies a parcel of typical native range unaffected by coal operations and other ground-disturbing activities. It lies just east of the north-south fence bounding the east side of the loadout area, but is currently unfenced. A low-standard dirt road passes just below (within 40 feet of) the area, affording easy access but not otherwise affecting it. The legal location is the NW 1/4 of the SE 1/4 of section 33, township 13 south, range 9 east, Salt Lake Base and Meridian (see Plate 1 of Mining and Reclamation Plan).

As currently marked, the reference area is rectangular, 300 by 160 feet, with the short sides perpendicular to the contour. The area's size is thus about 48,000 square feet, or 1.10 acre. All observations and sampling were confined to this tract, but the resultant estimates and descriptions apply (except for the drainageway to the north and the disturbed area to the west) to the land encircling this perimeter.

The terrain is convex, faces east-southeast, and has two small, non-incised gullies. The elevation is approximately 6170 feet, with only a 10 to 12-foot difference from the top to the bottom of the area. Slopes range from nearly level to about 8%.

The soil underlying the site belongs to the Hernandez family (Jensen and Borchert, 1988, page 294), and is a fine-loamy, mixed, mesic, Ustollic Calciorhoid. The map unit, 52 (sheet 8 of the soil survey), is in the Semidesert Loam (Wyoming Big Sagebrush) range site. This unit extends well beyond the reference area, signifying that the area, while small, is not atypical of the surrounding soils. The Hernandez soil family and its capabilities are described in detail in the new survey (Jensen and Borchert, 1988), especially on page 45. The geology is alluvim mainly derived from sandstone and shale.

The natural vegetation that typifies the Hernandez soil corresponds very strongly to that currently occupying the reference area.
Land Use and Animal Influences

Although unaffected by coal operations, the reference area is grazed and browsed by cattle, sheep, and mule deer, with most use occurring in fall and winter. Cattle use, judged by manure, ground conditions, and plant composition, is probably very light or incidental, whereas signs of sheep and deer use are considerably more evident. Both sheep and deer pellets are abundant, and two Utah juniper just off the area were severely "high-lined" by wintering deer. However, there are no bed grounds or any other sign of unusual livestock or deer concentrations, such as severe browsing, patches of weed, or devegetated ground.

No vegetation or land treatments (spraying, disking, chaining) have been imposed on the area or its surroundings, nor have non-native forage plants been accidentally or deliberately established on the area.

The reference area serves as habitat for cottontail rabbits and prairie dogs. There was no evidence whatsoever of recent grasshopper depredations. Refer to page 195 of the soil survey for wildlife habitat evaluations of this soil family.

Vegetation and Surficial Conditions

The plant community is dominated by big sagebrush (Artemisia tridentata subspecies wyomingensis and tridentata) and Indian ricegrass (Oryzopsis hymenoides), both common, native species. Subordinate species include galleta (Hilaria jamesii), winterfat (Eurotia lanata), pricklypear (Opuntia sp.), low rabbitbrush (Chrysothamnus viscidiflorus), downy brome (Bromus tectorum), and needleandthread (Stipa comata). Other, much less abundant species and genera noted in the area were:

Trees and shrubs:

- Juniperus osteosperma (Utah juniper) -- one sapling, 4.5' high
- Pinus edulis (Two-needle pinyon) -- one seedling

Forbs:

- Descurainia sp. (Tansymustard)
- Plantago sp. (Wooly indianwheat)
- Machaeranthera sp.
- Oysterplant (Tragopogon sp.) -- two plants

Grasses:

- Sitanion hystrix (bottlebrush squirreltail)
- Crested wheatgrass (Agropyron cristatum) -- one plant

These minor species would not be encountered during normal sampling intensities, are of little importance in the plant community, and show no
signs of increasing. Furthermore, not all of them would necessarily be
found on an equivalent-sized area of this rangeland type, whether natural
or reclaimed. Both pinyon and juniper trees grow close to the reference
area, but are not invading it.

Specimens of most species were collected, and some identifications
were made with the assistance of the USU Extension Range Management
Specialist. After a close search, no extraordinary plant taxa were
observed within the area or around its perimeter, so a negative declaration
regarding T & E species is warranted. The Gordon Creek/Wildcat Canyon area
is not a known locality for endemic or unusual plants.

Much of the soil surface is bare, but there are no signs of
accelerated erosion nor of deposition of soil fines from the adjacent coal
area. Thin traces of coal dust have been deposited on the surface, but
their occurrence is very slight. Moderate sheetwash is the only apparent
influence on the surface; neither rilling, pronounced pedestalizing of
shrubs, nor incipient gullying are evident. At the same time, seasonal
crusting of the soil may limit establishment of new plants, and there is no
microphytic (mosses, algae, and lichens) soil crust whatsoever.

Vegetation Cover and Shrub Density

Fifteen (15) 40-foot (13 m) transects were established throughout the
area to estimate cover by line interception (Canfield 1941). Random
numbers (Steel and Torrie 1980) were used to determine x-y coordinates and
transect orientation. Other work had shown that this sampling intensity
(abot 100 m of line per acre) would yield reasonably precise estimates of
the major cover forms. The following results were obtained:

<table>
<thead>
<tr>
<th>Form &amp; Species</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>80% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Surface</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bare ground</td>
<td>68.1</td>
<td>10.5</td>
<td>64.5 - 71.8</td>
</tr>
<tr>
<td>Litter</td>
<td>10.2</td>
<td>6.5</td>
<td>8.0 - 12.4</td>
</tr>
<tr>
<td>Shrubs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sagebrush</td>
<td>8.7</td>
<td>6.9</td>
<td>6.3 - 11.1</td>
</tr>
<tr>
<td>Winterfat</td>
<td>0.7</td>
<td>1.1</td>
<td>0.3 - 1.1</td>
</tr>
<tr>
<td>Rabbitbrush</td>
<td>0.5</td>
<td>0.9</td>
<td>0.2 - 0.8</td>
</tr>
<tr>
<td>Grasses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>3.5</td>
<td>2.9</td>
<td>2.5 - 4.5</td>
</tr>
<tr>
<td>Galleta</td>
<td>6.2</td>
<td>11.0</td>
<td>2.4 - 10.1</td>
</tr>
<tr>
<td>Downy brome</td>
<td>0.5</td>
<td>1.8</td>
<td>-0.1 - 1.1</td>
</tr>
<tr>
<td>Needleandthread</td>
<td>0.6</td>
<td>0.9</td>
<td>0.3 - 0.9</td>
</tr>
<tr>
<td>Other</td>
<td></td>
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<tr>
<td>Pricklypear</td>
<td>0.2</td>
<td>0.5</td>
<td>0.1 - 0.4</td>
</tr>
</tbody>
</table>

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The two subspecies of sagebrush apparently present (Wyoming and basin) were not distinguished during sampling. The former seems to occupy slightly shallower soils on the interfluves, in a nearly monotypic stand, whereas the latter grows taller and in closer association with other species. However, there is little basis for demarcating two different shrub communities.

Shrub (woody plant) density was estimated with the point-centered quarter method (Cottam and Curtis, 1956; DOGM, 1982), using seventy (70) randomly placed points and measuring distance to plant stems to the nearest inch. The combined density of sagebrush (all sizes, both apparent species), winterfat, and rabbitbrush was estimated as 5,384 plants/acre (80% confidence interval of 4,094 to 7,862 plants/acre).

A supplemental (non-required) measurement taken to help describe the community and its "relative maturity" was a large sample of mature sagebrush heights:

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Mean Height (&quot;')</th>
<th>St. Dev.</th>
<th>80% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>24.7</td>
<td>12.0</td>
<td>24.0&quot; - 25.3&quot;</td>
</tr>
</tbody>
</table>

Thus, the dominant sagebrush plants vary little in height. Very few displayed inflorescences, a possible consequence of browsing pressure. However, sagebrush seedlings are easily abundant enough to ensure perpetuation of the stand for the foreseeable future. Overall, the reference area supports a multi-sized, multi-aged sagebrush component. Although there are a few dozen dead sagebrush crowns, by no means is the stand declining or decadent. Combined cover of shrubs does not surpass 20%, but the area should be classed as "shrubland" (West 1983).

No productivity estimates were obtained, as they were not required and the cool-season grasses were well past maturity whereas the galleta had not headed out in response to summer rains. The SCS (Jensen and Borchert, 1988, page 166) states that 500 lb/acre of dry weight forage can be expected in an "unfavorable" year from this range site. At the time of sampling, certainly no more than this was available from all species, and production of palatable grasses on the area would not have exceeded 250 lb/acre. Depending on the class of livestock or big game using the area, its condition would be rated between "fair" and "good"—certainly neither "poor" nor "excellent". The trend, as judged by the lack of tree invasion, grass reproduction, and the quantity and vigor of winterfat plants, is at least stable or slightly upward. Both sagebrush reproductive effort and winterfat numbers might increase after fencing.

In conclusion, the reference area appears to meet important criteria of representativeness, current range condition, typical levels of production, and lack of exogenous disturbances from the loadout operation or other cultural activities. There are no signs whatever of imminent or long-term change away from its current appearance and composition.
References and Background Literature


Wednesday, October 12, 1988
Logan, Utah

Mr. Michael Glasson
Tower Division
Andalex Resources, Inc.
P. O. Box 902
Price, Utah 84501

Dear Mike:

As you requested earlier this morning, here are the field data sheets I retained from the August work at the Wildcat loadout reference area. The Division of Oil, Gas, and Mining guidelines do state that the consultant should be prepared to submit copies of the data sheets used in the field. I am happy to do so, and I apologize for not thinking of this earlier when I sent the report.

After your call, I took the time to write out and attach explanatory notes to the field forms, which are otherwise unedited and might be hard for a reader to understand. I have also tried to remedy any legibility problems possibly caused by my back problem on the day of the visit. I did not keep verbal field notes nor plant voucher specimens past the week in September when I said I was available for a follow-up visit; those were discarded in connection with a general cleanup of outdated files and specimens at the lab where I work.

You may wish to retain a photocopy of the sheets while sending the originals on to the state, with or without this letter. If I need to stop by Price in the near future, call me at 750-2471 and I'll get in touch with you about an early November date -- I'll be going through Price enroute to Moab, probably on the 7th.

Thank you.

Sincerely yours,

Nick Van Pelt

Nicholas Van Pelt

Attachments
October 12, 1988

Explanatory notes to accompany field data sheets and computer printouts --- in connection with Nicholas Van Pelt's report to Andalex Resources concerning the small Wildcat loadout reference area, mid-August, 1988.

Overall:

1. The two required estimates were for ground-surface and plant species cover, and for density of the major shrubs. The respective techniques used were line-intercept ("LI") and point-centered-quarter method ("PCQM").

2. For sample locations, I used coordinates generated from a random-numbers table in a standard statistics book (see photocopy). This is standard procedure, in preference to spacing line ends or plot centers systematically (for example, every 5 meters or 3 yards) or subjectively (choosing the placements to be "representative" or "typical").

3. Printouts are from MINITAB statistical package runs.

Refer to explanations attached to the sheets for the particular analysis.
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04315
97513
45045
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09788
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TABLE A-15 Table of random digits

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Source: Tuble oj I05'(X)() Rum/om [)('dmtll Digits. Interstate COllullcrl'c Comrnis!'.ion. Burcau of Transport


There is no standard field sheet that I know of for recording line-intercept data. The sheets used here show a species or ground-cover category (see explanation of abbreviations, below) on the left and right sides, with new categories added as encountered. Each division, of the 80 total, represents one-half meter. The cover estimated along the line for each species or other form of cover is represented by the penciled line segments. The total length of the segments for each cover category was added up, and then converted to percentages of the total line length (40 meters) for that transect. The percentages for each cover category for all transects were next entered into a computer data file, and the statistics shown were readily generated. All the means should add up to virtually 100.00 percent; in this instance, the total (C1 through C10) was 99.39%.

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Species or Other Category</th>
<th>Printout Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;bg&quot;</td>
<td>bare ground</td>
<td>C1</td>
</tr>
<tr>
<td>&quot;ltr&quot;</td>
<td>plant litter</td>
<td>C2</td>
</tr>
<tr>
<td>&quot;At&quot;</td>
<td>Artemisia tridentata</td>
<td>C3</td>
</tr>
<tr>
<td>&quot;ukg&quot;</td>
<td>Unknown grass, later identified as galleta</td>
<td>C4</td>
</tr>
<tr>
<td>&quot;Orhy&quot;</td>
<td>Oryzopsis hymenoides</td>
<td>C5</td>
</tr>
<tr>
<td>&quot;Cela&quot;</td>
<td>Ceratoides lanata</td>
<td>C6</td>
</tr>
<tr>
<td>&quot;Chry&quot;</td>
<td>Chrysothamnus spp.</td>
<td>C7</td>
</tr>
<tr>
<td>&quot;Cact&quot;</td>
<td>Cactus, later identified as Opuntia sp.</td>
<td>C8</td>
</tr>
<tr>
<td>&quot;Brte&quot;</td>
<td>Bromus tectorum</td>
<td>C9</td>
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<tr>
<td>&quot;Stco&quot;</td>
<td>Stipa comata</td>
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MTB > TINTERVAL WITH 90 PERCENT CONFIDENCE FOR DATA IN C1-C10

<table>
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<tr>
<th></th>
<th>N</th>
<th>MEAN</th>
<th>STDEV</th>
<th>SE MEAN</th>
<th>80.0 PERCENT C.I.</th>
</tr>
</thead>
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<tr>
<td>C1</td>
<td>15</td>
<td>68.13</td>
<td>10.53</td>
<td>2.72</td>
<td>(64.47, 71.79)</td>
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<td>C2</td>
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<td>(6.35, 14.02)</td>
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<td>0.72</td>
<td>(3.36, 9.98)</td>
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<tr>
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<td>15</td>
<td>3.533</td>
<td>2.900</td>
<td>0.749</td>
<td>(2.57, 4.49)</td>
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<tr>
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<td>0.733</td>
<td>1.163</td>
<td>0.300</td>
<td>(0.329, 1.137)</td>
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<tr>
<td>C6</td>
<td>15</td>
<td>0.467</td>
<td>0.915</td>
<td>0.236</td>
<td>(0.149, 0.785)</td>
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<td>15</td>
<td>0.200</td>
<td>0.561</td>
<td>0.145</td>
<td>(0.005, 0.395)</td>
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<td>0.533</td>
<td>1.807</td>
<td>0.467</td>
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<td>0.600</td>
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<td>(0.284, 0.916)</td>
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<td>15</td>
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MTB > READ 'WILDCAT.HTS' C1
Job HEIGHTS (1798) queued to PRX_NR213 on 16-AUG-1988 22:23 by user PJSYN. UIC [PJSYN], under account 540002 at priority 100.


MTB > TINTERVAL WITH 80 PERCENT CONFIDENCE FOR HTS IN C1

<table>
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<th>STDEV</th>
<th>SE MEAN</th>
<th>80.0 PERCENT C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>90</td>
<td>62.74</td>
<td>12.00</td>
<td>1.27 ( 61.11, 64.38)</td>
</tr>
</tbody>
</table>

MTB > READ 'MAP.ART' C1
70 ROWS READ

| C1 | 3.2 | 2.2 | 1.2 | 1.5 |

MTB > OUTFILE 'ART.CVR'
(x) = transact (40-mated) number

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
Density of the most prominent shrub species (second stapled set).

Once a random point had been located via coordinates, four 90-degree quadrants were established with a round sampling ring having four spokes, again with the divisions among them determined randomly (for example, compass bearing of 136 degrees as determining the dividing line between the upper left and upper right quadrants). On the data sheets, the quadrants were coded as follows:

- "UL" means upper left
- "UR" means upper right
- "LR" means lower left
- "LL" means lower left

Distances to the nearest plant of the species in that quadrant were recorded in the appropriate column. "At" means Artemisia (sagebrush species), "Cela" means Ceratoides lanata (winterfat) above the column for averages. For each point, "MAP" means mean area per plant, subsequently used (per the grand mean; see printouts) in the formula supplied in the DOGM guidelines. Note that winterfat were so sparse that they only occurred within a reasonable distance of the point in 10 of the samples, whereas sagebrush were within about 116" (about 10 feet) in all samples.

Estimation of mean heights of mature sagebrush -- optional measure (final sheet, not stapled).

Computer printout; I do not have the field sheet.
MTB > TINTERVAL WITH 80 PERCENT CONFIDENCE FOR MAP IN C1

<table>
<thead>
<tr>
<th>N</th>
<th>MEAN</th>
<th>SIGMA</th>
<th>BE MEAN</th>
<th>80.0 PERCENT C. I.</th>
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<tbody>
<tr>
<td>C1</td>
<td>70</td>
<td>8.09</td>
<td>16.49</td>
<td>1.97 (5.54, 10.64)</td>
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</table>

MTB > TINTERVAL WITH 95 PERCENT CONFIDENCE FOR MAP IN C1

<table>
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<td>8.09</td>
<td>16.49</td>
<td>1.97 (4.15, 12.02)</td>
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</table>

