

STATE OF  
COLORADO

Gagnon - DNR, Nikie &lt;nikie.gagnon@state.co.us&gt;

---

**RE: M-2024-056 Evans Permit Application - Decision Date Extension Request #1**

---

**Sydney Connor** <Sydney@lewicki.biz>

Fri, Jan 31, 2025 at 1:14 PM

To: Greg Geras &lt;GregG@asphaltspecialties.com&gt;, "Gagnon - DNR, Nikie" &lt;nikie.gagnon@state.co.us&gt;

Cc: Ben Miller &lt;ben@lewicki.biz&gt;

Nikie,

Please see the attached adequacy response. I've included a comparison document to show the changes made to the permit text to help your review. We will send out a physical copy to you next week.

Sydney Connor

Lewicki &amp; Associates

[sydney@lewicki.biz](mailto:sydney@lewicki.biz)

(719) 323-9867

---

**From:** Greg Geras <[GregG@asphaltspecialties.com](mailto:GregG@asphaltspecialties.com)>**Sent:** Friday, January 31, 2025 8:57 AM**To:** Gagnon - DNR, Nikie <[nikie.gagnon@state.co.us](mailto:nikie.gagnon@state.co.us)>**Cc:** Sydney Connor <[Sydney@lewicki.biz](mailto:Sydney@lewicki.biz)>; Ben Miller <[ben@lewicki.biz](mailto:ben@lewicki.biz)>**Subject:** M-2024-056 Evans Permit Application - Decision Date Extension Request #1

Hi Nikie,

Please find the attached decision date extension request for the Evans Mining Resource (M-2024-056) from Monday, February 17, 2025 to **Friday, March 14, 2025**. A delay in submitting the adequacy review response occurred on my end, but I anticipate you will receive the adequacy response from Lewicki sometime next week or the following (i.e., first or second week of February). The extension is necessary to give you 2-weeks to review, but I added a little extra time in case you have any additional comments.

Please let me know if you have any questions.

Thanks,

Greg Geras

Land Resource Manager

Asphalt Specialties Co., Inc.

345 W. 62<sup>nd</sup> Ave.

Denver, CO 80216

Office (Direct): 720-322-7055 | Cell: 303-495-9888

Office (Main): 303-289-8555 | Fax: 303-289-7707

E-mail: [GregG@asphaltspecialties.com](mailto:GregG@asphaltspecialties.com)

Web: [www.asphaltspecialties.com](http://www.asphaltspecialties.com)

IMPORTANT NOTICE: This message is intended only for the addressee and may contain confidential, privileged information. If you are not the intended recipient, you may not use, copy or disclose any information contained in the message. If you have received this message in error, please notify the sender by reply e-mail and delete the message.

---

**3 attachments**



**Evans Adequacy 1 Response Compiled Letter & Attachments.pdf**  
3005K



**Evans Pit Maps Adequacy Response 1.pdf**  
14089K



**Evans DRMS Adequacy Response 1 Text Changes 250131.docx**  
2148K

January 17, 2024

Nikie Gagnon  
Colorado Division of Reclamation, Mining, and Safety  
1313 Sherman St, Rm. 215  
Denver, CO 80203

Delivered Via Email

**RE: Evans Mining Resource, DRMS File M-2024-056**  
**112 Construction Materials Permit Application - Preliminary Adequacy Response**

Nikie Gagnon,

The attached letter addresses each adequacy item in your January 10, 2024 letter regarding the Evans Mining Resource 112 Permit Application. Feel free to contact me with any questions.

Regards,



Sydney Connor,  
Lewicki & Associates, PLLC  
(719)323-9867  
[sydney@lewicki.biz](mailto:sydney@lewicki.biz)

1. *As required by Rule 1.6.2(d) and 1.6.5(2), please submit proof of publication in a newspaper of general circulation in the locality of the proposed mining operation. Proof of publication may consist of either a copy of the last newspaper publication, to include the date published, or a notarized statement from the paper.*

The proof of publication is attached to this letter.

2. *As required by Rule 1.6.2 (e), please submit Proof of Notice to all Owners of Record of the surface and mineral rights of the affected land and the Owners of Record of all land surface within 200 feet of the boundary of affected land. Proof of Notice may be by submitting return receipts of a certified mailing or by proof of personal service.*

The proof of notice certified mail receipts are attached to this letter.

3. *The Division received comments from Colorado Parks and Wildlife and the Colorado Division of Water Resources. The comment letters are attached for your review. Please acknowledge and address the comments noted in the letters and make changes to the application/exhibits as necessary.*

These comments are addressed after the DRMS items.

**Application Form:**

4. *Page 1, Questions 1.1 and 3.2: Please provide answers the two questions and resubmit the first page of the application.*

The updated application page is provided with this letter.

5. *The C-1 Baseline Map lists Martin Hernandez as the owner of parcel R895279 on the south side of the permit area. According to the Weld County Property Portal, parcel R8952790 is owned by the CR394 Dream Family Revocable Trust. Please update and resubmit the C-1 map and provide evidence that the correct landowner was notified of the application as required by Rule 1.6.2 (e).*

The updated map is attached to this letter. The certified mail receipt provided with this letter shows that a new public notice and structure agreement were sent to the Dream Family Revocable Trust.

**Exhibit D – Mining Plan (Rule 6.4.4):**

6. *Exhibit A describes a right-of-way for 35<sup>th</sup> Avenue owned by the City of Evans. During the pre-operation inspection, the Division observed the dirt north/south road between two parcels owned by the Hunt Brothers on the west side of the permit area. According to the Mining Plan this road is included in the affected acres. Will this road be utilized by the proposed mining operation? Per Rule 6.4.4 (f), please update the mining plan to include a description of any existing or proposed roads that will be used for the mining operation. Describe any improvements necessary on existing roads and the specifications to be used in the construction of new roads. Describe any associated drainage and runoff conveyance structures to include sufficient information to evaluate structure sizing. Additionally, prior to commencement of mining operations, please commit to submitting a copy of the Special Use agreement with the City of Evans to the Division for the use of this road.*

Mining activities will utilize this road for access. The mining plan has been updated to include information on this road, including descriptions of improvements and drainage runoff. The applicant commits to submitting the Special Use agreement with the City of Evans to use this road.

7. *The Mining Plan map shows several natural gas pipelines within the permit area. Please add a discussion to the Mining Plan describing how the mining operation will avoid impacting the oil and gas facilities in the permit area during the different mining phases. If any of the facilities will be removed, expand on the notification and removal process required by the Energy and Carbon Management Commission.*

The mining plan has been updated to include language on the handling of oil and gas facilities within the permit area.

8. *Please discuss if processing will entail washing of the product and if a pond or ponds will be included in the process area. If so, add a discussion to the text of Exhibit D and to the Map C-2.*

Processing will entail washing of aggregates and pond(s) will be created in the processing and operating area. These ponds were already shown on Map C-2, but language has been added to the text for further clarification.

9. *Section 4 Topsoil. Per Rules 3.1.9(4-5) please update the text to state that topsoil will be re-handled as little as possible and placed in a way to prevent erosion of this resource and a discussion added regarding the practices to stabilize slopes (i.e., roughen slopes prior to*

*placement of topsoil). Note, a Technical Revision shall be submitted before topsoil stockpiles may be relocated.*

Language has been added to the revised text to address topsoil handling. Erosion prevention through vegetation of these stockpiles was already addressed. The applicant acknowledges that a technical revision is required to relocate stockpiles.

**Exhibit E – Reclamation Plan (Rule 6.4.5):**

*10. In Section 1, the Reclamation Plan states that the distribution of rangeland and water storage ponds may vary based on the market demand for inert backfill storage. Please acknowledge that a Technical Revision will be required for alterations to the post mining land use acres in Table E-1.*

The text has been updated to acknowledge the requirement of a technical revision for changes in reclaimed land use areas.

*11. In Section 2, the applicant describes an Alternative Reclamation Plan which includes backfilling the mining pits entirely to rangeland. Please acknowledge the requirement to submit an Amendment application to completely backfill the pit.*

The text has been updated to acknowledge the requirement of an amendment for changes in reclaimed land uses.

*12. Section 3 of the Mine Plan states that recycled aggregate from the Evans Pit may be used as backfill as needed to facilitate the reclamation material balance. According to Rule 3.1.5(9), the operator may backfill a pit with structural fill material generated within the permitted area, however, any inert structural fill generated outside the permit area requires the operator to submit an Inert Fill Notice that meets the Rule. Please acknowledge that this notice shall be submitted as a Technical Revision for approval by the Division prior to placing any material from off-site in the pit. Additionally, the text states “A certification form is attached to this exhibit.” No form was attached. Please either submit this attachment or delete this from the text.*

The applicant acknowledges that this is a requirement to import backfill material. The text has been updated to acknowledge this requirement but not reference the form.

**Exhibit G – Water Information (Rule 6.4.7):**

*13. Please update the text to include a discussion on the use of water for processing gravel. If no products will be washed onsite, this should be stated in Exhibit G.*

The Exhibit G text has been updated to include this discussion.

14. *The applicant proposes a 100-foot setback from the South Platte River on the north end of Phase 5. For protection of the riverbank, please review the attached, “Floodplain Protection Standards for Sand and Gravel Pits Adjacent to Rivers and Perennial Streams”. This Guidance document is based on the MHFD Guidelines. Note that in the scenario where no pitside bank or riverbank protection is provided, the standard setback from the river or stream is 400 feet. Based on Table 1- Standard Setbacks on Page 3 in the Guidance, the minimum setback from the river is 150 feet which requires stabilization of the riverbank and pitside banks. Please update the Mining and Reclamation Plans and maps to describe the stabilization structures that will be installed on the north side of mining Phases 3 and 5. Resubmit the maps and provide detailed designs of proposed structures (e.g., riprap, grouted boulders, side channel spillways) to be installed on pitside banks and riverbanks to control water erosion.*

The maps and text have been updated to reflect the standards in this guidance document. The 150-foot setback has been applied to the eastern-most pit, while the previously proposed inflow/outflow structure meets the standards for pit-side and bank-side protection. All other mining has been adjusted to maintain the 400-foot minimum setback that requires no armoring. Please refer to the updated Map C-2 and Exhibits for these changes in the mining plan.

**Exhibit H – Wildlife Information (Rule 6.4.8):**

15. *The applicant must address the comments of the Colorado Parks and Wildlife Division (CPW), which are enclosed with this review letter. Each of the comments must be directly addressed in your response letter, and, as applicable, comments must also be addressed by revising Exhibit H.*

These comments and recommendations are addressed after the DRMS adequacy items. Exhibit H has been updated to reflect any commitments made in response to the CPW comments.

16. *During the pre-operation inspection, the Division observed prairie dogs in the permit area. Please address timing considerations related to burrowing owls and update the discussion in Exhibit H as necessary.*

A discussion on the prairie dog presence and burrowing owl considerations have been added to the revised Exhibit H.

**Exhibit M – Other Permits and Licenses (Rule 6.4.13):**

17. *Please update the list of permits to include the City of Evans Special Use Permit.*

This change has been made in the revised Exhibit M.

**Exhibit R – Proof of Filing with County Clerk and Recorder (Rule 6.4.18):**

18. Please provide proof that a copy of the applicant responses to this adequacy review have been placed with the Weld County Clerk and Recorder for review. Evidence may be in the form of an affidavit or receipt indicating the date on which the information is delivered.

This documentation is attached.

**Exhibit S – Permanent Man-Made Structures (Rule 6.4.19):**

19. In accordance with Rule 6.4.19, when mining operations will adversely affect the stability of any significant, valuable and permanent man-made structure located within 200 feet of the affected area the applicant shall provide a notarized agreement between the applicant and the person(s) having an interest in the structure, that the applicant is to provide compensation for any damage to the structure. Please submit the signed/notarized structure agreements to the Division for each structure listed on Table S-1.

No structure agreements were signed by the owners listed in Table S-1. If any agreements are received in the future, they will be provided to the Division.

20. The applicant states, “In the event that a structure agreement is unobtainable, defer to the Geotechnical Stability Exhibit which indicates that all structures will be protected.” A Geotechnical Stability Exhibit was not included in the application package. Pursuant to Rule 6.4.19, the Division requires the Applicant to demonstrate that they attempted to obtain notarized structure agreements with all owners of the structures within 200 feet of the affected area of the proposed mine site. This attempt must be made prior to the Division’s consideration of a stability analysis. Please provide this demonstration; this can be in the form of certified mailing receipts or similar documentation.

The geotechnical stability exhibit and structure agreement mailing receipts are provided with this letter.

**Colorado Parks and Wildlife (CPW) Comments & Recommendations**

1. *The Importance of High Priority Habitats (HPH)*

The CPW Mapping service was consulted in the development of the wildlife discussion of the permit. The HPH mapping was reviewed for the site in response to these comments. The HPH’s identified are Aquatic Native Species Conservation Waters, Bald Eagle Active Nest Site, Mule Deer Migration Corridor, Mule Deer Severe Winter Range, and Mule Deer Winter Concentration. The presence of these habitats have been added to Exhibit H with a discussion on how to manage and mitigate impacts from mining.

2. *Mule Deer Severe Winter Concentration and Winter Concentration Areas*



The presence of these habitats was identified in the initial permit application and the applicant acknowledges the recommendations provided by the CPW. However, due to the nature of an aggregate operation, the recommended construction limitation from December 1-April 30 is not feasible. Additionally, the entirety of what will be mined has historically been disturbed by agricultural operations. However, the river corridor and trees where the presence of mule deer is more likely will not be disturbed which provides a buffer for these important habitats. To protect these habitats, the applicant commits to limiting new ground disturbances to only occur out of the December 1 – April 30 window.

### *3. Aquatic Native Species Conservation Waters*

The importance of this habitat is acknowledged and measures will be taken to minimize impacts to this habitat as much as possible. The 500 foot setback year round is not feasible and not common practice as there is an abundance of similar mining operations that operate within this area. All processing operations, permanent structures, and the majority of activity will be occurring well outside of this 500 foot buffer. All mining occurs outside of the river corridor and denser vegetation that surrounds it where these species would be most concentrated. Best management practices will be used to prevent disturbances outside of the mining area and to prevent any direct impacts to the South Platte River.

### *4. Fencing*

No new fencing is planned to be constructed in this application. If fencing is constructed in the future, it will be completed following the CPW fencing guidelines.

### *5. Noxious Weeds and Native Re-seeding*

Noxious weeds and re-seeding are addressed in the reclamation section of the permit.

### *6. Wildlife Escape Ramps*

The ramp used to access the pit floor during mining will serve as the pit ramp.

### *7. Lighting*

Lighting will be limited as much as possible, and down-shielded when present.

### *8. Retention Ponds*

These recommendations will be taken into consideration. Shorelines will be irregular due to the nature of backfilling and grading of reclaimed slopes. If islands are constructed, they will be in accordance with the CPW recommendations.

## **Colorado Division of Water Resources Comments**

### *1. Conditions for Approval: SWSP and Gravel Well Permit Requirements*

An SWSP or augmentation plan will be acquired prior to obtaining a well permit. A gravel well permit will be acquired as necessary.

2. *Concerns for Gravel Pit Liner Impacts of Local Groundwater Flow*

These concerns are addressed in the groundwater model and french drain design.

3. *Reclamation SWSP and Augmentation Plan*

Lining of the reservoirs will occur prior to groundwater exposure, therefore an SWSP is not necessary for the pits during mining and reclamation. Water will not be collected in the reclaimed reservoir due to the slurry wall, therefore an augmentation plan is not required.

4. *Existing Well with Permit No. 299707*

This well is located near a residence outside of the permit area and will not be utilized by the operator.

## Attachments

- Newspaper Proof of Publication
- Structure Agreement Certified Mail Receipts
- Dream Family Revocable Trust Public Notice & Structure Agreement Certified Mail Receipt
- Page 1 of Application Form
- Revised Permit Items:
  - Maps C-1, C-2, F-1, F-2, F-3, C-3, G-1
  - Exhibits D, E, G, H, M
  - Geotechnical Stability Exhibit

**PUBLIC NOTICE**

Asphalt Specialties, 345 W 62nd Avenue, Denver, Colorado 80216, (303) 289-8555, has filed an application for a Regular (112) Construction Materials Operation Reclamation Permit with the Colorado Mined Land Reclamation Board under provisions of the Colorado Land Reclamation Act for the Extraction of Construction Materials. The proposed mine is known as the Evans Mining Resource, and is located at or near Section 6, Township 5N, Range 66W, 6th Prime Meridian.

The proposed date of commencement is February 2025, and the proposed date of completion is February 2046. The proposed future use of the land is Rangeland. Additional information and tentative decision date may be obtained from the Division of Reclamation, Mining and Safety, 1313 Sherman St, Room 215, Denver, Colorado 80203, (303) 866-3567, or at the Weld County Clerk and Recorder's Office, 1250 H Street, Greeley, Colorado 80631, or the above-named applicant.

Comments must be in writing and must be received by the Division of Reclamation, Mining, and Safety by 4:00p.m. 20 days after the final publication of this notice.

Please note that under the provisions of C.R.S. 34-32.5-101 et seq. Comments related to noise, truck traffic, hours of operation, visual impacts, effects on property values and other social or economic concerns are issues not subject to this Office's jurisdiction. These subjects, and similar ones, are typically addressed by your local governments, rather than the Division of Reclamation, Mining, and Safety or the Mined Land Reclamation Board.

Published: Greeley Tribune November 23, 30, December 7, 14, 2024-2086643

**Prairie Mountain Media, LLC**

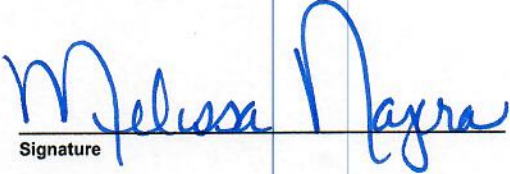
**PUBLISHER'S AFFIDAVIT**

**County of Weld  
State of Colorado**

The undersigned, Agent, being first duly sworn under oath, states and affirms as follows:

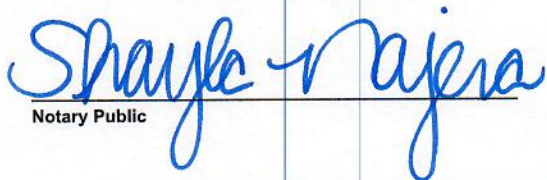
1. He/she is the legal Advertising Reviewer of **Prairie Mountain Media LLC**, publisher of the *Greeley Tribune*.
2. The *Greeley Tribune* is a newspaper of general circulation that has been published continuously and without interruption for at least fifty-two weeks in Weld County and meets the legal requisites for a legal newspaper under Colo. Rev. Stat. 24-70-103.
3. The notice that is attached hereto is a true copy, published in the *Greeley Tribune* in Weld County on the following date(s):

Nov 23, 30 and Dec 7, 14, 2024

  
Signature

Subscribed and sworn to me before me this

16th day of December 2024.

  
Notary Public

(SEAL)

**SHAYLA NAJERA  
NOTARY PUBLIC  
STATE OF COLORADO  
NOTARY ID 20174031965  
MY COMMISSION EXPIRES July 31, 2025**

Account: 1064948  
Ad Number: 2086643  
Fee: \$204.00

# EXHIBIT S

# PERMANENT MAN-MADE STRUCTURES

The following is a list of man-made structures within 200 feet of the affected area. All of these structures are shown on Map C-1. Landowner boundaries can also be found on Map C-1. Proof of delivery of structure agreements is attached to this exhibit. In the event that a structure agreement is unobtainable, defer to the Geotechnical Stability Exhibit which indicates that all structures will be protected.

**Table S-1. Permanent Structures within 200' of the Affected Area**

| STRUCTURE                         | OWNER                        | MAILING ADDRESS             | CITY     | STATE |
|-----------------------------------|------------------------------|-----------------------------|----------|-------|
| OIL TANKS, SEPARATOR, EQUIPMENT   | PDC ENERGY                   | 1775 SHERMAN ST SUITE 3000  | DENVER   | CO    |
| 35TH AVE ROW & BARN, FENCES       | CITY OF EVANS                | 1100 37TH STREET            | EVANS    | CO    |
| IRRIGATION DITCH                  | GODFREY DITCH CO.            | 23896 WCR 35                | LA SALLE | CO    |
| POWER POLES AND ELECTRIC CABLE    | XCEL ENERGY                  | 1123 W 3RD AVE              | DENVER   | CO    |
| WATER PIPE                        | WELD COUNTY                  | 2235 2ND AVE                | GREELEY  | CO    |
| BURIED COMMUNICATION ASSETS       | CENTURY LINK                 | 2505 1ST AVE ROOM CO3.23    | GREELEY  | CO    |
| CR 394 ROW                        | WELD COUNTY                  | 1150 0 ST                   | GREELEY  | CO    |
| GAS LINES & METER STATION         | CP MIDSTREAM LLC             | 370 17TH ST, SUITE 2500     | DENVER   | CO    |
| GAS LINE                          | ATMOS ENERGY                 | 1200 11TH AVE               | GREELEY  | CO    |
| AUGMENTATION POUNDS, FENCES, ROAD | CITY OF AURORA               | 15151 E ALAMEDA PKWY # 3200 | AURORA   | CO    |
| FENCES, DIRT ROAD                 | SCHANK ESTHER M              | 4020 54TH STREET RD         | GREELEY  | CO    |
| FENCES, DIRT ROAD                 | BRODBECK CADE K              | 14054 W 84TH PL             | ARVADA   | CO    |
| FENCES, DIRT ROAD                 | SAGNER GEORGE W              | 14054 W 84TH PL             | ARVADA   | CO    |
| FENCES, ROAD, WELL, BUILDINGS     | DREAM FAMILY REVOCABLE TRUST | 17043 COUNTY RD 394         | LA SALLE | CO    |



Structure Agreement  
Mailing Certifications

U.S. Postal Service  
Certified Mail Receipt

**OUTBOUND TRACKING NUMBER**  
9414 7118 9956 1492 0382 21

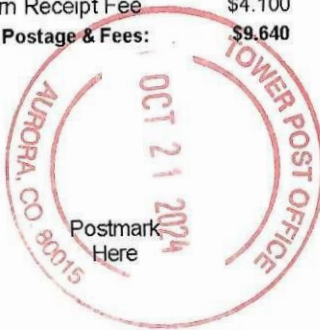
**RETURN RECEIPT TRACKING NUMBER**  
9490 9118 9956 1492 0382 01

**FEES**

|                                  |                |
|----------------------------------|----------------|
| Postage per piece                | \$0.690        |
| Certified Fee                    | \$4.850        |
| Return Receipt Fee               | \$4.100        |
| <b>Total Postage &amp; Fees:</b> | <b>\$9.640</b> |

**ARTICLE ADDRESS TO:**

Century Link  
2505 1st Ave Rm CO3.23  
Greeley CO 80631-7401



U.S. Postal Service  
Certified Mail Receipt

**OUTBOUND TRACKING NUMBER**  
9414 7118 9956 1495 9879 60

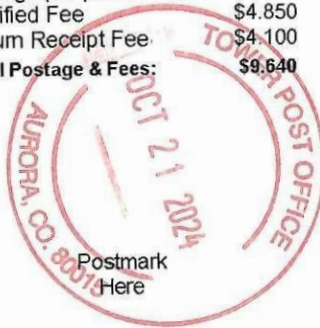
**RETURN RECEIPT TRACKING NUMBER**  
9490 9118 9956 1495 9879 26

**FEES**

|                                  |                |
|----------------------------------|----------------|
| Postage per piece                | \$0.690        |
| Certified Fee                    | \$4.850        |
| Return Receipt Fee               | \$4.100        |
| <b>Total Postage &amp; Fees:</b> | <b>\$9.640</b> |

**ARTICLE ADDRESS TO:**

Atmos Energy  
1200 11th Ave  
Greeley CO 80631-3828



U.S. Postal Service  
Certified Mail Receipt

**OUTBOUND TRACKING NUMBER**  
9414 7118 9956 1495 9206 77

**RETURN RECEIPT TRACKING NUMBER**  
9490 9118 9956 1495 9201 14

**FEES**

|                                  |                |
|----------------------------------|----------------|
| Postage per piece                | \$0.690        |
| Certified Fee                    | \$4.850        |
| Return Receipt Fee               | \$4.100        |
| <b>Total Postage &amp; Fees:</b> | <b>\$9.640</b> |

**ARTICLE ADDRESS TO:**

George W Sagner  
14054 W 84th Pl  
Arvada CO 80005-5880



U.S. Postal Service  
Certified Mail Receipt

**OUTBOUND TRACKING NUMBER**  
9414 7118 9956 1495 9899 64

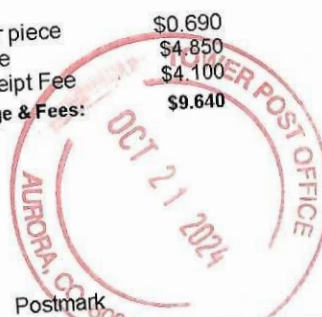
**RETURN RECEIPT TRACKING NUMBER**  
9490 9118 9956 1495 9899 20

**FEES**

|                                  |                |
|----------------------------------|----------------|
| Postage per piece                | \$0.690        |
| Certified Fee                    | \$4.850        |
| Return Receipt Fee               | \$4.100        |
| <b>Total Postage &amp; Fees:</b> | <b>\$9.640</b> |

**ARTICLE ADDRESS TO:**

City of Aurora  
1240 E Alameda Pkwy Ste 3200



U.S. Postal Service  
Certified Mail Receipt

OUTBOUND TRACKING NUMBER  
9414 7118 9956 1495 9631 17

RETURN RECEIPT TRACKING NUMBER  
9490 9118 9956 1495 9631 59

FEES

Postage per piece \$0.690  
Certified Fee \$4.850  
Return Receipt Fee \$4.100  
Total Postage & Fees: \$9.640

ARTICLE ADDRESS TO:

Esther M Schank  
4020 54th Street Rd  
Greeley CO 80634-9147

Postmark  
Here



U.S. Postal Service  
Certified Mail Receipt

OUTBOUND TRACKING NUMBER  
9414 7118 9956 1495 9020 17

RETURN RECEIPT TRACKING NUMBER  
9490 9118 9956 1495 9020 59

FEES

Postage per piece \$0.690  
Certified Fee \$4.850  
Return Receipt Fee \$4.100  
Total Postage & Fees: \$9.640

ARTICLE ADDRESS TO:

CP Midstream LLC  
370 17th St Ste 2500  
Denver CO 80202-5604

Postmark  
Here



U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com).  
Greeley, CO 80631

Certified Mail Fee \$4.85  
Extra Services & Fees (check box, add fee as appropriate)  
☒ Return Receipt (hardcopy) \$4.10  
☐ Return Receipt (electronic) \$0.00  
☐ Certified Mail Restricted Delivery \$0.00  
☐ Adult Signature Required \$0.00  
☐ Adult Signature Restricted Delivery \$0.00  
Postage \$1.01  
Total Postage and Fees \$9.96  
Postmark Here  
10/22/2024

Sent To Weld County  
Street and Apt. No., or PO Box No.  
1150 O St  
City, State, ZIP+4®  
Greeley CO 80631

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com).  
Arvada, CO 80005

Certified Mail Fee \$4.85  
Extra Services & Fees (check box, add fee as appropriate)  
☒ Return Receipt (hardcopy) \$4.10  
☐ Return Receipt (electronic) \$0.00  
☐ Certified Mail Restricted Delivery \$0.00  
☐ Adult Signature Required \$0.00  
☐ Adult Signature Restricted Delivery \$0.00  
Postage \$0.73  
Total Postage and Fees \$9.68  
Postmark Here  
10/22/2024

Sent To Cade K Brodbeck  
Street and Apt. No., or PO Box No.  
14054 W 84th Pl  
City, State, ZIP+4®  
Arvada CO 80005

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions



U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)®.

