

**Office of Surface Mining
Reclamation and Enforcement**

Pittsburgh Field Division



Evaluation Report

Approximate Original Contour

Maryland Regulatory Program

Evaluation Year 2010

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OBJECTIVES

As established in the Evaluation Year 2010 Performance Agreement between MDE and OSM the primary focus of this evaluation was an oversight review of the implementation of Maryland's program requirements for achieving approximate original contour (AOC), where active surface coal mining is taking place. OSM's Directive REG-8, Appendix 1, establishes that OSM and the State should agree on the interpretation of AOC. The review focused on three aspects of Maryland's program:

- 1) AOC interpretation and permitting documentation.
- 2) Processes for on-the-ground AOC verification.
- 3) Field verification that backfilling and grading are following the approved plan.

INE-26, which deals primarily with OSM's oversight of individual sites, remained the controlling directive in terms of violations or other actions concerning site compliance.

SUMMARY

OSM used a series of questions, provided in the **FINDINGS** section of this report, as part of this study. The sample size for each State was 20 percent of all permits with mining or reclamation activity in the previous year, but not more than 5 permits. To the extent practicable, the sample included a representative range of sizes and types of permits and permit revisions. OSM conducted appropriate field verification of AOC on 50 percent (or more) of the permits reviewed. Once these reviews were completed, a draft report was prepared for review and comment according to normal oversight review procedures in Maryland. The OSM Appalachian Regional Director was responsible for guidance and quality control on the evaluation process and the final report. The National AOC Study Team prepared a summary report by combining the results from each Region into an agency report. The overarching question to be answered by this effort was:

- ❖ **Based on the review, does the OSM office find that the State's implementation of its approved program is achieving AOC**

Maryland is effectively achieving AOC at active operations and State administered forfeitures, however several actions could be taken to improve this process. These actions are outlined in the **RECOMMENDATIONS** section of this report.

BACKGROUND

Maryland's regulatory definition of AOC, Code of Maryland Regulations 26.20.01.02, mirrors the federal definition found in SMCRA Section 701(2). The State definition is as follows:

(8)"Approximate original contour" means that surface configuration achieved by backfilling and grading of the affected area that eliminates all highwalls and spoil piles, so that the reclaimed area, including any terracing or access roads, closely resembles the general surface configuration of the land before mining and blends into and complements the drainage pattern of the surrounding terrain, with all highwalls, spoil piles, and coal refuse piles eliminated. Permanent water impoundments may be allowed where the Bureau has determined that these impoundments comply with the Regulatory Program.

Additional requirements for achieving AOC in Maryland are found at COMAR 26.20.28.03, in particular, descriptions of situations where AOC may be achieved, without returning to pre-mining site conditions, as in the case of previously mined areas.

A. Postmining final graded slopes need not be uniform but shall approximate the general nature of the pre-mining topography. These requirements may be modified by the Bureau where the

surface mining activities are re-affecting previously mined lands that have not been restored to these standards, and sufficient spoil is not available to otherwise comply with this chapter. The permittee shall, at a minimum:

- (1) Retain all overburden and spoil on the solid portion of existing or new benches; and*
- (2) Backfill and grade to the most moderate slope possible to eliminate the highwall which does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.5. In all cases the highwall shall be eliminated.*

B. On approval by the Bureau in order to conserve soil moisture, ensure stability, and control erosion on final graded slopes, cut and fill terraces may be allowed. The terraces shall be compatible with the approved postmining land use, and can be appropriate substitutes for construction of lower grades on the reclaimed lands. The terraces shall meet all of the following requirements:

- (1) The width of the individual terrace bench may not exceed 20 feet, unless specifically approved by the Bureau as necessary for stability, erosion control, or roads included in the approved postmining land use plan.*
- (2) The vertical distance between terraces shall be as specified by the Bureau to prevent excessive erosion and to provide long-term stability.*
- (3) The slope of the terrace outslope may not exceed 2:1. Outslopes which exceed 2:1 may be approved, if they have a minimum static safety factor of 1.5, provide adequate control over erosion, and closely resemble the surface configuration of the land before mining. Highwalls may not be left as part of terraces.*

C. Small depressions may be constructed, if they:

- (1) Are approved by the Bureau to minimize erosion, conserve soil moisture, create and enhance wildlife habitat, or promote vegetation;*
- (2) Do not restrict normal access; and*
- (3) Are approved, in writing, by the landowner.*

D. Preparation of final graded surfaces shall be conducted in a manner which minimizes erosion and provides a surface for replacement of topsoil which will minimize slippage.

E. Spoil may be placed on the permit outside the mined-out area in non-steep slope areas to restore the approximate original contour by blending the spoil into the surrounding terrain if the following requirements are met:

- (1) All vegetative and organic material shall be removed from the area;*
- (2) The topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with COMAR 26.20.25.02;*
- (3) The spoil shall be backfilled and graded on the area in accordance with the requirements of this chapter.*

METHODOLOGY

OSM met with The Maryland Department of The Environment (MDE) February 10, 2010 to describe the methodology for this evaluation as well as discuss, in general, MDE's interpretation and implementation of AOC. A questionnaire was provided to MDE at this time, and the State's responses are included in the **FINDINGS** of this report.

OSM interviewed Maryland program staff, to determine if any complaints regarding AOC had been filed over the past three years and the outcome of any complaints. No complaints had been received. The interview also identified Maryland's process for evaluating AOC during the reclamation process, as compared to the approved reclamation plans. OSM also interviewed Maryland's permit manager to determine if variances to AOC are granted (i.e., for re-mining or steep-slope). No variances had recently been issued. Finally, the interview determined whether permit applications include contour maps and/or cross-sections that show pre- and proposed post-mining land form. These documents are included in each permit application.

OSM selected a sample of five sites where backfilling and grading has been completed either over the entire permit area, or a portion of the site (large, medium, small surface mines). The sample population included at least one site where re-mining was occurring. This site also included a pre-existing highwall.

Field verification occurred on three of the five sites selected. The intent of this work was to evaluate the success of reclamation as described in the permit application, and make observations about the effectiveness of the operators' and State's implementation and oversight of the reclamation process to achieve AOC. In particular, elevation measurements were made, using altimeter-enabled Global Positioning System (GPS) receivers, along the surface of cross sections presented in the permit application.

Field verification was conducted by an OSM Technical Support Specialist and OSM Environmental Protection Specialist. OSM notified Maryland's inspection staff of the site visits and they participated in the field verification outings. Using altimeter-enabled Garmin eTrex handheld GPS units, tracks of cross sections, provided in the permit applications, were developed in the office. In the field, the tracks were traversed on foot and latitude, longitude, and altitude data collected. A second GPS unit was placed in a stationary location, in the vicinity of the cross section to be traversed. This unit collected altimeter measurements at regular intervals. The intent of this stationary device was to function as a "base station" to record barometric changes during the traverse interval. The data collected from both instruments was downloaded and the tracks corrected for any barometric change observed during the interval.

Where available, GIS spatial analysis tools were used to evaluate geo-referenced, pre and post mining remote sensing or survey imagery of mine site. The field location of geologic cross-sections, provided in the permit application, was identified using altimeter-enabled Garmin eTrex GPS receivers. In areas that were not in the vicinity of a cross-sections, representative slopes were located where pre-mining slope measurements were reported in the permit application or could be determined from pre-mining contours. Sufficient slope measurements were collected to make a reasonable comparison of pre-and post-mining slopes that were representative of these areas. Pre- and post-mining configurations were also evaluated by comparing watershed size, drainage patterns, and, where appropriate, stream gradients of the reclaimed area to those that existed pre-mining. Any areas of significant variances were noted and comments provided regarding possible reasons these variances exist.

OSM consolidated and reviewed the data collected and draft a report was provided to MDE Staff for comment. OSM summarized the findings of the study in this draft report including answers to the questions in the national guidelines, recommendations, and the results of any discussions with Maryland. Maryland was provided with an opportunity to review and comment on the draft report. OSM considered and addressed each of Maryland's comments in the final report. The review was completed within the schedule provided by the national guidelines.

