0004

ANDALEX
RESOURCES, INC

P.O. BOX 902
PRICE, UTAH 84501
PHONE (435) 637-5385
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INCOMING
(C0070033)

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

Attn: Pamela Grubaugh-Littig, Permit Supervisor

Re: Division Order (DO-04), Wildcat Loadout, ACT/007/033

Dear Pam,

Enclosed are 5 copies of the Andalex Resources, Inc. response to the Division Order (DO-04) for the Wildcat Loadout.

The requested information is submitted as an amendment to the M.R.P. and C_1/C_2 forms are enclosed.

If you have any questions, or need additional information, please let me know.

Sincerely,

Michael W. Glasson
Operations Manager

RECEIVED
MAR 15 2005
DIV. OF OIL, GAS & MINING

APPLICATION FOR PERMIT PROCESSING

Permit Change X	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: C/007/ 033
Title of Proposal: Response to Division Order (DO-04)						Mine: Wildcat Loadout
						Permittee: Andalex Resources, Inc.

Description, include reason for application and timing required to implement: Change from Surety to Letter of Credit.

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

☐ Yes	X No	1. Change in the size of the Permit Area? ____ acres Disturbed Area? ____ acres ☐ increase ☐ decrease.
X Yes	☐ No	2. Is the application submitted as a result of a Division Order? DO # DO-04
☐ Yes	X No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
☐ Yes	X No	4. Does application include operations in hydrologic basins other than as currently approved?
☐ Yes	X No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
☐ Yes	X No	6. Does the application require or include public notice/publication?
☐ Yes	X No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
☐ Yes	X No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
☐ Yes	X No	9. Is the application submitted as a result of a Violation? NOV #
X Yes	☐ No	10. Is the application submitted as a result of other laws or regulations or policies? Explain: DIVISION ORDER
☐ Yes	X No	11. Does the application affect the surface landowner or change the post mining land use?
☐ Yes	X No	12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)
☐ Yes	X No	13. Does the application require or include collection and reporting of any baseline information?
☐ Yes	X No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
☐ Yes	X No	15. Does application require or include soil removal, storage or placement?
☐ Yes	X No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
☐ Yes	X No	17. Does the application require or include construction, modification, or removal of surface facilities?
☐ Yes	X No	18. Does the application require or include water monitoring, sediment or drainage control measures?
☐ Yes	X No	19. Does the application require or include certified designs, maps, or calculations?
☐ Yes	X No	20. Does the application require or include subsidence control or monitoring?
☐ Yes	X No	21. Have reclamation costs for bonding been provided for?
☐ Yes	X No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
☐ Yes	X No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

X Attach 5 complete copies of the application.

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

Michael Glasson Ops. Mngr. 03/10/05
Signed - Name - Position - Date

Subscribed and sworn to before me this 9th day of March, ~~19~~ 2005

Linda Kerns
Notary Public

My Commission Expires: 05.08.05, ~~19~~ }
Attest: STATE OF Utah }
COUNTY OF Carbon }

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

Received by Oil, Gas & Mining
RECEIVED
MAR 15 2005
DIV. OF OIL, GAS & MINING

ASSIGNED TRACKING NUMBER

Application for Permit Processing
Detailed Schedule of Changes to the MRP

Title of Application:	
Response to Division Order (DO-04)	Permit Number: C/007/033
	Mine: Wildcat Loadout
	Permittee: Andalex Resources, Inc.

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

			DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
☐ ADD	X REPLACE	☐ REMOVE	Table of Contents, page 1xvi
☐ ADD	X REPLACE	☐ REMOVE	Pages 4-9 and 4-10
☐ ADD	X REPLACE	☐ REMOVE	Page 4-11
☐ ADD	X REPLACE	☐ REMOVE	Page 5-110
X ADD	☐ REPLACE	☐ REMOVE	Appendix P
☐ ADD	☐ REPLACE	☐ REMOVE	
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Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

Appendices:

PSD Permit and Compliance with Air Quality Laws

The Environmental Protection Agency has determined that this project does not require a PSD Air Quality Permit. The loadout is not subject to the PSD regulations because of the new definition of a major source.

R645-301-421. CLEAN AIR ACT AND OTHER APPLICABLE LAWS

See R645-301-420.

R645-301-422. UTAH BUREAU OF AIR QUALITY

See R645-301-420.

R645-301-423. SURFACE COAL MINING AND RECLAMATION ACTIVITIES EXCEEDING 1,000,000 TONS PER YEAR

See R645-301-420.