Evans, CO 80620

Certified Mail Fee \$4.85  
Extra Services & Fees (check box, add fee as appropriate)  
☒ Return Receipt (hardcopy) \$4.10  
☐ Return Receipt (electronic) \$0.00  
☐ Certified Mail Restricted Delivery \$0.00  
☐ Adult Signature Required \$0.00  
☐ Adult Signature Restricted Delivery \$0.00

0127  
41

Postmark  
Here

Postage \$0.73

Total Postage and Fees \$9.68

10/22/2024

Sent To City of Evans  
Street and Apt. No., or PO Box No. 1100 37th St  
City, State, ZIP+4® Evans CO 80620

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)®.

La Salle, CO 80645

Certified Mail Fee \$4.85  
Extra Services & Fees (check box, add fee as appropriate)  
☒ Return Receipt (hardcopy) \$4.10  
☐ Return Receipt (electronic) \$0.00  
☐ Certified Mail Restricted Delivery \$0.00  
☐ Adult Signature Required \$0.00  
☐ Adult Signature Restricted Delivery \$0.00

0127  
41

Postmark  
Here

Postage \$0.73

Total Postage and Fees \$9.68

10/22/2024

Sent To Godfrey Ditch Co  
Street and Apt. No., or PO Box No. 23896 WCR 35  
City, State, ZIP+4® La Salle CO 80645

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)®.

Denver, CO 80223

Certified Mail Fee \$4.85  
Extra Services & Fees (check box, add fee as appropriate)  
☒ Return Receipt (hardcopy) \$4.10  
☐ Return Receipt (electronic) \$0.00  
☐ Certified Mail Restricted Delivery \$0.00  
☐ Adult Signature Required \$0.00  
☐ Adult Signature Restricted Delivery \$0.00

0127  
41

Postmark  
Here

Postage \$0.73

Total Postage and Fees \$9.68

10/22/2024

Sent To Xcel Energy  
Street and Apt. No., or PO Box No. 1123 W 3rd Ave  
City, State, ZIP+4® Denver CO 80223

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions



92 4269 2471 0225 0710 6856

U.S. Postal Service<sup>™</sup>  
CERTIFIED MAIL<sup>®</sup> RECEIPT  
Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com).

Denver, CO 80203

Certified Mail Fee \$4.85

Extra Services & Fees (check box, add fee as appropriate)

☒ Return Receipt (hardcopy)

☐ Return Receipt (electronic)

☐ Certified Mail Restricted Delivery

☐ Adult Signature Required

☐ Adult Signature Restricted Delivery

\$0.73

Total Postage and Fees \$7.63

Sent To PDC Energy

Street and Apt. No. or PO Box No. 1775 Sherman St #3000

City, State, ZIP+4<sup>®</sup> Denver, CO 80203

10/31/2024

Postmark Here

TOWER POST OFFICE

PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions

9589 0710 5270 0692 8991 25

| U.S. Postal Service™<br><b>CERTIFIED MAIL® RECEIPT</b><br>Domestic Mail Only                     |                                                    |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------|
| For delivery information, visit our website at <a href="http://www.usps.com">www.usps.com</a> ®. |                                                    |
| <b>OFFICIAL USE</b>                                                                              |                                                    |
| Certified Mail Fee<br>\$ <u>4.82</u>                                                             | <i>Mailed</i><br>Postmark Here<br><u>1/28/2025</u> |
| Extra Services & Fees (check box, add if appropriate)                                            |                                                    |
| <input checked="" type="checkbox"/> Return Receipt (hardcopy) \$ <u>4.12</u>                     |                                                    |
| <input type="checkbox"/> Return Receipt (electronic) \$ _____                                    |                                                    |
| <input type="checkbox"/> Certified Mail Restricted Delivery \$ _____                             |                                                    |
| <input type="checkbox"/> Adult Signature Required \$ _____                                       |                                                    |
| <input type="checkbox"/> Adult Signature Restricted Delivery \$ _____                            |                                                    |
| Postage<br>\$ <u>9.77</u>                                                                        |                                                    |
| Total Postage and Fees<br>\$ <u>9.92</u>                                                         |                                                    |
| Sent To                                                                                          |                                                    |
| Street and                                                                                       | Dream Family Revocable Trust                       |
|                                                                                                  | 17043 County Road 394                              |
| City, State,                                                                                     | La Salle, CO 80645                                 |
| PS Form 3800, January 2023 PSN 7530-02-000-9047 See Reverse for Instructions                     |                                                    |

Dream Family Revocable Trust  
Public Notice & Structure  
Agreement Certified Mail  
Receipt

**ASPHALT**

**SPECIALTIES CO.**

345 West 62nd Ave.  
Denver, CO 80216

**CERTIFIED MAIL®**



9589 0710 5270 0692 8991 25

FIRST-CLASS



US POSTAGE<sup>IMP</sup>PITNEY BOWES



ZIP 80216  
02 7H  
0006046558  
**\$ 009.92<sup>0</sup>**  
JAN 28 2025

Dream Family Revocable Trust  
  
17043 County Road 394  
  
La Salle, CO 80645

# STATE OF COLORADO

## DIVISION OF RECLAMATION, MINING AND SAFETY

Department of Natural Resources

1313 Sherman St., Room 215  
Denver, Colorado 80203  
Phone: (303) 866-3567  
FAX: (303) 832-8106



### CONSTRUCTION MATERIALS REGULAR (112) OPERATION RECLAMATION PERMIT APPLICATION FORM

**CHECK ONE:** \_\_\_\_\_ **There is a File Number Already Assigned to this Operation**

Permit #   M   -        -        -        (Please reference the file number currently assigned to this operation)

\_\_\_\_\_ **New** Application (Rule 1.4.5)

\_\_\_\_\_ **Amendment** Application (Rule 1.10)

\_\_\_\_\_ **Conversion** Application (Rule 1.11)

Permit #   M   -        -        -        (provide for **Amendments** and **Conversions** of existing permits)

The application for a Construction Materials Regular 112 Operation Reclamation Permit contains three major parts: (1) the application form; (2) Exhibits A-S, Addendum 1, any sections of Exhibit 6.5 (Geotechnical Stability Exhibit; and (3) the application fee. When you submit your application, be sure to include one (1) complete signed and notarized ORIGINAL and one (1) copy of the completed application form, two (2) copies of Exhibits A-S, Addendum 1, appropriate sections of 6.5 (Geotechnical Stability Exhibit, and a check for the application fee described under Section (4) below. Exhibits should **NOT** be bound or in a 3-ring binder; maps should be folded to 8 1/2" X 11" or 8 1/2" X 14" size. To expedite processing, please provide the information in the format and order described in this form.

#### GENERAL OPERATION INFORMATION

Type or print clearly, in the space provided, **ALL** information requested below.

1. **Applicant/operator or company name (name to be used on permit):** \_\_\_\_\_

1.1 Type of organization (corporation, partnership, etc.): \_\_\_\_\_

2. **Operation name (pit, mine or site name):** \_\_\_\_\_

3. **Permitted acreage (new or existing site):** \_\_\_\_\_ permitted acres

3.1 Change in acreage (+) \_\_\_\_\_ acres

3.2 Total acreage in Permit area \_\_\_\_\_ acres

4. **Fees:**

4.1 New Application \$2,696.00 application fee

4.2 New Quarry Application \$3,342.00 quarry application

4.4 Amendment Fee \$2,229.00 amendment fee

4.5 Conversion to 112 operation (set by statute) \$2,696.00 conversion fee

5. **Primary commoditie(s) to be mined:** \_\_\_\_\_

5.1 Incidental commoditie(s) to be mined: 1. \_\_\_\_\_ lbs/Tons/yr 2. \_\_\_\_\_ / \_\_\_\_\_ lbs/Tons/yr

3. \_\_\_\_\_ / \_\_\_\_\_ lbs/Tons/yr 4. \_\_\_\_\_ / \_\_\_\_\_ lbs/Tons/yr 5. \_\_\_\_\_ / \_\_\_\_\_ lbs/Tons/yr

5.2 Anticipated end use of primary commoditie(s) to be mined: \_\_\_\_\_

5.3 Anticipated end use of incidental commoditie(s) to be mined: \_\_\_\_\_

# EXHIBIT D

# MINING PLAN

## 1. General Mining Plan

The property boundary has been surveyed and marked. Map C-2 outlines the mining plan including the affected area of 159.2-acres, with an average elevation of 4667 ft. above mean sea level. Sand and gravel will be extracted for use in construction materials such as crushed rock, sand, washed rock, concrete, and asphalt. There is also the possibility of incidental fill dirt production. The maximum mining disturbance at any given time will be 50-acres. Exhibit L outlines the reclamation conditions for this maximum disturbance scenario and the associated bond.

Access to the mine will be via the existing site entrance located on the southwest end of the operation connecting to Highway 394. To prevent groundwater infiltration into the pit and facilitate water storage after reclamation, two slurry walls will be installed around the various mining areas.

Due to timing of the operation, Phase 1 has already been stripped for the existing operations. Phase 1 will not be mined but has been included in the area descriptions and tables. Phase 1 will remain as an industrial operation after mining has completed. Phasing and areas are described below.

**Table D-1 Phasing**

| Phase | Description                                                                                       | Approximate Acreage |
|-------|---------------------------------------------------------------------------------------------------|---------------------|
| 1     | Processing & Industrial Area – already developed and in operation. Will remain after reclamation. | 20.5                |
| 2     | Westernmost mining pod.                                                                           | 21.4                |
| 3     | Northern portion of center pod.                                                                   | 18.2                |
| 4     | Southern portion of center pod.                                                                   | 18.2                |
| 5     | Northern portion of eastern pod.                                                                  | 20.8                |
| 6     | Southern portion of eastern pod.                                                                  | 20.7                |

Dozers and scrapers will strip topsoil and overburden from mining areas, storing them in designated stockpiles. Any stockpile remaining for over 90 days will be seeded to prevent erosion. Sand and gravel extraction will involve loaders, excavators, dozers, and trucks, with material transported to the southern permit area for processing. While haul trucks are currently anticipated, there is potential for replacement by a conveyor belt in the future.

The sand and gravel deposit, averaging 36 feet in thickness, will be mined progressively from north to south in each mining area. Mining will take place across three areas as shown on Map C-2. Groundwater is anticipated to be found 6-feet below the natural topography. Mining and reclamation will occur concurrently to minimize overall disturbance. There is ample on-site topsoil and overburden for successful reclamation, transforming the site into water storage ponds surrounded by rangeland. The reclamation process will involve backfilling, regrading, topsoiling, and revegetation. Some or all of the water storage ponds may be filled based on market demands for inert fill disposal.

Mining will extend to the bottom of the gravel deposit, maintaining final mining slopes at 1.5H:1V along the perimeter. The active highwall will have a near-vertical slope, progressing halfway down the final mining slope to enable the dozer to knock down the remaining highwall, creating the completed mining slope. Slopes will then be backfilled with sand or overburden to achieve the reclaimed 3H:1V slopes, with specific slope details available on Map C-3 cross sections.

Mining setbacks are shown on Map C-2. No mining will take place within 150-ft of the South Platte River. See Exhibit G for details on surface water protection.

Processing of the mined materials will include aggregate washing, crushing, asphalt, and concrete production. Water for these purposes will be sourced from ponds and/or groundwater wells located in or around the processing area. Prior to construction and use of water from these sources, necessary permits and augmentation plans when necessary will be acquired.

No blasting will occur at the Evans Mining Resource. If refuse, acid, or toxic materials are unexpectedly encountered, these materials will be removed from the site and disposed of appropriately.

## 2. Mining Timetable

Mining operations at the Evans Mining Resource are expected to take approximately 21 years to complete, based on an annual average production of 300,000 tons. Actual production rates will fluctuate based on market conditions. An approximate mining timetable based on this production and the phased mining plan is shown in Table D-2.

**Table D-2 Mining Timetable**

| <b>Description</b>                                                                                                                    | <b>Time Required</b> |
|---------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Construction of slurry wall A.</b>                                                                                                 | 2 months             |
| <b>Initial stripping of Phase 2.</b>                                                                                                  | 1 month              |
| <b>Mine and reclaim Phase 2 according to approved plans. Reclamation occurs as mining has reached its maximum extents in an area.</b> | 4.5 years            |
| <b>Construction of slurry wall B.</b>                                                                                                 | 2 months             |
| <b>Initial stripping of Phase 3/4.</b>                                                                                                | 1 month              |



|                                                                                                                                                                                                                 |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Mine and reclaim Phase 3 &amp; 4 according to approved plans. Reclamation occurs as mining has reached its maximum extents in an area. Stripping of Phase 4 occurs towards the end of mining in Phase 3.</b> | 8 years   |
| <b>Initial stripping of Phase 5/6.</b>                                                                                                                                                                          | 2 months  |
| <b>Mine and reclaim Phase 5 &amp; 6 according to approved plans. Reclamation occurs as mining has reached its maximum extents in an area. Stripping of Phase 6 occurs towards the end of mining in Phase 5.</b> | 8.5 years |
| <b>Total</b>                                                                                                                                                                                                    | ~21 years |

### Timing Limitations

Various timing limitations will be taken due to the presence of high-priority habitats for multiple species at the site. The limitations are based on Colorado Parks and Wildlife (CPW) recommended best management practices. These limitations are shown on Map C-2 and defined below:

1. Bald Eagle Nest: No new ground disturbances between Dec. 1 – Jul. 31 within a 0.25-mile radius of the nest.
2. Mule Deer Critical Habitat: No new ground disturbances between Dec. 1 – Apr. 30 within a 500-foot setback from the high-water line of the South Platte River.
3. Potential Burrowing Owl Presence: Cultivate the fallow fields to destroy all abandoned prairie dog burrows before March 15 so that burrowing owls cannot use the burrows for nesting. Otherwise, a burrowing owl survey must be completed for any new ground disturbing activities between Mar. 15 – Oct. 31.

## 3. Mine Facilities and Operation

The site will contain the following facilities and equipment:

### Facilities:

- Portable toilet
- Mine office (portable)
- Portable fuel storage
- Portable concrete plant
- Portable asphalt plant
- Portable crusher/screen

### Equipment:

- Front-end loaders
- Bulldozers
- Scrapers

- Haul trucks (off highway)
- Water trucks
- Graders
- Excavators
- Conveyors

Asphalt Specialties will provide portable toilets and bottled water to employees on site during operations. Fuel will be stored on site in the processing area. Storage of such fuel will be maintained in accordance with the Evans Mining Resource SPCC Plan. All facilities at Evans will be removed during reclamation.

Plants used at the Evans Industrial Site are included in the permit boundary but will remain following mining and reclamation at the site.

Recycled aggregate from the Evans Mining Resource may be used as backfill as needed to facilitate the reclamation material balance. All such material will be certified clean by the operator. Any import backfill material will be received only if it is certified clean by the importing party. An Inert Fill Notice form must be submitted to the division through a TR prior to import and backfill with this material.

## 4. Topsoil and Overburden Handling

Topsoil ranges from 6 to 8 inches. Overburden ranges from 2 to 4 feet throughout the site, for an average of 3 feet. Topsoil and overburden will be stripped with appropriate earthmoving equipment as deemed suitable for the operation such as front-end loaders, dozers, excavators, and water trucks. Topsoil and overburden will be stockpiled separately onsite in either designated stockpiles, berms, or directly placed to create final reclamation slopes. Stockpiles will not be created in the floodway that makes up the majority of the northern portion of the site. Initial stripping will be placed in temporary stockpiles located on the south side of the operation. Materials will be directly placed in the designated stockpile areas or berms which can be seen on Map C-3. Stockpiles to be in place longer than 90 days will be seeded with the permanent seed mix to prevent erosion (see Exhibit E for seed mix). Topsoil stockpiles will be re-handled as little as possible to prevent erosion and vegetation disturbance. A technical revision is required to relocate topsoil stockpiles.

An average of 0.58 feet of topsoil and 3 feet of overburden were assumed to determine the overall material balance shown in Table D-3.

**Table D-3 Topsoil and Overburden Material Generated During Mining**

| <b>Material Generated (CY)</b> |         |
|--------------------------------|---------|
| <b>Topsoil</b>                 | 112,700 |
| <b>Overburden</b>              | 579,800 |

Due to the reclaimed land use as water storage ponds, there will be an excess of topsoil than what is needed for reclamation. This is because the pond makes up the majority of the

reclaimed land and does not need to be topsoiled entirely. Excess topsoil and overburden will be used to achieve the final grading shown in the reclamation map in Exhibit F. Overburden, topsoil, and sand will be used to backfill mining slopes to their final reclaimed state. Topsoil will be replaced on all disturbances outside of the ponds and on the pond slopes. It will not be replaced on the pond floor. Topsoil will be replaced in an average 6- to 8-inch layer based on the available topsoil stripped. Details pertaining to reclamation can be found in Exhibit E and the maps in Exhibit F.

## 5. Oil & Gas Facility Handling

Existing oil and gas facilities will be disturbed as minimal as possible, with proper setbacks kept from any facilities that will remain through mining. The slurry wall will be installed with proper care where it interacts directly with these facilities. Areas surrounding gas and other pipelines will be excavated carefully to avoid causing damage. The slurry will then be poured under and around these facilities which will serve to seal and support them. This is a common practice for slurry walls that the installation crew will have experience in handling.

Some of the oil and gas facilities will be removed, as shown on Map C-2. These will be removed by the facility owner with collaboration of the mining operator.

## 6. Site Access

Primary access to the site is via the entrance road on the north side of Weld County Road (WCR) 394. Site access is shown on map C-1. No improvements to this access are necessary.

## 7. Internal Roads

Internal access to the mining and operating areas will be achieved with gravel roads approximately 30 ft. wide although this may vary. An existing road through the center of the west and center pod will be utilized for mining activities, however no improvements will be constructed on this road. Other roads to access currently undisturbed areas will be constructed by topsoil and vegetation stripping, then covering in road base or gravel which will be sourced from the site. All roads will be sprayed for dust control and will drain internally to the pits.

## 8. Water Information, Rights, and Augmentation

All water right issues such as availability of water for this operation, consumption rates, dust control, etc. are presented in Exhibit G – Water Information.

## 9. Schedule of Operations

Mining operations will occur as dictated by demand with an average annual production of 300,000 tons. Mining, screening, and processing will be conducted on site with portable

equipment throughout the year. The operator will not have night gravel mining operations, although minor truck activity and repairs may occur after hours.

## 10. City of Evans Impacts and Environmental Impacts

All potential city impacts and concerns are addressed in the City of Evans Special Use Permit.

# EXHIBIT E

# RECLAMATION PLAN

## 1. General Reclamation Plan

The total mining area to be reclaimed under this permit is 99.3 acres out of the 159.2-acre permit and affected area. Reclamation of the Evans Mining Resource will convert the site to a final land use of a water storage pond and rangeland. The industrial area containing the asphalt plant and aggregate processing/recycling plants will remain after reclamation. Reclamation will occur concurrently with mining. Final reclamation will be completed after mining has finished. The pre-mine land use is predominantly agriculture. Surroundings land uses include agriculture, open space, mining, and industrial. Pursuant to Rule 6.4.5.2(b), the applicant evaluated the post-mine land use in regard to adopted state and local land use plans for this area and adjacent land uses. The proposed post-mine land use of water storage ponds and rangeland is compatible with the general agricultural character of the area. Table E-1 below summarizes the anticipated final land uses within the affected area upon completion of reclamation. The distribution of rangeland and water storage ponds may vary based on the market demand for inert backfill storage. A technical revision is required prior to change the final land use acreages.

**Table E-1 Reclamation Areas**

| Description                                           | Area (Acres) |
|-------------------------------------------------------|--------------|
| Rangeland                                             | 5.3          |
| Water Storage Pond                                    | 94           |
| Processing & Industrial Areas (Will Not be Reclaimed) | 20.5         |
| Disturbed Area Total                                  | 119.8        |
| Undisturbed Area                                      | 39.4         |
| <b>Total Affected Area</b>                            | <b>159.2</b> |

Reclamation will occur concurrently as mining progresses. The maximum area disturbed at any time will be 50 acres. Mining slopes will be backfilled and graded to a maximum 3H:1V slope. The slopes will then be compacted for stabilization and to prevent erosion. All portable facilities and equipment will be removed from the area. All berms will be flattened. The slurry wall will remain during and after reclamation. The pond slopes and any other surrounding disturbances will be topsoiled and seeded for revegetation. Topsoil will be replaced in a 6- to 8-inch average thickness layer to restore the current soil profile. Revegetation will be completed using a native seed mix recommended by the Natural Resource Conservation Service. Revegetation efforts will be monitored following reclamation. The pit will be used for freshwater storage after it has been fully reclaimed and revegetated.

There will be more than enough material stockpiled from on-site materials to fulfill reclamation needs as the water storage pond takes up the majority of the reclamation area. Table E-2 shows the volumes of topsoil and overburden required for reclamation and the material volumes that will be stripped and stockpiled. As shown, there is an excess of topsoil and overburden that

is stripped versus what is required for reclamation. These calculations were made assuming that the site has an average 7 inches of topsoil and 3-feet of overburden across all areas. Topsoil will be replaced in an average 6- to 8-inch layer across all non-pond disturbances and the pond slopes, while overburden and other excess material will be used to backfill the pit slopes from 1.5H:1V to 3H:1V.

**Table E-2 Reclamation Volumes**

| Material Available on Site |              |                       |                          | Requirements for Reclamation |                                   |
|----------------------------|--------------|-----------------------|--------------------------|------------------------------|-----------------------------------|
| Reclamation Area           | Area (acres) | Topsoil Stripped (CY) | Overburden Stripped (CY) | Topsoil Required (CY)        | Overburden Backfill Required (CY) |
| Mining Area & Surroundings | 99.3         | 93,450                | 480,600                  | 30,180                       | 287,550                           |

Excess material will be used for backfilling slopes. Sand that may be encountered will be used for backfilling or will be sold. Asphalt Specialties will keep the minimum amount of material (topsoil, overburden, and potentially sand) required for reclamation throughout the entire mine life.

## 2. Alternative Reclamation Plan

The pits may alternatively be backfilled and reclaimed to entirely rangeland, following a Amendment with the DRMS to change the final land use. One or more of the pits will be backfilled entirely with excess material from both on and off site. Material will be graded and compacted prior to topsoiling, ripping, and seeding for revegetation. All other components of reclamation will remain the same as the primary reclamation plan, except for the removal of the water storage use. Pit walls will be backfilled to 3H:1V after mining is completed in an area. See Map F-3 for the details on the alternative reclamation plan.

The approximate volumes needed for reclamation are as follows. It is assumed that all pit walls have been backfilled to 3H:1V prior to the total backfilling of the pit. The volume to backfill the walls to their final reclaimed slopes is shown in Table E-2.

An affidavit of import materials has been included with this reclamation plan to facilitate the backfilling of the pits with off-site materials. The operator commits to filing this application prior to importing fill.



**Table E-4 Alternative Reclamation Volumes**

| Reclamation Area     | Material Available on Site |                       |                          | Requirements for Reclamation |                            |
|----------------------|----------------------------|-----------------------|--------------------------|------------------------------|----------------------------|
|                      | Area (acres)               | Topsoil Stripped (CY) | Overburden Stripped (CY) | Topsoil Required (CY)        | Pit Backfill Required (CY) |
| <b>Phase 2 Pod</b>   | 21.4                       | 20,150                | 103,550                  | 20,150                       | 1,003,650                  |
| <b>Phase 3+4 Pod</b> | 36.4                       | 34,250                | 176,200                  | 34,250                       | 1,742,150                  |
| <b>Phase 5+6 Pod</b> | 41.5                       | 39,050                | 200,850                  | 200,850                      | 1,869,950                  |
| <b>Total</b>         | 99.3                       | 93,450                | 480,600                  | 93,450                       | 4,615,750                  |

### 3. Topsoil Replacement

An average 6-8 inches of topsoil will be stripped and stockpiled prior to mining. After backfilling and grading has been completed during reclamation, topsoil will be replaced at an average depth of 6-8 inches in a manner that is similar to the pre-mine soil profile. Topsoil will only be placed on the pond slopes and other surrounding disturbances. Topsoil will not be replaced on the pond floors. Replaced topsoil will be directly placed by loaders and haul trucks. All topsoiled areas will be disced to aid in root penetration.

### 4. Haul Roads and Access

All internal haul roads will remain following reclamation to support the future land use.

