Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, Utah 84720
Phone (435) 867-5331 • Fax (435) 867-1192

C0250005
Incoming
#4323
K

April 2, 2013

Daron R. Haddock
Coal Program Manager
Oil, Gas & Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801

Subject: **Change in Mining Sequence, Response to Deficiencies Task ID # 4254 Coal Hollow Project, Kane County, Utah, C/025/0005**

Dear Mr. Haddock,

Alton Coal Development, LLC has attached response to the deficiencies identified under Task ID #4254. Changes have been made and are submitted for review.

Please find enclosed 3 (three) redline strikeout paper copies of additions and revisions and 2 (two) clean copies for insertion into the MRP. Please do not hesitate to contact me if you have any questions. Sequence

Sincerely

B. Kirk Nicholes

B. Kirk Nicholes
Environmental Specialist

File in:
- ☐ Confidential
- ☐ Shelf
- ☒ Expandable

Date Folder: 04/03/13 0250005
Incoming

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APPLICATION FOR COAL PERMIT PROCESSING

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: Alton Coal Development, LLC
Mine: Coal Hollow **Permit Number:** C/025/0005
Title: Change in Mining Sequence
Description, Include reason for application and timing required to implement:
Change in mining sequence to allow for more efficient use of manpower and equipment

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

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

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

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.

B. Kirk Nicholas
Print Name

B. Kirk Nicholas, Environmental Specialist 4/2/13
Sign Name, Position, Date

Subscribed and sworn to before me this 2nd day of April, 2013

Notary Public

My commission Expires: 10/02, 2013

Attest: State of UTAH }
County of IRON } ss:

WINSTON YOUNG
Notary Public
State of Utah
Comm. No. 580496
My Comm. Expires Oct 2, 2013

For Office Use Only:	Assigned Tracking Number:	Received by Oil, Gas & Mining
		RECEIVED APR 03 2013 DIV. OF OIL, GAS & MINING

APPLICATION FOR COAL PERMIT PROCESSING
Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: Alton Coal Development, LLC
Mine: Coal Hollow **Permit Number:** C/025/0005
Title: Change in Mining Sequence

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

			DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED
☐ Add	☒ Replace	☐ Remove	Vol. 3 Chapter 5 Pages 5-17, 5-18, 5-20 through 5-22, 5-35, 5-38 through 5-40, 5-61, and 5-65 through 5-68
☐ Add	☒ Replace	☐ Remove	Vol. 8 Chapter 8 Page 8-1 through 8-3
☐ Add	☒ Replace	☐ Remove	Vol. 8 Chapter 8 Appendix 8-1Page 1 through 4
☐ Add	☒ Replace	☐ Remove	Vol. 8 Chapter 8 Appendix 8-1 Phase 2 - Reclamation Estimate (Estimate Detail) Page 1-3
☐ Add	☒ Replace	☐ Remove	Vol. 8 Chapter 8 Appendix 8-1 Phase 2 - Reclamation Estimate (Pit Backfill -Truck and Shovel, Topsoil and Subsoil Fleet Production and Cost Analysis) All
☐ Add	☒ Replace	☐ Remove	Vol. 8 Chapter 8 Appendix 8-1 Phase 3 - Reclamation Estimate (Estimate Detail) Page 1-3
☐ Add	☒ Replace	☐ Remove	Vol. 8 Chapter 8 Appendix 8-1 Phase 3 - Reclamation Estimate (Pit Backfill -Truck and Shovel, Topsoil and Subsoil Fleet Production and Cost Analysis) All
☐ Add	☒ Replace	☐ Remove	Vol. 3 Chapter 5 Drawing 5-2
☐ Add	☒ Replace	☐ Remove	Vol. 3 Chapter 5 Drawing 5-3
☐ Add	☒ Replace	☐ Remove	Vol. 3 Chapter 5 Drawing 5-9
☐ Add	☒ Replace	☐ Remove	Vol. 3 Chapter 5 Drawing 5-10
☐ Add	☒ Replace	☐ Remove	Vol. 4 Chapter 5 Drawing 5-16
☐ Add	☒ Replace	☐ Remove	Vol. 4 Chapter 5 Drawing 5-17
☐ Add	☒ Replace	☐ Remove	Vol. 4 Chapter 5 Drawing 5-18
☐ Add	☒ Replace	☐ Remove	Vol. 4 Chapter 5 Drawing 5-19
☐ Add	☒ Replace	☐ Remove	Vol. 5 Chapter 5 Drawing 5-38
☐ Add	☒ Replace	☐ Remove	Vol. 1 Chapter 2 Drawing 2-2
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Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.	Received by Oil, Gas & Mining
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Deficiency List

Task No. 4254

R645-301-121.100, Only existing topsoil stockpiles and subsoil stockpiles should be indicated on Drawing 2-2.

Topsoil Stock Pile # 3, which will be consumed shortly, has been redraw on drawing 2-2 to assist with keeping track of Stockpile numbering. All other information has been removed.

R645-301-232.600, The timing for live-haul topsoil salvage shown on Dwg 2-2 needs to be revised in accordance with the new overburden removal sequence shown on Dwg 5-2 Disturbance Sequence.

Drawing 2-2 has been reconfigured to represent topsoil salvage in accordance with the mining sequence changes.

R645-301-234, In the event that live topsoil haulage exceeds replacement depth, a temporary storage location should be selected for the excess. The storage location should be shown on Dwg 2-2. Excess live haul must be mulched and seeded in accordance with the fugitive dust control plan and the soil handling plans found in Sections 231.100 and 241.100).

An additional temporary topsoil and subsoil stockpile location has been selected and shown on drawing 2-2.

R645-301-422, The application must provide documentation of communication with the DEQ/DAQ concerning the changes in exposed surface area described by the application.

Overall the acres disturbed for the Coal Hollow Mine have decreased, however the sequence change allowing ACD to skip sequence and mine Pit 28 does increase the length of Overburden haul by approximately 300'. Also, the current proposed changes eliminate mining of Pits 29 and 30, which would have been the longest haul for coal removal, the longest coal hauls have been reduce by approximately 80'. Included in this submittal is E-mail correspondence with Mr. Jon Black, permitting engineer with the Utah Division of Air Quality for the Coal Hollow Mine.

R645-301-121.200,

1) The legend on Dwg 5-10 should indicate that Year 1 refers to the year mining began, 2011.

The legend for Dwg 5-10 has been modified to indicate the year of (proposed) mining of coal in each pit.

2) Redline text on page 5-22 incorrectly states that the mining will occur in the "southwest ¼ of Sec 30, beginning with pit 28". Please correct this statement to read, "southeast ¼ Sec 30" or "southwest ¼ Sec 29".

The error has been corrected.

3) Dwg 5-18 shows overlap of Stage 2 and active pits in the NW ¼ Sec 29, please redraw Stage 2 and correct the number of backfilled acres accordingly.

The spoils pile has been reconfigured the properly display the above surface placement of spoils at the end of Phase 2.

4) The Division observed that Stage 3 Backfill reclamation area includes pits 13 – 22, however, the calculations on Dwg 5-19 provide a total LCY of backfill and overburden for "Phase 3 Overburden (Pits 14 – 22)." Please revise calculations accordingly.

Calculations and Drawings have been revised accordingly.

5) Dwg 5-17 should illustrate a stage of activity in pits 1, 2, 4, & 7.

A stage of activity has been added to both Drawings 5-17 and 5-18.

6) Dwg 5-3 refers to Dwg 2-2 for topsoil placement, however, Dwg 2-2 must be revised to show the re-arranged live haul requirements for reclamation.

Completed

7) Please reconcile the Phases shown on Dwg 5-3 with the Reclamation Sequence shown on Dwg 5-38.

Drawing 5-3 depicts the area disturbed in each "Phase" of the three Phases of bonding.

R645-301-521.100, Cross Sections and Maps, Drawing 5-10 must be restored to show the information previously given by Note 2, as shown on the Division approved Drawing 5-10 or replace Year 1 with the year that mining began as suggested by deficiency #1 under R645-301-121.200 above. [PHH]

Note 2 has been restored to Drawing 5-10

R645-301-830.140, Detailed Estimated Cost with Supporting Calculations, The Permittee must correct the submitted cost estimate sheets for Phases 2 and 3, Alternative Reclamation Scenario, by addressing the six previously identified errors using 2013 unit cost data. [PHH]

1) The unit costs obtained from the "Cost Mine Coal Cost Guide 2009" and utilized in the Phase 2 and Phase 3 reclamation cost estimates are 4 years old. The Permittee must either
    a. confirm that these costs are either still current, or

b. the Permittee must update those unit costs with data from the "Coal Mine Coal Cost Guide 2013" or at the very minimum, costs from the "2012" guide.

At the time of this revision, the most recent edition of "Coal Mine Coal Cost Guide" is the 2012 edition.

2) The unit costs utilized from the RS Means Heavy Construction Manual appear to be out of date. Unit costs obtained from the 2013 RS Means show an increase of at least 16 % to the equipment related production costs utilized in the reclamation cost estimate. Costs for seeding and mulching went down approximately 23 % for these reclamation activities. New unit costs (2013) are therefore necessary to re-calculate the reclamation cost estimate. Updated unit cost information from the 2013 R S Means was provided to the Permittee on March 5, 2013.
3) An error of at least $50,000 exists for the total cost for Specialized Reclamation Areas in Phases 2 and 3.

An error in the spreadsheet has been identified and fix to allow the proper summarization of Specialized Area reclamation cost.

4) To calculate the indirect costs for Phases 2 and 3, the Permittee only used a 25 % factor to calculate dollar amounts to cover mobe / de-mobe, project management and engineering, and contractor profit and overhead. A factor of 26.8 % must be used according to the OSM Handbook for Bond Estimation.

The additional 1.8% has been added to Project Management/Engineering Cost for a total of 26.8% of indirect cost.

5) The Task ID # 4254 application proposes that Phase 2 will initiate coal recovery from pits 9-13 at the approximate same time as coal recovery will be initiated from pits 28 to 23. Overburden removal and coal recovery will occur from two areas of the permit area at approximately the same time. The Permittee must discuss how this will affect the incremental bonding which has been calculated for the Phase 2 and Phase 3 increments of the Coal Hollow Mine.

Bonding for each of the Phases, is the worst case scenario for each respective phase. The largest cost is the cost of backfilling the largest open pit(s) during each of the three phases. The bonds represent this in each Phase.

6) The escalation factor for 2013 is 1.5 %. This number must be used to escalate both of the cost estimates for Phase 2 and Phase 3 through 2017,

which is when all coal recovery and reclamation work is projected to be completed (See Drawing 5-38).

The escalation factor has been incorporated into both the Phase 2 and Phase 3 calculations.

R645.301.724.500 & R645.301.728.310 In order for the amendment to concur with existing MRP Chapter 7 language, studies, and appendixes the amendment must state that no pits will be open longer than 120 days. If the operator intends to maintain Pits 17-21 open for longer than 120 days the amendment must include updated language at minimum for Sections 724.500, 728.310, 728.333, and 728.334, and Appendix 7-1. [KMH]

Both the original MRP and the current revision recognize that the Preferred Scenario require additional approvals with UDOGM. Currently ACD is permitted to complete the Alternate Scenario also describe within the MRP.

Kirk Nicholes

From: Jon Black <jlblack@utah.gov>
Sent: Monday, April 01, 2013 4:48 PM
To: Kirk Nicholes
Subject: Re: Coal Hollow Mine, Project ID: N14047-0002

Hi Kirk,

If I understand you correctly this would be an overall reduction in vehicle miles traveled over the estimated annual miles traveled (rolling 12-month total). Based on this, if my assumption is correct, there would be an overall decrease in the potential PM10/PM2.5 emission rates. If nothing else is changing in the permit we could do an Administrative Amendment to your current Approval Order changing AO Condition II.B.3.e to state the new haul road length changes. This action would not require a public comment period due to the fact it would be considered a reduction in air contaminants (R307-401-12 - Reduction in Air Contaminants). It would be necessary to submit a Notice of Intent requesting the above stated change and document the reduction in emissions by calculating what the current emissions are under the existing haul road limitations of Condition II.B.3.e (2500', 7975') and what they would be under the new proposed haul road limitations (2800', 7150').

Please let me know if you think that this proposal would work or if I have missed the boat.

Thanks,
Jon
(801) 371-1106

On Thu, Mar 28, 2013 at 10:57 AM, Kirk Nicholes <knicholes@altoncoal.com> wrote:

Hello Jon,

Alton Coal Development is currently making a change in the mining sequence of the pit at the Coal Hollow Mine. The change would allow us to move down to the south and mine pit 28 and continue back to the north (pits 29 and 30 would be eliminated). In order to do this, all of the Overburden material removed from Pit 28 would have to be hauled by truck to the Excess Spoils pile and/or the previously mined pit. The concern is that this will cause an overburden haul road that will exceed the 2500 foot length specified in II.B.3.e of the Approval Order by approximately 300 feet. Of course by eliminating Pits 29 and 30 which were previously the longest distance from the facilities, the longest coal haul will be approximately 7150 feet traveling the same route as the overburden haul for 2800', then beyond to the facility for processing. Does this exceedance require any changes in the Approval Order section II.B.3.e or possibly require any other changes to the Approval Order?

Please call if you have any questions or require additional information, I can be reached at 435-691-1551.

detail the designs and specifications for each one of the proposed facilities. The following is a description of each facility and a reference for the associated drawings:

- Roads: Two primary mine haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to the pits ~~1 through 15~~ (pits shown on Drawing 5-10). This road will be approximately ~~2,600~~2,800 feet in length and will be utilized ~~mainly during the first two years of~~throughout mining. There will be three culverts installed along this road all sized for a 100 year, 24 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix A5-3. The third culvert is crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe.

  The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds southeast to ~~approximately pit 25~~long term topsoil stockpile 2 and subsoil stockpile pile 1 . This road is approximately ~~2,500~~1,300 feet in length~~and will be used for the south pits 16 through 30~~. There is one culvert crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert sized for maximum anticipated flows in the diversion.

  The following specifications apply to these Primary mine haul roads:
  1) Roads will be approximately 80' in width
  2) Approximately a 2% crown
  3) Approximately one foot deep cut ditches along shoulders for controlling storm water
  4) 18" of crushed rock or gravel for road surfacing
  5) Cut and fill slopes of 1.5 h:1v
  6) Minimum fill over each culvert will be 2 times diameter of culvert
  7) Berms placed as necessary along fills

  The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width. A typical cross section for the ancillary roads can be viewed on Drawing 5-24.

  The location and details for Primary Mine Haul roads can be viewed on Drawings 5-3 and 5-22 and 5-23.

  In addition to the two roads primary Mine Haul roads, the road located within the facilities area is also classified as a primary road. This road is planned to be 24 feet wide with 24 inches of compacted sub base and 8 inches of compacted 1 inch minus

gravel as surfacing. This road is referred to as "Facilities Roadway" and more details are described in 527.200 along with Drawings 5-22A and 5-22B.

In addition to the primary roads that will be present during active mining, four additional roads are planned to exist postmining and are also classified as primary roads for this reason.

Roads that will remain postmining are the following:

- Road to Water Well with details shown on Drawing 5-22D
- Road to east C. Burton Pugh property (K3993) with details shown on Drawing 5-22C. Kane County has claimed this road as County Road K3993.
- County Road 136 (K3900) with details on Drawing 5-22E, 5-22F and 5-22H. This County road will be reconstructed within the permit area by Kane County. This reconstruction will occur concurrently with the final ~~stage~~ phase of reclamation as scheduled on Drawing 5-38 and is expected to be completed by ~~the end of Year 4~~2017.
- Road to Swapp Ranch (same specification as the Water Well Road)

The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography.

The ramps, benches and equipment travel paths within the active surface mining area are temporary in nature and will be relocated frequently as mining progresses. These temporary travelways are considered part of the pit due to their short term use, and are not individually designed nor engineered. They will be built and maintained to facilitate safe and efficient mine and reclamation operations.

- Conveyors: A conveyor system will be used to stockpile coal and to load highway approved haul trucks for transportation to market. The first conveyor is mainly a stacker system for the coal stockpile which will be located at the coal unloading area and will be approximately 451' in length. This conveyor is estimated to be a 48" solid frame system.

  The second conveyor is a coal reclaim belt that will be loaded by an above ground reclaim feeder from the coal stockpile and will convey coal to the loadout chute which will load the highway approved coal haulage trucks. This section will be approximately 290' in length. Similar to the first section, this conveyor is estimated to be a 48" solid frame system.

  Drawings of this system can be viewed on Drawings 5-3 through 5-5.

521.180. Support facilities.

Description of the support facilities is provided in Section 526.220. Drawings 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-8A, 5-8B, and 5-8C provide the maps, appropriate cross sections,

may be recovered in the future when adjacent property rights are secured. Current plans are for a planned maximum mining depth of approximately 200 ft. and a strip ratio of 10:1; however, the ultimate mining depth will depend on cost related factors.

A detailed mine plan has been developed for the proposed permit area and the following table along with Drawing 5-9 summarize the coal extraction for the permit area:

Description	Extraction Status	Average Coal Thickness (ft)	Average Strip Ratio* (yd^3/Ton)	Quantity (**Ton)
Total Coal within Permit Boundary	N/A	16.3	7.7	9,159,000
High Strip Ratio Area (NE corner of permit area)	Not Mined	16.5	13.5	2,764,000
Coal under highwalls and sedimentation structures	Not Mined	17.2	4.8	1,~~207~~582,000
Coal under Robinson Creek Diversion	Not Mined	15.5	3.9	172,000
Recoverable Coal	Mined	16.3	6.4	~~5,916~~4,641,000

*All strip ratios are bank cubic yards of overburden to tons of coal
**All coal tons are based on a 95% recovery factor

Once approval is received to progress with mining on the adjacent federal coal reserves, an additional 57% of the coal under the highwalls will be recovered as part of the progression into these adjacent reserves.

The application of highly flexible, open pit truck/shovel techniques will minimize losses of coal due to pit geometry or spoil support requirements, allowing the maximum possible exposure of the coal resource. The full seam section will be loaded primarily using large hydraulic backhoes. The backhoes, which can work from the top of the seam, provide the ability to efficiently and cleanly excavate the lower part of the coal seam without disturbing the pit floor. This, along with the machine's high degree of bucket horizon control will minimize floor losses. The backhoes can also work safely from the top of the seam to oversteepen the loading face along the pit walls, thus recovering the maximum amount of coal.

Where pit geometry or operational factors preclude the use of backhoes for loading, a large rubber tire front end loader will be used. These machines provide similar horizon control, can operate on the floor of the pit or on an intermediate bench, and can recover coal from confined areas such as the ends of the pits.

Rear dump haul trucks, loaded by the backhoes or front end loader, will be used to move the coal from the pit via inpit roads and the primary haulroad to the crusher and stockpile. The trucks will be equipped with "combo" beds suitable for hauling both coal and overburden, and configured to minimize coal spillage.

A net recovery of 95% (including the effects of in-pit coal losses and out-of-seam dilution) of the coal exposed in the pit is anticipated. Normal coal losses are expected due to cleaning of the top of the seam, loading losses at the seam floor, and coal oxidation near the outcrop.

No coal washing is contemplated at this time, thus there will be no coal processing losses.

Maps and cross sections providing detailed information related to coal recovery activities can be viewed on Drawings 5-9 through 5-14.