Field Verification and Document Review

Permit documents only were reviewed for the following two sites:

Permit Information	Number	SM-87-411
	Name	Jenkins Development Co.
	Issued	6/8/1987
	Status	Active
Latitude	642600 N	
Longitude	236100 E	
County	Allegany	
Watershed	Georges Creek	
Nearest Stream	Koontz Run	
Nearest Community	Lonaconing	

The Jenkins Development Site is an active operation.

Permit Information	Number	SM-84-373
	Name	Kirby Energy, Inc.
	Issued	2/27/1984
	Status	Abandoned
Latitude	678000 N	
Longitude	275000 E	
County	Allegany	
Watershed	Georges Creek	
Nearest Stream	Trotters Run	
Nearest Community	Mt. Savage	

The Kirby Energy site is a forfeiture site that is currently being reclaimed by the MDE Abandoned Mine Land Program. This project has been ongoing for roughly 10 years and is nearing completion. At the time of forfeiture approximately 24 acres remained un-reclaimed.

Field verification was completed at the following operations:

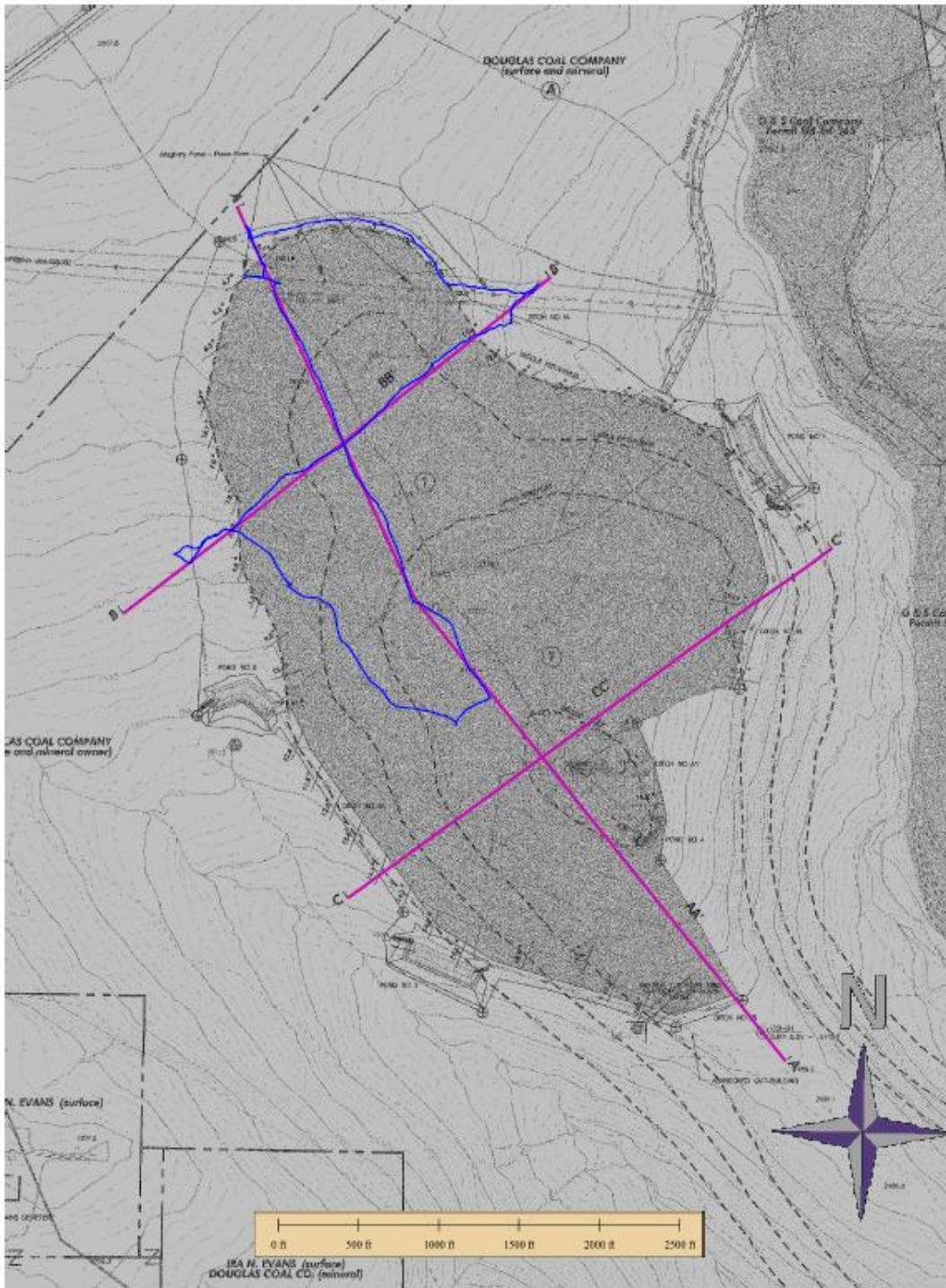
Permit Information	Number	SM-02-443
	Name	Vindex Energy Corp.
	Issued	8/12/2002
	Status	Active
Latitude	590031 N	
Longitude	176816 E	
County	Garrett	
Watershed	Potomac River	
Nearest Stream	Three Forks Run	
Nearest Community	Kitzmilller	

The Vindex Energy site is a relatively large, active mining operation. Permit documents included detailed plans and cross-sections delineating pre-mining and proposed post-mining conditions. OSM evaluation of reclaimed area was completed using the field methods described previously in this report. Field observations indicated that the area had been restored to pre-mining topographic conditions. Vegetation was well established over the majority of the area evaluated. The Forest Reclamation Approach (FRA) had been applied to a portion of the re-claimed area.



Vindex Energy SM-02-443

The following figure depicts the Vindex Energy permit area with the location of the permit cross sections shown in plan view (pink) as well as OSM GPS data collected 4/14/10 (blue). The previous image is of the area in the vicinity of the intersection of cross sections A-A' and B-B' depicted by the figure below.



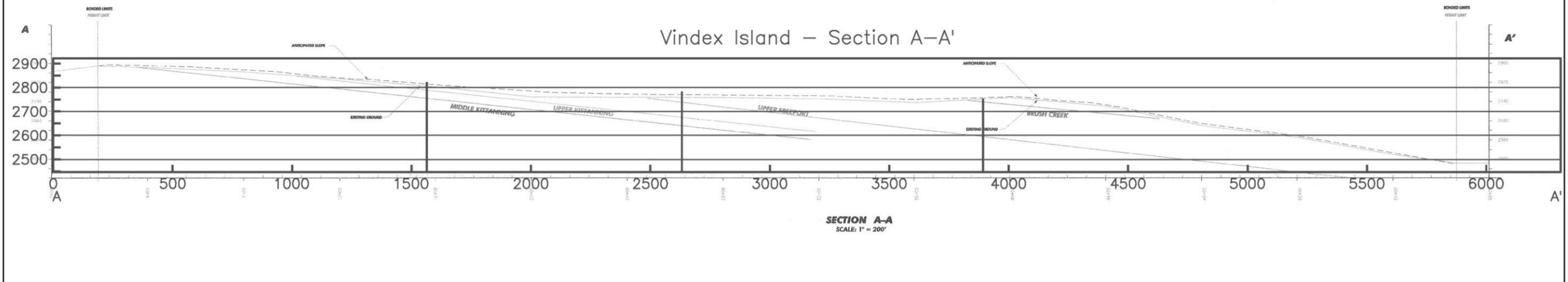
Vindex Energy SM-02-443

The following graphics depict two of the cross sections provided in the permit application (A-A' and B-B') with overlays of available topographic data and OSM collected GPS data. A final composite of all three data sources is also provided, for both cross sections, for comparative purposes. A third cross section was provided in the permit application (C-C') but was not evaluated in the field.

