REPORT

2022 Annual Facility Performance Report

Coarse Coal Refuse Facilities

Submitted to:

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Executive Summary

This report presents the 2022 annual facility performance report (AFPR) for coarse coal refuse (CCR) facilities at the Teck Coal Limited (Teck), Greenhills Operations (GHO) mine site. The reporting period for this AFPR is between 1 September 2021 and 31 August 2022. This AFPR includes the dormant Site A facility and the active Site B and Site E facilities.

The 2022 site visit was carried out during the week of 29 August 2022. Based on observations during the site visit, Site A, B, and E CCR facilities appeared to be in good condition with no identified deficiencies that required immediate action.

The 2022 inspection and reporting of the Site C and Site D CCR facilities is included as part of the GHO tailings storage facility AFPR.

Review of Key Hazards

Facility safety is assessed by comparing the design basis for each facility (Golder 2022c) against observed performance and available data during the monitoring period for the following failure modes/hazards:

- Instability
  - Stability analyses were completed for the Site A, B, and E facilities and met a minimum static factor of safety of 1.3. No seismic stability analyses were completed for the Site A and E facilities. An update of the stability analyses for the facilities is planned for 2023 (Recommendation 2021-02).
  - A portion of the Site B facility was observed to have been placed beyond the design extent in August 2021. Remediation of this area was completed in late 2021 to achieve minimum design criteria.
  - The Site A, B, and E facilities were observed to be in good condition at the time of the 2022 site visit. No significant changes were noted during the inspection.
- Internal erosion
  - There is no source of free water, and a hydraulic gradient that could result in internal erosion is not expected.
  - The Site A, B, and E facilities were observed to be in good condition at the time of the 2022 site visit. No significant changes were noted during the inspection.
- External erosion
  - A surface water management plan is in place for the CCR facilities, which includes water control measures to limit external erosion on the facility by directing runoff away from the facility.
  - The Site A, B, and E facilities were observed to be in good condition at the time of the 2022 site visit. No significant changes were noted during the inspection.

Consequences of Failure

Teck no longer adopts a classification system that has levels of potential human loss of life and instead aims to eliminate any credible risk of loss of life and reduce all other credible catastrophic risks to As Low As Reasonably Practicable. Adopting this approach meets or exceeds regulatory requirements and aligns with Teck's goal to eliminate any risk for loss of life, which is consistent with industry best practices.

Summary of Significant Changes

There were no significant changes in the operation and performance of the CCR facilities during the reporting period.

A failure mode assessment was completed for each facility in July 2022. Additional risk assessments/registers for the CCR facilities are planned for 2023, however the completion of the failure mode assessment meets the intent of Recommendation 2021-03, which is now considered closed.

Significant Changes in Instrumentation or Visual Monitoring Records

No significant changes were noted during the 2022 site inspection or routine GHO visual inspections.

Based on a single reading from the VW piezometers installed in the CCR facilities, data were consistent with historic values and indicative of expected conditions.

Significant Changes to Stability and/or Surface Water Control

There were no significant changes to facility stability or integrity and/or control of surface water during the reporting period.

Operation, Maintenance, and Surveillance Manual and Emergency Preparedness and Response Plan

The GHO CCR facilities are managed under Teck's Standard Practices and Procedures 1022, H1324, and H1350. The development of an operation, maintenance, and surveillance is planned for 2023 (Recommendation 2021-02)with the aim of addressing recommendation 2021-02.

Recommendations

There are no previous or current Priority 1 or 2 deficiencies/recommendations. Previous Priority 3 and 4 deficiencies and/or recommendations are presented in Table 2 in Section 6.5.

Abbreviations

Abbreviation	Definition
AFPR	annual facility performance report
CCR	coarse coal refuse (also known as coarse refuse/rejects; CR)
CDA	Canadian Dam Association
DSR	dam safety review
EMLI	British Columbia Ministry of Energy, Mines and Low Carbon Innovation
GHO	Greenhills Operations
HSRC	Health, Safety and Reclamation Code for Mines in British Columbia
Ministry of Energy and Mines	British Columbia Ministry of Energy and Mines, now known as the British Columbia Ministry of Energy, Mines and Low Carbon Innovation (EMLI)
NBCC	National Building Code of Canada
OMS	operation, maintenance, and surveillance
QP	Qualified Person
RTK	real-time kinematic
SP&P	Standard Practice and Procedure
Teck	Teck Coal Limited
TSF	tailings storage facility
TWRS	tailings and water retaining structures
VW	vibrating wire
WSP	WSP Canada Inc., formerly WSP Golder and Golder Associates Ltd.

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1.0 INTRODUCTION

1.1 Purpose, Scope of Work, and Method

At the request of Teck Coal Limited, Greenhills Operations (GHO), WSP Canada (formerly WSP Golder and Golder Associates Ltd.) has completed the 2022 annual facility performance report (AFPR) for select coarse coal refuse (CCR) facilities at the GHO mine site. This AFPR includes the following facilities:

- **Site A facility**—dormant
- **Site B facility**—active
- **Site E facility**—active

Facility status is defined in Teck's Standard Practices and Procedures (SP&Ps) H1324 (Teck 2018a) as follows:

- **Active**—open for dumping and have received material within the last 48 hours.
- **Dormant**—no dumping within the last year and visual monitoring in that period has indicated no movement is occurring.

The Site C and Site D CCR facilities are located immediately downstream of the GHO tailings storage facility (TSF) and the 2022 inspection and reporting of these facilities is included as part of the GHO TSF AFPR.

This AFPR consists of the following:

- a summary of site conditions and background information
- a summary of the construction, operation, and/or maintenance activities for the reporting period
- site photographs and records of inspection
- review of
  - available instrumentation data
  - consequence of failure
  - required operational documents
  - climate data
  - facility performance relative to potential failure modes

The 2022 site visit was carried out during the week of 29 August 2022. Photographs of the CCR facilities are presented in Appendix A and a summary of observations during the August 2022 site visit is included in Appendix B.

This report is to be read in conjunction with the Study Limitations, which follows the text.

1.2 Regulatory Requirements

1.2.1 BC Health, Safety and Reclamation Code

The GHO CCR facilities are regulated under the Health, Safety and Reclamation Code (HSRC) for Mines in British Columbia (EMLI 2021).

This AFPR has been prepared in accordance with the requirements of the HSRC (EMLI 2021) and in consideration of the guidelines for annual reports provided in the HSRC Guidance Document (Ministry of Energy and Mines 2016) and Teck Resources Limited's Guideline for Tailings and Water Retaining Structures (Teck Resources 2019).

This report is intended to satisfy the requirements of an annual safety inspection and it is understood that this report will be submitted by Teck to the Chief Inspector of Mines for British Columbia.

1.2.2 Permits and Licences

Specific permits, including amendments, and licences that apply to the CCR facilities, include the following:

- C-137 Permit
- Environmental Management Act Permit PE-6248, 17 December 2021 (BC Ministry of Environment)

2.0 BACKGROUND

The GHO site is an active open pit steelmaking coal mine located 14 km north of Elkford, BC. The GHO site plan is shown in Figure 1 with the location of the CCR facilities shown in Figure 2.

The mine was started by Westar Mining Ltd. with production between 1982 and 1992, after which the site was temporarily inactive. In December 1993, mine ownership changed to a joint venture between Fording Coal Limited (Fording) and Pohang Steel Canada Ltd., and the mine was operated by Fording. The operating company changed from Fording to Elk Valley Coal Corporation in 2003 and then to Teck Coal Limited in 2008.

2.1 Greenhills Operations Process Plant Waste Storage

Raw coal from the open pit is processed at the Process Plant to produce marketable steelmaking coal with by- product streams of CCR and fine refuse (both of which are considered as tailings for the purpose of this report). The CCR is unsaturated and comprises 50 mm minus gravel- to sand-sized rock and coal particles. CCR is transported, placed, and stored near the Process Plant in facilities (Sites B and E, Figure 2). Fine refuse is transported as a slurry for storage within the TSF. Approximately 900,000 m^3 of CCR is produced annually (Golder 2021a).

2.2 Overview of Design, Construction, and Previous Operation

The design intent for the Site A, B, and E facilities is that they do not store free water or saturated tailings, which is consistent with TSFs that cannot retain water or saturated tailings, in accordance with Section 4.2 of the HSRC for Mines in BC Guidance Document (BC MEM 2016). The design criteria and design basis are documented, based on available data (Golder 2022c).

Water management in relation to CCR facilities is included in the GHO Mine Water Management Plan (Teck 2020). Surface water from Site A and Site B facilities drains into Greenhills Creek. GHO uses catch basins

and the Greenhills Settling Pond to control total suspended solids in the Greenhills Creek prior to release to Fording River.

2.2.1 Site A Facility

2.2.1.1 Overview of Design and Subsurface Conditions

The Site A facility was the first CCR facility at GHO and was developed in 1989. The facility is located to the east of the Process Plant and the coal conveyor, and west of Greenhills Creek, as shown in Figure 2. The facility was completed to an ultimate elevation of approximately 1,740 m in 1995 and is now dormant. Cross-sections of the Site A facility are shown in Figure 4.

The initial design was completed in 1988 (Hardy 1988, 1989) and initial geometry comprised a 4 m wide bench every 30 m vertically and a maximum elevation of 1,740 m. The overall slope was designed at 2H:1V with inter- bench slopes at angle of repose (1.33H:1V).

In 1993, the design of the facility was modified due to a proposed change in material placement methodology (end-dumping at angle of repose) above elevation 1,730 m (Golder 1993). The revised geometry included a 4 m setback at elevation 1,730 m and regrading to flatter than 2H:1V.

A geotechnical investigation comprising six boreholes was completed in 1988 (Hardy 1989) to assess the subsurface conditions within the footprint of the Site A facility foundation. Foundation materials generally comprised stiff to hard, silty, sandy gravel glacial till between approximately 3.2 and 46.4 m, which overlies siltstone or sandstone bedrock. A sandy fluvial silt lens was encountered at depths of 4.7 and 7.2 m below ground surface in two boreholes. Standard penetration test N values ranged from 20 to 130 blows per 300 mm in the glacial till. The upper 2 m of the till was assessed to be weathered. The underlying rock was variable, comprising moderately to highly weathered siltstone interbedded with sandstone. In one borehole, strong to very strong, densely jointed, highly weathered sandstone was encountered at a depth of 3.2 m below ground surface. The investigation did not indicate that colluvium was present in the foundation.

Standpipes installed in investigation boreholes indicated a groundwater level of about 2.7 m below ground surface, near the southeast toe of the facility (Golder 1993), with deeper water depths at higher elevations (Hardy 1989).

A review of a historical aerial photograph of the site prior to development (date unknown) identified an area of pre- existing sloughing near the southeast side of the facility, indicating movement may have occurred prior to the development of the facility. At the time of this report, no re-initiation of this movement has been observed, based on inspection records from Teck and WSP.

2.2.1.2 Construction History

Records of the Site A stockpile construction were not available for review. Available geotechnical assessments indicated that the foundation area at the toe of the facility was stripped during site preparation (Golder 1993). The facility was constructed as a bottom-up facility (Hardy 1988), and permit conditions suggest the stockpile material was placed in layers of less than about 2 m thick (Golder 1993). The slopes of the facility were reclaimed by 2001 (Golder 2013).