### 5. Reclamation Timetable and Sequence

The sequence and timing of reclamation can be seen in Table E-4 below. The reclamation schedule is dependent on the rate of mining and fluctuating market demands. The operator will reclaim the site concurrently with the progression of mining to limit the total disturbance.

**Table E-4 Reclamation Timetable**

| Description                                                                                                                    | Time Required |
|--------------------------------------------------------------------------------------------------------------------------------|---------------|
| Construction of slurry wall A.                                                                                                 | 2 months      |
| Initial stripping of Phase 1 & 2.                                                                                              | 1 month       |
| Mine and reclaim Phase 2 according to approved plans. Reclamation occurs as mining has reached its maximum extents in an area. | 4.5 years     |
| Construction of slurry wall B.                                                                                                 | 2 months      |
| Initial stripping of Phase 3/4.                                                                                                | 1 month       |

|                                                                                                                                                                                                                 |                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Mine and reclaim Phase 3 &amp; 4 according to approved plans. Reclamation occurs as mining has reached its maximum extents in an area. Stripping of Phase 4 occurs towards the end of mining in Phase 3.</b> | 8 years          |
| <b>Initial stripping of Phase 5/6.</b>                                                                                                                                                                          | 2 months         |
| <b>Mine and reclaim Phase 5 &amp; 6 according to approved plans. Reclamation occurs as mining has reached its maximum extents in an area. Stripping of Phase 6 occurs towards the end of mining in Phase 5.</b> | 8.5 years        |
| <b>Finish remaining reclamation in Phase 5 &amp; 6 Pit.</b>                                                                                                                                                     | 0.5 years        |
| <b>Vegetation Monitoring</b>                                                                                                                                                                                    | 2 years          |
| <b>Total</b>                                                                                                                                                                                                    | <b>~23 years</b> |

## 6. Revegetation Plans

Seed will be placed in all areas to be vegetated following grading, topsoiling, and discing of the soil. All disturbances that are retopsoiled will be seeded with a Rangeland Seed Mix. The Weld County recommended mix to be used is as follows:

### 6.1. Rangeland Seed Mix

| <b><u>Species</u></b> | <b><u>Pounds of pure live seed<br/>per acre (drilled)</u></b> |
|-----------------------|---------------------------------------------------------------|
| Sand Bluestem         | 1.0                                                           |
| Sand Lovegrass        | 2.5                                                           |
| Indian Ricegrass      | 3.0                                                           |
| Prairie Sandreed      | 0.75                                                          |
| Green Needlegrass     | 1.5                                                           |
| Little Bluestem       | 0.75                                                          |
| Yellow Indiangrass    | 0.5                                                           |
| Switchgrass           | 1.5                                                           |
| Sand Dropseed         | 0.5                                                           |
| <b>Total</b>          | <b>12.0</b>                                                   |

Broadcast seeding will be done at double the drill rate. Mulch will be placed at roughly 4000 pounds per acre.

## 7. Post Reclamation Site Drainage

The site will drain internally following reclamation. All water that enters the site will drain to the water storage ponds in the center of the site. Refer to Map G-1 for the post reclamation drainage of the site. In the case of the alternative reclamation plan, the site will return to pre-mining drainage conditions.

## 8. Revegetation Success Criteria

Revegetation will be deemed adequate when erosion is controlled, the vegetation cover matches neighboring wildlife habitat areas, and when it is considered satisfactory according to Division standards. This will be monitored for a minimum of two years following the completion of reclamation.

## 9. Monitoring Reclamation Success

Measures will be employed for the control of any noxious weed species. The objective of this weed management plan is to control undesirable plants on the Evans property. Plants identified through the Colorado Noxious Weed Act (C.R.S 35-5.5) and the Weld County Noxious Weed List as undesirable and designated for management within the county will be controlled. Any weeds identified as List A species will be eradicated. Other lower listed plants identified as noxious weeds will be managed by control measures. A Weed Control Plan will be utilized as follows:

- 1) Each April, a weed survey will be taken of the permit area.
- 2) If any patches or plants have been identified, they will be addressed by implementing control measures appropriate based on their list. Control measures may include monitoring for containment, mowing, and/or spraying as deemed appropriate by the weed control staff of Weld County.
- 3) After reclamation, weed surveys and implementation of control measures will continue until the perennial cover and production of the site have met DRMS requirements and bond release has been obtained.

The Division and Weld County staff will be consulted regarding any weed infestation areas and any control measures prior to their initiation. The plan does not contemplate total weed removal on the property. Rather, the goal is to prevent the spread of weeds into uninfected areas as is the primary goal of the Weld County Weed Management Plan.

Each year during the mining operation, the permit area will be monitored closely, through which the operator may determine if any additional weeds have grown. If any new species of weeds are found, Weld County and the Division will be consulted in order to formulate the best plan for the new infestation.

## 9.1. Weed List

Weeds listed in

Table E-1 will be eradicated or suppressed according to Weld County requirements.

**Table E-1. Weld County Weed List**

| <b>Eradication</b>             | <b>Suppression</b>     |
|--------------------------------|------------------------|
| <b>List A (in Weld County)</b> |                        |
| Cypress Spurge                 | Myrtle Spurge          |
| Haire Willow-Herb              | Purple Loosestrife     |
| Japanese                       | Yellow Flag Iris       |
| <b>List B (in Weld County)</b> |                        |
| Absinth Wormwood               | Eurasian Watermilfoil  |
| Black Henbane                  | Jointed Goatgrass      |
| Bull Thistle                   | Musk Thistle           |
| Chamomile species              | Russian knapweed       |
| Chinese Clematis               | Scotch Thistle         |
| Houndstongue                   | Yellow Nutsedge        |
| Moth Mullein                   | Bouncingbet            |
| Oxeye Daisy                    | Common Tansy           |
| Plumeless thistle              | Dalmation Toadflax     |
| Spotted knapweed               | Dames Rocket           |
| Sulfur Cinquefoil              | Diffuse Knapweed       |
| Tamarisk                       | Hoary Cress            |
| Wild Caraway                   | Leafy Spurge           |
| Yellow Toadflax                | Perrenial Pepperweed   |
| Canada Thistle                 | Russian Olive          |
| Common & Cutleaf Thistle       |                        |
| <b>List C (in Weld County)</b> |                        |
| Common Mullein                 | Field Bindweed         |
| Cheatgrass/Downy Brome         | Puncturevine/Goatheads |

# EXHIBIT G

# WATER INFORMATION

## 1. General

The Evans Mining Resource is within the floodplain and floodway of the South Platte River. Mining within the floodway will be conducted with no filling or stockpiling above the natural ground grade. Groundwater is located roughly five feet below the natural grade. All groundwater onsite is part of the South Platte River alluvial aquifer. Prior to mining, slurry walls will be installed around the perimeter, as shown on Map C-3. These slurry walls will be for the development of water storage reservoirs following reclamation. Asphalt Specialties is committed to protecting the hydrological balance and water quality at the site.

## 2. Water Quality Protection

The primary concerns surrounding water quality protection at the Evans Mining Resource site are the potential impacts to the surface and groundwater from sediment, hydraulic fluids, and diesel fuel. Sediment will be controlled through the use of stormwater retention within the disturbance area through the life of the mine. The site will be graded in a manner that maintains all surficial flows within the disturbed area, in turn containing all sediment and unwanted discharges from leaving the site. Hydraulic fluids and diesel fuels will be contained within vehicles that follow best practices of maintenance; these practices include regular inspections of vehicles, hydraulic lines, and any other potential spill sources. Diesel fuel or other oils will not be stored on-site.

Any surface water discharges from the site will be sampled in accordance with the existing NPDES discharge permit. All discharge will be via the approved Outfall under the existing permit number COG502204.

**Table G-1. Surface Water Discharge Monitoring Requirements from Existing NPDES Discharge Permit**

| <b>Parameter</b>                  | <b>Monitoring Frequency</b>                | <b>Sample Type</b> |
|-----------------------------------|--------------------------------------------|--------------------|
| <b>Flow</b>                       | Instantaneous, Monthly                     | In-situ            |
| <b>pH</b>                         | 2x/month                                   | Grab               |
| <b>Total Suspended Solids</b>     | 2x/month                                   | Grab               |
| <b>Oil and Grease Visual</b>      | 2x/month                                   | Visual             |
| <b>Oil and Grease</b>             | Contingent on visibility of oil and grease | Grab               |
| <b>Total Flow</b>                 | Instantaneous, Monthly                     | Calculated         |
| <b>Electrical Conductivity</b>    | Quarterly                                  | Grab               |
| <b>Arsenic, Total Recoverable</b> | 2x/month                                   | Grab               |

### 3. Floodplain

The majority of the site is within the 100-year floodplain and floodway as reported by the Federal Emergency Management Agency. These boundaries are shown in the Exhibit C and F maps. The minimum distance maintained from the South Platte River to excavation activities is 150 feet where river and pit-side armoring will occur. This can be seen on Map C-2 and F-1 in the easternmost pit. All other mining activities will maintain a minimum 400 foot setback from the river which is the minimum setback for no armoring. Additionally, no stockpiling or filling above the natural grade will occur in the floodway. Overall, the downstream flood impacts should remain the same or be reduced from activity at the site as the removal of material results in more storage space for flood water below the existing grade. A no-rise certification will be provided to Weld County as part of its floodplain development permit.

In accordance with the Mile High Flood Control District technical guidelines, an inflow/outflow structure will be installed along the riverbank where mining reaches its closest point to the South Platte River to prevent erosion of the bank. Details of these designs can be seen on Map G-1.

In the event of flooding at the site, equipment from the active mining floor will be removed and the pit will be allowed to fill with water. The flooded pit will be pumped only after the flood has subsided. All fuel will be stored at least one foot above the base flood elevation and in sufficient secondary containment with 110% carrying capacity.

### 4. Wetlands

No wetlands exist on the site.



## 5. Aquifers

The only identified aquifer located at the site is the shallow alluvial aquifer of the South Platte River. The depth to this aquifer varies throughout the year but is typically five feet below surface. According to the U.S. Geological Survey's Ground Water Atlas of the United States<sup>1</sup>, the underlying bedrock aquifer is the Laramie Fox Hills Aquifer of the Denver Basin system. The entirety of the Evans Mining Resource operation will take place in the overlaying alluvium above a shale/siltstone layer; the Laramie Fox Hills Aquifer will not be mined.

## 6. Surface Water

The mining operation will impact surface water in the area through the stormwater runoff that enters the site. Map G-1 shows the drainage patterns and how they are affected throughout the life of the mine. The maps include information on the drainage basins currently, during mining, and post reclamation as well as the drainage directions throughout these stages. The primary concern for surface water protection at the site is preventing the discharge of sediment, oil, and/or hydraulic fluids from the operation areas. Oils and hydraulic fluids are stored on site following the standard best management practices. These practices include the use of secondary containment at fluid storage and transfer points, spill kits, and employee training regarding safe handling practices. Sediment is trapped onsite using controls and best management practices by directing and controlling surface water runoff that enters the disturbed areas. More information on sediment and surface water control is provided below.

### 6.1. Surface Water Handling

One drainage basin collects all stormwater runoff on and around the Evans site. This is shown on the Drainage Map.

#### 6.1.1. Mining

During all phases of mining, surface water runoff will drain to the active pit or reclaimed reservoir. Water collected in the active mining pod will be allowed to evaporate or will be discharge via the approved CDPHE outfall once sediment has settled out.

#### 6.1.2. Post Reclamation

The drainage patterns during mining will be retained following reclamation of the site. Any surface water runoff will collect in the reclaimed reservoir. There is enough storage capacity above the anticipated reservoir level and the top of the shore to store the 100-year storm events.

#### 6.1.3. Flood Protection

Mining will extend to within 150 feet from the South Platte River as shown on the Drainage Map. Due to this proximity to the river, measures will be taken to protect the riverbank from erosion

---

<sup>1</sup> [https://pubs.usgs.gov/ha/ha730/ch\\_c/](https://pubs.usgs.gov/ha/ha730/ch_c/)

during a flood event. An inflow and outflow structure will be constructed between the River and the mining pod once mining is within 300 feet of the river. These structures will allow for the safe exchange of flood waters between the pit and river which prevents erosion of the riverbank and pitside slope during flood events. These structures are of a design approved for use by the Mile High Flood District. Details of the inflow/outflow structure are shown on Map F-2.

## 6.2. Disturbed Area Runoff

During all stages of mining, there is enough water storage capacity to contain the 5-year and 100-year 24-hour storm events and prevent erosion from surface water discharge. The expected rainfall from these events at the Evans Site is provided in Table G-2 below.

**Table G-2. Area Storm Events (from NOAA<sup>2</sup>)**

| Event Probability | Event Rainfall (inches) |
|-------------------|-------------------------|
| 100-YR 24-HR      | 4.74                    |

The peak runoff was generated from these values for the three drainage basins during all stages of mining. Pre-mine, mining, and reclamation conditions are delineated on the Drainage Map. The discharge volumes from these storm events are calculated in Appendix G-1 at the end of this exhibit. Table G-3 summarizes the runoff volumes and storage volumes for each drainage. All drainage calculations were made using the Rational Method identified in the Mile High Flood Control District.

**Table G-3. Drainage Calculations**

| Drainage Basin Runoff & Destination |                         |           |                    |                             |                               |                            |
|-------------------------------------|-------------------------|-----------|--------------------|-----------------------------|-------------------------------|----------------------------|
| Drainage Basin                      | Phase of Operation      | Area (ac) | Runoff Coefficient | 100-YR 24-HR Runoff (ac-ft) | Detention Capacity (ac-ft)*** | Discharge Flow Rate (gpm)* |
| 1                                   | Baseline                | 39.8      | 0.23               | 1.41                        | N/A                           | 0                          |
|                                     | Mining                  |           | 0.37               | 2.64                        | 500+                          | 1000-3000**                |
|                                     | Reclamation             |           | 0.59               | 4.21                        | 43                            | 0                          |
|                                     | Reclamation Alternative |           | 0.23               | 1.41                        | N/A                           | 0                          |
| 2                                   | Baseline                | 120       | 0.22               | 4.42                        | N/A                           | 0                          |
|                                     | Mining                  |           | 0.4                | 8.60                        | 2000+                         | 1000-3000**                |
|                                     | Reclamation             |           | 0.7                | 16.75                       | 156                           | 0                          |
|                                     | Reclamation Alternative |           | 0.21               | 4.21                        | N/A                           | 0                          |

\* The discharge flow rate is calculated from the peak discharge of the 100-Yr 24-Hr storm event.

\*\*Discharge flow rate is variable and controlled during mining as all discharges are pumped from the pit

\*\*\*Detention Capacity calculated in CAD as volume in pit or volume above water storage.

<sup>2</sup> National Oceanic and Atmospheric Administration

## 7. Groundwater

Groundwater is located approximately five feet below the surface at the Evans site. This was determined from wells installed onsite. Table G-4 outlines all wells within 600' of the permit area. These well locations are also shown on Map C-2. Groundwater quality data was gathered in advance of mining. This data and discussion of it can be seen in the Groundwater Monitoring Plan in Appendix G-2.

**Table G-4. Wells Within 600' of Permit Area**

| Applicant/Well ID                    | Permit ID | Total Depth (feet) | Purpose               | Distance from nearest mining area (ft) |
|--------------------------------------|-----------|--------------------|-----------------------|----------------------------------------|
| ASPHALT SPECIALTIES CO INC           | 332478-   | 38                 | MONITORING & SAMPLING | <100 FT                                |
| ASPHALT SPECIALTIES CO INC           | 332479-   | 41                 | MONITORING & SAMPLING | <100 FT                                |
| ASPHALT SPECIALTIES CO INC           | 332484-   | 42                 | MONITORING & SAMPLING | <100 FT                                |
| ASPHALT SPECIALTIES CO INC           | 332483-   | 40                 | MONITORING & SAMPLING | <100 FT                                |
| ASPHALT SPECIALTIES CO INC           | 332482-   | 37                 | MONITORING & SAMPLING | <100 FT                                |
| ASPHALT SPECIALTIES CO INC           | 332481-   | 34                 | MONITORING & SAMPLING | <100 FT                                |
| ASPHALT SPECIALTIES CO IN            | 332480-   | 43                 | MONITORING & SAMPLING | <100 FT                                |
| SORIN NATURAL RESOURCES PARTNERS LLC | 55499-MH  | 12                 | MONITORING & SAMPLING | <400 FT                                |
| SORIN NATURAL RESOURCES PARTNERS LLC | 55498-MH  | 12                 | MONITORING & SAMPLING | <100 FT                                |
| GURNEY, NORMAN                       | 103102-   | 30                 | DOMESTIC              | >600 FT                                |
| HERNANDEZ, MARTIN                    | 299707-   | 40                 | DOMESTIC              | >600 FT                                |
| CONOVER JR, DAVID                    | 283674-   | 21                 | IRRIGATION STOCK      | ~150 FT                                |

### 7.1. Groundwater – Mining

Prior to mining, slurry walls will be installed around the perimeter of the pit to prevent groundwater flow into the mining area. Following slurry wall installation, the operator will mine out the pod by dewatering it via the approved CDPHE discharge point. Pumping to conduct this dewatering will take place during the initial mining and then pumping will cease. Stormwater runoff that is collected may be pumped out to protect local water rights, once sediment has settled. For this reason, the CDPHE discharge point will be maintained over the life of the mine. The pump will be located at least two feet below the active mining floor at the lowest point of the pit. It will be surrounded by a gravel filter. This configuration minimizes the risk of sediment being pumped out of the pit.

## 7.2. Groundwater – Reclamation

Permanent water storage reservoirs will be left behind, as can be seen on Map F-1. There will be no groundwater consumptive use in reclamation.

## 7.3. Groundwater – Slurry Wall Impact

The installation of a slurry wall within the alluvial aquifer of the South Platte River creates two main potential impacts to the aquifer: the creation of local groundwater shadows or mounding that damage neighboring structures or property and the potential exacerbation of regional groundwater impacts. These impacts however are anticipated to be very localized and not impact nearby wells. Additionally, a french drain will be constructed up-gradient of the slurry walls to control groundwater mounding. The drain will direct abnormally high water to an infiltration gallery in the permit area that will return the water to the groundwater aquifer and river.

# 8. Water Related Permits

The operator is applying for all necessary permits that have not already been acquired for water handling at the Evans Mining Resource. This includes a discharge permit with the Colorado Department of Public Health and Environment and a gravel well permit for initial dewatering of each pod with the Colorado Division of Water Resources.

# 9. Water Consumption and Source

Water for dust control will be the primary consumptive use at the Evans Mining Resource site. Water will be sourced from ponds in the processing area for processing and aggregate washing purposes. Additional water may be sourced from a groundwater well. The proper permits (gravel well permit, groundwater well permit, augmentation plan) will be acquired prior to construction and use of water from these sources. Water may also be bought from a local source and transported to the site.

No ongoing water consumptive use exists in reclamation, since the water storage pod is lined. Table G-5 summarizes the estimated water consumption for the operation throughout the year.

**Table G-5. Water Consumption**

| <b>Month</b> | <b>Dust Control<br/>(ac-ft)</b> | <b>Evaporative Depletions<br/>(ac-ft)</b> | <b>Water Removed from Mining<br/>(ac-ft)</b> | <b>Total<br/>(ac-ft)</b> |
|--------------|---------------------------------|-------------------------------------------|----------------------------------------------|--------------------------|
| <b>Jan</b>   | 0.11                            | 0.00                                      | 0.00                                         | 0.1                      |
| <b>Feb</b>   | 0.12                            | 0.00                                      | 0.00                                         | 0.1                      |
| <b>Mar</b>   | 0.19                            | 0.00                                      | 0.00                                         | 0.2                      |
| <b>Apr</b>   | 0.32                            | 0.00                                      | 0.00                                         | 0.3                      |
| <b>May</b>   | 0.42                            | 0.00                                      | 0.00                                         | 0.4                      |
| <b>Jun</b>   | 0.51                            | 0.00                                      | 0.00                                         | 0.5                      |
| <b>Jul</b>   | 0.53                            | 0.00                                      | 0.00                                         | 0.5                      |
| <b>Aug</b>   | 0.47                            | 0.00                                      | 0.00                                         | 0.5                      |
| <b>Sep</b>   | 0.35                            | 0.00                                      | 0.00                                         | 0.4                      |
| <b>Oct</b>   | 0.25                            | 0.00                                      | 0.00                                         | 0.3                      |
| <b>Nov</b>   | 0.14                            | 0.00                                      | 0.00                                         | 0.1                      |
| <b>Dec</b>   | 0.11                            | 0.00                                      | 0.00                                         | 0.1                      |
| <b>Total</b> | <b>3.50</b>                     | <b>0.00</b>                               | <b>0.00</b>                                  | <b>3.5</b>               |

The Evans Mining Resource sources water for operations via water contract. Any groundwater exposure will be covered by a gravel well permit with the Colorado Division of Water Resources.

# EXHIBIT H

# WILDLIFE INFORMATION

## 1. Introduction

Wildlife habitat types in or near the Evans Mining Resource area are primarily comprised of cultivated cropland/pasture which is degraded from a wildlife perspective by historic land use practices. The grazing tends to keep the vegetation short, minimizing cover for wildlife and allowing weeds to increase in the area.

Given the location of the Evans Mining Resource just south of Evans, adjacent to the highway, and surrounded by an abundance of gravel pits and agricultural fields, wildlife habitat fragmentation has already occurred. Colorado Parks and Wildlife (CPW) habitat and range mapping has been used to develop this wildlife analysis. The CPW will be consulted as part of the mine permitting process.

## 2. Description of Significant Wildlife Resources on the Affected Land

The affected land is within seasonal and general range of a few non-endangered species.

Examples of mammal species expected in the vicinity that may use the degraded cropland/pasture but not observed include the mule deer (*Odocoileus hemionus*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), porcupine (*Erethizon dorsatum*), deer mouse (*Peromyscus maniculatus*) and Nuttall's cottontail (*Sylvilagus nuttallii*). The area is suitable for species that prefer sparse cover, such as western meadow lark, (*Sturnella neglecta*). While not observed directly, fresh diggings from pocket gophers were observed in the area. The species may be the plains pocket gopher (*Geomys bursarius*). Prairie dogs were observed in abundance on the agricultural portions of the site.

It has been determined that some migratory birds may utilize the Evans Mining Resource Area. These birds are protected under the Migratory Bird Treaty Act (MBTA) and killing, or possession of these birds is prohibited. The active nesting season for most migratory birds in this region of Colorado occurs sometime between April 1 and August 31. Migratory birds are utilizing the Evans Mining Resource site. The mature overstory cottonwood trees and Shrubland and Herbaceous vegetation community on the adjoining property to the Evans Mining Resource property provides potential habitat for migratory birds.

Several migratory birds were observed at the Evans Mining Resource Area, including mourning dove, American robin (*Turdus migratorius*), great blue heron (*Ardea herodias*), mallards, western meadowlark, red-winged blackbird, black-capped chickadee (*Parus atricapillus*), northern flicker (*Colaptes auratus*), Say's phoebe (*Sayornis saya*), American Goldfinch (*Spinus tristis*) and chipping sparrow (*Spizella passerina*). The presence of prairie dogs at the site

indicates the potential presence of burrowing owls, although they were not observed as of Spring 2021, or identified by CPW as of January 2025.

Any future land use changes that occur on Evans Mining Resource Area that remove vegetation during the active nesting season shall ensure that active nests are not disturbed. Colorado Parks and Wildlife (CPW) recommends that active migratory bird nest protected under the MBTA be left undisturbed until the juvenile bird have fledged or until the nest is no longer in use. The MBTA does not restrict disturbances to inactive nests or the surrounding habitat.

Any active raptor nest sites are further protected by the MBTA and CPW. The CPW has established recommended buffer zones and seasonal activity restrictions for a variety of Colorado raptors. No active raptor nest was observed in or just outside of the affected area.

A bald eagle (*Haliaeetus leucocephalus*) was observed flying west along the South Platte riparian corridor. A Swainson's hawk (*Buteo swainsoni*) was seen hunting in the middle portion of the mine resource area. A ferruginous hawk (*Buteo regalis*) was observed perched on a power pole to the south of the property. The bald eagle, ferruginous hawk and Swainson's hawk were not observed in or near any of the raptor nest sites. No bald or golden eagles are known to nest or roost in or near the area. As of December 2024, CPW High Priority Habitat mapping identifies an active bald eagle nest to the northeast of the site, which can be seen on Map C-1 and C-2. CPW recommends that new ground disturbing activities should not occur between December 1-July 31 in a quarter-mile radius from the nest. These timing limitations will be followed for any new ground disturbances, and are addressed on Map C-2 and in Exhibit D.

### 3. Seasonal Use of the Area

The adjoining properties habitat and adjacent riparian corridor includes Western Great Plains Riparian Woodland, shrubland, and herbaceous vegetation communities that provide wildlife values in the South Platte River. Large cottonwood trees (*Populus deltoides*) are present in the riparian corridor and provide potential nesting habitat for hawks, owls, and tree nesting songbirds. No raptor nests were observed in these trees during the spring of 2021. During this time, leaves were just starting to emerge and would have allowed the observation of raptor nests. These trees do provide nesting habitat for species such as American robin (*Turdus migratorius*) and mourning dove (*Zenaida macroura*). Many species of bats may pass through the area and could utilize cottonwood trees for temporary roosting habitat.

The local Mule Deer population utilize the site for winter habitat, with the northernmost portion of the site near the river being classified as critical winter range and a migration corridor by the CPW. The CPW provided recommendations on best management practices surrounding these habitats as part of the DRMS commenting process. The operator will not create any new ground disturbances within a 500 foot setback from the river high water line between December 1-April 30. These timing limitations are also addressed on Map C-2 and in Exhibit D.

CPW High Priority Habitat Mapping identifies, as of December 2024, an active bald eagle nest to the northeast of the site which requires seasonal timing limitations. New ground disturbances



will not occur in the 0.25-mile radius of the nest from December 1-July 31 as recommended by the CPW Best Management Practices.

#### 4. Presence and Estimated Population of Threatened or Endangered Species

No federally listed threatened and endangered species and/or habitat were identified on the property or immediately surrounding the affected land.