Evaluation of data provided in the permit application and OSM measurements at the Vindex site, indicate the

A - A' cross section is within the margin of error of 20 feet (contour interval of USGS topographic map). The B - B' cross section shows a maximum difference of approximately 60 feet between the OSM GPS measurements and the company provided pre-mining topography. However, LIDAR data overlain by OSM on the pre-mining permit cross section (Page 14) shows a deviation from pre-mining topographic elevations by greater than 20 feet in the same general direction (positive) as indicated from the OSM GPS measurements. In short, it appears the permit cross section "underestimates" the actual pre-mining elevation over the entire cross section B - B'. Furthermore, the discrepancy between OSM's GPS measurements and the permit cross section only occurs along a portion of the B - B' cross section. Considering these factors and the limited amount of data evaluated, the operation can be considered to be achieving AOC. These observations and the variability noted, however, further argue for use of permit maps and cross sections in electronic formats with validation by the State permitting program, using GIS tools, in conjunction with electronic data provided by permit applicants and readily available from other public sources, to more accurately evaluate pre and post-mining topography

Vindex Island – Section A–A'



PERMIT ORIGINAL GRADE

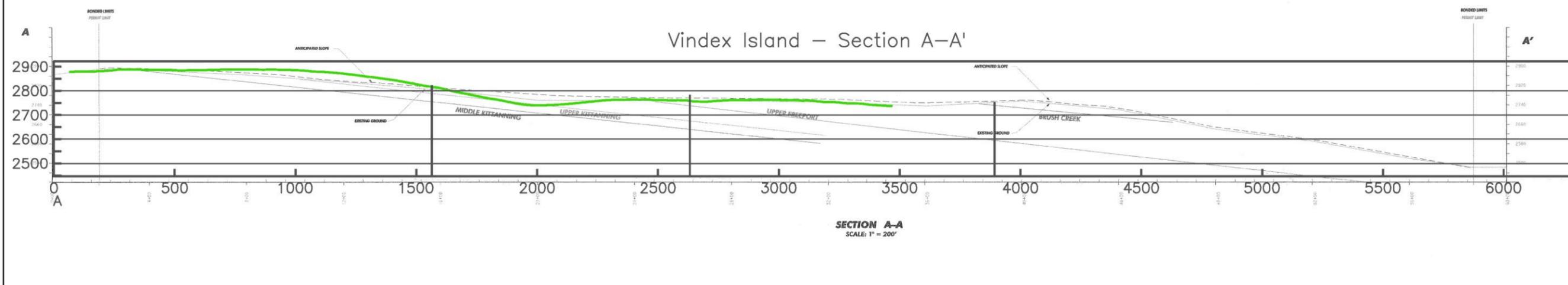
GPS VERIFIED POST-MINING GRADE

APPROXIMATE ORIGINAL CONTOUR
MD VINDEK ENERGY CORPORATION
ISLAND MINE

CROSS SECTION A–A'

A–A' CROSS SECTION FROM PERMIT
WITH PRE AND POST MINING DATA

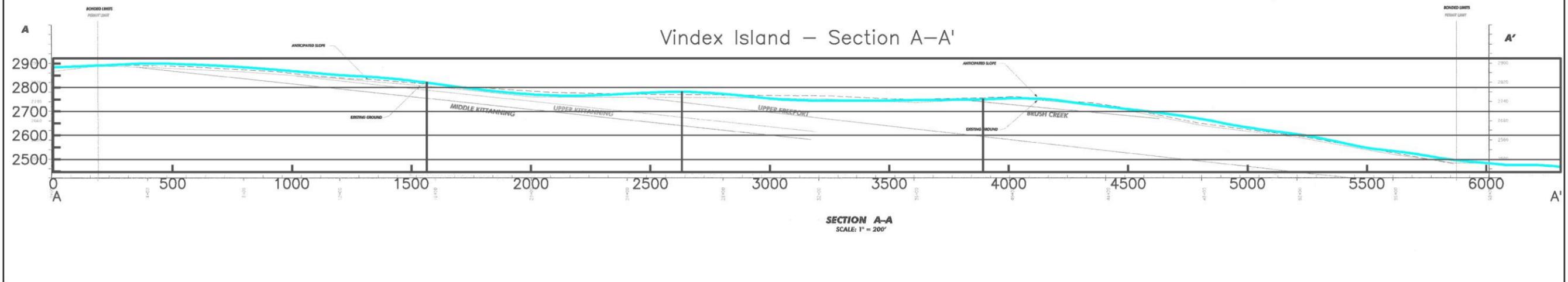
Vindex Island – Section A-A'



PERMIT ORIGINAL GRADE
 GPS VERIFIED POST-MINING GRADE

APPROXIMATE ORIGINAL CONTOUR MD VINDEK ENERGY CORPORATION ISLAND MINE
CROSS SECTION A-A'
A-A' CROSS SECTION FROM PERMIT WITH PRE AND POST MINING DATA

Vindex Island – Section A-A'

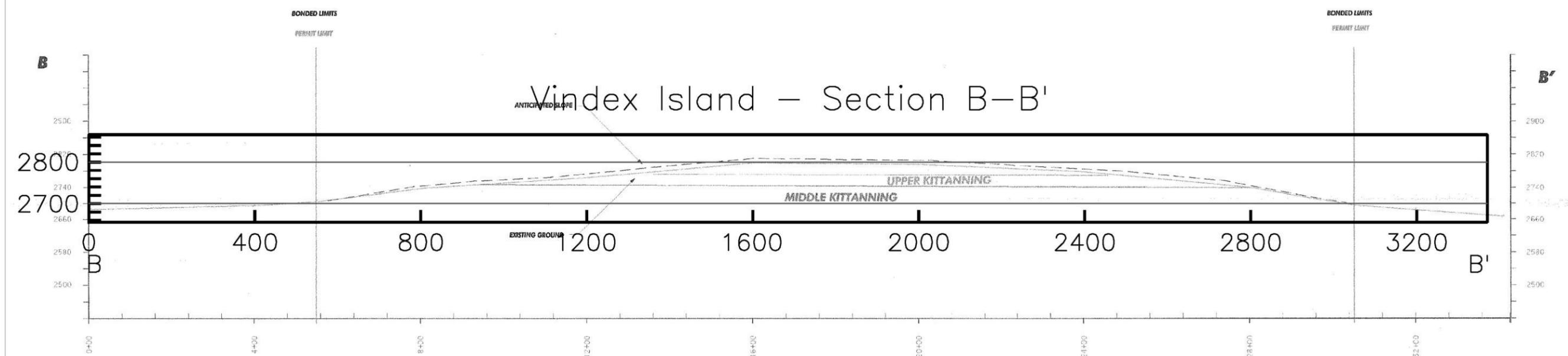


SECTION A-A
SCALE: 1" = 200'



— PERMIT ORIGINAL GRADE
 — GPS VERIFIED POST-MINING GRADE

APPROXIMATE ORIGINAL CONTOUR MD VINDEK ENERGY CORPORATION ISLAND MINE
CROSS SECTION A-A'
A-A' CROSS SECTION FROM PERMIT WITH PRE AND POST MINING DATA



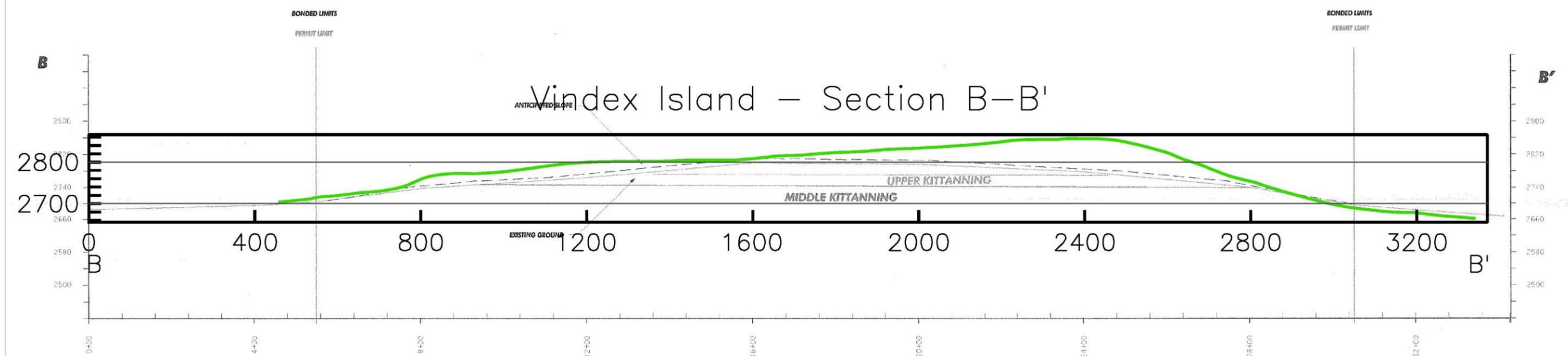
Vindex Island – Section B–B'