The stockpile covers a plan area of approximately 126,000 m^2, has a height of around 70 m, and a total design storage volume of 2.36 million m^3 (Hardy 1988). The overall average slope angle of the Site A facility, interpreted from available LiDAR surveys, was 1.88H:1V with localized steeper sections up to 1.6H:1V along the south face.

2.2.1.3 Previous Operations

Placement of CCR occurred from 1989 to 1995 (Golder 1993, 1996). The Site A CCR facility was dormant in the 2021/2022 reporting period and no CCR materials were placed or removed. The Site A platform is used as a storage and material laydown area for mine operations.

2.2.2 Site B Facility

2.2.2.1 Overview of Design and Subsurface Conditions

The Site B facility is located to the north of the Process Plant and the Site A facility (Figure 2). The facility began receiving CCR in 1995 (Golder 1996) and is designated as an active facility. The facility is currently being advanced to a design elevation of 1,850 m. Cross-sections are shown in Figure 5.

The initial design was completed in 1994 (Golder 1994) and the geometry comprised 15 m platforms with intermediate benches to a maximum elevation of 1,760 m. The overall slope was designed at 2H:1V with bench slopes at angle of repose (1.33H:1V). The facility was extended to the west and north with a top elevation of 1,790 m (EVC 2007a). Another extension to the facility with an ultimate elevation of 1,850 m was also prepared in 2007 (EVC 2007a), which indicates the proposed extension was to be completed with 10 m wide intermediate benches every 15 m vertically. The Site B Facility is expected to have a total storage volume of 13.4 million m^3 when completed to the design elevation of 1,850 m (EVC 2008).

A site investigation to assess the foundation conditions underlying the Site B facility was completed in 1994 (Golder 1994), with four boreholes drilled. The foundation materials encountered in the boreholes consisted of topsoil between 0.5 and 0.9 m thick in all boreholes, firm to stiff silt colluvium between 1.4 and 1.8 m thick with variable amounts of sand and clay, and glacial till to depths of 8.5, 14.2, and 24.1 m. The underlying bedrock consisted of siltstone and shale. Golder (1996) noted that organic and soft soils at the foundation area of the east facility toe were stripped prior to construction.

Standpipes installed in three of the boreholes indicated groundwater levels of 2.85 to 20.5 m below the original ground surface from west to east (Golder 1994).

The Site B facility has been extended to the west and north since 2008. No further field investigations are known to have been completed at the facility area since 1994. Observations from the 2022 site inspection indicated that surficial topsoil, organic soils, and soft soils were likely stripped for the abutments as well as in the majority of the toe area of the west and north extensions (Photograph 14). This aligns with available geotechnical assessments, which noted the foundation area was stripped during site preparation (Golder 1993). An area of soft, saturated ground was observed at the toe of the north extension, where topsoil, organic soils, and/or soft soils were potentially left in place prior to CCR placement. Observations of the area indicate that movement of the Site B extension may have occurred during or soon after placement of CCR in the area and that CCR placement in the lower slope area was stopped and the facility set back (Photographs 15 and 16).

2.2.2.2 Construction History

The Site B stockpile was developed using the bottom-up method, by end-dumping CCR, and levelling using a bulldozer (Golder 2013). The initial phase of the stockpile was developed from 1995 to 1998, and approximately 2.6 million m^3 of CCR was placed (Golder 1999). From 1998 to 2007, the stockpile was extended to the west and north and raised to an elevation of 1,790 m (EVC 2007a). LiDAR data indicate that the extension was completed at angle of repose slopes with benches every 15 m vertically. The CCR placement records from 2016 to 2020 indicate that the CCR was placed in approximately 2 m thick lifts.

The Site B stockpile is being extended to elevation 1,850 m (EVC 2007a). This extension started in the fall of 2005 (Golder 2006).

The facility has been developed to an elevation of about 1,830 m as of 26 August 2021 (Figure 5), with a height of around 130 m. The overall average slope angle of the facility, interpreted from 2021 LiDAR data, was around 2.15H:1V (~25°) with inter-bench slopes of around 1.33H:1V (~37°).

Surface water around the facility is managed by diverting water using ditches. Surface runoff toward the west side of the stockpile is channeled through the access road ditch to the tailings pond (Golder 2013). The low-lying area in the north extension of the stockpile is drained by four ditches installed during foundation preparation (Golder 2013).

Golder (2013) noted that GHO started reclaiming the regraded slopes in 2001. Aerial photographs and GHO Process Plant CCR placement records indicate that reclamation of the lower slopes is ongoing.

2.2.2.3 Previous Operations

Placement of CCR at the Site B Facility commenced in 1995 and is currently ongoing.

2.2.3 Site E Facility

2.2.3.1 Overview of Design and Subsurface Conditions

The Site E facility is an active CCR facility, located on sloping ground immediately southwest of the GHO TSF and is located between the main and west tailings dams (Figure 2). Placement of CCR at the Site E facility commenced in 2000 and is currently ongoing. The facility is being advanced to a design elevation of 1,770 m. Cross-sections of the Site E facility are shown in Figure 6.

Reviewed information indicates the facility design comprised four phases to an ultimate elevation of 1,785 m, or a total height of 135 m. The design geometry comprised 10 m wide intermediate benches every 15 m vertically. The inter-bench slope below elevation 1,675 m was designed at 2H:1V, while upper inter-bench slopes were at angle of repose (1.33H:1V) in order to achieve an overall slope of 2H:1V. A 20 m wide bench was provided at elevation 1,690 m for access.

Subsurface conditions at the Site E facility were inferred from previous investigations (Hardy 1980) completed for the Site D CCR facility and the south abutment of the Main Tailings Dam of the GHO TSF. The foundation soils inferred from the borehole logs (Hardy 1980) consist of very stiff silty, sandy colluvium, overlying hard glacial clay till, overlying shale bedrock. The colluvium was up to 10 m thick. Borehole logs indicated that the groundwater level was within the colluvium and till layers.

2.2.3.2 Construction History

Available annual reports, GHO Process Plant CCR placement records, and Skycatch real-time kinematic (RTK) positioning drone mapping survey data (19 August 2022) indicate the Site E facility has been developed in four phases above elevation 1,675 m.

- **Phase 1: 2000 to 2003**—elevation 1,675 to 1,725 m
- **Phase 2: 2004 to 2012**—developed to the west of Phase 1 from elevation 1,675 to 1,725 m
- **Phase 3: 2004 to 2014**—Phase 1 and 2 raised from elevation 1,725 to 1,740 m
- **Phase 4: 2014 to 2022**—currently raised to elevation 1,777 m, as of August 2022

Material was placed using the bottom-up construction method (Golder 2001) with CCR free dumped and spread by bulldozer in approximately 2 m thick layers at angle of repose slopes (Golder 2013). The inter bench slope below elevation 1,675 m was regraded to 2H:1V before the upper lifts were developed (Golder 2001).

The overall average slope angle, interpreted from 2021 LiDAR data, was approximately 2.4H:1V (~23°) with inter- bench slopes of 1.38H:1V (~36°).

Due to its proximity to the TSF, the facility is used as a CCR source for tailings dam construction.

2.2.3.3 Previous Operations

Placement of CCR at the Site E facility commenced in 2000 and is currently ongoing. Based on the 2021 LiDAR data, the volume of CCR placed at the facility as of August 2021 was approximately 7.9 million m^3. Since 2008, Teck has been extending the Site E stockpile to elevation 1,785 m (EVC 2007a).

2.3 Site Seismicity

Golder developed a seismic hazard model for GHO based on historical seismicity and a review of geologic and paleoseismological features (Golder 2016b). The model incorporates data from the 5th Generation Seismic Hazard Model, including nine faults and fault segments mapped in northwest Montana. The 5th Generation Seismic Hazard Model was developed by Natural Resources Canada for use in the 2015 National Building Code of Canada (NBCC; NRCC 2015). The results of the seismic probabilistic analysis from the site hazard model are presented in Table 1.

Table 1: Greenhills Operations Site Seismic Hazard Values

Exceedance Probability	Return Period (years)	2015 Peak Ground Acceleration (g)
40% in 50 years	100	0.020
10% in 50 years	475	0.063
5% in 50 years	1,000	0.097
2% in 50 years	2,475	0.158
0.5% in 50 years	10,000	0.300

Notes: For firm ground site class “C,” very dense soil and soft rock foundation, as defined by 2015 National Building Code of Canada (NRCC 2015). Return periods are not exact representations of annual exceedance probabilities; rounding per the Canadian Dam Association (CDA 2013, 2019) is shown.

The NBCC seismic hazard values were updated in 2020 (NRCC 2022) based on data from the 6th Generation Seismic Hazard Model developed by Natural Resources Canada (NRC). The potential impact to calculated peak ground accelerations determined during the Golder (2016b) have not been determined based on the revised NBCC (2022) seismic hazard values.

2.4 Key Operational Components

Key operational components of the CCR facilities are as follows:

- visual inspections
- short-range planning prepared monthly by the tailings and water retaining structures (TWRS) group
- vibrating wire (VW) piezometers (Figure 3)
  - historical data for these instruments was available between 2012 and 2017 and monitoring of these instruments was reinitiated in the 2021/2022 reporting period with a reading taken in June 2022

Visual inspections of the CCR facilities are completed by GHO according to Teck's SP&Ps:

- **Dormant facilities (Site A)**—quarterly
- **Active facilities (Site B and E)**—monthly

Annual inspections of the facilities are also completed by WSP and TWRS group personnel.

The CCR facilities are developed based on short-range plans prepared monthly by the TWRS group. Monthly meetings are held with relevant personnel to develop the deposition strategy for the upcoming month. Deposition plans are developed and controlled based on MineSight 3D computer models and communicated to operations staff using slideshow presentations.

2.5 Key Personnel

The qualified person (QP) for the CCR stockpiles is Patrick Green, P.Eng., an employee of Teck.

During the reporting period WSP undertook due diligence with the intent of assuming the role of Engineer of Record, if required by Teck, for the Site A, B, and E CCR facilities in March 2023.

2.6 Quantifiable Performance Objectives

A geotechnical monitoring program is in place to monitor the stability of the CCR facilities, including VW piezometers to monitor piezometric levels within the CCR material and groundwater elevations in the foundations.

Quantifiable performance objectives were not in place for the CCR facilities at the time of this report and will be developed following update of stability analyses (Golder 2022d).

3.0 OPERATIONS, MAINTENANCE, AND CONSTRUCTION DURING THE 2021/2022 REPORTING PERIOD

3.1 Operations

3.1.1 Site A Facility

The Site A facility is dormant and no CCR material was placed or removed from the facility during the reporting period. The crest of Site A is used as a laydown area for site equipment and will continue to be used as such for the Process Plant dewatering project.

Surveillance activities at the facility during the reporting period comprised quarterly visual inspections by GHO and reading of the installed VW piezometers.

3.1.2 Site B Facility

The Site B facility was an active facility during the reporting period. Based on comparison of the 2021 LiDAR data and 2022 Skycatch RTK positioning drone mapping survey data (19 August 2022), approximately 270,000 m^3 of CCR was added to the Site B facility in the period between August 2021 and 2022 to reach an approximate elevation of 1,840 m The Site B facility is approximately 150 m high and covers a plan area of approximately 450,000 m^2.