The presence of prairie dogs on the agricultural portions of the site indicates the potential presence of burrowing owls which are considered threatened in Colorado. The presence of this species was not noted as of Spring 2021, and is not identified in CPW mapping as of January 2025. However, timing limitations of new ground disturbances must be taken into consideration until a Burrowing Owl Survey has been completed. These limitations are identified in Exhibit D and include burrowing owl surveys or destroying the burrows by discing.

#### 5. Effect of Proposed Operation on Existing Wildlife

Impacts on wildlife use from the proposed project would include direct temporary elimination of potential habitat within the affected area during mining, and temporary localized displacement associated with additional noise and lighting from the proposed project. This localized loss of habitat would not disrupt regional migration or significant movement patterns and would not threaten the overall health and viability of any species. Nearby lands are also disturbed for similar uses, and as such, the Evans Mining Resource will not cause a significant impact on the local area's wildlife habitat.

The affected area will be fully reclaimed at the conclusion of mining which will restore some degree of wildlife habitat over time. Concurrent reclamation and phased mining will also help to reduce the total impact on wildlife. Transformation of the bulk of the agricultural fields onsite into water storage ponds will be a permanent change in overall habitat.

#### 6. Impacts to Fish

Mining will not take place in any waterways or natural lakes. Surface water controls will protect offsite drainages and fish habitats from sediment discharges. Asphalt Specialties will not stock the reclaimed lake with non-native species at any time.

# EXHIBIT M

# OTHER PERMITS REQUIRED

The following permits are necessary to operate at the Evans Mining Resource. Copies of all permits will be provided to the Division after they have been acquired.

1. Colorado Air Pollution Control Division Fugitive Dust Permit and Air Pollution Emission Notice (APEN)
2. Water Quality Control Commission Discharge Permit
3. Colorado Dept. of Transportation access permit
4. City of Evans Floodplain Development permit
5. Colorado Division of Water Resources gravel well permit
6. City of Evans Special Use Permit

# RULE 6.5: GEOTECHNICAL STABILITY EXHIBIT

There are no known geologic hazards on the proposed site. Based on a slope stability analysis, buildings or other structures within 200' of the Evans Pit affected area will not be affected by mining excavation. Sufficient buffers will be maintained to structures. Maps C-3 and F-1 shows these buffers. Slurry walls installed prior to mining will be 30-ft away from the edge of mining. Map C-3 shows the mining and reclamation slopes of the mine. A standard slope was analyzed for stability as it is a good example of the nearest structure, the slurry wall.

The material properties are derived from Table 2.5 in the SME Mining Reference Handbook<sup>1</sup>, as there is no site-specific strength data of the material available. Therefore, all materials are matched to a classification from this table that best matches the materials in terms of description. The native alluvial material is best classified as sand and gravel with a mixed grain size. A layer of overburden and sand lies atop the sand and gravel deposit. This material is best described as loose sand, mixed grain size. The bedrock is a soft sedimentary rock (claystone/siltstone) according to the SME Table 2.5. A summary of the material properties can be seen in Table 6.5-1.

**Table 6.5-1 Material Properties**

| Material                          | Unit Weight (lbs/ft) | Cohesion | Friction Angle |
|-----------------------------------|----------------------|----------|----------------|
| Sand and gravel, mixed grain size | 110                  | 0        | 45             |
| Loose sand, mixed grain size      | 99                   | 0        | 34             |
| Bedrock                           | 110                  | 20,000   | 25.0           |

The final mining (1.5H:1V) and final reclamation (3H:1V) slopes were analyzed. Mining will be conducted at a near active highwall angle until the highwall has reached the half-way point of the final mining slope. Then the vertical active highwall slope will be knocked down to the final mining slope of 1.5H:1V. Then it will be backfilled with overburden/sand to the final reclamation slope of 3H:1V. The final mining and reclaimed slope crests will be the closest excavation comes to the slurry wall and any structures.

## 1. Mining and Reclamation Slopes

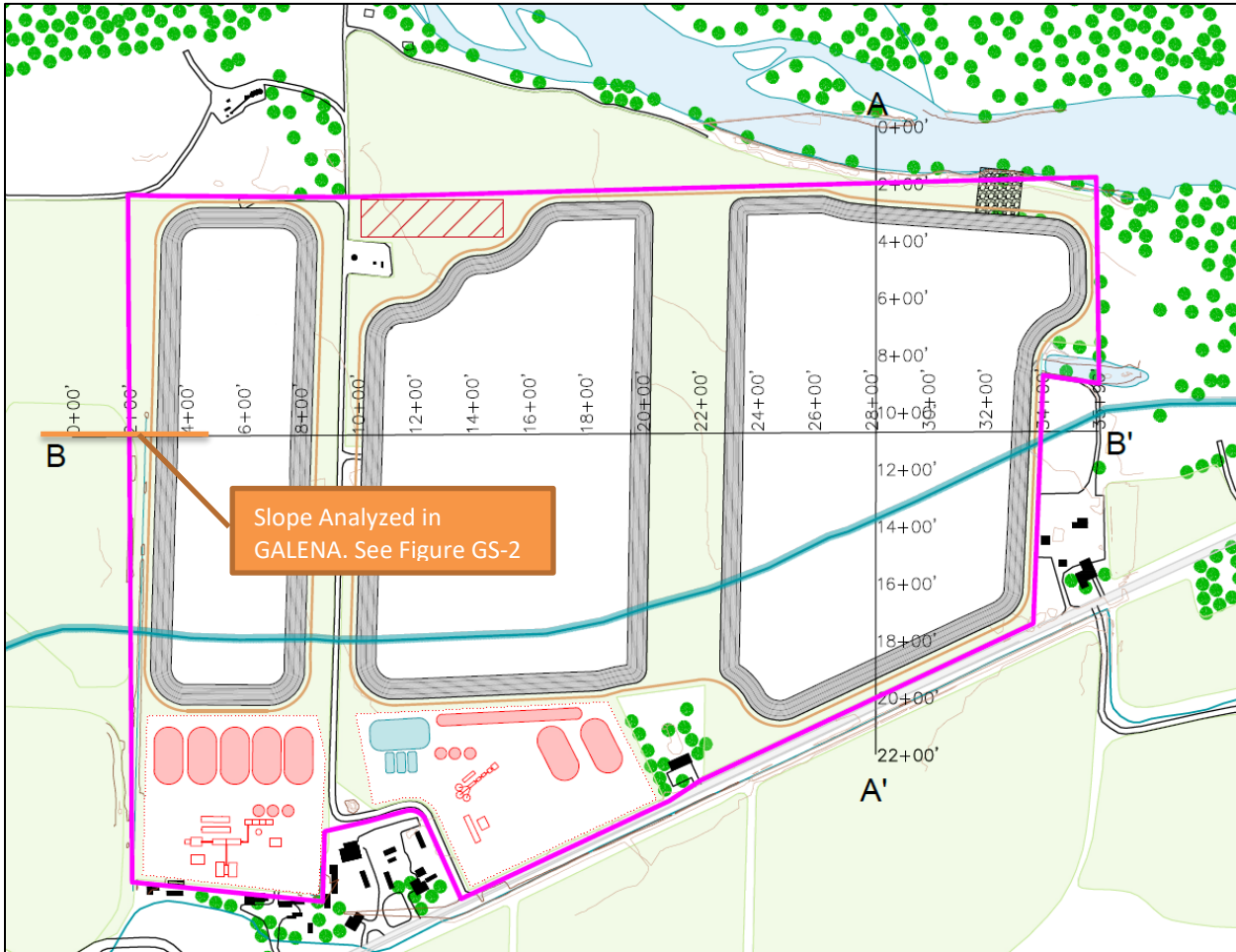
Factor of Safety is expressed in terms of strength divided by stress as a ratio. It is arrived at by an iterative computer process where a slope failure is assumed, the strength and stress of that slope failure are calculated, and those values are compared to determine a lowest factor of

---

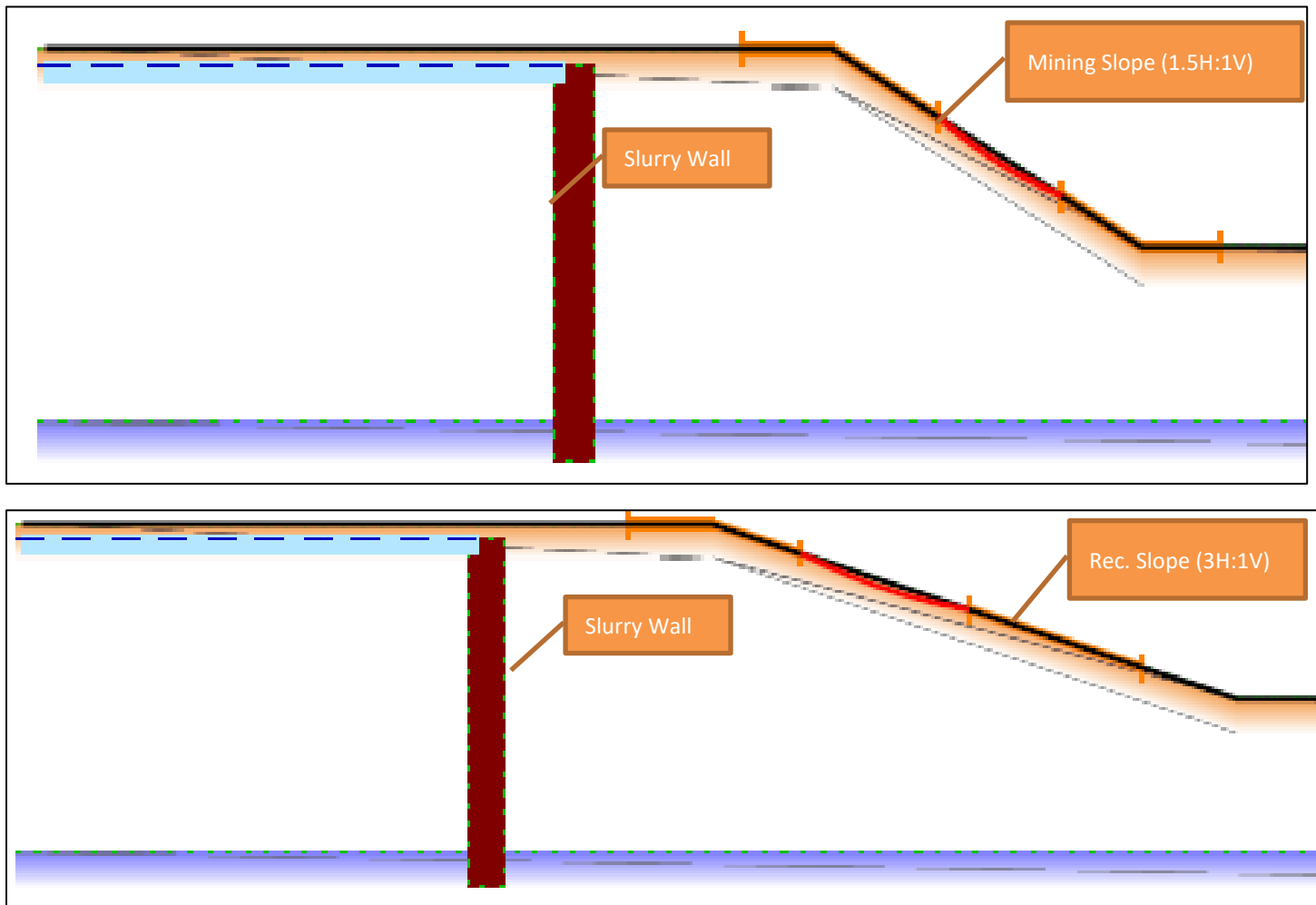
<sup>1</sup> Original source: Hoek and Bray 1977

safety. In the case of the Evans Pit slope stability analysis, the Bishop’s Method of Slices was the iterative calculation used, and the software GALENA was used to model slopes and calculate the factor of safety. One slope closest to major structures (see Figure GS-1) was analyzed to look at the factor of safety. Table GS-1 lists the analysis conducted and their respective factors of safety.

GALENA data tables and analysis result figures are attached as Appendix GS-1.



**Figure GS-1. Locations of Slope Stability Analysis from Map F-1**



**Figure GS-2. GALENA Cross Sections (Mining and Reclamation)**

**Table GS-1. Factors of Safety for Slope Stability**

| Slope Condition   | Lowest Factor of Safety (static) | Lowest Factor of Safety (seismic) | Nearest Structure |
|-------------------|----------------------------------|-----------------------------------|-------------------|
| Full Mining       | 1.51                             | 1.34                              | Slurry wall       |
| Final Reclamation | 3.03                             | 2.45                              | Slurry wall       |

## 2. Conclusion

The Final Reclamation slope has a minimum factor of safety (FoS = 3.03) of greater than 1.5 for static conditions. The Final Mining slope also has a minimum FoS greater than 1.5 (1.51) for static conditions. These Factors of Safety are greater than the CDRMS minimum for critical structure of 1.5. The seismic conditions analysis for both scenarios are similarly above the CDRMS minimums for critical structures:  $1.34 > 1.3$  and  $2.45 > 1.3$

The slope stability analysis in this permit has been prepared according to appropriate engineering standards and practices.

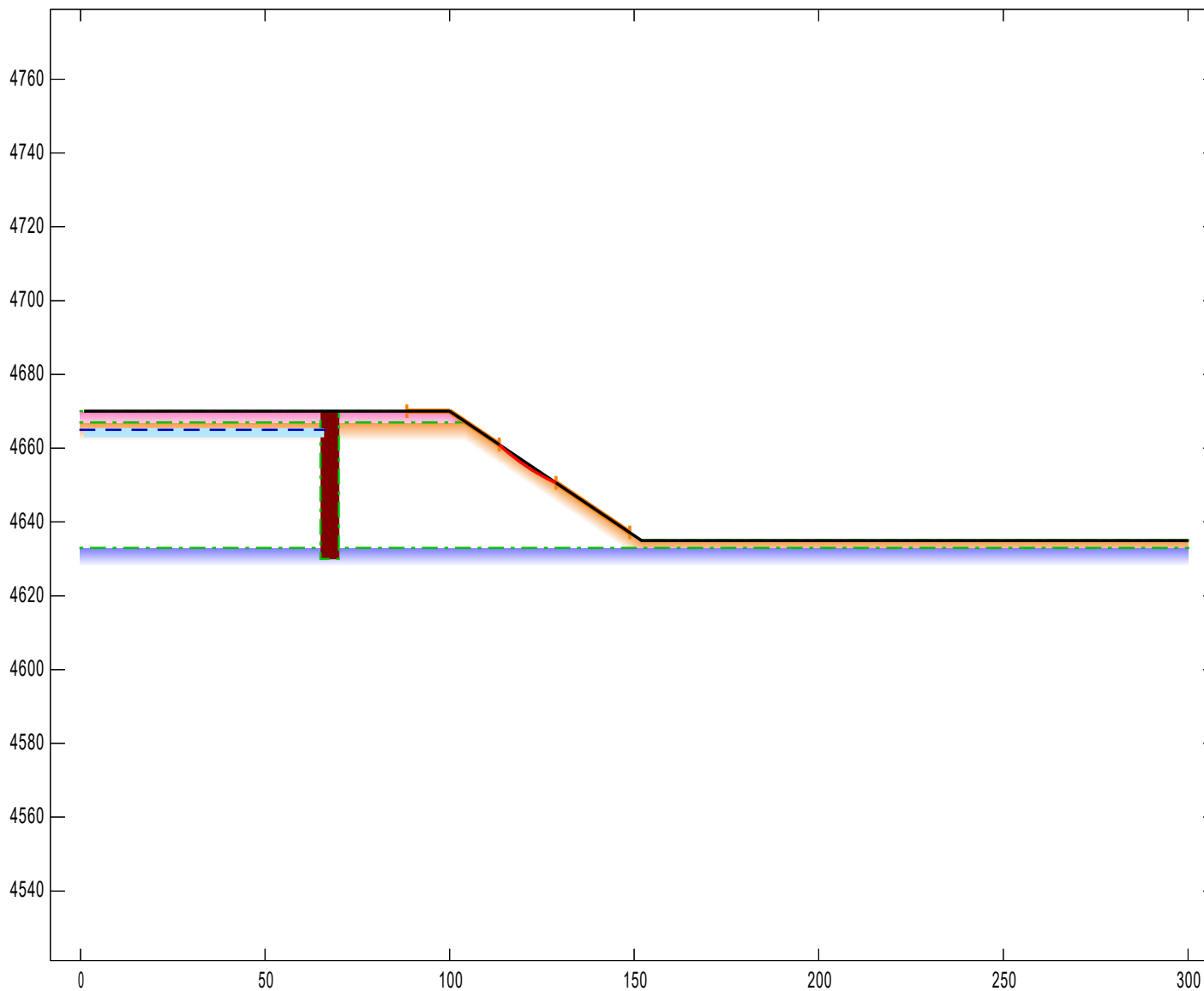
Ben Langenfeld, P.E.

P.E.# 0047151

## APPENDIX GS-1

## GALENA INFORMATION





### Material Keys

- 1: Sand and gravel, mixed grain size
- 2: OB - loose sand, mixed grain size
- 3: Bedrock - claystone
- 4: Slurry Wall

### Analysis 1

Multiple Stability Analysis

Method: Bishop Simplified

Surface: Circular

### Results

Critical Factor of Safety: 1.51

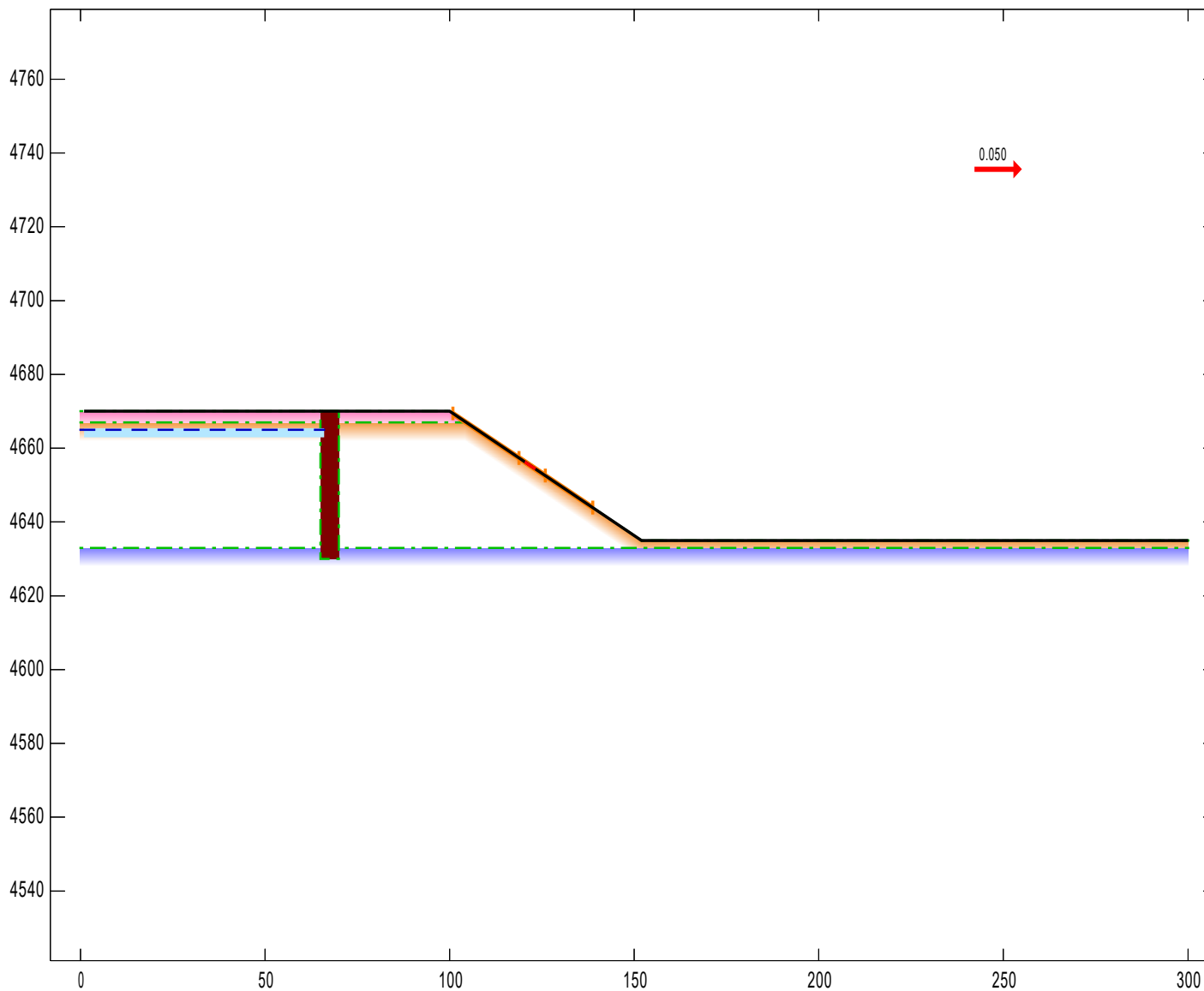
Edited: 13 Nov 2024  
Processed: 13 Nov 2024



**Project** Evans Pit  
Mining Condition

File: E:\Work\GLA Dropbox\Ben Langenfeld\Asphalt Specialties\Evans\Slope Stability\Evans Slope Stability.gmf

Licensed to: Greg Lewicki and Associates



### Material Keys

- 1: Sand and gravel, mixed grain size
- 2: OB - loose sand, mixed grain size
- 3: Bedrock - claystone
- 4: Slurry Wall

### Analysis 2

Multiple Stability Analysis

Method: Bishop Simplified

Surface: Circular (Critical Seed)

### Results

Critical Factor of Safety: 1.34

**GALENA** Version 7.1

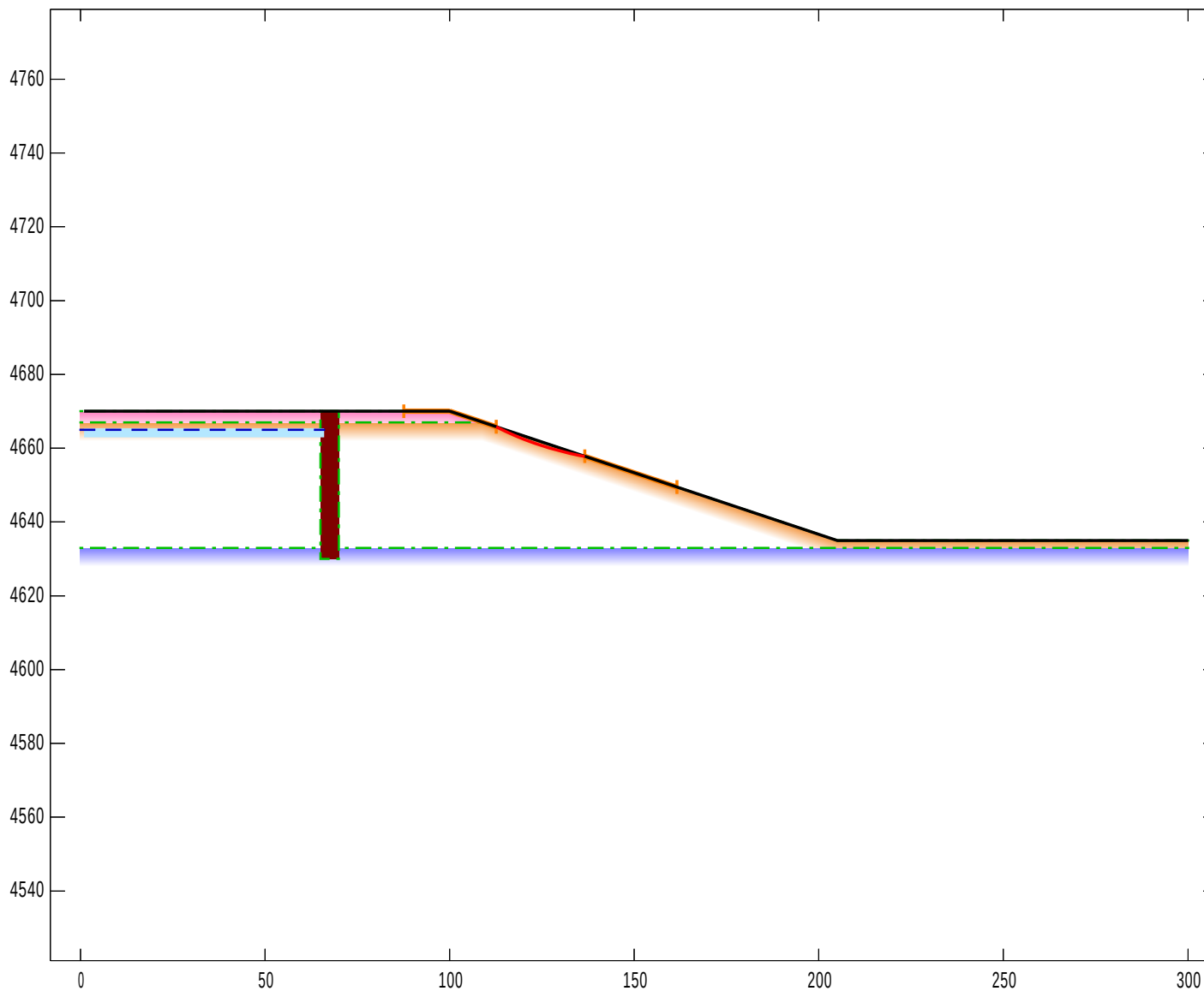
Licensed to: Greg Lewicki and Associates

**Project** Evans Pit  
Mining Condition

File: E:\Work\GLA Dropbox\Ben Langenfeld\Asphalt Specialties\Evans\Slope Stability\Evans Slope Stability.gmf

Edited: 13 Nov 2024  
Processed: 13 Nov 2024





### Material Keys

- 1: Sand and gravel, mixed grain size
- 2: OB - loose sand, mixed grain size
- 3: Bedrock - claystone
- 4: Slurry Wall