523. MINING METHOD(s).

The Coal Hollow Mine will be a surface coal mining operation using open pit mining methods to produce up to 2 million tons of coal per year. Primary mining equipment will include hydraulic excavators and end-dump mining trucks. The coal will be crushed at the mine site, and hauled to market in over-the-road coal trucks.

The mine is planned to produce approximately ~~5.02~~4.64 million tons of coal over a life of approximately ~~3~~-6 years. The estimated production schedule is summarized below:

		Tons Produced
Year		(000)
1		~~2,000~~542
2		~~2,000~~505
3		~~1,016~~750
4		1,000
5		1,000
6		844
Total		~~5,016~~4,641

Initial mine development will involve removal and storage of topsoil from mine infrastructure locations. Facilities for equipment maintenance/warehouse, coal handling, and offices will be constructed. During the development and initial mining period, facilities temporary in nature may be used until permanent facilities can be built. Construction of sedimentation ponds, diversion ditches, and mine roads accessing the initial mining areas will also be ongoing.

Mining will employ typical open pit methods using truck/loader type equipment to remove overburden and recover the coal. Mining will advance across the property in successive cuts approximately 250 ft. in width and 800 to 1,300 ft. long (generally equal to the width of the property less property barriers). Layout of these pits can be viewed on Drawing 5-10. The overburden will be removed in layers or lifts approximately 20 to 40 feet deep. In practice, these overburden lifts are mined in a stairstep fashion ahead of the coal removal operation to provide adequate working room for the equipment and stable advancing slopes. Once mining is complete, excavated overburden (spoil) from a successive cut is used to backfill the excavation. General cross sections of this process can be viewed on Drawings 5-11 and 5-12.

Prior to beginning mining, the area will be cleared of vegetation, and the topsoil will be recovered and either stockpiled or live hauled to regraded areas. It is not anticipated that blasting of the overburden will be necessary based on drilling data. Should this process become necessary, this is the phase where it would be implemented. Overburden will then be removed using large hydraulic excavator(s) or front end loaders and off-road trucks which will haul the spoil and place it in parts of the pit where the coal has been removed, or in the excess spoil area shown on Drawings 5-3, 5-35 and 5-36. Overburden is removed in successively deeper benches until the coal seam is exposed. Some overburden in lower lifts may be moved by direct dozing into the mined out pit by large bulldozers.

When overburden removal is finished in a particular pit, the top of the coal will be cleaned (removal of any roof rock or other non-coal material on top of the seam) using a motor grader, dozer or front end loader. The material removed will be placed in the adjacent mined out pit. If necessary, the coal seam will be loosened by drilling and blasting or ripping prior to loading. Drilling and blasting of the coal is not expected to be necessary. The cleaned, exposed coal is then excavated by backhoe or front end loader and placed into off-road rear dump trucks.

Once the coal is removed, the pit will be backfilled by spoil from adjacent mine pits. Spoil will be placed in lifts and spread with a dozer. Once the pit is backfilled to the planned final surface contour, suitable topsoil and subsoil will be replaced, and the area reseeded. Revegetation work will proceed seasonally as appropriate for planting.

Overburden excavation and coal mining at Coal Hollow will begin near the subcrop of the coal seam at the western end of the permit area in the NW ¼ NE ¼ of Section 30, T39S, R5W. Topsoil will be removed and stored separately in topsoil stockpiles as shown on Map 2-2. Overburden from the initial pits will be hauled to the excess spoil pile east of the mining area. Once the initial pits are established, as much spoil as possible will be placed directly in the pit backfill, allowing reclamation to closely follow mining. This initial phase includes pits 1 through 8 as shown on Drawing 5-10. The mining and reclamation process for this phase can be viewed on Drawing 5-17.

From the initial mining area, operations will proceed eastward through the NE ¼ of Section 30 to the NW ¼ of Section 29 (as shown on Drawing 5-10) and from the southeast ¼ of Section 30, beginning with pit 28 and proceeding north. The mining and reclamation process for this phase can be viewed on Drawing 5-18. ~~The pit will then turn south, and advance to the north edge of Section 31 T39S, R5W. This mining and reclamation phase can be viewed on Drawing 5-19.~~ As shown on Drawing 5-19, the final pits, pit 17 through 21, will not be backfilled at this stage. The proposed method for filling these pits back to approximate original contour will be accomplished by utilizing overburden from the pit(s) in the adjacent federal reserves located immediately west of this area. Alton Coal Development, LLC is currently in the process of an Environmental Impact Study for these reserves with the intent of acquiring the rights to mine. It is expected that these rights will be acquired prior to the completion of the final phase in the

All other roads planned for construction within the permit area will be classified as ancillary. These will include temporary ramps, benches and equipment travel paths within the active mining area.

527.200 Description of Roads

Roads for the Coal Hollow Mine include seven primary roads, a conveyor system, and miscellaneous ancillary/temporary roads. Numerous drawings detail the designs and specifications for each one of the proposed facilities. The following is a description of each facility and a reference for the associated drawings:

- Roads: Two primary mine haul roads are planned within the permit area. The first road extends from the coal unloading area to the first series of pits along the west side of the property. This road will be utilized for access to the pits ~~1 through 15~~ (pits shown on Drawing 5-10). This road will be approximately ~~2,500~~2,800 feet in length and will be utilized ~~mainly during the first two years of~~throughout mining. There will be three culverts installed along this road all sized for a 100 year, 24 hour storm event. The first culvert will be across a tributary of Lower Robinson Creek and will be a 36 inch corrugated steel pipe. The second culvert is the main crossing over Lower Robinson Creek and is a 96 inch corrugated steel pipe. Both of these culverts have been sized based on analysis of the Lower Robinson Creek watershed. This analysis can be viewed in Appendix A5-3. The third culvert is crossing over a diversion ditch that will route water mainly from disturbed areas along the south side of Lower Robinson Creek to a sediment impoundment. This culvert will be a 24 inch corrugated steel pipe.

  The second road extends from an intersection with the first road, located just south of the Lower Robinson Creek crossing, and proceeds southeast to ~~approximately pit 25~~ long term topsoil stockpile 2 and subsoil stockpile 1. This road is approximately ~~2,500~~1,300 feet in length ~~and will be used for the south pits 16 through 30~~. There is one culvert crossing along this road to cross a diversion ditch. This culvert will be a 24 inch culvert sized for maximum anticipated flows in the diversion.

  The following specifications apply to these Primary mine haul roads:
  1) Roads will be approximately 80' in width
  2) Approximately a 2% crown
  3) Approximately one foot deep cut ditches along shoulders for controlling storm water
  4) 18" of crushed rock or gravel for road surfacing
  5) Cut and fill slopes of 1.5 h:1v
  6) Minimum fill over each culvert will be 2 times diameter of culvert
  7) Berms placed as necessary along fills

  The ancillary roads will have similar specifications except surfacing will occur only as needed and may be narrowed to a 40 foot road width. A typical cross section for the ancillary roads can be viewed on Drawing 5-24.

528. HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE:

528.100. Coal removal, handling, storage, cleaning, and transportation areas and structures;

Coal handling activities are confined to the active pit, and the coal sizing/loading areas located north of the pit. All areas and facilities will be designed and constructed, utilized and maintained in conformance with industry standards and all applicable regulations. At the conclusion of mining, the facilities will be removed as part of final mine reclamation activities. Material from coal stockpile areas, and other areas of potential coal accumulation will be excavated and the excavated material placed in the final mined out pit.

528.200. Overburden;

Overburden will be excavated after the removal of topsoil and subsoil as defined in Chapter 2. The overburden excavation will be accomplished by utilizing hydraulic excavators with end dump haul trucks and dozers. This process will include excavating this material in a stairstep fashion that will include benches approximately every 40 feet in depth. These benches are planned to be approximately 40 feet in width and will create an overall 2h:1v slope for the highwalls to create a stable and safe working area. This is a conservative approach for initial mining and once mining begins, ongoing geotechnical studies and monitoring will be used to further define the proper slope angle to ensure slope stability while maximizing resource recovery.

Based on the overburden isopach map (Drawing 5-15), the overburden removal has been separated into three major stages. The first stage of overburden removal is the initial mining area, Pits 1-8. These pits have a relatively low strip ratio, approximately 5:1 (refer to Drawing 5-13). In order to efficiently remove overburden for this phase, spoil from the first three pits will be placed in an excess spoil area. This excess spoil structure will hold approximately 2.7 million loose cubic yards (LCY) of material. Once the excess spoil pile is filled, overburden from the next 4 pits can then be used as pit backfill as the mining progresses through Pit 8. The completion of this phase is shown on Drawing 5-17.

Phase 2 requires mining to occur in two areas of the permit alternately. As mining progresses through Pits 9-~~15~~13, the isopach (Drawing 5-15) shows that the overburden significantly increases. This increase and the shape of the mining boundary for the Permit Area requires a fill above approximate original contour. Material from Pits 9-~~15~~ 13 significantly exceeds the backfill capacity available from the preceding pits (Pits 1-8). The fill above approximate original contour blends in with the excess spoil structure from Stage 1 and extends an additional ~~2,500~~2,000 feet to the east as the mining sequence proceeds to Pit 15.

Also, mining begins with Pit 28 and proceeds alternately with Pits 9-13, north to Pit 23. The isopach shows that Pits 28 -23 have a relatively low strip ratio, approximately 4.2:1 increasing to 4.9:1 respectively. Overburden from Pit 28 will all be hauled to the excess spoil structure, with overburden from the successive pits to north back filling the previously mined. In this stage, the fill above original contour is approximately ~~5.8~~3.0 million LCY. Drawing 5-18 (~~Stage~~ Phase 2) shows the details of this stage of the overburden removal and resulting landform.

~~Stage~~ Phase 3 overburden removal begins in Pit ~~16~~ 14 and proceeds alternately with Pit 22 coming from the south to meet at Pit 18, the last pit to be mined~~through Pit 30~~. During this stage, the strip ratio reduces significantly from ~~Stage~~ Phase 2 as mining progresses ~~to the south end of the property~~to Pit 18. As the strip ratio reduces to the south, significant backfill capacity is available in the preceding pits. This results in the distance between the backfill and the active coal face increasing. At the end of mining, an area will not be completely backfilled that is approximately ~~2,000~~1,600 feet in length and ~~1,300~~875 feet wide and will require ~~6.8~~3.3 million yards of fill to complete reclamation to approximate original contour. The backfill configuration at the end of this stage is shown in Drawing 5-19.

The proposed plan for backfilling these final pits includes acquiring the right to mine the adjacent federal coal reserves, located immediately west of this area. This plan provides an efficient method for transitioning operations into the federal reserves. At the time that this transition occurs, overburden will be removed from the federal reserves and placed in the final pits to approximate original contour. This final landform can be viewed on Drawing 5-35 and 5-36.

In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, all the fill above approximate original contour and part of the excess spoil structure will be rehandled and placed back in the remaining backfill area. The final landform for this scenario is shown on Drawing 5-37. This step requires rehandle of approximately ~~6.8~~3.3 million yards of spoil.

The following tables show the material balance during the different phases of overburden removal for each scenario:

Preferred Scenario (Adjacent Federal Reserves Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	~~7,945,000~~7,936,000	~~5,204,000~~5,195,000	2,741,000	2,741,000
2	~~15,145,000~~14,168,000	~~9,303,000~~11,127,000	~~5,842,000~~3,041,000	~~8,583,000~~5,782,000
3	~~15,447,000~~14,631,000	~~22,247,000~~14,631,000	0	~~8,583,000~~5,782,000
4 (Federal)	~~6,800,000~~3,300,000	~~6,800,000~~3,300,000	0	~~8,583,000~~5,782,000
Total	~~45,337,000~~40,035,000	~~36,754,000~~34,253,000	~~8,583,000~~5,782,000	~~8,583,000~~5,782,000

*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

Alternate Scenario (Adjacent Federal Reserves Not Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	~~7,945,000~~7,936,000	~~5,204,000~~5,195,000	2,741,000	2,741,000
2	~~15,145,000~~14,168,000	~~9,303,000~~11,127,000	~~5,842,000~~3,041,000	~~8,583,000~~5,782,000
3	~~15,447,000~~14,631,000	~~22,247,000~~14,631,000	0	~~8,583,000~~5,782,000
4 (Rehandle)	0	~~6,800,000~~3,300,000	~~-6,800,000~~-3,300,000	~~1,783,000~~2,482,000
Total	~~38,537,000~~36,735,000	~~36,754,000~~34,452,000	~~1,783,000~~2,482,000	~~1,783,000~~2,482,000

*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

The Preferred scenario for overburden removal will minimize overall disturbance and maximize resource recovery by providing a transition into the adjacent federal reserves with minimal effect to existing reclamation and backfill in the Permit Area. This scenario will also minimize variances from approximate original contour on the federal lands by eliminating the need for an excess spoil structure from the initial boxcut once operations are transitioned into these reserves.

During the course of mining, some additional excavated overburden may be placed temporarily on mined over and backfilled areas due to operational considerations. This material will be re-excavated and moved to it's final placement location as operations allow.

All maps related to the overburden removal process can be viewed on Drawings 5-15 through 5-19.

528.300. Spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures;

528.310. Excess Spoil. Excess spoil will be placed in designated disposal areas within the permit areas, in a controllable manner to ensure mass stability and prevent mass movement during and after construction. Excess spoil will meet the design criteria of R645-301-535. For the purposes of SURFACE COAL MINING AND RECLAMATION ACTIVITIES, the permit application must include a description of the proposed disposal site and the design of the spoil disposal structures according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.100, R645-301-745.300, and R645-301-745.400.

Excess spoil will be placed in the area designated on Drawing 5-3 and 5-35. This fill will be placed in lifts not to exceed 4 feet in thickness. The material will be transported from the overburden removal area to the fill by end dump haul trucks and a dozer(s) will spread the spoil to this lift thickness. The fill will meet at

revegetation. No permanent final pit impoundments are currently planned. The excess spoil structure will remain. All exposed coal seams, and acidic or toxic-forming strata will be covered with at least five feet of noncombustible material.

- Topsoil and Subsoil Replacement. 8 inches of topsoil underlain by 40 inches of subsoil will be placed on the backfilled pits and excess spoil. Other disturbed areas will have topsoil replaced (including facilities sites, roads etc.).

- Removal of Structures. Before abandoning the permit area or seeking bond release, all structures not needed for the approved post mining land use will be removed and reclaimed. The Lower Robinson Creek diversion is proposed to be temporary. Material from the coal stockpile base area and other areas where coal spillage may accumulate will be excavated and placed in a controlled manner in the final pit and covered with noncombustible material to prevent sustained combustion. The only structure planned to exist postmining is the water well with details shown in Drawing 5-8C and location shown on 5-3, 5-35 and 5-37.

- Removal of Roads. Roads not retained for use under an approved postmining land use will be reclaimed immediately after they are no longer needed for mining and reclamation operations. Roads that are not listed as postmining roads in this section, will be closed to traffic; and all bridges and culverts removed. Prior to reclamation, surface material that is incompatible with the postmining land use and revegetation requirements will be removed from the roads and properly disposed of at the mine site. The roadbeds will be scarified or ripped to break up the surface. Topsoil will be replaced on the roadbed and the surface revegetated in accordance with the standards set forth in R645.

  Roads that will remain postmining are the following:
  - Road to Water Well with details shown on Drawing 5-22D
  - Road to east C. Burton Pugh property (K3993) with details shown on Drawing 5-22C
  - County Road 136 (K3900) with details on Drawing 5-22E, 5-22F and 5-22G. This County road will be reconstructed within the permit area by Kane County. This reconstruction will occur concurrently with the final stage of reclamation as scheduled on Drawing 5-38 and is expected to be completed by ~~the end of Year 4~~2017.
  - Road to Swapp Ranch (same specification as the Water Well Road)

  The location of these roads is shown on Drawings 5-35 and 5-37 along with the post mining topography.

- Removal of Water Control Structures. All sedimentation control structures, including ditches, berms and sedimentation ponds not retained as part of the approved post-mining land use will be removed, the areas regraded, topsoiled, and revegetated. All water control structures will be removed at final reclamation.

Final pit backfilling, removal of buildings, roads and other facilities, along with replacement of topsoil is expected to require approximately 15 months after the last coal is removed. In the alternate reclamation scenario (Drawing 5-37), the bulk of this period will be required to backfill the final pits.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.
If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731

Boreholes will be backfilled to within 1 foot of the land surface with concrete or other materials approved by the Division as necessary to prevent contamination of groundwater or surface-water resources or to protect the prevailing hydrologic balance. The upper approximately 1 foot will be backfilled with native materials to facilitate reclamation (see Drawing 6-11). Exploration holes and boreholes that may be uncovered during mining and reclamation activities will be permanently closed unless approved for water monitoring or otherwise managed in a manner approved by the Division.

552. PERMANENT FEATURES.

552.100

Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

552.200

All impoundments will be reclaimed, no permanent impoundments are proposed.

553 BACKFILLING AND GRADING:

Backfilling and Grading of the mined area will proceed in conjunction with coal recovery operations.

The planned mine will recover approximately ~~5.02~~4.64 million tons of coal, and remove approximately ~~31.6~~30.1 million Bank Cubic Yards (BCY) of overburden. The following is a description of the overburden removal and backfilling process:

Based on the overburden isopach map (Drawing 5-15), the overburden removal and backfilling process has been separated into three major stages. The first stage of this process is for the initial mining area, Pits 1-8. These pits have a relatively low strip ratio, approximately 5:1 (refer to Drawing 5-13). In order to efficiently remove overburden for this phase, spoil from the first three pits will be placed in an excess spoil area located immediately west of Pit 1. This excess spoil structure will hold approximately 2.7 million loose cubic yards (LCY) of material and is shown on Drawing 5-17. Once the excess spoil pile is filled, overburden from the next 4 pits can then be used as pit backfill as the mining progresses through Pit 8. The completion of this phase is shown on Drawing 5-17.

Phase 2 requires mining to occur in two areas of the permit alternately. As mining progresses through Pits 9-~~15~~13, the isopach (Drawing 5-15) shows that the overburden significantly increases. This increase and the shape of the mining boundary for the Permit Area require a fill above approximate original contour that is an extension of the excess spoil pile. Material from Pits 9-~~15~~ 13 significantly exceeds the backfill capacity available from the preceding pits (Pits 1-8). The fill above approximate original contour blends in with the excess spoil structure from ~~Stage~~ Phase 1 and extends an additional ~~2,500~~2,000 feet to the east as the mining sequence proceeds to Pit 15.

Also, mining begins with Pit 28 and proceeds alternately with Pits 9-13, north to Pit 23. The isopach shows that Pits 28 -23 have a relatively low strip ratio, approximately 4.2:1 increasing to 4.9:1 respectively. Overburden from Pit 28 will all be hauled to the excess spoil structure, with overburden from the successive pits to north back filling the previously mined. In this stage, the fill above original contour is approximately 5.8 million LCY. Drawing 5-18 (Stage 2) shows the details of this stage of the overburden removal and resulting landform.