R645-301-423.100. COMPLIANCE WITH FEDERAL AND UTAH AIR QUALITY STANDARDS

See R645-301-420.

R645-301-423.200. FUGITIVE DUST CONTROL PLAN

The Wildcat Loadout and surrounding area were impacted by a previous pre-law operator. This operation left a fair amount of the existing permit area, as well as an unknown amount of the adjacent, undisturbed area, impacted by accumulations of coal fines. After Andalex Resources, Inc. took over the site, the operation was permitted under SMCRA and obtained an Air Quality Approval Order. The problem of coal fine accumulation on, and around, this area has been addressed by Andalex since the beginning of the Wildcat Loadout operation, and has included remedial measures such as scraping coal off previously impacted areas to salvage topsoil, and vacuuming coal fines from undisturbed, impacted areas to protect soils and vegetation. In addition, Andalex Resources, Inc. has implemented a considerable number of dust control measures at the Wildcat Loadout to reduce fugitive dust and wind-blown coal fines. The following are some of the measures incorporated into the design and operation of the facility to reduce dust emissions:

(1) All roads are paved or gravel surfaced;
(2) Road speed limits are posted at 5 mph;
(3) Roads are chemically treated and watered on a regular basis;
(4) Truck dump hoppers are located below ground and equipped with sprays;
(5) Coal is recovered from stockpiles via underpile reclaim systems;
(6) All surface conveyors are covered;
(7) Conveyor transfer points are enclosed;
(8) Radial stackers load at the highest point of the pile to minimize drop distances;
(9) Railcars are loaded from an enclosed bin and extendable chute;
(10) Refuse pile is regularly compacted and watered as needed;
(11) Coal moisture is maintained at a minimum of 6% overall;
(12) Moisture content of minus 40 mesh coal is at least 4.0% by weight;
(13) All disturbed areas are drained to sedimentation ponds;
(14) Runoff from ASCA areas is controlled by containment, vegetation, silt fences and/or straw bales;
(15) Wind fences are employed along the eastern edge of the largest stockpile, near Pond B;
(16) The location of stockpiles (more to the west) helps confine the wind-blown coal fines within the permit area.

The designs of the various controls listed above have been provided in the following sections of this permit:

(1) Impoundments/Hydrology - R645-301-512.240
(2) Roads - R645-301-512.250
(3) Operations - R645-301-520
(4) Coal Handling - R645-301-521.

While the above controls and practices are designed to minimize fugitive dust and wind-blown coal fines, it is impossible to completely eliminate them. As a result, some soils and vegetation will be impacted by dust accumulations in the future. To minimize these impacts, Andalex Resources, Inc. proposes vacuuming of coal fine accumulations on undisturbed areas within the permit area either prior to salvage of the topsoil or prior to reclamation/reseeding. Vacuuming is considered by Andalex as the best and least destructive option for removal of coal fine accumulations.

There is also some potential for coal dust to be blown beyond the permit boundary under extreme wind conditions. There is evidence of coal dust outside the permit area, but the time and source of these accumulations are unknown. Andalex Resources, Inc.

is therefore proposing to conduct a program to monitor coal fine deposition outside the permit area, specifically east of the permit boundary. The proposed monitoring is described in Appendix P, Response to Division Order DO-04, by Patrick D. Collins, Ph.D.

See also Appendix B

R645-301-424. FUGITIVE DUST CONTROL - SURFACE COAL MINING AND RECLAMATION OPERATIONS LESS THAN 1,000,000 TONS PER YEAR

N/A - Greater than 1,000,000 ton/yr.

R645-301-425. AIR QUALITY MONITORING - SURFACE COAL MINING AND RECLAMATION OPERATIONS LESS THAN 1,000,000 TONS PER YEAR

N/A

R645-301-526.116.1 MINING OPERATIONS WITHIN 100 FEET OF THE RIGHT-OF-WAY OF A PUBLIC ROAD

N/A

R645-301-526.116.2 RELOCATING A PUBLIC ROAD

N/A

R645-301-526.200. UTILITY INSTALLATION AND SUPPORT FACILITIES

See R645-301-520.

R645-301-526.210. DESCRIPTION

See R645-301-520.

R645-301-526.220. COMPLIANCE REQUIREMENTS

See R645-301-520.

R645-301-526.221. PROTECTION

See R645-301-520.

R645-301-526.222. MINIMIZATION OF ENVIRONMENTAL IMPACT AND COMPLIANCE WITH EFFLUENT LIMITATIONS

See R645-301-423.200 for details, and R645-301-512.240, R645-301-512.250, R645-301-520, and R-645-301-521 for designs.