MTB > READ 'MAP.ELA' C1
10 ROWS READ

```
MTB > TINTERVAL WITH 80 PERCENT CONFIDENCE FOR DATA IN C1

    N  MEAN    STDEV SE MEAN  80.0 PERCENT C.I.
C1  10  5.96    4.50  1.42  ( 3.99,  7.93)

MTB > STOP
*** Minitab Release 6.1.1 *** Minitab, Inc. ***
Storage available 842925
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APPENDIX J

Probable Hydrologic Consequences of Operations at the Wildcat Loadout

Prepared for: Andalex Resources, Inc.

Prepared by: Blackhawk Engineering Company

July, 1988
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<td>Acid-Toxic Forming Potentials</td>
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Probable Hydrologic Consequences of Operations at the Wildcat Loadout

1.0 Introduction

The Wildcat Loadout is a coal loading/processing facility owned by Andalex Resources, Inc., and located in the Gordon Creek Area of Carbon County, Utah. Andalex Resources, Inc., is applying for a Mining and Reclamation Permit for the Wildcat Loadout in accordance with the "Utah Coal Mining and Reclamation Permanent Program" - Regulations Pertaining to Surface Effects of Underground Coal Mining Activities.

The purpose of this document is to present an assessment of the probable hydrologic consequences of the Wildcat Loadout operation. Where appropriate, references are made to sections of the Permit Application Package that have already addressed required items in detail.

This document is divided into five sections. Section 2.0 presents a discussion of groundwater in the area, along with potential impacts. Section 3.0 presents a similar discussion on surface water. Conclusions and references are listed in Sections 4.0 and 5.0 respectively.

2.0 Groundwater

2.1 Probable Impacts

2.1-1 Background Information

Information presented in Chapter III, Part C, Section 1.2 of the PAP indicate that groundwater is extremely scarce in the general area and essentially non-existent within the permit area. As indicated in this section, a series of boreholes were drilled from 45' to 60' deep for foundation analysis at the outset of construction, and none of the holes encountered water. Two of the 60' deep holes were left open and checked on a regular basis for any water accumulation - no accumulation was noted. A statement of observation is provided as Attachment 3 of this Appendix. This statement will serve as the record of checks on the boreholes and the results of those checks. The locations of the boreholes are shown on Figure 1 of Appendix C of this PAP.
The geologic location of the permit and surrounding area is discussed in detail in Chapters III and IV of this PAP. As indicated, the permit area is located in the Masuk Member of the Mancos Shale Formation. There are no springs or seeps located within the permit boundary. The nearest spring is located approximately 1/2 mile to the southwest and is shown on Figure III-2 of Chapter III as the Garley Canyon Spring. This is a small spring/seep, with flows typically less than 5 gpm and with poor quality typical of springs or seeps within the Mancos Shale. Rights to this spring are owned by Andalex Resources, Inc. A water analysis of the spring is provided in Appendix G.

There are no aquifer tests or other data available on groundwater in or near the permit area, due to the lack of groundwater. Leachate tests have been conducted on all materials stored on site. These tests were designed to show potential impact of leaching of the materials into the ground (and groundwater, if any were to exist). The tests show no potential for stored materials to impact any groundwater in the area. Results of the leachate tests are summarized in Attachment 1 of this Appendix. In addition, both the coal and coal waste material were tested for acid or toxic-forming potential. The results of these tests are shown in Attachment 2 of this Appendix. These tests also show no potential impact of the stored materials on the groundwater regime.

2.1-2

Potential Impacts

As with any operation where materials are stored on site, there is a potential for leaching of runoff or inherent moisture from the materials into the ground. Leachate and acid-toxic forming potential tests were performed on the materials, and the results indicate no adverse impacts would occur from the leaching or runoff from such materials.

The leachate data was compared to the Utah agricultural water quality standards to determine that no adverse impacts would
occur. This comparison is summarized in Attachment 4 of this PHC.

There is no aquifer or other groundwater occurrence within at least 60' of the surface within the permit area. This is confirmed by the drilling on site as described above. In fact, the nearest groundwater is likely much deeper in this area, as discussed in Chapter III, Part C, Section 1.2-2 of the PAP. The nearest occurrence of any groundwater is in the Garley Canyon Spring to the south. This is an alluvial spring/seep as discussed in Chapter III, Part C, Section 1.2-1 of the PAP, and is recharged from the higher elevation terraces to the west.

Since there is no groundwater known to exist within or near the permit area, and since the leachate tests show no potential for acid or toxic materials, it can be concluded that there will be no adverse impacts on the groundwater regime by the operation of the Wildcat Loadout.

2.2 Groundwater Monitoring Plan

Since no groundwater exists within or near the permit area, there is no groundwater monitoring plan for this operation.

3.0 Surface Water

3.1 Probable Impacts

3.1-1 Background Information

As discussed in Chapter III, Part C, Section 1.3-2.1 of the PAP, the Wildcat Loadout is located in the lower Gordon Creek Drainage. The permit and adjacent area is drained by ephemeral drainages which flow into the ephemeral Garley Canyon Drainage and eventually into the Price River to the east. The nearest spring is the Garley Canyon Spring located approximately 1/2 mile to the southwest of the permit area. This is an alluvial spring/seep and is characterized by low flows and poor quality. The spring outcrops near the railroad tracks at Garley Canyon and disappears within a short distance downstream. The nearest perennial streams
are: North Fork of Gordon Creek located approximately 1-1/2 miles to the south; and the Price River, located approximately 3-1/2 miles to the east.

3.1-2 Potential Impacts

Runoff from all disturbed areas of the operation is directed into sedimentation facilities or contained within bermed areas (Small Area Exemptions). All runoff and sediment control facilities are designed in accordance with Division regulations, and are maintained to minimize sediment concentrations from the surface facilities to the receiving drainage. Sediment ponds have NPDES Discharge Permits, which further restrict effluent standards for any discharge from the property.

Undisturbed drainage is diverted around the operation as shown on Plate 2 of the PAP. These diversions are designed and maintained to prevent undisturbed runoff from entering the disturbed area.

Existing (and proposed) facilities as described in this PAP are adequate to control runoff from the operation and will minimize sediment concentrations to the receiving drainages. Proper maintenance of the sediment control facilities will continue to minimize potential impacts of the operation on surface waters. See Chapter IV for details on sediment control facilities.

3.2 Surface Water Monitoring Plan

A surface water monitoring plan has been described in Chapter IV, Part K, Section 8 of the PAP. This plan will monitor drainages above and below the operation, as well as any sediment pond discharges.

Baseline water monitoring results are summarized in Appendix M of this PAP.
4.0 Conclusions

The following conclusions are presented, based on information included in this Appendix as well as referenced information from the Permit Application Package (PAP):

- No groundwater is known to exist within or near the permit area.
- Leachate and acid-toxic forming potential analyses indicate no adverse impacts from stored materials.
- No adverse impacts to the groundwater regime will occur as a result of this operation.
- No perennial or intermittent drainages exist within or near the permit area.
- Existing (and proposed) sediment and runoff control facilities are adequate to prevent additional sediment contributions to receiving drainages.
- With proper maintenance of surface water control facilities, no adverse impacts will occur to the surface waters of the area as a result of this operation.
- Surface waters will be monitored to detect any possible impact as a result of the operation.

5.0 References


Attachment 1

Stored Material

Leachate Analyses
Job No.: 9233
Date Rec'd: May 11, 1988
Date Sampled: May 11, 1988
Sampled By: ANDALEX
Andalex
P.O. Box 902
Price, Utah 84501

WATER ANALYSIS

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Dave Candel |
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Date Rec'd: May 11, 1988
Date Sampled: May 11, 1988
Sampled By: ANDALEX

Andalex
P.O. Box 902
Price, Utah 84501

May 23, 1988
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Time Rec'd 3:00 p.m. hr.

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**WATER ANALYSIS**

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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Original Copy Watermarked
For Your Protection

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS,
TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES

MANAGER: D. CROCKETT
May 23, 1988

Sample ID:

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No Time Sampled
Time Rec’d 3:00 p.m. hr.

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<tr>
<td>Arsenic</td>
<td>0.005 mg/l</td>
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<tr>
<td>Anions, Total</td>
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<td>Calcium</td>
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<td>Copper</td>
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<td>Mercury</td>
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<td>Molybdenum</td>
<td>0.10 mg/l</td>
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<tr>
<td>Nickel</td>
<td>0.02 mg/l</td>
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<tr>
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<td>Nitrogen, Nitrate</td>
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<tr>
<td>Oil and Grease</td>
<td>6.0 mg/l</td>
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<tr>
<td>Oxvoren, Dissolved</td>
<td>5.4 mg/l</td>
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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES
Job No.: 9232a
Date Rec'd: May 11, 1988
Date Sampled: May 11, 1988
Sampled By: Andalex
Andalex
P.O. Box 902
Price, Utah 84501

May 23, 1988
Sample ID:
BONE WILDCAT
No Time Sampled
Time Rec'd 3:00 P.M. hr.

WATER ANALYSIS

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<tr>
<th>Substance</th>
<th>Date</th>
<th>Value</th>
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<td>pH</td>
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<td>7.63 Units</td>
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<td>Potassium</td>
<td>05/13/88</td>
<td>3.92 mg/l</td>
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<tr>
<td>Selenium</td>
<td>05/19/88</td>
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<td>Sodium</td>
<td>05/13/88</td>
<td>39.70 mg/l</td>
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<td>Sulfate</td>
<td>05/13/88</td>
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<td>Sulfide</td>
<td>05/19/88</td>
<td>0.30 mg/l</td>
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</tbody>
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Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES
Attachment 2

Acid-Toxic Forming Potentials
July 22, 1988

Utah State University
Logan, Utah 84322-4830

Attn.: Mr. Karl Topper, Soils Plant and Water Laboratory

Dear Mr. Topper:

Enclosed please find samples taken from Andalex Resources' Coal and "Boney" Storage Files located at the Wildcat Loadout Facility. The Division of Oil, Gas, and Mining is requiring these samples be tested for acid and toxic forming materials. The tests which they require include:

- Acid-Base Potential
- pH
- Ec
- Saturation Percent
- Texture
- Organic C
- SAR
- Selenium
- Boron

The samples are labeled Coal and "Boney" and have been crushed to a top size of #8 mesh. Please advise me by telephone at 637-5385 if pre-payment for this analysis is required.

Thank you very much.

Sincerely,

Michael W. Glasson
Senior Geologist
Western Division

MWG/as
Enclosures

cc: File
August 23, 1988

Andalex Resources, INC.
Michael W. Glasson
PO Box 902
Price, UT 84501

Coal samples received 8/2/88.

Non-Typical Soil: Test Results May Be Unreliable.

<table>
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<tr>
<th>USU LOG#</th>
<th>ID</th>
<th>%CaCO₃</th>
<th>%Sulfur</th>
<th>%O.M.</th>
<th>mg/l</th>
<th>Saturation Percentage</th>
<th>SAR</th>
<th>pH</th>
<th>ECE</th>
<th>mmhos/cm</th>
<th>*Texture</th>
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</thead>
<tbody>
<tr>
<td>2447</td>
<td>Coal</td>
<td>0.8</td>
<td>0.53</td>
<td>96.6</td>
<td>0.5</td>
<td>64.6</td>
<td>0.5</td>
<td>7.6</td>
<td>0.7</td>
<td>93.9% Sand</td>
<td>Sand</td>
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<tr>
<td>2448</td>
<td>Boney</td>
<td>9.5</td>
<td>1.02</td>
<td>74.4</td>
<td>1.3</td>
<td>52.8</td>
<td>1.2</td>
<td>7.4</td>
<td>1.9</td>
<td>90.6% Sand</td>
<td>Sand</td>
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</table>

*Texture: % Retained on 300 Mesh Sieve.
February 23, 1989

Sample identification
by
Andalex Resources, Inc.
Boney Coal and Coal

Kind of sample reported to us
Soil

Sample taken at
Wildcat

Sample taken by
Andalex Resources, Inc.

Date sampled
xxxxx

Date received
October 11 and October 13, 1988

Analysis report no. 59-84506 and 84507

% Nitrate Nitrogen

84506 Boney Coal .10

84507 Coal .07

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, Huntington Laboratory

OVER 40 BRANCH LABORATORIES STRATEGICALLY LOCATED IN PRINCIPAL COAL MINING AREAS, TIDEWATER AND GREAT LAKES PORTS, AND RIVER LOADING FACILITIES
Attachment 3

Engineers' Statement
on
Borehole Observations
July 27, 1988

Mr. John Whitehead  
Permit Supervisor  
State of Utah  
Dept. of Natural Resources  
Division of Oil, Gas & Mining  
355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  

Dear Mr. Whitehead:

This letter is to confirm that observation tests were made on two (2) bore holes located at the Wildcat loadout to determine the presence of ground water at this facility. (Reference; Rollins, Brown and Gunnel report regarding bore hole locations and depths). Observations were made over a two month period in the Spring of 1982 during the months of May and June. Observations were made on a weekly basis using a hand made measuring probe. At no time did any ground water appear in the bore holes. The bore holes were then sealed following this observation. The observations were performed by David Shaver, Andalex Resource's chief engineer.

Sincerely,

Michael W. Glasson  
Senior Geologist  
Western Operations  

MWG/amr
Attachment 4

Comparison of Leachate Tests to Utah Agricultural Water Quality Standards
Comparison of Leachate Tests to Utah Agricultural Water Quality Standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Leachate (mg/l)</th>
<th>Agricultural Standard (mg/l max.)</th>
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<tr>
<td>Aluminum</td>
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<td>Alk. (Bi-carb)</td>
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<tr>
<td>Alk. (Carb.)</td>
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<tr>
<td>Arsenic</td>
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<tr>
<td>Anions (Total)</td>
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<tr>
<td>Barium</td>
<td>0.09</td>
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<tr>
<td>Boron</td>
<td>0.13</td>
<td>0.75</td>
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<tr>
<td>Cadmium</td>
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<td>0.01</td>
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<tr>
<td>Calcium</td>
<td>87.6</td>
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<tr>
<td>Cations (Total)</td>
<td>8.12</td>
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</tr>
<tr>
<td>Chloride</td>
<td>37.5</td>
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<tr>
<td>Chromium</td>
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<td>Conductivity</td>
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<td>Flouride</td>
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<td>Molybdenum</td>
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<td>Nickel</td>
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<td>Nitrogen, Ammonia</td>
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<tr>
<td>Nitrogen, Nitrate</td>
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<td>Nitrogen, Nitrite</td>
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<td>Oil and Grease</td>
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<td>Gross Beta (pCi/l)</td>
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<tr>
<td>BOD (mg/l)</td>
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Utah Division of Health numerical standards for water in the state.

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<th>Constituent</th>
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<td>IB</td>
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<td>(30-day Geometric Mean)</td>
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<td>Maximum Total Coliforms</td>
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<td>Maximum Temp. Change</td>
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<td>Turbidity increase (c)</td>
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<td>HCl as H (un-ionized)</td>
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<td>Chlorine</td>
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<td>Fluoride, dissolved (c)</td>
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<td>HCl as F</td>
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<td>Radium 226, 228 combined</td>
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<td>2, 4-D</td>
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<td>2, 4, 5-T</td>
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<tr>
<td>Pollution Indicators (g)</td>
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<td>Gross Beta (pCi/l)</td>
<td>50</td>
<td>50</td>
<td>50</td>
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<tr>
<td>BOD (mg/l)</td>
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<td></td>
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<td>NO as N (mg/l)</td>
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<tr>
<td>PC (%P (mg/l))</td>
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<td></td>
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</table>

In sufficient evidence to warrant the establishment of numerical standard. Limits assigned on case-by-case basis.

(a) These limits are not applicable to lower water levels in deep impoundments.

(b) Not to exceed 110% of saturation.

(c) For Classes A, B, C, and D at background levels of 100 mg/l or greater, a 10% increase limit will be used instead of the numeric value listed. For Class D at background levels of 150 mg/l or greater, a 20% increase limit will be used instead of the numeric value listed. Short-term variances may be considered on a case-by-case basis.

(d) Limits shall be increased threelold if CaCO3 hardness in water exceeds 150 mg/l.

(e) Maximum concentration varies according to the daily maximum mean air temperature.

(f) Total dissolved solids (TDS) limit may be adjusted on a case-by-case basis.

(g) Investigations should be conducted to develop more information where these pollution indicator levels are exceeded.

(h) PC as %P (mg/l) limit for lakes and reservoirs shall be .05.
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</table>

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RESPECTFULLY SUBMITTED,
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<th>Forms of Sulfur</th>
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APPENDIX L
GRADE CONTROL STRUCTURES
6.7.2 Types of Grade Control Structures

Grade control structures can range in complexity from simple rock riprap type drop structures to concrete structures with baffled aprons and stilling basins. For the range of discharges and velocities typically expected on a surface mine site, and considering the construction techniques typically employed, only the design of rock riprap structures is covered in this manual. Figure 6.9 illustrates a loose rock drop structure.

General guidelines for construction of loose rock drop structures constructed in mild slope channels are similar to stone check dams. The following specific recommendations are made:

1. Maximum drop height of three feet (guidelines for designing loose rock drop structures for drop heights greater than three feet are given in the Part 2.
2. Top width no less than five feet.
3. Downstream slope of 2 horizontal to 1 vertical.
4. 25 percent of the rock by volume will be 18 inches or larger. The remaining 75 percent shall be well graded material consisting of sufficient rock small enough to fill the voids between the larger rocks.
5. Energy dissipation should be provided at the downstream toe of a structure with a small plunge pool and large rocks.

6.7.3 Design Procedure Involving Grade Control Structures

Development of the graphical design procedure presented below is detailed in Appendix D. The design procedure is based on an application of Shields' relation (Equation 6.3) and the Manning equation (Equation 4.13). The primary design relationship is

\[
S = \frac{0.047 (G_s - 1) D_{50}}{R}
\]  

(6.11)

where \( S \) is the static equilibrium slope, \( G_s \) is the specific gravity of the bed and bank material, often assumed to be 2.65, \( D_{50} \) is the median riprap size available or the armor particle size present in the natural alluvium, and \( R \) is the hydraulic radius.

The relationship defining \( R \) for a given combination of Manning's \( n \), discharge \( Q \) and \( D_{50} \) is given in Figures 6.10a to 6.10c, where \( K \) is defined as
Figure 6.9. Definition sketch of a rock riprap drop structure (protection upstream and downstream according to Section 5.4).
6.45

\[
K = \frac{Qn}{0.323 \sqrt{(G_s - 1)} D_{S0}} \quad (6.12)
\]

For values of \( K \) beyond the limits given in the figures, Equation D.9 in Appendix D must be solved.

The design procedure using these figures is simple to apply. After establishing the \( D_{S0} \) of the available riprap, or the natural alluvium for development of an armor layer, the value of \( K \) is computed for the design flow \( Q \) and the representative Manning \( n \). For gravel-cobble size rock, Equation 4.18 gives a good estimate of the Manning \( n \). With \( K \) established, the value of \( R \) is determined from the graphs. Equation 6.11 can then be solved for the static equilibrium slope required to maintain stability for the given \( D_{S0} \) and flow conditions. If the natural terrain slope is less than the computed static equilibrium slope, the riprap will be stable without the need for drop structures. Otherwise, drop structures will be needed to establish the required slope.