SECTION B–B'
SCALE: 1" = 200'



PERMIT ORIGINAL GRADE
GPS VERIFIED POST-MINING GRADE

APPROXIMATE ORIGINAL CONTOUR MD VINDEK ENERGY CORPORATION ISLAND MINE
CROSS SECTION B–B'
B–B' CROSS SECTION FROM PERMIT WITH PRE AND POST MINING DATA

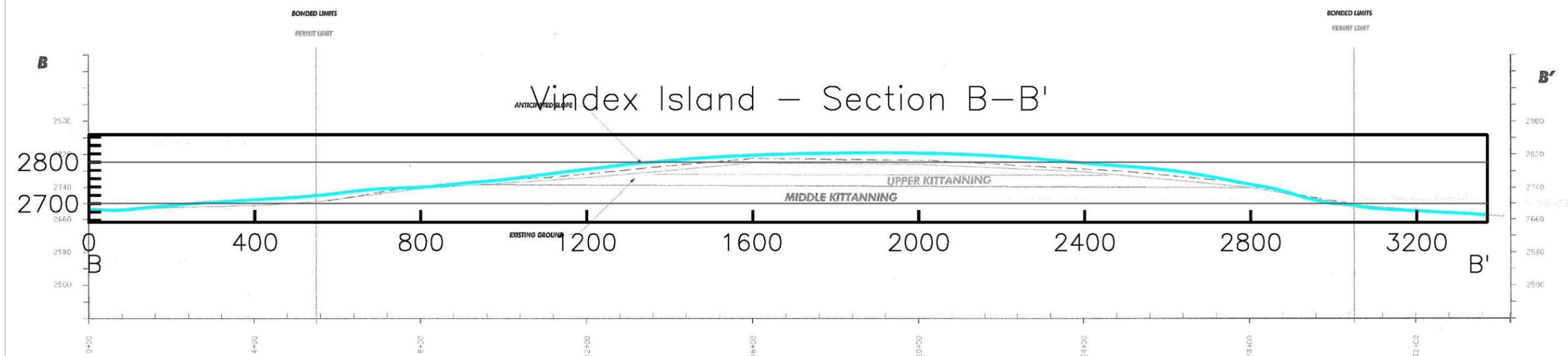


PERMIT ORIGINAL GRADE
 GPS VERIFIED POST-MINING GRADE

APPROXIMATE ORIGINAL CONTOUR
 MD VINDEX ENERGY CORPORATION
 ISLAND MINE

CROSS SECTION B–B'

B–B' CROSS SECTION FROM PERMIT
 WITH PRE AND POST MINING DATA



— PERMIT ORIGINAL GRADE
 — GPS VERIFIED POST-MINING GRADE

APPROXIMATE ORIGINAL CONTOUR MD VINDEK ENERGY CORPORATION ISLAND MINE
CROSS SECTION B–B'
B–B' CROSS SECTION FROM PERMIT WITH PRE AND POST MINING DATA