### Analysis 3

Multiple Stability Analysis

Method: Bishop Simplified

Surface: Circular

### Results

Critical Factor of Safety: 3.03

**GALENA** Version 7.1

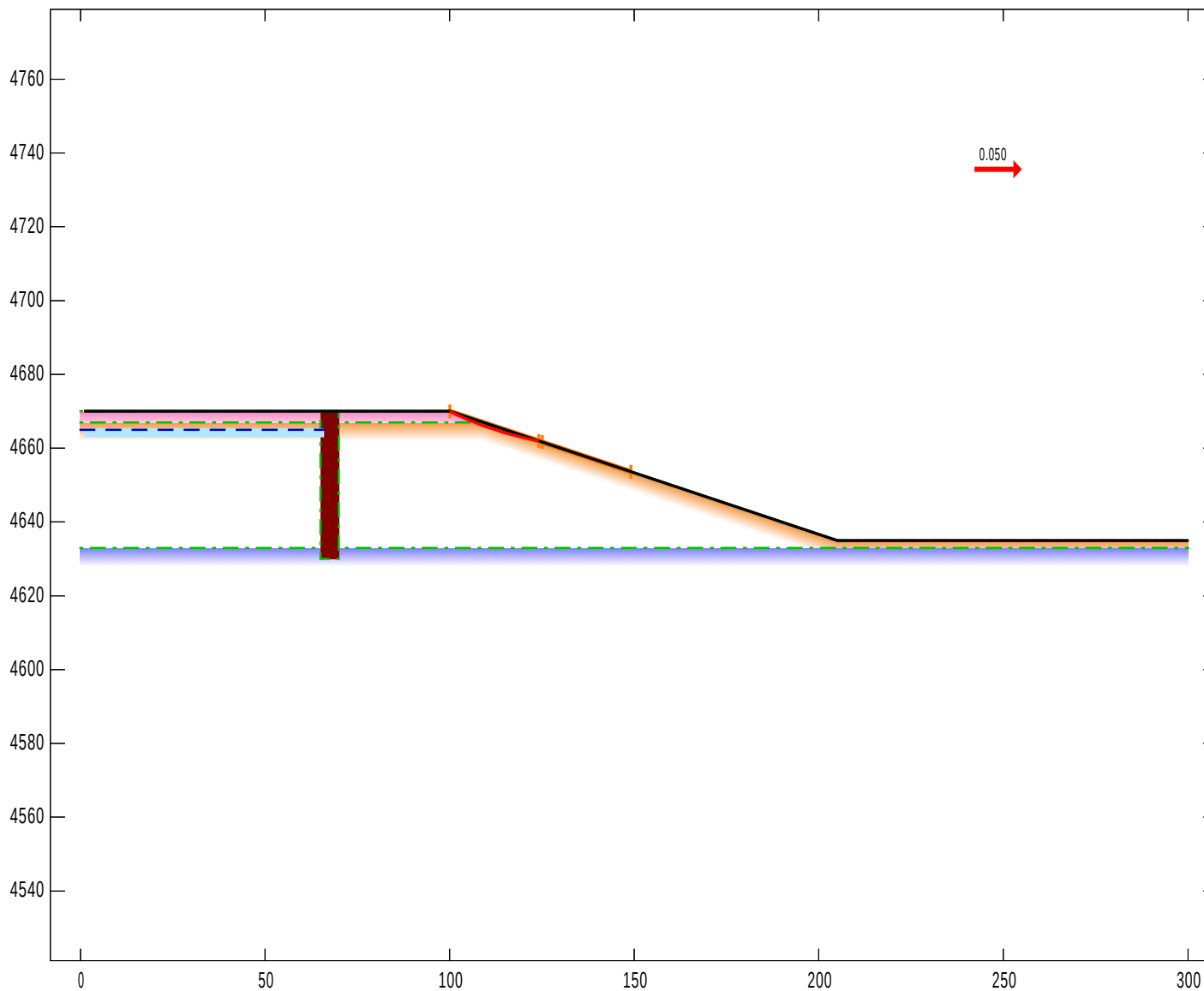
Licensed to: Greg Lewicki and Associates

Project Evans Pit  
Reclaimed Condition

File: E:\Work\GLA Dropbox\Ben Langenfeld\Asphalt Specialties\Evans\Slope Stability\Evans Slope Stability.gmf

Edited: 13 Nov 2024  
Processed: 13 Nov 2024





### Material Keys

- 1: Sand and gravel, mixed grain size
- 2: OB - loose sand, mixed grain size
- 3: Bedrock - claystone
- 4: Slurry Wall

### Analysis 4

Multiple Stability Analysis

Method: Bishop Simplified

Surface: Circular (Critical Seed)

### Results

Critical Factor of Safety: 2.45

**GALENA** Version 7.1

Licensed to: Greg Lewicki and Associates

**Project** Evans Pit  
Reclaimed Condition

File: E:\Work\GLA Dropbox\Ben Langenfeld\Asphalt Specialties\Evans\Slope Stability\Evans Slope Stability.gmf

Edited: 13 Nov 2024  
Processed: 13 Nov 2024



---

Project: Evans Pit  
File: E:\Work\GLA Dropbox\Ben Langenfeld\Asphalt Specialties\Evans\Slope Stability\Evans Slope Stability.gmf  
Processed: 13 Nov 2024 17:52:45

---

DATA: Analysis 1 - Mining Condition

Material Properties (4 materials)

Material: 1 (Mohr-Coulomb Isotropic) - Sand and gravel, mixed grain size

Cohesion Phi UnitWeight Ru

0.00 45.0 110.00 Auto

Material: 2 (Mohr-Coulomb Isotropic) - OB - loose sand, mixed grain size

Cohesion Phi UnitWeight Ru

0.00 34.0 99.00 Auto

Material: 3 (Mohr-Coulomb Isotropic) - Bedrock - claystone

Cohesion Phi UnitWeight Ru

20000.00 25.0 110.00 Auto

Material: 4 (Mohr-Coulomb Isotropic) - Slurry Wall

Cohesion Phi UnitWeight Ru

Unsaturated: 0.00 0.0 112.00 Auto

Saturated: 0.00 0.0 115.00 Auto

Water Properties

Unit weight of water: 62.400 Unit weight of water/medium above ground: 0.000

Material Profiles (4 profiles)

Profile: 1 (2 points) Material beneath: 2 - OB - loose sand, mixed grain size

0.00 4670.00 300.00 4670.00

Profile: 2 (2 points) Material beneath: 1 - Sand and gravel, mixed grain size

0.00 4667.00 300.00 4667.00

Profile: 3 (2 points) Material beneath: 3 - Bedrock - claystone

0.00 4633.00 300.00 4633.00

Profile: 4 (5 points) Material within: 4 - Slurry Wall

65.00 4670.00 70.00 4670.00 70.00 4630.00 65.00 4630.00 65.00 4670.00

Slope Surface (4 points)

1.00 4670.00 100.00 4670.00 152.00 4635.00 300.00 4635.00

Phreatic Surface (2 points)

0.00 4665.00 66.00 4665.00

Piezometric Surfaces (1 surface)

Failure Surface

Initial circular surface for critical search defined by: XL,XR,R

Intersects: XL: 100.90 YL: 4669.39 XR: 138.80 YR: 4643.88

Centre: XC: 144.68 YC: 4693.54 Radius: R: 50.00

Variable Restraints

-----  
Parameter descriptor:           XL       XR       R  
Range of variation:           25.00   20.00   10.50  
Trial positions within range:   10       10       10

-----  
RESULTS: Analysis 1 - Mining Condition

Bishop Simplified Method of Analysis - Circular Failure Surface

-----  
Critical Failure Surface Search using Multiple Circle Generation Techniques

Factor of Safety for initial failure surface approximation: 1.686

There were: 1001 successful analyses from a total of 1001 trial surfaces

Critical (minimum) Factor of Safety: 1.51

-----  
Results Summary - Lowest 99 Factor of Safety circles

| Circle | X-Left | Y-Left  | X-Right | Y-Right | X-Centre | Y-Centre | Radius | FoS   |                      |
|--------|--------|---------|---------|---------|----------|----------|--------|-------|----------------------|
| 1      | 113.40 | 4660.98 | 128.80  | 4650.62 | 151.51   | 4700.98  | 55.25  | 1.510 | <-- Critical Surface |
| 2      | 113.40 | 4660.98 | 128.80  | 4650.62 | 150.85   | 4700.00  | 54.08  | 1.511 |                      |
| 3      | 113.40 | 4660.98 | 128.80  | 4650.62 | 150.19   | 4699.02  | 52.92  | 1.512 |                      |
| 4      | 113.40 | 4660.98 | 128.80  | 4650.62 | 149.53   | 4698.03  | 51.75  | 1.513 |                      |
| 5      | 113.40 | 4660.98 | 128.80  | 4650.62 | 148.87   | 4697.05  | 50.58  | 1.515 |                      |
| 6      | 113.40 | 4660.98 | 128.80  | 4650.62 | 148.20   | 4696.06  | 49.42  | 1.516 |                      |
| 7      | 113.40 | 4660.98 | 131.02  | 4649.12 | 152.49   | 4700.03  | 55.25  | 1.518 |                      |
| 8      | 113.40 | 4660.98 | 128.80  | 4650.62 | 147.54   | 4695.08  | 48.25  | 1.518 |                      |
| 9      | 113.40 | 4660.98 | 131.02  | 4649.12 | 151.82   | 4699.04  | 54.08  | 1.519 |                      |
| 10     | 113.40 | 4660.98 | 128.80  | 4650.62 | 146.87   | 4694.09  | 47.08  | 1.519 |                      |
| 11     | 110.62 | 4662.85 | 128.80  | 4650.62 | 149.95   | 4701.66  | 55.25  | 1.520 |                      |
| 12     | 113.40 | 4660.98 | 131.02  | 4649.12 | 151.16   | 4698.06  | 52.92  | 1.521 |                      |
| 13     | 113.40 | 4660.98 | 128.80  | 4650.62 | 146.21   | 4693.10  | 45.92  | 1.521 |                      |
| 14     | 110.62 | 4662.85 | 128.80  | 4650.62 | 149.28   | 4700.67  | 54.08  | 1.521 |                      |
| 15     | 113.40 | 4660.98 | 131.02  | 4649.12 | 150.49   | 4697.07  | 51.75  | 1.522 |                      |
| 16     | 110.62 | 4662.85 | 128.80  | 4650.62 | 148.62   | 4699.68  | 52.92  | 1.523 |                      |
| 17     | 113.40 | 4660.98 | 128.80  | 4650.62 | 145.54   | 4692.11  | 44.75  | 1.523 |                      |
| 18     | 113.40 | 4660.98 | 131.02  | 4649.12 | 149.83   | 4696.08  | 50.58  | 1.524 |                      |
| 19     | 110.62 | 4662.85 | 128.80  | 4650.62 | 147.95   | 4698.69  | 51.75  | 1.525 |                      |
| 20     | 113.40 | 4660.98 | 131.02  | 4649.12 | 149.16   | 4695.09  | 49.42  | 1.526 |                      |
| 21     | 113.40 | 4660.98 | 133.24  | 4647.62 | 153.44   | 4699.05  | 55.25  | 1.527 |                      |
| 22     | 110.62 | 4662.85 | 128.80  | 4650.62 | 147.29   | 4697.70  | 50.58  | 1.527 |                      |
| 23     | 113.40 | 4660.98 | 131.02  | 4649.12 | 148.49   | 4694.10  | 48.25  | 1.528 |                      |
| 24     | 113.40 | 4660.98 | 133.24  | 4647.62 | 152.77   | 4698.06  | 54.08  | 1.528 |                      |
| 25     | 110.62 | 4662.85 | 128.80  | 4650.62 | 146.62   | 4696.71  | 49.42  | 1.529 |                      |
| 26     | 110.62 | 4662.85 | 131.02  | 4649.12 | 150.90   | 4700.67  | 55.25  | 1.529 |                      |
| 27     | 113.40 | 4660.98 | 131.02  | 4649.12 | 147.82   | 4693.10  | 47.08  | 1.530 |                      |
| 28     | 113.40 | 4660.98 | 133.24  | 4647.62 | 152.11   | 4697.07  | 52.92  | 1.530 |                      |
| 29     | 110.62 | 4662.85 | 128.80  | 4650.62 | 145.95   | 4695.71  | 48.25  | 1.531 |                      |
| 30     | 110.62 | 4662.85 | 131.02  | 4649.12 | 150.23   | 4699.68  | 54.08  | 1.531 |                      |
| 31     | 107.84 | 4664.72 | 128.80  | 4650.62 | 148.36   | 4702.29  | 55.25  | 1.532 |                      |
| 32     | 113.40 | 4660.98 | 133.24  | 4647.62 | 151.44   | 4696.07  | 51.75  | 1.533 |                      |
| 33     | 113.40 | 4660.98 | 131.02  | 4649.12 | 147.15   | 4692.11  | 45.92  | 1.533 |                      |
| 34     | 110.62 | 4662.85 | 131.02  | 4649.12 | 149.56   | 4698.68  | 52.92  | 1.533 |                      |
| 35     | 110.62 | 4662.85 | 128.80  | 4650.62 | 145.28   | 4694.72  | 47.08  | 1.533 |                      |
| 36     | 107.84 | 4664.72 | 128.80  | 4650.62 | 147.69   | 4701.29  | 54.08  | 1.534 |                      |
| 37     | 113.40 | 4660.98 | 133.24  | 4647.62 | 150.77   | 4695.08  | 50.58  | 1.535 |                      |
| 38     | 113.40 | 4660.98 | 131.02  | 4649.12 | 146.48   | 4691.11  | 44.75  | 1.535 |                      |
| 39     | 110.62 | 4662.85 | 131.02  | 4649.12 | 148.89   | 4697.69  | 51.75  | 1.535 |                      |

|    |        |         |        |         |        |         |       |       |
|----|--------|---------|--------|---------|--------|---------|-------|-------|
| 40 | 110.62 | 4662.85 | 128.80 | 4650.62 | 144.61 | 4693.72 | 45.92 | 1.536 |
| 41 | 107.84 | 4664.72 | 128.80 | 4650.62 | 147.02 | 4700.30 | 52.92 | 1.536 |
| 42 | 113.40 | 4660.98 | 135.47 | 4646.13 | 154.38 | 4698.04 | 55.25 | 1.537 |
| 43 | 113.40 | 4660.98 | 133.24 | 4647.62 | 150.10 | 4694.08 | 49.42 | 1.537 |
| 44 | 110.62 | 4662.85 | 131.02 | 4649.12 | 148.22 | 4696.69 | 50.58 | 1.538 |
| 45 | 107.84 | 4664.72 | 128.80 | 4650.62 | 146.34 | 4699.30 | 51.75 | 1.538 |
| 46 | 110.62 | 4662.85 | 128.80 | 4650.62 | 143.94 | 4692.73 | 44.75 | 1.539 |
| 47 | 113.40 | 4660.98 | 135.47 | 4646.13 | 153.70 | 4697.04 | 54.08 | 1.539 |
| 48 | 110.62 | 4662.85 | 133.24 | 4647.62 | 151.83 | 4699.65 | 55.25 | 1.539 |
| 49 | 113.40 | 4660.98 | 133.24 | 4647.62 | 149.42 | 4693.08 | 48.25 | 1.540 |
| 50 | 110.62 | 4662.85 | 131.02 | 4649.12 | 147.55 | 4695.69 | 49.42 | 1.540 |
| 51 | 107.84 | 4664.72 | 128.80 | 4650.62 | 145.67 | 4698.30 | 50.58 | 1.541 |
| 52 | 113.40 | 4660.98 | 135.47 | 4646.13 | 153.03 | 4696.04 | 52.92 | 1.542 |
| 53 | 110.62 | 4662.85 | 133.24 | 4647.62 | 151.16 | 4698.65 | 54.08 | 1.542 |
| 54 | 107.84 | 4664.72 | 131.02 | 4649.12 | 149.28 | 4701.27 | 55.25 | 1.542 |
| 55 | 113.40 | 4660.98 | 133.24 | 4647.62 | 148.75 | 4692.08 | 47.08 | 1.543 |
| 56 | 110.62 | 4662.85 | 131.02 | 4649.12 | 146.87 | 4694.69 | 48.25 | 1.543 |
| 57 | 107.84 | 4664.72 | 128.80 | 4650.62 | 145.00 | 4697.30 | 49.42 | 1.544 |
| 58 | 113.40 | 4660.98 | 135.47 | 4646.13 | 152.36 | 4695.04 | 51.75 | 1.544 |
| 59 | 110.62 | 4662.85 | 133.24 | 4647.62 | 150.48 | 4697.65 | 52.92 | 1.545 |
| 60 | 107.84 | 4664.72 | 131.02 | 4649.12 | 148.61 | 4700.26 | 54.08 | 1.545 |
| 61 | 105.07 | 4666.59 | 128.80 | 4650.62 | 146.73 | 4702.87 | 55.25 | 1.545 |
| 62 | 113.40 | 4660.98 | 133.24 | 4647.62 | 148.08 | 4691.08 | 45.92 | 1.546 |
| 63 | 110.62 | 4662.85 | 131.02 | 4649.12 | 146.20 | 4693.69 | 47.08 | 1.546 |
| 64 | 107.84 | 4664.72 | 128.80 | 4650.62 | 144.32 | 4696.30 | 48.25 | 1.547 |
| 65 | 113.40 | 4660.98 | 135.47 | 4646.13 | 151.68 | 4694.04 | 50.58 | 1.547 |
| 66 | 110.62 | 4662.85 | 133.24 | 4647.62 | 149.81 | 4696.65 | 51.75 | 1.547 |
| 67 | 107.84 | 4664.72 | 131.02 | 4649.12 | 147.93 | 4699.26 | 52.92 | 1.548 |
| 68 | 105.07 | 4666.59 | 128.80 | 4650.62 | 146.06 | 4701.87 | 54.08 | 1.548 |
| 69 | 113.40 | 4660.98 | 137.69 | 4644.63 | 155.29 | 4697.00 | 55.25 | 1.548 |
| 70 | 113.40 | 4660.98 | 133.24 | 4647.62 | 147.40 | 4690.08 | 44.75 | 1.549 |
| 71 | 110.62 | 4662.85 | 131.02 | 4649.12 | 145.52 | 4692.69 | 45.92 | 1.549 |
| 72 | 107.84 | 4664.72 | 128.80 | 4650.62 | 143.65 | 4695.30 | 47.08 | 1.550 |
| 73 | 113.40 | 4660.98 | 135.47 | 4646.13 | 151.01 | 4693.04 | 49.42 | 1.550 |
| 74 | 110.62 | 4662.85 | 133.24 | 4647.62 | 149.13 | 4695.65 | 50.58 | 1.550 |
| 75 | 107.84 | 4664.72 | 131.02 | 4649.12 | 147.26 | 4698.26 | 51.75 | 1.551 |
| 76 | 105.07 | 4666.59 | 128.80 | 4650.62 | 145.38 | 4700.87 | 52.92 | 1.551 |
| 77 | 113.40 | 4660.98 | 137.69 | 4644.63 | 154.62 | 4696.00 | 54.08 | 1.551 |
| 78 | 110.62 | 4662.85 | 135.47 | 4646.13 | 152.74 | 4698.61 | 55.25 | 1.551 |
| 79 | 110.62 | 4662.85 | 131.02 | 4649.12 | 144.85 | 4691.68 | 44.75 | 1.553 |
| 80 | 107.84 | 4664.72 | 128.80 | 4650.62 | 142.97 | 4694.29 | 45.92 | 1.553 |
| 81 | 113.40 | 4660.98 | 135.47 | 4646.13 | 150.33 | 4692.03 | 48.25 | 1.553 |
| 82 | 110.62 | 4662.85 | 133.24 | 4647.62 | 148.46 | 4694.64 | 49.42 | 1.554 |
| 83 | 107.84 | 4664.72 | 131.02 | 4649.12 | 146.58 | 4697.25 | 50.58 | 1.554 |
| 84 | 105.07 | 4666.59 | 128.80 | 4650.62 | 144.70 | 4699.86 | 51.75 | 1.554 |
| 85 | 113.40 | 4660.98 | 137.69 | 4644.63 | 153.94 | 4694.99 | 52.92 | 1.554 |
| 86 | 110.62 | 4662.85 | 135.47 | 4646.13 | 152.06 | 4697.60 | 54.08 | 1.554 |
| 87 | 107.84 | 4664.72 | 133.24 | 4647.62 | 150.19 | 4700.21 | 55.25 | 1.554 |
| 88 | 107.84 | 4664.72 | 128.80 | 4650.62 | 142.29 | 4693.28 | 44.75 | 1.557 |
| 89 | 113.40 | 4660.98 | 135.47 | 4646.13 | 149.65 | 4691.02 | 47.08 | 1.557 |
| 90 | 110.62 | 4662.85 | 133.24 | 4647.62 | 147.78 | 4693.63 | 48.25 | 1.557 |
| 91 | 107.84 | 4664.72 | 131.02 | 4649.12 | 145.90 | 4696.24 | 49.42 | 1.557 |
| 92 | 105.07 | 4666.59 | 128.80 | 4650.62 | 144.03 | 4698.85 | 50.58 | 1.557 |
| 93 | 113.40 | 4660.98 | 137.69 | 4644.63 | 153.26 | 4693.98 | 51.75 | 1.557 |
| 94 | 110.62 | 4662.85 | 135.47 | 4646.13 | 151.38 | 4696.59 | 52.92 | 1.557 |
| 95 | 107.84 | 4664.72 | 133.24 | 4647.62 | 149.51 | 4699.20 | 54.08 | 1.557 |
| 96 | 105.07 | 4666.59 | 131.02 | 4649.12 | 147.63 | 4701.81 | 55.25 | 1.557 |
| 97 | 102.29 | 4668.46 | 128.80 | 4650.62 | 145.08 | 4703.41 | 55.25 | 1.558 |
| 98 | 113.40 | 4660.98 | 139.91 | 4643.14 | 156.19 | 4695.93 | 55.25 | 1.561 |
| 99 | 105.07 | 4666.59 | 131.02 | 4649.12 | 146.95 | 4700.80 | 54.08 | 1.561 |

Critical Failure Surface (circle 1)



-----  
Intersects: XL: 113.40 YL: 4660.98 XR: 128.80 YR: 4650.62  
Centre: XC: 151.51 YC: 4700.98 Radius: R: 55.25  
Generated failure surface: (20 points)  
113.40 4660.98 114.12 4660.31 114.85 4659.65 115.59 4659.01 116.34 4658.38  
117.10 4657.76 117.87 4657.15 118.66 4656.56 119.45 4655.98 120.26 4655.42  
121.07 4654.87 121.89 4654.34 122.73 4653.82 123.57 4653.32 124.42 4652.83  
125.28 4652.36 126.15 4651.90 127.02 4651.45 127.91 4651.03 128.80 4650.62