6.7.4 Spacing of Grade Control Structures

If the above computation indicates grade control structures are required, the number and spacing of the structures must be determined. The vertical height that must be controlled for the given reach to achieve the required static equilibrium slope can be evaluated from

\[
\Delta H = (S_o - S) \Delta X \quad (6.13)
\]

where \( \Delta H \) is the total height requiring structural control, \( S_o \) is the original channel slope, \( S \) is the estimated static equilibrium slope, and \( \Delta X \) is the length of channel to be controlled.

To prevent highly erosive velocities at the base of a rock riprap drop structure, the maximum allowable height of the structure is three feet. Therefore, the number of structures \( N \) required to control the total vertical height is

\[
N = \frac{\Delta H}{3} \quad (6.14)
\]
Figure 6.10a. Relationship between hydraulic radius R and K for trapezoidal channel with 2:1 side slopes and 6-foot base width.
Figure 6.10a. Relationship between hydraulic radius \( R \) and \( K \) for trapezoidal channel with 2:1 side slopes and 6-foot base width. (continued).
Figure 6.10b. Relationship between hydraulic radius $R$ and $K$ for trapezoidal channel with 2:1 side slopes and 10-foot base width.
Figure 6.10c. Relationship between hydraulic radius $R$ and $K$ for trapezoidal channels with 2:1 side slopes and 14-foot base width.
Figure 6.10c. Relationship between hydraulic radius $R$ and $K$ for trapezoidal channels with 2:1 side:tops and 10-foot base width (continued).
The spacing $L$ of the drop structures is then

$$L = \frac{\Delta x}{N}$$

(6.15)

6.7.5 Protection of Grade Control Structures

The velocity of flow on the downstream side of a drop structure can be quite high, creating the potential for local scour at the toe and possible undercutting of the structure. Therefore, a riprap transition between the toe and the downstream channel must be provided with adequate energy dissipation measures.

The method for determining the length of protection required below a grade control structure is identical to the procedure for protection below steep slopes presented in Section 5.4. A riprap layer should be extended below the structure for a distance equal five times the downstream depth of flow, but never less than 15 feet. Additionally a small plunge pool can be provided at the downstream toe to help dissipate energy.

6.8 Design Procedure Summary

1. Design channel based on maximum permissible velocity method according to steps 1-6, Section 6.4.1.
2. Evaluate the channel for reasonable shape using Equations 6.7-6.10, and engineering judgment.
3. If a more hydraulically efficient channel is desired, evaluate the use of linings (vegetation or riprap) or grade control structures. Table 6.6 will aid in this evaluation.
   a. Vegetation
      1) Determine maximum permissible velocity for given vegetation type from Table 6.2.
      2) To design for stability, assume vegetation is mowed and identify retardance class from Table 6.3.
      3) Enter Figures 6.5a-e for given velocity, retardance and design slope to establish $R$.
      4) Calculate $A = Q/V$.
      5) Determine $d$ for given $b$ such that
VEGETATION TEST PLOT MONITORING OF THE WILDCAT LOADOUT AREA

- 1991 -
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Price, Utah 84501

Report: Patrick D. Collins, Ph.D.
Fieldwork: Patrick D. Collins
Dean Collins

Report Date: February 1992
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<td>DISCUSSION</td>
<td>5</td>
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<tr>
<td>SUMMARY TABLES</td>
<td>7-15</td>
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INTRODUCTION

The Wildcat Loadout is the site of a storage and loadout area for coal. The coal is loaded on truck or rail and transported from the area to consumers.

Disturbed areas from the loadout facility lies within a broad valley basin surrounded by rolling hills of shadscale and scattered pinyon-juniper plant communities. The valley basin is composed of alluvial soils and those derived from Mancos Shale, supporting big sagebrush and rabbitbrush communities.

Test plots were planted in the fall of 1989 to test revegetation feasibility of some of the on-site material. The four test plot areas were seeded, fertilized and mulched with straw. A list of the plant species that were seeded is shown on Table 9. Because 1991 was the second growing season following plot implementation and seeding, qualitative and quantitative data were collected on the site.
The four test plots were labeled A - D on data sheets and tables in this report. These plots were located in four different locations around the loadout facility.

METHODS

Quantitative and qualitative data were taken on the plots at the Wildcat Loadout facility on October 2, 1991. This date was prior to any significant frost in the area.

Cover and Composition

Regular placement of sample points were predetermined to provide unbiased accuracy of the data compiled. This was accomplished by establishing transect lines at regular intervals on each end of the plots. These transect lines were placed over the entire study area to adequately represent the area as a whole. Regular points on the transect lines were then marked. From these marks, the sample points were determined by random distance numbers at right angles to the transect lines.

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 data sheets were: estimated precipitation, slope, exposure, grazing use, animal disturbance and other appropriate notes. Plant nomenclature follows Welsh et al. (1987) for nonplanted species. To avoid confusion, the same names were used as when they were planted for the species in the seed mixtures.

Woody Species Density

Because woody species densities were very low, all individuals were counted in each plot.

Sample Adequacy

Sample adequacy for cover was achieved employing a the formula below.

\[
\left( \frac{1.28 \times s}{x \times 0.1} \right)^2 = n_{\text{min}}
\]

where:

- \(x\) = sample mean
- \(s\) = standard deviation
- \(n_{\text{min}}\) = minimum number of samples.
RESULTS

Plot A

This relatively narrow, rectangular plot is located near a coal pile in the loadout area. Total living cover of the plot was 40.63% (Table 1). Most of that cover, however, were weedy species e.g. Russian Thistle (*Salsola iberica*) and Summer Cypress (*Kochia scoparia*). Three desirable plant species did occur in the quadrats, although collectively they represented less than 2% total cover. For a list of the cover by species, refer to Table 2. No woody plant species were observed for density measurements in this plot.

Plot B

Plot B is located near the electrical substation and railroad tracks. Total living cover of this plot was estimated as 52.50% (Table 3). Nearly 30% of the living cover were desirable grass species (Table 3). Dominate plant species was Summer Cypress. The most common grass species were Western Wheatgrass (*Agropyron smithii*) and Indian Ricegrass (*Oryzopsis hymenoides*). For a list of cover by species, refer to Table 4. No shrubs were observed in the plot.
Plot C

Plot C is located near the railroad loading area. Total living cover was measured at 48.75% (Table 5). Again the same weedy forb species dominated the plot, comprising 99.43% of the total living cover (Table 5). No grasses were observed in the sample quadrats. There was, however, one desirable forb (Lewis flax or Linum lewsii) and one shrub (Four-winged Saltbush or Atriplex canescens) species observed infrequently in the quadrats (Table 6).

Plot D

The last plot to be sampled was Plot D. This plot was measured at 40.31% cover (Table 7). The quadrats sampled in this plot comprised exclusively of weedy annual forb species. No grasses or shrubs were found to be present in the samples (Table 8).

DISCUSSION

None of the four plots did particularly well to date if one considers the amount of desirable plant species that have begun
to establish themselves. However, one Plot B did noticeably better than the other plots and Plot C had a few shrubs beginning to establish.

MT. NEBO SCIENTIFIC was not involved at the time of implementation of the plots so we cannot rule out some of those early planting variables. One should note that the plots were implemented in the middle of an extended drought period for the area which continued through important germination and subsequent establishment periods. This could explain at least some of the reasons for the poor success.
TABLE 1: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot A (near coal pile).

<table>
<thead>
<tr>
<th>TOTAL COVER</th>
<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
<th>SAMPLE SIZES</th>
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</thead>
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<tr>
<td>Living Cover</td>
<td>40.63</td>
<td>5.56</td>
<td>16</td>
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<tr>
<td>Litter</td>
<td>9.69</td>
<td>5.01</td>
<td>16</td>
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<tr>
<td>Bareground</td>
<td>48.56</td>
<td>8.07</td>
<td>16</td>
</tr>
<tr>
<td>Rock</td>
<td>1.13</td>
<td>0.70</td>
<td>16</td>
</tr>
</tbody>
</table>

COMPOSITION

| Trees & Shrubs | 0.00 | 0.00 | 16 |
| Forbs | 97.36 | 6.99 | 16 |
| Grasses | 2.64 | 6.99 | 16 |
TABLE 2: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot A (near coal pile).

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
<th>SAMPLE SIZE</th>
<th>RELATIVE FREQUENCY</th>
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</thead>
<tbody>
<tr>
<td>SHRUBS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kochia scoparia</td>
<td>37.19</td>
<td>3.94</td>
<td>16</td>
<td>100.00</td>
</tr>
<tr>
<td>Salsola iberica</td>
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<td>4.96</td>
<td>16</td>
<td>18.75</td>
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<tr>
<td>Sphaeralcea grossulariaefolia</td>
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<td>1.21</td>
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<td>6.25</td>
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<td>FORBS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRASSES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agropyron smithii</td>
<td>0.63</td>
<td>2.42</td>
<td>16</td>
<td>6.25</td>
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<tr>
<td>Stipa comata</td>
<td>0.63</td>
<td>2.42</td>
<td>16</td>
<td>6.25</td>
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Perennial Cover 1.57%
TABLE 3: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot B (near substation).

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<th>TOTAL COVER</th>
<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
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<td>Litter</td>
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<tr>
<td>Rock</td>
<td>0.88</td>
<td>0.70</td>
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COMPOSITION

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<th>% MEAN COVER</th>
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<th>SAMPLE SIZES</th>
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<tr>
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<td>0.00</td>
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<td>70.04</td>
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<td>Grasses</td>
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<td>23.72</td>
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TABLE 4: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot B (near substation).

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<tr>
<th>SPECIES</th>
<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
<th>SAMPLE SIZE</th>
<th>RELATIVE FREQUENCY</th>
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<td><strong>SHRUBS</strong></td>
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<td></td>
</tr>
<tr>
<td><em>Kochia scoparia</em></td>
<td>36.25</td>
<td>12.31</td>
<td>16</td>
<td>100.00</td>
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<tr>
<td><strong>FORBS</strong></td>
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<tr>
<td><em>Agropyron dasystachyum</em></td>
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<td><em>Oryzopsis hymenoides</em></td>
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TABLE 5: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot C (near rail loadout).

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<th>TOTAL COVER</th>
<th>% MEAN COVER</th>
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<td>Bareground</td>
<td>27.50</td>
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<tr>
<td>Rock</td>
<td>12.50</td>
<td>6.12</td>
<td>16</td>
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COMPOSITION

<table>
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<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
<th>SAMPLE SIZES</th>
</tr>
</thead>
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<td>2.20</td>
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</tr>
<tr>
<td>Forbs</td>
<td>99.43</td>
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</tr>
<tr>
<td>Grasses</td>
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<td>0.00</td>
<td>16</td>
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</table>
TABLE 6: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot C (near rail loadout).

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
<th>SAMPLE SIZE</th>
<th>RELATIVE FREQUENCY</th>
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</thead>
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<td><strong>SHRUBS</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Atriplex canescens</td>
<td>0.31</td>
<td>1.21</td>
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<tr>
<td><strong>FORBS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linum lewissii</td>
<td>0.31</td>
<td>1.21</td>
<td>16</td>
<td>6.25</td>
</tr>
<tr>
<td>Kochia scoparia</td>
<td>48.13</td>
<td>5.27</td>
<td>16</td>
<td>100.00</td>
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<tr>
<td><strong>GRASSES</strong></td>
<td></td>
<td></td>
<td></td>
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</table>
TABLE 7: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the total cover and composition for Plot D.

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<th>TOTAL COVER</th>
<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
<th>SAMPLE SIZES</th>
</tr>
</thead>
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<td>Litter</td>
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<td>Bareground</td>
<td>51.13</td>
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<tr>
<td>Rock</td>
<td>4.19</td>
<td>2.13</td>
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**COMPOSITION**

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<th>% MEAN</th>
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<th>SAMPLE</th>
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<td>0.00</td>
<td>16</td>
</tr>
<tr>
<td>Forbs</td>
<td>100.00</td>
<td>0.00</td>
<td>16</td>
</tr>
<tr>
<td>Grasses</td>
<td>0.00</td>
<td>0.00</td>
<td>16</td>
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</table>
TABLE 8: Summary of 1991 vegetation sampling for Wildcat Loadout area. The table shows the cover and frequency by species for Plot D.

<table>
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<tr>
<th>SPECIES</th>
<th>% MEAN COVER</th>
<th>STANDARD DEVIATION</th>
<th>SAMPLE SIZE</th>
<th>RELATIVE FREQUENCY</th>
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<tbody>
<tr>
<td><strong>SHRUBS</strong></td>
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TABLE 9: Species planted in the Wildcat Loadout Test Plots.

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<th>Scientific Name</th>
<th>Common Name</th>
<th>Lbs/Ac</th>
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<td>Medicago sativa</td>
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<td>Sphaeralcea grossulariaefolia</td>
<td>Gooseberryleaf Globemallow</td>
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<td><strong>GRASSES</strong></td>
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<td><strong>TOTAL</strong></td>
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3. **Topsoil:**

The top flat portion of all of the topsoil stockpiles have been drillseeded (December 18, 1989). The topsoil stockpile south of Sediment Pond A was mistakenly omitted from seeding. The operator will seed the topsoil pile near Pond A and will broadcast seed the side slopes of all of the topsoil stockpiles. After broadcasting seed, the operator will cover seed by running a track dozer over the surface.

4. **Hydrologic Balance:**

4(b) **Diversions**

The undisturbed road diversion ditch west of the Stocker Grizzly needs to be reshaped to establish a defined diversion channel.

The road diversion ditch east of the drain field needs to be reshaped to establish a defined channel.

The two culverts on either side of the access road to the shop area from the screening pad needs cleaning. The culverts are functional.

4(c) **Sediment Pond and Impoundments**

A half-round culvert is presently being installed as an inlet structure to Sediment Pond E.

13. **Revegetation:**

The construction of the revegetation test plots has been completed. One ton alfalfa hay/acre was incorporated into the soil. Seed was hand broadcast over the plots and a drill seeder was employed to cover the seed.

Lynn Kunzler of the Division approved of the following revisions to the topsoil stockpile seed mixture: delete Needle and Thread Grass and shrub species; replace with Basin wildrye (3 lbs/acre) and Slender wheatgrass (2.5 lbs/acre).

Djh

AT43/61-64
November 17, 1989

Mr. Mike Glasson  
Andalex Resources, Inc.  
P.O. Box 902  
Price, Utah 84501

Dear Mr. Glasson:

Re: Revised Seed Mix for Revegetation of Topsoil Piles, Wildcat Loadout Facility, ACT/007/009, Folder #2, Carbon County, Utah

As per our phone conversation today, this letter documents the revised seed mix for seeding of the topsoil piles this fall at the Wildcat Loadout Facility. As discussed with you on the phone, the Division hereby approves the deletion of needle and thread grass from the seed mix, as well as the shrub species as listed on the permanent seed list. In place thereof, Andalex will add to the seed mix great basin wild rye, (Elymus cinereus) at three pounds pure live seed per acre and slender wheat grass, (Agropyron trachycaulum) at a rate of 2.5 pounds pure live seed per acre.

As you know this revision pertains only to seeding of the topsoil stockpiles. Should you have further questions regarding this matter, please don't hesitate to call.

Sincerely,

Lynn Kunzler  
Reclamation Biologist

c1
cc: Henry Sauer  
BT27/29
6. Quarter 1989 No problems noted.
13. There are four revegetation plots that have been recently prepared (tilled) and mulched (Straw). Seeds were tested by an official 11/1/89. The operator is awaiting results before seeding. The plots are located east of Unit A, across from trail (east), by the substation, east by Pond C. All of these sites should not be disturbed by the operation.

Permit No. AET/007/033
Inspection Date 11/3/89

February 13, 1989

Mr. John Whitehead
Permit Supervisor
State of Utah
Department of Natural Resources
Division of Oil, Gas, and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

Dear Mr. Whitehead:

Pursuant to our discussion on Friday the 10th of February, I have enclosed the following information for your perusal which can be placed into our PAP and hopefully will complete our requirements.

All of the right of way information is up to date, including a 1" = 2000' map depicting the outline of our ROW as it exists now. Also attached are the original grant and its four amendments, including the legal descriptions.

It is my understanding that the BLM has sent you a concurrence letter which includes the final draft of the wildlife enhancement project and that you will make it part of our PAP.

I have also attached an affidavit of publication indicating we have published regarding the complete PAP.

Finally I have enclosed data pertaining to acid-base potential in our remaining ponds and in our topsoil pile A. Also, is geochemical information pertaining to the topsoil substitute test areas. Please have Mr. Sauer call me if this is sufficient.

I will be phoning you by mid-week to discuss the nature and amount of the reclamation bond.

Thank you very much. Best of luck in your new career! It has been a pleasure working with you.

Sincerely,

Michael W. Glasson
Senior Geologist

cc: File
October 19, 1988

Utah State University
Logan, Utah 84321

Attn.: Mr. Carl Topper, Soils Laboratory

Dear Mr. Topper:

Enclosed please find twenty (20) samples of potential substitute topsoil material. There are four test plot locations, A through D, and samples at each location have been taken from 0 to 6", 6 to 12", 1 to 2 ft., 2 to 3 ft., and 3 to 4 ft. The following parameters must be analyzed:

- soil color
- texture
- pH
- organic carbon
- saturation percentage
- alkalinity
- electrical conductivity
- calcium carbonate percentage
- sodium absorption ratio
- soluble potassium
- magnesium
- calcium
- sodium
- total nitrogen
- available phosphorus
- available water capacity
- percent rock fragments

We would appreciate receiving these results at your earliest convenience. If prepayment is necessary or any questions should arise, please contact me at (801) 637-5385.

Sincerely,

Michael W. Glasson
Senior Geologist

Enclosures

cc: File
August 23, 1988

Andalex Resources, INC.
Michael W. Glasson
PO Box 902
Price, UT 84501

Coal samples received 8/2/88.

Non-Typical Soil: Test Results May Be Unreliable.

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<th>%Sulfur</th>
<th>%O.M.</th>
<th>mg/l Boron</th>
<th>Saturation Percentage</th>
<th>SAR</th>
<th>pH</th>
<th>ECe</th>
<th>mmhos/cm</th>
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*Texture: % Retained on 300 Mesh Sieve.
## Soil Analysis for Andalex Resources

**USU Soil, Plant, & Water Analysis Lab**

Utah State University
Logan, Utah 84322-4830

December 8, 1988

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## Water Soluble

- **mg/kg**
- **ppm**
- **Atm.**

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ADDENDUM TO APPENDIX N

As was noted in Lynn Kunzler’s memo, dated November 17, 1989 in the Correspondence folder, the seed mix reported in Appendix N, Table 9, was not seeded, but was modified, with approval: the mix did not include any shrub seed and did not include Stipa comata, but it did include Elymeus cinereus (Basin wildrye) and Agropyron trachycaulum (slender wheatgrass).
APPENDIX O

COAL PROCESSING WASTE PILE
May 24, 1989

Mr. John DeMichiei
District Manager
MSHA-Coal Mine Safety and Health
P.O. Box 25367
Denver, Colorado 80225-0367

RE: Wildcat Loadout
I.D. #42-01864
30 CFR, 77.215-2
Refuse Pile Reporting

Dear Mr. DeMichiei,