Surveillance activities at the facility during the 2022 reporting period comprised monthly inspections carried out by the TWRS group and reading of the installed VW piezometers.

A new runout ramp was installed at the north side of the Site B facility during the reporting period.

3.1.3 Site E Facility

Based on comparison of the 2021 LiDAR data and 2022 Skycatch RTK positioning drone mapping survey data (19 August 2022), approximately 581,000 m^3 of CCR was added to the Site E facility, and 150,000 m^3 were removed (as construction fills) in the period between August 2021 and 2022. Based on review of the 2022 Skycatch RTK positioning drone mapping survey data, the Site E facility was approximately 127 m high and covered a plan area of approximately 332,000 m^2 with an estimated total stored volume of 8.3 million m^3 as of August 2022.

Surveillance activities at the facility during the 2022 reporting period comprised monthly inspections carried out by GHO and reading of the installed VW piezometers.

3.2 Maintenance

3.2.1 Site A Facility

Typical routine maintenance activities occurred during the reporting period, such as regrading access roads.

3.2.2 Site B Facility

As reported in the 2021 AFPR (Golder 2022a) a portion of the stockpile on the northeast side had been constructed beyond the planned extent, such that CCR had been placed to a maximum height of approximately 32.5 m without an intermediate bench. Golder performed stability analyses of the as-constructed sections to assess the stability of this geometry (Golder 2022b) and recommended that the area be remediated by constructing an intermediate bench to bring the stockpile within design criteria. Work was completed by Teck in January 2022.

Other typical routine maintenance activities occurred such as regrading access roads.

3.2.3 Site E Facility

Typical routine maintenance activities occurred during the reporting period such as regrading access roads.

3.3 Construction

3.3.1 Site A Facility

No construction occurred on Site A during the reporting period.

3.3.2 Site B Facility

No construction occurred on Site B during the reporting period.

3.3.3 Site E Facility

Construction of a new Process Plant Light Vehicle Access Road, on the Site E CCR facility commenced in spring 2022 and was completed in early 2023.

4.0 REVIEW OF PRECIPITATION DATA

CCR materials are relatively erodible material and high intensity rainfall or rapid snow melt (high precipitation over a short period of time) may result in an increase in erosion features. As such, precipitation records are reviewed as an indicator of the expected number and extent of external erosion features on the GHO CCR facilities.

Precipitation data collected at the GHO Office climate station were provided by GHO for the 2021/2022 hydrologic reporting period (i.e., August 2021 to July 2022). The data was compared to the long-term synthetic precipitation dataset for the period from 1970 to July 2021, and a summary of the recorded monthly total precipitation for the hydrologic reporting period (1 August 2021 to 31 July 2022) and the historical monthly averages at the GHO Office station location are presented in Chart 1. Precipitation records from the Fording River Cominco climate station adjusted to GHO Office station elevation are presented for comparison purposes.

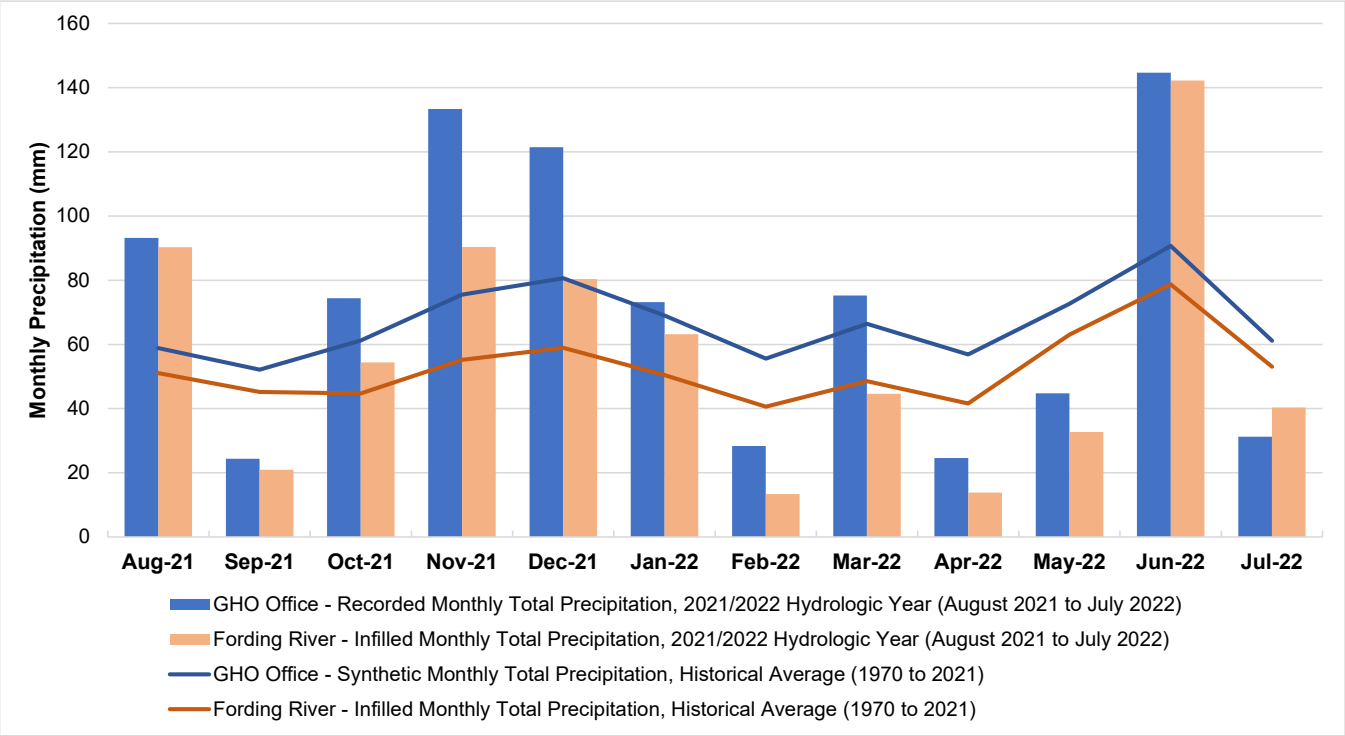

Chart 1: Comparison Between 2021/2022 Total Precipitation and Historical Average for Greenhills Operations

The precipitation data for the reporting period (1 August 2021 to 31 July 2022) indicate the following:

- Total precipitation was approximately 9% higher than the GHO Office synthetic historical average for the same period (1 August to 31 July).
  - Average monthly precipitation in late summer (August 2021 to September 2021) was comparable to the historical monthly average. However, average monthly precipitation in August 2021 was 58% higher, while September 2021 was 53% lower compared to the historical monthly average.
  - Average monthly precipitation in fall and winter (October 2021 to February 2022) was 21% higher compared to the historical monthly average. Differences in the fall/winter monthly precipitation vary from 77% higher to 50% lower compared to the historical monthly average.
  - Average monthly precipitation from late winter to early summer (March 2020 to July 2021) was 14% lower compared to the historical monthly average. Differences in the monthly precipitation vary from 59% higher to 57% lower compared to the historical monthly average.

5.0 COARSE COAL REFUSE FACILITIES SAFETY ASSESSMENT

This section presents an assessment of the performance of the CCR facilities based on a review of field observations, instrumentation data, and background information.

5.1 Site Visit

An inspection of the CCR facilities was carried out during the week of 29 August 2022 by Mr. Andy Haynes, P.Eng., and Mr. Martyn Willan, P.Eng., both of WSP. The visit was accompanied by Mr. Patrick Lea, P.Eng., of Teck. A close-out meeting was also held and attended by the QP, Mr. Patrick Green, P.Eng., of Teck.

Appendix A presents a summary of photographs taken during the August 2022 inspection. Photograph locations and directions are presented in Figure 2. A summary of observations made during the August 2022 visit are included in Appendix B.

Based on visual observations during the week of 29 August 2022, Site A, Site B, and Site E CCR facilities appeared to be in a safe condition with no identified deficiencies that required immediate action.

5.2 Review of Background Information

GHO provided the following information for this AFPR:

- Skycatch RTK positioning drone mapping survey (19 August 2022)
- Site climate data recorded at the GHO Office, GHO Elkford, and GH101 weather stations for the reporting period (Section 4.0).
- VW piezometer data for the reporting period.
- Routine inspection records, including photographs and visual observations.
  - Quarterly inspection records for the Site A facility.
  - Monthly inspection records for the Site B and E facilities.

5.3 Consequence of Failure

Teck no longer adopts a classification system that has levels of potential human loss of life and instead aims to eliminate any credible risk of loss of life and reduce all other credible catastrophic risks to As Low As Reasonably Practicable (ALARP). Adopting this approach meets or exceeds regulatory requirements and aligns with Teck's goal to eliminate any risk for loss of life, which is consistent with industry best practices.

5.4 Review of Operational Documentation

Procedures for the operation, maintenance, and surveillance of the CCR facilities at GHO are documented in the following GHO SP&Ps documents:

- **Dumping Procedures: Process Refuse Stockpile**—SP&P 1022 (Teck 2019)
- **Spoil Monitoring**—SP&P H1324 (Teck 2018a)
- **Temporary and Extended Access Below Spoils**—SP&P H1350 (Teck 2018b)

These documents cover CCR facilities but focus on practices and procedures associated with waste rock stockpiles. Development of an Operations, Maintenance, and Surveillance manual for the CCR facilities (Recommendation 2021-04) is planned for 2023.

The ultimate configurations of the active Site B and E CCR facilities, including proposed changes as a result of the planned transition to Site F, are not available. Teck should consider documenting the ultimate configuration.

5.5 Assessment of Coarse Coal Refuse Facilities Relative to Failure Modes and Facility Performance

Facility performance is assessed by comparing the design basis (Golder 2022c) against observed performance and available data during the monitoring period for the following failure modes/hazards:

- **Instability**—A mechanism involving movement of a part of the facility (either entirely within the facility or including portions of the foundation materials) as a result of imbalanced forces, with possible loss of integrity of the facility.
- **Internal erosion**—Internal instability of the facility can be caused by materials migrating out of the facility via seepage under a sufficient hydraulic gradient and leaving voids within the facility, as a result of increased pore pressures or an elevated phreatic surface within the facility. Under such conditions, internal erosion (piping) can occur by regressive erosion of particles from within the facility forming a continuous pipe or void within the facility.
- **Erosion of the slope face or toe**—External instability of the facility can be caused by removal of materials from the slope face and/or toe as a result of rainfall, snowmelt, or surface water flows.

5.5.1 Site A Facility

5.5.1.1 Instability

Design Basis and Existing Controls

The stability of the Site A facility was assessed for static loading conditions as part of the design (Golder 1993). Results indicated a minimum static factor of safety (FoS) of 1.3 for the selected critical slip surface (failure through the foundation soils) and an assumed phreatic level of 1 m above original ground surface. The calculated FoS meet the prevailing guidelines in place at the time of design.

The design basis and criteria for the Site A facility has been documented (Golder 2022c) and closes Recommendation 2021-01.

An update of the stability analyses for the facilities is planned for 2023 (Recommendation 2021-02).
Two VW piezometers, SP-97-1 and SP-97-2, are installed in the Site A facility, as shown in Figure 3, to monitor the phreatic surface within the facility.