Slice Geometry and Properties - Critical Failure Surface (circle 1, 38 slices)

| Slice     | X-Left | X-S Area | Angle        | Width | Base Length | Matl        | Cohesion | Phi     | PoreWater Weight | Normal Force | Test Stress | Factor |
|-----------|--------|----------|--------------|-------|-------------|-------------|----------|---------|------------------|--------------|-------------|--------|
| 1         | 113.40 | 0.02     | 43.1         | 0.36  | 0.49        | 1           | 0.00     | 45.0    | 1.85             | 0.00         | 3.18        | 0.85   |
| 2         | 113.76 | 0.05     | 43.1         | 0.36  | 0.49        | 1           | 0.00     | 45.0    | 5.56             | 0.00         | 9.58        | 0.85   |
| 3         | 114.12 | 0.08     | 42.1         | 0.36  | 0.49        | 1           | 0.00     | 45.0    | 9.23             | 0.00         | 15.87       | 0.84   |
| 4         | 114.48 | 0.11     | 42.1         | 0.36  | 0.49        | 1           | 0.00     | 45.0    | 12.56            | 0.00         | 21.57       | 0.84   |
| 5         | 114.85 | 0.15     | 41.1         | 0.37  | 0.49        | 1           | 0.00     | 45.0    | 15.96            | 0.00         | 27.35       | 0.84   |
| 6         | 115.22 | 0.17     | 41.1         | 0.37  | 0.49        | 1           | 0.00     | 45.0    | 18.96            | 0.00         | 32.48       | 0.84   |
| 7         | 115.59 | 0.20     | 40.1         | 0.38  | 0.49        | 1           | 0.00     | 45.0    | 22.06            | 0.00         | 37.71       | 0.84   |
| 8         | 115.96 | 0.22     | 40.1         | 0.38  | 0.49        | 1           | 0.00     | 45.0    | 24.66            | 0.00         | 42.16       | 0.84   |
| 9         | 116.34 | 0.25     | 39.0         | 0.38  | 0.49        | 1           | 0.00     | 45.0    | 27.48            | 0.00         | 46.90       | 0.84   |
| 10        | 116.72 | 0.27     | 39.0         | 0.38  | 0.49        | 1           | 0.00     | 45.0    | 29.67            | 0.00         | 50.64       | 0.84   |
| 11        | 117.10 | 0.29     | 38.0         | 0.39  | 0.49        | 1           | 0.00     | 45.0    | 32.09            | 0.00         | 54.68       | 0.84   |
| 12        | 117.49 | 0.31     | 38.0         | 0.39  | 0.49        | 1           | 0.00     | 45.0    | 33.90            | 0.00         | 57.76       | 0.84   |
| 13        | 117.87 | 0.33     | 37.0         | 0.39  | 0.49        | 1           | 0.00     | 45.0    | 35.92            | 0.00         | 61.12       | 0.84   |
| 14        | 118.26 | 0.34     | 37.0         | 0.39  | 0.49        | 1           | 0.00     | 45.0    | 37.31            | 0.00         | 63.49       | 0.84   |
| 15        | 118.66 | 0.35     | 36.0         | 0.40  | 0.49        | 1           | 0.00     | 45.0    | 38.93            | 0.00         | 66.18       | 0.83   |
| 16        | 119.05 | 0.36     | 36.0         | 0.40  | 0.49        | 1           | 0.00     | 45.0    | 39.87            | 0.00         | 67.77       | 0.83   |
| 17        | 119.45 | 0.37     | 35.0         | 0.40  | 0.49        | 1           | 0.00     | 45.0    | 41.07            | 0.00         | 69.79       | 0.83   |
| 18        | 119.85 | 0.38     | 35.0         | 0.40  | 0.49        | 1           | 0.00     | 45.0    | 41.55            | 0.00         | 70.59       | 0.83   |
| 19        | 120.26 | 0.38     | 33.9         | 0.41  | 0.49        | 1           | 0.00     | 45.0    | 42.28            | 0.00         | 71.82       | 0.83   |
| 20        | 120.66 | 0.38     | 33.9         | 0.41  | 0.49        | 1           | 0.00     | 45.0    | 42.30            | 0.00         | 71.86       | 0.83   |
| 21        | 121.07 | 0.39     | 33.0         | 0.41  | 0.49        | 1           | 0.00     | 45.0    | 42.53            | 0.00         | 72.22       | 0.83   |
| 22        | 121.48 | 0.38     | 32.9         | 0.41  | 0.49        | 1           | 0.00     | 45.0    | 42.07            | 0.00         | 71.47       | 0.83   |
| 23        | 121.89 | 0.38     | 31.9         | 0.42  | 0.49        | 1           | 0.00     | 45.0    | 41.83            | 0.00         | 71.05       | 0.83   |
| 24        | 122.31 | 0.37     | 31.9         | 0.42  | 0.49        | 1           | 0.00     | 45.0    | 40.84            | 0.00         | 69.41       | 0.83   |
| 25        | 122.73 | 0.36     | 30.9         | 0.42  | 0.49        | 1           | 0.00     | 45.0    | 40.09            | 0.00         | 68.17       | 0.83   |
| 26        | 123.15 | 0.35     | 30.9         | 0.42  | 0.49        | 1           | 0.00     | 45.0    | 38.62            | 0.00         | 65.67       | 0.83   |
| 27        | 123.57 | 0.34     | 29.8         | 0.43  | 0.49        | 1           | 0.00     | 45.0    | 37.31            | 0.00         | 63.52       | 0.84   |
| 28        | 124.00 | 0.32     | 29.9         | 0.43  | 0.49        | 1           | 0.00     | 45.0    | 35.34            | 0.00         | 60.14       | 0.84   |
| 29        | 124.42 | 0.30     | 28.8         | 0.43  | 0.49        | 1           | 0.00     | 45.0    | 33.43            | 0.00         | 56.98       | 0.84   |
| 30        | 124.85 | 0.28     | 28.8         | 0.43  | 0.49        | 1           | 0.00     | 45.0    | 30.96            | 0.00         | 52.77       | 0.84   |
| 31        | 125.28 | 0.26     | 27.9         | 0.43  | 0.49        | 1           | 0.00     | 45.0    | 28.51            | 0.00         | 48.65       | 0.84   |
| 32        | 125.71 | 0.23     | 27.8         | 0.43  | 0.49        | 1           | 0.00     | 45.0    | 25.50            | 0.00         | 43.54       | 0.84   |
| 33        | 126.15 | 0.20     | 26.8         | 0.44  | 0.49        | 1           | 0.00     | 45.0    | 22.47            | 0.00         | 38.44       | 0.84   |
| 34        | 126.59 | 0.17     | 26.8         | 0.44  | 0.49        | 1           | 0.00     | 45.0    | 18.92            | 0.00         | 32.34       | 0.84   |
| 35        | 127.02 | 0.14     | 25.8         | 0.44  | 0.49        | 1           | 0.00     | 45.0    | 15.29            | 0.00         | 26.19       | 0.84   |
| 36        | 127.47 | 0.10     | 25.8         | 0.44  | 0.49        | 1           | 0.00     | 45.0    | 11.18            | 0.00         | 19.17       | 0.84   |
| 37        | 127.91 | 0.06     | 24.8         | 0.45  | 0.49        | 1           | 0.00     | 45.0    | 6.94             | 0.00         | 11.93       | 0.84   |
| 38        | 128.35 | 0.02     | 24.8         | 0.45  | 0.49        | 1           | 0.00     | 45.0    | 2.30             | 0.00         | 3.95        | 0.84   |
| X-S Area: |        | 9.70     | Path Length: |       | 18.65       | X-S Weight: |          | 1067.34 |                  |              |             |        |

DATA: Analysis 2 - Mining Condition

Material Properties (4 materials)

Material: 1 (Mohr-Coulomb Isotropic) - Sand and gravel, mixed grain size

Cohesion Phi UnitWeight Ru  
0.00 45.0 110.00 Auto

Material: 2 (Mohr-Coulomb Isotropic) - OB - loose sand, mixed grain size

Cohesion Phi UnitWeight Ru  
0.00 34.0 99.00 Auto

Material: 3 (Mohr-Coulomb Isotropic) - Bedrock - claystone

Cohesion Phi UnitWeight Ru  
20000.00 25.0 110.00 Auto

Material: 4 (Mohr-Coulomb Isotropic) - Slurry Wall

Cohesion Phi UnitWeight Ru  
Unsaturated: 0.00 0.0 112.00 Auto  
Saturated: 0.00 0.0 115.00 Auto

#### Water Properties

Unit weight of water: 62.400 Unit weight of water/medium above ground: 0.000

#### Material Profiles (4 profiles)

Profile: 1 (2 points) Material beneath: 2 - OB - loose sand, mixed grain size

0.00 4670.00 300.00 4670.00

Profile: 2 (2 points) Material beneath: 1 - Sand and gravel, mixed grain size

0.00 4667.00 300.00 4667.00

Profile: 3 (2 points) Material beneath: 3 - Bedrock - claystone

0.00 4633.00 300.00 4633.00

Profile: 4 (5 points) Material within: 4 - Slurry Wall

65.00 4670.00 70.00 4670.00 70.00 4630.00 65.00 4630.00 65.00 4670.00

#### Slope Surface (4 points)

1.00 4670.00 100.00 4670.00 152.00 4635.00 300.00 4635.00

#### Phreatic Surface (2 points)

0.00 4665.00 66.00 4665.00

#### Piezometric Surfaces (1 surface)

#### Failure Surface (Critical, from previous analysis)

Initial circular surface for critical search defined by: XL,XR,R

Intersects: XL: 113.40 YL: 4660.98 XR: 128.80 YR: 4650.62

Centre: XC: 151.51 YC: 4700.98 Radius: R: 55.25

#### Earthquake Force

Pseudo-static earthquake (seismic) coefficient: 0.050

#### Variable Restraints

Parameter descriptor: XL XR R  
Range of variation: 25.00 20.00 10.50  
Trial positions within range: 10 10 10

#### RESULTS: Analysis 2 - Mining Condition

#### Bishop Simplified Method of Analysis - Circular Failure Surface

# Critical Failure Surface Search using Multiple Circle Generation Techniques

Factor of Safety for initial failure surface approximation: 1.359

There were: 881 successful analyses from a total of 1001 trial surfaces  
120 analyses terminated due to unacceptable geometry

Critical (minimum) Factor of Safety: 1.34

## Results Summary - Lowest 99 Factor of Safety circles

| Circle | X-Left | Y-Left  | X-Right | Y-Right | X-Centre | Y-Centre | Radius | FoS   |                      |
|--------|--------|---------|---------|---------|----------|----------|--------|-------|----------------------|
| 1      | 120.34 | 4656.31 | 123.24  | 4654.35 | 153.61   | 4702.59  | 57.00  | 1.336 | <-- Critical Surface |
| 2      | 120.34 | 4656.31 | 123.24  | 4654.35 | 154.26   | 4703.56  | 58.17  | 1.336 |                      |
| 3      | 120.34 | 4656.31 | 123.24  | 4654.35 | 155.56   | 4705.50  | 60.50  | 1.337 |                      |
| 4      | 120.34 | 4656.31 | 123.24  | 4654.35 | 152.96   | 4701.62  | 55.83  | 1.337 |                      |
| 5      | 120.34 | 4656.31 | 123.24  | 4654.35 | 154.91   | 4704.53  | 59.33  | 1.337 |                      |
| 6      | 120.34 | 4656.31 | 123.24  | 4654.35 | 150.35   | 4697.75  | 51.17  | 1.337 |                      |
| 7      | 120.34 | 4656.31 | 123.24  | 4654.35 | 152.31   | 4700.66  | 54.67  | 1.337 |                      |
| 8      | 117.57 | 4658.18 | 121.02  | 4655.85 | 153.05   | 4707.17  | 60.50  | 1.337 |                      |
| 9      | 120.34 | 4656.31 | 123.24  | 4654.35 | 151.00   | 4698.72  | 52.33  | 1.337 |                      |
| 10     | 120.34 | 4656.31 | 123.24  | 4654.35 | 151.65   | 4699.69  | 53.50  | 1.337 |                      |
| 11     | 117.57 | 4658.18 | 121.02  | 4655.85 | 152.40   | 4706.21  | 59.33  | 1.337 |                      |
| 12     | 120.34 | 4656.31 | 123.24  | 4654.35 | 149.70   | 4696.78  | 50.00  | 1.337 |                      |
| 13     | 117.57 | 4658.18 | 121.02  | 4655.85 | 150.45   | 4703.30  | 55.83  | 1.337 |                      |
| 14     | 117.57 | 4658.18 | 121.02  | 4655.85 | 149.80   | 4702.33  | 54.67  | 1.337 |                      |
| 15     | 117.57 | 4658.18 | 121.02  | 4655.85 | 151.75   | 4705.24  | 58.17  | 1.337 |                      |
| 16     | 117.57 | 4658.18 | 121.02  | 4655.85 | 151.10   | 4704.27  | 57.00  | 1.337 |                      |
| 17     | 117.57 | 4658.18 | 121.02  | 4655.85 | 149.14   | 4701.36  | 53.50  | 1.337 |                      |
| 18     | 125.90 | 4652.57 | 129.91  | 4649.87 | 161.01   | 4700.40  | 59.33  | 1.337 |                      |
| 19     | 125.90 | 4652.57 | 129.91  | 4649.87 | 161.66   | 4701.37  | 60.50  | 1.337 |                      |
| 20     | 117.57 | 4658.18 | 121.02  | 4655.85 | 147.19   | 4698.46  | 50.00  | 1.337 |                      |
| 21     | 114.79 | 4660.05 | 118.80  | 4657.35 | 150.55   | 4708.85  | 60.50  | 1.337 |                      |
| 22     | 117.57 | 4658.18 | 121.02  | 4655.85 | 148.49   | 4700.40  | 52.33  | 1.337 |                      |
| 23     | 114.79 | 4660.05 | 118.80  | 4657.35 | 149.90   | 4707.88  | 59.33  | 1.337 |                      |
| 24     | 114.79 | 4660.05 | 118.80  | 4657.35 | 149.24   | 4706.91  | 58.17  | 1.337 |                      |
| 25     | 125.90 | 4652.57 | 129.91  | 4649.87 | 160.36   | 4699.43  | 58.17  | 1.337 |                      |
| 26     | 125.90 | 4652.57 | 129.91  | 4649.87 | 159.70   | 4698.46  | 57.00  | 1.337 |                      |
| 27     | 114.79 | 4660.05 | 118.80  | 4657.35 | 148.59   | 4705.94  | 57.00  | 1.337 |                      |
| 28     | 117.57 | 4658.18 | 121.02  | 4655.85 | 147.84   | 4699.43  | 51.17  | 1.337 |                      |
| 29     | 114.79 | 4660.05 | 118.80  | 4657.35 | 147.29   | 4704.00  | 54.67  | 1.337 |                      |
| 30     | 125.90 | 4652.57 | 129.91  | 4649.87 | 158.40   | 4696.52  | 54.67  | 1.337 |                      |
| 31     | 114.79 | 4660.05 | 118.80  | 4657.35 | 147.94   | 4704.97  | 55.83  | 1.337 |                      |
| 32     | 125.90 | 4652.57 | 129.91  | 4649.87 | 159.05   | 4697.49  | 55.83  | 1.337 |                      |
| 33     | 125.90 | 4652.57 | 129.91  | 4649.87 | 157.75   | 4695.56  | 53.50  | 1.338 |                      |
| 34     | 123.12 | 4654.44 | 127.69  | 4651.36 | 159.15   | 4703.04  | 60.50  | 1.338 |                      |
| 35     | 114.79 | 4660.05 | 118.80  | 4657.35 | 146.64   | 4703.03  | 53.50  | 1.338 |                      |
| 36     | 123.12 | 4654.44 | 127.69  | 4651.36 | 158.50   | 4702.07  | 59.33  | 1.338 |                      |
| 37     | 125.90 | 4652.57 | 129.91  | 4649.87 | 156.44   | 4693.62  | 51.17  | 1.338 |                      |
| 38     | 125.90 | 4652.57 | 129.91  | 4649.87 | 157.10   | 4694.59  | 52.33  | 1.338 |                      |
| 39     | 123.12 | 4654.44 | 127.69  | 4651.36 | 157.85   | 4701.10  | 58.17  | 1.338 |                      |
| 40     | 114.79 | 4660.05 | 118.80  | 4657.35 | 145.98   | 4702.07  | 52.33  | 1.338 |                      |
| 41     | 114.79 | 4660.05 | 118.80  | 4657.35 | 145.33   | 4701.10  | 51.17  | 1.338 |                      |
| 42     | 114.79 | 4660.05 | 118.80  | 4657.35 | 144.68   | 4700.13  | 50.00  | 1.338 |                      |
| 43     | 123.12 | 4654.44 | 127.69  | 4651.36 | 157.20   | 4700.13  | 57.00  | 1.338 |                      |
| 44     | 125.90 | 4652.57 | 129.91  | 4649.87 | 155.79   | 4692.65  | 50.00  | 1.338 |                      |
| 45     | 123.12 | 4654.44 | 127.69  | 4651.36 | 156.54   | 4699.16  | 55.83  | 1.338 |                      |
| 46     | 123.12 | 4654.44 | 127.69  | 4651.36 | 155.89   | 4698.19  | 54.67  | 1.338 |                      |
| 47     | 120.34 | 4656.31 | 125.47  | 4652.86 | 156.64   | 4704.71  | 60.50  | 1.338 |                      |
| 48     | 123.12 | 4654.44 | 127.69  | 4651.36 | 155.24   | 4697.22  | 53.50  | 1.338 |                      |
| 49     | 120.34 | 4656.31 | 125.47  | 4652.86 | 155.99   | 4703.74  | 59.33  | 1.338 |                      |

|    |        |         |        |         |        |         |       |       |
|----|--------|---------|--------|---------|--------|---------|-------|-------|
| 50 | 123.12 | 4654.44 | 127.69 | 4651.36 | 154.59 | 4696.25 | 52.33 | 1.338 |
| 51 | 120.34 | 4656.31 | 125.47 | 4652.86 | 155.34 | 4702.77 | 58.17 | 1.338 |
| 52 | 123.12 | 4654.44 | 127.69 | 4651.36 | 153.93 | 4695.29 | 51.17 | 1.338 |
| 53 | 120.34 | 4656.31 | 125.47 | 4652.86 | 154.69 | 4701.80 | 57.00 | 1.338 |
| 54 | 120.34 | 4656.31 | 125.47 | 4652.86 | 154.03 | 4700.83 | 55.83 | 1.338 |
| 55 | 123.12 | 4654.44 | 127.69 | 4651.36 | 153.28 | 4694.32 | 50.00 | 1.338 |
| 56 | 117.57 | 4658.18 | 123.24 | 4654.35 | 154.13 | 4706.37 | 60.50 | 1.338 |
| 57 | 117.57 | 4658.18 | 123.24 | 4654.35 | 153.48 | 4705.40 | 59.33 | 1.338 |
| 58 | 120.34 | 4656.31 | 125.47 | 4652.86 | 152.73 | 4698.89 | 53.50 | 1.338 |
| 59 | 120.34 | 4656.31 | 125.47 | 4652.86 | 153.38 | 4699.86 | 54.67 | 1.339 |
| 60 | 120.34 | 4656.31 | 125.47 | 4652.86 | 152.08 | 4697.92 | 52.33 | 1.339 |
| 61 | 117.57 | 4658.18 | 123.24 | 4654.35 | 152.83 | 4704.44 | 58.17 | 1.339 |
| 62 | 117.57 | 4658.18 | 123.24 | 4654.35 | 152.18 | 4703.47 | 57.00 | 1.339 |
| 63 | 120.34 | 4656.31 | 125.47 | 4652.86 | 151.42 | 4696.95 | 51.17 | 1.339 |
| 64 | 117.57 | 4658.18 | 123.24 | 4654.35 | 151.52 | 4702.50 | 55.83 | 1.339 |
| 65 | 114.79 | 4660.05 | 121.02 | 4655.85 | 151.62 | 4708.04 | 60.50 | 1.339 |
| 66 | 120.34 | 4656.31 | 125.47 | 4652.86 | 150.77 | 4695.98 | 50.00 | 1.339 |
| 67 | 125.90 | 4652.57 | 132.13 | 4648.37 | 162.73 | 4700.56 | 60.50 | 1.339 |
| 68 | 117.57 | 4658.18 | 123.24 | 4654.35 | 150.87 | 4701.53 | 54.67 | 1.339 |
| 69 | 114.79 | 4660.05 | 121.02 | 4655.85 | 150.97 | 4707.07 | 59.33 | 1.339 |
| 70 | 117.57 | 4658.18 | 123.24 | 4654.35 | 150.22 | 4700.56 | 53.50 | 1.339 |
| 71 | 125.90 | 4652.57 | 132.13 | 4648.37 | 162.08 | 4699.59 | 59.33 | 1.339 |
| 72 | 100.90 | 4669.39 | 118.80 | 4657.35 | 143.09 | 4712.76 | 60.50 | 1.339 |
| 73 | 114.79 | 4660.05 | 121.02 | 4655.85 | 150.32 | 4706.10 | 58.17 | 1.339 |
| 74 | 125.90 | 4652.57 | 132.13 | 4648.37 | 161.43 | 4698.62 | 58.17 | 1.339 |
| 75 | 117.57 | 4658.18 | 123.24 | 4654.35 | 149.57 | 4699.59 | 52.33 | 1.339 |
| 76 | 114.79 | 4660.05 | 121.02 | 4655.85 | 149.66 | 4705.13 | 57.00 | 1.339 |
| 77 | 125.90 | 4652.57 | 132.13 | 4648.37 | 160.78 | 4697.65 | 57.00 | 1.339 |
| 78 | 117.57 | 4658.18 | 123.24 | 4654.35 | 148.91 | 4698.62 | 51.17 | 1.339 |
| 79 | 125.90 | 4652.57 | 132.13 | 4648.37 | 160.12 | 4696.68 | 55.83 | 1.339 |
| 80 | 123.12 | 4654.44 | 129.91 | 4649.87 | 160.22 | 4702.23 | 60.50 | 1.340 |
| 81 | 114.79 | 4660.05 | 121.02 | 4655.85 | 149.01 | 4704.16 | 55.83 | 1.340 |
| 82 | 112.01 | 4661.92 | 118.80 | 4657.35 | 149.11 | 4709.71 | 60.50 | 1.340 |
| 83 | 117.57 | 4658.18 | 123.24 | 4654.35 | 148.26 | 4697.65 | 50.00 | 1.340 |
| 84 | 125.90 | 4652.57 | 132.13 | 4648.37 | 159.47 | 4695.71 | 54.67 | 1.340 |
| 85 | 114.79 | 4660.05 | 121.02 | 4655.85 | 148.36 | 4703.19 | 54.67 | 1.340 |
| 86 | 112.01 | 4661.92 | 118.80 | 4657.35 | 148.46 | 4708.74 | 59.33 | 1.340 |
| 87 | 123.12 | 4654.44 | 129.91 | 4649.87 | 159.57 | 4701.26 | 59.33 | 1.340 |
| 88 | 125.90 | 4652.57 | 132.13 | 4648.37 | 158.82 | 4694.74 | 53.50 | 1.340 |
| 89 | 112.01 | 4661.92 | 118.80 | 4657.35 | 147.80 | 4707.77 | 58.17 | 1.340 |
| 90 | 123.12 | 4654.44 | 129.91 | 4649.87 | 158.91 | 4700.29 | 58.17 | 1.340 |
| 91 | 114.79 | 4660.05 | 121.02 | 4655.85 | 147.70 | 4702.22 | 53.50 | 1.340 |
| 92 | 112.01 | 4661.92 | 118.80 | 4657.35 | 147.15 | 4706.80 | 57.00 | 1.340 |
| 93 | 123.12 | 4654.44 | 129.91 | 4649.87 | 158.26 | 4699.32 | 57.00 | 1.340 |
| 94 | 125.90 | 4652.57 | 132.13 | 4648.37 | 158.16 | 4693.77 | 52.33 | 1.340 |
| 95 | 114.79 | 4660.05 | 121.02 | 4655.85 | 147.05 | 4701.25 | 52.33 | 1.340 |
| 96 | 114.79 | 4660.05 | 121.02 | 4655.85 | 146.40 | 4700.28 | 51.17 | 1.340 |
| 97 | 112.01 | 4661.92 | 118.80 | 4657.35 | 146.50 | 4705.83 | 55.83 | 1.340 |
| 98 | 123.12 | 4654.44 | 129.91 | 4649.87 | 157.61 | 4698.35 | 55.83 | 1.340 |
| 99 | 120.34 | 4656.31 | 127.69 | 4651.36 | 157.71 | 4703.89 | 60.50 | 1.340 |

#### Critical Failure Surface (circle 1)

Intersects: XL: 120.34 YL: 4656.31 XR: 123.24 YR: 4654.35  
Centre: XC: 153.61 YC: 4702.59 Radius: R: 57.00

Generated failure surface: (20 points)

|        |         |        |         |        |         |        |         |        |         |
|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| 120.34 | 4656.31 | 120.49 | 4656.20 | 120.64 | 4656.09 | 120.79 | 4655.99 | 120.95 | 4655.88 |
| 121.10 | 4655.78 | 121.25 | 4655.67 | 121.40 | 4655.57 | 121.55 | 4655.46 | 121.70 | 4655.36 |
| 121.86 | 4655.26 | 122.01 | 4655.15 | 122.16 | 4655.05 | 122.32 | 4654.95 | 122.47 | 4654.85 |
| 122.62 | 4654.75 | 122.78 | 4654.65 | 122.93 | 4654.55 | 123.09 | 4654.45 | 123.24 | 4654.35 |

Slice Geometry and Properties - Critical Failure Surface (circle 1, 38 slices)

| Slice     | X-S    |      | Base         |       |        |             | PoreWater |      | Normal | Test  | Factor |        |
|-----------|--------|------|--------------|-------|--------|-------------|-----------|------|--------|-------|--------|--------|
|           | X-Left | Area | Angle        | Width | Length | Matl        | Cohesion  | Phi  | Weight | Force |        | Stress |
| 1         | 120.34 | 0.00 | 35.4         | 0.07  | 0.09   | 1           | 0.00      | 45.0 | 0.01   | 0.00  | 0.11   | 0.80   |
| 2         | 120.42 | 0.00 | 35.7         | 0.07  | 0.09   | 1           | 0.00      | 45.0 | 0.04   | 0.00  | 0.31   | 0.80   |
| 3         | 120.49 | 0.00 | 35.4         | 0.07  | 0.09   | 1           | 0.00      | 45.0 | 0.06   | 0.00  | 0.56   | 0.80   |
| 4         | 120.57 | 0.00 | 35.6         | 0.07  | 0.09   | 1           | 0.00      | 45.0 | 0.09   | 0.00  | 0.77   | 0.80   |
| 5         | 120.64 | 0.00 | 35.1         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.11   | 0.00  | 0.95   | 0.80   |
| 6         | 120.72 | 0.00 | 35.3         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.13   | 0.00  | 1.16   | 0.80   |
| 7         | 120.79 | 0.00 | 35.2         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.15   | 0.00  | 1.30   | 0.80   |
| 8         | 120.87 | 0.00 | 35.0         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.17   | 0.00  | 1.48   | 0.80   |
| 9         | 120.95 | 0.00 | 34.9         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.19   | 0.00  | 1.62   | 0.80   |
| 10        | 121.02 | 0.00 | 34.7         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.20   | 0.00  | 1.73   | 0.80   |
| 11        | 121.10 | 0.00 | 34.6         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.22   | 0.00  | 1.88   | 0.80   |
| 12        | 121.17 | 0.00 | 34.9         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.23   | 0.00  | 1.98   | 0.80   |
| 13        | 121.25 | 0.00 | 34.3         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.24   | 0.00  | 2.06   | 0.80   |
| 14        | 121.32 | 0.00 | 34.6         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.25   | 0.00  | 2.16   | 0.80   |
| 15        | 121.40 | 0.00 | 34.5         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.25   | 0.00  | 2.20   | 0.80   |
| 16        | 121.47 | 0.00 | 34.3         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.26   | 0.00  | 2.28   | 0.80   |
| 17        | 121.55 | 0.00 | 34.2         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.27   | 0.00  | 2.31   | 0.80   |
| 18        | 121.63 | 0.00 | 33.9         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.27   | 0.00  | 2.32   | 0.80   |
| 19        | 121.70 | 0.00 | 33.9         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.27   | 0.00  | 2.36   | 0.80   |
| 20        | 121.78 | 0.00 | 34.1         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.27   | 0.00  | 2.35   | 0.80   |
| 21        | 121.86 | 0.00 | 33.6         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.27   | 0.00  | 2.37   | 0.80   |
| 22        | 121.93 | 0.00 | 33.8         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.27   | 0.00  | 2.33   | 0.80   |
| 23        | 122.01 | 0.00 | 33.5         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.26   | 0.00  | 2.30   | 0.80   |
| 24        | 122.09 | 0.00 | 33.5         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.26   | 0.00  | 2.23   | 0.80   |
| 25        | 122.16 | 0.00 | 33.5         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.25   | 0.00  | 2.16   | 0.80   |
| 26        | 122.24 | 0.00 | 33.5         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.24   | 0.00  | 2.08   | 0.80   |
| 27        | 122.32 | 0.00 | 33.2         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.23   | 0.00  | 1.98   | 0.80   |
| 28        | 122.39 | 0.00 | 33.2         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.22   | 0.00  | 1.88   | 0.80   |
| 29        | 122.47 | 0.00 | 33.1         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.21   | 0.00  | 1.80   | 0.80   |
| 30        | 122.55 | 0.00 | 33.1         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.19   | 0.00  | 1.66   | 0.80   |
| 31        | 122.62 | 0.00 | 32.8         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.17   | 0.00  | 1.52   | 0.80   |
| 32        | 122.70 | 0.00 | 32.8         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.16   | 0.00  | 1.38   | 0.80   |
| 33        | 122.78 | 0.00 | 32.5         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.14   | 0.00  | 1.20   | 0.80   |
| 34        | 122.86 | 0.00 | 32.7         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.11   | 0.00  | 0.98   | 0.80   |
| 35        | 122.93 | 0.00 | 32.7         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.09   | 0.00  | 0.80   | 0.80   |
| 36        | 123.01 | 0.00 | 32.4         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.07   | 0.00  | 0.58   | 0.80   |
| 37        | 123.09 | 0.00 | 32.4         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.04   | 0.00  | 0.36   | 0.80   |
| 38        | 123.17 | 0.00 | 32.1         | 0.08  | 0.09   | 1           | 0.00      | 45.0 | 0.02   | 0.00  | 0.15   | 0.80   |
| X-S Area: |        | 0.06 | Path Length: |       | 3.50   | X-S Weight: |           | 6.85 |        |       |        |        |