Enclosed is the information required by 30 CFR, 77.215-2 concerning a refuse pile to be located at Wildcat Loadout. The refuse pile will consist primarily of +4" rock and boney material which is removed from the mine-run coal. This is not the reject product of a washer plant. No impoundment structures will be constructed in conjunction with this reject pile.

If you have any questions concerning this matter or need additional information, I can be contacted at (801) 537-5202.

Sincerely,

Thomas R. May
Safety Director
WILDCAT LOADOUT
MSHA I.D. #42-01864
REFUSE PILE REPORT

As per the requirements of 30 CFR, 77.215-2(b) the following information is submitted:

(1) Operator : Andalex Resources, Inc.
              P.O. Box 902
              Price, Utah 84501

Refuse Pile Name : Coal Refuse Disposal Site #1
Refuse Pile Number : #1211-UT-09-01864-01
Wildcat Loadout ID #: #42-01864

(2) See enclosed USGS topographic map

(3) This is a new refuse pile location. No impoundment structures (dams, dikes, etc.) will be constructed in conjunction with the refuse pile. The refuse material will primarily consist of +4" rock and boney material which is removed from the mine-run coal. This material is placed on the ground near the lump coal conveyor belt. When a sufficient amount of the rock and boney material has accumulated it will be transported to the refuse pile by a front-end loader. The reject material will be placed on the pile in lifts which will not exceed 2 feet in thickness. The reject material will accumulate only during the domestic heating seasons when rock and boney is being removed from the lump coal conveyor. The refuse pile will be located on an area which the previous operator used as a coal storage area. The foundation of the refuse area is firm and undisturbed soil. The area is devoid of vegetation. Due to the size and nature of the reject material, compaction is not possible. The refuse pile will not exceed 20 feet in thickness and the slopes will not exceed 2 feet horizontal to 1 foot vertical.

(4) See enclosed Plate #1

(5) The nature and size of the refuse material is such that no spontaneous combustion is anticipated.
(6) No water will be impounded by the refuse pile. All natural drainage is diverted as shown on enclosed Plate 1. The only moisture that will come in contact with the refuse material will be natural precipitation which will pass through the material due to its size and surface location which is gentle sloping terrain.

(7) See the enclosed Plate 2.
JUN - 9 1989

Thomas R. May  
Safety Director  
Andalex Resources, Inc.  
P.O. Box 902  
Price, UT 84501

Re: Wildcat Loadout  
ID No. 42-01864  
Coal Refuse Disposal Site No. 1  
ID No. 1211-UT-09-01864-01  
Refuse Pile Construction Plan

Dear Mr. May:

This is in response to Andalex Resources, Inc.'s, letter dated June 2, 1989, concerning the new refuse pile for the referenced raw coal loadout facility. The proposed location of the new refuse pile is acknowledged. The information, consisting of a cover letter, two pages, two area maps, and cross section drawings, has been made part of the mine file.

Sincerely,

Robert A. Elam  
Acting District Manager
LEGEND:
- Original Surface
- Proposed Coal Refuse Pile

NOTE:
1. See Plate I for cross section locations

Plate 2
Appendix O
APPENDIX P

RESPONSE TO DIVISION ORDER DO-04

WIND-BLOWN FINES ACCUMULATIONS

CONTENTS:

1) NARRATIVE
2) FIGURE 1, COAL FINES ACCUMULATION MAP
3) FIGURE 2, CLEANUP PROJECT AREA
4) FIGURE 3, INTERIM SEED MIX
5) FIGURE 4, SEDIMENT POND G DESIGN DETAIL
5) EXHIBIT 5, SOILS REPORT, JAMES NYENHUIS
APPENDIX P

RESPONSE TO DIVISION ORDER DO-04

WIND-BLOWN FINES ACCUMULATIONS

In 2004, the Division issued an Order DO-04 for wind-blown fines which had accumulated outside the disturbed area, primarily in the area southwest of the main coal storage pile below sediment Pond B. The primary source of these coal-fines is from proximity to the main coal storage pile, and from truck traffic on the perimeter road between the coal storage area and existing Sediment Pond B. The accumulation area is directly down-wind and down-gradient from these sources, and over the past 30 years of operations has experienced an obvious accumulation of coal fines. Although the coal-fines accumulation is generally contained within the existing permit area, there is concern for the underlying topsoil in the area, and additional concern that some of the accumulation is down-drainage from Pond B, and therefore is not being properly contained and treated from a hydrologic standpoint. To address the concerns raised by this Order, Permittee proposes the following plan of action:

1) Remove the deeper coal fines in the area of greatest accumulations around and below Pond B (denoted as “Mechanical Cleanup Area” on Plate 1A) by utilizing heavy equipment,

2) Salvage topsoil from the Pond B - Potential Pond G drainage area to prevent future soil contamination at such time as is necessary, additionally this area was disc and seeded in October 2010, and,

3) At such time as becomes necessary due to the inability to contain fines from potentially larger coal stockpiles, eliminate Pond B, and replace it by constructing a new Pond G located approximately 450' southeast of (i.e., down-drainage and down-wind from) Pond B.

4) Remove the shallow coal fines in the adjacent area, north of Pond B (denoted as “Vacuum Cleanup Area” on Plate 1A), by
utilizing truck-mounted vacuum equipment,

5) Access road PR-5 will be graveled prior to coal trucks accessing the main stockpile loading area from the East side of the property, (i.e., by Primary Road PR-5).

6) Conduct future monitoring to assess the wind-blown fines situation at such time as becomes necessary.

7) Review of reclamation costs and bonding annually.

These items are discussed in greater detail in the following narrative:

1) **Remove deeper coal fines:** The area of greatest coal fines accumulations is generally shown on Plate 1A and is labeled "Mechanical Cleanup Area". Also, Figure 1 attached to this appendix shows the nature of the aerial extent of the accumulations. This exhibit was prepared by Environmental Industrial Services (E.I.S.) based upon on-site measurements. Prior to beginning any construction or clean-up activities in this area, "disturbed area" perimeter markers will be installed around the proposed construction site. The general area of interest is shown on Figure 2 of this appendix.

Prior to beginning any construction or clean-up activities in this area, "disturbed area" perimeter markers will be installed. Temporary sediment control measures will then be installed below the construction site. This will consist of installing a row of excelsior logs (filter logs) laid along the contour northwest side of the Trestle Road. The purpose of these filter logs is to prevent any sediment or coal fines from getting off the permit area while the area is being cleaned up, topsoil is being salvaged, and Pond G is being constructed.

Accumulated coal fines will be scraped up using an assortment of mechanical equipment such as a vacuum truck, grader, back-hoe and/or front end loader, down to the native soil. The equipment to be used will be selected so that the coal fines can be gathered up in a manner that minimizes the disturbance to the underlying topsoil. The coal-fines will then be hauled off to the main coal pile to be blended back into the coal sales.
product, or will be hauled to the mine refuse pile located on the west side of the loadout facility. The choice of where to dispose of the coal fines will be made by the loadout operators and will be made based on the quality of the collected material.

2) **Salvage and stockpile topsoil:** In July, 2003, a soils survey of the immediate area was conducted by James Nyenhuis. This report was incorporated into the MRP in May, 2006, appearing as a supplement to Appendix D. This report gives a complete description of the soils in this area, and is included in this appendix for ease of reference, as Exhibit 5.

After the coal fines have been cleaned up and removed from the site topsoil will be salvaged from the "mechanical cleanup area", as shown on Plate 1A. Care will be taken to avoid damage to the existing larger vegetation in this area (juniper-pinyon trees, barrel cactus clusters, etc.) during topsoil salvage. A minimum of 6" of topsoil will be salvaged and stockpiled nearby as an extension of existing Topsoil Pile A. Topsoil will be salvaged in this area to allow for the construction of new Sediment Pond G, and to provide a measure of protection of the topsoil resource in the future in the likely event that this area sees additional deposits of wind and/or water-borne coal fines. The mechanical cleanup area involves approximately 3.84 acres. At a 6" salvage depth it is estimated that approximately 3097 cubic yards of topsoil will be gathered up. This will be stored as an extension of Topsoil Pile A. Pile A presently has an estimated volume of 440 cu. yds. Therefore, the expanded pile should have a total storage volume of about 3500 cu. yds. The new pile will be kept at the pre-existing height of about 6', and is estimated to be about 250' long x 70' wide when completed. There will be no topsoil removed in the area directly underneath the extended topsoil pile.

After the topsoil is salvaged from the "mechanical cleaning area" the area will then be roughened. The purpose of this roughening is to help minimize erosion, and also to help capture any additional wind-blown fines and prevent them from migrating downhill. This area was disced and seeded in October 2010.
3) If and when it becomes necessary to replace Pond B with Pond G due to the inability to contain windblown coal fines due to potentially larger coal stockpiles: After the coal fines have been cleaned up and the topsoil salvaged from the mechanical cleanup area a new sediment pond will be constructed. This new pond is to be called Pond G. Pond G will be located within the existing permit area immediately northwest of the Trestle Road, and down-drainage from the existing Pond B, as shown on Plates 1A and 2A. Pond G will essentially be a replacement for Pond B but will also treat the expanded cleanup area, based on a 10 year-24 hour precipitation event. The design details for Pond G are included in Appendix R (Sedimentation and Drainage Control Plan) and also on Plate 3G. This plate is also presented as Figure 4 of this appendix for ease of reference.

The embankment for Pond G will be constructed using native material, compacted in 18" lifts. It will have a 20' wide crest with a 3H-1V outslope and a 2H-1V in slope. The Pond will include a 24" CMP primary spillway equipped with an inverted oil skimmer, and a 24" CMP emergency spillway. After construction, the crest and outslopes of the pond embankment will be re-seeded for interim reclamation. A row of excelsior filter logs will be installed around the perimeter (toe) of the outslope of the dam for interim sediment control.

4) Re-seeding:

After construction, the topsoil pile will be roughened and re-seeded with an approved interim reclamation seed mix as specified in Chapter 2 and Chapter 3. A copy of this seed mix is also included with this appendix as Figure 3 for ease of reference. The company will endeavor to utilize locally acquired seeds if possible. A retention berm and ditch will be constructed around the perimeter of the pile to prevent soil loss, and a row of excelsior filter logs will be installed around the perimeter to provide siltation control. The pile will also be equipped with an identification sign.

Establishment of vegetation on the topsoil piles at this site has
previously required two seedings. Therefore, stabilization of the new expanded topsoil pile A will include the application of wood fiber hydromulch after or with seeding. Wood fiber mulch and tackifier application is an accepted practice that will protect the topsoil pile from slopes and will protect the soil from erosion during seed establishment.

The areas associated with and including the sediment pond G and the coal fines removal as shown on Plates 1A and 1B will be broadcast seeded using the interim seed mix described in Figure 3. Seeding will occur in the fall or as recommended by a DOGM biologist. The area immediately around the extended topsoil pile will not have topsoil removed, nor any coal fines removed, but this area will be disturbed simply by the movement of heavy equipment involved in constructing the topsoil pile. Therefore, after the pile is constructed, this area will be roughened and re-seeded in the approved manner similar to the topsoil pile and the coal fines removal area (a.k.a., "mechanical cleanup area").

According to the approved reclamation plan gouging is described as 18" deep x 2'-3' wide, spaced 6'-10' apart (Section R645-301-240). On such gentle slope, the gouges will serve less to control erosion and more to provide for water collection. The problems with creating gouges in this manner are that the gouges will be deeper than the replaced topsoil and the topsoil that is removed from the gouge becomes a mound adjacent to the gouge, with steep slopes that will not retain seed, and the gouge may expose compacted fill soil. Gouging will be used during operations to promote vegetation growth in the drop zone and to collect coal fines. This method will be alternated with ripping of the surface to a depth of 12" and both measures can be qualitatively evaluated for success at final reclamation. Andalex commits to using the most effective roughening technique (either ripping or gouging) at final reclamation.

5) Remove shallow coal fines: Immediately to the north of the area of heaviest accumulations is another area targeted for cleanup. The coal fines accumulations are less in this area and it is felt that this area can adequately be cleaned up by utilizing a truck mounted vacuum system. This area is shown on Plate 1A (and also Figure 2) and is denoted as the "Vacuum
Cleanup Area”. It occupies approximately 1.59 acres. The area depicted is the general area proposed for cleaning, although the company will seek concurrence from the Division regarding the final area.

There are a number of juniper-pinyon trees growing in this area, and the use of vacuum equipment will allow this area to be cleaned without adversely affecting these trees. To the extent practicable, the vacuum truck will utilize the existing adjacent roadway and use a long extension hose for the cleanup so as to minimize the on-ground disturbance. Because the accumulations are less in this area there are no plans to remove or salvage any topsoil after the coal fines have been cleaned up. Coal cleanup material vacuumed up from this area will be taken to the main coal storage area for re-sale, or will be taken to the coal refuse pile, depending on quality.

Input from Division representatives will be requested to make certain that the area targeted for vacuum cleanup is concurred with. Prior to doing any cleaning in this area, "disturbed area” perimeter markers will be installed around the proposed cleanup area. Although the area will not technically be considered "disturbed" for the purpose of sedimentation and drainage control or final reclamation, it will nevertheless be somewhat disturbed by the vacuum operation.

6) Gravel a portion of access road PR-5 at such time as the construction of Pond G becomes necessary: Access road PR-5 runs between the main coal storage pile area and the coal-fines accumulation area, as shown on Plate 1A and Figure 2. PR-5 was originally constructed as a low volume road to provide thru-access around the base of the coal storage pad. As such it was constructed on the native Mancos Shale material existing in the area, and was never graveled. Subsequently, new sales contracts required that semi-trucks utilize this road to gain access to the coal storage pad where they could then be loaded with a front-end loader. This heavier truck traffic on this road has contributed to the wind-blown fines situation. Therefore, the company proposes to gravel a 570’ segment of this road, including the ramp up onto the coal storage pile, at such time as it becomes necessary to utilize this road for additional coal storage, which is utilized by the larger trucks needing access the coal pad.

7 MAR 12 2013
INCORPORATED
The segment of road to be graveled is shown on Plate 1A. Once the graveled road is in operation, it will be watered as needed in the future to control fugitive dust emissions.

7) **Conduct future monitoring of wind-blown fines:** After the cleanup is completed and the construction is finished, the company will continue with an operational monitoring plan for the area. This will consist of an inspection of the area to assess the amounts of future coal-fines accumulation, augmented by digital photography. Following two consecutive months of no coal transloading, the inspections shall be annual. Following two consecutive months of transloading at least 10,000 tons of coal, inspections shall be quarterly. Monitoring results are included in the annual report. The general approach of monitoring (depth assessment and location on a map) will be stated in the annual report. Refer to Document "Wildcat Coal Fines Issue - Division Order-04 Wind Blown Fines) Annual Monitoring", dated November 29, 2012. This detailed study will be performed in the 2nd Quarter of each year.

8) **Bonding:** At present (July, 2010) the Wildcat reclamation bond is posted in the amount of $1,144,000. This bond was re-adjusted in December 2007. Under the DO-04 cleanup plan there will be no additional demolition cost during final reclamation. The earthwork regrading costs will cancel out because Pond B is being replaced by Pond G. There will be slightly higher topsoiling costs and re-vegetation costs due to the additional disturbed acreage associated the cleanup plan. The existing disturbed area is 66.91 acres; the estimated disturbed area after implementation of the plan will be 73.26 acres, or an increase of 6.35 acres. Using the presently approved reclamation costs, the additional costs are computed as follows:

1) Topsoil: $15,013/66.91 ac = $224/acre  
   $224/acre x 6.35 acres = $1422

2) Reveg: $359,746/66.91 ac = $5377/acre  
   $5377/acre x 6.35 acres = $34,141

Total reclamation cost increase = $1422 + $34,141 = $35,563

Percent increase ($1,144,000 + $34,141)/$1,144,000 = 1.028
Therefore, implementation of the cleanup plan is estimated to increase the reclamation costs by less than 3% of the posted bond.

9) **Construction Schedule:** Construction will not begin until it is determined to be necessary.
WILDCAT COAL FINES ISSUE
DIVISION ORDER-04(WIND BLOWN FINES)
ANNUAL MONITORING

NOVEMBER 29, 2012

Prepared for:

AMERICAN WEST RESOURCES

Prepared by:

EIS ENVIRONMENTAL & ENGINEERING CONSULTING
31 NORTH MAIN
HELPER, UTAH

MAR 12 2013

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Div. of Oil, Gas & Mining
INTRODUCTION

The purpose of this report is to provide annual monitoring of coal fines accumulation at the Wildcat Loadout as described in Appendix P, Response to Division Order DO-04 (Wind Blown Fines), Page 7, “Conduct future monitoring of wind-blown fines”.

PROCEDURE

Previous reports monitoring coal fines accumulation were completed on August 26, 2011, November 14, 2011, March 15, 2012, June 15, 2012, and October 31, 2012. In a letter from Mr. Peter Hess dated November 23, 2012, a new procedure was outlined for the monitoring of coal fines. This new procedure addresses the concerns outlined in this November 23, 2012 letter. The changes made to the coal fines monitoring procedure follows item 2) R645-301-423.200, R645-301-424, Plan for Fugitive Dust Control Practices on page 2 of this letter. Comments from DOGM are italicized and listed as follows:

1) Please designate an area about each stake to be evaluated each year for the percent cover as described in item 4.

A 3’ x 3’ jig (incremented in tenths of feet) was constructed for the monitoring of ground cover. This jig was moved from site to site and was used to determine ground cover percentages. The field data sheets are located in Appendix 2 of this report.

2) Please provide the GPS co-ordinates for each monitoring point, so data can be coordinated with future monitoring.

Each coal fine monitoring point was located with a Trimble Geo XM 2005 Series GPS. The UTM measurements were taken in NAD 1983 Conus). The coordinates for each point is in the Appendix 1.

3) The Division recommends that five additional monitoring points be installed in the area west of the eastern DOGM permit boundary (four, east of monitoring points N6, N8, N5, N4, and one additional point east of N1).

Five (5) additional random points were installed as outlined above. These points along with existing points are shown on Figure 1.

4) The Division requests that each area being monitored (represented by stake, with documented GPS location information) be evaluated for percent cover in four ways;
   a. the percentage of rock cover on the surface;
   b. the percentage of soil cover making up the surface;
   c. the percentage of vegetation;
   d. the percentage covered by coal fines, either in trace amounts or other observed volumes.
The cover information along with coal fines comments are shown in Appendix 2 under Ground Cover Information Spreadsheet.

5) The permittee should develop a spreadsheet to track the amount of coal fines at each location for each quarter monitoring. Yearly information is required by the commitment in the mining and reclamation plan as part of the Annual Report (See MRP, Appendix P, Item 7). This would facilitate comparisons of data.

As per a conversation with Mr. Pete Hess DOGM, on January 16, 2013:

1. Ground cover calculations procedures will only be conducted during one quarter of the year. During the other three quarters the method listed in item (2) will be followed.

2. The 3' x 3' jig will be used each quarter during the coal fines evaluation process. The depth of coal fines will be recorded at various locations inside of the jig. Five reading will be taken at each staked location. One measurement will be taken inside each corner of the jig and the fifth measurement will be taken in front of the stake in the center of the jig.

6) The Permittee must update the monitoring protocol in the mining and reclamation plan, Appendix P, item 7 to include the newly established monitoring points with GPS locations and other criteria described above.

The results and new monitoring procedures will be updated in Appendix P as described above.

CONCLUSION

This new procedure of using the 3' x 3' jig will make future coal fines measurements more consistent and reliable. This modified procedure will be used on future coal fines measurement activities.

The Ground Cover Information Spreadsheet in Appendix 2 indicates that the average coal fines cover is higher in the northern section (70.38%) as compared to the southern section (16.71%). Also the depth of coal fines is consistently higher in the northern section.

The rock ground cover was very low (northern section .14%, southern section .37%). Because of the low rock ground cover, it is suggested that in the future this parameter should be dropped from the total ground cover measurements. Rock cover will be included in the soil cover percentage.