Observed Performance

General observations during GHO quarterly inspections and at the time of the 2022 site visit include the following:

- No signs of instability were observed that are a concern to facility safety.
- Visual observations of the ancient/relict landslide near the southeast toe of the Site A facility did not indicate any signs of recent movement at the time of the 2022 site visit (Photograph 4).

Based on a single reading from the VW piezometers installed in the Site A CCR facility, data was consistent with historic values and indicative of expected conditions.

The results of this performance review do not indicate a risk to facility safety. The observed performance was consistent with that expected.

5.5.1.2 Internal Erosion

Design Basis and Existing Controls

The design intent of the CCR facilities is that they do not store free water or saturated tailings. Internal erosion requires a hydraulic gradient within the CCR material, which does not develop under normal operating conditions. The elevation of the phreatic surface is monitored with installed VW piezometers to verify that CCR material remains unsaturated.

Surface water management practices minimize infiltration to prevent saturated conditions and the development of a hydraulic gradient that could result in internal erosion. A surface water management plan is in place for the CCR facilities and includes regrading benches to promote surface water drainage on the facility.

Observed Performance

No signs of seepage on the slopes or at the toe of the Site A facility, in relation to internal erosion, were observed during GHO quarterly inspections or at the time of the 2022 site visit.

Based on a single reading from the VW piezometers installed in the Site A CCR facility, data was consistent with historic values and indicative of expected conditions.

The results of this performance review do not indicate a risk to facility safety.

5.5.1.3 External Erosion

Design Basis and Existing Controls

The Site A facility is dormant, and portions/benches of the facility are vegetated to reduce erosion.

A surface water management plan is in place for the CCR facilities, which includes water control measures to limit external erosion on the facility by directing runoff away from the facility. Minor surface rilling from rainfall and snowmelt is to be expected and does not present a risk to facility safety.

Observed Performance

General observations at the time of the 2022 site visit and during GHO quarterly inspections, in relation to external erosion of the slope of the Site A facility, included minor erosion rills on the unvegetated areas of the east slopes of the facility, as a result of precipitation. These features do not present a risk to facility safety.

No erosion of the toe of the Site A facility was observed during the 2022 site visit.

5.5.2 Site B Facility

5.5.2.1 Instability

Design Basis and Existing Controls

A stability assessment of the Site B facility under static and seismic loading was completed in 2008 (Golder 2008). The resulting minimum FoS was 1.6 against global static failure and 1.3 against seismic-induced failure for a seismic load of 0.068 g (based on a 1-in-1,000-year seismic return event determined at the time of the 2008 study). The calculated FoS meet the prevailing guidelines in place at the time of design.

The design basis and criteria for Site B facility has been documented (Golder 2022c) and closes Recommendation 2021-01.

An update of the stability analyses for the facilities is planned for 2023 (Recommendation 2021-02). Two VW piezometers, SP-04-1B and SP-04-2B, are installed at the south side of the Site A facility to measure the phreatic surface within the CCR. In addition, two VW piezometers, SP-08B-NW and SP-08B-SW, are installed at the west side of the facility and measure the groundwater level in the till. The locations of the piezometers are shown in Figure 3.

Observed Performance

Monthly inspections by Teck noted a portion of the northeast slope of the Site B facility was constructed beyond the planned extent in August 2021. Maintenance records provided by Teck as well as observations during the 2022 site visit indicated that the overbuilt portion of the northeast slope of the Site B facility above the haul road had been remediated by constructing an intermediate bench (Photograph 9) to bring the stockpile within design criteria as recommended by Golder (2022b).

Based on a single reading from the VW piezometers installed in the Site B CCR facility, data was consistent with historic values and indicative of expected conditions.

The results of this performance review do not indicate a risk to facility safety. The observed performance was consistent with that expected.

5.5.2.2 Internal Erosion

Design Basis and Existing Controls

The design intent of the CCR facilities is that they do not store free water or saturated tailings. Internal erosion requires a hydraulic gradient within the CCR material, which does not develop under normal operating conditions. The elevation of the phreatic surface is monitored with installed VW piezometers to verify that CCR material remains unsaturated.

Surface water management practices minimize infiltration to prevent saturated conditions and the development of a hydraulics gradient that could result in internal erosion. A surface water management plan is in place for the CCR facilities and includes regrading benches to promote surface water drainage on the facility.

Observed Performance

No signs of seepage on the slopes or at the toe of the Site B facility, in relation to internal erosion, were observed during GHO monthly inspections or at the time of the 2022 site visit.

Based on a single reading from the VW piezometers installed in the Site B CCR facility, data was consistent with historic values and indicative of expected conditions.

Based on the historical and current performance of the facility, the observed conditions do not indicate a risk to facility safety.

5.5.2.3 External Erosion

Design Basis and Existing Controls

A surface water management plan is in place for the CCR facilities, which includes water control measures to limit external erosion on the facility by directing runoff away from the facility. Minor surface rilling from rainfall and snowmelt is to be expected and does not present a risk to facility safety.

Portions/benches of the Site B facility that will not have planned future disturbance are vegetated to prevent erosion.

Observed Performance

A minor gulley, caused by erosion, was noted on the south slope of the Site B facility during GHO monthly inspections in April 2022 and reported by Teck as remediated.

Observations at the time of the 2022 site visit indicated minor ponded surface water at a low spot in the haul road (Photographs 10, 11, and 12). The inter-bench slope above the haul road has experienced some undercutting from spray from the haul traffic.

Conditions do not represent a concern to facility safety and should be managed as part of routine maintenance.

5.5.3 Site E Facility

5.5.3.1 Instability

Design Basis and Existing Controls

Stability analyses against static failure were completed as part of the design of the Site E facility (Golder 2000). Results indicated a minimum static FoS of 1.3 for selected critical slip surface with failure through the foundation soils. FoS meet the prevailing guidelines in place at the time of design.

The design basis and criteria for Site E facility has been documented (Golder 2022c) and closes Recommendation 2021-01.

An update of the stability analyses for the facilities is planned for 2023 (Recommendation 2021-02). Two VW piezometers, SP-04-1E and SP-04-2E, are installed in the Site E facility, as shown in Figure 3, to monitor the phreatic surface within the facility.

Observed Performance

The Site E CCR facility was observed to be in good condition during the 2022 site visit and as part of monthly inspections by Teck.

Based on a single reading from the VW piezometers installed in the Site E CCR facility, data was consistent with historic values and indicative of expected conditions.

The results of this performance review do not indicate a risk to facility safety. The observed performance was consistent with that expected.

5.5.3.2 Internal Erosion

Design Basis and Existing Controls

The design intent of the CCR facilities is that they do not store free water or saturated tailings. Internal erosion requires a hydraulic gradient within the CCR material, which does not develop under normal operating conditions. The elevation of the phreatic surface is monitored with installed VW piezometers to determine the phreatic level within the CCR material.

Surface water management practices minimize infiltration to prevent saturated conditions and the development of a hydraulics gradient that could result in internal erosion. A surface water management plan is in place for the CCR facilities and includes regrading benches to promote surface water drainage on the facility.

Observed Performance

No signs of seepage on the slopes or at the toe of the Site B facility, in relation to internal erosion, were observed during GHO monthly inspections or at the time of the 2022 site visit.

Based on a single reading from the VW piezometers installed in the Site E CCR facility, data was consistent with historic values and indicative of expected conditions.

Based on the historical and current performance of the facility, the observed conditions do not appear to present a risk to facility safety.

5.5.3.3 External Erosion

Design Basis and Existing Controls

A surface water management plan is in place for the CCR facilities, which includes water control measures to limit external erosion on the facility by directing runoff away from the facility. Minor surface rilling from rainfall and snowmelt is to be expected and does not present a risk to facility safety.

Portions/benches of the Site E facility that will not have planned future disturbance are vegetated to prevent erosion.

Observed Performance

Observations at the time of the 2022 site visit indicated erosion adjacent to a surface water culvert located downstream of the Site E CCR facility toe (Photograph 22) with material partially blocking the culvert (Photograph 23).

Conditions do not represent a concern to facility safety and should be managed as part of routine maintenance.

6.0 SUMMARY AND RECOMMENDATIONS FOR THE 2022 ANNUAL FACILITY PERFORMANCE REVIEW

6.1 Summary of Activities During Reporting Period

The following activities were completed during the reporting period:

- monthly facility inspections by Teck for the Site B and E CCR facility
- quarterly facility inspections by Teck for the Site A CCR facility

Site A was dormant during the reporting period, with no material being placed or removed from the facility. General maintenance activities such as grading of access roads were completed throughout the period.

Site B was active during the reporting period with approximately 270,000 m^3 of CCR material being placed in the facility. General maintenance activities such as grading of access roads were completed throughout the period. The overbuilt portion of the northeast slope of the Site B facility above the haul road was remediated in January 2022.

Site E was active during the reporting period with approximately 580,000 m^3 CCR material being placed in the facility and 150,000 m^3 removed (as construction fill) in the period between August 2021 and 2022. Surveillance activities at the facility during the 2022 reporting period comprised monthly inspections carried out by GHO and reading the installed VW piezometers. The new Process Plant Light Vehicle Access Road was also constructed.

6.2 Summary of Precipitation

Climate data for the 2022 reporting period (Section 4.0) indicate lower rainfall and higher snowfall during the monitoring period. These findings are consistent with observed performance during the site inspection; in that there was no observed increase in erosion features on the platforms and slopes of the CCR facilities.

6.3 Summary of Performance and Changes

There were no significant changes to stability, integrity, surface water control, or operation of the Site A, B, and E CCR facilities during the reporting period.

The performance of the CCR facilities during the reporting period was as expected.

6.4 Consequence of Failure

Teck no longer adopts a classification system that has levels of potential human loss of life and instead aims to eliminate any credible risk of loss of life and reduce all other credible catastrophic risks to As Low As Reasonably Practicable. Adopting this approach meets or exceeds regulatory requirements and aligns with Teck's goal to eliminate any risk for loss of life, which is consistent with industry best practices.

6.5 Recommendations

Previous deficiencies and recommendations from the 2021 AFPR (Golder 2022a) are presented in Table 2. Closed items are shown with grey shading. Updates to previous deficiencies and recommendations are shown in ***bold italicized*** text.

Table 2: 2022 Recommended Actions for Site A, B, and E Coarse Coal Refuse Facilities

ID Number	Facility	Deficiency	Potential Safety Hazard	Recommendation	Priority	Recommended Deadline	Status
2021-01	All CCR facilities	Design criteria for the CCR facilities not documented.	Inability to assess performance against design basis.	Consolidate design criteria and design basis information for CCR facilities into a single reference document.	4	End Q3 2022	**Completed**—design criteria/basis documented in Golder (2022c).
2021-02		Slope stability analyses do not reflect current geometry or seismic loading. Pseudo-static analyses for Site A and Site E facilities were not available.	Current understanding of facility stability unknown.	Update stability of CCR facilities considering updates to seismic loading criteria and areas where foundation conditions cannot be confirmed (Recommendation 2021- 06).	3	End Q2 2023	**In Progress**—Planned for 2023
2021-03		Risk assessments not available.	Facility risk undocumented.	Perform risk assessment for all CCR facilities. ~~*For critical controls, develop QPOs and associated TARPs.*~~	4	End Q2 2023	**Completed**—credible failure mode assessment completed. FMEA Risk Registers to be developed.
2021-04		Prepare OMS.	Potential confusion in determining OMS requirements for CCR facilities.	Prepare OMS manual for CCR facilities applicable to the short remaining active stage and the dormant stage. ***For critical controls, develop QPOs and associated TARPs.***	4	End Q2 2023	**In Progress**— Planned for 2023

Table 2: 2022 Recommended Actions for Site A, B, and E Coarse Coal Refuse Facilities

ID Number	Facility	Deficiency	Potential Safety Hazard	Recommendation	Priority	Recommended Deadline	Status
2021-05		Limited piezometric data are available to confirm piezometric levels within the CCR facilities.	Inability to monitor control relative to facility safety.	Confirm tip elevations and remeasure existing piezometers. Maintain if needed.	3	End Q3 2022	**Closed** —piezometer tip elevations confirmed.
2021-06	Site B and Site E	Foundation information at Site B facility west and north extensions and at Site E facility not available.	Inability to assess performance against known conditions.	Assess available data and determine if sufficient for characterization of foundation conditions.	3	End Q2 2023	**Closed**— to be documented as part of stability analysis reporting (Recommendation 2021- 02).