DATA: Analysis 3 - Reclaimed Condition

Material Properties (4 materials)

Material: 1 (Mohr-Coulomb Isotropic) - Sand and gravel, mixed grain size

Cohesion Phi UnitWeight Ru  
0.00 45.0 110.00 Auto

Material: 2 (Mohr-Coulomb Isotropic) - OB - loose sand, mixed grain size

Cohesion Phi UnitWeight Ru  
0.00 34.0 99.00 Auto

Material: 3 (Mohr-Coulomb Isotropic) - Bedrock - claystone

Cohesion Phi UnitWeight Ru  
20000.00 25.0 110.00 Auto

Material: 4 (Mohr-Coulomb Isotropic) - Slurry Wall

|              |          |     |            |      |
|--------------|----------|-----|------------|------|
|              | Cohesion | Phi | UnitWeight | Ru   |
| Unsaturated: | 0.00     | 0.0 | 112.00     | Auto |
| Saturated:   | 0.00     | 0.0 | 115.00     | Auto |

#### Water Properties

Unit weight of water: 62.400      Unit weight of water/medium above ground: 0.000

#### Material Profiles (4 profiles)

Profile: 1 (2 points) Material beneath: 2 - OB - loose sand, mixed grain size  
0.00 4670.00 300.00 4670.00  
Profile: 2 (2 points) Material beneath: 1 - Sand and gravel, mixed grain size  
0.00 4667.00 300.00 4667.00  
Profile: 3 (2 points) Material beneath: 3 - Bedrock - claystone  
0.00 4633.00 300.00 4633.00  
Profile: 4 (5 points) Material within: 4 - Slurry Wall  
65.00 4670.00 70.00 4670.00 70.00 4630.00 65.00 4630.00 65.00 4670.00

#### Slope Surface (4 points)

1.00 4670.00 100.00 4670.00 205.00 4635.00 300.00 4635.00

#### Phreatic Surface (2 points)

0.00 4665.00 66.00 4665.00

#### Piezometric Surfaces (1 surface)

#### Failure Surface

Initial circular surface for critical search defined by: XL,XR,R  
Intersects: XL: 100.10 YL: 4669.97 XR: 149.10 YR: 4653.63  
Centre: XC: 146.87 YC: 4728.60 Radius: R: 75.00

#### Variable Restraints

|                               |       |       |       |
|-------------------------------|-------|-------|-------|
| Parameter descriptor:         | XL    | XR    | R     |
| Range of variation:           | 25.00 | 25.00 | 20.00 |
| Trial positions within range: | 20    | 20    | 10    |

RESULTS: Analysis 3 - Reclaimed Condition

#### Bishop Simplified Method of Analysis - Circular Failure Surface

Critical Failure Surface Search using Multiple Circle Generation Techniques

Factor of Safety for initial failure surface approximation: 3.163

There were: 4001 successful analyses from a total of 4001 trial surfaces

Critical (minimum) Factor of Safety: 3.03

#### Results Summary - Lowest 99 Factor of Safety circles

| Circle | X-Left | Y-Left  | X-Right | Y-Right | X-Centre | Y-Centre | Radius | FoS   |                      |
|--------|--------|---------|---------|---------|----------|----------|--------|-------|----------------------|
| 1      | 112.60 | 4665.80 | 136.60  | 4657.80 | 151.18   | 4741.54  | 85.00  | 3.030 | <-- Critical Surface |
| 2      | 112.60 | 4665.80 | 136.60  | 4657.80 | 150.47   | 4739.41  | 82.78  | 3.032 |                      |

|    |        |         |        |         |        |         |       |       |
|----|--------|---------|--------|---------|--------|---------|-------|-------|
| 3  | 112.60 | 4665.80 | 137.92 | 4657.36 | 151.80 | 4741.22 | 85.00 | 3.033 |
| 4  | 111.28 | 4666.24 | 136.60 | 4657.80 | 150.49 | 4741.66 | 85.00 | 3.033 |
| 5  | 112.60 | 4665.80 | 136.60 | 4657.80 | 149.76 | 4737.27 | 80.56 | 3.033 |
| 6  | 100.76 | 4669.75 | 136.60 | 4657.80 | 144.89 | 4742.40 | 85.00 | 3.034 |
| 7  | 112.60 | 4665.80 | 137.92 | 4657.36 | 151.09 | 4739.08 | 82.78 | 3.035 |
| 8  | 111.28 | 4666.24 | 136.60 | 4657.80 | 149.78 | 4739.52 | 82.78 | 3.035 |
| 9  | 112.60 | 4665.80 | 136.60 | 4657.80 | 149.05 | 4735.14 | 78.33 | 3.035 |
| 10 | 99.44  | 4670.00 | 136.60 | 4657.80 | 143.83 | 4742.49 | 85.00 | 3.036 |
| 11 | 102.07 | 4669.31 | 136.60 | 4657.80 | 145.59 | 4742.32 | 85.00 | 3.036 |
| 12 | 109.97 | 4666.68 | 136.60 | 4657.80 | 149.80 | 4741.77 | 85.00 | 3.037 |
| 13 | 111.28 | 4666.24 | 137.92 | 4657.36 | 151.11 | 4741.33 | 85.00 | 3.037 |
| 14 | 112.60 | 4665.80 | 139.23 | 4656.92 | 152.43 | 4740.89 | 85.00 | 3.037 |
| 15 | 111.28 | 4666.24 | 136.60 | 4657.80 | 149.07 | 4737.39 | 80.56 | 3.037 |
| 16 | 112.60 | 4665.80 | 137.92 | 4657.36 | 150.38 | 4736.95 | 80.56 | 3.037 |
| 17 | 112.60 | 4665.80 | 136.60 | 4657.80 | 148.33 | 4733.00 | 76.11 | 3.038 |
| 18 | 100.76 | 4669.75 | 136.60 | 4657.80 | 144.17 | 4740.23 | 82.78 | 3.039 |
| 19 | 112.60 | 4665.80 | 139.23 | 4656.92 | 151.71 | 4738.75 | 82.78 | 3.039 |
| 20 | 111.28 | 4666.24 | 137.92 | 4657.36 | 150.40 | 4739.19 | 82.78 | 3.039 |
| 21 | 109.97 | 4666.68 | 136.60 | 4657.80 | 149.08 | 4739.63 | 82.78 | 3.039 |
| 22 | 111.28 | 4666.24 | 136.60 | 4657.80 | 148.35 | 4735.25 | 78.33 | 3.039 |
| 23 | 112.60 | 4665.80 | 137.92 | 4657.36 | 149.67 | 4734.81 | 78.33 | 3.039 |
| 24 | 112.60 | 4665.80 | 136.60 | 4657.80 | 147.62 | 4730.86 | 73.89 | 3.040 |
| 25 | 108.65 | 4667.12 | 136.60 | 4657.80 | 149.10 | 4741.88 | 85.00 | 3.041 |
| 26 | 109.97 | 4666.68 | 137.92 | 4657.36 | 150.42 | 4741.44 | 85.00 | 3.041 |
| 27 | 111.28 | 4666.24 | 139.23 | 4656.92 | 151.73 | 4741.00 | 85.00 | 3.041 |
| 28 | 102.07 | 4669.31 | 136.60 | 4657.80 | 144.87 | 4740.16 | 82.78 | 3.041 |
| 29 | 104.71 | 4668.43 | 136.60 | 4657.80 | 147.00 | 4742.16 | 85.00 | 3.041 |
| 30 | 112.60 | 4665.80 | 140.55 | 4656.48 | 153.05 | 4740.56 | 85.00 | 3.041 |
| 31 | 103.39 | 4668.87 | 136.60 | 4657.80 | 146.30 | 4742.24 | 85.00 | 3.041 |
| 32 | 112.60 | 4665.80 | 139.23 | 4656.92 | 151.00 | 4736.61 | 80.56 | 3.041 |
| 33 | 111.28 | 4666.24 | 137.92 | 4657.36 | 149.68 | 4737.05 | 80.56 | 3.041 |
| 34 | 109.97 | 4666.68 | 136.60 | 4657.80 | 148.37 | 4737.49 | 80.56 | 3.041 |
| 35 | 99.44  | 4670.00 | 136.60 | 4657.80 | 143.11 | 4740.32 | 82.78 | 3.042 |
| 36 | 112.60 | 4665.80 | 137.92 | 4657.36 | 148.95 | 4732.67 | 76.11 | 3.042 |
| 37 | 111.28 | 4666.24 | 136.60 | 4657.80 | 147.64 | 4733.11 | 76.11 | 3.042 |
| 38 | 106.02 | 4667.99 | 136.60 | 4657.80 | 147.70 | 4742.07 | 85.00 | 3.042 |
| 39 | 112.60 | 4665.80 | 136.60 | 4657.80 | 146.91 | 4728.72 | 71.67 | 3.042 |
| 40 | 107.34 | 4667.55 | 136.60 | 4657.80 | 148.40 | 4741.98 | 85.00 | 3.042 |
| 41 | 108.65 | 4667.12 | 136.60 | 4657.80 | 148.39 | 4739.73 | 82.78 | 3.043 |
| 42 | 111.28 | 4666.24 | 139.23 | 4656.92 | 151.02 | 4738.86 | 82.78 | 3.043 |
| 43 | 109.97 | 4666.68 | 137.92 | 4657.36 | 149.70 | 4739.30 | 82.78 | 3.043 |
| 44 | 112.60 | 4665.80 | 140.55 | 4656.48 | 152.33 | 4738.42 | 82.78 | 3.043 |
| 45 | 100.76 | 4669.75 | 137.92 | 4657.36 | 145.49 | 4742.02 | 85.00 | 3.043 |
| 46 | 112.60 | 4665.80 | 139.23 | 4656.92 | 150.29 | 4734.47 | 78.33 | 3.044 |
| 47 | 109.97 | 4666.68 | 136.60 | 4657.80 | 147.66 | 4735.35 | 78.33 | 3.044 |
| 48 | 111.28 | 4666.24 | 137.92 | 4657.36 | 148.97 | 4734.91 | 78.33 | 3.044 |
| 49 | 103.39 | 4668.87 | 136.60 | 4657.80 | 145.58 | 4740.09 | 82.78 | 3.044 |
| 50 | 112.60 | 4665.80 | 137.92 | 4657.36 | 148.24 | 4730.53 | 73.89 | 3.044 |
| 51 | 104.71 | 4668.43 | 136.60 | 4657.80 | 146.28 | 4740.01 | 82.78 | 3.044 |
| 52 | 111.28 | 4666.24 | 136.60 | 4657.80 | 146.92 | 4730.96 | 73.89 | 3.044 |
| 53 | 100.76 | 4669.75 | 136.60 | 4657.80 | 143.44 | 4738.06 | 80.56 | 3.044 |
| 54 | 102.07 | 4669.31 | 137.92 | 4657.36 | 146.20 | 4741.96 | 85.00 | 3.045 |
| 55 | 108.65 | 4667.12 | 137.92 | 4657.36 | 149.72 | 4741.54 | 85.00 | 3.045 |
| 56 | 111.28 | 4666.24 | 140.55 | 4656.48 | 152.35 | 4740.66 | 85.00 | 3.045 |
| 57 | 109.97 | 4666.68 | 139.23 | 4656.92 | 151.03 | 4741.10 | 85.00 | 3.045 |
| 58 | 112.60 | 4665.80 | 141.86 | 4656.05 | 153.66 | 4740.22 | 85.00 | 3.045 |
| 59 | 107.34 | 4667.55 | 136.60 | 4657.80 | 147.69 | 4739.83 | 82.78 | 3.045 |
| 60 | 112.60 | 4665.80 | 136.60 | 4657.80 | 146.19 | 4726.58 | 69.44 | 3.045 |
| 61 | 106.02 | 4667.99 | 136.60 | 4657.80 | 146.99 | 4739.92 | 82.78 | 3.045 |
| 62 | 108.65 | 4667.12 | 136.60 | 4657.80 | 147.67 | 4737.59 | 80.56 | 3.045 |
| 63 | 109.97 | 4666.68 | 137.92 | 4657.36 | 148.99 | 4737.15 | 80.56 | 3.045 |
| 64 | 111.28 | 4666.24 | 139.23 | 4656.92 | 150.30 | 4736.71 | 80.56 | 3.046 |

|    |        |         |        |         |        |         |       |       |
|----|--------|---------|--------|---------|--------|---------|-------|-------|
| 65 | 112.60 | 4665.80 | 140.55 | 4656.48 | 151.62 | 4736.28 | 80.56 | 3.046 |
| 66 | 102.07 | 4669.31 | 136.60 | 4657.80 | 144.15 | 4738.00 | 80.56 | 3.046 |
| 67 | 103.39 | 4668.87 | 137.92 | 4657.36 | 146.91 | 4741.88 | 85.00 | 3.046 |
| 68 | 99.44  | 4670.00 | 137.92 | 4657.36 | 144.44 | 4742.11 | 85.00 | 3.046 |
| 69 | 112.60 | 4665.80 | 139.23 | 4656.92 | 149.57 | 4732.33 | 76.11 | 3.046 |
| 70 | 111.28 | 4666.24 | 137.92 | 4657.36 | 148.26 | 4732.77 | 76.11 | 3.046 |
| 71 | 109.97 | 4666.68 | 136.60 | 4657.80 | 146.94 | 4733.21 | 76.11 | 3.046 |
| 72 | 107.34 | 4667.55 | 137.92 | 4657.36 | 149.02 | 4741.63 | 85.00 | 3.047 |
| 73 | 104.71 | 4668.43 | 137.92 | 4657.36 | 147.61 | 4741.81 | 85.00 | 3.047 |
| 74 | 111.28 | 4666.24 | 136.60 | 4657.80 | 146.21 | 4728.82 | 71.67 | 3.047 |
| 75 | 112.60 | 4665.80 | 137.92 | 4657.36 | 147.52 | 4728.38 | 71.67 | 3.047 |
| 76 | 108.65 | 4667.12 | 137.92 | 4657.36 | 149.00 | 4739.39 | 82.78 | 3.047 |
| 77 | 111.28 | 4666.24 | 140.55 | 4656.48 | 151.63 | 4738.52 | 82.78 | 3.047 |
| 78 | 109.97 | 4666.68 | 139.23 | 4656.92 | 150.32 | 4738.96 | 82.78 | 3.047 |
| 79 | 112.60 | 4665.80 | 141.86 | 4656.05 | 152.95 | 4738.08 | 82.78 | 3.047 |
| 80 | 106.02 | 4667.99 | 137.92 | 4657.36 | 148.32 | 4741.72 | 85.00 | 3.048 |
| 81 | 107.34 | 4667.55 | 136.60 | 4657.80 | 146.97 | 4737.69 | 80.56 | 3.048 |
| 82 | 103.39 | 4668.87 | 136.60 | 4657.80 | 144.86 | 4737.93 | 80.56 | 3.048 |
| 83 | 104.71 | 4668.43 | 136.60 | 4657.80 | 145.57 | 4737.85 | 80.56 | 3.048 |
| 84 | 99.44  | 4670.00 | 136.60 | 4657.80 | 142.40 | 4738.15 | 80.56 | 3.048 |
| 85 | 108.65 | 4667.12 | 136.60 | 4657.80 | 146.96 | 4735.45 | 78.33 | 3.048 |
| 86 | 111.28 | 4666.24 | 139.23 | 4656.92 | 149.59 | 4734.57 | 78.33 | 3.048 |
| 87 | 109.97 | 4666.68 | 137.92 | 4657.36 | 148.27 | 4735.01 | 78.33 | 3.048 |
| 88 | 112.60 | 4665.80 | 140.55 | 4656.48 | 150.90 | 4734.13 | 78.33 | 3.048 |
| 89 | 112.60 | 4665.80 | 136.60 | 4657.80 | 145.48 | 4724.43 | 67.22 | 3.048 |
| 90 | 106.02 | 4667.99 | 136.60 | 4657.80 | 146.27 | 4737.77 | 80.56 | 3.048 |
| 91 | 100.76 | 4669.75 | 137.92 | 4657.36 | 144.77 | 4739.85 | 82.78 | 3.049 |
| 92 | 108.65 | 4667.12 | 139.23 | 4656.92 | 150.33 | 4741.19 | 85.00 | 3.049 |
| 93 | 112.60 | 4665.80 | 143.18 | 4655.61 | 154.28 | 4739.88 | 85.00 | 3.049 |
| 94 | 109.97 | 4666.68 | 140.55 | 4656.48 | 151.65 | 4740.76 | 85.00 | 3.049 |
| 95 | 111.28 | 4666.24 | 141.86 | 4656.05 | 152.97 | 4740.32 | 85.00 | 3.049 |
| 96 | 111.28 | 4666.24 | 137.92 | 4657.36 | 147.54 | 4730.62 | 73.89 | 3.049 |
| 97 | 109.97 | 4666.68 | 136.60 | 4657.80 | 146.23 | 4731.06 | 73.89 | 3.049 |
| 98 | 112.60 | 4665.80 | 139.23 | 4656.92 | 148.86 | 4730.18 | 73.89 | 3.049 |
| 99 | 102.07 | 4669.31 | 137.92 | 4657.36 | 145.48 | 4739.79 | 82.78 | 3.049 |

#### Critical Failure Surface (circle 1)

Intersects: XL: 112.60 YL: 4665.80 XR: 136.60 YR: 4657.80  
Centre: XC: 151.18 YC: 4741.54 Radius: R: 85.00

#### Generated failure surface: (20 points)

|        |         |        |         |        |         |        |         |        |         |
|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| 112.60 | 4665.80 | 113.80 | 4665.20 | 115.00 | 4664.62 | 116.21 | 4664.06 | 117.44 | 4663.52 |
| 118.67 | 4663.00 | 119.91 | 4662.50 | 121.15 | 4662.02 | 122.41 | 4661.56 | 123.67 | 4661.12 |
| 124.94 | 4660.69 | 126.21 | 4660.29 | 127.49 | 4659.91 | 128.78 | 4659.55 | 130.07 | 4659.20 |
| 131.37 | 4658.88 | 132.67 | 4658.58 | 133.97 | 4658.30 | 135.29 | 4658.04 | 136.60 | 4657.80 |

#### Slice Geometry and Properties - Critical Failure Surface (circle 1, 38 slices)

| Slice | X-Left | X-S  | Area | Angle | Width | Base | Length | Matl | Cohesion | Phi  | PoreWater Weight | Normal Force | Test Stress | Factor |
|-------|--------|------|------|-------|-------|------|--------|------|----------|------|------------------|--------------|-------------|--------|
| 1     | 112.60 | 0.03 | 26.6 | 0.60  | 0.67  | 1    | 0.00   | 45.0 | 3.28     | 0.00 | 4.70             | 0.96         |             |        |
| 2     | 113.20 | 0.09 | 26.5 | 0.60  | 0.67  | 1    | 0.00   | 45.0 | 9.79     | 0.00 | 14.07            | 0.96         |             |        |
| 3     | 113.80 | 0.15 | 25.6 | 0.60  | 0.67  | 1    | 0.00   | 45.0 | 16.11    | 0.00 | 23.09            | 0.96         |             |        |
| 4     | 114.40 | 0.20 | 25.6 | 0.60  | 0.67  | 1    | 0.00   | 45.0 | 21.94    | 0.00 | 31.44            | 0.96         |             |        |
| 5     | 115.00 | 0.25 | 24.8 | 0.61  | 0.67  | 1    | 0.00   | 45.0 | 27.67    | 0.00 | 39.58            | 0.96         |             |        |
| 6     | 115.61 | 0.30 | 24.8 | 0.61  | 0.67  | 1    | 0.00   | 45.0 | 32.79    | 0.00 | 46.90            | 0.96         |             |        |
| 7     | 116.21 | 0.34 | 23.8 | 0.61  | 0.67  | 1    | 0.00   | 45.0 | 37.88    | 0.00 | 54.10            | 0.95         |             |        |
| 8     | 116.83 | 0.38 | 23.8 | 0.61  | 0.67  | 1    | 0.00   | 45.0 | 42.32    | 0.00 | 60.42            | 0.95         |             |        |
| 9     | 117.44 | 0.43 | 22.9 | 0.62  | 0.67  | 1    | 0.00   | 45.0 | 46.77    | 0.00 | 66.69            | 0.95         |             |        |
| 10    | 118.05 | 0.46 | 23.0 | 0.62  | 0.67  | 1    | 0.00   | 45.0 | 50.47    | 0.00 | 71.95            | 0.95         |             |        |
| 11    | 118.67 | 0.49 | 22.1 | 0.62  | 0.67  | 1    | 0.00   | 45.0 | 54.23    | 0.00 | 77.22            | 0.95         |             |        |
| 12    | 119.29 | 0.52 | 22.0 | 0.62  | 0.67  | 1    | 0.00   | 45.0 | 57.22    | 0.00 | 81.50            | 0.95         |             |        |



|    |        |      |      |      |      |   |      |      |       |      |       |      |
|----|--------|------|------|------|------|---|------|------|-------|------|-------|------|
| 13 | 119.91 | 0.55 | 21.1 | 0.62 | 0.67 | 1 | 0.00 | 45.0 | 60.26 | 0.00 | 85.75 | 0.95 |
| 14 | 120.53 | 0.57 | 21.2 | 0.62 | 0.67 | 1 | 0.00 | 45.0 | 62.53 | 0.00 | 88.97 | 0.95 |
| 15 | 121.15 | 0.59 | 20.3 | 0.63 | 0.67 | 1 | 0.00 | 45.0 | 64.82 | 0.00 | 92.17 | 0.95 |
| 16 | 121.78 | 0.60 | 20.2 | 0.63 | 0.67 | 1 | 0.00 | 45.0 | 66.34 | 0.00 | 94.34 | 0.95 |
| 17 | 122.41 | 0.62 | 19.3 | 0.63 | 0.67 | 1 | 0.00 | 45.0 | 67.87 | 0.00 | 96.47 | 0.95 |
| 18 | 123.04 | 0.62 | 19.3 | 0.63 | 0.67 | 1 | 0.00 | 45.0 | 68.61 | 0.00 | 97.53 | 0.95 |
| 19 | 123.67 | 0.63 | 18.4 | 0.63 | 0.67 | 1 | 0.00 | 45.0 | 69.39 | 0.00 | 98.61 | 0.95 |
| 20 | 124.30 | 0.63 | 18.4 | 0.63 | 0.67 | 1 | 0.00 | 45.0 | 69.39 | 0.00 | 98.63 | 0.95 |
| 21 | 124.94 | 0.63 | 17.6 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 69.34 | 0.00 | 98.53 | 0.95 |
| 22 | 125.57 | 0.62 | 17.5 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 68.58 | 0.00 | 97.48 | 0.95 |
| 23 | 126.21 | 0.62 | 16.6 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 67.75 | 0.00 | 96.33 | 0.95 |
| 24 | 126.85 | 0.60 | 16.6 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 66.16 | 0.00 | 94.06 | 0.95 |
| 25 | 127.49 | 0.59 | 15.7 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 64.53 | 0.00 | 91.80 | 0.95 |
| 26 | 128.13 | 0.57 | 15.8 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 62.18 | 0.00 | 88.44 | 0.95 |
| 27 | 128.78 | 0.54 | 14.8 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 59.71 | 0.00 | 85.01 | 0.95 |
| 28 | 129.42 | 0.51 | 14.8 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 56.55 | 0.00 | 80.52 | 0.95 |
| 29 | 130.07 | 0.48 | 13.9 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 53.23 | 0.00 | 75.87 | 0.95 |
| 30 | 130.72 | 0.45 | 14.0 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 49.26 | 0.00 | 70.19 | 0.95 |
| 31 | 131.37 | 0.41 | 13.0 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 45.07 | 0.00 | 64.31 | 0.95 |
| 32 | 132.02 | 0.37 | 13.0 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 40.35 | 0.00 | 57.59 | 0.95 |
| 33 | 132.67 | 0.32 | 12.1 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 35.34 | 0.00 | 50.50 | 0.96 |
| 34 | 133.32 | 0.27 | 12.1 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 29.76 | 0.00 | 42.54 | 0.96 |
| 35 | 133.97 | 0.22 | 11.2 | 0.66 | 0.67 | 1 | 0.00 | 45.0 | 23.87 | 0.00 | 34.18 | 0.96 |
| 36 | 134.63 | 0.16 | 11.2 | 0.66 | 0.67 | 1 | 0.00 | 45.0 | 17.53 | 0.00 | 25.10 | 0.96 |
| 37 | 135.29 | 0.10 | 10.3 | 0.66 | 0.67 | 1 | 0.00 | 45.0 | 10.80 | 0.00 | 15.50 | 0.96 |
| 38 | 135.94 | 0.03 | 10.4 | 0.66 | 0.67 | 1 | 0.00 | 45.0 | 3.60  | 0.00 | 5.17  | 0.96 |

X-S Area: 15.94 Path Length: 25.39 X-S Weight: 1753.30

DATA: Analysis 4 - Reclaimed Condition

Material Properties (4 materials)