WILDCAT LOADOUT
COAL FINES CLEAN-UP AREA
RESPONSE TO D0-04
RANDOM PHOTOGRAPH SITES
APPENDIX 1

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UTMs in NAD 1983 (Conus)

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MAR 12 2013
Orv. of Oil, Gas & Mining
APPENDIX 2

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<td>Coal fines cover total area</td>
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| S1       | 2                 | 0.89              | 0            | 0.00         | 223              | 99.11            | 0                 | 0.00             | 2"         | Trace over total area |
| S2       | 11.75             | 5.22              | 0            | 0.00         | 0                | 0.00             | 213.25            | 94.78            | Trace       | Trace over total area |
| S3       | 13.5              | 6.00              | 0            | 0.00         | 0                | 0.00             | 211.5             | 94.00            | Trace       | Signs of flowing water in the past, traces of fines |
| S4       | 8                 | 3.56              | 0            | 0.00         | 0                | 0.00             | 217               | 96.64            | Trace       | G of trace whole area |
| S5       | 7.25              | 3.22              | 3.25         | 1.44         | 0                | 0.00             | 214.5             | 95.35            | Trace       | 0" to trace whole area |
| S6       | 15.25             | 6.78              | 0            | 0.00         | 0                | 0.00             | 209.75            | 93.25            | Trace       | Trace over total area, straw cover over large portion |
| S7       | 23.75             | 10.56             | 0            | 0.00         | 191.5            | 85.12            | 9.75              | 4.33             | 1/4"       | Trace to 1/4" most of the area |
| S8       | 95                | 42.22             | 0            | 0.00         | 112              | 49.78            | 18                | 8.00             | Trace       | Trace to 1/4" most of the area |
| S9       | 99.25             | 44.11             | 0            | 0.00         | 0                | 0.00             | 125.75            | 55.89            | Trace       | Trace over total area |
| S10      | 72                | 32.00             | 0            | 0.00         | 0                | 0.00             | 153               | 68.00            | Trace       | Trace over total area |
| S11      | 0                 | 0.00              | 0.00         | 0.25         | 0.00             | 238.75           | 97.20             | 0"              | No coal in area |
| S12      | 6.25              | 2.78              | 2            | 0.89         | 0                | 0.00             | 216.75            | 96.33            | 0"          | G of trace whole area |
| S13      | 21.75             | 9.67              | 0            | 0.00         | 0                | 0.00             | 203.25            | 90.33            | Trace       | G of trace whole area |
| S14      | 0                 | 0.00              | 0            | 0.00         | 0.00             | 225              | 100.00            | 0"              | No coal in area |
| AVERAGE  | 11.93             | 0.37              | 0.00         | 0.00         | 0.00             | 0.00             | 16.71             | 70.59            | 0"         | Coal fines cover total area |

INCORPORATED
MAR 1 2 2013

Div of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N1
Date: 11/29/12
Scale: 1"=1'

Notes: 0°-T WILDCAT AREA

Vegetation = 4.5, 2, 5, 1.5' = 45.5 Squares

Rock = ~2 Squares

Soil = 38, 9, 32 = 79 Squares

INCORPORATED
MARCH 12 2013
DIAMOND Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 2
Date: 11/29/12

Scale: 1"=1'

Notes:

Vegetation 2.75a
Soil: 88.5

INCORPORATED
MAR 12 2013
ASPIRO Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: 3
Date: 11/29/12

Scale: 1"=1'

Notes:

\[
V E G E T A T I O N : \frac{5.5}{5}, \frac{5}{10.7}, \frac{5.5}{2}, \frac{1}{1.5} = 31.2 \text{ SQUARES}
\]

SOIL: 27.3 SQUARES
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 4
Date: 11/29/12
Scale: 1"=1'

Notes:

VEGETATION: 4.9, 4.6, 3.2, 2 = 16.5 sq

SOIL: 5.9, 4.7, 6.7, 4.5 = 74.9 sq
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N5
Date: 11/29/12
Scale: 1"=1'

Notes:

T - 1/2" REST OF AREA

VEGETATION: 14, 4.7, 6, 3, 18, 2 = 42.3 sq

SOIL: 3.5

INCORPORATED
MAR 12 2013

Div. of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 6
Date: 11/29/12

Scale: 1"=1'

Notes:

T - 1/4' HIGH AT AREA

VEGETATION: 2, 1, 2, 5, 2, 1.5, 3, 2, 2.75, 1 = 17.75 SQUARES

SOIL (WITH TRACE) = 52 SQUARES

COAL
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N7
Date: 11/29/12
Scale: 1"=1'

Notes:

1/4-3/8" REST OF AREA

VEGETATION: 3, 1, 1, 1 = 7 SQUARES

SOIL: 6.75 SQUARES
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 8
Date: 11/29/12

Scale: 1"=1'

Notes: 2" - 4"

VEGETATION: 94.5, 47.5, 3.5 = 101.75

INCORPORATED
MAR 12 2013
Inv. of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N9
Date: 11/24/12
Scale: 1"=1'

Notes:

- 1/4" WILDCAT AREA

Vegetation: 42.75, 4.5, 6.5, 3.5, 2, 3.5, 5.5, 25 = 68.5 sq

Soil: 22.5 squares

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MAR 12 2013
Div. of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 10
Date: 11/29/12

Scale: 1"=1'

Notes: 0-T WHOLE AREA

Vegetation: 4, 7.5, 2, 1, 7.5, 2.5, 7, 10.25 = 54.25 Squares

Soil: 2.65, 6, 5, 11 = 48.5 Squares
Notes:

- Vegetation: 17, 11, 1 = 29 sq

- Soil: 82 sq

- Rock: 1 sq
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N12
Date: 11/29/12

Scale: 1"=1'

Notes:

O - T whole area

Vegetation: 3.75 = 3.75 sq
Rock: ~2 sq
Soil: 0
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 1/3
Date: 11/29/12
Scale: 1"=1'

Notes: $1/2"-11/2"$ W/HOLE AREA

VEGETATION: 4.25, 2.5, 1.75, 1.5, 7.5 = 16.5 sq

COAL REST OF THE AREA

INCORPORATED
MAR 12 2013
Div of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 14
Date: 11/29/12

Scale: 1"=1'

Notes:

1 - 2" REST OF AREA

VEGETATION: 19.5, 25.75, 22.5, 10.5, 4.5, 3, 2 = 87.75 SQ
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 15
Date: 11/29/12

Scale: 1"=1'

Notes:

WHOLE AREA

VEGETATION: 8, 75, 2, 5, 25, 75, 75 = 17.5 sq

SOIL: 6, 75 = 13.5 sq

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MAR 12 2013

Div. of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: N 16
Date: 1/29/18

Scale: 1"=1'

Notes:

T UP TO 2" REVISION

VEGETATION: 6.5, 10, 1.5, 1, 2, 2 = 23 SQ
WILDCAT LOADOUT
Coal Fines Monitoring

Site: 51
Date: 11/29/12
Scale: 1"=1'

Notes:
2"-2½" Whole Area

Vegetation: 2 sq

INTEGRATED
MAR 12 2013
Div of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: 52
Date: 11/24/17

Scale: 1"=1'

Notes:

T WHOLE AREA

VEGETATION: .5, 1.5, 3.5, 2, 2.5, 5, 2.5, 1.5 = 11.75 sq
WILDCAT LOADOUT
Coal Fines Monitoring

Site: 4
Date: 11/29/18

Scale: 1"=1'

Notes:

O T Whole Area

VEGETATION: 2.5, .5, .75, 2, 1, 1.25 = 8 sq

INCORPORATED
MAR 12 2013
Div. of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: 55
Date: 11/29/12

Scale: 1"=1'

Notes:

O"-T WHOLE AREA

VEGETATION: 5, 1.25, 2.5, 1.25, 1.75 = 7.25 SQ.

ROCK: 1.25, 1.25, 1.25, 1.75 = 3.25 SQ.
WILDCAT LOADOUT
Coal Fines Monitoring

Site: SG
Date: 11/29/18
Scale: 1"=1'

Notes: T WHOLE AREA

Vegetation: 4.5, 7.5, 7.5, 11.5, 17.5, 15, 3 = 15.25 sq
WILDCAT LOADOUT
Coal Fines Monitoring

Site: S7
Date: 11/29/12
Scale: 1"=1'

Notes:

VEGETATION: 1.75, 5, 75, 4.5, 1.25, 1.5, 7 = 23.75 sq

SOIL: 6, 2, 1.75 = 9.75

INCORPORATED
MAR 12 2013
Div of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: SB
Date: 11/29/12

Scale: 1"=1'

Notes: T = 1/8" WOOLE AREA

VEGETATION: 26.5, 7.4, 17.25, 3.75, 36.5 = 95 SQ

SOIL: 13.5, 9.5 = 18 SQ
WILDCAT LOADOUT
Coal Fines Monitoring

Site: S9
Date: 11/29/12

Scale: 1"=1'

Notes:

WHOLE AREA

VEGETATION: 39.5, 9.5, 11.5, 3, 22.5, 18, 21, 1.25, = 99.25 sq

INCORPORATED
MAR 12 2013

Div. of Oil, Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: SU1
Date: 11/29/12

Scale: 1"=1'

Notes:

T WHOLE AREA

VEGETATION: 15, 9.75, 3.5, 1.25, 1, 2, 22.75, 12.75, 4 = 72.54

INCORPORATED
MAR 12 2013
Div of Oil Gas & Mining
WILDCAT LOADOUT
Coal Fines Monitoring

Site: S11
Date: 11/29/12
Scale: 1"=1'

Notes:
- 0" WHOLE AREA
- ~12x12 SMALL ROCKS (TOTAL) R = 60.25 SQ
WILDCAT LOADOUT
Coal Fines Monitoring

Site: S12
Date: 11/29/12
Scale: 1"=1'

Notes:

Q"-T WHOLE AREA

VEGETATION = 3, 3.25 = 6.25 sq

ROCK: ~ 250 sq
WILDCAT LOADOUT
Coal Fines Monitoring

Site: S 13
Date: 11/29/12
Scale: 1"=1'

Notes:

VEGETATION: 4, 1.5, 3.25, 1, 2, 3, 4 = 21.75 sq
APPENDIX 3
PHOTOGRAPHS
ADDENDUM TO APPENDIX P

RESPONSE TO DIVISION NOV #10132

COAL FINES ACCUMULATIONS

CONTENTS:

1) NARRATIVE
2) FIGURE, COAL FINES ACCUMULATION OVER 4" MAP

INCORPORATED
JUN 17 2014
Div. of Oil, Gas & Mining
On November 26, 2013, Division Citation NOV #10132 was issued for coal fine accumulations in both undisturbed areas within the current permit area as well as outside the approved permit area. After several meetings and discussions with the Permittee (IPA), the Operator (Wild West Equipment & Hauling), and UDOGM personnel, the following courses of action were agreed upon to mitigate the NOV:

Clean up of accumulations in the areas cited in the NOV and areas where coal fine accumulations are greater than 4” in depth. Refer to Figure 1 “Coal Fines over 4” Map”. This will be accomplished by the use of mechanical equipment and the topsoil will remain in place as recommended by Priscilla Burton of the Price UDOGM Field Office. Any sediment controls (straw bales, excelsior logs, etc.) damaged or removed for the clean up will be replaced and additional sediment controls added as needed. The areas will then be reseeded with the Interim seed mix as described in Chapter 4, Pages 3-23 & 3-24 of the MRP, with the exception of the exclusion of Triticale from the cold season grasses as Ms. Burton indicated this particular species did not perform well in the area.

The previously 6.83 acres defined as undisturbed area within the current Permit boundary will be designated as disturbed area as indicated on Plate 1, and monitored regularly for coal fine accumulations.

Extend the existing snow/drift fence approximately 600 feet to the North along PR-5 to reduce the accumulations of wind blown fines in the newly defined disturbed area. Additional snow/drift fences have also been installed along the east edge of the coal pad above PR-5 and along the eastern edge of the new Topsoil Pile “A-I”.

Grade/blade the road surface of PR-5 occasionally to reduce dusty conditions in addition to watering.

A revised Reclamation Cost Estimate summary escalated to 2014 dollars has also been completed to include the additional 6.83 acres to be defined as disturbed area which includes an adjustment of $24,147 for reclamation costs. The current bond amount is sufficient to cover this addition so no additional bonding is required at this time.

Additionally, IPA intends to submit significant revisions to the MRP in the near future, to expand the Permit boundary and designate this expansion as disturbed area, including the possible addition of more sediment controls, potential additional ASCA’s, additional control of drop points on stacker conveyors, additional monitoring locations, and other measures to ensure that these accumulations will controlled and managed as effectively and efficiently as possible.
APPENDIX R

WILDCAT LOADOUT
SEDIMENTATION AND DRAINAGE CONTROL PLAN

INCORPORATED
SEPTEMBER 14, 2012
DIVISION OIL, GAS & MINING
# SEDIMENTATION AND DRAINAGE CONTROL PLAN
## WILDCAT LOADOUT
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### SEDIMENTATION AND DRAINAGE CONTROL PLAN

**WILDCAT LOADOUT**

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### APPENDICES

Appendix 1 - Computer Backup Data
1. **Introduction**

The Sedimentation and Drainage Control Plan for the Wildcat Loadout has been designed according to the State of Utah R645 - Coal Mining Rules, (revised August 1, 2001). This plan represents the proposed drainage control plan. All design criteria and construction has been certified by a Utah Registered Professional Engineer.

The entire drainage and control plan has been re-evaluated and updated for 2 main reasons:

1. To evaluate the adequacy and provide up-to-date calculations for existing drainage controls, and;

2. To provide an overall plan to accommodate the proposed modifications to the site.

The proposed changes to the site plan include the following:

1. A 1.59 acre area east of the Primary Coal Storage Area will be cleaned by vacuuming coal fines from the surface. No topsoil will be removed from this area;

2. A 3.84 acre area southeast of the Primary Coal Storage Area will be cleaned mechanically by removing coal fines and topsoil from the surface;

3. Existing Sediment Pond “B” will be eliminated and replaced with a new, larger Sediment Pond “G” located in the SE corner of the property at such time as it becomes necessary due to the inability to contain fines from potentially larger coal stockpiles: Refer to “RESPONSE TO DIVISION ORDER DO-04” in Appendix P

4. Topsoil removed from the mechanically cleaned area and new Sediment Pond “G” will be placed on the existing Topsoil Pile “A” located in ASCA-4 east of Sediment Pond “A”;

---

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(5) One small ASCA (ASCA-8) will be added for the outslope of new Sediment Pond “G”.

All existing and proposed structures are shown on updated Plates 1A and 2A.

The general surface water control plan for this site consists of the following:

(1) Wherever possible, undisturbed drainage is diverted around the site into natural channels;

(2) The entire disturbed area (except the 8 small ASCA’s) and portions of the undisturbed area not diverted, are drained to one of the 6 sediment ponds, permanent impoundment or depression area, via properly sized ditches and culverts;

(3) There are 8 small Alternate Sediment Control Areas (A.S.C.A.). These areas are described in detail under Section 2.11.

(4) All sediment ponds are sized to contain the runoff from a 10 year - 24 hour precipitation event, plus a minimum of 3 years sediment storage as described in Section 3 of this Appendix. The Permanent Impoundment and Depression Area are sized to contain the runoff from a 100 year - 6 hour precipitation event.
DESIGN OF DRAINAGE CONTROL STRUCTURES

Design Parameters

2.1 Precipitation
2.2 Flow
2.3 Velocity
2.4 Drainage Area
2.5 Slope Lengths
2.6 Runoff
2.7 Runoff Curve Numbers
2.8 Culvert Sizing
2.9 Culverts
2.10 Ditches
2.11 ASCA Areas
2.12 Erosion Control

Table 1  Drainage Area Data
         Runoff Summary
         Drainage Structures
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         Ditch Data
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Figures

Figure 1  Culvert Nomograph
Figure 2  Rip-Rap Chart
Figure 3  Ditch, Typical Section (Unlined Ditch)
Figure 4  Ditch, Typical Section (Lined Ditch)
Design Parameters

2.1 Precipitation

The precipitation-frequency values for the area were taken from "NOAA, Precipitation-Frequency Atlas of the Western U.S., Atlas 2, Volume VI.

<table>
<thead>
<tr>
<th>Frequency - Duration</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 year - 6 hour</td>
<td>0.85&quot;</td>
</tr>
<tr>
<td>10 year - 6 hour</td>
<td>1.23&quot;</td>
</tr>
<tr>
<td>10 year - 24 hour</td>
<td>1.85&quot;</td>
</tr>
<tr>
<td>25 year - 6 hour</td>
<td>1.48&quot;</td>
</tr>
<tr>
<td>25 year - 24 hour</td>
<td>2.15&quot;</td>
</tr>
<tr>
<td>100 year - 6 hour</td>
<td>1.91&quot;</td>
</tr>
</tbody>
</table>

Disturbed ditch and culvert designs for runoff control are based on the 10 year - 24 hour event of 1.85" and the 25 year - 6 hour event of 1.48", where required.

Undisturbed culvert designs are based on the 10 year - 24 hour event of 1.85".

The sedimentation ponds are designed to contain the runoff from a 10 year - 24 hour event of 1.85" as required by the Division. Reclamation designs are based on the 100 year - 6 hour event of 1.91", where applicable for permanent structures.

ASCA areas are sized to contain or treat runoff from a 10 year - 24 hour precipitation event.
2.2 Flow

Peak flows, flow depths, areas and velocities were calculated using the computer program "Office of Surface Mining Watershed Model", Storm Version 6.20 by Gary E. McIntosh. (Trapezoidal Channel Flow). All flow is based on the SCS - TR55 Method for Type II storms.

Time of concentration of storm events was calculated for each drainage area using the following formula:

\[
t_L = \frac{L^{0.8} (S+1)^{0.7}}{1900 \cdot Y^{0.5}}
\]

where:
- \( t_c \) = Time of Concentration (hrs.)
- \( t_L \) = Lag Time (hrs.) = 0.6 \( t_c \)
- \( L \) = Hydraulic Length of Watershed (ft.)
- \( Y \) = Average Land Slope (%)
- \( S \) = \( \frac{1000}{10^4 - 10} \) CN
2.3 **Velocity**

Flow velocities for each ditch structure were calculated using the Storm computer program with Manning’s Formula:

\[ V = \frac{1.49 \cdot R^{2.3} \cdot S^{1/2}}{n} \]

where:
- \( V \) = Velocity (fps)
- \( R \) = Hydraulic Radius (ft.)
- \( S \) = Slope (ft. per ft.)
- \( n \) = Manning’s n; Table 3.1, p.159,


**Note:** The following Manning’s n were used in the calculations:

<table>
<thead>
<tr>
<th>Structure</th>
<th>Manning’s n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culverts (cmp)</td>
<td>0.020</td>
</tr>
<tr>
<td>Rip-rapped or Natural Drainage Channels</td>
<td>0.035 - 0.040</td>
</tr>
<tr>
<td>Unlined Disturbed Area Ditches</td>
<td>0.035 - 0.040</td>
</tr>
<tr>
<td>Bedrock Channels with Rubble</td>
<td>0.030</td>
</tr>
<tr>
<td>Concrete Lined Channels</td>
<td>0.015</td>
</tr>
</tbody>
</table>

2.4 **Drainage Areas**

All drainage areas are designated with a DA-number (i.e. DA-2) as shown on Plate 2 and 15. All drainage areas were planimetered directly from As-Constructed Plate 2 (Drainage Map) and Plate 15 (Watershed Map).

2.5 **Slopes, Lengths**

All slopes and hydraulic lengths were measured directly from the topography on Plates 2 and 15.
2.6 Runoff

Runoff was calculated using the SCS Formula for Type II Storm:

\[ Q = \frac{(P - 0.2 \, S)^2}{P + 0.8 \, S} \]

where:
- \( Q \) = Runoff in inches
- \( P \) = Precipitation in inches
- \( S \) = \( 1000 - 10 \, \text{CN} \)
- \( \text{CN} \) = Runoff Curve Number

2.7 Runoff Curve Numbers

A runoff curve number of 90 was used for all disturbed areas. This is a conservative number based on the SCS determinations for Runoff Curve Numbers for Antecedent Moisture Condition II. A runoff curve number of 65 was used for undisturbed areas. This number is based on the SCS determinations for Runoff Curve Numbers for Antecedent Moisture Condition II, Soil Group B, Range Land in Fair to Good Condition.

The selection of the curve number is also based on field observations and subsequent discussions with DOGM personnel.

The native soil in the area is quite sandy and porous in nature, resulting in a relatively low runoff potential. This was the basis for the selection of SCS Soil Group B.

The runoff numbers were also checked against the chart in Figure 2.26, page 85, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner, and Haan, 1983.
2.8 Culvert Sizing

All culverts were sized using the “Haestad Methods, Flowmaster I, Version 3.43” Computer Program.

Minimum culvert sizing is based on the following Manning’s Equation:

\[
D = \left( \frac{2.16 Q n}{\sqrt{S}} \right)^{0.35}
\]

where: 
- \(D\) = Required Diameter (ft.)
- \(Q\) = \(QP\) = Peak Discharge (cfs)
- \(n\) = Roughness Factor (0.020 for cmp)
- \(S\) = Slope (ft. per ft.)

Using the above formula, minimum required culvert sizes were calculated for each applicable area. Culverts were then selected above the required minimum, and these sizes were checked for adequacy against the Culvert Nomograph included as Figure 1 of this report.

2.9 Culverts

Culverts have been sized according to the calculations previously described, and are shown on Plate 2, Drainage Control Map.

All culverts are designated with C-number (i.e. C-2) as shown on Plate 2. All culverts are sized to carry the runoff from a 10 year - 24 hour storm, which is well in excess of the 10 year - 6 hour storm required by the regulations. The only exceptions to the above culvert sizing is for culverts used as sediment pond overflows - these culverts are sized to carry the 25 year - 6 hour flows as required for sediment pond designs.

Culverts will be inspected regularly, and cleaned as necessary to provide for passage of design flows. Inlets and outlets shall also be maintained so as to prevent plugging or undue restriction of water flow.

All disturbed area culverts are temporary, and will be removed upon

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2.10 Ditches

Ditches are shown on the Minesite Drainage Plan, Plate 2, and are designated with a D-number (i.e., D-2).

All ditches are designed to carry the expected runoff from a 10 year - 24 hour event with a minimum freeboard of 0.5' (See Figures 3 and 4). The 0.5' freeboard represents a minimum of 20% of the flow depth in all disturbed area ditches.

Ditches which exhibit expected flow velocities greater than 5 fps, based on the 10 year - 24 hour runoff, will be lined with rip-rap, belting or ½ round culvert for erosion protection. Typical cross-sections, flow depths and areas for all lined and unlined ditches are shown on Figures 3 and 4 of this report.

Ditch slopes have been determined from Plate 2

All ditches will be inspected regularly, and maintained to the minimum dimensions for the required 10 year - 24 hour runoff to provide adequate capacity for the design flow. All ditches are temporary and will be removed as described under the reclamation hydrology section. (Section 4)
2.11 Alternate Sediment Control Areas (ASCA)

There will be 10 Alternate Sediment Control Areas (ASCA) remaining on this site. The ASCA designations are ASCA-1, ASCA-2, ASCA-3, ASCA-4, ASCA-5, ASCA-6, ASCA-7 and Proposed ASCA’s-A,B & C. Only areas not able or required to be drained to sediment ponds are included as ASCA’s. All ASCA’s are existing.

The following are descriptions of each of the ASCA’s and methods of treatment:

ASCA-1 - This is the area west of the railroad right-of-way and scale house access road. The area is approximately 0.76 acres and is treated for sediment control by vegetation.

ASCA-2 - This is an existing ASCA area on the outslope east of Sediment Pond E. The area is approximately 0.15 acres and is treated by vegetation.

ASCA-3 - This is an area north of new Sediment Pond "G", and includes the area proposed for vacuum cleaning. The area is approximately 2.32 acres and is treated for sediment by straw bales and vegetation.

ASCA-4 - This is the area surrounding Sediment Pond "A" and including Topsoil Storage Pile A. This is an area of approximately 2.73 acres and is treated by straw bales and vegetation.

ASCA-5 - This is the area south and west of Topsoil Storage Piles E and B, including those piles. The area is approximately 1.71 acres, and is treated by a combination of berms, straw bales and vegetation.

ASCA-6 - This is an area southeast of the train loading facility along the Disturbed Area boundary. It is approximately 1.08 acres and is treated by vegetation.