CCR = coarse coal refuse; OMS = operation, maintenance, and surveillance; QPO = quantifiable performance objective; TARP = Trigger Action Response Plan.

Priority Level	Description
1	A high probability or actual facility safety issue considered immediately dangerous to life, health or the environment, or a significant risk of regulatory enforcement.
2	If not corrected could likely result in facility safety issues leading to injury, environmental impact, or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.
3	Single occurrences of deficiencies or non-conformances that alone would not be expected to result in facility safety issues.
4	Best Management Practice – Further improvements are necessary to meet industry best practices or reduce potential risks.

7.0 CLOSURE

The reader is referred to the Study Limitations section, which follows the text and forms an integral part of this report.

We trust that this report meets your present requirements. If you have any questions or requirements, please contact the undersigned.

WSP Canada Inc.

Martyn Willan, P.Eng.
Lead Geotechnical Engineer

Andy Haynes, P.Eng.
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KA/MBW/AJH/hp

https://golderassociates.sharepoint.com/sites/158994/project files/6 deliverables/issued/2022-139-r-rev0-2000-annual facility performance report_ccrs/22516234-2022-139-r-rev0-2000-2022 afpr_ccr stockpiles 02mar_23.docx

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STUDY LIMITATIONS

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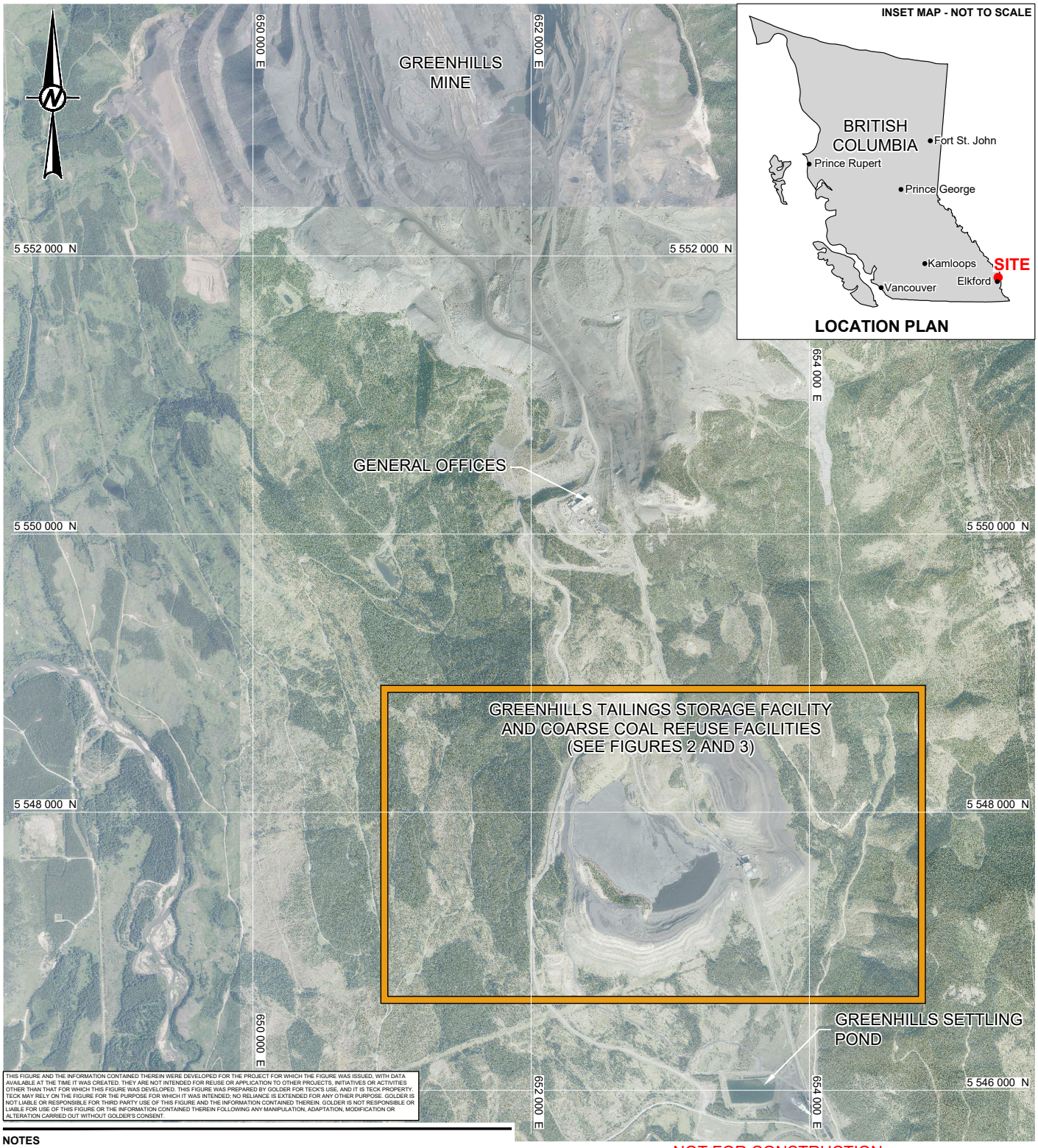

NOTES

1. ALL UNITS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
2. COORDINATES ARE IN UTM NAD83 ZONE 11.

REFERENCE

1. 2021 AERIAL PHOTOGRAPHY PROVIDED BY TECK COAL LIMITED. FILES : "082J02C14.TIF", "082J02F04.TIF", "082J02E01.TIF", "082J02C14.TIF", "082J02C13.TIF", "082J02D16.TIF", "082J02C11.TIF", "082J02C12.TIF", "082J02D09.TIF". DATES FLOWN: 22 JULY, 25 AND 26 AUGUST 2021, RECEIVED : 21 SEPTEMBER 2021.

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CLIENT
TECK COAL LIMITED
GREENHILLS OPERATIONS
ELKFORD, B.C.

CONSULTANT
wsp

YYYY-MM-DD	2023-02-07
DESIGNED	KA
PREPARED	EA
REVIEWED	MBW
APPROVED	AJH

PROJECT
GREENHILLS COARSE COAL REFUSE FACILITIES
2022 ANNUAL FACILITY PERFORMANCE REPORT

TITLE
GREENHILLS OPERATIONS SITE PLAN

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
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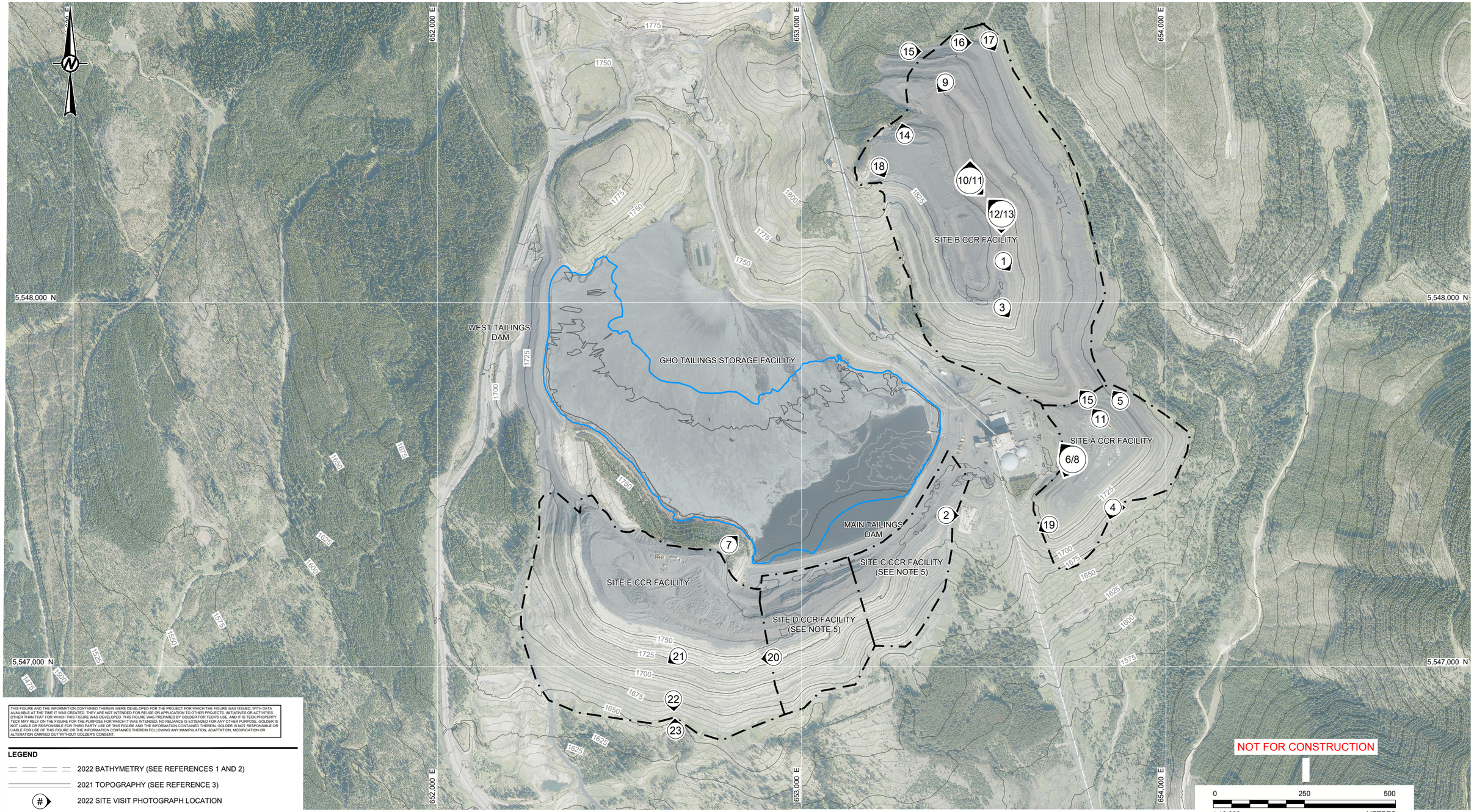

LEGEND

- 2022 BATHYMETRY (SEE REFERENCES 1 AND 2)
- 2021 TOPOGRAPHY (SEE REFERENCE 3)
- (#) 2022 SITE VISIT PHOTOGRAPH LOCATION
- CCR COARSE COAL REFUSE
- COARSE COAL REFUSE SITE BOUNDARY
- POND OUTLINE (24 AUGUST 2022)

NOTES

1. ALL UNITS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
2. COORDINATES ARE IN UTM NAD83 ZONE 11, ELEVATIONS ARE REFERENCED TO THE ELK VALLEY ELEVATION DATUM.
3. BATHYMETRY CONTOURS (SEE REFERENCE 2) SHOWN AT 5.0 m MAJOR AND 1.0 m MINOR INTERVAL.
4. TOPOGRAPHIC CONTOURS (SEE REFERENCE 3) SHOWN AT 25.0 m MAJOR AND 5.0 m MINOR INTERVAL.
5. SITE C AND SITE D CCR FACILITIES ARE NOT INCLUDED AND ARE REPORTED AS PART OF GHO TSF AFPR.