Stage 3 overburden removal begins in Pit ~~16~~ 14 and proceeds alternately with Pit 22 coming from the south to meet at Pit 18, the last pit to be mined~~through Pit 30~~. During this stage, the strip ratio reduces significantly from Stage 2 as mining progresses to ~~the south end of the property~~Pit 18. As the strip ratio reduces to the south, significant backfill capacity is available in the preceding Pit 15. This results in the distance between the backfill and the active coal face increasing because there is a lack of spoil in the lower ratio pits as mining proceeds south to fill the preceding higher ratio area. At the end of mining this phase, an area will not be completely backfilled that is approximately ~~2,000~~1,600 feet in length and ~~1,300~~875 feet wide and will require ~~6.8~~ 3.3 million yards of fill to complete reclamation to approximate original contour. This remaining pit provides an open pit adjacent to the federal coal reserves for backfilling of overburden so that a smooth transition can be made without developing another boxcut and an excess spoil area. The backfill configuration at the end of this stage is shown in Drawing 5-19.

The proposed plan (Preferred Scenario) for backfilling the final pits is based on the assumption that Alton Coal Development, LLC will be successful with acquiring the adjacent federal coal reserves, located immediately to the west of the project area. This Preferred scenario for backfilling will minimize overall disturbance, and maximize resource recovery by providing a transition into the adjacent federal reserves with minimal effect to existing reclamation and backfill in the Permit Area. This scenario will also minimize variances from approximate original contour on the federal lands by eliminating the need for an excess spoil structure from the initial box cut as operations are transitioned into these reserves. In addition, this scenario provides a method for implementing concurrent reclamation during the project by eliminating temporary stockpiles of spoil that can not be reclaimed and have to be placed in backfilled areas at a later time. Use of temporary spoil stockpiles significantly delay reclamation and this plan eliminates the need for these type of temporary structures.

At the time that the transition occurs into the federal reserves, overburden will be removed from the federal reserves and placed in the final pits to approximate original contour. This final landform can be viewed on Drawings 5-35 and 5-36.

The following is an overburden and backfill balance for this scenario:

Preferred Scenario (Adjacent Federal Reserves Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	~~7,945,000~~7,936,000	~~5,204,000~~5,195,000	2,741,000	2,741,000
2	~~15,145,000~~14,168,000	~~9,303,000~~11,127,000	~~5,842,000~~3,041,000	~~8,583,000~~5,782,000
3	~~15,447,000~~14,631,000	~~22,247,000~~14,631,000	0	~~8,583,000~~5,782,000
4 (Federal)	~~6,800,000~~3,300,000	~~6,800,000~~3,300,000	0	~~8,583,000~~5,782,000
Total	~~45,337,000~~43,535,000	~~36,754,000~~34,453,000	~~8,583,000~~5,782,000	~~8,583,000~~5,782,000

*Loose Cubic Yards is estimated based on an overall 22% swell factor (Caterpillar Performance Handbook)

In the case that Alton Coal Development is not successful with acquiring the adjacent federal coal reserves, an alternate scenario has been developed. The Alternate scenario requires that all fill above approximate original contour and part of the excess spoil structure will be rehandled and placed in the remaining backfill area. The final landform for this scenario is shown on Drawing 5-37. This step requires rehandle of approximately ~~6.8~~3.3 million yards of spoil. In this scenario, reclamation of the project area will be significantly delayed and the transition into adjacent federal coal reserves at a later date will disturb additional backfill along the west permit boundary approximately 2,000 feet in length by 230 feet wide (10 acres). An additional excess spoil structure would then need to be constructed on the federal lands to place spoil from the initial boxcut. Part of the excess spoil would likely be material removed from the Permit Area to access the coal beneath the Permit Area highwalls and provide the proper layback of the backfill material along the Permit boundary.

The following table summarizes the overburden and backfill balance for this scenario:

Alternate Scenario (Adjacent Federal Reserves Not Acquired)				
Phase	Overburden (LCY)	Available Backfill (LCY)	Excess Spoil (LCY)	Total Excess Spoil (LCY)
1	~~7,945,000~~7,936,000	~~5,204,000~~5,195,000	2,741,000	2,741,000
2	~~15,145,000~~14,168,000	~~9,303,000~~11,127,000	~~5,842,000~~3,041,000	8,583,000~~5,782,000~~
3	~~15,447,000~~14,631,000	~~22,247,000~~14,631,000	0	8,583,000~~5,782,000~~
4 (Rehandle)	0	~~6,800,000~~3,300,000	- ~~6,800,000~~3,300,000	~~1,783,000~~2,483,000
Total	~~38,537,000~~36,735,000	~~36,754,000~~34,253,000	~~1,783,000~~2,482,000	~~1,783,000~~2,482,000

In both scenarios (Preferred and Alternate), Rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet except for the exemption in the south end of the mining area (Pits ~~24~~17 through ~~30~~21), which is described above in a step by step manner in the ~~Stage~~ Phase 3 overburden removal process, the above tables and Drawings 5-17 through 5-19. This exemption is expected to take place in the last ~~Y~~year ~~3~~ of the mining process.

Major steps in the backfilling and grading process are:

- Backfilling of the Mined Out Pit. Material from active pits will be used to backfill mined out pits as mining progresses. Material will be placed in the in-pit backfill in lifts, until the approximate planned final elevation is reached. Working stability in the backfill will be achieved by placement of the material, and control of the overall spoil face slope at stable angles. The mined out area will be filled to its planned post-mining elevation, which approximates the pre-mining land contour. The backfill will be inherently stable because the exposed surface will have shallow slopes, and the backfill surface will not be significantly higher than the surrounding undisturbed ground with the exception of the variance shown on Drawing 5-3.
- Backfilling of Ramps. Ramps and travelways within the active mining will be moved as necessary for safe operation and efficient hauling of overburden and coal. When a particular ramp or travelway is no longer needed, it will be backfilled with excavated overburden from the advancing pit.
- Grading. After backfilling is complete in each mined out area, the area will be graded using dozers and motor graders to achieve the planned post-mining contour, facilitate stable positive drainage patterns, and to blend in with the surrounding topography. Postmining slopes will not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and prevent slides. A geotechnical analysis has been completed for the excess spoil structure and can be found in Appendix 5-1.

Timing of backfilling and grading operations will depend on the rate of mine advance and the availability of backfill space and material. It is planned that mined areas will be backfilled and graded within approximately 60 days following coal removal, or 1,500 feet of the active coal removal face. As described in the previous text and shown on Drawing 5-19, there will be a variance from this standard in the final pits. Areas needed for in-pit roads, ramps, drainage controls or areas which must be left open temporarily for operational reasons will be backfilled and graded as they become available.

In the initial mining area, pits 1 through 8 (spoil from pit 2 and 3 will be permanently placed in the excess spoil area and pit 1. Part of Pit 3 is placed in the previous pit. All of the 4th pit is placed in the pit 3, beginning the sequential pit backfilling process. By the time coal recovery is complete, rough backfilling and grading will be complete through 7 pits. Rough backfilling and grading will continue and be completed through pit 8.

CHAPTER 8

R645-301-800. BONDING AND INSURANCE

820. REQUIREMENT TO FILE A BOND

820.100 The Operator Agrees to File a Bond.

After the permit application is approved, but before the permit is issued, the applicant will file with the Division, on a form prescribed and furnished by the Division, a bond or bonds conditioned upon performance of all requirements of the State Program, the permit and the reclamation bond.

820.110-111 Area to be Covered by the Performance Bond

The disturbed area at the Coal Hollow Project will be bonded. ~~The disturbed areas are~~Bonding will be in Phases according to sequence of disturbance identified on Drawing 5-3. The area to be mined is also identified on Drawing 5-3.

820.112-114 Incremental Bonding

Not applicable at this time.

820.120 Acceptance of Bond

The applicant agrees not to commence operations until the Division approves a performance bond for the Coal Hollow Project.

820.130 Coverage of Bond

The applicant will provide a performance bond for the disturbed area within the permit.

820.200 Form of the Performance Bond

820.223 Surety Bond

Alton Coal Development, LLC is proposing to submit a surety bond consistent with the requirements of R645-301-860.100 and any additional requirements in the State Program.

830. DETERMINATION OF BOND AMOUNT

830.100 Determined by the Division

The amount of the bond required will be determined by the Division.

830.140 Detailed Estimated Costs

The bonding amount for final reclamation will depend upon the approved permit and reclamation plan (R645-301-830.120). Estimates have been completed for the individual mining phases shown in Drawings 5-17, 5-18 and 5-19. These estimates are provided as Appendix 8-1. These cost calculations are based on the specific details shown on these drawings. As requested by the Division, a separate bond estimate is completed for all three phases shown in the drawings and in general, each stage is representative of the expected reclamation liability for ~~years~~ Phase 1, 2 and 3, respectively. The bond estimate by ~~year~~ Phase, escalated for the 2017 (anticipated end of mining) is the following:

Phase 1:	$5,346,000
Phase 2:	$~~10,859,000~~9,888,000
Phase 3:	$~~10,889,000~~6,624,000

A summary and supporting calculations for these cost estimates is provided in Appendix 8-1.

840. GENERAL TERMS AND CONDITIONS OF THE BOND

General terms and conditions of the bond as stated at R645-301-840 through R645-301-840.520 will be met by Alton Coal Development, LLC

850. BOND REQUIREMENTS FOR UNDERGROUND COAL MINING

Not Applicable

860. FORM OF BOND

860.100 Surety Bond

The applicant will submit a surety bond as defined under R645-100-200 and meet all the requirements under R645-301-860.110 to .120.

870. REPLACEMENT OF BONDS

Equivalent bond coverage will be provided if Alton Coal Development, LLC replaces the surety bond.

880. REQUIREMENT TO RELEASE PERFORMANCE BONDS

Upon completion of reclamation operations, the applicant will apply for bond release and meet the requirements of R645-301-880.

890. TERMS AND CONDITIONS FOR LIABILITY INSURANCE

890.100 Certificate of Liability Insurance

A copy of the Certificate of Liability Insurance is provided in Appendix 1-3. Alton Coal Development, LLC will meet the requirements of R645-301-890 prior to commencing any mining operations.

BONDING

Introduction

The purpose of this appendix is to provide a reclamation bond estimate as required by R645-301-830.140. As requested in the Division's Technical Analysis (TA) dated March 26, 2009, this bond estimate is calculated in a manner that allows for incremental bonding at the Coal Hollow mine in accordance with the requirements of R645-301-820.111, 820.112 through 820.133.

Based on the request in the Division's TA, there are three separate bond cost estimates for the three general stages of mining as detailed in the Mining and Reclamation Plan. These stages of mine development, are shown on Drawings 5-17, 5-18, 5-19 and fully described in Chapter 5 text. The drawings in combination with the text describe the anticipated status of reclamation and the size of the open coal pit at each stage. In the following cost estimate, the stages of mine development are referred to as Phase 1, Phase 2 and Phase 3. Because concurrent (or contemporaneous) reclamation will be implemented, these estimates are not meant to be cumulative (or added together) as the mine progresses through the different stages but instead is meant as the total reclamation liability during each individual phase. Therefore, each phase cost estimate is meant as the total bond amount to be applied while in each development stage.

This appendix includes the following details:

- Bond Estimate Summary

- Mine Facilities - Reclamation Estimate
  - a) Estimate Details

- Phase 1 Reclamation - Reclamation Estimate
  - a) Estimate Details
  - b) Pit Backfill - Dozer Simulation
  - c) Pit Backfill - Truck/Shovel, Fleet Production and Cost Analysis (FPC)
  - d) Subsoil - Truck/Shovel, Fleet Production and Cost Analysis (FPC)
  - e) Topsoil - Truck/Shovel, Fleet Production and Cost Analysis (FPC)

- Phase 2 Reclamation - Reclamation Estimate
  - a) Estimate Details
  - b) Pit Backfill - Dozer Simulation
  - c) Pit Backfill - Truck/Shovel, Fleet Production and Cost Analysis (FPC)
  - d) Subsoil - Truck/Shovel, Fleet Production and Cost Analysis (FPC)
  - e) Topsoil - Truck/Shovel, Fleet Production and Cost Analysis (FPC)

- Phase 3 Reclamation - Reclamation Estimate
  - a) Estimate Details
  - b) Pit Backfill - Truck/Shovel, Fleet Production and Cost Analysis (FPC)

c) Subsoil - Truck/Shovel, Fleet Production and Cost Analysis (FPC)
d) Topsoil - Truck/Shovel, Fleet Production and Cost Analysis (FPC)

All material volume and surface area calculations were performed utilizing Carlson Civil and Mining software.

Cost data sources include:

- RSMeans Heavy Cost Construction ~~2009~~2013
- RSMeans Construction Cost Data ~~2009~~ 2013
- CostMine Coal Cost Guide ~~2009~~2012
- CostMine Mine and Mill Equipment Cost Data, ~~2008~~ 2012 (latest version available)

These sources are applied where appropriate in each of the cost estimates. Each line item in the estimate lists specifies which source is utilized for cost data.

Summary

In agreement with the Division's assessment, Alton Coal Development has developed this cost estimate in an incremental phase approach. The facilities reclamation cost, including building demolition/disposal, earthwork and seeding/mulching, is calculated separately and then added to each phase to provide an overall total. In addition, reclamation of the ponds and Lower Robinson Creek are also separated in the calculations and applied to the total costs for each phase as appropriate. The main categories for the cost estimate are:

- Mine Facilities
- Specialized Reclamation Areas
- Phase 1 Mine Development
- Phase 2 Mine Development
- Phase 3 Mine Development

The following is a brief summary of the information and methods used to calculate the costs for each category:

Mine Facilities
This section includes demolition, disposal, earthwork and land reclamation costs for the entire facilities area, including ponds and ditches. The calculations for this section is based on the facilities and pond drawings in the current version of the Mining and Reclamation Plan. These drawings are all provided in Chapter 5 as Drawings 5-3 through 5-8C. The RSMeans Cost data is applied to this estimate. The overall cost estimate for the facilities reclamation is approximately $1,395,000.

Specialized Reclamation Areas
The specialized reclamation areas include ponds 2, 3 and 4 along with the Lower Robinson Creek reconstruction. The calculations for these specific areas are provided separately and applied to each phase of development as appropriate. The overall cost estimate for these areas varies depending on the mine development phase.

Phase 1
The details for this phase of mine development is shown on Drawing 5-17. At this point of mine development, Pits 1 through 8 have been mined. A 2.7 million yard excess spoil pile has been constructed and pits 1 through 6 have been backfilled, subsoil/topsoil placed and the surface graded to the approximate original contour (AOC). This estimate includes rehandle of the entire excess spoil pile to backfill Pits 7 and 8 which are open at this point. This requires a combination of dozers and truck/shovel operations to backfill these pits to the AOC. Once the pit is backfilled, the subsoil and topsoil is then placed followed by seeding and mulching. RSMeans Cost Data is used for everything except material handling. The data supplied by RSMeans for material handling is mainly reflective of construction type projects and is not representative of the mass volumes of material handling required for this project. Therefore, this cost estimate utilizes dozer and truck/shovel simulations to develop production rate estimates. Cost data from CostMine's Coal Cost Guide and Mine/Mill Equipment Cost Data are then applied to the production rates to develop overall cost estimates. The software packages Dozsim and Fleet Production /Cost Analysis (FPC) are utilized to perform the necessary calculations.

Once the overall cost for the material handling is estimated using this process, contractor overhead/profit, engineering/supervision and mobilization costs are then added to the total.

The overall cost estimate for Phase 1 including facilities, specialized reclamation areas, and mine reclamation using this process is approximately $5,345,000.

Phase 2
The detail for this phase of mine development is shown on Drawing 5-18. At this point, Pits 1 through ~~15~~ 13 and Pits 23 through 28 have been mined. The excess spoil pile/fill above AOC now contains approximately ~~8.6~~5.7 million cubic yards of spoil. Pits 1 through ~~14~~ 12 and Pits 24 through 28 have been backfilled and graded. The estimate for this phase includes rehandling of the excess spoil to backfill Pits ~~15~~ 13 and 23 which ~~is~~ are the open pits at this point. This requires material handling of approximately ~~7~~ 6 million yards by a combination of dozers and truck/shovel equipment to complete. Same methods described above in Phase 1 are also used in Phase 2 to calculate the cost estimate

The overall cost estimate for Phase 2 including facilities, specialized reclamation areas, and mine reclamation using this process is approximately $~~10,859,000.~~9,316,000

Phase 3

The detail for this phase of mine development is shown on Drawing 5-19. At this point, Pits 1 through ~~30~~ 28 have been mined. Pits 1 through ~~23~~ 16 and 22 through 28 have been backfilled and graded. The excess spoil pile/fill above approximate original contour contains approximately ~~8.6~~5.7 million yards of spoil. The estimate for this phase includes rehandling of the excess spoil to backfill pits ~~24~~ 17 through ~~30~~ 21 which are ~~the~~ partially open pits. This requires material handling of approximately ~~6.6~~3.3 million cubic yards by a combination of dozers and truck/shovel equipment to complete. The same methods described above in Phase 1 are also used in Phase 3 to calculate the cost estimate.

The overall cost estimate for Phase 3 including facilities, specialized reclamation areas, and mine reclamation using this process is approximately $~~10,889,000~~6,241,000.

The following documentation provides the details for each of these bond estimates.