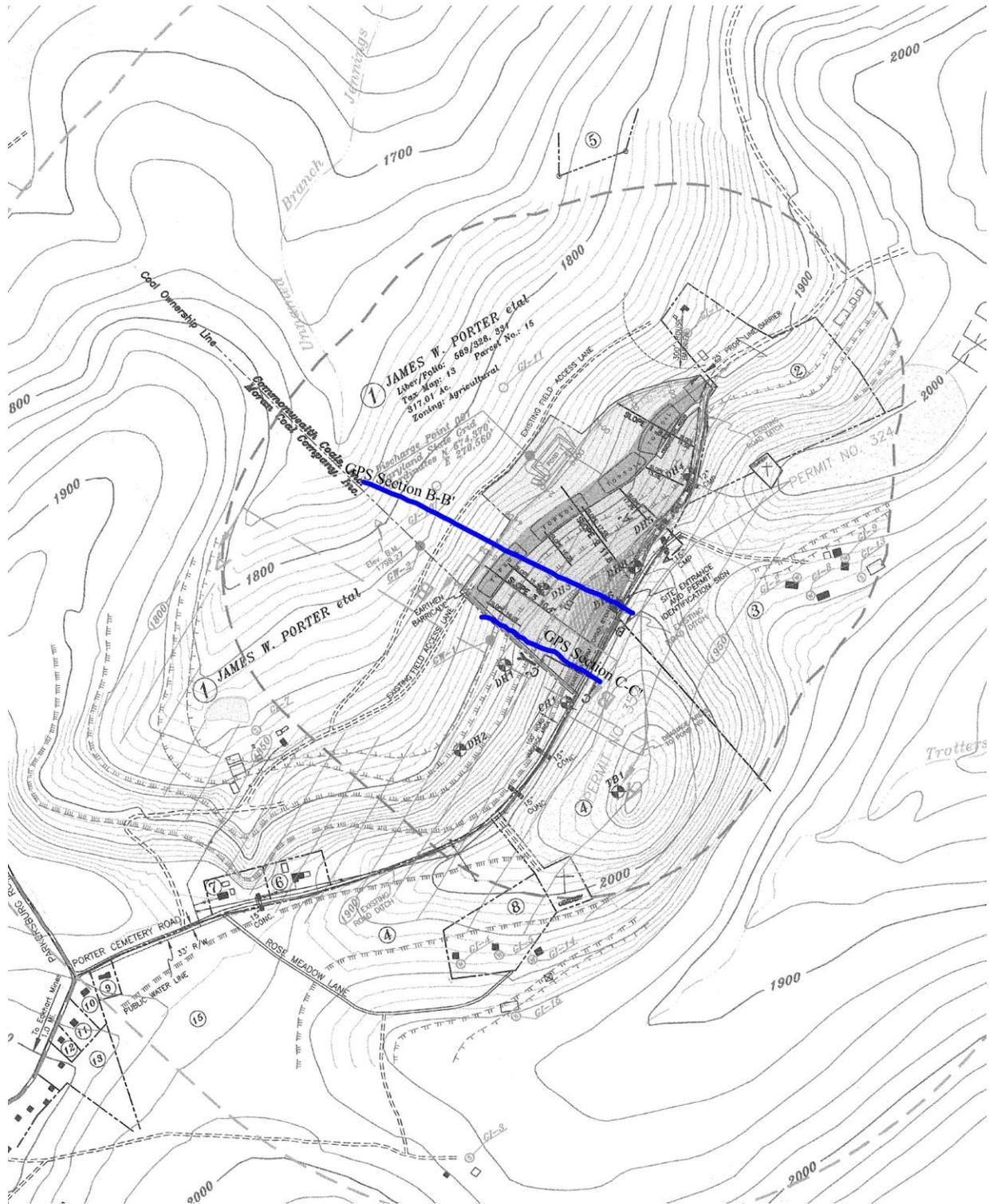
Mountaineer Mining



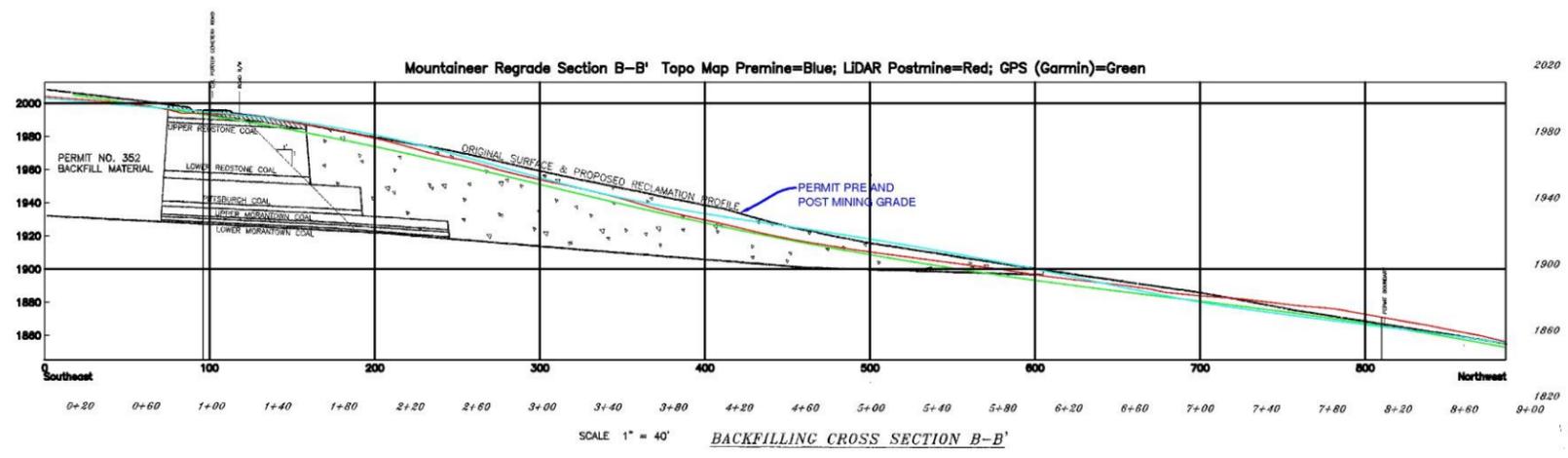
Permit Information	Number	SM-01-438
	Name	Mountaineer Mining
	Issued	8/16/2001
	Status	Completed
Latitude	674050 N	
Longitude	270780 E	
County	Allegany	
Watershed	Georges Creek	
Nearest Stream	Jennings Run	
Nearest Community	Eckhart	

The following figure depicts the Mountaineer Mining permit area with the location of the permit cross sections shown in plan view with OSM GPS data collected 4/14/10 (blue).image. The image above was collected near the southeast end of cross section C-C'.

Mountaineer Plan View with GPS Tracks



The following graphic depicts one of the cross sections provided in the permit application (B-B') with overlays of available topographic data and OSM collected GPS data as noted in the legend.



- TOPO ORIGINAL GRADE
- PERMIT PRE AND POST MINING GRADE
- LIDAR VERIFIED POST MINING GRADE
- GPS VERIFIED POST MINING GRADE

APPROXIMATE ORIGINAL CONTOUR MD MOUNTAINEER MINING #438
CROSS SECTION B-B
TOTAL CROSS SECTION FROM PERMIT WITH LIDAR AND GPS CROSS SECTION

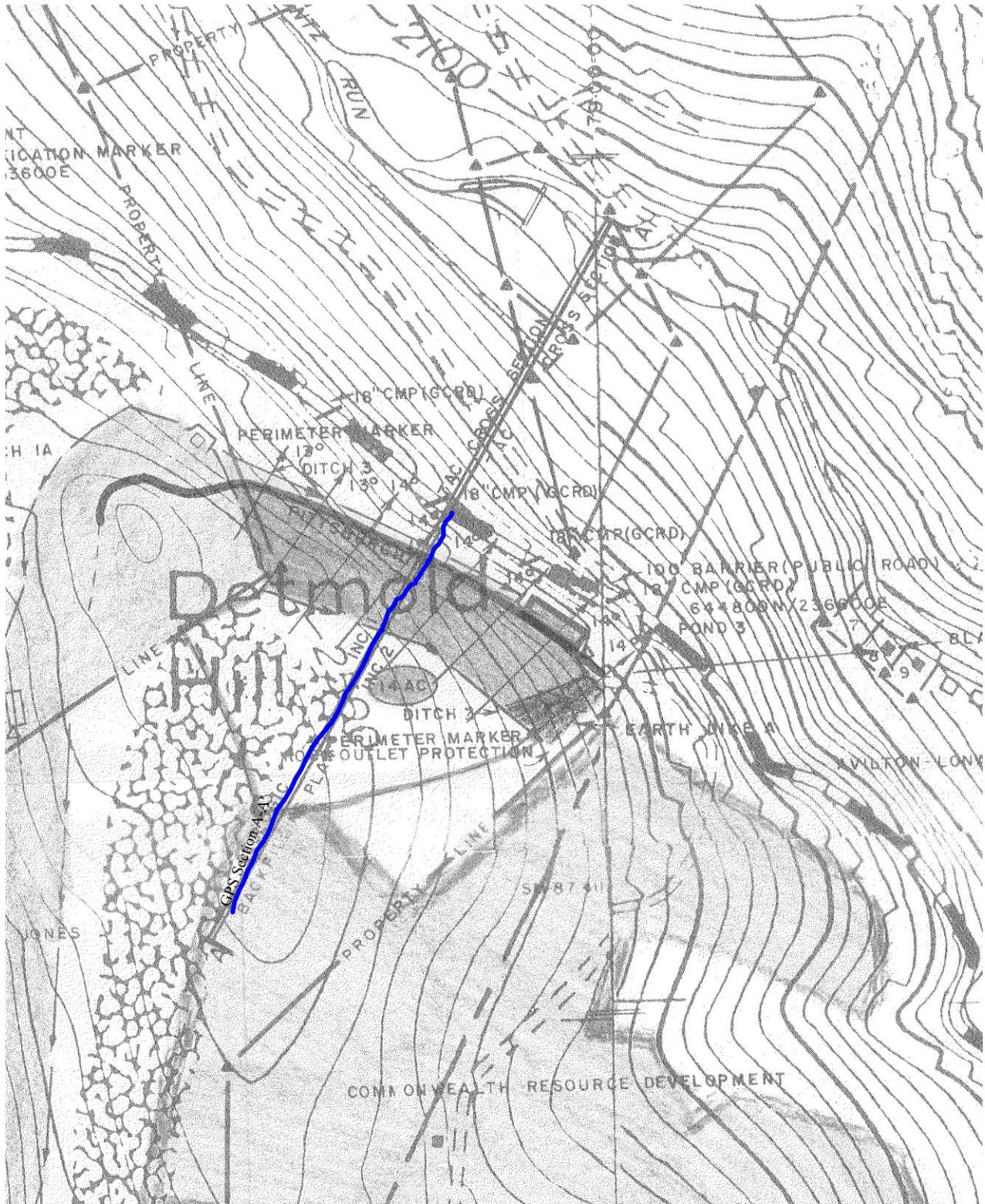
Pine Mountain Coal Company



Permit Information	Number	SM-95-424
	Name	Pine Mountain Coal Company
	Issued	2/3/1995
	Status	Active
Latitude	644500 N	
Longitude	234500 E	
County	Garrett	
Watershed	Laurel Run	
Nearest Stream	Jennings Run	
Nearest Community	Lonaconing	