R645-301-526.300. WATER POLLUTION CONTROL FACILITIES

See R645-301-520.

R645-301-526.400. AIR POLLUTION CONTROL FACILITIES

Appendix B - DAQE-013-03 Air Quality Permit.

APPENDIX P

RESPONSE TO DIVISION ORDER
(DO-04)

RESPONSE TO DIVISION ORDER (DO-04)

to
ANDALEX RESOURCES
Wildcat Loadout Site

by
Patrick D. Collins, Ph.D.
Mt. Nebo Scientific, Inc.
P.O. Box 337
Springville, UT 84663

March 10, 2005

INTRODUCTION

The State of Utah, Division of Oil, Gas & Mining (DOGM) issued a Division Order (DO) pursuant to State Rules R645-303-212. The DO requires changes to be made in Andalex's permit to address coal dust at the Wildcat Loadout site.

The permit deficiency and subsequent DO was based on DOGM's concerns regarding the effects of coal fines on vegetation and wildlife habitat in the areas adjacent to the Wildcat Loadout site. An earlier study (Collins, 2003) found an average of 2.33 inches of coal dust had accumulated in a portion of the permit area on a one-acre parcel immediately east of the coal pile. The prevailing wind direction of the area is from the west to east so if coal dust becomes airborne, one would expect it to accumulate east of the pile.

DOGM based their permit deficiency findings on field visits to the site, the aforementioned study (Collins, 2003), and some published studies regarding the potential effects of dust on vegetation and their associated plant communities. The intention of this document is to address some of DOGM's concerns and comments about the coal dust at the loadout, comment on the literature previously cited in the DO, and provide suggestions regarding the dust issue at the Wildcat Loadout.

REVIEW OF LITERATURE CITED

A review of the literature cited in the DO was made. Probably the most applicable study for comparisons to the Wildcat Loadout site was the paper by Sharifi et al. (1997) who reported their findings of the surface impact of dust on plants in the Mojave Desert. This was a well-designed study that looked at the impact of heavily dusted plants on three desert species including fourwing saltbush (*Atriplex canescens*), burro bush (*Hymenoclea salsola)*, and creosote bush

(*Larrea* tridentata). Although physiological responses were measured, the effects of dust on the plants were due more to the mechanical nature of the dust rather than its chemical components. In other words, the responses measured to the plants were due to dust that was physically found on the leaves and stems and not due to the chemical nature of the dust. Physiological responses to the plants included net photosynthetic rate, stomatal conductance, transpiration, and water-use efficiency – all important components for maintaining healthy individuals in native plant communities.

The effects of dust on the three plant species were significant, although fourwing saltbush – a species that is a close relative to a dominant plant species in the Wildcat Loadout site (shadscale, or *Atriplex confertifolia*) – appeared to be less impacted than burro bush and creosote bush. For example, reduction in the maximum rates of net photosynthesis was smallest in fourwing saltbush. Moreover, the net effect of changes in gas exchange parameters on water relations was not affected (intrinsic water efficiency), and the ratio of internal to ambient CO_2 remained unchanged in this species when the heavily dusted plants were compared to the controls (no dust).

Comparisons to the Wildcat Loadout

There are some **similarities** of the Sharifi et al. (1997) study to the Wildcat Loadout site. First, the study was conducted on desert plants, one of which is a close relative to a dominant species at the Wildcat Loadout. Fourwing saltbush has the same genus as shadscale and can be found growing in similar habitats.

Second, the study in the Mojave Desert concentrates on the physical presence of dust and not the chemical aspects of it. This means in theory that some of the results of the study could be similar to what could happen at the Wildcat Loadout, even though the Mojave study shows the impacts of dust from the native *soils* and the Wildcat concerns are from *coal* dust.

There are also some notable **dissimilarities** between the study sites. To begin, the study in the Mojave desert looked at "heavily dusted" plants adjacent a dirt road used by military transport vehicles on the downwind side of the road. Collections were made during dusty periods of time, or a time without much rainfall and when the roads were being used extensively. The heavily dusted plants in the study probably had a lot more dust on the plants than the plants at the Wildcat Loadout, even when the plants in the one-acre parcel next to and east of the coal pile are considered. Reasons for this are several. First, the anatomy of the plants most affected in the Mojave Desert had resinous or "sticky" leaf surfaces, a quality than enhances dust collection and encourages it to remain on the plants. Most of the dominant plant species at the Wildcat Loadout site do not have such resinous leaf surfaces. However, many species of saltbushes (*Atriplex* spp.) do have *vesiculated trichromes*, or tiny hairs with vessel-like structures used to secrete salts, that may also hold some dust particles.