Phase 2 Mine Reclamation Cost Estimate

Phase 2 Specialized Reclamation Areas

Item	*Unit	Quantity	Unit Cost ($)	Cost	**Cost Data Reference
Pond 2 backfill from embankment	yd^3	160	$2.26	$362	RSMeans Heavy Constr., 31 23 23.17 0020
Pond 2 backfill from excess spoil	yd^3	7,122	$4.75	$33,830	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 2 topsoil	yd^3	860	$4.75	$4,085	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 2 seeding	M.S.F	35	$30.00	$1,050	RS Means Heavy Constr., 32 92 19.14 3700
Pond 2 mulching	M.S.F	35	$46.00	$1,610	RS Means Heavy Constr., 32 91 13.16 0350
Pond 2 Subtotal				**$40,936**	
Pond 3 backfill from embankment	yd^3	4,767	$2.26	$10,773	RSMeans Heavy Constr., 31 23 23.17 0020
Pond 3 backfill from excess spoil pile	yd^3	6,107	$4.75	$29,008	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 3 topsoil	yd^3	3,011	$4.75	$14,302	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 3 seeding	M.S.F	122	$30.00	$3,660	RS Means Heavy Constr., 32 92 19.14 3700
Pond 3 mulching	M.S.F	122	$46.00	$5,612	RS Means Heavy Constr., 32 91 13.16 0350
Pond 3 Subtotal				**$63,356**	
Pond 4 backfill from embankment	yd^3	1,410	$2.26	$3,187	RSMeans Heavy Constr., 31 23 23.17 0020
Pond 4 backfill from excess spoil pile	yd^3	14,692	$4.75	$69,787	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 4 topsoil	yd^3	2,055	$4.75	$9,763	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 4 seeding	M.S.F	188	$30.00	$5,640	RS Means Heavy Constr., 32 92 19.14 3700
Pond 4 mulching	M.S.F	142	$46.00	$6,532	RS Means Heavy Constr., 32 91 13.16 0350
Pond 4 Subtotal				**$94,908**	
Phase 2 Specialized Reclamation Areas Total				**$199,200**	

Phase 2 Mine Reclamation Cost Estimate

Phase 2 Pit Backfill and Land Reclamation

Item	*Unit	Quantity	Unit Cost ($)	Cost	**Cost Data Reference
Pit Backfill Rehandle Excess Spoil Pile - Dozer	yd^3 (Loose)	3,055,350	$0.93	$2,832,309	Production from Dozsim Software, Cost data from CostMine Coal Cost Guide 2012
Pit 13 Backfill Rehandle Excess Spoil Pile - Excavator	yd^3 (Loose)	2,118,628	$0.94	$1,994,377	Production from Fleet Production and Cost Analysis Software, Cost data from CostMine Coal Cost Guide 2012
Pit 23 Backfill Rehandle Excess Spoil Pile - Excavator	yd^3 (Loose)	775,424	$0.97	$754,435	Production from Fleet Production and Cost Analysis Software, Cost data from CostMine Coal Cost Guide 2012
Topsoil	yd^3 (Loose)	76,893	$0.93	$71,775	Production from Fleet Production and Cost Analysis Software, Cost data from CostMine Coal Cost Guide 2012
Subsoil	yd^3 (Loose)	198,242	$0.93	$185,047	Production from Fleet Production and Cost Analysis Software, Cost data from CostMine Coal Cost Guide 2012
Seeding	M.S.F	3,311	$30.00	$99,317	RS Means Heavy Constr., 32 92 19.14 3700
Mulching	M.S.F	3,311	$46.00	$152,286	RS Means Heavy Constr., 32 91 13.16 0350
Subtotal				**$6,089,547**	
Mobilization/Demobolization (5%)				$304,477	
Project Management/Engineering (6.8%)				$414,089	
Contractor Profit/Overhead (15%)				$913,432	
Phase 2 Mine Reclamation Total				**$7,721,545**	

Phase 2 Reclamation Bond Summary

Facilities Reclamation	$1,395,235
Specialized Areas Reclamation	$199,200
Mine Reclamation	$7,721,545
Phase 2 Overall Bond Total	**$9,315,981**
Phase 2 Overall Bond Total Escalated for 2017	**$9,887,642**

Phase 2 Mine Reclamation Material Handling Summary

Equipment Description	Production Rate (BCY)	Production Rate (LCY)	Cost/BCY	Cost/LCY	Total Volume (BCY)	Total Volume (LCY)	Total Cost
Rehandle with Dozer	138.8	184.6	$1.23	$0.927	2,297,256	3,055,350	$2,832,309
Rehandle with Truck/Shovel Pit 13	512	681.0	$1.25	$0.941	1,592,953	2,118,628	$1,994,377
Rehandle with Truck/Shovel Pit 23	484	643.7	$1.29	$0.973	583,026	775,424	$754,435
Topsoil Pit 13	427.0	526.1	$1.15	$0.93	62,413	76,893	$71,775
Topsoil Pit 23	425.0	523.6	$1.16	$0.94	19,370	23,863	$22,391
Subsoil Pit 13	427.0	526.1	$1.15	$0.93	161,172	198,242	$185,047
Subsoil Pit 23	425.0	523.6	$1.16	$0.94	96,703	118,945	$111,607
Total Phase 2 Material Handling							$5,860,335

Rehandle with Dozer Quantity	3,055,350	Loose Cubic Yards
Rehandle with Truck/Shovel Quantity Pit 13	2,118,628	Loose Cubic Yards
Rehandle with Truck/Shovel Quantity Pit 23	775,424	Loose Cubic Yards
Total Rehandle Quantity	5,949,402	Loose Cubic Yards

Software Overburden Swell Factor	33%
Software Topsoil Swell Factor	23%
Software Subsoil Swell Factor	23%

Topsoil Area Pit 13	58	acres
Topsoil Area Pit 23	18	acres
Subsoil Area (Open Pit13)	30	acres
Subsoil Area (Open Pit23)	18	acres

Equipment Cost Data (Cost Mine 2012 Coal Cost Guide/2012 Mine and Mill Equipment Costs)

Equipment Description	$/hr
7 yd. Excavator	$155.23
26 Ton Haul Truck	$33.02
5,000 Gal. Water Truck	$33.04
14 Grader	$52.76
D10 Dozer	$112.12
D7 Dozer	$50.21
13 yd. Excavator	$281.71
40 Ton Haul Truck	$57.37

Manpower Type	$/hr (46% burden)
Excavator Operator	$37.45
Truck Drivers	$37.62
Heavy Equipment Operators	$36.31
Utility Operators	$33.12

Fleet Production and Cost Analysis

Phase 2 Truck - Shovel | **Pit 13 Backfill Haul** | **FLEET**

Alton Coal Development, LLC | **Coal Hollow Mine** | **3/24/2013**

Cycle Times

Hauler Cycle Time

	5 769C
Load with Exchange (min)	1.55
Haul (min)	1.03
Dump and Maneuver (min)	1.2
Return (min)	0.81
Potential Cycle Time (min)	4.59
Wait on Slow Hauler (min)	0
Wait to Load (min)	3.16
Additional Bunching (min)	0.01
Wait to Dump (min)	0
TMPH Wait (min)	
Total Cycle Time (min)	7.76
Bunching	Avg
Haul Start mph	0
Haul End mph	0
Return Start mph	0
Return End mph	0

Loader Cycle Time

	5 769C
Loader Model	385C LME
Loader Quantity	1
Bucket Capacity (CY)	7.25
Loader Fill Factor (%)	100
Loose Density (Lbs/LCY)	2,107
Tons per Pass	7.64
System Passes per Hauler	3
Hauler Payload (Tons)	22.91
% of Max GVW	96.57
Hauler Volume (LCY)	21.75
% of Body Fill	70
Loader Cycle Time (min)	0.4
First Bucket Dump (min)	0.05
Hauler Exchange Time (min)	0.7

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	90	%
Schedule Period	Shift	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	89.72	%
Production per Sched Hr	511.11	BCY
Total Production	1,592,953	BCY
Sched Hrs Required	3,116.68	
Total Cost ($)	1,998,344	
Cost per BCY ($)	1.254	
Production per Shift	1,022,213	BCY
Shifts Required	1.56	

Theoretical Production

	Quantity	Model	BCY per Hour	Cycles per Hour
1	1	385C LME	634	
2	5	769C	1,069	13.1

Actual Production

	Quantity	Model	Cycles per Hou	Payload in Tons	Tons per Hour
1	5	769C	7.73	22.91	885.56
Fleet Tons per Operating Hour					885.56
x 90.00% Operator Efficiency =					797
x 89.72% Fleet Availability =					715.04

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	2,805	540,469	0.339
Haulers:	5	769C	C202	70.64	14,025	990,729	0.622
Totals	5				14,025	990,729	0.622
Support	1	5,000 Gal. Water Truck		75.66	2,805	212,227	0.133
	1	14 Grader		90.88	2,805	254,919	0.16
Totals	2				5,610	467,146	0.293
Fleet Totals	8				22,440	1,998,344	1.254

Haul Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY			
Model:	769C	Gross Weight:	118,200	Lbs
Identifier:		Payload:	22.91	Tons
Tire Type:	E3 28P	Propulsion Correctior	1	
Tire Size:	18.00-33	Retarding Correction	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.9	13.5	13.5	0.13	0	0.125
2	1,331	4	2	5.47	25		19.1	17.02	0	1.03	0	0.906

Return Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY			
Model:	769C	Gross Weight:	118,200	Lbs
Identifier:		Payload:	22.91	Tons
Tire Type:	E3 28P	Propulsion Correctior	1	
Tire Size:	18.00-33	Retarding Correction	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0.11	0	0.108
2	1,331	4	2	5.57	25		30.27	25	0	0.81	0	0.706

Fleet Size Annual

Loader: 1 385C LME Availability 90 % 90 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Shift
Avg Bunching

Qty		Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Shift	Shifts Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail*
1	1	769C	156	156	10,216	2.481	3,952,238	311,860	5.11	59	46	
2	2	769C	290	134	5,488	1.552	2,472,182	580,496	2.74	55	43	
3	3	769C	395	104	4,036	1.302	2,074,469	789,425	2.02	50	39	
4	4	769C	483	89	3,296	1.195	1,904,011	966,479	1.65	42	33	
5	5	769C	511	28	3,117	1.254	1,998,344	1,022,213	1.56	35	27	

Fleet Size Efficiency

Loader: 1 385C LME Availability 90 % 90 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Shift
Avg Bunching

Qty		Fleet Match	Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront*	Normal TMPHRear*
1	1	0.34	81	100	100	100	214	156	156	2.481	59	46
2	2	0.67	81	100	93.07	93.07	428	290	134	1.552	55	43
3	3	1.01	81	98.8	85.4	84.38	642	395	104	1.302	50	39
4	4	1.35	88.26	74.1	95.95	71.1	856	483	89	1.195	42	33
5	5	1.69	89.72	59.28	99.84	59.19	1,069	511	28	1.254	35	27

Fleet Production and Cost Analysis

Phase 2 Truck - Shovel | **Pit 23 Backfill Haul** | **FLEET**

Alton Coal Development, LLC | **3/25/2013**

Cycle Times

Hauler Cycle Time

	5 769C	
Load with Exchange (min)		1.25
Haul (min)		2.19
Dump and Maneuver (min)		1.2
Return (min)		1.7
Potential Cycle Time (min)		6.34
Wait on Slow Hauler (min)		0
Wait to Load (min)		0
Additional Bunching (min)		1.07
Wait to Dump (min)		0
TMPH Wait (min)		
Total Cycle Time (min)		7.41
Bunching	Avg	
Haul Start mph		0
Haul End mph		0
Return Start mph		0
Return End mph		0

Loader Cycle Time

	5 769C	
Loader Model	385C LME	
Loader Quantity		1
Bucket Capacity (CY)		7.25
Loader Fill Factor (%)		100
Loose Density (Lbs/LCY)		2,107
Tons per Pass		7.64
System Passes per Hauler		3
Hauler Payload (Tons)		22.91
% of Max GVW		96.57
Hauler Volume (LCY)		21.75
% of Body Fill		70
Loader Cycle Time (min)		0.25
First Bucket Dump (min)		0.05
Hauler Exchange Time (min)		0.7

Phase 2 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Cost Analysis
Pit 23 Backfill Haul

FLEET
3/25/2013

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	90	%
Schedule Period	Shift	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	81	%
Production per Sched Hr	483.69	BCY
Total Production	775,424	BCY
Sched Hrs Required	1,603.16	
Total Cost ($)	1,003,497	
Cost per BCY ($)	1.294	
Production per Shift	967,370	BCY
Shifts Required	0.8	

Theoretical Production

	Quantity	Model	BCY per Hour	Cycles per Hour
1	1	385C LME	786	
2	5	769C	775	9.5

Actual Production

	Quantity	Model	Cycles per Hour	Payload in Tons	Tons per Hour
1	5	769C	8.1	22.91	928.22
Fleet Tons per Operating Hour					928.22
x 90.00% Operator Efficiency =					835.4
x 81.00% Fleet Availability =					676.68

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	1,443	278,007	0.359
Haulers:	5	769C	C202	70.64	7,214	509,612	0.657
Totals	5				7,214	509,612	0.657
Support	1	5,000 Gal. Water Truck		62.58	1,443	90,293	0.116
	1	14 Grader		87.04	1,443	125,585	0.162
Totals	2				2,886	215,878	0.278
Fleet Totals	8				11,543	1,003,497	1.294

Phase 2 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Cost Analysis
Pit 23 Backfill Haul

FLEET
3/25/2013

Haul Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY		
Model:	769C	Gross Weight:	118,200 Lbs
Identifier:		Payload:	22.91 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.9	13.5	13.5	0.13	0	0.125
2	3,274	4	2	5.43	25		19.1	19.1	0	2.19	0	2.064

Return Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY		
Model:	769C	Gross Weight:	118,200 Lbs
Identifier:		Payload:	22.91 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0.11	0	0.108
2	3,274	4	2	5.48	25		30.27	25	0	1.7	0	1.589

Phase 2 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Cost Analysis
Pit 23 Backfill Haul

FLEET
3/25/2013

Fleet Size Annual

Loader:	1 385C LME	Availability 90 %	90 % Operator Efficiency
Haulers:	5 769C	Availability 90 %	2000 Sched Hours per Shift
Avg Bunching			

Qty	Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Shift	Shifts Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail *
1	1 769C	113	113	6,858	3.287	2,548,864	226,127	3.43	101	79	
2	2 769C	226	113	3,429	1.925	1,492,444	452,254	1.71	101	79	
3	3 769C	323	97	2,403	1.546	1,198,806	645,275	1.2	96	75	
4	4 769C	409	86	1,895	1.375	1,065,923	818,217	0.95	92	71	
5	5 769C	484	75	1,603	1.294	1,003,497	967,370	0.8	87	68	

Fleet Size Efficiency

Loader:	1 385C LME	Availability 90 %	90 % Operator Efficiency
Haulers:	5 769C	Availability 90 %	2000 Sched Hours per Shift
Avg Bunching			

Qty	Fleet Match		Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront*	Normal TMPHRear *
1	1	0.2	81	100	100	100	155	113	113	3.287	101	79
2	2	0.39	81	100	100	100	310	226	113	1.925	101	79
3	3	0.59	81	100	95.12	95.12	465	323	97	1.546	96	75
4	4	0.79	81	100	90.46	90.46	620	409	86	1.375	92	71
5	5	0.99	81	100	85.56	85.56	775	484	75	1.294	87	68

Cycle Times

Hauler Cycle Time

	5 769C	
Load with Exchange (min)		2.35
Haul (min)		2.88
Dump and Maneuver (min)		1.2
Return (min)		2.14
Potential Cycle Time (min)		8.56
Wait on Slow Hauler (min)		0
Wait to Load (min)		3.19
Additional Bunching (min)		0.43
Wait to Dump (min)		0
TMPH Wait (min)		
Total Cycle Time (min)		12.18
Bunching	Avg	
Haul Start mph		0
Haul End mph		0
Return Start mph		0
Return End mph		0

Loader Cycle Time

	5 769C	
Loader Model	385C LME	
Loader Quantity		1
Bucket Capacity (CY)		7.25
Loader Fill Factor (%)		100
Loose Density (Lbs/LCY)		1,601
Tons per Pass		5.8
System Passes per Hauler		4.31
Hauler Payload (Tons)		25.01
% of Max GVW		100
Hauler Volume (LCY)		31.25
% of Body Fill		101
Loader Cycle Time (min)		0.4
First Bucket Dump (min)		0.05
Hauler Exchange Time (min)		0.7

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	91.12	%
Schedule Period	Year	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	87.87	%
Production per Sched Hr	427.29	BCY
Total Production	171,712	BCY
Sched Hrs Required	401.87	
Total Cost ($)	197,434	
Cost per BCY ($)	1.15	
Production per Year	854,576	BCY
Years Required	0.2	

Theoretical Production

	Quantity	Model	BCY per Hour	Cycles per Hour
1	1	385C LME	553	
2	5	769C	759	7

Actual Production

	Quantity	Model	Cycles per Hou	Payload in Tons	Tons per Hour
1	5	769C	4.93	25.01	616.1
Fleet Tons per Operating Hour					616.1
x 91.12% Operator Efficiency =					561.41
x 87.87% Fleet Availability =					493.3

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	362	69,688	0.406
Haulers:	5	769C	C202	70.64	1,808	127,745	0.744
Totals	5				1,808	127,745	0.744
Fleet Totals	6				2,170	197,434	1.15

Haul Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY		
Model:	769C	Gross Weight:	122,400 Lbs
Identifier:		Payload:	25.01 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.01	13.32	13.32	0.13	0	0.127
2	4,244	4	2	5.43	25		18.17	18.17	0	2.88	0	2.749

Return Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY		
Model:	769C	Gross Weight:	122,400 Lbs
Identifier:		Payload:	25.01 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0.11	0	0.108
2	4,244	4	2	5.46	25		30.27	25	0	2.14	0	2.03

Phase 2 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Cost Analysis
Pit 13 Subsoil Haul

FLEET
3/24/2013

Fleet Size Annual

Loader:	1 385C LME	Availability 90 %	91 % Operator Efficiency
Haulers:	5 769C	Availability 90 %	2000 Sched Hours per Year
Avg Bunching			

Qty	Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Year	Years Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail*
1	1 769C	112	112	1,532	2.115	363,168	224,104	0.77	100	78	
2	2 769C	216	104	795	1.391	238,873	432,118	0.4	96	75	
3	3 769C	301	85	570	1.21	207,689	602,124	0.29	89	70	
4	4 769C	362	61	475	1.182	203,021	723,511	0.24	80	63	
5	5 769C	427	66	402	1.15	197,434	854,576	0.2	70	55	
6	6 769C	449	22	382	1.235	212,006	898,821	0.19	60	47	
7	7 769C	453	4	379	1.364	234,265	906,618	0.19	52	41	
8	8 769C	454	0	379	1.504	258,175	907,224	0.19	45	36	
9	9 769C	454	0	379	1.644	282,211	907,321	0.19	40	32	
10	10 769C	454	0	378	1.784	306,270	907,336	0.19	36	28	

Fleet Size Efficiency

Loader:	1 385C LME	Availability 90 %	91 % Operator Efficiency
Haulers:	5 769C	Availability 90 %	2000 Sched Hours per Year
Avg Bunching			

Qty	Fleet Match		Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched	$ per BCY	Normal TMPHFront*	Normal TMPHRear*
1	1	0.27	81	100	100	100	152	112	112	2.115	100	78
2	2	0.55	81	100	96.41	96.41	304	216	104	1.391	96	75
3	3	0.82	81	100	89.56	89.56	455	301	85	1.21	89	70
4	4	1.1	81	91.1	88.6	80.71	607	362	61	1.182	80	63
5	5	1.37	87.87	72.88	96.47	70.3	759	427	66	1.15	70	55
6	6	1.65	89.59	60.73	99.52	60.44	911	449	22	1.235	60	47
7	7	1.92	89.93	52.06	100	52.06	1,063	453	4	1.364	52	41
8	8	2.2	89.99	45.55	100	45.55	1,214	454	0	1.504	45	36
9	9	2.47	90	40.49	100	40.49	1,366	454	0	1.644	40	32
10	10	2.74	90	36.44	100	36.44	1,518	454	0	1.784	36	28

Fleet Production and Cost Analysis

Phase 2 Truck - Shovel	**Pit 23 Subsoil Haul**	**FLEET**
Alton Coal Development,LLC	**Coal Hollow Mine**	**3/25/2023**

Cycle Times

Hauler Cycle Time

	5 769C
Load with Exchange (min)	2.35
Haul (min)	3.11
Dump and Maneuver (min)	1.2
Return (min)	2.31
Potential Cycle Time (min)	8.97
Wait on Slow Hauler (min)	0
Wait to Load (min)	2.78
Additional Bunching (min)	0.56
Wait to Dump (min)	0
TMPH Wait (min)	
Total Cycle Time (min)	12.31
Bunching	Avg
Haul Start mph	0
Haul End mph	0
Return Start mph	0
Return End mph	0

Loader Cycle Time

	5 769C
Loader Model	385C LME
Loader Quantity	1
Bucket Capacity (CY)	7.25
Loader Fill Factor (%)	100
Loose Density (Lbs/LCY)	1,601
Tons per Pass	5.8
System Passes per Hauler	4.31
Hauler Payload (Tons)	25.01
% of Max GVW	100
Hauler Volume (LCY)	31.25
% of Body Fill	101
Loader Cycle Time (min)	0.4
First Bucket Dump (min)	0.05
Hauler Exchange Time (min)	0.7