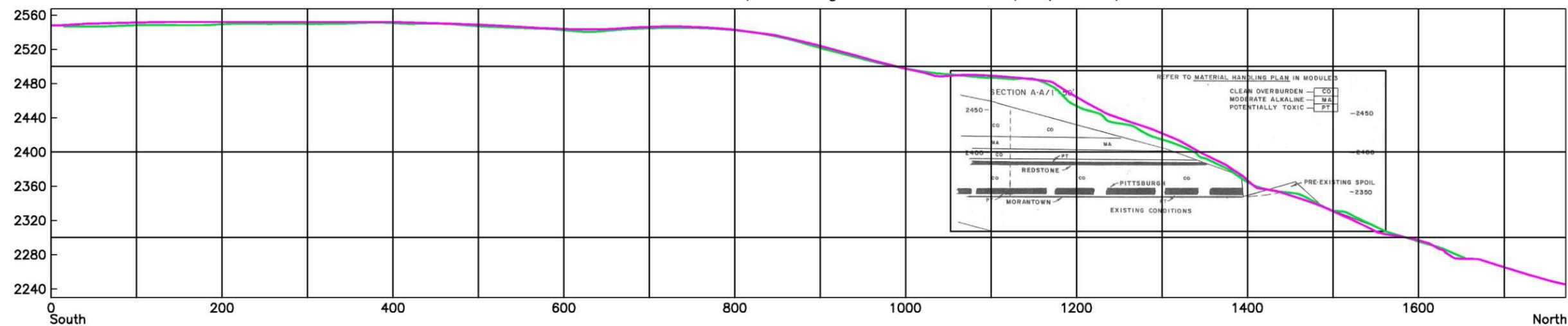
The following figure depicts the Pine Mountain permit area with the location of the permit cross sections (A-A') shown in plan view, overlain with OSM GPS data collected (blue). The image above was collected near the southeast end of cross section A-A'.

Pine Mountain Plan View with GPS Track



The following graphic depicts one of the cross sections provided in the permit application (A-A) with overlays of available topographic data and OSM collected GPS data as noted in the legend. A comparison of OSM collected GPS data to publicly available remote sensing data is also provide to illustrate the comparability of these two sources.

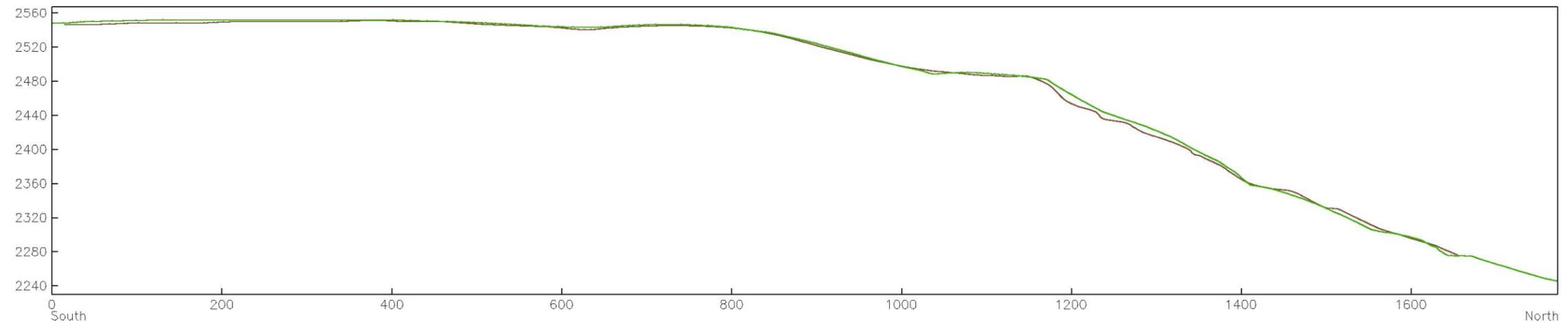
Pine Mountain Section A-A. 2004 Topo is Magenta 2010 Topo (Garmin) is Green



— PERMIT ORIGINAL GRADE
— VERIFIED GRADE

APPROXIMATE ORIGINAL CONTOUR
MD PINE MOUNTAIN #424
CROSS SECTION A-A
TOTAL CROSS SECTION FROM PERMIT GPS CROSS SECTION

Pine Mountain Section A-A. 2004 Topo (LiDAR) is Green; 2010 Topo (Garmin) is Brown.



FINDINGS

The following table summarizes MDE and OSM responses to questions outlined in the Work Plan:

Question	State Response	OSM Comments
Is there an agreement between the regulatory authority and OSM as to the interpretation of AOC as envisioned by Directive REG-8, Appendix 1?	There are no written policies or procedures that interpret AOC beyond the regulations as sited in the Background findings. However, mine inspectors are fully aware of the requirement when making inspections of each mine site, especially during the backfilling and reclamation phase of mine reclamation. Permit maps include topographic contours (USGS or better) that are very representative of the original ground configuration prior to mining and are used when inspecting and evaluating a site for AOC compliance. The permit map becomes the standard to judge backfilling operations to AOC. Inspectors may use their authority to inform a permittee that any backfilling operation does not appear to meet AOC standards and require backfilling cross sections or contour mapping if necessary to insure compliance with the required standards. In addition to the mine inspector's review of any reclaimed site, Maryland's Land Reclamation Committee (§15-204 Annotated Code of Maryland), made up of 13 professional individuals with diverse technical backgrounds and interests, review Phase II and Phase III reclamation and must vote on an approval before any bond can be released by the Bureau. Generally, AOC is evaluated by visual observation by the mine inspector, other Bureau regulatory personnel and the Land Reclamation Committee.	OSM has a clear understanding of Maryland's interpretation and implementation of AOC, though no written agreements are in place to document this understanding.
Are there any outstanding program amendments or 30 CFR 732 letters related to AOC or post mining land uses associated with AOC waivers?	NO	NO
Has OSM or the State received any citizen complaints related to AOC in the past 3 years and what was the ultimate outcome of the case(s).	NO	NO

<p>Does the State have a process for applying its interpretation of AOC to evaluation of backfilling and grading plans, and is the process documented and reproducible from site to site?</p>	<p>The process is ongoing and constant observation during the backfilling and reclamation process. Question 21 of Inspection Report asks: “Is the approved Backfilling and Grading Plan being followed?” COMAR 26.20.28.02 is cited as a regulatory reference which refers to “...all disturbed areas shall be returned to their approximate original contour.” This question is often addressed monthly during a routine inspection and is at least addressed quarterly during a complete inspection. In that sense, the process is documented and used on all sites.</p>	<p>YES. During the permitting process topographic maps of pre-mining site conditions are evaluated. Annually, topographic maps indicating site conditions, resultant from mining activity, are provided by the operator. As noted in the State response, this is also documented using the standard Inspection Report Form. All of these measurements and observations are considered by the State in determining, qualitatively, if AOC is being achieved. It should be noted, however, that this approach requires the State to rely primarily on quantifiable measurements provided by the operator.</p>
<p>Does the State’s interpretation of AOC appear to meet the State program definition of AOC?</p>	<p>n/a</p>	<p>YES</p>
<p>Do the permit documents reflect the State interpretation of AOC? {Note: If the State grants variances to AOC, the review should include a sample of those permits with an AOC variance to determine if a reviewer could generally make a distinction between a permit returning to AOC and one granted an AOC variance. Also the reviewers should pay close attention to drainage patterns including the size of the watersheds before mining and that proposed by the re-grading plans to determine if drainage patterns or watershed areas have been altered. }</p>	<p>n/a</p>	<p>YES. Each of the permits reviewed contained the necessary documentation for State staff to ascertain the proposed reclamation plan, in accordance with the regulatory definition. Records of State inspections were also present in each case to document evaluation of backfilling and grading at regular intervals.</p>
<p>Are there sufficient cross-sections or contour maps in the permit to properly evaluate AOC?</p>	<p>n/a</p>	<p>YES</p>
<p>If an AOC variance has been granted are the reasons documented and in accordance with regulatory requirements for that State and OSM’s June 22, 2000 Post Mining Land Use Policy?</p>	<p>n/a</p>	<p>No instances of AOC variances were noted as part of this study.</p>