ASCA-7 - This is Topsoil Storage Pile F. It is approximately 0.30 acres and is treated by a berm and vegetation.
ASCA-A- This will be a new ASCA located in the northernmost drainage of the proposed expansion area. It will have an area of approximately 3.62 acres and will be treated by vegetation and excelsior logs.

ASCA-B- This will be a new ASCA located in the center drainage of the proposed expansion area. It will have an area of approximately 6.84 acres and will be treated by vegetation and excelsior logs.

ASCA-C- This will be a new ASCA located in the southernmost drainage of the proposed expansion area. It will have an area of approximately 6.43 acres and will be treated by vegetation and excelsior logs.

The locations of the proposed new ASCA locations can be found on Plate 2a – Drainage Map

SEDCAD Calculations for proposed ASCA’s A, B, and C are included.

A summary of the results and conclusions supporting the use of waddles as the primary method of sediment control in ASCA’s A, B, and C follows on Page 10b, with Soil Erosion Calculations following on Pages 10c, 10d, and 10e.
Three ASCA areas have been added to the Wildcat surface facilities map to control runoff and sediment. These areas have been designated as follows: Area “A”, Area “B” and Area “C”. Waddles have been installed in the drainage to reduce the sediment leaving the areas.

Area “A” - The waddles would be placed approximately 90 to 100 feet apart and are approximately 140 to 180 feet in width, refer to Drainage Map (Plate 2A) in original submittal. The waddles are 9” in diameter logs and comprised of excelsior. Based upon the Universal Soil Loss Equation (see attached sheet titled “Soil Erosion for ASCA Area “A”), the sediment load per year in this area would be about 80.13 cubic feet per year or around to 80 cu.ft./yr. Total sediment containment forms an area of 9 inches in depth, 26 feet in length and 8 feet in width. Each waddle would contain a small portion of the sediment. The average width of the waddle would be about 160 feet and based on using 8 feet per year for sediment retention the waddle would last about 20 years. Additional waddles could be added if sediment continues to develop over the years.

Area “B” - The waddles would be placed approximately 60 to 95 feet apart and approximately 80 feet in width, refer to Drainage Map (Plate 2A) in original submittal. The waddles are 9” in diameter logs and comprised of excelsior. Based upon the Universal Soil Loss Equation (see attached sheet titled “Soil Erosion for ASCA Area “B”), the sediment load per year in this area would be about 484.94 cubic feet per year or around to 485 cu.ft./yr. There are six waddles in this area. Total sediment containment for each waddle forms an area of 9 inches in depth, 26 feet in length and 8 feet in width and holds approximately 81 cubic feet. Each waddle would contain a small portion of the sediment. The average width of the waddle would be about 78 feet and based on using 8 feet per year for sediment retention the waddle would last about 9% years. Additional waddles could be added if sediment continues to develop over the years.

Area “C” - The waddles have been placed approximately 30 to 50 feet apart and approximately 224 feet in width, refer to Drainage Map (Plate 2A) in original submittal. The waddles are 9” in diameter logs and comprised of excelsior. Based upon the Universal Soil Loss Equation (see attached sheet titled “Soil Erosion for ASCA Area “C”), the sediment load per year in this area would be about 291.67 cubic feet per year or around to 292 cu.ft./yr. There are four waddles in this area. Total sediment containment forms an area of 9 inches in depth, 24 feet in length and 8 feet in width and holds approximately 73 cubic feet. Each waddle would contain a small portion of the sediment. The average width of the waddle would be about 40 feet and based on using 8 feet per year for sediment retention the waddle would last about 5 years. Additional waddles could be added if sediment continues to develop over the years.
SOIL EROSION FOR ASCA AREA “A”

Use the modified Universal Soil Loss Equation:

\[ A = R \times K \times LS \times VM \]


- **A** = Amount of Soil loss per unit area
- **R** = Rainfall Factor
- **K** = Soil Erodibility Factor
- **LS** = Topographic Factor
- **VM** = Erosion Control Factor
  - **VM** = 0.9 for bare

For ASCA “A”

\[ R = 17.79 \text{ Foot-Ton/Acre/Hour} \]
\[ K = 0.16 \text{ Tons/Acre/El} \]

\[ LS = \frac{(65.41s^2 + 4.56s + 0.065)}{s^2 + 10,000 + s^2 * 10,000} \]
\[ = 72.6 \]

\[ s = \text{slope gradient} - 5.08\% \]
\[ m = \begin{cases} 
0.2 & \text{for } 0 < s < 1 \\
0.3 & \text{for } 1 < s < 3 \\
0.4 & \text{for } 3.5 < s < 4.5 \\
0.5 & \text{for } s > 5 
\end{cases} \]

\[ LS = \frac{(65.41(5.08)^2 + 4.56(5.08) + 0.065)}{(5.08)^2 + 10,000 + (5.08)^2 * (10,000)^{0.5}} \]
\[ = 650^{0.5} \]
\[ = 72.6 \]

<table>
<thead>
<tr>
<th>DRAINAGE AREA</th>
<th>SLOPE LENGTH</th>
<th>SLOPE</th>
<th>R</th>
<th>K</th>
<th>LS</th>
<th>VM</th>
<th>Tons/acre/ Yr (A)</th>
<th>ACRES</th>
<th>Tons/yr (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCA “A”</td>
<td>650</td>
<td>5.08</td>
<td>17.79</td>
<td>0.16</td>
<td>.27</td>
<td>0.9</td>
<td>.69</td>
<td>3.62</td>
<td>2.50</td>
</tr>
</tbody>
</table>

Determine cubic feet per year

Weight of Soil

- Specific gravity of Soil = 1.0
- Specific weight of Soil = 62.4lb/cu. ft. x 1.0 = 62.4 lbs./cu.ft.

\[ 2.50 \text{ Tons/yr.} \times 2,000 \text{ lbs} = 5,000 \text{ lbs/yr.} \div 62.4 \text{lbs./cu.ft.} = 80.13 \text{ cu. ft. / yr.} \]
SOIL EROSION FOR ASCA AREA "B"

Use the modified Universal Soil Loss Equation:

\[ A = R \times K \times LS \times VM \]


- **A** = Amount of Soil loss per unit area
- **R** = Rainfall Factor
- **K** = Soil Erodibility Factor
- **LS** = Topographic Factor
- **VM** = Erosion Control Factor
  = 0.9 for bare

For ASCA "B"

- \( R = 17.79 \text{ Foot-Ton/Acre/Hour} \)
- \( K = 0.16 \text{ Tons/Acre/El} \)

\[ LS = \frac{(65.41s^2+4.56s+0.065)}{s^2+10,000} \times \left( \frac{1}{72.6} \right)^m \]

- \( I = \text{slope length} - 715 \text{ ft}, \)
- \( s = \text{slope gradient} - 5.59\% \)
- \( m = 0.2 \text{ for } 0<s<1 \)
- \( m = 0.3 \text{ for } 1<s<3 \)
- \( m = 0.4 \text{ for } 3.5<s<4.5 \)
- \( m = 0.5 \text{ for } s>5 \)

\[ LS = \frac{(65.41(5.59)^2+4.56(5.59)+0.065)}{(5.59)^2+10,000+(5.59)^2} \times (10,000)^{0.5} \times \frac{715}{72.6} \]

<table>
<thead>
<tr>
<th>DRAINAGE AREA</th>
<th>SLOPE LENGTH</th>
<th>SLOPE</th>
<th>R</th>
<th>K</th>
<th>LS</th>
<th>VM</th>
<th>Tons/acre/ Yr (A)</th>
<th>ACRES</th>
<th>Tons/yr (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCA &quot;B&quot;</td>
<td>715</td>
<td>5.59</td>
<td>17.79</td>
<td>0.16</td>
<td>.86</td>
<td>0.9</td>
<td>2.21</td>
<td>6.84</td>
<td>15.13</td>
</tr>
</tbody>
</table>

Determine cubic feet per year

Weight of Soil

Specific gravity of Soil = 1.0

Specific weight of Soil = 62.4lb/cu. ft. x 1.0 = 62.4 lbs./cu.ft.

15.13 Tons/yr. x 2,000 lbs = 30,260.00 lbs/yr. ÷ 62.4lbs./cu.ft. = 484.94 cu. ft. / yr.
**SOIL EROSION FOR ASCA AREA “C”**

Use the modified Universal Soil Loss Equation:

\[ A = R \cdot K \cdot LS \cdot VM \]


- **A** = Amount of Soil loss per unit area
- **R** = Rainfall Factor
- **K** = Soil Erodibility Factor
- **LS** = Topographic Factor
- **VM** = Erosion Control Factor
  - 0.9 for barel

For ASCA “C”

\[ R = 17.79 \text{ Foot-Ton/Acre/Hour} \]
\[ K = 0.16 \text{ Tons/Acre/El} \]

\[ LS = \frac{(65.41s^2+4.56s+0.065)^m}{s^2+10,000+s^2 \cdot 10,000} \]

\[ I = \text{slope length} - 900 \text{ ft,} \]
\[ s = \text{slope gradient} - 4.44\% \]
\[ m = \begin{cases} 0.2 & \text{for } 0<s<1 \\ 0.3 & \text{for } 1<s<3 \\ 0.4 & \text{for } 3.5<s<4.5 \\ 0.5 & \text{for } s>5 \end{cases} \]

\[ LS = \frac{(65.41(4.44)^2+4.56(4.44)+0.065)^{0.4}}{(4.44)^2+10,000+(4.44)^2 \cdot (10,000)^{0.5}} = 72.6 \]

<table>
<thead>
<tr>
<th>DRAINAGE AREA</th>
<th>SLOPE LENGTH</th>
<th>SLOPE %</th>
<th>R</th>
<th>K</th>
<th>LS</th>
<th>VM</th>
<th>Tons/acre/ Yr (A)</th>
<th>ACRES</th>
<th>Tons/yr (A)</th>
</tr>
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<tbody>
<tr>
<td>ASCA “C”</td>
<td>900</td>
<td>4.44</td>
<td>17.79</td>
<td>0.16</td>
<td>.55</td>
<td>0.9</td>
<td>1.43</td>
<td>6.34</td>
<td>9.10</td>
</tr>
</tbody>
</table>

Determine cubic feet per year

Weight of Soil

Specific gravity of Soil = 1.0

Specific weight of Soil = 62.4lb/cu. ft. x 1.0 = 62.4 lbs./cu.ft.

9.10 Tons/yr. x 2,000 lbs = 18,200.00 lbs/yr. ÷ 62.4lbs./cu.ft. = 291.67 cu. ft./yr.
2.12 Erosion Control

Wherever rip-rap is designated to be used, i.e. Culvert Outlets or Unlined Ditches, the following procedure shall be used:

(1) Rip-rap will consist of hard, non-slaking angular, material;

(2) Rip-rap shall meet the following size criteria:

<table>
<thead>
<tr>
<th>Rip-Rap Sizing</th>
<th>Percent (+ or - 10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 (D_{50}) - 0.5 (D_{50})</td>
<td>20</td>
</tr>
<tr>
<td>0.5 (D_{50}) - 1.0 (D_{50})</td>
<td>30</td>
</tr>
<tr>
<td>1.0 (D_{50}) - 2.0 (D_{50})</td>
<td>50</td>
</tr>
</tbody>
</table>

(3) Rip-rap shall be placed over a filter bedding consisting of -3/4" gravel and placed to a depth of at least the \(D_{50}\) of the rip-rap;

(4) Rip-rap depth shall be at least 1.5 times the \(D_{50}\) of the material;

(5) Belting, \(\frac{1}{2}\) round culvert, concrete lining or grouting of rip-rap may be used in lieu of the above procedures.
# TABLE 1
DRAINAGE AREA DATA

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DA-1</td>
<td>1.58</td>
<td>250</td>
<td>6198</td>
<td>6184</td>
<td>14</td>
<td>5.60</td>
<td>90</td>
</tr>
<tr>
<td>DA-2</td>
<td>1.01</td>
<td>100</td>
<td>6184</td>
<td>6180</td>
<td>4</td>
<td>4.00</td>
<td>90</td>
</tr>
<tr>
<td>DA-3</td>
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INTEGRATED INCORPORATED
SEPTEMBER 14, 2012
DIVISION OIL, GAS & MINING
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INCORPORATED

SEPTEMBER 14, 2012
DIVISION OIL, GAS & MINING

18
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INCORPORATED
SEPTEMBER 14, 2012
DIVISION OIL, GAS & MINING
### TABLE 5
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INCORPORATED
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TABLE 6
DITCH DESIGN SUMMARY

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* Based on 10 year - 24 hour flow.
TABLE 6 (Continued)
DITCH DESIGN SUMMARY

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* Based on 10 year - 24 hour flow.
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**DITCH DESIGN SUMMARY**

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**Construction**

| Minimum Area (ft²) | 4.20 | 1.55 | 1.77 | 1.88 | 1.22 |
| Minimum Depth (ft.) | 1.45 | 0.88 | 0.94 | 0.97 | 0.78 |
| *Erosion Protection | N | N | N | N | N |
| **Type** | - | - | - | - | - |

* Based on 10 year - 24 hour flow.
### TABLE 6 (Continued)
DITCH DESIGN SUMMARY

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<td>N</td>
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* Based on 10 year - 24 hour flow.
**TABLE 6 (Continued)**

DITCH DESIGN SUMMARY

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* Based on 10 year - 24 hour flow.
TABLE 6 (Continued)
DITCH DESIGN SUMMARY

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* Based on 10 year - 24 hour flow.
### TABLE 6 (Continued)
### DITCH DESIGN SUMMARY

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* Based on 10 year - 24 hour flow.
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CULVERT DESIGN SUMMARY

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INCORPORATED
SEPTEMBER 14, 2012
DIVISION OIL, GAS & MINING
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<th>Flow Capacity (cfs)</th>
<th>Erosion Protection at Outlet Required Y/N</th>
<th>Type of Erosion Protection</th>
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* Adequate for 25/6 flow of 2.89 cfs.
FIGURES

Figure 1    Culvert Nomograph

Figure 2    Rip-Rap Chart

Figure 3    Undisturbed and Disturbed Ditch, Typical Section
DESIGN OF SEDIMENT CONTROL STRUCTURES

Design of Sediment Control Structures

3.1 Design and Construction Specifications for Sedimentation Pond
3.2 Sediment Yield
3.3 Sediment Pond Volume

Table 9 Sediment Pond “C” Design
Table 10 Sediment Pond “E” Design
Table 11 Sediment Pond “F” Design
Table 12 Sediment Pond “G” Design
Table 13 Sediment Pond “A” Design
Table 14 Sediment Pond “D” Design
Table 15 Permanent Impoundment Design
Table 16 Depression Area Design
Table 17 Sediment Pond “C” Stage Volume Data (As-Constructed)
Table 18 Sediment Pond “E” Stage Volume Data (As-Constructed)
Table 19 Sediment Pond “F” Stage Volume Data (As-Constructed)
Table 20 Sediment Pond “G” Stage Volume Data (Proposed)
Table 21 Sediment Pond “A” Stage Volume Data (As-Constructed)
Table 22 Sediment Pond “D” Stage Volume Data (As-Constructed)
Table 23 Permanent Impoundment Stage Volume Data (As-Constructed)
Table 24 Depression Area Stage Volume Data (As-Constructed)
Table 25 Impoundment Discharge Data
Table 26 Sediment Ponds A, E and F Open-Channel Spillway
   Stage Discharge Data

3.4 Sediment Pond Summary
3.1 **Design and Construction Specifications for Sedimentation Pond**

a) All construction of sedimentation ponds will be performed under the direction of a qualified, registered professional engineer.

b) Sediment Ponds A, C, D, E and F and the Permanent Impoundment and Depression Area are all existing impoundments with no changes proposed. Existing Sediment Pond "B" will be eliminated and replaced with new Sediment Pond "G". All ponds are equipped with a cmp principle overflow and an emergency spillway or cmp overflow. All emergency overflows will be at least 1.0' above the primary overflows, and at least 2.0' below the top of the dam.

c) The area of pond construction shall be examined for topsoil, and where present in removable quantities, such soil shall be removed separately and stored in an approved topsoil storage location.

d) In areas where fill is to be placed for the pond impoundment structures, natural ground shall be removed for at least 12" below the base of the structure.

e) Native materials shall be used where practical. Fill will be placed in lifts not to exceed 15" and compacted prior to placement of next left. Compaction of all fill materials shall be at least 95%.

f) Rip-rap or other protection (culverts, concrete, etc.) will be placed at all inlets and outlets to prevent scouring. Rip-rap will consist of substantial (non-slaking) rock material of adequate size.
g) Decanting of the ponds, as required, will be accomplished by use of a portable pump with an inverted inlet, and a pumping capacity of 100 gpm or greater. Samples will be collected prior to decanting of the pond. If the quality of the water meets the requirements of the U.P.D.E.S. Permit, decanting will proceed. Discharge samples will be collected as per the approved U.P.D.E.S. Discharge Permit.

h) Slopes of the embankments shall not be steeper than 2h : 1v, inside or outside, with a total of the inslope and outslope not less than 5h : 1v, except where areas of the pond are incised.

i) Tops and external slopes of the impoundments will be planted with an approved seed mix to help prevent erosion and promote stability.

j) Top width of the embankments shall be not less than (H+35)/5, where H = Height of Dam in feet.
3.2 Sediment Yield

The Universal Soil Loss Equation (USLE) was used to estimate sediment yield from drainage areas. All soil loss from this area was assumed to be delivered to, and deposited in the respective sedimentation pond.

Erosion rate \( (A) \) in tons-per-acre-per-year is determined using the USLE as follows:

\[
A = (R) (K) (LS) (CP)
\]

where the variables \( R, K, LS, \) and \( CP \) are defined as follows:

Variable "\( R \)" is the rainfall factor which can be estimated from \( R = 27P^2 \); where \( P \) is the 2-year, 6-hour precipitation value. \( P \) for the Gordon Creek area is 0.85" as shown in Section 2.1. Therefore, the estimated value of "\( R \)" for this area is 18.88.

Variable "\( K \)" is the soil erodibility factor. For disturbed areas, the "\( K \)" value is conservatively estimated to be 0.5. "\( K \)" is estimated to be 0.035 for undisturbed areas.

Variable "\( LS \)" is the length-slope factor. This figure was determined by applying the slope length and percentage for each sub-drainage area to the chart in Figure 5.15, p. 334, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983.

Variable "\( CP \)" is the control practice factor, which can be divided into a cover and a practice factor. For purposes of these calculations, the following "\( CP \)" values were used:

<table>
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<th>Site</th>
<th>CP Factor</th>
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<tr>
<td>Undisturbed Areas</td>
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The sediment volume is based on a density of 100 pounds per cubic foot of sediment.
### Sediment Yield Calculations - USLE

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<thead>
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<th>Drainage</th>
<th>To:</th>
<th>R</th>
<th>K</th>
<th>Acres</th>
<th>Length (Feet)</th>
<th>Slope (%)</th>
<th>LS</th>
<th>CP</th>
<th>A*</th>
<th>Yield**</th>
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<td>250</td>
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<td>130</td>
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</table>

* A = tons/acre-year
** Yield = acre-ft/year
### 3.3 Sediment Pond Volume

The volumes shown in Tables 9 through 14 are from the volumes calculated from the precipitation, runoff and sediment yield for a 10 year - 24 hour precipitation event. The volumes were calculated based on the disturbed areas (and contributing undisturbed areas) runoff values, developed using the design parameters described in this section.

<table>
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<th>Pond E</th>
<th>Pond F</th>
<th>Pond G</th>
<th>Pond A</th>
<th>Pond D</th>
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<tr>
<td>Total Sediment - 3 yr. (ac. ft.)</td>
<td>0.213</td>
<td>0.162</td>
<td>0.048</td>
<td>0.102</td>
<td>0.135</td>
<td>0.192</td>
</tr>
<tr>
<td></td>
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<td></td>
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</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------</td>
<td>----------------------------------------------------------------</td>
<td>----------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-</td>
<td><strong>Use 1.85&quot; for 10 year - 24 hour event.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-</td>
<td><strong>Disturbed Area Draining to Pond = 18.43 acres.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-</td>
<td><strong>Runoff Curve Number = CN = 90 (Disturbed)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-</td>
<td><strong>Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)</strong></td>
<td><strong>= 1.490 ac.ft.</strong></td>
<td></td>
<td></td>
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<tr>
<td>5-</td>
<td><strong>Sediment Storage Volume</strong></td>
<td><strong>= 0.213 ac.ft.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-</td>
<td><strong>Direct Precipitation into Pond</strong></td>
<td><strong>= 0.133 ac.ft.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-</td>
<td><strong>Total Required Pond Volume</strong></td>
<td><strong>= 1.836 ac.ft.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-</td>
<td><strong>Pond Actual Volume at Principal Spillway</strong></td>
<td><strong>= 4.732 ac.ft.</strong></td>
<td></td>
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</tr>
<tr>
<td>9-</td>
<td><strong>Peak Flow (25 year - 6 hour event)</strong></td>
<td><strong>= 10.99 cfs</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
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</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-</td>
<td>Use 1.85&quot; for 10 year - 24 hour event.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-</td>
<td>Disturbed Area Draining to Pond = 10.38 acres.</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>3-</td>
<td>Runoff Curve Number = CN = 90 (Disturbed)</td>
<td></td>
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<tr>
<td>4-</td>
<td>Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.) = 0.840 ac.ft.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5-</td>
<td>Sediment Storage Volume USLE - 0.162 = 0.162 ac.ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-</td>
<td>Direct Precipitation into Pond 0.17 acres x 1.85&quot; / 12 in./ft. = 0.026 ac.ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-</td>
<td>Total Required Pond Volume 0.840 + 0.162 + 0.026 = 1.028 ac.ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-</td>
<td>Pond Volume at Principal Spillway = 1.092 ac.ft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-</td>
<td>Peak Flow (25 year - 6 hour event) = 5.77 cfs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Calculation</td>
<td>Result</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-</td>
<td>Use 1.85&quot; for 10 year - 24 hour event.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2-</td>
<td>Disturbed Area Draining to Pond = 5.37 acres.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-</td>
<td>Runoff Curve Number = CN = 90 (Disturbed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-</td>
<td>Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)</td>
<td>= 0.430 ac.ft.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5-</td>
<td>Sediment Storage Volume</td>
<td>USLE - 0.048</td>
<td>0.048 ac.ft.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6-</td>
<td>Direct Precipitation into Pond</td>
<td>0.18 acres x 1.85&quot; / 12 in./ft.</td>
<td>0.028 ac.ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-</td>
<td>Total Required Pond Volume</td>
<td>0.430 + 0.048 + 0.028</td>
<td>0.506 ac.ft.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8-</td>
<td>Pond Volume at Principal Spillway</td>
<td></td>
<td>0.869 ac.ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-</td>
<td>Peak Flow (25 year - 6 hour event)</td>
<td></td>
<td>2.89 cfs</td>
<td></td>
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</tr>
<tr>
<td>No.</td>
<td>Item</td>
<td>Calculation</td>
<td>Result</td>
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<tr>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Use 1.85&quot; for 10 year - 24 hour event.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Disturbed Area Draining to Pond = 6.98 acres.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Runoff Curve Number = CN = 90 (Disturbed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)</td>
<td></td>
<td>0.560 ac.ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sediment Storage Volume</td>
<td>USLE - 0.102</td>
<td>0.102 ac.ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Direct Precipitation into Pond</td>
<td>0.35 acres x 1.85&quot; / 12 in./ft.</td>
<td>0.054 ac.ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Total Required Pond Volume</td>
<td>0.560 + 0.102 + 0.054</td>
<td>0.716 ac.ft.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8</td>
<td>Pond Volume at Principal Spillway</td>
<td></td>