Next, although both areas – the Mojave study area and the Wildcat Loadout site – are both desert

environments, the Mojave site has much less annual precipitation than the later. Barstow, California, located about 31 miles northwest of the Mojave study site receives 4.33 inches of annual precipitation, whereas, Helper, Utah, located about 6 miles northeast of the Wildcat Loadout receives more than 3 times that amount, or 13.40 inches. This is important because additional rainwater washes dust off the plants' leaves, stems, flowers, and fruits. Compounding its importance, much of the precipitation at Wildcat can come in the form of snow. Most years, the Mojave site probably receives little or no precipitation as snow. Snow and freezing rain may enhance the dust cleaning process on the plants by acting as a "scouring" agent, removing dust particles when melting occurs.

Other Studies

Another publication cited in the DO was reviewed and contained general information (Farmer 1993). This paper provides a general review of the effects of dust on plants and their communities and is relevant for general information. The paper outlined some of the effects on plants and communities such grasslands and hearthlands, croplands, trees and woodlands, arctic areas, epiphytes and lichens. Although some of the impacts to these plant communities may be important and perhaps have some relevance to them, no desert plant communities such as those at Wildcat area were noted. The study does note, however, that the physiological responses of some plant communities (croplands) may be quite different than that of other communities (woodlands). Adding 'desert communities' to this statement could also be appropriate.

One of the conclusions in this publication was that the effects of dust on plants is understudied and future research is needed. The study does mention that coal can contain toxic substances such as fluoride and sulphur compounds which "*may be important in affecting vegetation if deposited as dust (Rao, 1971), but this has not been determined*".

In his paper Farmer cites Rao (1971). This paper was also reviewed because the study from which it is based reports on the effects of coal dust as a source of air pollution and how it may impact 2 fruit crop species, namely mango and lemon trees. The study reports the negative impacts of coal dust on fruit production.

Mango and lemon trees are insect- and self-pollinated. Successful pollination, of course, has a direct correlation to fruit production. In insect-pollinated and self-pollinated plant species, a relatively small amount of pollen is produced for successful fertilization. By comparison, desert species, such as those found in the Wildcat area, are primarily wind-pollinated. These species use their resources to produce copious amounts of pollen to insure successful pollination by a more unpredictable vector, the wind. Simply stated, pollination by wind is much less site-specific (the targeted stigmas are more difficult to find by pollen grains that are randomly blowing in the wind) when compared to those species that have insects (or are in close proximity as for self-pollinated species) that carry the pollen to their specific targets. Needless to say, it is difficult to make direct correlations between the effects of coal dust on the fruits of mangos and lemons to the biological processes and life cycles of shadscale and greasewood plants found at

the Wildcat Loadout site.

Although this study provided no direct relevance to the plant species that are found at the Wildcat site, the methodologies for the study could be helpful in designing future studies at Wildcat if they are warranted.

DISCUSSION

The effects of dust on semi-arid desert plant communities are not known. As described above, it may be difficult to use data from other studies around the world to make conclusions on what the effect coal dust may be having on the desert communities at the Wildcat Loadout site in Carbon County, Utah. That said, there is little doubt that the coal dust reported to be accumulating to depths that average 2.33 inches and located in the one-acre portion directly adjacent the coal pile at Wildcat, is probably having some impact on the plants found there.

As one moves eastward and away from the coal pile, less coal dust accumulates. Dust may be altogether absent in these areas or it may just be difficult to see because the accumulations are much less. Whether or not coal dust is present in the plant communities further east is one situation and, if present, whether the amounts are significant enough to affect the plants in these areas is another.

As suggested above, it may be that coal dust in being washed off by rain and snow. If so, that means that the coal dust may be present in the soils below the plants. Do these coal particles have a negative impact on the soils and the plants they support? It is difficult to say. There is at least one study conducted by *Mt. Nebo Scientific, Inc.* (Collins, 1998) on Mancos Shale slopes in Emery County, Utah where plant establishment on several growing media were compared. The test plots that had coal refuse mixed in them performed best.

DIVISION ORDER REQUIREMENTS

There were three requirements specified by DOGM to remedy the permit deficiency and the effects of coal fines accumulation on undisturbed soils within and outside the permit area. They are listed below.