Do you believe the States process for evaluating permits is adequate to ensure that backfilled and graded areas will achieve AOC?	n/a	YES
Does the State have methods to check the operator's compliance with his backfilling and grading plan?	Monthly inspections of the permitted site provides adequate review of the backfilling and grading process to assure compliance with the approved plans and the regulatory program.	YES. As previously noted, this is a component of the regular Inspection Report, and the Plan is reviewed prior to bond release.
Is the State routinely using these methods or verifying operator supplied information at some point prior to phase I bond release?	Each mine inspector has a copy of the approved permit documents (includes contour maps, plans and cross sections) and any special conditions required on each site inspected. The site conditions and the mining processes are continuously being reviewed during monthly inspections.	YES (as immediately above)
If grading problems are identified does the State require additional grading or permit revision?	If grading is not consistent with the approved plan (noncompliant with AOC), the permittee will be made aware of the inconsistency and directed by the inspector to rectify the matter. If the permittee fails to correct the problem, a violation will be issued and the permittee will be directed to rectify the problem within a specific time frame. A revision of grading plans is not an avenue to avoid achieving AOC requirements. Any final grading not consistent with the approved plans (AOC) will not receive Phase I approval.	No documentation specifically indicating this was noted during file reviews completed in support of this study, but it is known to OSM that MDE inspectors regularly address grading issues as part of their regular duties.
Has OSM done any spot checking of sites to verify compliance with the approved permit regarding backfilling and grading?	N/A	YES
Based on the entirety of this process is there a need for further checking of on the ground conditions?	N/A	Based on observations made by OSM, the proposed reclamation cross sections provided in one of the permits reviewed in this study (Pine Mountain Coal Co.), may require additional evaluation. There appeared to be some difference between what was provided in the permit application and what was measured in the field, namely, the pre-existing highwall and spoil pile noted on the permit cross-section was not distinctly apparent in OSM field measurements. This

		may indicate that pre-mining site conditions are not accurately represented in the data provided as part of the permit application, and underscores the need for both independent quantifiable measurement and qualitative review by the State.
Collect data using GPS, field surveys, or other appropriate methods on areas of the selected permits where backfilling and grading are complete.	N/A	This work was completed as previously presented in the report.
Based on the field data collected, was the site reclaimed to AOC in conformity with the approved mining and reclamation plan?	N/A	YES
If there are differences between the approved AOC configuration for the site and the actual land form following backfilling and grading, are these differences significant?	N/A	NO. Field measurements and observations are within the expected levels of accuracy and precision for the methods used by the State. However, more detailed analysis using readily available GIS, GPS and remote sensing data indicate that a greater level of precision and accuracy can be achieved with minimal effort.
Do differences, if any, between land forms following backfilling and grading and the approved AOC configuration observed on the sampled sites indicate a systematic problem in the State's methods for checking operator compliance with the approved backfilling and grading plan?		NO. There were no significant indications from this study that Maryland's methods for evaluating and enforcing AOC fail to achieve the intended land forms proposed in the reclamation plans evaluated.

Conclusions

- Maryland has a definition of Approximate Original Contour contained in the Code of Maryland Regulations which mirrors the Federal definition found at CFR.
- Permit applications for surface mines contain scaled cross sections and plans which adequately delineate the post-mining contours.
- MDE inspection staff evaluate the progress of reclamation during regular inspections, and at the time of bond release to determine this.

- Field verification of the result of Maryland's implementation of its approved program, indicates the program is achieving AOC
- Differences observed between cross sections, provided by mine operators in permit applications, and measurements made by OSM during this evaluation, are likely due to the expected accuracy of the GPS and altimeter instruments used.
- Some error in pre-mining topographic and elevation data, provided by permit applicants, was observed by OSM.

Recommendations

The findings of this study indicate that readily available technology and electronic data could be used by both mine operators and the State Regulatory authority, in several ways, to more efficiently and precisely return mine sites to approximate original contour:

- Permit maps and cross sections could be submitted in electronic formats.
- MDE's mine permitting program has the capability to and could apply GIS tools, in conjunction with electronic data provided by permit applicants and readily available from other public sources, to more accurately evaluate pre and post-mining topography.
- MDE inspection staff could use readily available GPS tools to collect data and verify reclamation topography in the field. This information could also be provided to permitting staff for comparison to permit information compiled in the GIS.

These recommendations are based on several factors; the GPS instruments used by OSM are relatively inexpensive, the GIS software used is available to MDE at no cost through OSM's TIPS program. The remote sensing data used by OSM was, purposely, obtained from public sources.

State Responses

- How does MDE interpret its definition of AOC? Are there any written policies or procedures that further interpret the definition or provide guidance to staff on evaluating AOC?
- There are no written policies or procedures that interpret AOC beyond the regulations as cited in the Background findings. However, mine inspectors are fully aware of the requirement when making inspections of each mine site, especially during the backfilling and reclamation phase of mine reclamation. Permit maps include topographic contours (USGS or better) that are very representative of the original ground configuration prior to mining and are used when inspecting and evaluating a site for AOC compliance. The permit map becomes the standard to judge backfilling operations to AOC. Inspectors may use their authority to inform a permittee that any backfilling operation does not appear to meet AOC standards and require backfilling cross sections or contour mapping if necessary to insure compliance with the required standards. In addition to the mine inspector's review of any reclaimed site, Maryland's Land Reclamation Committee (§15-204 Annotated Code of Maryland), made up of 13 professional individuals with diverse technical backgrounds and interests, review Phase II and Phase III reclamation and must vote on an approval before any bond can be released by the Bureau. Generally, AOC is evaluated by visual observation by the mine inspector, other Bureau regulatory personnel and the Land Reclamation Committee.
- What is Maryland's process for applying its interpretation of AOC to evaluation of backfilling and grading plans, and is the process documented and reproducible from site to site?
- The process is ongoing and constant observation during the backfilling and reclamation process. Question 21 of Inspection Report asks: "Is the approved Backfilling and Grading Plan being followed?" COMAR 26.20.28.02 is cited as a regulatory reference which refers to "...all disturbed areas shall be returned to their approximate original contour." This question is often addressed monthly during a routine inspection and is at least addressed quarterly during a complete inspection. In that sense, the process is documented and used on all sites.
- Has Maryland granted variances to AOC as provided by COMAR 26.20.28.03? I variances have been granted through the permit process, provide recent (within last three years) examples of permits with variances.
- Maryland has granted no variances from AOC within the past three years.
- How does Maryland determine if permit applicants must include pre-and post-mining cross sections and the number required? Does Maryland require that all applications include cross sections?
- Modules III 2.5 and IV 7.1 require pre-and post-mining cross sections of the mined areas, or Module IV can be satisfied with contours of the final reclaimed area. If the cross sections provided in the application are not sufficient to adequately define pre and post configuration of the reclaimed land, the Bureau may require additional cross sections adequate to determine if AOC will be accomplished after mining is completed.
- Has the State received any citizen complaints related to AOC in the past three years and what was the ultimate outcome of the complaints?
- No. There have been no complaints.

- What procedure does Maryland follow to evaluate compliance with backfilling and grading plans?
- Monthly inspections of the permitted site provides adequate review of the backfilling and grading process to assure compliance with the approved plans and the regulatory program.
- Does Maryland routinely use these methods to verify operator-supplied information prior to Phase I bond release.
- Each mine inspector has a copy of the approved permit documents (includes contour maps, plans and cross sections) and any special conditions required on each site inspected. The site conditions and the mining processes are continuously being reviewed during monthly inspections.
- If grading problems are identified, does the State require additional grading or permit revisions prior to granting a Phase I release?
- If grading is not consistent with the approved plan (noncompliant with AOC), the permittee will be made aware of the inconsistency and directed by the inspector to rectify the matter. If the permittee fails to correct the problem, a violation will be issued and the permittee will be directed to rectify the problem within a specific time frame. A revision of grading plans is not an avenue to avoid achieving AOC requirements. Any final grading not consistent with the approved plans (AOC) will not receive Phase I approval.
- Are there sufficient cross sections or contour maps in the permit application for inspectors to properly evaluate AOC?
- Yes, there is very sufficient information, which includes cross sections and contour maps, in the application for the inspector to assure compliance with the approved permit and regulatory program

Appendix A
Maryland Comments on Draft Report



MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Land Management Administration

Mining Program – Bureau of Mines
160 South Water Street
Frostburg, Maryland 21532
301-689-1440

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

May 24, 2010

Mr. George J. Rieger
Office of Surface Mining
Appalachian Regional Coordinating Center
Three Parkway Center
Pittsburgh, PA 15220

Dear Mr. Rieger,

Thank you for the opportunity to review and comment on the two studies conducted by your staff titled "Approximate Original Contour" and "Determination of Required Bond Amounts." As indicated during the quarterly meeting between OSM and Bureau personnel regarding these important topics, there would be a very short turn-around time to provide comments so hopefully these comments will be received in time to be included in the study reports.