<td>1.342 ac.ft.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Peak Flow (25 year - 6 hour event)</td>
<td></td>
<td>4.01 cfs</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

* Proposed.
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Use 1.85&quot; for 10 year - 24 hour event.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Disturbed Area Draining to Pond = 9.98 acres.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Runoff Curve Number = CN = 90 (Disturbed)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Disturbed Area Runoff = (From Table 2, 10 yr./24 hr.)</td>
<td>0.810 ac.ft.</td>
</tr>
<tr>
<td>5</td>
<td>Sediment Storage Volume</td>
<td>0.135 ac.ft.</td>
</tr>
<tr>
<td>6</td>
<td>Direct Precipitation into Pond</td>
<td>0.102 ac.ft.</td>
</tr>
<tr>
<td>7</td>
<td>Total Required Pond Volume</td>
<td>1.047 ac.ft.</td>
</tr>
<tr>
<td>8</td>
<td>Pond Volume at Principal Spillway</td>
<td>2.972 ac.ft.</td>
</tr>
<tr>
<td>9</td>
<td>Peak Flow (25 year - 6 hour event)</td>
<td>5.77 cfs</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Value</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td>Use 1.85&quot; for 10 year - 24 hour event.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Disturbed Area Draining to Pond = 7.64 acres.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Runoff Curve Number = CN = 90 (Disturbed)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Disturbed Area Runoff = (From Table 9, 10 yr./24 hr.)</td>
<td>0.620 ac.ft.</td>
</tr>
<tr>
<td>5</td>
<td>Sediment Storage Volume USLE - 0.192</td>
<td>0.192 ac.ft.</td>
</tr>
<tr>
<td>6</td>
<td>Direct Precipitation into Pond 0.29 acres x 1.85&quot; / 12 in./ft.</td>
<td>0.045 ac.ft.</td>
</tr>
<tr>
<td>7</td>
<td>Total Required Pond Volume 0.620 + 0.192 + 0.045</td>
<td>0.857 ac.ft.</td>
</tr>
<tr>
<td>8</td>
<td>Pond Volume at Principal Spillway</td>
<td>1.131 ac.ft.</td>
</tr>
<tr>
<td>9</td>
<td>Peak Flow (25 year - 6 hour event)</td>
<td>4.56 cfs</td>
</tr>
</tbody>
</table>
TABLE 15
PERMANENT IMPOUNDMENT DESIGN

1- Use 1.91" for 100 year - 6 hour event.

2- Disturbed Area Draining to Pond = 1.47 acres.

3- Runoff Curve Number = CN = 90 (Disturbed)

4- Disturbed Area Runoff = (From Table 2, 100 yr./6 hr.) = 0.120 ac.ft.

5- Undisturbed Watershed = 85.40 Acres

6- Weighted Runoff Curve Number - 65

7- Undisturbed Area Runoff (From Table 2, 100 yr/6 hr) = 0.790 ac.ft.

8- Direct Precipitation into Pond
    0.76 acres x 1.91" / 12 in./ft. = 0.121 ac.ft.

9- Total Required Pond Volume
    0.120 + 0.790 + 0.121 = 1.031 ac.ft.

10- Pond Actual Volume = 1.114 ac.ft.

11- Peak Flow (100 year - 6 hour event) = 4.41 cfs
TABLE 16
DEPRESSION AREA DESIGN

1- Use 1.91" for 100 year - 6 hour event.

2- Disturbed Area Draining to Pond = 6.43 acres.

3- Runoff Curve Number = CN = 90 (Disturbed)

4- Disturbed Area Runoff = (From Table 2, 100 yr./6 hr.) = 0.550 ac.ft.

5- Runoff from Permanent Impoundment = 1.031 ac.ft.

6- Direct Precipitation into Area
   6.43 acres x 1.91" / 12 in./ft. = 1.023 ac.ft.

7- Total Required Volume
   0.550 + 1.031 + 1.023 = 2.604 ac.ft.

8- Actual Volume = 4,990 ac.ft.
### Table 17
SEDIMENT POND “C”
STAGE VOLUME DATA (AS-CONSTRUCTED)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft)</th>
<th>Acc. Volume (ac. ft)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6127.0</td>
<td>2,870.5</td>
<td>0</td>
<td>0</td>
<td>Bottom of Pond</td>
</tr>
<tr>
<td>6130.0</td>
<td>18,075.7</td>
<td>0.721</td>
<td>0.721</td>
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<tr>
<td>6131.5</td>
<td>-</td>
<td>0.700</td>
<td>1.421</td>
<td>Sediment Cleanout Level</td>
</tr>
<tr>
<td>6132.0</td>
<td>22,596.8</td>
<td>0.234</td>
<td>1.655</td>
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<tr>
<td>6134.0</td>
<td>27,274.0</td>
<td>1.145</td>
<td>2.800</td>
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<tr>
<td>6136.0</td>
<td>32,557.0</td>
<td>1.374</td>
<td>4.174</td>
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<tr>
<td>6137.0</td>
<td>35,481.1</td>
<td>0.781</td>
<td>4.955</td>
<td>Principal Spillway</td>
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<tr>
<td>6138.0</td>
<td>38,405.1</td>
<td>0.848</td>
<td>5.803</td>
<td>Emergency Spillway</td>
</tr>
<tr>
<td>6140.0</td>
<td>45,286.6</td>
<td>1.921</td>
<td>7.724</td>
<td>Crest of Dam</td>
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</table>

### Table 18
SEDIMENT POND “E”
STAGE VOLUME DATA (AS-CONSTRUCTED)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft)</th>
<th>Acc. Volume (ac. ft)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6139.0</td>
<td>3,522.3</td>
<td>0</td>
<td>0</td>
<td>Bottom of Pond</td>
</tr>
<tr>
<td>6140.0</td>
<td>6,112.8</td>
<td>0.111</td>
<td>0.111</td>
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<tr>
<td>6140.5</td>
<td>6,514.7</td>
<td>0.073</td>
<td>0.184</td>
<td>Sediment Cleanout Level</td>
</tr>
<tr>
<td>6142.0</td>
<td>7,720.3</td>
<td>0.245</td>
<td>0.429</td>
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<td>6144.0</td>
<td>10,256.0</td>
<td>0.413</td>
<td>0.842</td>
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</tr>
<tr>
<td>6145.0</td>
<td>11,552.2</td>
<td>0.250</td>
<td>1.092</td>
<td>Principal Spillway</td>
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<tr>
<td>6146.0</td>
<td>12,848.3</td>
<td>0.280</td>
<td>1.372</td>
<td>Emergency Spillway</td>
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<tr>
<td>6148.0</td>
<td>15,515.4</td>
<td>0.651</td>
<td>2.023</td>
<td>Crest of Dam</td>
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TABLE 19
SEDIMENT POND “F”
STAGE VOLUME DATA (AS-CONSTRUCTED)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft.)</th>
<th>Acc. Volume (ac. ft.)</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>6166.0</td>
<td>2,811.6</td>
<td>0</td>
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<td>Bottom of Pond</td>
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<tr>
<td>6168.0</td>
<td>4,180.9</td>
<td>0.161</td>
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<td>Sediment Cleanout Level</td>
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<tr>
<td>6170.0</td>
<td>5,682.4</td>
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<td>6172.0</td>
<td>7,404.1</td>
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<td>0.687</td>
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<td>6173.0</td>
<td>8,414.3</td>
<td>0.182</td>
<td>0.869</td>
<td>Principal Spillway</td>
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<td>6174.0</td>
<td>9,424.5</td>
<td>0.204</td>
<td>1.073</td>
<td>Emergency Spillway</td>
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<tr>
<td>6176.0</td>
<td>11,497.2</td>
<td>0.480</td>
<td>1.553</td>
<td>Crest of Dam</td>
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TABLE 20
SEDIMENT POND “G”
STAGE VOLUME DATA (PROPOSED)

<table>
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<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft.)</th>
<th>Acc. Volume (ac. ft.)</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>6120.0</td>
<td>9,451.9</td>
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<td>Bottom of Pond</td>
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<tr>
<td>6121.2</td>
<td>10,495.9</td>
<td>0.275</td>
<td>0.275</td>
<td>60% Sediment Cleanout Level</td>
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<tr>
<td>6122.0</td>
<td>11,191.9</td>
<td>0.199</td>
<td>0.474</td>
<td>Maximum Sediment Level</td>
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<tr>
<td>6124.0</td>
<td>13,054.7</td>
<td>0.557</td>
<td>1.031</td>
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<tr>
<td>6125.0</td>
<td>14,048.0</td>
<td>0.311</td>
<td>1.342</td>
<td>Principal Spillway</td>
</tr>
<tr>
<td>6126.0</td>
<td>15,041.0</td>
<td>0.334</td>
<td>1.676</td>
<td>Emergency Spillway</td>
</tr>
<tr>
<td>6128.0</td>
<td>17,151.8</td>
<td>0.739</td>
<td>2.415</td>
<td>Crest of Dam</td>
</tr>
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</table>
### TABLE 21
SEDIMENT POND “A”
STAGE VOLUME DATA (AS-CONSTRUCTED)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft.)</th>
<th>Acc. Volume (ac. ft.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6142.0</td>
<td>9,003.8</td>
<td>0</td>
<td>0</td>
<td>Bottom of Pond</td>
</tr>
<tr>
<td>6144.0</td>
<td>13,714.8</td>
<td>0.522</td>
<td>0.522</td>
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</tr>
<tr>
<td>6146.0</td>
<td>19,531.8</td>
<td>0.763</td>
<td>1.285</td>
<td>Sediment Cleanout Level</td>
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<td>6148.0</td>
<td>25,889.5</td>
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</tr>
<tr>
<td>6149.0</td>
<td>30,216.6</td>
<td>0.644</td>
<td>2.972</td>
<td>Principal Spillway</td>
</tr>
<tr>
<td>6150.0</td>
<td>34,543.7</td>
<td>0.743</td>
<td>3.715</td>
<td>Emergency Spillway</td>
</tr>
<tr>
<td>6152.0</td>
<td>45,662.9</td>
<td>1.841</td>
<td>5.556</td>
<td>Crest of Dam</td>
</tr>
</tbody>
</table>

### TABLE 22
SEDIMENT POND “D”
STAGE VOLUME DATA (AS-CONSTRUCTED)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft.)</th>
<th>Acc. Volume (ac. ft.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6132.0</td>
<td>605.3</td>
<td>0</td>
<td>0</td>
<td>Bottom of Pond</td>
</tr>
<tr>
<td>6134.0</td>
<td>4,812.1</td>
<td>0.124</td>
<td>0.124</td>
<td></td>
</tr>
<tr>
<td>6135.0</td>
<td>6,350.3</td>
<td>0.128</td>
<td>0.252</td>
<td>Sediment Cleanout Level</td>
</tr>
<tr>
<td>6136.0</td>
<td>7,888.5</td>
<td>0.164</td>
<td>0.416</td>
<td></td>
</tr>
<tr>
<td>6138.0</td>
<td>11,213.8</td>
<td>0.438</td>
<td>0.854</td>
<td></td>
</tr>
<tr>
<td>6139.0</td>
<td>12,942.0</td>
<td>0.277</td>
<td>1.131</td>
<td>Principal Spillway</td>
</tr>
<tr>
<td>6140.0</td>
<td>14,670.1</td>
<td>0.317</td>
<td>1.448</td>
<td>Emergency Spillway</td>
</tr>
<tr>
<td>6142.0</td>
<td>18,552.8</td>
<td>0.763</td>
<td>2.211</td>
<td>Crest of Dam</td>
</tr>
</tbody>
</table>
### TABLE 23
PERMANENT IMPOUNDMENT
STAGE VOLUME DATA (AS-CONSTRUCTED)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft.)</th>
<th>Acc. Volume (ac. ft.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6192.0</td>
<td>571.8</td>
<td>0</td>
<td>0</td>
<td>Bottom of Upper Cell</td>
</tr>
<tr>
<td>6194.0</td>
<td>5,714.4</td>
<td>0.144</td>
<td>0.144</td>
<td></td>
</tr>
<tr>
<td>6195.8</td>
<td>8,472.6</td>
<td>0.293</td>
<td>0.437</td>
<td>Principal Spillway</td>
</tr>
<tr>
<td>6196.3</td>
<td>9,238.7</td>
<td>0.102</td>
<td>0.539</td>
<td>Emergency Spillway</td>
</tr>
<tr>
<td>6183.5</td>
<td>9,148.3</td>
<td>0.000</td>
<td>0.437</td>
<td>Bottom of Lower Cell</td>
</tr>
<tr>
<td>6185.8</td>
<td>16,486.7</td>
<td>0.677</td>
<td>1.114</td>
<td>Overflow - Lower Cell</td>
</tr>
</tbody>
</table>

### TABLE 24
DEPRESSION AREA
STAGE VOLUME DATA (AS-CONSTRUCTED)

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Area (ft²)</th>
<th>Volume (ac. ft.)</th>
<th>Acc. Volume (ac. ft.)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>6172.0</td>
<td>16,674.8</td>
<td>0</td>
<td>0</td>
<td>Bottom</td>
</tr>
<tr>
<td>6174.0</td>
<td>33,854.8</td>
<td>1.160</td>
<td>1.160</td>
<td></td>
</tr>
<tr>
<td>6176.0</td>
<td>132,985.0</td>
<td>3.830</td>
<td>4.990</td>
<td>Maximum Water Level</td>
</tr>
<tr>
<td>6178.0</td>
<td>152,100.6</td>
<td>6.544</td>
<td>11.534</td>
<td>Track Level</td>
</tr>
</tbody>
</table>
# Table 25
## Impoundment Discharge Data

<table>
<thead>
<tr>
<th>Impoundment Pond</th>
<th>Spillway</th>
<th>Type Size</th>
<th>25/6 Flow (cfs)</th>
<th>Flow Depth (ft)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Principal</td>
<td>18&quot; cmp</td>
<td>11.30</td>
<td>1.17 (78% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>C</td>
<td>Emergency</td>
<td>18&quot; cmp</td>
<td>11.30</td>
<td>1.17 (78% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>E</td>
<td>Principal</td>
<td>18&quot; cmp</td>
<td>5.77</td>
<td>0.74 (49% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>E</td>
<td>Emergency</td>
<td>Open Channel</td>
<td>5.77</td>
<td>0.47</td>
<td>Existing</td>
</tr>
<tr>
<td>F</td>
<td>Principal</td>
<td>12&quot; cmp</td>
<td>2.89</td>
<td>0.63 (63% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>F</td>
<td>Emergency</td>
<td>Open Channel</td>
<td>2.89</td>
<td>0.31</td>
<td>Existing</td>
</tr>
<tr>
<td>G</td>
<td>Principal</td>
<td>24&quot; cmp</td>
<td>4.01</td>
<td>0.54 (27% full)</td>
<td>Proposed</td>
</tr>
<tr>
<td>G</td>
<td>Emergency</td>
<td>24&quot; cmp</td>
<td>4.01</td>
<td>0.54 (27% full)</td>
<td>Proposed</td>
</tr>
<tr>
<td>A</td>
<td>Principal</td>
<td>18&quot; cmp</td>
<td>5.47</td>
<td>0.74 (49% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>A</td>
<td>Emergency</td>
<td>Open Channel</td>
<td>5.47</td>
<td>0.47</td>
<td>Existing</td>
</tr>
<tr>
<td>D</td>
<td>Principal</td>
<td>24&quot; cmp</td>
<td>4.56</td>
<td>0.65 (43% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>D</td>
<td>Emergency</td>
<td>24&quot; cmp</td>
<td>4.56</td>
<td>0.65 (43% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>PI</td>
<td>Principal</td>
<td>18&quot; cmp</td>
<td>*4.48</td>
<td>0.64 (43% full)</td>
<td>Existing</td>
</tr>
<tr>
<td>PI</td>
<td>Emergency</td>
<td>18&quot; cmp</td>
<td>*4.48</td>
<td>0.64 (43% full)</td>
<td>Existing</td>
</tr>
</tbody>
</table>

Notes:

1) Culverts are calculated on 3% slope.
2) Open-Channel spillways are 5' wide x 1' deep with 2:1 side slopes. (See Table 26)
3) Depression Area has no overflow.

* 100 year/6 hr. Flow.
TABLE 26
SEDIMENT PONDS A, E AND F
OPEN-CHANNEL SPILLWAY
STAGE DISCHARGE DATA

<table>
<thead>
<tr>
<th>STAGE (ft.)</th>
<th>DISCHARGE (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>0.20</td>
<td>1.49</td>
</tr>
<tr>
<td>0.31</td>
<td><strong>2.99</strong></td>
</tr>
<tr>
<td>0.47</td>
<td><em>5.91</em>*</td>
</tr>
<tr>
<td>0.60</td>
<td>8.90</td>
</tr>
<tr>
<td>0.80</td>
<td>14.58</td>
</tr>
<tr>
<td>1.00</td>
<td>21.61</td>
</tr>
</tbody>
</table>

Notes: *
25 year - 6 hour Peak Flow from Ponds A and E = 5.77 cfs.
Flow will pass through spillway at a depth of 0.47'.

**
25 year - 6 hour Peak Flow from Pond F = 2.89 cfs.
Flow will pass through spillway at a depth of 0.31'.

Calculations based on Broad Crested Weir Formula

\[ Q = 3.087 \cdot b \cdot H^{1.5}; \text{Where } b = \text{Average Width} = \frac{5 + (5 + 4d)}{2} \]
3.4 Sediment Pond Summary

a) The Sediment ponds have been designed to contain the disturbed area (and contributing undisturbed area) runoff from a 10 year - 24 hour precipitation event, along with 3 years of sediment storage capacity. The Permanent Impoundment and Depression Area are sized to contain the runoff from a 100 year - 6 hour precipitation event. Runoff to the ponds will be directed by various ditches and culverts as described in the plan.

b) There will be a total of 6 sediment ponds and 2 additional impoundments on this site. Existing Sediment Pond B will be eliminated and replaced with new pond G. Existing sediment ponds A, C, D, E and F, as well as the Permanent Impoundment and Depression Area will not be changed.

c) The ponds will meet a theoretical detention time of 24 hours. All sediment ponds are fitted with a combination of principal and emergency overflows sized to carry the runoff from a 25 year - 6 hour precipitation event. The Permanent Impoundment overflows are sized to carry runoff from a 100 year-6 hour event. Any discharge from the ponds will be in accordance with the approved UPDES Permit.

d) The pond inlets are protected from erosion. The principal spillways, and emergency spillways will also be protected from erosion by the use of culverts, rip-rap and/or belting.

e) The Permanent Impoundment and Depression Area are to be left in place.

f) The ponds have/will be constructed according to the design criteria listed under “Construction Specifications for Sedimentation Ponds”.
DESIGN OF DRAINAGE CONTROL STRUCTURES
FOR
RECLAMATION HYDROLOGY

Reclamation Hydrology

4.1 General
4.2 Reclaimed Area Drainage Control
4.3 Restored Channels
4.4 Sediment Ponds

Table 27 Final Reclamation - Drainage Areas Contributing to Channels
Table 28 Final Reclamation - Drainage Structure Flow Summary
Table 29 Final Reclamation - Restored Channel Design Parameters
Table 30 Final Reclamation - Restored Channel Flow Calculations

Figure 4 Restored Channel, Typical Sections
Reclamation Hydrology

4.1 General

The purpose of this section is to describe the plan for control of the permit and adjacent area hydrology during and after reclamation until bond release.

The plans herein described are based on requirements of the regulations and on proven, accepted reclamation techniques used in the Carbon-Emery area. The post-reclamation hydrology is designed to protect the reclaimed site from erosion, to protect the hydrologic regime from adverse impacts, and to meet requirement of DOGM and the landowner, BLM.

Upon completion of operations, all structures will be removed and the area will be recontoured as shown on Plate 9. All culverts and unnecessary ditches and ponds will be removed at that time. The post-reclamation drainage will be as shown on Plate 9.

Undisturbed Diversion UD-2 will remain in place, since it was installed prior to the operation, and has been shown to be adequate to carry a 100 year, 6 hour precipitation event.

As described in the following section, all sediment ponds will be removed during final reclamation, and recontoured as shown on Plate 9.

As sediment ponds are removed, any contaminated material will be hauled off to an approved disposal site. The 2-celled Permanent Impoundment will be left in place for wildlife enhancement, and the Depression Area will also remain as a final containment for runoff which was never planned to drain under the pre-existing Utah Railway.

Reclaimed channels are noted with an RC-Numer (i.e. RC-2). Channels are shown on Plate 9, "Final Reclamation Contours, Phase 2".

A typical channel cross-section for each reclaimed channel is shown on Figure 4. Calculated flows for the applicable storm event were then routed through the channels to determine if reclaimed channel sizes were adequate for the design flows. (See Table 30). In all cases, the channels were adequately sized to safely carry the contributing area runoff.
4.2 **Reclaimed Area Drainage Control**

During final reclamation, all previously installed drainage controls, including the sediment ponds, will be removed. The reclaimed area will be roughened by discontinuous tilling and/or “gouging” the area with a trackhoe bucket. The roughening will create furrows or depressions at approximately 18" deep throughout the reclaimed area. In addition, straw or wood mulch will be used in final seeding of the area. Roughening will continue to the reclaimed channel banks, and the entire reclaimed area, including channels, will be reseeded according to the approved plan.

Prior to removal of the sediment ponds, a series of 3 silt fences will be installed across the main drainage channel below the pond area, as shown on Plate 9. These silt fences will remain as final treatment for runoff from the reclaimed site until Phase II Bond Release requirements are met. These are, however, only secondary sediment controls. The primary sediment control from the reclaimed site will be extensive roughening/gouging, use of mulch and revegetation.
4.3 **Restored Channels**

The restored channels will have a bottom width of approximately 2' - 4' with $2h : 1v$ side slopes, as shown on Table 29.

The restored channel sizes were checked for adequacy to carry runoff from a 100 year - 6 hour storm event. As shown on Table 30, all channels are adequately sized to carry the projected runoff with at least 0.5' of freeboard. See Figure 4 for a typical section of the reclaimed channels and summary of flow depths and velocities.

4.4 **Sediment Ponds**

As discussed in Section 4.1, the sediment ponds will be removed during final reclamation. Prior to removal of the pond, a series of 3 silt fences will be placed across the main canyon channel below the pond. Sediment control for the reclamation will be accomplished by extensive roughening/gouging and revegetation of the reclaimed area and installation of sediment traps in the restored channels. The silt fences will act as secondary, final sediment controls. These fences will be maintained until Phase II Bond Release. See Plate 9 “Final Reclamation Contours, Phase 2” for location and reclamation details.
## TABLE 27
**FINAL RECLAMATION**
**DRAINAGE AREAS CONTRIBUTING TO CHANNELS**

<table>
<thead>
<tr>
<th>RECLAIMED CHANNEL</th>
<th>DRAINAGE AREAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD-1</td>
<td>DA-30, DA-31, DA-32, DA-38</td>
</tr>
<tr>
<td>RD-2</td>
<td>DA-19, DA-20, DA-21, DA-22, DA-23, DA-24, 1/2DA-16, 1/2DA-17</td>
</tr>
<tr>
<td>RD-3</td>
<td>1/4 DA-16</td>
</tr>
<tr>
<td>RD-4</td>
<td>DA-11, 1/2DA-12, DA-14, DA-9, 1/2DA-17, 1/4 DA-16, DA-18</td>
</tr>
<tr>
<td>RD-5</td>
<td>1/3 DA-35, DA-36, DA-1, DA-2, DA-3, DA-4, DA-5, DA-6, DA-7, DA-8, 1/2 DA-12, DA-13, DA-15</td>
</tr>
</tbody>
</table>

Refer to Plate 2A for drainage areas and Plate 9 for reclamation channels.
<table>
<thead>
<tr>
<th>Channel</th>
<th>100/6 cfs</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC-1</td>
<td>5.08</td>
</tr>
<tr>
<td>RC-2</td>
<td>17.97</td>
</tr>
<tr>
<td>RC-3</td>
<td>0.71</td>
</tr>
<tr>
<td>RC-4</td>
<td>15.04</td>
</tr>
<tr>
<td>RC-5</td>
<td>13.16</td>
</tr>
</tbody>
</table>

Flows from Table 2.
### TABLE 29
**FINAL RECLAMATION**
**RESTORED CHANNEL DESIGN PARAMETERS**

<table>
<thead>
<tr>
<th>Channel</th>
<th>Bottom Width (ft.)</th>
<th>Side Slope H:V</th>
<th>Slope %</th>
<th>Reclaimed Depth (ft.)</th>
<th>Manning's No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC-1</td>
<td>3</td>
<td>2:1</td>
<td>3.33</td>
<td>1.5</td>
<td>0.035</td>
</tr>
<tr>
<td>RC-2</td>
<td>4</td>
<td>2:1</td>
<td>4.17</td>
<td>1.5</td>
<td>0.035</td>
</tr>
<tr>
<td>RC-3</td>
<td>2</td>
<td>2:1</td>
<td>6.15</td>
<td>1.5</td>
<td>0.035</td>
</tr>
<tr>
<td>RC-4</td>
<td>4</td>
<td>2:1</td>
<td>4.14</td>
<td>1.5</td>
<td>0.035</td>
</tr>
<tr>
<td>RC-5</td>
<td>4</td>
<td>2:1</td>
<td>4.67</td>
<td>1.5</td>
<td>0.035</td>
</tr>
<tr>
<td>Channel</td>
<td>RC-1</td>
<td>RC-2</td>
<td>RC-3</td>
<td>RC-4</td>
<td>RC-5</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>100 yr - 6 hr event (in.)</td>
<td>1.91</td>
<td>1.91</td>
<td>1.91</td>
<td>1.91</td>
<td>1.91</td>
</tr>
<tr>
<td>Peak Flow (cfs)</td>
<td>5.08</td>
<td>17.97</td>
<td>0.71</td>
<td>15.04</td>
<td>13.16</td>
</tr>
<tr>
<td>Velocity (fps)</td>
<td>3.53</td>
<td>5.38</td>
<td>2.46</td>
<td>5.09</td>
<td>5.08</td>
</tr>
<tr>
<td>Req'd Area (ft.^2)</td>
<td>1.44</td>
<td>3.33</td>
<td>0.29</td>
<td>2.96</td>
<td>2.59</td>
</tr>
<tr>
<td>Flow Depth (ft.)</td>
<td>0.38</td>
<td>0.63</td>
<td>0.13</td>
<td>0.57</td>
<td>0.51</td>
</tr>
</tbody>
</table>
APPENDIX 1

COMPUTER BACKUP
ADDENDUM TO APPENDIX R
SEDIMENT POND B

INCORPORATED
SEPTEMBER 14, 2012
DIVISION OIL, GAS & MINING
<table>
<thead>
<tr>
<th>Design Parameters</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation</td>
<td>1</td>
</tr>
<tr>
<td>Flow</td>
<td>1</td>
</tr>
<tr>
<td>Drainage Area</td>
<td>1</td>
</tr>
<tr>
<td>Slope Lengths</td>
<td>1</td>
</tr>
<tr>
<td>Runoff</td>