REFERENCES

1. 2021 AERIAL PHOTO PROVIDED BY TECK COAL LIMITED.
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3. 2021 LIDAR TOPOGRAPHY PROVIDED BY TECK COAL LIMITED.
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wsp

YYYY-MM-DD	2023-02-07
DESIGNED	KA
PREPARED	EA
REVIEWED	MBW
APPROVED	AJH

PROJECT
GREENHILLS COARSE COAL REFUSE FACILITIES
2022 ANNUAL FACILITY PERFORMANCE REPORT

TITLE
FACILITY OVERVIEW AND 2022 SITE VISIT PHOTOGRAPH LOCATIONS

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
22516234	2000/2001/139	0	2

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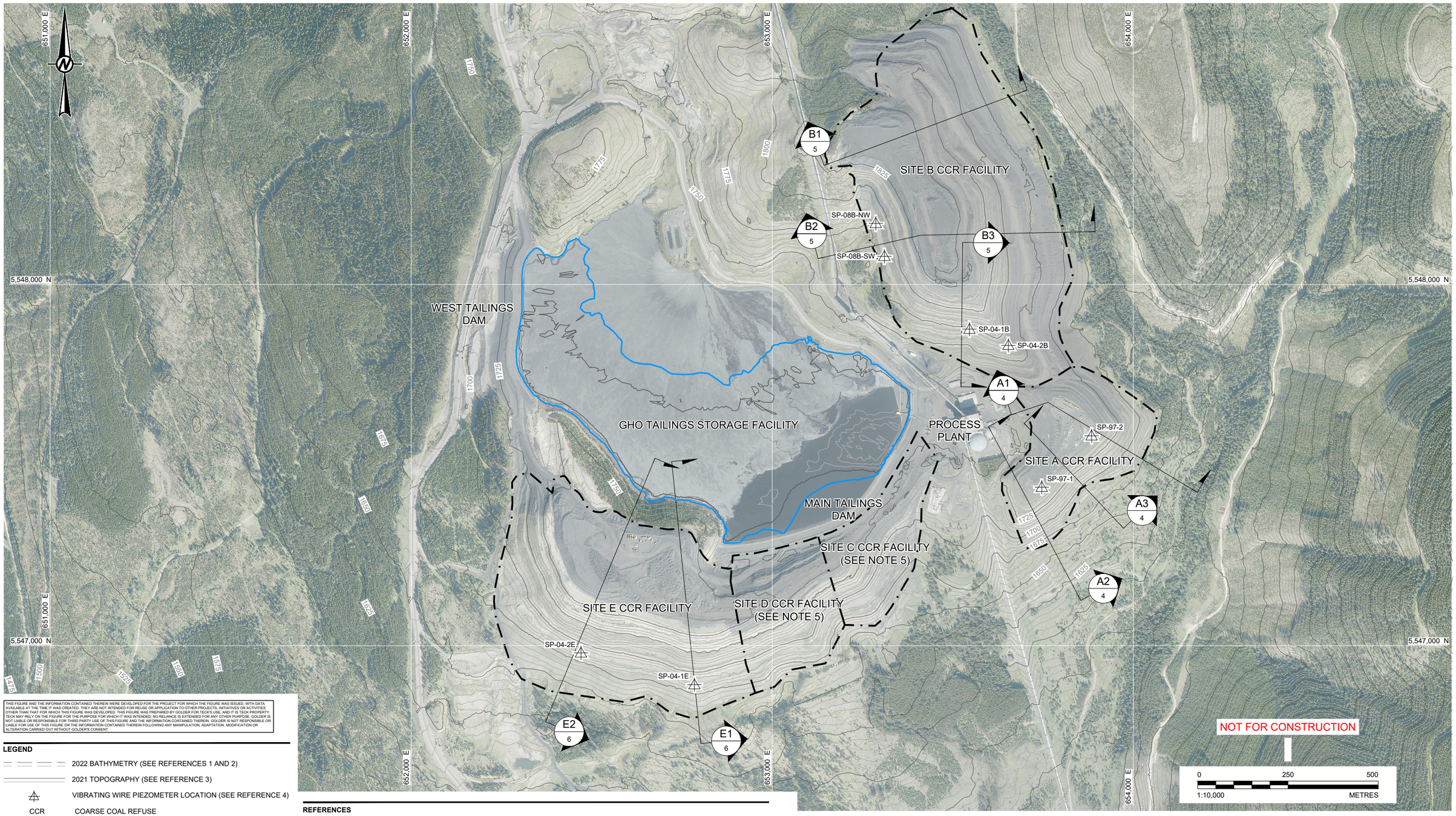


LEGEND

- 2022 BATHYMETRY (SEE REFERENCES 1 AND 2)
- 2021 TOPOGRAPHY (SEE REFERENCE 3)
- VIBRATING WIRE PIEZOMETER LOCATION (SEE REFERENCE 4)
- CCR — COARSE COAL REFUSE
- COARSE COAL REFUSE SITE BOUNDARY
- POND OUTLINE (24 AUGUST 2022)

NOTES

1. ALL UNITS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
2. COORDINATES ARE IN UTM NAD83 ZONE 11, ELEVATIONS ARE REFERENCED TO THE ELK VALLEY ELEVATION DATUM.
3. BATHYMETRY CONTOURS (SEE REFERENCE 2) SHOWN AT 5.0 m MAJOR AND 1.0 m MINOR INTERVAL.
4. TOPOGRAPHIC CONTOURS (SEE REFERENCE 3) SHOWN AT 25.0 m MAJOR AND 5.0 m MINOR INTERVAL.
5. SITE C AND SITE D CCR FACILITIES ARE NOT INCLUDED AND ARE REPORTED AS PART OF GHO TSF AFPR.

REFERENCES

1. 2021 AERIAL PHOTO PROVIDED BY TECK COAL LIMITED.
   FILES: "082j02f03.TIF", "082j02f04.TIF", "082J02C12.TIF", "082J02C13.TIF", "082j02e01.TIF", RECEIVED: 21 SEPTEMBER 2021.
   DATES FLOWN : 22 JULY AND 25, 26 AUGUST 2021.
2. 2022 BATHYMETRY INFORMATION PROVIDED BY TECK COAL LIMITED, FILE NAMES: "220824-Bathy+Flight_Sfc SpoilsClipped.00t.dxf" DATED 24 AUGUST 2022, RECEIVED: 30 SEPTEMBER 2022.
3. 2021 LIDAR TOPOGRAPHY PROVIDED BY TECK COAL LIMITED.
   FILES : "be_082J02C11.xyz", "be_082J02C12.xyz","be_082J02C13.xyz", "be_082J02C14.xyz","be_082J02D09.xyz","be_082J02D16.xyz", "be_082J02E01.xyz", "be_082J02F03.xyz", "be_082J02F04.xyz"
   RECEIVED: 21 SEPTEMBER 2021, DATES FLOWN : 22 JULY AND 25, 26 AUGUST 2021, MERGED WITH AS-BUILT DAM SURVEY PROVIDED BY TECK COAL LIMITED, FILE : "2021-10-22 21-148 ASBUILT.dwg", DATED 22 OCTOBER 2021, RECEIVED : 27 OCTOBER 2021.
4. VIBRATING WIRE PIEZOMETER LOCATIONS PROVIDED BY TECK;
   FILE NAME "01) GHO VWP-TSF.xlsm". RECEIVED 28 SEPTEMBER 2022.

CLIENT
TECK COAL LIMITED
GREENHILLS OPERATIONS
ELKFORD, B.C.