The Bureau of Mines has no comments on the "Approximate Original Contour" study. The report appears to be accurate in its assessment that Maryland is compliant with achieving approximate original contour on its regulated sites and therefore concurs with the conclusions of the study.

The Bureau of Mines has comments on the "Determination of Required bond Amounts" study. On page 4, the last paragraph under "Methodology" states that "Maryland was provided with an opportunity to review and comment on the draft report." This statement was included in the copy of the report that Maryland reviewed for the first time. If this statement is contained in the draft report and Maryland's comments are included in the report, Maryland has no concerns with this language. If the report received by Maryland for comments is the final report, which this statement would seem to indicate, then the statement is invalid.

The remaining comments will focus on the "Conclusions" section of the study. The third bullet included in the Conclusion portion of the study states: "*This assessment, as well as several past assessments, indicates that Maryland's bonding system and available funds are at risk from the failure of several small to medium sized mining operations, or one large operation.*" The Bureau concurs that its current method of bonding needs to be updated and improved and is working in that direction however,

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Mr. George J. Rieger
May 24, 2010
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while assessments and evaluations are important and valuable, Maryland has actually had fairly recent multiple permit revocations and bond forfeitures of 13 permitted operations of two companies in 2006 and 2007. Of the 13 sites all but three sites have been reclaimed, transferred or reinstated to other viable, compliant mining companies. Also, of the three sites that remain to be reclaimed, agreements have been made on each of the sites to reclaim significant portions of the sites at little or no cost and the bond available on each site is more than adequate to complete the reclamation.

In addition, approximately ten years ago, Maryland was faced with a potential situation of multiple permit revocations and forfeitures from a single company that was in the process of filing bankruptcy. Maryland worked with other companies to acquire the permits held by the bankrupt company and averted the revocation and forfeiture process of, again, 13 permitted facilities in various stages of mining and reclamation.

Two situations occurring within the past decade, each equaling 20% of Maryland's permitted facilities, should at least approach the designation of a "catastrophic event" and were resolved timely without delays in reclamation. The earliest situation resulted in no expenditure of the Bond Supplement Reserve and the later resulted in a significant monetary gain to the Reserve.

Based on Maryland's record, to indicate that Maryland's bonding system is at risk from the failure of several small to medium sized mining operations or one large operation is an overstatement and possibly an oversight of the methods used and available to mitigate and avoid excessive liability from bond forfeitures.

The sixth bullet in the Conclusion portion states: "*State managed reclamation of forfeiture sites is not occurring in a timely manner, thereby increasing the risk to the bonding system and reducing the State's buying power due to inflation.*" The Bureau agrees with the latter portion of the statement that delays may increase the cost of reclamation of forfeited sites and continues to promote an expedited reclamation process. However, the two forfeited sites which are suspected to be the basis for the statement were delayed due to other interested companies who showed a credible interest in the continued mining of each site. Delays would not have occurred had there been no interest to take over the sites by others.

The second part of the seventh bullet states: "*...however, actual completed reclamation costs indicate that the State may be significantly underestimating costs on current forfeitures.*" This statement is further expressed in the last or 11th bullet of the conclusion as well and will be addressed in this comment. The only basis for this statement is found on page 12 of the report that compares four sites where the bond was forfeited, three that have a reclamation cost estimated by the State, with four different sites that were reclaimed after bond forfeiture. The comparison of both groups of sites relies on a cost per acre calculation showing a significant difference in the cost per acre between the first and second groups of forfeited sites. Maryland cautions anyone who uses an average cost per acre calculation from one site to project the cost of reclamation on another, as an inaccurate method that will be significantly different from site to site. To compare one group of sites with an average cost per acre estimate to a completely different group of site's average costs per acre is indeed an "apples to oranges" comparison. Had the writer compared the sites of the second group's costs to the same site's estimated costs, the comparison would have been valid but that method was not accomplished. Further, the paragraph on page 12 directly after the Historic Reclamation Construction Costs Chart compares an old visual cost estimate with and

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Maryland Comments on Draft Report

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actual reclamation cost, which is a poor comparison and not representative of anything conclusive. The bullet at the end of page 12 also is inaccurate in that the writer of the report takes the balance of the Bond Supplemental Reserve and divides that number by the writer's calculated average cost per acre to determine the number of acres that could be reclaimed from the Reserve balance without any consideration of the amount of the required performance bond that would also be available on a forfeiture. The same comment would also apply to the ninth bullet which seems to reflect numbers that contradict the information provided on page 12.

A general comment pertaining to several of the conclusion bullets is the implication that Maryland is not in compliance with 30 CFR 800.11(e). This statement is not warranted. While Maryland has on occasion delayed the reclamation of a forfeited site because of other viable interests from credible operators is true, the State is also aware that such delays are not always in the State's best interest and has agreed upon an internal process to insure that inflation costs due to delays is not an issue. The assumption that any delays in reclamation will increase the cost of reclamation due to inflation is not necessarily accurate. If a modest delay results in avoiding a lengthy engineering and procurement process to secure a contractor, reclamation may be accomplished at a quicker pace using alternative options than if the State takes on the responsibility.

Other inconsistencies in the report could be commented on but the above comments represent the most significant issues that required a response. Finally, the document modestly reports on the changes to Maryland's bonding requirements and practices that are underway that will lead to the full cost bonding of each site in the near future. It would've been helpful to focus on the process Maryland has initiated to significantly reduce reclamation liability concerns.

Thank you for the opportunity to comment on these important report documents.

Sincerely,

A handwritten signature in blue ink, appearing to read "John E. Carey". To the right of the signature, the letters "for" are written in blue ink.

John E. Carey, Director
MDE, Bureau of Mines

cc: Edmon Larrimore
Al Hooker
Tom Murray

Appendix A
Maryland Comments on Draft Report

From: John Carey [<mailto:JCarey@mde.state.md.us>]
Sent: Tuesday, November 23, 2010 5:45 PM
To: Edmon Larrimore; Rieger, George J.
Cc: Owens, Ben H.; Cunningham, Thomas P. "Tom"
Subject: Re: Maryland Approximate Original Contour Oversight Study

George:

I tried to contact Ed today to see if he had reviewed the attached and he was out. Due to the short time allotted to review and the holidays I am providing this response to you. After reviewing the document, we have no comments. Thanks for the opportunity to make one final review of the study. Hope you have a wonderful Thanksgiving holiday!

*John E. Carey, Director
Maryland Bureau of Mines
160 South Water Street
Frostburg, MD 21532
301-689-1442*

>>> "Rieger, George J." <grieger@osmre.gov> 11/19/2010 12:34 PM >>>

Attached is a final draft report of the Pittsburgh Field Division on Approximate Original Contour oversight study of the Maryland program conducted earlier this year. This final draft report is being provided for your final review and as an opportunity for Maryland to submit final comments. Your comments will be included in the appendix of final report. You were provided an earlier draft report of our study on May 15, 2010 and provided comments which have been incorporated in this draft to address the Maryland identified concerns. This final draft report also contains updates addressing review comments and concerns of the Appalachian Region. You are being provided a limited time for this final review due to our anticipated completion date of November 30 for public distribution, consequently your comments to be included must be received no later than November 29, 2010.

Thank you in advance for your prompt attention to this request. If you have any questions or concerns please contact me at your convenience at grieger@osmre.gov or 717-782-4849 ext 11