Fleet Production and Cost Analysis

Phase 2 Truck - Shovel | **Pit 23 Subsoil Haul** | **FLEET**

Alton Coal Development,LLC | **Coal Hollow Mine** | **3/25/2023**

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	91.62	%
Schedule Period	Year	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	87.87	%
Production per Sched Hr	424.96	BCY
Total Production	96,703	BCY
Sched Hrs Required	227.56	
Total Cost ($)	111,798	
Cost per BCY ($)	1.156	
Production per Year	849,912	BCY
Years Required	0.11	

Theoretical Production

	Quantity	Model	BCY per Hour	Cycles per Hour
1	1	385C LME	553	
2	5	769C	725	6.7

Actual Production

	Quantity	Model	Cycles per Hour	Payload in Tons	Tons per Hour
1	5	769C	4.87	25.01	609.39
Fleet Tons per Operating Hour					609.39
x 91.62% Operator Efficiency =					558.35
x 87.87% Fleet Availability =					490.61

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	205	39,462	0.408
Haulers:	5	769C	C202	70.64	1,024	72,337	0.748
Totals	5				1,024	72,337	0.748
Fleet Totals	6				1,229	111,798	1.156

Haul Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY		
Model:	769C	Gross Weight:	122,400 Lbs
Identifier:		Payload:	25.01 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.01	13.32	13.32	0.13	0	0.127
2	4,619	4	2	5.43	25		18.17	18.17	0	3.11	0	2.983

Return Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY		
Model:	769C	Gross Weight:	122,400 Lbs
Identifier:		Payload:	25.01 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0.11	0	0.108
2	4,619	4	2	5.46	25		30.27	25	0	2.31	0	2.201

Phase 2 Truck - Shovel
Alton Coal Development,LLC

Fleet Production and Cost Analysis
Pit 23 Subsoil Haul
Coal Hollow Mine

FLEET
3/25/2023

Fleet Size Annual

Loader: 1 385C LME Availability 90 % 92 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Year
Avg Bunching

Qty		Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Year	Years Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail*
1	1	769C	108	108	899	2.203	213,029	215,158	0.45	104	81	
2	2	769C	209	101	464	1.441	139,382	417,063	0.23	101	79	
3	3	769C	292	83	331	1.247	120,615	583,896	0.17	94	74	
4	4	769C	356	64	272	1.203	116,337	711,060	0.14	86	67	
5	5	769C	425	69	228	1.156	111,798	849,912	0.11	76	59	
6	6	769C	449	24	215	1.236	119,488	898,123	0.11	65	51	
7	7	769C	456	7	212	1.357	131,211	911,593	0.11	57	44	
8	8	769C	456	0	212	1.495	144,603	912,202	0.11	50	39	
9	9	769C	456	0	212	1.635	158,065	912,300	0.11	44	35	
10	10	769C	456	0	212	1.774	171,540	912,314	0.11	40	31	

Fleet Size Efficiency

Loader: 1 385C LME Availability 90 % 92 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Year
Avg Bunching

Qty		Fleet Match	Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront*	Normal TMPHRear*
1	1	0.26	81	100	100	100	145	108	108	2.203	104	81
2	2	0.52	81	100	96.92	96.92	290	209	101	1.441	101	79
3	3	0.79	81	100	90.46	90.46	435	292	83	1.247	94	74
4	4	1.05	81	95.4	86.6	82.62	580	356	64	1.203	86	67
5	5	1.31	87.87	76.32	95.42	72.83	725	425	69	1.156	76	59
6	6	1.57	89.59	63.6	98.9	62.9	870	449	24	1.236	65	51
7	7	1.83	89.93	54.52	100	54.52	1,015	456	7	1.357	57	44
8	8	2.1	89.99	47.7	100	47.7	1,160	456	0	1.495	50	39
9	9	2.36	90	42.4	100	42.4	1,305	456	0	1.635	44	35
10	10	2.62	90	38.16	100	38.16	1,450	456	0	1.774	40	31

Fleet Production and Cost Analysis

Phase 2 Truck - Shovel	**Pit 13 Topsoil Haul**	**FLEET**
Alton Coal Development, LLC	**Coal Hollow Mine**	**3/25/2013**

Cycle Times

Hauler Cycle Time

	5 769C
Load with Exchange (min)	2.35
Haul (min)	2.88
Dump and Maneuver (min)	1.2
Return (min)	2.14
Potential Cycle Time (min)	8.56
Wait on Slow Hauler (min)	0
Wait to Load (min)	3.19
Additional Bunching (min)	0.43
Wait to Dump (min)	0
TMPH Wait (min)	
Total Cycle Time (min)	12.18
Bunching	Avg
Haul Start mph	0
Haul End mph	0
Return Start mph	0
Return End mph	0

Loader Cycle Time

	5 769C
Loader Model	385C LME
Loader Quantity	1
Bucket Capacity (CY)	7.25
Loader Fill Factor (%)	100
Loose Density (Lbs/LCY)	1,601
Tons per Pass	5.8
System Passes per Hauler	4.31
Hauler Payload (Tons)	25.01
% of Max GVW	100
Hauler Volume (LCY)	31.25
% of Body Fill	101
Loader Cycle Time (min)	0.4
First Bucket Dump (min)	0.05
Hauler Exchange Time (min)	0.7

Fleet Production and Cost Analysis

Phase 2 Truck - Shovel | **Pit 13 Topsoil Haul** | **FLEET**

Alton Coal Development, LLC | **Coal Hollow Mine** | **3/25/2013**

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	91.12	%
Schedule Period	Year	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	87.87	%
Production per Sched Hr	427.29	BCY
Total Production	62,413	BCY
Sched Hrs Required	146.07	
Total Cost ($)	71,762	
Cost per BCY ($)	1.15	
Production per Year	854,576	BCY
Years Required	0.07	

Theoretical Production

	Quantity	Model	BCY per Hour	Cycles per Hour
1	1	385C LME	553	
2	5	769C	759	7

Actual Production

	Quantity	Model	Cycles per Hour	Payload in Tons	Tons per Hour
1	5	769C	4.93	25.01	616.1
Fleet Tons per Operating Hour					616.1
x 91.12% Operator Efficiency =					561.41
x 87.87% Fleet Availability =					493.3

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	131	25,330	0.406
Haulers:	5	769C	C202	70.64	657	46,432	0.744
Totals	5				657	46,432	0.744
Fleet Totals	6				789	71,762	1.15

Haul Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY			
Model:	769C	Gross Weight:	122,400	Lbs
Identifier:		Payload:	25.01	Tons
Tire Type:	E3 28P	Propulsion Correction:	1	
Tire Size:	18.00-33	Retarding Correction:	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.01	13.32	13.32	0.13	0	0.127
2	4,244	4	2	5.43	25		18.17	18.17	0	2.88	0	2.749

Return Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY			
Model:	769C	Gross Weight:	122,400	Lbs
Identifier:		Payload:	25.01	Tons
Tire Type:	E3 28P	Propulsion Correction:	1	
Tire Size:	18.00-33	Retarding Correction:	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0.11	0	0.108
2	4,244	4	2	5.46	25		30.27	25	0	2.14	0	2.03

Fleet Production and Cost Analysis
Pit 13 Topsoil Haul
Coal Hollow Mine

Fleet Size Annual

Loader: 1 385C LME Availability 90 % 91 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Year
Avg Bunching

	Qty	Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Year	Years Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail*
1	1	769C	112	112	557	2.115	132,002	224,104	0.28	100	78	
2	2	769C	216	104	289	1.391	86,824	432,118	0.14	96	75	
3	3	769C	301	85	207	1.21	75,490	602,124	0.1	89	70	
4	4	769C	362	61	173	1.182	73,793	723,511	0.09	80	63	
5	5	769C	427	66	146	1.15	71,762	854,576	0.07	70	55	
6	6	769C	449	22	139	1.235	77,059	898,821	0.07	60	47	
7	7	769C	453	4	138	1.364	85,149	906,618	0.07	52	41	
8	8	769C	454	0	138	1.504	93,840	907,224	0.07	45	36	
9	9	769C	454	0	138	1.644	102,576	907,321	0.07	40	32	
10	10	769C	454	0	138	1.784	111,321	907,336	0.07	36	28	

Fleet Size Efficiency

Loader: 1 385C LME Availability 90 % 91 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Year
Avg Bunching

	Qty	Fleet Match		Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront*	Normal TMPHRear*
1	1		0.27	81	100	100	100	152	112	112	2.115	100	78
2	2		0.55	81	100	96.41	96.41	304	216	104	1.391	96	75
3	3		0.82	81	100	89.56	89.56	455	301	85	1.21	89	70
4	4		1.1	81	91.1	88.6	80.71	607	362	61	1.182	80	63
5	5		1.37	87.87	72.88	96.47	70.3	759	427	66	1.15	70	55
6	6		1.65	89.59	60.73	99.52	60.44	911	449	22	1.235	60	47
7	7		1.92	89.93	52.06	100	52.06	1,063	453	4	1.364	52	41
8	8		2.2	89.99	45.55	100	45.55	1,214	454	0	1.504	45	36
9	9		2.47	90	40.49	100	40.49	1,366	454	0	1.644	40	32
10	10		2.74	90	36.44	100	36.44	1,518	454	0	1.784	36	28

Cycle Times

Hauler Cycle Time

	5 769C	
Load with Exchange (min)		2.35
Haul (min)		3.11
Dump and Maneuver (min)		1.2
Return (min)		2.31
Potential Cycle Time (min)		8.97
Wait on Slow Hauler (min)		0
Wait to Load (min)		2.78
Additional Bunching (min)		0.56
Wait to Dump (min)		0
TMPH Wait (min)		
Total Cycle Time (min)		12.31
Bunching	Avg	
Haul Start mph		0
Haul End mph		0
Return Start mph		0
Return End mph		0

Loader Cycle Time

	5 769C	
Loader Model	385C LME	
Loader Quantity		1
Bucket Capacity (CY)		7.25
Loader Fill Factor (%)		100
Loose Density (Lbs/LCY)		1,601
Tons per Pass		5.8
System Passes per Hauler		4.31
Hauler Payload (Tons)		25.01
% of Max GVW		100
Hauler Volume (LCY)		31.25
% of Body Fill		101
Loader Cycle Time (min)		0.4
First Bucket Dump (min)		0.05
Hauler Exchange Time (min)		0.7

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	91.62	%
Schedule Period	Year	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	87.87	%
Production per Sched Hr	424.96	BCY
Total Production	19,370	BCY
Sched Hrs Required	45.58	
Total Cost ($)	22,394	
Cost per BCY ($)	1.156	
Production per Year	849,912	BCY
Years Required	0.02	

Theoretical Production

Quantity		Model	BCY per Hour	Cycles per Hour
1	1	385C LME	553	
2	5	769C	725	6.7

Actual Production

Quantity		Model	Cycles per Hour	Payload in Tons	Tons per Hour
1	5	769C	4.87	25.01	609.39
Fleet Tons per Operating Hour					609.39
x 91.62% Operator Efficiency =					558.35
x 87.87% Fleet Availability =					490.61

Cost

	Qty		Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders		1	385C LME		192.68	41	7,904	0.408
Haulers:		5	769C	C202	70.64	205	14,489	0.748
Totals		5				205	14,489	0.748
Fleet Totals		6				246	22,394	1.156

Haul Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY			
Model:	769C	Gross Weight:	122,400	Lbs
Identifier:		Payload:	25.01	Tons
Tire Type:	E3 28P	Propulsion Correction:	1	
Tire Size:	18.00-33	Retarding Correction:	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.01	13.32	13.32	0.13	0	0.127
2	4,619	4	2	5.43	25		18.17	18.17	0	3.11	0	2.983

Return Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY			
Model:	769C	Gross Weight:	122,400	Lbs
Identifier:		Payload:	25.01	Tons
Tire Type:	E3 28P	Propulsion Correction:	1	
Tire Size:	18.00-33	Retarding Correction:	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0.11	0	0.108
2	4,619	4	2	5.46	25		30.27	25	0	2.31	0	2.201

Fleet Size Annual

Loader: 1 385C LME Availability 90 % 92 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Year
Avg Bunching

Qty	Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Year	Years Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail*
1	1 769C	108	108	180	2.203	42,671	215,158	0.09	104	81	
2	2 769C	209	101	93	1.441	27,919	417,063	0.05	101	79	
3	3 769C	292	83	66	1.247	24,160	583,896	0.03	94	74	
4	4 769C	356	64	54	1.203	23,303	711,060	0.03	86	67	
5	5 769C	425	69	46	1.156	22,394	849,912	0.02	76	59	
6	6 769C	449	24	43	1.236	23,934	898,123	0.02	65	51	
7	7 769C	456	7	42	1.357	26,282	911,593	0.02	57	44	
8	8 769C	456	0	42	1.495	28,964	912,202	0.02	50	39	
9	9 769C	456	0	42	1.635	31,661	912,300	0.02	44	35	
10	10 769C	456	0	42	1.774	34,360	912,314	0.02	40	31	

Fleet Size Efficiency

Loader: 1 385C LME Availability 90 % 92 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Year
Avg Bunching

Qty	Fleet Match		Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront*	Normal TMPHRear*
1	1	0.26	81	100	100	100	145	108	108	2.203	104	81
2	2	0.52	81	100	96.92	96.92	290	209	101	1.441	101	79
3	3	0.79	81	100	90.46	90.46	435	292	83	1.247	94	74
4	4	1.05	81	95.4	86.6	82.62	580	356	64	1.203	86	67
5	5	1.31	87.87	76.32	95.42	72.83	725	425	69	1.156	76	59
6	6	1.57	89.59	63.6	98.9	62.9	870	449	24	1.236	65	51
7	7	1.83	89.93	54.52	100	54.52	1,015	456	7	1.357	57	44
8	8	2.1	89.99	47.7	100	47.7	1,160	456	0	1.495	50	39
9	9	2.36	90	42.4	100	42.4	1,305	456	0	1.635	44	35
10	10	2.62	90	38.16	100	38.16	1,450	456	0	1.774	40	31

Phase 3 Mine Reclamation Cost Estimate

Phase 3 Specialized Reclamation Areas

Item	*Unit	Quantity	Unit Cost ($)	Cost	**Cost Data Reference
Pond 2 backfill from embankment	yd^3	160	$2.26	$362	RSMeans Heavy Constr., 31 23 23.17 0020
Pond 2 backfill from excess spoil	yd^3	7,122	$4.75	$33,830	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 2 topsoil	yd^3	860	$4.75	$4,085	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 2 seeding	M.S.F	35	$30.00	$1,050	RS Means Heavy Constr., 32 92 19.14 3700
Pond 2 mulching	M.S.F	35	$46.00	$1,610	RS Means Heavy Constr., 32 91 13.16 0350
Pond 2 Subtotal				**$40,936**	
Pond 3 backfill from embankment	yd^3	4,767	$2.26	$10,773	RSMeans Heavy Constr., 31 23 23.17 0020
Pond 3 backfill from excess spoil pile	yd^3	6,107	$4.75	$29,008	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 3 topsoil	yd^3	3,011	$4.75	$14,302	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 3 seeding	M.S.F	122	$30.00	$3,660	RS Means Heavy Constr., 32 92 19.14 3700
Pond 3 mulching	M.S.F	122	$46.00	$5,612	RS Means Heavy Constr., 32 91 13.16 0350
Pond 3 Subtotal				**$63,356**	
Pond 4 backfill from embankment	yd^3	1,410	$2.26	$3,187	RSMeans Heavy Constr., 31 23 23.17 0020
Pond 4 backfill from excess spoil pile	yd^3	14,692	$4.75	$69,787	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 4 topsoil	yd^3	2,055	$4.75	$9,763	RSMeans Heavy Constr., 31 23 23.20 3014 & 31 23 16.42 1300 & 31 23 23.17 0020
Pond 4 seeding	M.S.F	188	$30.00	$5,640	RS Means Heavy Constr., 32 92 19.14 3700
Pond 4 mulching	M.S.F	142	$46.00	$6,532	RS Means Heavy Constr., 32 91 13.16 0350
Pond 4 Subtotal				**$94,908**	
Phase 3 Specialized Reclamation Areas Total				**$199,200**	

Phase 3 Mine Reclamation Cost Estimate

Phase 3 Pit Backfill and Land Reclamation

Item	*Unit	Quantity	Unit Cost ($)	Cost	**Cost Data Reference
Pit Backfill Rehandle Excess Spoil Pile - Excavator	yd^3 (Loose)	3,300,000	$0.80	$2,637,519	Production from Fleet Production and Cost Analysis Software, Cost data from CostMine Coal Cost Guide 2012
Topsoil	yd^3 (Loose)	189,582	$1.38	$261,752	Production from Fleet Production and Cost Analysis Software, Cost data from CostMine Coal Cost Guide 2012
Subsoil	yd^3 (Loose)	211,458	$1.38	$291,956	Production from Fleet Production and Cost Analysis Software, Cost data from CostMine Coal Cost Guide 2012
Seeding	M.S.F	6,229	$30.00	$186,872	RS Means Heavy Constr., 32 92 19.14 3700
Mulching	M.S.F	6,229	$46.00	$286,538	RS Means Heavy Constr., 32 91 13.16 0350
Subtotal				$3,664,637	
Mobilization/Demobolization (5%)				$183,232	
Project Management/Engineering (6.8%)				$249,195	
Contractor Profit/Overhead (15%)				$549,696	
Phase 3 Mine Reclamation Total				$4,646,759	

Phase 3 Reclamation Bond Summary

Facilities Reclamation	$1,395,235
Specialized Areas Reclamation	$199,200
Mine Reclamation	$4,646,759
Phase 3 Overall Bond Total	$6,241,195
Phase 3 Overall Bond Total Escalated for 2017	$6,624,177

Phase 3 Mine Reclamation Material Handling Summary

Equipment Description	Production Rate (BCY)	Production Rate (LCY)	Cost/BCY	Cost/LCY	Total Volume (BCY)	Total Volume (LCY)	Total Cost
Rehandle with Truck/Shovel	589	783.4	$1.06	$0.80	2,481,203	3,300,000	$2,637,519
Topsoil	368.0	453.4	$1.70	$1.38	153,881	189,582	$261,752
Subsoil	368.0	453.4	$1.70	$1.38	171,917	211,458	$291,956
Total Phase 3 Material Handling							$3,191,227

Rehandle with Truck/Shovel Quantity	3,300,000	Loose Cubic Yards
Total Rehandle Quantity	3,300,000	Loose Cubic Yards

Software Overburden Swell Factor	33%
Software Topsoil Swell Factor	23%
Software Subsoil Swell Factor	23%

Topsoil Area	143	acres
Subsoil Area (Open Pit)	32	acres

Equipment Cost Data (Cost Mine 2012 Coal Cost Guide/2012 Mine and Mill Equipment Costs)

Equipment Description	$/hr
7 yd. Excavator	$155.23
26 Ton Haul Truck	$33.02
5,000 Gal. Water Truck	$38.04
14 Grader	$52.76
D10 Dozer	$112.12
D7 Dozer	$50.21
13 yd. Excavator	$281.71
40 Ton Haul Truck	$57.87

Manpower Type	$/hr (46% burden)
Excavator Operator	$37.45
Truck Drivers	$37.62
Heavy Equipment Operators	$36.31
Utility Operators	$38.12