CONSULTANT
wsp

YYYY-MM-DD	2023-02-07
DESIGNED	KA
PREPARED	EA
REVIEWED	MBW
APPROVED	AJH

PROJECT
GREENHILLS COARSE COAL REFUSE FACILITIES
2022 ANNUAL FACILITY PERFORMANCE REPORT

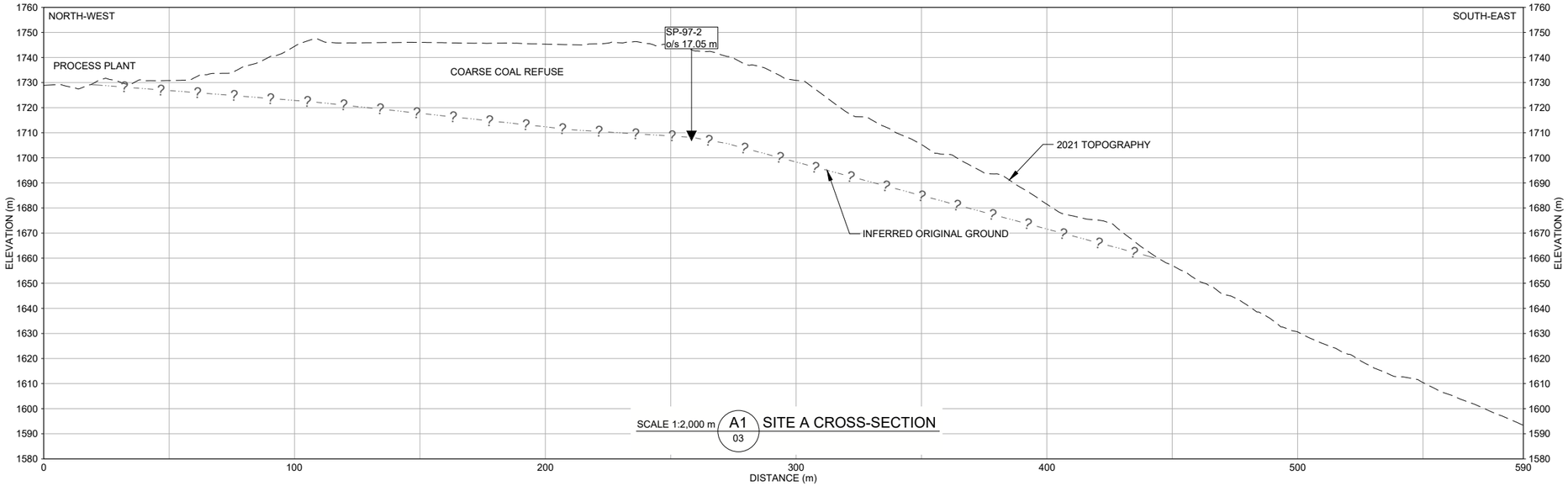
TITLE
COARSE COAL REFUSE INSTRUMENTATION LOCATIONS AND SECTIONS

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
22516234	2000/2001/139	0	3

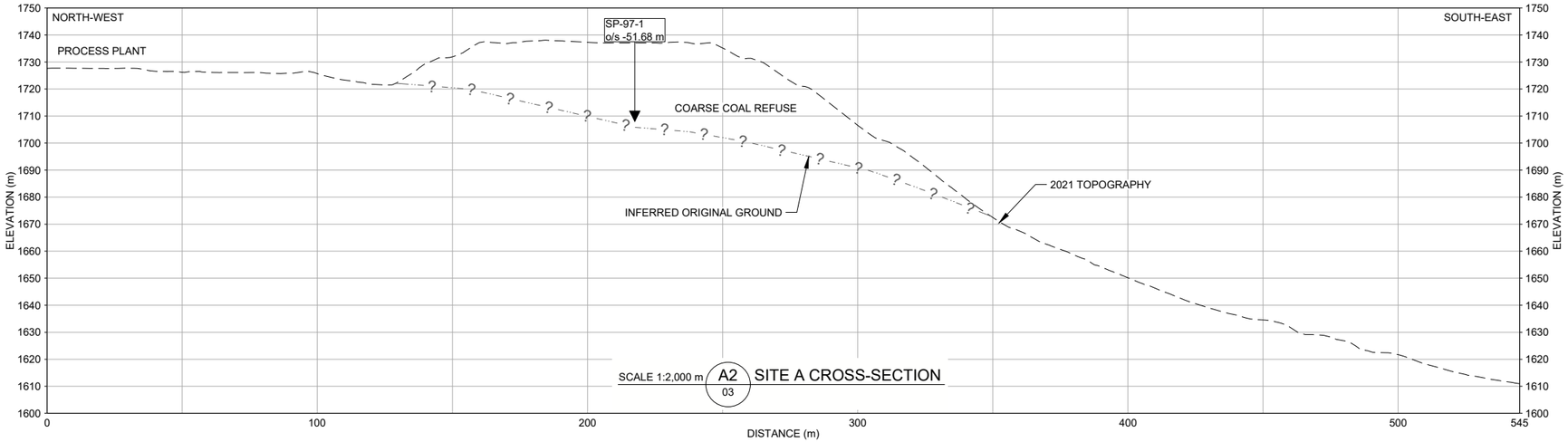
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 — 25 mm

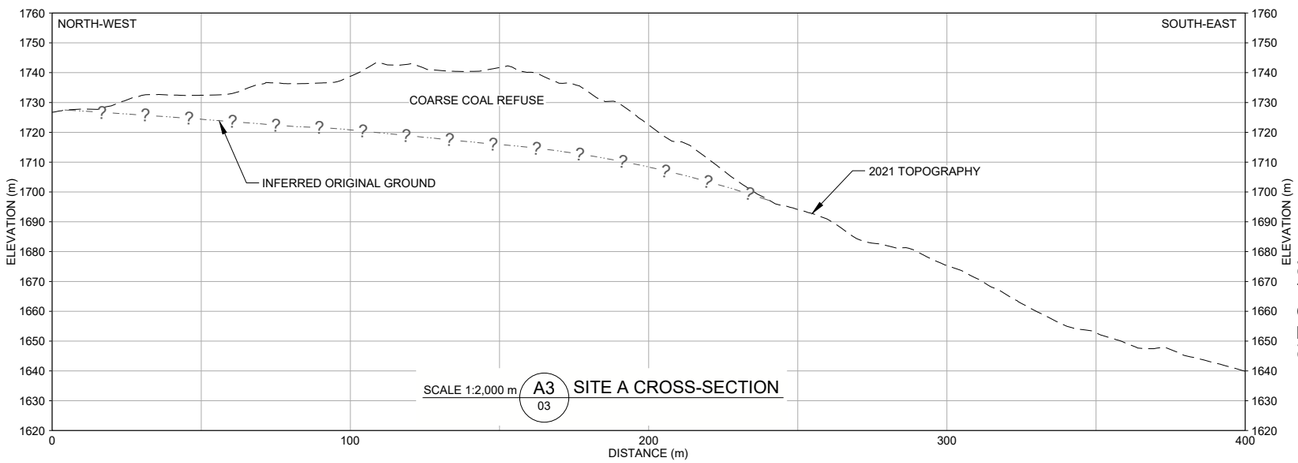
Path: \\golder.gds\somptesdata\office\Vancouver\CAD-GIS\Client\Teck Coal\Greenhills\99_PROJECTS\22516234_EoR Support\2000_EOR\2001_AFPR\Doc139_CCR\02_PRODUCTION\DWG | File Name: 22516234_2000_2001_139-03.dwg



SCALE 1:2,000 m — A1 / 03 — SITE A CROSS-SECTION



SCALE 1:2,000 m — A2 / 03 — SITE A CROSS-SECTION



SCALE 1:2,000 m — A3 / 03 — SITE A CROSS-SECTION

LEGEND

2021 TOPOGRAPHY (SEE REFERENCE 1)

INFERRED ORIGINAL GROUND (SEE REFERENCE 2)

NOTES

1. ALL UNITS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
2. MATERIAL BOUNDARIES ARE APPROXIMATE.
3. ELEVATIONS ARE REFERENCED TO THE ELK VALLEY ELEVATION DATUM.

REFERENCES

1. 2021 LIDAR TOPOGRAPHY PROVIDED BY TECK COAL LIMITED.
   FILES : "be_082J02C11.xyz", "be_082J02C12.xyz","be_082J02C13.xyz", "be_082J02C14.xyz","be_082J02D09.xyz","be_082J02D16.xyz", "be_082J02E01.xyz", "be_082J02F03.xyz", "be_082J02F04.xyz"
   RECEIVED: 21 SEPTEMBER 2021, DATES FLOWN : 22 JULY AND 25, 26 AUGUST 2021, MERGED WITH AS-BUILT DAM SURVEY
   PROVIDED BY TECK COAL LIMITED, FILE : "2021-10-22 21-148 ASBUILT.dwg", DATED 22 OCTOBER 2021, RECEIVED : 27 OCTOBER 2021.
2. ORIGINAL GROUND SURFACE INFERRED INFORMATION DETERMINED BY WSP GOLDER DURING 2021 DATA REVIEW.
3. VIBRATING WIRE PIEZOMETER TIP ELEVATIONS DETERMINED BY WSP GOLDER DURING 2021 DATA REVIEW.

NOT FOR CONSTRUCTION

0 — 50 — 100
1:2,000 METRES

CLIENT
TECK COAL LIMITED
GREENHILLS OPERATIONS
ELKFORD, B.C.

CONSULTANT

YYYY-MM-DD	2023-02-07
DESIGNED	KA
PREPARED	EA
REVIEWED	MBW
APPROVED	AJH

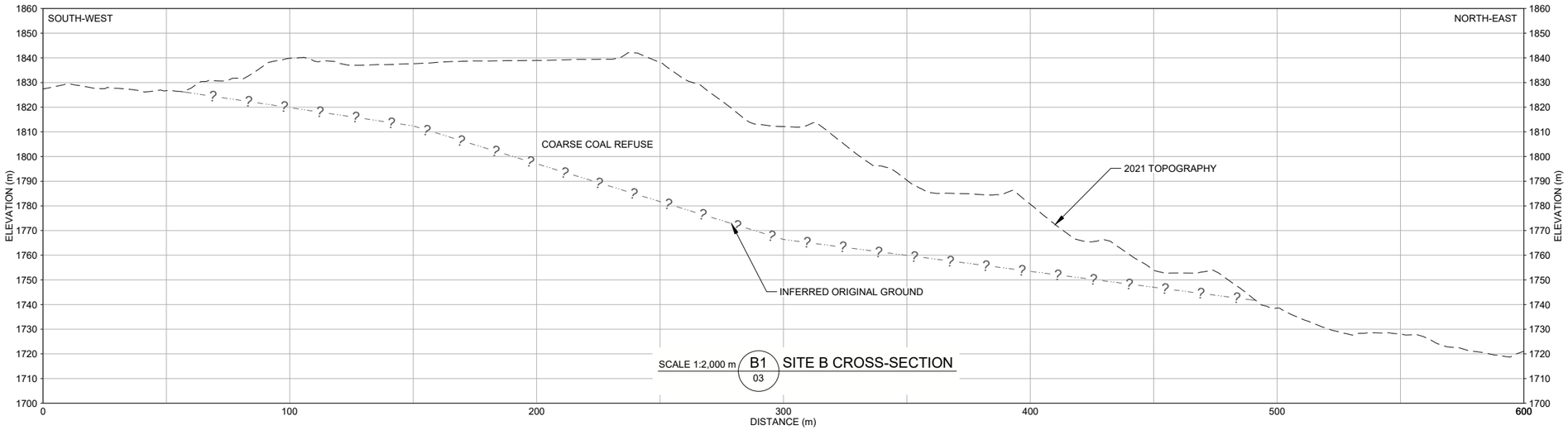
PROJECT
GREENHILLS COARSE COAL REFUSE FACILITIES
2022 ANNUAL FACILITY PERFORMANCE REPORT

TITLE
SITE A CCR FACILITY CROSS-SECTIONS

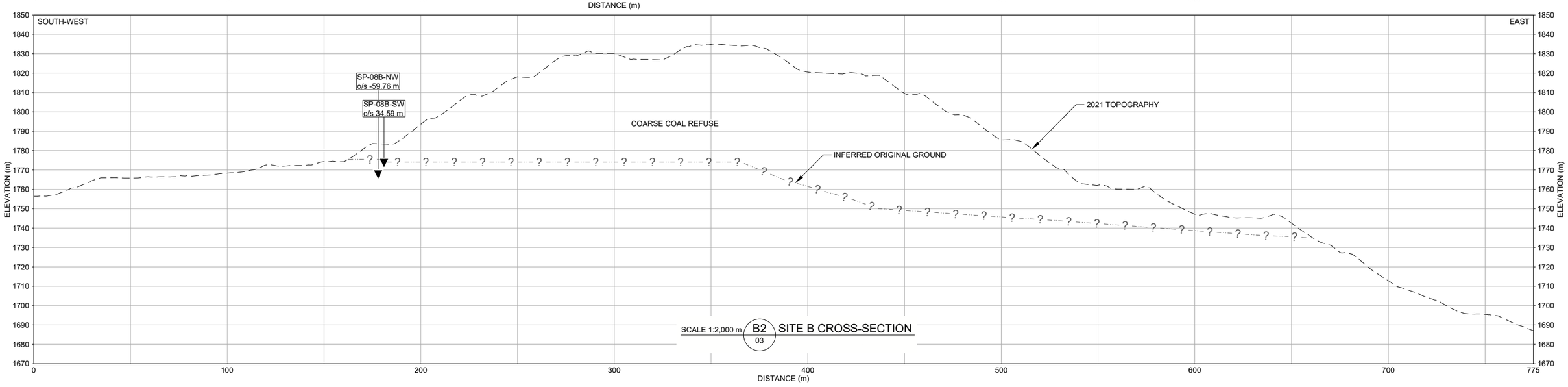
PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
22516234	2000/2001/139	0	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