Material: 1 (Mohr-Coulomb Isotropic) - Sand and gravel, mixed grain size

Cohesion Phi UnitWeight Ru  
0.00 45.0 110.00 Auto

Material: 2 (Mohr-Coulomb Isotropic) - OB - loose sand, mixed grain size

Cohesion Phi UnitWeight Ru  
0.00 34.0 99.00 Auto

Material: 3 (Mohr-Coulomb Isotropic) - Bedrock - claystone

Cohesion Phi UnitWeight Ru  
20000.00 25.0 110.00 Auto

Material: 4 (Mohr-Coulomb Isotropic) - Slurry Wall

Cohesion Phi UnitWeight Ru  
Unsaturated: 0.00 0.0 112.00 Auto  
Saturated: 0.00 0.0 115.00 Auto

Water Properties

Unit weight of water: 62.400 Unit weight of water/medium above ground: 0.000

Material Profiles (4 profiles)

Profile: 1 (2 points) Material beneath: 2 - OB - loose sand, mixed grain size

0.00 4670.00 300.00 4670.00

Profile: 2 (2 points) Material beneath: 1 - Sand and gravel, mixed grain size

0.00 4667.00 300.00 4667.00

Profile: 3 (2 points) Material beneath: 3 - Bedrock - claystone

0.00 4633.00 300.00 4633.00  
 Profile: 4 (5 points) Material within: 4 - Slurry Wall  
 65.00 4670.00 70.00 4670.00 70.00 4630.00 65.00 4630.00 65.00 4670.00

Slope Surface (4 points)

-----  
 1.00 4670.00 100.00 4670.00 205.00 4635.00 300.00 4635.00

Phreatic Surface (2 points)

-----  
 0.00 4665.00 66.00 4665.00

Piezometric Surfaces (1 surface)

-----  
 Failure Surface (Critical, from previous analysis)

-----  
 Initial circular surface for critical search defined by: XL,XR,R  
 Intersects: XL: 112.60 YL: 4665.80 XR: 136.60 YR: 4657.80  
 Centre: XC: 151.18 YC: 4741.54 Radius: R: 85.00

Earthquake Force

-----  
 Pseudo-static earthquake (seismic) coefficient: 0.050

Variable Restraints

-----  
 Parameter descriptor: XL XR R  
 Range of variation: 25.00 25.00 20.00  
 Trial positions within range: 20 20 10

-----  
 RESULTS: Analysis 4 - Reclaimed Condition

Bishop Simplified Method of Analysis - Circular Failure Surface

-----  
 Critical Failure Surface Search using Multiple Circle Generation Techniques

Factor of Safety for initial failure surface approximation: 2.592

There were: 3896 successful analyses from a total of 4001 trial surfaces  
 105 analyses terminated due to unacceptable geometry

Critical (minimum) Factor of Safety: 2.45

-----  
 Results Summary - Lowest 99 Factor of Safety circles

| Circle | X-Left | Y-Left  | X-Right | Y-Right | X-Centre | Y-Centre | Radius | FoS   |                      |
|--------|--------|---------|---------|---------|----------|----------|--------|-------|----------------------|
| 1      | 100.10 | 4669.97 | 124.10  | 4661.97 | 141.87   | 4755.29  | 95.00  | 2.447 | <-- Critical Surface |
| 2      | 100.10 | 4669.97 | 124.10  | 4661.97 | 141.16   | 4753.16  | 92.78  | 2.450 |                      |
| 3      | 100.10 | 4669.97 | 124.10  | 4661.97 | 140.46   | 4751.03  | 90.56  | 2.454 |                      |
| 4      | 100.10 | 4669.97 | 124.10  | 4661.97 | 139.75   | 4748.90  | 88.33  | 2.457 |                      |
| 5      | 100.10 | 4669.97 | 124.10  | 4661.97 | 139.04   | 4746.77  | 86.11  | 2.461 |                      |
| 6      | 100.10 | 4669.97 | 124.10  | 4661.97 | 138.32   | 4744.64  | 83.89  | 2.464 |                      |
| 7      | 101.42 | 4669.53 | 124.10  | 4661.97 | 142.56   | 4755.16  | 95.00  | 2.468 |                      |
| 8      | 100.10 | 4669.97 | 124.10  | 4661.97 | 137.61   | 4742.51  | 81.67  | 2.468 |                      |
| 9      | 100.10 | 4669.97 | 125.42  | 4661.53 | 142.50   | 4754.98  | 95.00  | 2.469 |                      |
| 10     | 101.42 | 4669.53 | 124.10  | 4661.97 | 141.85   | 4753.03  | 92.78  | 2.471 |                      |
| 11     | 100.10 | 4669.97 | 125.42  | 4661.53 | 141.79   | 4752.85  | 92.78  | 2.472 |                      |
| 12     | 100.10 | 4669.97 | 124.10  | 4661.97 | 136.90   | 4740.37  | 79.44  | 2.473 |                      |

|    |        |         |        |         |        |         |       |       |
|----|--------|---------|--------|---------|--------|---------|-------|-------|
| 13 | 101.42 | 4669.53 | 124.10 | 4661.97 | 141.14 | 4750.90 | 90.56 | 2.474 |
| 14 | 101.42 | 4669.53 | 124.10 | 4661.97 | 140.43 | 4748.78 | 88.33 | 2.476 |
| 15 | 100.10 | 4669.97 | 124.10 | 4661.97 | 136.19 | 4738.24 | 77.22 | 2.477 |
| 16 | 100.10 | 4669.97 | 125.42 | 4661.53 | 141.08 | 4750.72 | 90.56 | 2.478 |
| 17 | 100.10 | 4669.97 | 125.42 | 4661.53 | 140.37 | 4748.59 | 88.33 | 2.479 |
| 18 | 101.42 | 4669.53 | 124.10 | 4661.97 | 139.72 | 4746.65 | 86.11 | 2.479 |
| 19 | 100.10 | 4669.97 | 124.10 | 4661.97 | 135.48 | 4736.10 | 75.00 | 2.482 |
| 20 | 100.10 | 4669.97 | 125.42 | 4661.53 | 139.66 | 4746.45 | 86.11 | 2.482 |
| 21 | 101.42 | 4669.53 | 124.10 | 4661.97 | 139.01 | 4744.52 | 83.89 | 2.483 |
| 22 | 100.10 | 4669.97 | 125.42 | 4661.53 | 138.95 | 4744.32 | 83.89 | 2.486 |
| 23 | 101.42 | 4669.53 | 124.10 | 4661.97 | 138.30 | 4742.39 | 81.67 | 2.486 |
| 24 | 101.42 | 4669.53 | 125.42 | 4661.53 | 143.19 | 4754.85 | 95.00 | 2.487 |
| 25 | 100.10 | 4669.97 | 126.73 | 4661.09 | 143.13 | 4754.66 | 95.00 | 2.487 |
| 26 | 101.42 | 4669.53 | 125.42 | 4661.53 | 142.48 | 4752.72 | 92.78 | 2.490 |
| 27 | 101.42 | 4669.53 | 124.10 | 4661.97 | 137.59 | 4740.26 | 79.44 | 2.490 |
| 28 | 100.10 | 4669.97 | 125.42 | 4661.53 | 138.24 | 4742.18 | 81.67 | 2.490 |
| 29 | 102.73 | 4669.09 | 124.10 | 4661.97 | 143.24 | 4755.02 | 95.00 | 2.490 |
| 30 | 100.10 | 4669.97 | 126.73 | 4661.09 | 142.42 | 4752.53 | 92.78 | 2.490 |
| 31 | 101.42 | 4669.53 | 125.42 | 4661.53 | 141.77 | 4750.59 | 90.56 | 2.492 |
| 32 | 102.73 | 4669.09 | 124.10 | 4661.97 | 142.54 | 4752.89 | 92.78 | 2.492 |
| 33 | 101.42 | 4669.53 | 124.10 | 4661.97 | 136.88 | 4738.12 | 77.22 | 2.493 |
| 34 | 100.10 | 4669.97 | 126.73 | 4661.09 | 141.71 | 4750.40 | 90.56 | 2.494 |
| 35 | 100.10 | 4669.97 | 125.42 | 4661.53 | 137.52 | 4740.04 | 79.44 | 2.494 |
| 36 | 102.73 | 4669.09 | 124.10 | 4661.97 | 141.83 | 4750.77 | 90.56 | 2.494 |
| 37 | 101.42 | 4669.53 | 125.42 | 4661.53 | 141.06 | 4748.46 | 88.33 | 2.495 |
| 38 | 102.73 | 4669.09 | 124.10 | 4661.97 | 141.12 | 4748.65 | 88.33 | 2.497 |
| 39 | 100.10 | 4669.97 | 126.73 | 4661.09 | 141.00 | 4748.26 | 88.33 | 2.497 |
| 40 | 101.42 | 4669.53 | 124.10 | 4661.97 | 136.17 | 4735.99 | 75.00 | 2.497 |
| 41 | 101.42 | 4669.53 | 125.42 | 4661.53 | 140.35 | 4746.33 | 86.11 | 2.498 |
| 42 | 100.10 | 4669.97 | 125.42 | 4661.53 | 136.81 | 4737.90 | 77.22 | 2.499 |
| 43 | 102.73 | 4669.09 | 124.10 | 4661.97 | 140.41 | 4746.52 | 86.11 | 2.499 |
| 44 | 100.10 | 4669.97 | 126.73 | 4661.09 | 140.28 | 4746.13 | 86.11 | 2.501 |
| 45 | 101.42 | 4669.53 | 125.42 | 4661.53 | 139.64 | 4744.20 | 83.89 | 2.501 |
| 46 | 102.73 | 4669.09 | 124.10 | 4661.97 | 139.70 | 4744.39 | 83.89 | 2.502 |
| 47 | 101.42 | 4669.53 | 126.73 | 4661.09 | 143.82 | 4754.54 | 95.00 | 2.503 |
| 48 | 100.10 | 4669.97 | 128.05 | 4660.65 | 143.75 | 4754.34 | 95.00 | 2.503 |
| 49 | 100.10 | 4669.97 | 125.42 | 4661.53 | 136.10 | 4735.76 | 75.00 | 2.504 |
| 50 | 100.10 | 4669.97 | 126.73 | 4661.09 | 139.57 | 4743.99 | 83.89 | 2.504 |
| 51 | 102.73 | 4669.09 | 124.10 | 4661.97 | 138.99 | 4742.26 | 81.67 | 2.505 |
| 52 | 101.42 | 4669.53 | 125.42 | 4661.53 | 138.93 | 4742.07 | 81.67 | 2.505 |
| 53 | 101.42 | 4669.53 | 126.73 | 4661.09 | 143.11 | 4752.41 | 92.78 | 2.506 |
| 54 | 100.10 | 4669.97 | 128.05 | 4660.65 | 143.04 | 4752.21 | 92.78 | 2.507 |
| 55 | 102.73 | 4669.09 | 124.10 | 4661.97 | 138.28 | 4740.13 | 79.44 | 2.508 |
| 56 | 102.73 | 4669.09 | 125.42 | 4661.53 | 143.88 | 4754.72 | 95.00 | 2.508 |
| 57 | 101.42 | 4669.53 | 125.42 | 4661.53 | 138.22 | 4739.93 | 79.44 | 2.508 |
| 58 | 101.42 | 4669.53 | 126.73 | 4661.09 | 142.40 | 4750.28 | 90.56 | 2.508 |
| 59 | 100.10 | 4669.97 | 126.73 | 4661.09 | 138.86 | 4741.85 | 81.67 | 2.509 |
| 60 | 102.73 | 4669.09 | 125.42 | 4661.53 | 143.17 | 4752.59 | 92.78 | 2.509 |
| 61 | 100.10 | 4669.97 | 128.05 | 4660.65 | 142.33 | 4750.07 | 90.56 | 2.510 |
| 62 | 102.73 | 4669.09 | 125.42 | 4661.53 | 142.46 | 4750.46 | 90.56 | 2.511 |
| 63 | 102.73 | 4669.09 | 124.10 | 4661.97 | 137.57 | 4738.00 | 77.22 | 2.511 |
| 64 | 101.42 | 4669.53 | 126.73 | 4661.09 | 141.69 | 4748.15 | 88.33 | 2.512 |
| 65 | 101.42 | 4669.53 | 125.42 | 4661.53 | 137.51 | 4737.80 | 77.22 | 2.512 |
| 66 | 100.10 | 4669.97 | 126.73 | 4661.09 | 138.14 | 4739.71 | 79.44 | 2.513 |
| 67 | 104.05 | 4668.65 | 124.10 | 4661.97 | 143.93 | 4754.87 | 95.00 | 2.513 |
| 68 | 102.73 | 4669.09 | 125.42 | 4661.53 | 141.75 | 4748.34 | 88.33 | 2.513 |
| 69 | 100.10 | 4669.97 | 128.05 | 4660.65 | 141.62 | 4747.94 | 88.33 | 2.513 |
| 70 | 102.73 | 4669.09 | 124.10 | 4661.97 | 136.86 | 4735.87 | 75.00 | 2.514 |
| 71 | 101.42 | 4669.53 | 126.73 | 4661.09 | 140.98 | 4746.01 | 86.11 | 2.515 |
| 72 | 104.05 | 4668.65 | 124.10 | 4661.97 | 143.22 | 4752.75 | 92.78 | 2.515 |
| 73 | 102.73 | 4669.09 | 125.42 | 4661.53 | 141.04 | 4746.21 | 86.11 | 2.515 |
| 74 | 104.05 | 4668.65 | 124.10 | 4661.97 | 142.51 | 4750.63 | 90.56 | 2.516 |

|    |        |         |        |         |        |         |       |       |
|----|--------|---------|--------|---------|--------|---------|-------|-------|
| 75 | 101.42 | 4669.53 | 125.42 | 4661.53 | 136.79 | 4735.66 | 75.00 | 2.516 |
| 76 | 100.10 | 4669.97 | 128.05 | 4660.65 | 140.90 | 4745.80 | 86.11 | 2.517 |
| 77 | 100.10 | 4669.97 | 126.73 | 4661.09 | 137.43 | 4737.57 | 77.22 | 2.517 |
| 78 | 101.42 | 4669.53 | 126.73 | 4661.09 | 140.26 | 4743.88 | 83.89 | 2.518 |
| 79 | 100.10 | 4669.97 | 129.36 | 4660.21 | 144.37 | 4754.02 | 95.00 | 2.518 |
| 80 | 101.42 | 4669.53 | 128.05 | 4660.65 | 144.44 | 4754.23 | 95.00 | 2.518 |
| 81 | 102.73 | 4669.09 | 125.42 | 4661.53 | 140.33 | 4744.08 | 83.89 | 2.518 |
| 82 | 104.05 | 4668.65 | 124.10 | 4661.97 | 141.81 | 4748.51 | 88.33 | 2.518 |
| 83 | 102.73 | 4669.09 | 126.73 | 4661.09 | 144.51 | 4754.41 | 95.00 | 2.520 |
| 84 | 101.42 | 4669.53 | 128.05 | 4660.65 | 143.73 | 4752.09 | 92.78 | 2.520 |
| 85 | 104.05 | 4668.65 | 124.10 | 4661.97 | 141.10 | 4746.38 | 86.11 | 2.520 |
| 86 | 100.10 | 4669.97 | 128.05 | 4660.65 | 140.19 | 4743.66 | 83.89 | 2.521 |
| 87 | 102.73 | 4669.09 | 125.42 | 4661.53 | 139.62 | 4741.95 | 81.67 | 2.521 |
| 88 | 100.10 | 4669.97 | 129.36 | 4660.21 | 143.66 | 4751.88 | 92.78 | 2.521 |
| 89 | 101.42 | 4669.53 | 126.73 | 4661.09 | 139.55 | 4741.74 | 81.67 | 2.521 |
| 90 | 102.73 | 4669.09 | 126.73 | 4661.09 | 143.80 | 4752.28 | 92.78 | 2.522 |
| 91 | 104.05 | 4668.65 | 124.10 | 4661.97 | 140.39 | 4744.26 | 83.89 | 2.522 |
| 92 | 100.10 | 4669.97 | 126.73 | 4661.09 | 136.71 | 4735.42 | 75.00 | 2.522 |
| 93 | 101.42 | 4669.53 | 128.05 | 4660.65 | 143.02 | 4749.96 | 90.56 | 2.523 |
| 94 | 102.73 | 4669.09 | 125.42 | 4661.53 | 138.91 | 4739.82 | 79.44 | 2.524 |
| 95 | 102.73 | 4669.09 | 126.73 | 4661.09 | 143.09 | 4750.16 | 90.56 | 2.524 |
| 96 | 100.10 | 4669.97 | 129.36 | 4660.21 | 142.95 | 4749.74 | 90.56 | 2.524 |
| 97 | 104.05 | 4668.65 | 124.10 | 4661.97 | 139.68 | 4742.13 | 81.67 | 2.524 |
| 98 | 100.10 | 4669.97 | 128.05 | 4660.65 | 139.48 | 4741.51 | 81.67 | 2.525 |
| 99 | 101.42 | 4669.53 | 126.73 | 4661.09 | 138.84 | 4739.61 | 79.44 | 2.525 |

Critical Failure Surface (circle 1)

-----  
Intersects: XL: 100.10 YL: 4669.97 XR: 124.10 YR: 4661.97  
Centre: XC: 141.87 YC: 4755.29 Radius: R: 95.00

Generated failure surface: (20 points)

|        |         |        |         |        |         |        |         |        |         |
|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| 100.10 | 4669.97 | 101.30 | 4669.39 | 102.51 | 4668.83 | 103.73 | 4668.28 | 104.96 | 4667.75 |
| 106.20 | 4667.24 | 107.44 | 4666.75 | 108.68 | 4666.28 | 109.94 | 4665.82 | 111.20 | 4665.38 |
| 112.47 | 4664.96 | 113.74 | 4664.55 | 115.02 | 4664.16 | 116.30 | 4663.80 | 117.59 | 4663.45 |
| 118.88 | 4663.11 | 120.18 | 4662.80 | 121.48 | 4662.50 | 122.79 | 4662.23 | 124.10 | 4661.97 |

Slice Geometry and Properties - Critical Failure Surface (circle 1, 39 slices)

| Slice | X-S    |      | Base  |       |        |      |          | PoreWater |        | Normal Force | Test Stress | Factor |
|-------|--------|------|-------|-------|--------|------|----------|-----------|--------|--------------|-------------|--------|
|       | X-Left | Area | Angle | Width | Length | Matl | Cohesion | Phi       | Weight |              |             |        |
| 1     | 100.10 | 0.03 | 25.7  | 0.60  | 0.67   | 2    | 0.00     | 34.0      | 2.62   | 0.00         | 3.84        | 0.98   |
| 2     | 100.70 | 0.08 | 25.7  | 0.60  | 0.67   | 2    | 0.00     | 34.0      | 7.94   | 0.00         | 11.65       | 0.98   |
| 3     | 101.30 | 0.13 | 24.9  | 0.61  | 0.67   | 2    | 0.00     | 34.0      | 13.00  | 0.00         | 19.03       | 0.98   |
| 4     | 101.91 | 0.18 | 24.9  | 0.61  | 0.67   | 2    | 0.00     | 34.0      | 17.77  | 0.00         | 26.02       | 0.98   |
| 5     | 102.51 | 0.23 | 24.1  | 0.61  | 0.67   | 2    | 0.00     | 34.0      | 22.34  | 0.00         | 32.62       | 0.98   |
| 6     | 103.12 | 0.27 | 24.1  | 0.61  | 0.67   | 2    | 0.00     | 34.0      | 26.52  | 0.00         | 38.73       | 0.98   |
| 7     | 103.73 | 0.31 | 23.3  | 0.61  | 0.67   | 2    | 0.00     | 34.0      | 30.57  | 0.00         | 44.56       | 0.97   |
| 8     | 104.35 | 0.35 | 23.3  | 0.61  | 0.67   | 2    | 0.00     | 34.0      | 34.19  | 0.00         | 49.83       | 0.97   |
| 9     | 104.96 | 0.38 | 22.4  | 0.62  | 0.67   | 2    | 0.00     | 34.0      | 37.70  | 0.00         | 54.86       | 0.97   |
| 10    | 105.58 | 0.41 | 22.5  | 0.62  | 0.67   | 2    | 0.00     | 34.0      | 40.72  | 0.00         | 59.23       | 0.97   |
| 11    | 106.20 | 0.44 | 21.7  | 0.61  | 0.66   | 2    | 0.00     | 34.0      | 43.16  | 0.00         | 63.44       | 0.97   |
| 12    | 106.81 | 0.47 | 21.7  | 0.63  | 0.68   | 1    | 0.00     | 45.0      | 47.55  | 0.00         | 65.14       | 0.93   |
| 13    | 107.44 | 0.49 | 20.9  | 0.62  | 0.67   | 1    | 0.00     | 45.0      | 51.03  | 0.00         | 70.76       | 0.93   |
| 14    | 108.06 | 0.51 | 20.8  | 0.62  | 0.67   | 1    | 0.00     | 45.0      | 54.50  | 0.00         | 75.60       | 0.93   |
| 15    | 108.68 | 0.26 | 20.1  | 0.32  | 0.34   | 1    | 0.00     | 45.0      | 28.80  | 0.00         | 79.42       | 0.93   |
| 16    | 109.00 | 0.40 | 20.1  | 0.47  | 0.50   | 1    | 0.00     | 45.0      | 43.75  | 0.00         | 81.09       | 0.93   |
| 17    | 109.47 | 0.40 | 20.1  | 0.47  | 0.50   | 1    | 0.00     | 45.0      | 44.50  | 0.00         | 82.49       | 0.93   |
| 18    | 109.94 | 0.55 | 19.3  | 0.63  | 0.67   | 1    | 0.00     | 45.0      | 60.65  | 0.00         | 84.18       | 0.93   |
| 19    | 110.57 | 0.56 | 19.2  | 0.63  | 0.67   | 1    | 0.00     | 45.0      | 61.32  | 0.00         | 85.14       | 0.93   |
| 20    | 111.20 | 0.56 | 18.4  | 0.63  | 0.67   | 1    | 0.00     | 45.0      | 61.96  | 0.00         | 86.09       | 0.93   |
| 21    | 111.83 | 0.56 | 18.5  | 0.63  | 0.67   | 1    | 0.00     | 45.0      | 61.99  | 0.00         | 86.12       | 0.93   |
| 22    | 112.47 | 0.56 | 17.6  | 0.64  | 0.67   | 1    | 0.00     | 45.0      | 61.90  | 0.00         | 86.10       | 0.93   |

|    |        |      |      |      |      |   |      |      |       |      |       |      |
|----|--------|------|------|------|------|---|------|------|-------|------|-------|------|
| 23 | 113.10 | 0.56 | 17.6 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 61.22 | 0.00 | 85.14 | 0.93 |
| 24 | 113.74 | 0.55 | 16.8 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 60.42 | 0.00 | 84.13 | 0.93 |
| 25 | 114.38 | 0.54 | 16.8 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 59.04 | 0.00 | 82.22 | 0.93 |
| 26 | 115.02 | 0.52 | 16.0 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 57.53 | 0.00 | 80.24 | 0.93 |
| 27 | 115.66 | 0.50 | 16.0 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 55.46 | 0.00 | 77.36 | 0.93 |
| 28 | 116.30 | 0.48 | 15.2 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 53.22 | 0.00 | 74.34 | 0.93 |
| 29 | 116.95 | 0.46 | 15.2 | 0.64 | 0.67 | 1 | 0.00 | 45.0 | 50.39 | 0.00 | 70.38 | 0.93 |
| 30 | 117.59 | 0.43 | 14.4 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 47.42 | 0.00 | 66.36 | 0.93 |
| 31 | 118.24 | 0.40 | 14.4 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 43.94 | 0.00 | 61.48 | 0.93 |
| 32 | 118.88 | 0.37 | 13.6 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 40.19 | 0.00 | 56.37 | 0.94 |
| 33 | 119.53 | 0.33 | 13.6 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 35.94 | 0.00 | 50.39 | 0.94 |
| 34 | 120.18 | 0.29 | 12.8 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 31.51 | 0.00 | 44.28 | 0.94 |
| 35 | 120.83 | 0.24 | 12.8 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 26.51 | 0.00 | 37.25 | 0.94 |
| 36 | 121.48 | 0.19 | 12.0 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 21.29 | 0.00 | 30.00 | 0.94 |
| 37 | 122.14 | 0.14 | 12.0 | 0.65 | 0.67 | 1 | 0.00 | 45.0 | 15.61 | 0.00 | 21.99 | 0.94 |
| 38 | 122.79 | 0.09 | 11.2 | 0.66 | 0.67 | 1 | 0.00 | 45.0 | 9.57  | 0.00 | 13.52 | 0.94 |
| 39 | 123.44 | 0.03 | 11.2 | 0.66 | 0.67 | 1 | 0.00 | 45.0 | 3.20  | 0.00 | 4.52  | 0.94 |

|           |       |              |       |             |         |
|-----------|-------|--------------|-------|-------------|---------|
| X-S Area: | 14.24 | Path Length: | 25.37 | X-S Weight: | 1526.96 |
|-----------|-------|--------------|-------|-------------|---------|



**Lewicki & Associates**  
ENGINEERING | GEOLOGY | ENVIRONMENTAL

January 27, 2025

Weld County Clerk and Recorder  
1250 H St  
Greeley 80631

**Evans Mining Resource  
112 Construction Materials Reclamation Permit Application - Adequacy Response 1**

Dear Weld County Clerk:

Please certify that a copy of the adequacy response for the Evans Mining Resource 112c Construction Materials application is currently available for public viewing.

The applicant is Asphalt Specialties Co. Inc. The Colorado Division of Reclamation, Mining, and Safety requires evidence that a public copy of the updated application has been provided to your office. This copy is to be available for viewing by members of the public upon request; recording is not requested.

Please sign and date below certifying that the application has been filed. Return this page to the email address provided below.

The application update was received on the following date:

Date: 1/31/25

Recipient: Carolyn Hopper

Regards,

Sydney Connor  
Lewicki & Associates, PLLC  
sydney@lewicki.biz  
(719)323-9867