<td>1</td>
</tr>
<tr>
<td>Runoff Curve Number</td>
<td>2</td>
</tr>
<tr>
<td>Direct Precipitation into Pond</td>
<td>2</td>
</tr>
<tr>
<td>Sediment Yield Capacity</td>
<td>2</td>
</tr>
<tr>
<td>Sediment Pond Volume</td>
<td>3</td>
</tr>
<tr>
<td>Spillway Description</td>
<td>3</td>
</tr>
</tbody>
</table>
**Design Parameters**

**Precipitation**

The sedimentation pond was designed to contain the runoff of a 10 year – 24 hour event of 1.85" as required by the Division. The precipitation frequency value was obtained from Section 2.1 of Appendix R – Wildcat Loadout Sedimentation and Drainage Control Plan.

**Flow**

Peak flows and runoff volumes were calculated using the computer program “SEDCAD 4 for Windows by Civil Software Design”. All flows are based on the NRCS Method for Type II storms.

**Drainage Area**

The drainage area was determined by using a Placom Digital Planimeter KP-80N directly from Wildcat Loadout Existing Surface Map Plate 1.

**Table 1**

<table>
<thead>
<tr>
<th>Acres</th>
<th>Hydraulic Length</th>
<th>High Elevation</th>
<th>Low Elevation</th>
<th>Change Elevation</th>
<th>Slope</th>
<th>Runoff CN</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.04</td>
<td>178</td>
<td>6154</td>
<td>6140</td>
<td>14</td>
<td>7.87</td>
<td>92</td>
</tr>
</tbody>
</table>

**Slope Lengths**

All slopes and hydraulic lengths were measured directly from the topography on Plate 1.

**Runoff**

Runoff was calculated using the NRCS Method for Type II storms. Runoff for a 10 year – 24 hour storm event with precipitation frequency of 1.85" was peak flow of 1.39 cfs and runoff volume of 0.28 ac.-ft.
Runoff Curve Number

SEDCAD does not have a curve number of 90; therefore a more conservative curve number of 92 was substituted. The curve number is for 85% impervious material under a Group B soil type as used in Appendix R.

Direct Precipitation into Pond

The following formula is used to calculate the amount of precipitation falling directly into the pond:

\[ V = 0.18 \text{ acres} \times 1.85" + 12 \text{ in/ft.} = 0.002 \text{ ac.-ft.} \]

Sediment Yield Capacity

The Universal Soil Loss Equation (USLE) was used to estimate sediment yield from the drainage area. All soil loss from the area was assumed to be delivered to and deposited in the sedimentation pond.

Erosion rate (A) in ton/acre/year is determined using USLE as follows

\[ A = (R) (K) (LS) (CP) \]

Where the variable R, K, LS and CP are defined as follows:

Variable “R” is the rainfall factor which can be estimated \( R=27(P_{2,6})^{2.2} \); where \( P_{2,6} \) is the 2 year – 6 hour precipitation value. P for Gordon Creek area is 0.85” as shown in Section 2.1 of Appendix R. Therefore, the estimated value of “R” for this area is 18.88.

Variable “K” is the soil erodibility factor. The conservative estimate for “K” is 0.5.

Variable “LS” is the length slope factor. This figure was determined by applying the slope length and percentage for the drainage area to the chart Figure 5.5, page 334, “Applied Hydrology and Sedimentology for Disturbed Areas”, Barfield, Warner, and Haan, 1985. The estimated value for “LS” for this area is 1.15.

Variable “CP” is control practice factor, which is divided into a cover and practice factor. The “CP” value used to calculate erosion rate is 1.20.
The sediment volume is based on a density of 100 lbs./cu.ft. from Appendix R.

\[ A = (R) (K) (Ls) (CP) \]
\[ = (18.88)(0.5)(1.15)(1.20) \]
\[ = 13.03 \text{ ton/acre/year} \]

\[ A = 13.03 \text{ ton/acre/year} \times 3.04 \text{ acres} \]
\[ = 39.61 \text{ ton/year} \]

\[ A = 39.61 \text{ ton/year} \times 2000 \text{ lb./ton + 100 lb./cu. ft.} \]
\[ = 792.05 \text{ cu. ft. + 43,560 cu. ft./ac.-ft.} \]
\[ = 0.02 \text{ ac.-ft./year} \]

The storage volume for sediment for three years would be 0.06 ac.-ft.

**Sediment Pond Volume**

The sediment pond volume was determined using 10 year – 24 hour storm event. The disturbed area draining to the pond is 3.04 acres and using a curve number of 92, the disturbed runoff is 0.28 ac.-ft. The sediment capacity required for the pond is 0.29 ac.-ft. The precipitation falling directly into the pond is 0.002 ac.-ft.

Required pond capacity is as follows:

\[ T = 0.28 \text{ ac.-ft.} + 0.29 \text{ ac.-ft.} + 0.002 \text{ ac.-ft.} \]
\[ = 0.572 \text{ ac.-ft.} \]

The actual pond capacity at the principal spillway, elevation 6138 feet, is 0.573 ac.-ft.

**Spillway Description**

Sediment Pond B has a 12" CMP principal spillway. The emergency spillway is a rock lined, approximately ten (10') wide, broad crested weir. Refer to the attached drawing for the location of these two structures.
SEDCAD CALCULATIONS
WILDCAT LOADOUT SEDIMENT POND
"B"

Tom Paluso
# General Information

**Storm Information:**

<table>
<thead>
<tr>
<th>Storm Type:</th>
<th>NRCS Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Storm:</td>
<td>10 yr - 24 hr</td>
</tr>
<tr>
<td>Rainfall Depth:</td>
<td>1.850 inches</td>
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</table>
Structure Networking:

<table>
<thead>
<tr>
<th>Type</th>
<th>Stru # (flows into)</th>
<th>Stru #</th>
<th>Mus. K (hrs)</th>
<th>Mus. X</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond</td>
<td>#1 =&gt; #3</td>
<td></td>
<td>0.017</td>
<td>0.311</td>
<td></td>
</tr>
<tr>
<td>Null</td>
<td>#3 =&gt; End</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td></td>
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</tbody>
</table>

Structure Routing Details:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>S. Nearly bare and untilled, and alluvial valley fans</td>
<td>7.87</td>
<td>14.00</td>
<td>178.00</td>
<td>2.80</td>
<td>0.017</td>
</tr>
<tr>
<td>#1</td>
<td>Muskingum K:</td>
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</table>
## Structure Summary:

<table>
<thead>
<tr>
<th></th>
<th>Immediate Contributing Area (ac)</th>
<th>Total Contributing Area (ac)</th>
<th>Peak Discharge (cfs)</th>
<th>Total Runoff Volume (ac-ft)</th>
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</thead>
<tbody>
<tr>
<td>#1 In</td>
<td>3.040</td>
<td>3.040</td>
<td>3.39</td>
<td>0.28</td>
</tr>
<tr>
<td>#1 Out</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#3</td>
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<td>3.040</td>
<td>1.39</td>
<td>0.28</td>
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Filename: Sediment Pond B.ac4
Structure Detail:

Structure #1 (Pond)

Pond Inputs:

<table>
<thead>
<tr>
<th>Initial Pool Elev:</th>
<th>6,136.00 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Pool:</td>
<td>0.57 ac-ft</td>
</tr>
</tbody>
</table>

Broad-crested Weir

<table>
<thead>
<tr>
<th>Weir Width (ft)</th>
<th>Spillway Elev (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.00</td>
<td>6,139.00</td>
</tr>
</tbody>
</table>

Straight Pipe

<table>
<thead>
<tr>
<th>Barrel Diameter (in)</th>
<th>Barrel Length (ft)</th>
<th>Barrel Slope (%)</th>
<th>Manning's n</th>
<th>Spillway Elev (ft)</th>
<th>Entrance Loss Coefficient (ft)</th>
<th>Tailwater Depth (ft)</th>
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</thead>
<tbody>
<tr>
<td>12.00</td>
<td>20.00</td>
<td>66.00</td>
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Pond Results:

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<thead>
<tr>
<th>Peak Elevation:</th>
<th>6,136.74 ft</th>
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<tr>
<td>Dewater Time:</td>
<td>0.61 days</td>
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</table>

Dewatering time is calculated from peak stage to lowest spillway

Elevation-Capacity-Discharge Table

<table>
<thead>
<tr>
<th>Elevation (ft)</th>
<th>Area (ac)</th>
<th>Capacity (ac-ft)</th>
<th>Discharge (cfs)</th>
<th>Dewater Time (hrs)</th>
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</thead>
<tbody>
<tr>
<td>6,130.00</td>
<td>0.010</td>
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<tr>
<td>6,130.50</td>
<td>0.017</td>
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<tr>
<td>6,131.00</td>
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<td>0.017</td>
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<tr>
<td>6,131.50</td>
<td>0.037</td>
<td>0.033</td>
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</tr>
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<td>6,132.00</td>
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<td>6,132.50</td>
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<td>0.081</td>
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<td>0.110</td>
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<td>6,133.50</td>
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<td>6,134.00</td>
<td>0.070</td>
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<td>6,134.50</td>
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<td>6,135.00</td>
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<td>0.251</td>
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</table>
### Detailed Discharge Table

<table>
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<th>Capacity (ac-ft)</th>
<th>Discharge (cfs)</th>
<th>Dewater Time (hrs)</th>
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</thead>
<tbody>
<tr>
<td>6,130.00</td>
<td>0.000</td>
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<td>0.000</td>
</tr>
<tr>
<td>6,130.50</td>
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<td>0.000</td>
</tr>
<tr>
<td>6,131.00</td>
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</tr>
<tr>
<td>6,131.50</td>
<td>0.000</td>
<td>0.000</td>
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</tr>
<tr>
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<tr>
<td>6,132.50</td>
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</tr>
<tr>
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<tr>
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<tr>
<td>6,136.00</td>
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<tr>
<td>6,136.50</td>
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<tr>
<td>6,137.00</td>
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<tr>
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<td>6,140.00</td>
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</table>

Structure #3 (null)
**Subwatershed Hydrology Detail:**

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>SWS Area (ac)</th>
<th>Time of Conc (hrs)</th>
<th>Musk K (hrs)</th>
<th>Musk X (hrs)</th>
<th>Curve Number</th>
<th>UHS</th>
<th>Peak Discharge (cfs)</th>
<th>Runoff Volume (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>3.040</td>
<td>0.017</td>
<td>0.017</td>
<td>0.311</td>
<td>92,000</td>
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<td>0.279</td>
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<tr>
<td>#3</td>
<td></td>
<td>3.040</td>
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<td></td>
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</tbody>
</table>

**Subwatershed Time of Concentration Details:**

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>5. Nearly bare and untillled, and alluvial valley fans</td>
<td>7.87</td>
<td>14.00</td>
<td>178.00</td>
<td>2.600</td>
<td>0.017</td>
</tr>
<tr>
<td>#1</td>
<td>1</td>
<td>Time of Concentration:</td>
<td></td>
<td></td>
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<td></td>
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</table>

**Subwatershed Muskingum Routing Details:**

<table>
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<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>5. Nearly bare and untillled, and alluvial valley fans</td>
<td>7.87</td>
<td>14.00</td>
<td>178.00</td>
<td>2.800</td>
<td>0.017</td>
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<tr>
<td>#1</td>
<td>1</td>
<td>Muskingum K:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.017</td>
</tr>
</tbody>
</table>

Filename: Sediment Pond B.sc4

INCORPORATED
SEPTEMBER 14, 2012
DIVISION OIL, GAS & MINING
<table>
<thead>
<tr>
<th>ITEM</th>
<th>ELEVATION</th>
<th>VOLUME (AC. FL.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CREST OF Embankment</td>
<td>6140.0</td>
<td>0.881</td>
</tr>
<tr>
<td>Emergency Spillway</td>
<td>6139.0</td>
<td>0.715</td>
</tr>
<tr>
<td>Principal Spillway</td>
<td>6138.0</td>
<td>0.537</td>
</tr>
<tr>
<td>Sediment Cleanout Level</td>
<td>6133.0</td>
<td>0.29</td>
</tr>
<tr>
<td>Pond Bottom</td>
<td>6130.0</td>
<td>0</td>
</tr>
</tbody>
</table>

VOLUME:

REQUIRED: 0.572 Ac. FL
DESIGNED: 0.573 Ac. FL
PERMIT AREA EXPANSION

ASCA AREA "A"

Tom Paluso
General Information

Storm Information:

<table>
<thead>
<tr>
<th>Storm Type</th>
<th>NRCS Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Storm</td>
<td>10 yr - 24 hr</td>
</tr>
<tr>
<td>Rainfall Depth</td>
<td>1.640 inches</td>
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</tbody>
</table>
**Structure Networking:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Stru # (flows into)</th>
<th>Stru #</th>
<th>Musk. K (hrs)</th>
<th>Musk. X</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond</td>
<td>#1</td>
<td>#2</td>
<td>0.026</td>
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<td>End</td>
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<td>0.000</td>
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**Structure Routing Details:**

<table>
<thead>
<tr>
<th>Stru #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>8. Large gullies, diversions, and low flowing streams</td>
<td>5.08</td>
<td>33.00</td>
<td>650.00</td>
<td>6.75</td>
<td>0.026</td>
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<tr>
<td>#1</td>
<td>Muskingum K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.026</td>
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</tbody>
</table>

INCORPORATED

NOV 06 2015

Div. of Oil, Gas & Mining

Filename: ASCA AREA A.asc

Printed 07-21-2014
Structure Summary:

<table>
<thead>
<tr>
<th></th>
<th>Immediate Contributing Area (ac)</th>
<th>Total Contributing Area (ac)</th>
<th>Peak Discharge (cfs)</th>
<th>Total Runoff Volume (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>In</td>
<td>3.620</td>
<td>2.22</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Out</td>
<td>3.620</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>#2</td>
<td></td>
<td>0.000</td>
<td>2.22</td>
<td>0.00</td>
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</tbody>
</table>

*Denotes structures with incomplete design parameters. Results for these structures have not been evaluated, and may affect downstream structures.
Structure Detail:

Structure #1 (Pond)
Structure design parameters are not specified. No results to show.

Structure #2 (Null)
### Subwatershed Hydrology Detail:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>SWS Area (ac)</th>
<th>Time of Conc (hrs)</th>
<th>Musk K (hrs)</th>
<th>Musk X</th>
<th>Curve Number</th>
<th>UHS</th>
<th>Peak Discharge (cfs)</th>
<th>Runoff Volume (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>3.620</td>
<td>0.026</td>
<td>0.026</td>
<td>0.399</td>
<td>85.000</td>
<td>F</td>
<td>2.22</td>
<td>0.163</td>
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<td></td>
<td>Σ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.22</td>
<td>0.163</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>2.22</td>
<td>0.000</td>
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</table>

### Subwatershed Time of Concentration Details:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
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<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>8. Large gullies, diversions, and low flowing streams</td>
<td>5.08</td>
<td>33.00</td>
<td>650.00</td>
<td>6.750</td>
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### Subwatershed Muskingum Routing Details:

<table>
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<th>SWS #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
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<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>8. Large gullies, diversions, and low flowing streams</td>
<td>5.08</td>
<td>33.00</td>
<td>650.00</td>
<td>6.750</td>
<td>0.026</td>
</tr>
<tr>
<td>#1</td>
<td>1</td>
<td>Musklingum K:</td>
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<td></td>
<td></td>
<td></td>
<td>0.026</td>
</tr>
</tbody>
</table>
PERMIT AREA EXPANSION
ASCA AREA "B"

Tom Paluso

INTEGRITY
NOV 06 2015
Div. of Oil, Gas & Mining
General Information

Storm Information:

<table>
<thead>
<tr>
<th>Storm Type:</th>
<th>NRCS Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Storm:</td>
<td>10 yr - 24 hr</td>
</tr>
<tr>
<td>Rainfall Depth:</td>
<td>1.670 inches</td>
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</table>
Structure Networking:

<table>
<thead>
<tr>
<th>Type</th>
<th>Stru # (flows into)</th>
<th>Stru #</th>
<th>Musk. K (hrs)</th>
<th>Musk. X</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond</td>
<td>#1 ⇆ #2</td>
<td></td>
<td>0.028</td>
<td>0.403</td>
<td></td>
</tr>
<tr>
<td>Null</td>
<td>#2 ⇆ End</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

Structure Routing Details:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>8. Large gullies, diversions, and low flowing streams</td>
<td>5.59</td>
<td>40.00</td>
<td>715.00</td>
<td>7.09</td>
<td>0.028</td>
</tr>
<tr>
<td>#1</td>
<td>Muskingum K:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Div. of Oil, Gas & Mining
## Structure Summary:

<table>
<thead>
<tr>
<th></th>
<th>Immediate Contributing Area (ac)</th>
<th>Total Contributing Area (ac)</th>
<th>Peak Discharge (cfs)</th>
<th>Total Runoff Volume (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1*</td>
<td>In 6.840</td>
<td>Out 6.840</td>
<td>2.97</td>
<td>0.21</td>
</tr>
<tr>
<td>#2</td>
<td>0.000</td>
<td>6.840</td>
<td>2.97</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Denotes structures with incomplete design parameters. Results for these structures have not been evaluated, and may affect downstream structures.
Structure Detail:

Structure #1 (Pond)
Structure design parameters are not specified. No results to show.

Structure #2 (Null)
### Subwatershed Hydrology Detail:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>SWS Area (ac)</th>
<th>Time of Conc (hrs)</th>
<th>Musk K (hrs)</th>
<th>Musk X</th>
<th>Curve Number</th>
<th>UHS</th>
<th>Peak Discharge (cfs)</th>
<th>Runoff Volume (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>6.840</td>
<td>0.028</td>
<td>0.028</td>
<td>0.403</td>
<td>80.000</td>
<td>F</td>
<td>2.97</td>
<td>0.212</td>
</tr>
<tr>
<td></td>
<td>Σ</td>
<td>6.840</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#2</td>
<td>1</td>
<td>6.840</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Subwatershed Time of Concentration Details:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>B. Large gullies, diversions, and low flowing streams</td>
<td>5.59</td>
<td>40.00</td>
<td>715.00</td>
<td>7.090</td>
<td>0.028</td>
</tr>
<tr>
<td>#1</td>
<td>1</td>
<td>Time of Concentration:</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

### Subwatershed Muskingum Routing Details:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
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</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>B. Large gullies, diversions, and low flowing streams</td>
<td>5.59</td>
<td>40.00</td>
<td>715.00</td>
<td>7.090</td>
<td>0.028</td>
</tr>
<tr>
<td>#1</td>
<td>1</td>
<td>Muskingum K:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Div. of Oil, Gas & Mining
PERMIT AREA EXPANSION

ASCA AREA "C"

Tom Paluso

EIS Environmental & Engineering Consulting
31 North Main Street
Helper, Utah 84526

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NOV 06 2015
Div. of Oil, Gas & Mining
General Information

Storm Information:

<table>
<thead>
<tr>
<th>Storm Type:</th>
<th>NRCS Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Storm:</td>
<td>10 yr - 24 hr</td>
</tr>
<tr>
<td>Rainfall Depth:</td>
<td>1.670 inches</td>
</tr>
</tbody>
</table>
**Structure Networking:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Stru # (flows into)</th>
<th>Stru #</th>
<th>Musk. K (hrs)</th>
<th>Musk. X</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond</td>
<td>#1 == &gt; #2</td>
<td></td>
<td>0.039</td>
<td>0.394</td>
<td></td>
</tr>
<tr>
<td>Null</td>
<td>#2 == &gt; End</td>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

---

**Structure Routing Details:**

<table>
<thead>
<tr>
<th>Stru #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
<th>Vert. Dist. (ft)</th>
<th>Horiz. Dist. (ft)</th>
<th>Velocity (fps)</th>
<th>Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>8. Large gullies, diversions, and low flowing streams</td>
<td>4.44</td>
<td>40.00</td>
<td>900.00</td>
<td>6.32</td>
<td>0.039</td>
</tr>
<tr>
<td>#1</td>
<td>Muskingum K:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.039</td>
</tr>
</tbody>
</table>
### Structure Summary:

<table>
<thead>
<tr>
<th></th>
<th>Immediate Contributing Area</th>
<th>Total Contributing Area</th>
<th>Peak Discharge (cfs)</th>
<th>Total Runoff Volume (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>In 6.430</td>
<td>6.430</td>
<td>2.79</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Out 0.000</td>
<td>6.430</td>
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<tr>
<td>#2</td>
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<td>6.430</td>
<td>2.79</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*Denotes structures with incomplete design parameters. Results for these structures have not been evaluated, and may affect downstream structures.*
**Structure Detail:**

*Structure #1 (Pond)*

Structure design parameters are not specified. No results to show.

*Structure #2 (Null)*
### Subwatershed Hydrology Detail:

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<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
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<th>Runoff Volume (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>6.430</td>
<td>0.039</td>
<td>0.039</td>
<td>0.394</td>
<td>80.000</td>
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<td>2.79</td>
<td>0.200</td>
</tr>
<tr>
<td>Σ</td>
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<td>6.430</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>2.79</td>
<td>0.200</td>
</tr>
<tr>
<td>#2</td>
<td>Σ</td>
<td>6.430</td>
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<td></td>
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<td></td>
<td>2.79</td>
<td>0.000</td>
</tr>
</tbody>
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### Subwatershed Time of Concentration Details:

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<tr>
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</thead>
<tbody>
<tr>
<td>#1</td>
<td>1</td>
<td>8. Large gullies, diversions, and low flowing streams</td>
<td>4.44</td>
<td>40.00</td>
<td>900.00</td>
<td>6.320</td>
<td>0.039</td>
</tr>
</tbody>
</table>

### Subwatershed Muskingum Routing Details:

<table>
<thead>
<tr>
<th>Stru #</th>
<th>SWS #</th>
<th>Land Flow Condition</th>
<th>Slope (%)</th>
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<td>4.44</td>
<td>40.00</td>
<td>900.00</td>
<td>6.320</td>
<td>0.039</td>
</tr>
<tr>
<td>#1</td>
<td>1</td>
<td>Muskingum K:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.039</td>
</tr>
</tbody>
</table>