1. The Mining and Reclamation Plan must include design specifications of measures already in place and/or to be put into use to control wind blown coal fine accumulation and coal particles blown from stockpiles, roadways, and other disturbed areas associated with the mine. The information must be provided separately from the Air Quality Approval Order DAQE-005-00 found in Appendix B.

2. Then Mining and Reclamation Plan must describe removal of accumulations of coal fines on undisturbed soils within the permit area after consultation with the Division. Describe the methods of coal fine removal to be followed by seeding. Vacuuming is not acceptable.

3. The Mining and Reclamation Plan must address or include a plan for monitoring of coal fine deposition outside the permit area, specifically east of the permit boundary (since the prevailing winds are from west to east).

CONCLUSION & RECOMMENDATIONS

To address the requirements specified by DOGM above, first determinations should be made as to the extent of the coal dust dispersal. Below are some ideas for determining and monitoring the extent of the coal dust at the loadout site. They are presented in a tiered outline, meaning one procedure may negate the need for the next.

1. Visual Observations

Qualitative visual observations could be made by the representatives from Andalex Resources and DOGM as to the extent of the coal fines within and outside the permit area. If it can be determined by these methods where the coal dust is accumulating, remedial actions can be taken at that time. For example, if the fines are found to be placed in relatively small areas such as the 1-acre site already studied, then a plan can be formulated to remove the fines or delineate the additional areas as part of the "disturbed area". A reclamation plan would then be designed. The plan could include vacuuming the fines without regard to creating additional disturbance to the soils (since they are being treated as disturbed areas anyway). Subsequent to vacuuming and prior to revegetation, the new disturbed areas could be sampled and analyzed for toxic properties. Results of the lab analyses would dictate the reclamation techniques to then be employed. If the area was deemed unsuitable for use as a growing medium for revegetation, then they could be mixed with more suitable media or buried to a depth determined suitable by reclamation specialists and approved by DOGM.

2. Air Sampling

Following visual observations, if it is then decided that quantitative data are needed to determine the amount and extent of the coal dust dispersal patterns outside the permit area, simple air sampling techniques could be employed to make this determination. These samplers could be placed at specific distances moving away from (or eastward of) the coal pile. They could be placed at a specific heights (e.g. 3 ft) above the ground surface. Collections and analyses could be made for specified periods of time (monthly) or by seasons (spring, summer, fall, winter). This monitoring method could adequately

determine the extent, pattern and volume of the coal dust dispersed at the site.

3. Plant Collections

If it is determined that coal fines do indeed reach the undisturbed plant communities in amounts that may impact the these communities, leaf and stem collections could be taken and analyzed to determined how much of the dust is accumulating on the plant materials. These plant parts could be washed and the solution could then be analyzed for carbon (coal dust) content.

If the coal dust has reached the native, undisturbed plants outside the permit area and is also accumulating on these plants, studies could be done to determine the impact on these plants.

Another option in this situation would be to increase the size of the permit area so that reclamation and revegetation designs would be required.

4. Soil Sampling

Finally, if it is determined from numbers 2 and 3 above that coal dust is reaching the native, undisturbed plants outside the permit area, but not accumulating on the plants, it would be a logical conclusion that the fines are ending up in the soils underneath the plants. To test this assumption, soil samples could be taken and analyzed for toxicities.

The option to increase the permit area is a viable option in this situation too. Results of the lab analyses would dictate the reclamation techniques to then be employed. If the area was deemed unsuitable for use as a growing medium, the affected soils could be mixed with more suitable media or buried to a depth determined suitable by reclamation specialists and approved by DOGM.

LITERATURE CITED

Collins, P.D. 1998. *Executive Summary - Sample results for the Des-Bee-Dove Revegetation Test Plots: 1994-1997.* Rep. *by* Mt. Nebo Scientific Research & Consulting, Inc., Springville, UT.

Collins, P.D. and J.N. Nyenhuis. 2003. *Soil survey for the one-acre expansion at the Wildcat Loadout.* Rep. by Mt. Nebo Scientific Research & Consulting, Inc., Springville, UT. 13 p.

Farmer, A.M. 1993. *The effects dust on vegetation–a review.* Environmental Pollution 79:63-75.

Rao, D.N. 1971. *The study of the air pollution problem due to coal unloading in Varanasi, India.* In Proceeding of the Second International Clean Air Congress, ed. H.M. Englund & W.T Beery. Academic Press, New York, pp. 273-76.

Sharifi, M.R., Gibson, A.C., Rundel, P.W. 1997. *Surface dust impact on gas exchange in Mojave Desert shrubs.* Journal of Applied Ecology 34:837-846.