Fleet Production and Analysis

Phase 3 Truck - Shovel | **Backfill Remaining Pit** | **FLEET**

Alton Coal Development, LLC | **Coal Hollow Mine** | **3/25/2013**

Cycle Times

Hauler Cycle Time

	5 769C
Load with Exchange (min)	1:15
Haul (min)	1:22
Dump and Maneuver (min)	1:12
Return (min)	1:04
Potential Cycle Time (min)	4:52
Wait on Slow Hauler (min)	0:00
Wait to Load (min)	1:23
Additional Bunching (min)	0:21
Wait to Dump (min)	0:00
TMPH Wait (min)	0:00
Total Cycle Time (min)	6:36
Bunching	Avg
Haul Start mph	0
Haul End mph	0
Return Start mph	0
Return End mph	0

Loader Cycle Time

	5 769C
Loader Model	385C LME
Loader Quantity	1
Bucket Capacity (CY)	7.25
Loader Fill Factor (%)	100
Loose Density (Lbs/LCY)	2,107
Tons per Pass	7.64
System Passes per Hauler	3
Hauler Payload (Tons)	22.91
% of Max GVW	96.57
Hauler Volume (LCY)	21.75
% of Body Fill	70
Loader Cycle Time (min)	0:15
First Bucket Dump (min)	0:03
Hauler Exchange Time (min)	0:42

Phase 3 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Analysis
Backfill Remaining Pit
Coal Hollow Mine

FLEET
3/25/2013

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	90	%
Schedule Period	Shift	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	87.87	%
Production per Sched Hr	589.07	BCY
Total Production	3,300,000	BCY
Sched Hrs Required	5,602.00	
Total Cost ($)	3,506,574	
Cost per BCY ($)	1.063	
Production per Shift	1,178,150	BCY
Shifts Required	2.8	

Theoretical Production

	Quantity	Model	BCY per Hour	Cycles per Hour
1	1	385C LME	786	
2	5	769C	1,008	12.3

Actual Production

	Quantity	Model	Cycles per Hour	Payload in Tons	Tons per Hour
1	5	769C	9.1	22.91	1,042.11
Fleet Tons per Operating Hour					1,042.11
x 90.00% Operator Efficiency =					937.9
x 87.87% Fleet Availability =					824.12

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	5,042	971,455	0.294
Haulers:	5	769C	C202	70.64	25,209	1,780,765	0.54
Totals	5				25,209	1,780,765	0.54
Support	1	5,000 Gal. Water Truck		62.58	5,042	315,516	0.096
	1	14 Grader		87.04	5,042	438,839	0.133
Totals	2				10,084	754,355	0.229
Fleet Totals	8				40,334	3,506,574	1.063

Phase 3 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Analysis
Backfill Remaining Pit
Coal Hollow Mine

FLEET
3/25/2013

Haul Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY			
Model:	769C	Gross Weight:	118,200	Lbs
Identifier:		Payload:	22.91	Tons
Tire Type:	E3 28P	Propulsion Correction:	1	
Tire Size:	18.00-33	Retarding Correction:	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.9	13.5	13.5	0:08	0	0.125
2	1,880	4	2	5.46	25		19.1	19.1	0	1:22	0	1.235

Return Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY			
Model:	769C	Gross Weight:	118,200	Lbs
Identifier:		Payload:	22.91	Tons
Tire Type:	E3 28P	Propulsion Correction:	1	
Tire Size:	18.00-33	Retarding Correction:	1	
Speed Correction:	1			

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0:06	0	0.108
2	1,880	4	2	5.53	25		30.27	25	0	1:04	0	0.956

Phase 3 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Analysis
Backfill Remaining Pit
Coal Hollow Mine

FLEET
3/25/2013

Fleet Size Annual

Loader:	1 385C LME	Availability 90 %	90 % Operator Efficiency
Haulers:	5 769C	Availability 90 %	2000 Sched Hours per Shift
Avg Bunching			

Qty	Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Shift	Shifts Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail*
1	1 769C	147	147	22,447	2.528	8,342,516	294,020	11.22	77	60	
2	2 769C	286	139	11,549	1.523	5,026,568	571,457	5.77	75	59	
3	3 769C	401	115	8,230	1.244	4,104,985	801,968	4.11	70	55	
4	4 769C	492	91	6,711	1.144	3,774,045	983,472	3.36	65	50	
5	5 769C	589	97	5,602	1.063	3,506,574	1,178,150	2.8	57	45	

Fleet Size Efficiency

Loader:	1 385C LME	Availability 90 %	90 % Operator Efficiency
Haulers:	5 769C	Availability 90 %	2000 Sched Hours per Shift
Avg Bunching			

Qty	Fleet Match		Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront*	Normal TMPHRear*
1	1	0.26	81	100	100	100	202	147	147	2.528	77	60
2	2	0.51	81	100	97.18	97.18	403	286	139	1.523	75	59
3	3	0.77	81	100	90.92	90.92	605	401	115	1.244	70	55
4	4	1.03	81	97.46	85.8	83.62	807	492	91	1.144	65	50
5	5	1.28	87.87	77.97	94.75	73.88	1,008	589	97	1.063	57	45

Fleet Production and Cost Analysis

Phase 3 Truck - Shovel	**Subsoil Haul**	**Fleet**
Alton Coal Development, LLC	**Coal Hollow Mine**	**3/25/2013**

Cycle Times

Hauler Cycle Time

	5 769C
Load with Exchange (min)	1:15
Haul (min)	3:05
Dump and Maneuver (min)	1:12
Return (min)	2:37
Potential Cycle Time (min)	8:09
Wait on Slow Hauler (min)	0:00
Wait to Load (min)	0:00
Additional Bunching (min)	0:49
Wait to Dump (min)	0:00
TMPH Wait (min)	0:00
Total Cycle Time (min)	8:58
Bunching	Avg
Haul Start mph	0
Haul End mph	0
Return Start mph	0
Return End mph	0

Loader Cycle Time

	5 769C
Loader Model	385C LME
Loader Quantity	1
Bucket Capacity (CY)	7.25
Loader Fill Factor (%)	100
Loose Density (Lbs/LCY)	1,601
Tons per Pass	5.8
System Passes per Hauler	3
Hauler Payload (Tons)	17.41
% of Max GVW	87.58
Hauler Volume (LCY)	21.75
% of Body Fill	70
Loader Cycle Time (min)	0:15
First Bucket Dump (min)	0:03
Hauler Exchange Time (min)	0:42

Fleet Production and Cost Analysis

Phase 3 Truck - Shovel | **Subsoil Haul** | **Fleet**

Alton Coal Development, LLC | **Coal Hollow Mine** | **3/25/2013**

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	90	%
Schedule Period	Shift	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	81	%
Production per Sched Hr	367.94	BCY
Total Production	171,917	BCY
Sched Hrs Required	467.25	
Total Cost ($)	292,473	
Cost per BCY ($)	1.701	
Production per Shift	735,873	BCY
Shifts Required	0.23	

Theoretical Production

	Quantity	Model	BCY per	Cycles per
1	1	385C LME	724	
2	5	769C	555	7.4

Actual Production

	Quantity	Model	Cycles per	Payload in	Tons per
1	5	769C	6.69	17.41	582.69
Fleet Tons per Operating Hour					582.69
x 90.00% Operator Efficiency =					524.42
x 81.00% Fleet Availability =					424.78

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	421	81,026	0.471
Haulers:	5	769C	C202	70.64	2,103	148,528	0.864
Totals	5				2,103	148,528	0.864
Support	1	5,000 Gal. Water Truck		62.58	421	26,316	0.153
	1	14 Grader		87.04	421	36,602	0.213
Totals	2				841	62,918	0.366
Fleet Totals	8				3,364	292,473	1.701

Haul Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY		
Model:	769C	Gross Weight:	107,195 Lbs
Identifier:		Payload:	17.41 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel	Segment Time (min)
1	100	4	0	3.62	15		30.27	14.02	14.02	0:07	0	0.121
2	5,300	4	2	5.47	25		21.3	21.3	0	3:05	0	2.961

Return Times

Bank Density: 2309 Lbs per CY	Loose Density: 1601 Lbs per CY		
Model:	769C	Gross Weight:	107,195 Lbs
Identifier:		Payload:	17.41 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0:06	0	0.108
2	5,300	4	2	5.45	25		30.27	25	0	2:37	0	2.51

Phase 3 Truck - Shovel
Alton Coal Development, LLC

Fleet Production and Cost Analysis
Subsoil Haul
Coal Hollow Mine

Fleet
3/25/2013

Fleet Size Annual

Loader: 1 385C LME Availability 90 % 90 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Shift
Avg Bunching

Qty	Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Shift	Shifts Required	Normal TMPHFront*	Normal TMPHRear*	Normal TMPHTrail*
1	1 769C	81	81	2,124	4.592	789,414	161,873	1.06	120	92	
2	2 769C	162	81	1,062	2.689	462,228	323,745	0.53	120	92	
3	3 769C	239	77	719	2.086	358,690	478,140	0.36	118	91	
4	4 769C	306	67	561	1.836	315,648	612,591	0.28	114	87	
5	5 769C	368	62	467	1.701	292,473	735,873	0.23	109	84	

Fleet Size Efficiency

Loader: 1 385C LME Availability 90 % 90 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Shift
Avg Bunching

Qty	Fleet Match		Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront*	Normal TMPHRear*
1	1	0.15	81	100	100	100	111	81	81	4.592	120	92
2	2	0.31	81	100	100	100	222	162	81	2.689	120	92
3	3	0.46	81	100	98.46	98.46	333	239	77	2.086	118	91
4	4	0.61	81	100	94.61	94.61	444	306	67	1.836	114	87
5	5	0.77	81	100	90.92	90.92	555	368	62	1.701	109	84

Phase 3 Truck - Shovel
Alton Coal Development, LLC

Cycle Times

Hauler Cycle Time

	5 769C
Load with Exchange (min)	1:15
Haul (min)	3:24
Dump and Maneuver (min)	1:12
Return (min)	2:37
Potential Cycle Time (min)	8:28
Wait on Slow Hauler (min)	0:00
Wait to Load (min)	0:00
Additional Bunching (min)	0:47
Wait to Dump (min)	0:00
TMPH Wait (min)	0:00
Total Cycle Time (min)	9:14
Bunching	Avg
Haul Start mph	0
Haul End mph	0
Return Start mph	0
Return End mph	0

Loader Cycle Time

	5 769C
Loader Model	385C LME
Loader Quantity	1
Bucket Capacity (CY)	7.25
Loader Fill Factor (%)	100
Loose Density (Lbs/LCY)	2,107
Tons per Pass	7.64
System Passes per Hauler	3
Hauler Payload (Tons)	22.91
% of Max GVW	96.57
Hauler Volume (LCY)	21.75
% of Body Fill	70
Loader Cycle Time (min)	0:15
First Bucket Dump (min)	0:03
Hauler Exchange Time (min)	0:42

Fleet Production

Fleet Estimates

Operating Schedule		
Operator Efficiency	90	%
Schedule Period	Shift	
Scheduled Hours	2,000.00	
Fleet Estimates		
Fleet Availability	81	%
Production per Sched Hr	387.76	BCY
Total Production	3,300,000	BCY
Sched Hrs Required	8,510.52	
Total Cost ($)	5,327,161	
Cost per BCY ($)	1.614	
Production per Shift	775,511	BCY
Shifts Required	4.26	

Theoretical Production

	Quantity	Model	BCY per Hour	Cycles per
1	1	385C LME	786	
2	5	769C	581	7.1

Actual Production

	Quantity	Model	Cycles per	Payload in	Tons per
1	5	769C	6.5	22.91	744.13
Fleet Tons per Operating Hour					744.13
x 90.00% Operator Efficiency =					669.72
x 81.00% Fleet Availability =					542.47

Cost

	Qty	Model	Machine Code	Hourly Cost Each Unit	Operating Hours	Total $	$ per BCY
Loaders	1	385C LME		192.68	7,659	1,475,826	0.447
Haulers:	5	769C	C202	70.64	38,297	2,705,324	0.82
Totals	5				38,297	2,705,324	0.82
Support	1	5,000 Gal. Water Truck		62.58	7,659	479,330	0.145
	1	14 Grader		87.04	7,659	666,680	0.202
Totals	2				15,319	1,146,010	0.347
Fleet Totals	8				61,276	5,327,161	1.614

Haul Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY		
Model:	769C	Gross Weight:	118,200 Lbs
Identifier:		Payload:	22.91 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.61	15		27.9	13.5	13.5	0:08	0	0.125
2	5,300	4	2	5.42	25		19.1	19.1	0	3:24	0	3.27

Return Times

Bank Density: 2798 Lbs per CY	Loose Density: 2107 Lbs per CY		
Model:	769C	Gross Weight:	118,200 Lbs
Identifier:		Payload:	22.91 Tons
Tire Type:	E3 28P	Propulsion Correction:	1
Tire Size:	18.00-33	Retarding Correction:	1
Speed Correction:	1		

	Distance (feet)	Nominal Rolling Resistance (%)	Grade Pct.	Total Effective Grade (%)	mph Limit	Retarding Speed	Potential Speed	Segment Max	End Speed	Cumulative Min	Cumulative Fuel (Gallons)	Segment Time (min)
1	100	4	0	3.52	15		41.34	15	15	0:06	0	0.108
2	5,300	4	2	5.45	25		30.27	25	0	2:37	0	2.51

Fleet Production and Cost Analysis
Pit Topsoiling

Fleet Size Annual

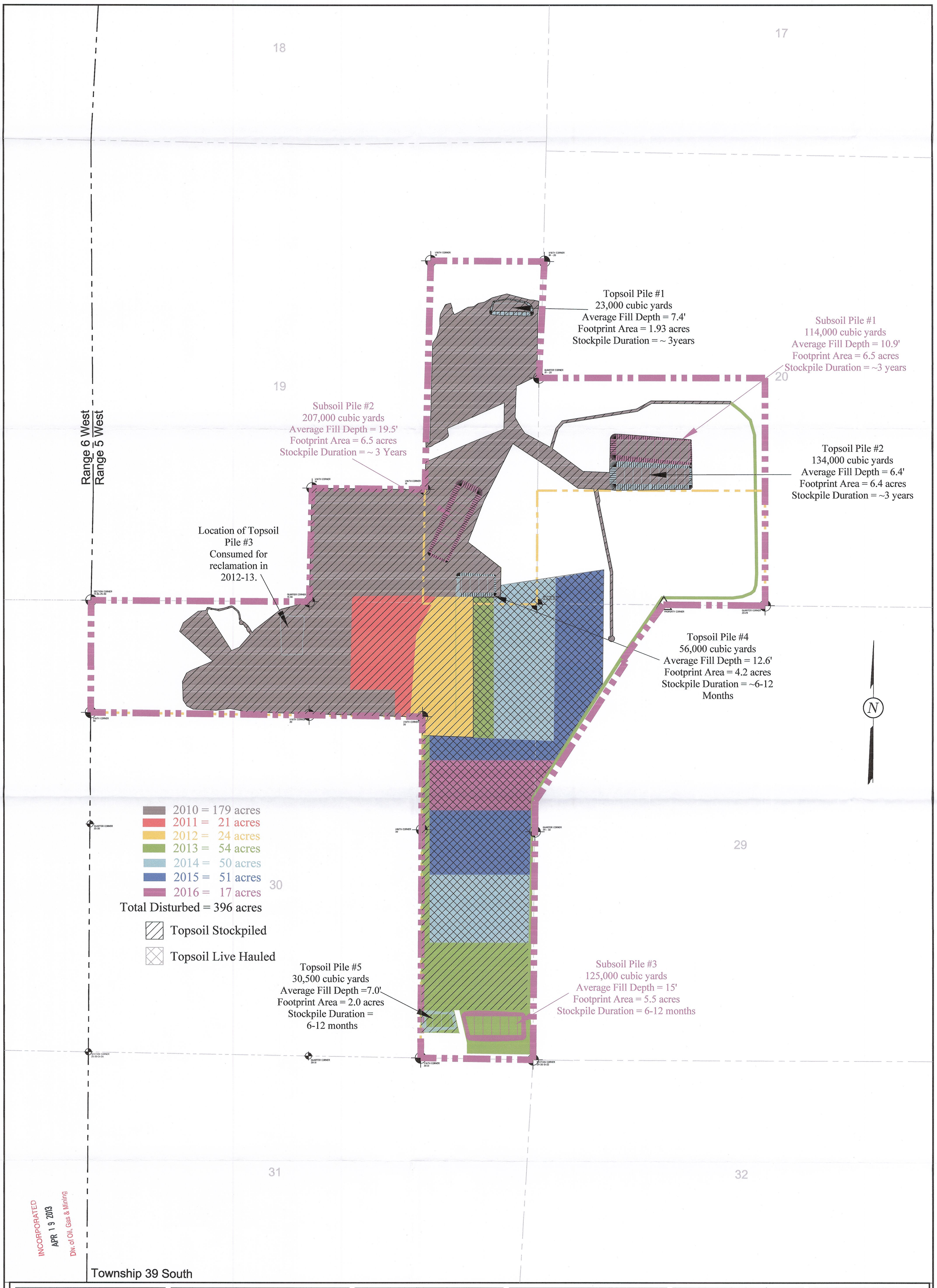
Loader: 1 385C LME Availability 90 % 90 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Shift
Avg Bunching

Qty	Model	BCY per Sched Hr	Inc. BCY per Sched Hr	Sched Hrs Req.	$ per BCY	Total $	BCY per Shift	Shifts Required	Normal TMPHFront *	Normal TMPHRear*	Normal TMPHTrail*
1	1 769C	85	85	38,982	4.39	14,487,668	169,307	19.49	121	95	
2	2 769C	169	85	19,491	2.571	8,483,008	338,614	9.75	121	95	
3	3 769C	251	82	13,129	1.985	6,548,908	502,689	6.56	120	94	
4	4 769C	322	71	10,246	1.746	5,761,856	644,179	5.12	116	90	
5	5 769C	388	66	8,511	1.614	5,327,161	775,511	4.26	111	87	

Fleet Size Efficiency

Loader: 1 385C LME Availability 90 % 90 % Operator Efficiency
Haulers: 5 769C Availability 90 % 2000 Sched Hours per Shift
Avg Bunching

Qty	Fleet Match	Fleet Avail	Mismatch	Bunching	Combined	BCY per 60 min Hour	BCY per Sched Hr	Inc. BCY per Sched Hr	$ per BCY	Normal TMPHFront *	Normal TMPHRear*
1	1	0.15	81	100	100	100	116	85	85	4.39	121	95
2	2	0.3	81	100	100	100	232	169	85	2.571	121	95
3	3	0.44	81	100	98.97	98.97	348	251	82	1.985	120	94
4	4	0.59	81	100	95.12	95.12	464	322	71	1.746	116	90
5	5	0.74	81	100	91.61	91.61	581	388	66	1.614	111	87



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APR 19 2013
Div. of Oil, Gas & Mining

LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	CHECKED BY:
J. STANSFIELD	LWJ
DRAWING: 2–2	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
1/11/08	CRM
10/27/08	CRM
02/24/11	JKSR
03/28/13	KN

TOPSOIL HANDLING

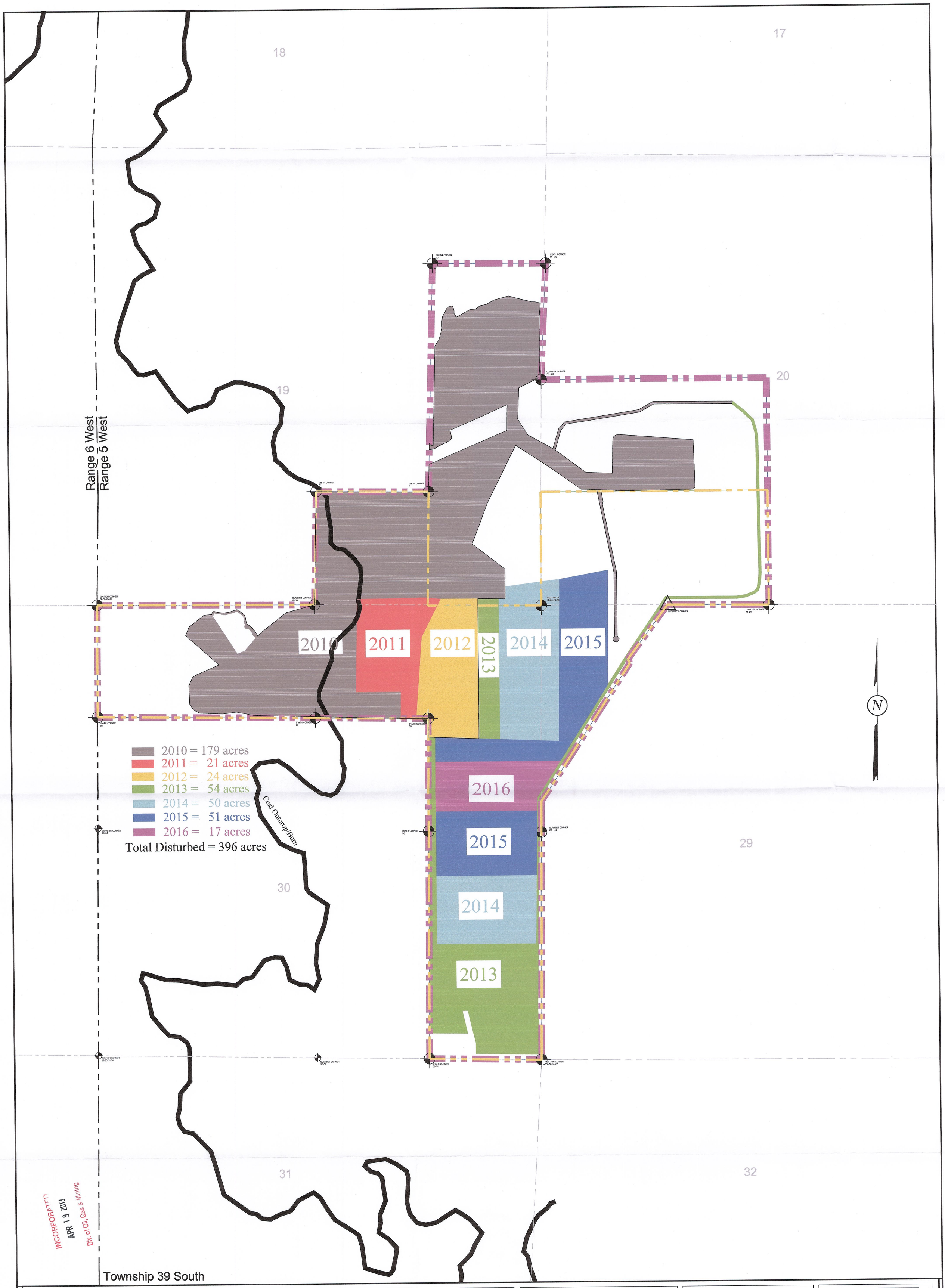
COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 2-2

Registered Professional Engineer
167590
Larry J. Adams
State of Utah
3/31/13

Alton Coal Development
Coal Hollow Project

463 North 100 West, Suite 1
Cedar City, Utah 84720
Phone (435)867-5331
Fax (435)867-1192



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LEGEND:

- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	CHECKED BY:
C. McCOURT	LWJ
DRAWING: 5-2	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
11/16/08	CRM
1/12/13	KN
3/28/13	KN

DISTURBANCE SEQUENCE

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-2

Registered Professional Engineer
167590
LARRY J. ADAMS
State of Utah
3/31/13

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Cedar City, Utah 84721
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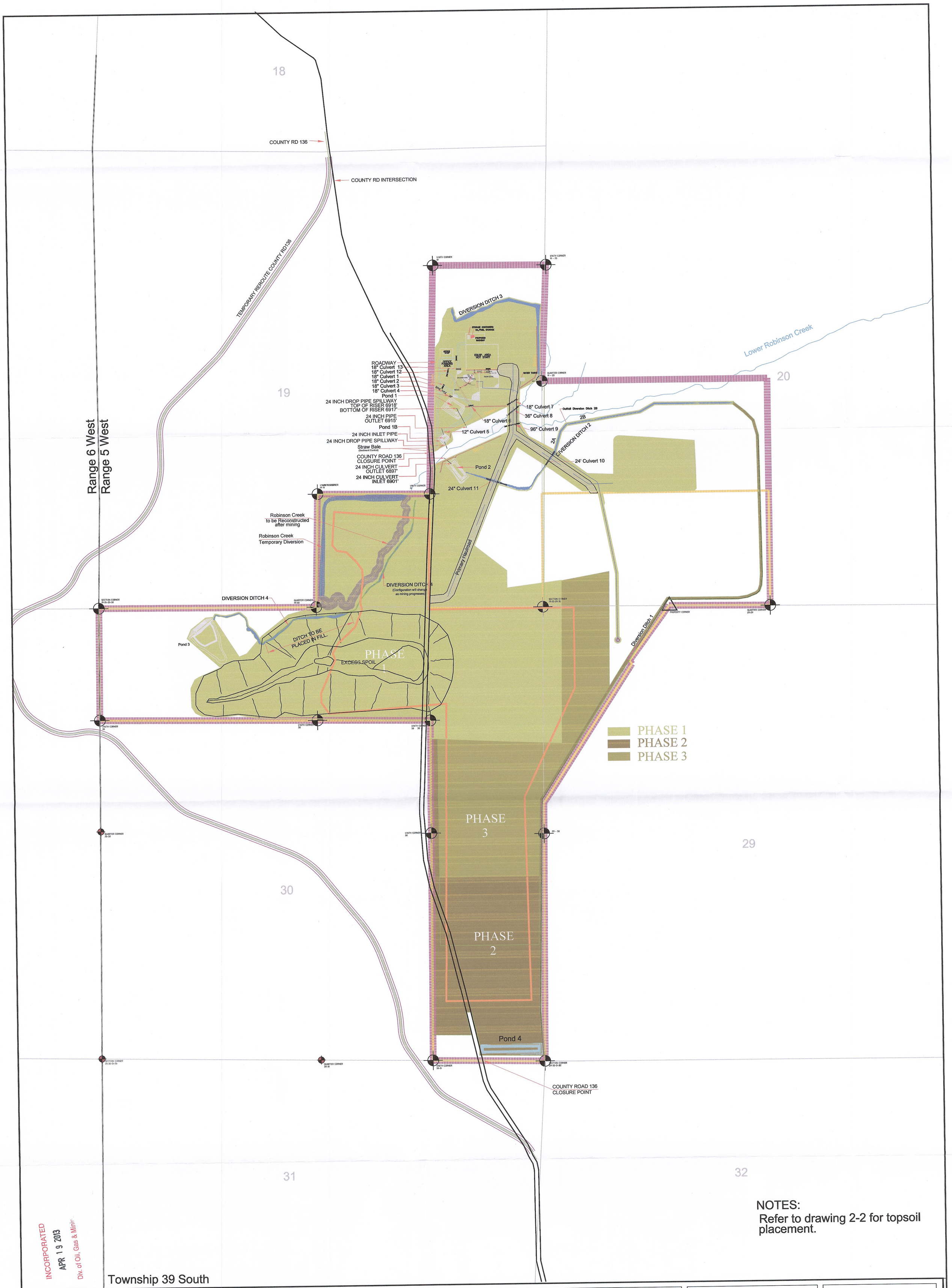

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Div. of Oil, Gas & Minin.

Township 39 South

NOTES:
Refer to drawing 2-2 for topsoil placement.

LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL RECOVERY LINE
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER
- DIVERSION DITCHES
- PROPOSED SEDIMENT IMPOUNDS
- BERM
- CENTERLINE
- WATER LINE
- WATER TANK / WELL

DRAWN BY:	CHECKED BY:
C. McCOURT G. Grossman	LWJ
DRAWING: 5-3	DATE: 11/10/08
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
11/16/08	CRM
6/13/11	KN/JKJR
1/13/13	JKSR KN
3/18/13	KN

FACILITIES & STRUCTURES

LAYOUT

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-3

Registered Professional Engineer
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LARRY J ADAMS
State of Utah
3/31/13

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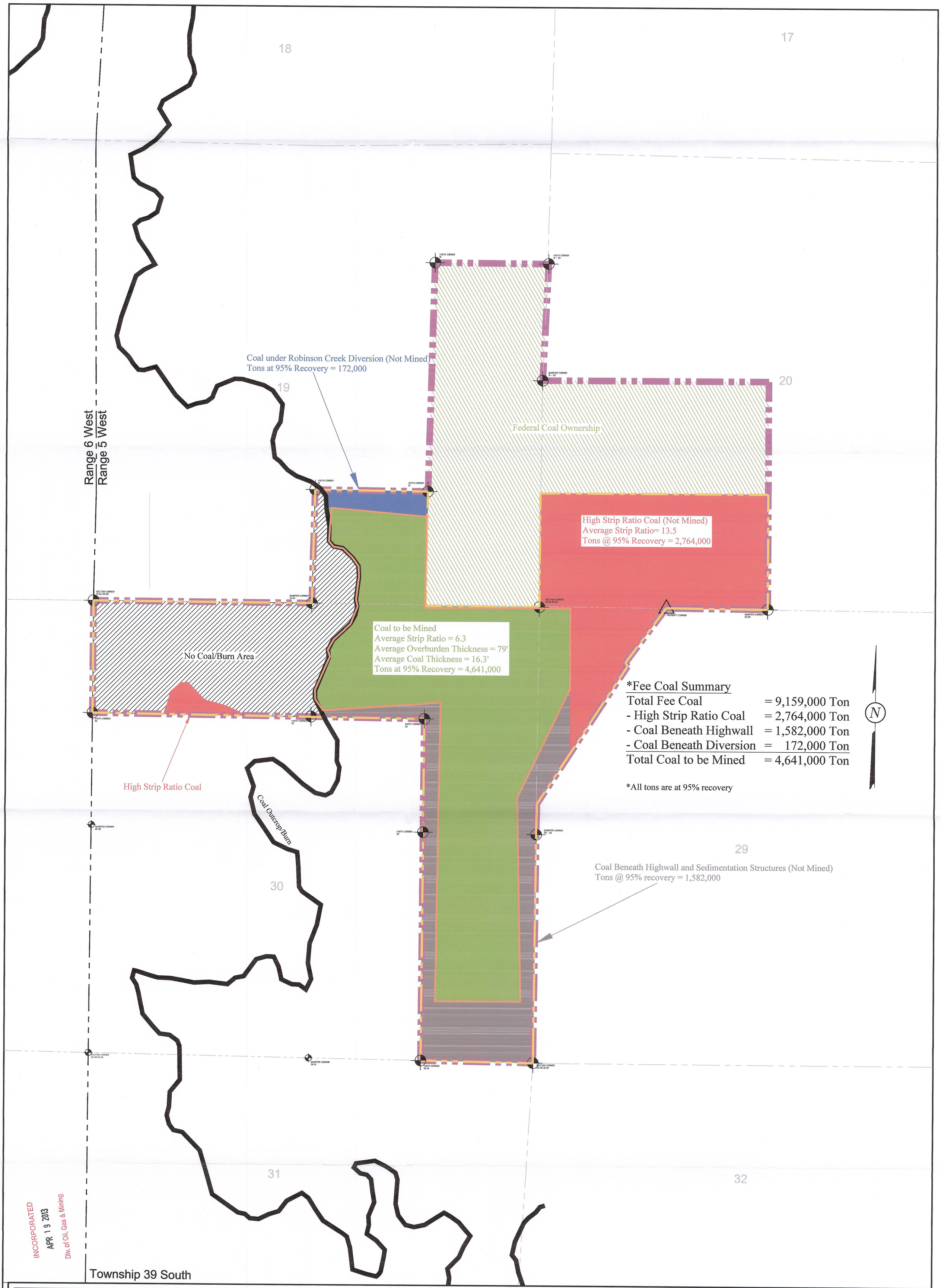

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LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- COAL RECOVERY LINE
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	CHECKED BY:
C. McCOURT	LWJ
DRAWING: 5-9	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
9/16/08	CRM
1/14/13	KN

COAL EXTRACTION OVERVIEW

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-9

Registered Professional Engineer
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3/21/13

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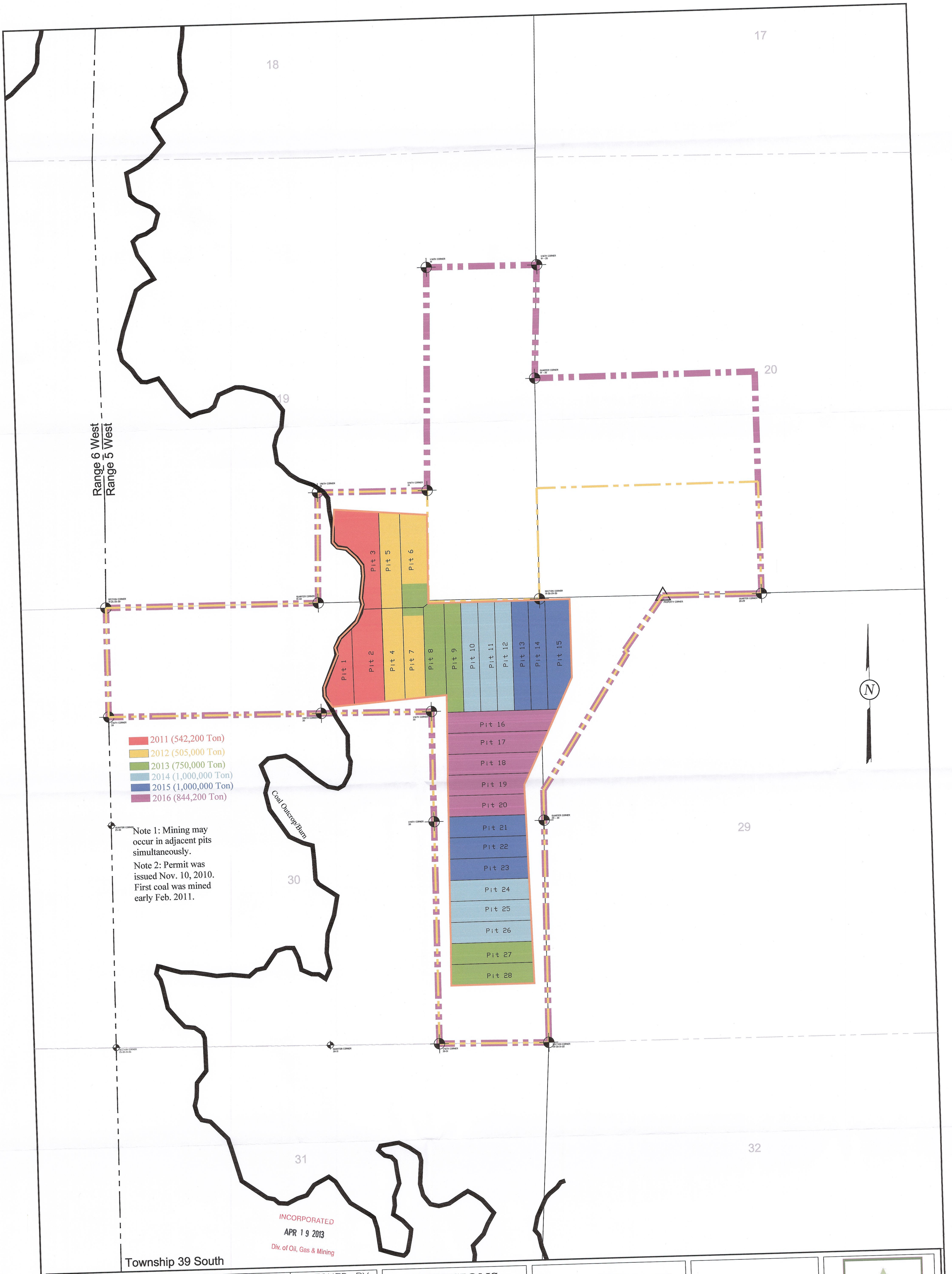

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LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- COAL RECOVERY
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	CHECKED BY:
C. McCOURT	LWJ
DRAWING: 5-10	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
9/16/08	CRM
02/24/11	JKSR
06/28/11	KN
01/16/13	KN
03/18/13	KN

COAL REMOVAL SEQUENCE

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-10

Registered Professional Engineer
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3/31/13

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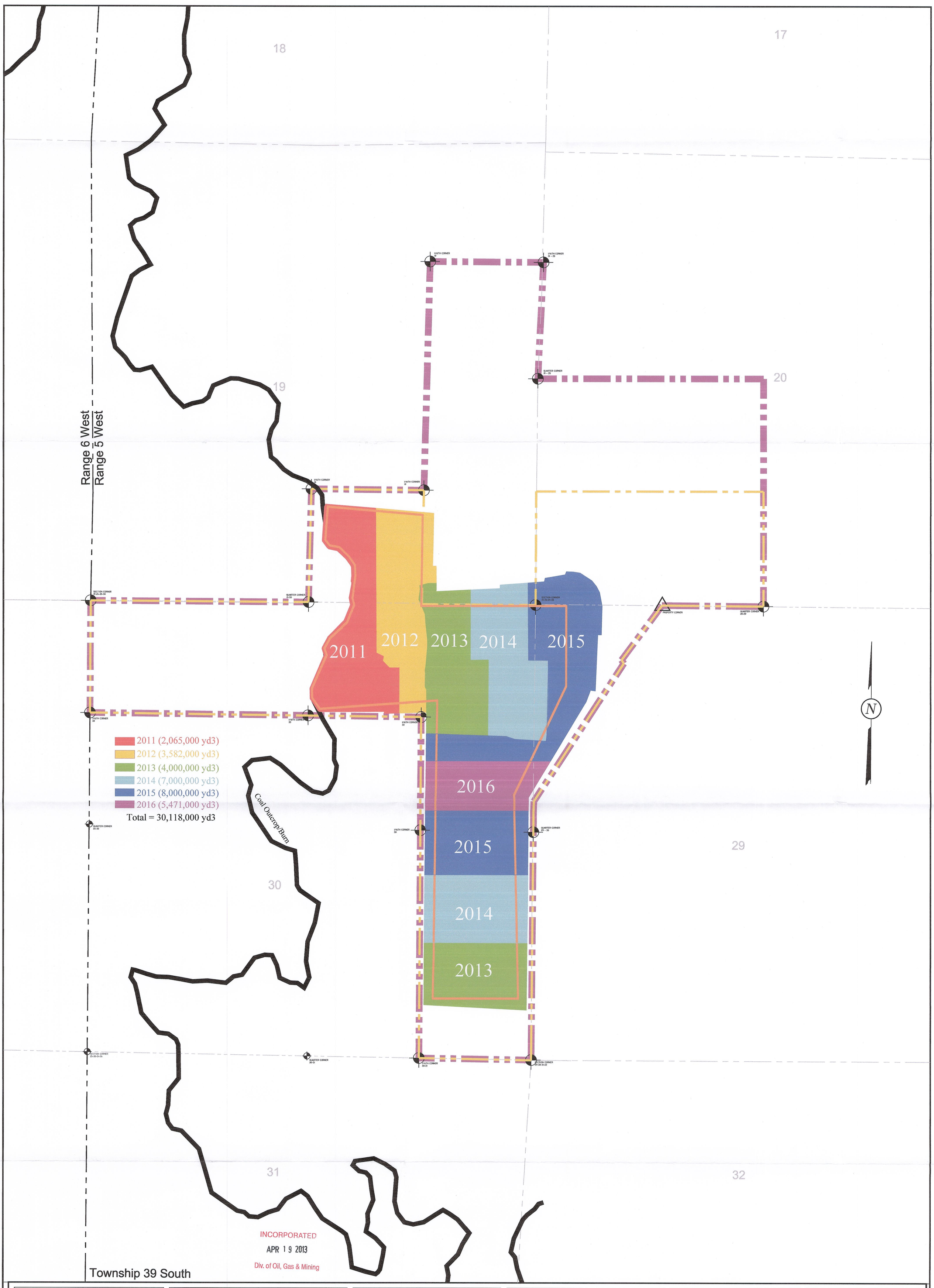

LEGEND:

- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- COAL RECOVERY LINE
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	CHECKED BY:
C. McCOURT	LWJ
DRAWING: 5–16	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
9/16/08	CRM
1/16/13	KN

OVERBURDEN REMOVAL SEQUENCE

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-16

Registered Professional Engineer
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3/31/13

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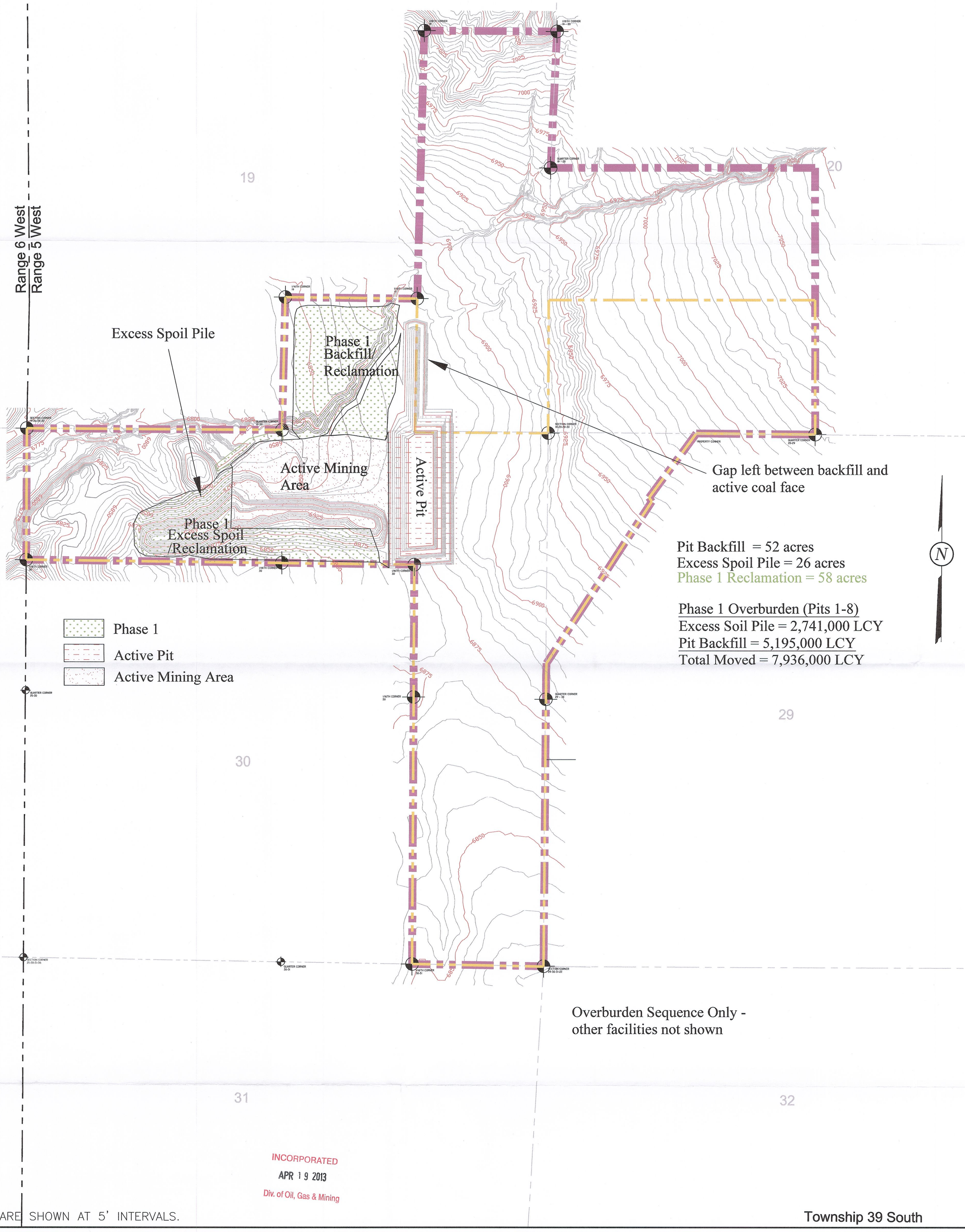

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Div. of Oil, Gas & Mining

CONTOURS ARE SHOWN AT 5' INTERVALS.

LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY: C. McCOURT	CHECKED BY: LWJ
DRAWING: 5-17	DATE: 04/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
11/28/08	CRM
01/21/13	KN
03/16/13	KN

OVERBURDEN REMOVAL PHASE 1

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-17

Registered Professional Engineer
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State of Utah
3/31/13

Alton Coal Development
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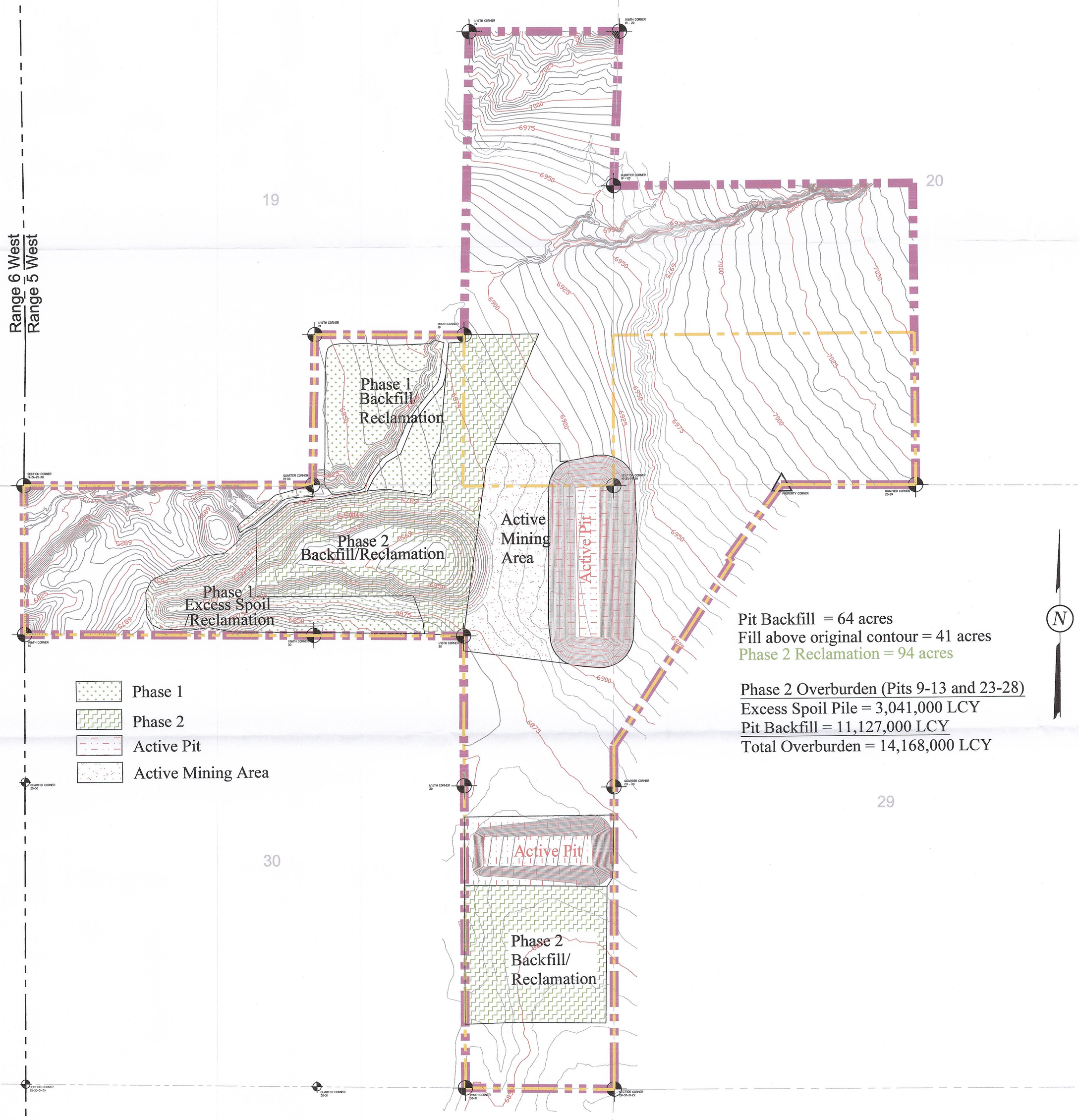

Overburden Sequence Only - other facilities not shown

INCORPORATED
APR 19 2013
Div. of Oil, Gas & Mining

Township 39 South

CONTOURS ARE AT 5' INTERVALS.

LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	CHECKED BY:
C. McCOURT	LWJ
DRAWING: 5-18	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
11/28/08	CRM
01/31/13	KN
03/15/13	KN

OVERBURDEN REMOVAL PHASE 2

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-18

Registered Professional Engineer
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LARRY J ADAMS
State of Utah
3/31/13

Alton Coal Development
Coal Hollow Project

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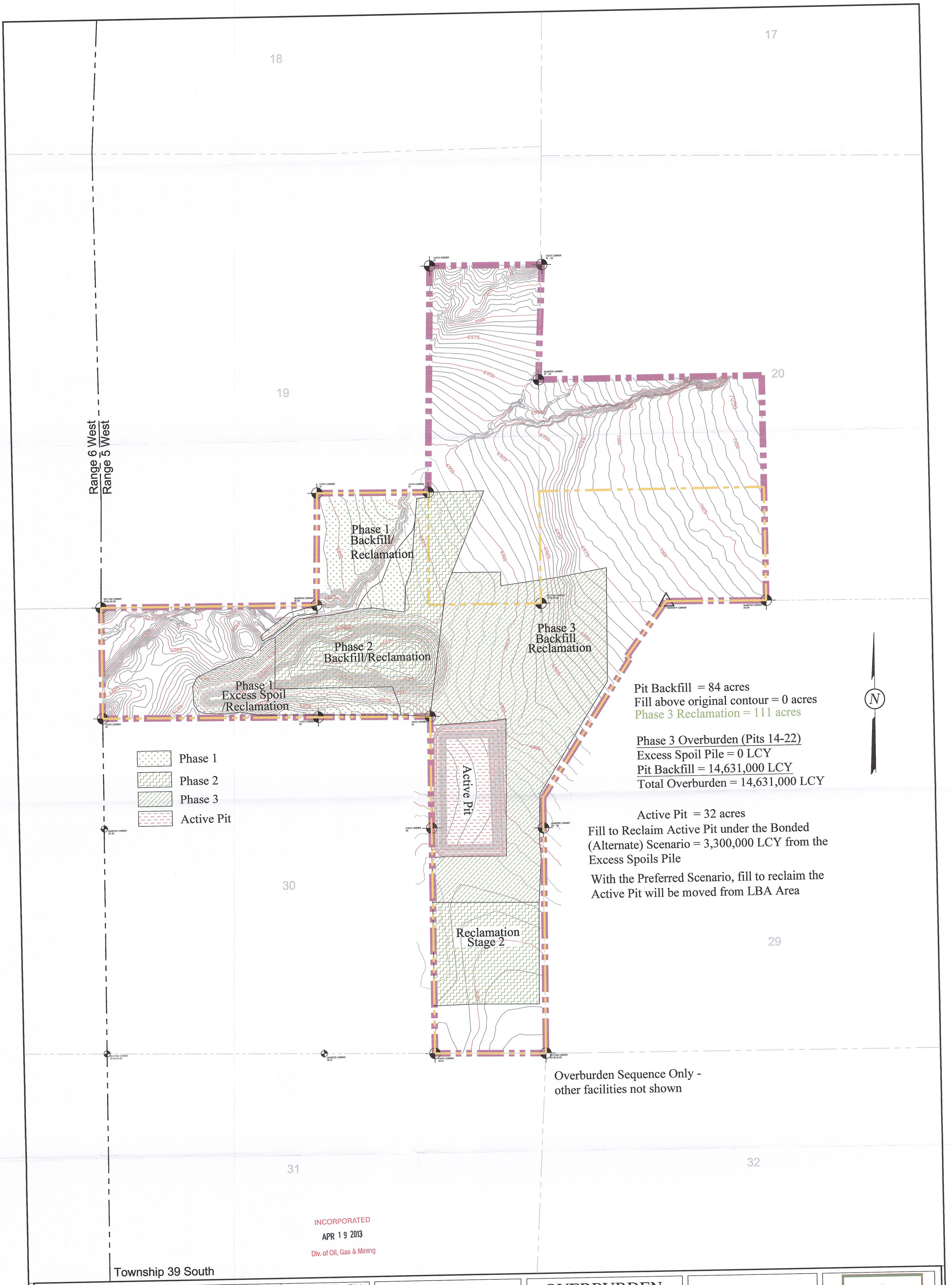
Fax (435)867-1192



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APR 19 2013
Div. of Oil, Gas & Mining

LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- COAL LINE BOUNDARY
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER

DRAWN BY:	CHECKED BY:
C. McCOURT	LWJ
DRAWING: 5-19	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
11/28/08	CRM
01/31/13	KN
03/17/13	KN

OVERBURDEN REMOVAL PHASE 3

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-19

Registered Professional Engineer
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State of Utah
3/31/13

Alton Coal Development
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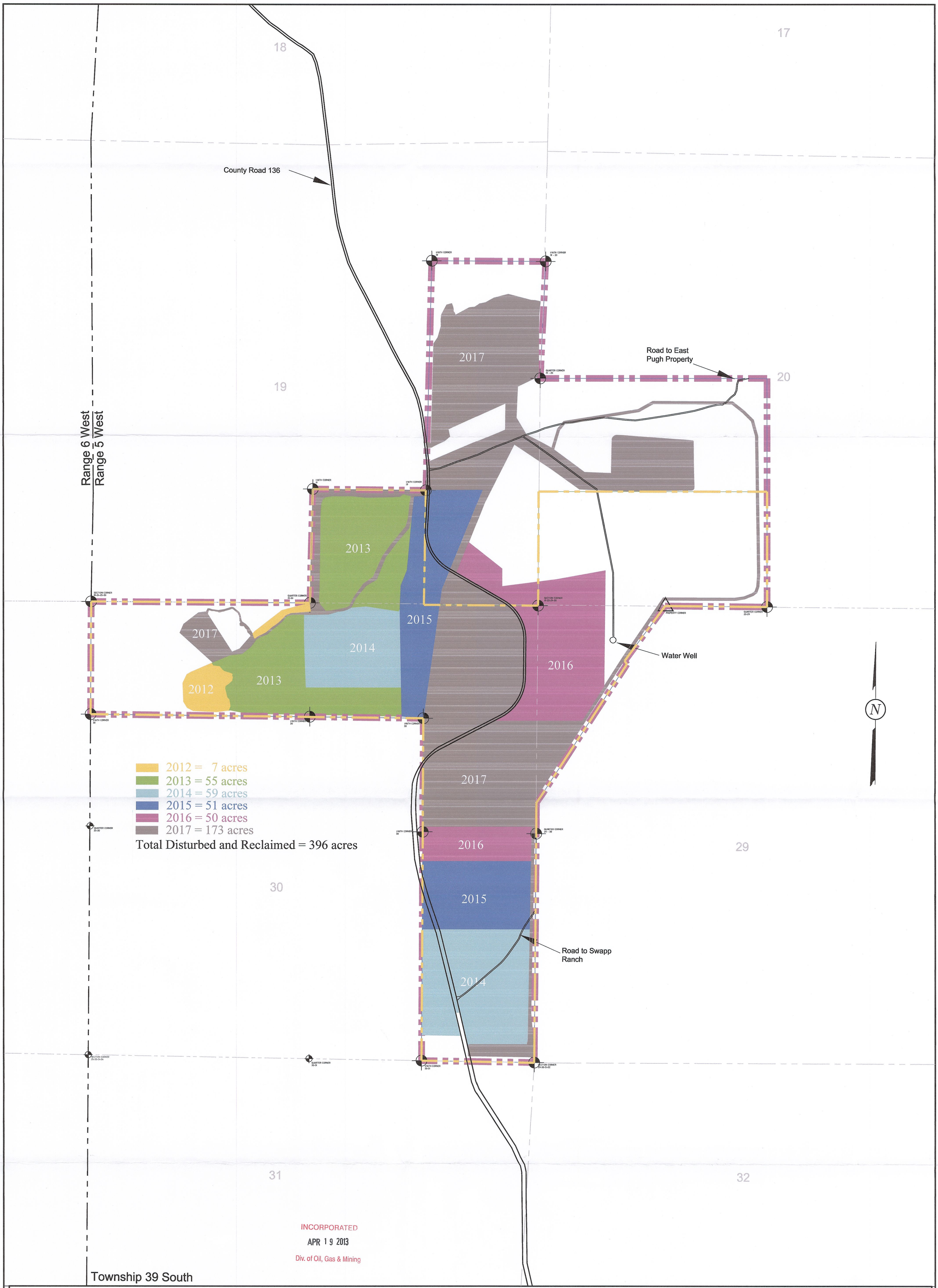
Fax (435)867-1192



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Div. of Oil, Gas & Mining

LEGEND:
- PERMIT BOUNDARY
- PRIVATE COAL OWNERSHIP
- SECTION LINE
- FOUND SECTION CORNER
- FOUND PROPERTY CORNER
- POSTMINING ROADS

DRAWN BY:	CHECKED BY:
C. McCOURT	LWJ
DRAWING: 5—38	DATE: 4/20/07
	SCALE: 1" = 500'
JOB NUMBER: 1400	SHEET

REVISIONS

DATE:	BY:
12/06/08	CRM
07/26/11	KN
01/18/13	KN
03/18/13	KN

RECLAMATION SEQUENCE

COAL HOLLOW PROJECT
ALTON, UTAH

DRAWING: 5-38

Registered Professional Engineer
167590
LARRY J. ADAMS
State of Utah
3/31/13

Alton Coal Development
Coal Hollow Project
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Fax (435)867-1192