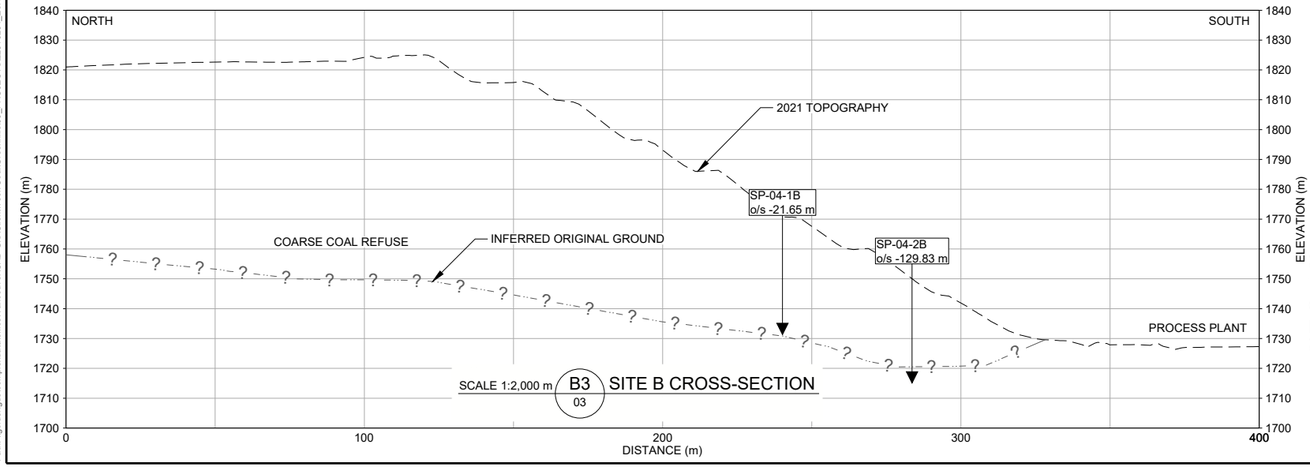
0 — 25 mm



SCALE 1:2,000 m — B1 / 03 — SITE B CROSS-SECTION



SCALE 1:2,000 m — B2 / 03 — SITE B CROSS-SECTION



SCALE 1:2,000 m — B3 / 03 — SITE B CROSS-SECTION

LEGEND

- 2021 TOPOGRAPHY (SEE REFERENCE 1)
- INFERRED ORIGINAL GROUND (SEE REFERENCE 2)
- VIBRATING WIRE PIEZOMETER TIP ELEVATION (SEE NOTE 3, AND REFERENCE 3)

NOTES

1. ALL UNITS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
2. MATERIAL BOUNDARIES ARE APPROXIMATE.
3. ELEVATIONS ARE REFERENCED TO THE ELK VALLEY ELEVATION DATUM.

REFERENCES

1. 2021 LIDAR TOPOGRAPHY PROVIDED BY TECK COAL LIMITED.
   FILES : "be_082J02C11.xyz", "be_082J02C12.xyz","be_082J02C13.xyz", "be_082J02C14.xyz","be_082J02D09.xyz","be_082J02D16.xyz", "be_082J02E01.xyz", "be_082J02F03.xyz", "be_082J02F04.xyz"
   RECEIVED: 21 SEPTEMBER 2021, DATES FLOWN : 22 JULY AND 25, 26 AUGUST 2021, MERGED WITH AS-BUILT DAM SURVEY
   PROVIDED BY TECK COAL LIMITED, FILE : "2021-10-22 21-148 ASBUILT.dwg", DATED 22 OCTOBER 2021, RECEIVED : 27 OCTOBER 2021.
2. ORIGINAL GROUND SURFACE INFERRED INFORMATION DETERMINED BY WSP GOLDER DURING 2021 DATA REVIEW.
3. VIBRATING WIRE PIEZOMETER TIP ELEVATIONS DETERMINED BY WSP GOLDER DURING 2021 DATA REVIEW.

NOT FOR CONSTRUCTION

0 50 100
1:2,000 METRES

CLIENT
TECK COAL LIMITED
GREENHILLS OPERATIONS
ELKFORD, B.C.

CONSULTANT

YYYY-MM-DD	2023-02-07
DESIGNED	KA
PREPARED	EA
REVIEWED	MBW
APPROVED	AJH

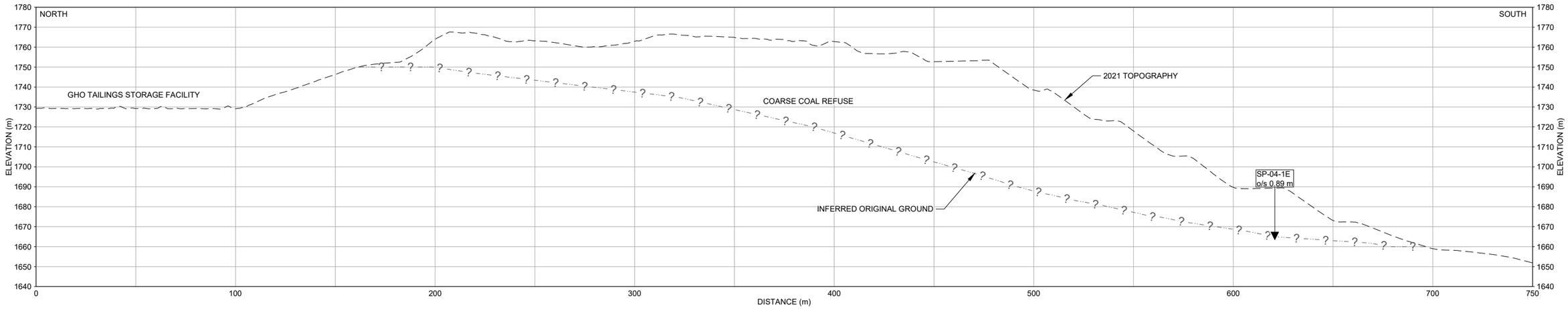
PROJECT
GREENHILLS COARSE COAL REFUSE FACILITIES
2022 ANNUAL FACILITY PERFORMANCE REPORT

TITLE
SITE B CCR FACILITY CROSS-SECTIONS

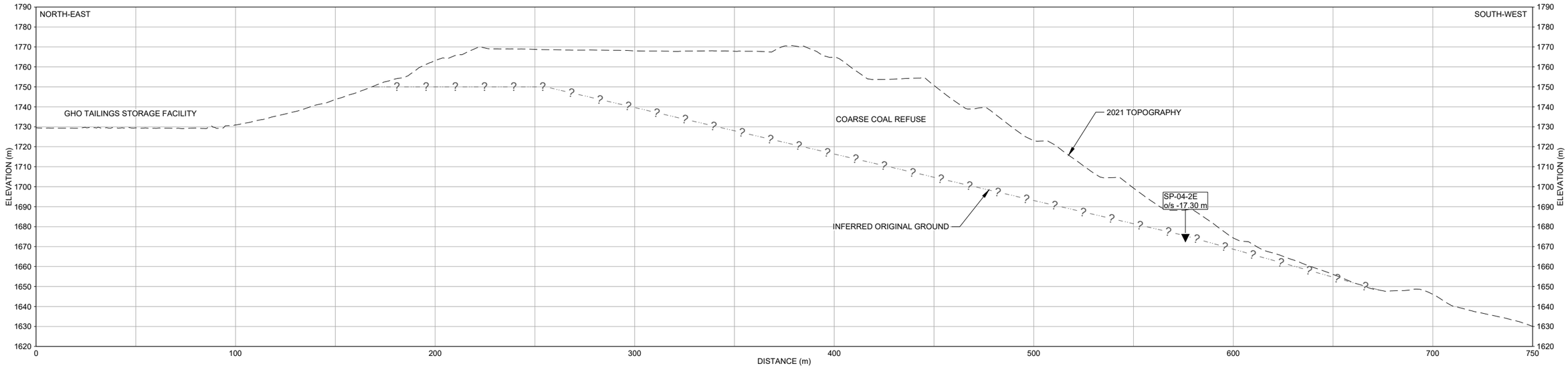
PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
22516234	2000/2001/139	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm



SCALE 1:2,000 m — E1 (03) — SITE E CROSS-SECTION



SCALE 1:2,000 m — E2 (03) — SITE E CROSS-SECTION

NOT FOR CONSTRUCTION

LEGEND

- 2021 TOPOGRAPHY (SEE REFERENCE 1)
- INFERRED ORIGINAL GROUND (SEE REFERENCE 2)
- VIBRATING WIRE PIEZOMETER TIP ELEVATION (SEE NOTE 3, AND REFERENCE 3)

NOTES

1. ALL UNITS ARE SHOWN IN METRES UNLESS NOTED OTHERWISE.
2. MATERIAL BOUNDARIES ARE APPROXIMATE.
3. ELEVATIONS ARE REFERENCED TO THE ELK VALLEY ELEVATION DATUM.

REFERENCES

1. 2021 LIDAR TOPOGRAPHY PROVIDED BY TECK COAL LIMITED.
   FILES : "be_082J02C11.xyz", "be_082J02C12.xyz","be_082J02C13.xyz", "be_082J02C14.xyz","be_082J02D09.xyz","be_082J02D16.xyz", "be_082J02E01.xyz", "be_082J02F03.xyz", "be_082J02F04.xyz"
   RECEIVED: 21 SEPTEMBER 2021, DATES FLOWN : 22 JULY AND 25, 26 AUGUST 2021, MERGED WITH AS-BUILT DAM SURVEY
   PROVIDED BY TECK COAL LIMITED, FILE : "2021-10-22 21-148 ASBUILT.dwg", DATED 22 OCTOBER 2021, RECEIVED : 27 OCTOBER 2021.
2. ORIGINAL GROUND SURFACE INFERRED INFORMATION DETERMINED BY WSP GOLDER DURING 2021 DATA REVIEW.
3. VIBRATING WIRE PIEZOMETER TIP ELEVATIONS DETERMINED BY WSP GOLDER DURING 2021 DATA REVIEW.

0 50 100
1:2,000 METRES

CLIENT
TECK COAL LIMITED
GREENHILLS OPERATIONS
ELKFORD, B.C.

CONSULTANT
wsp

YYYY-MM-DD	2023-02-07
DESIGNED	KA
PREPARED	EA
REVIEWED	MBW
APPROVED	AJH

PROJECT
GREENHILLS COARSE COAL REFUSE FACILITIES
2022 ANNUAL FACILITY PERFORMANCE REPORT

TITLE
SITE E CCR FACILITY CROSS-SECTIONS

PROJECT NO.	PHASE/TASK/DOC	REV.	FIGURE
22516234	2000/2001/139	0	6

APPENDIX A

2022 Site Inspection Photographs

Photograph 1: Site A CCR Facility – Overview from Site B CCR Facility, Looking Southeast, 30 August 2022

Photograph 2: Site A CCR Facility – Overview from Site C CCR Facility, Looking East, 30 August 2022

Photograph 3: Site A CCR Facility – Overview from Site B; Looking Southeast, 30 August 2022

Photograph 4: Site A CCR Facility – Downstream Slope Near Relict Landslide; Looking South, 30 August 2022

Photograph 5: Site A CCR Facility – East Slope; Looking Northwest (Site B CCR Facility in background), 30 August 2022

Photograph 6: Site A CCR Facility – Downstream Slope; Looking Southwest (Site C & D CCR Facilities in background), 30 August 2022

Photograph 7: Site B CCR Facility – Overview from Main Tailings Dam; Looking Northeast, 31 August 2022

Photograph 8: Site B CCR Facility – Overview from Site A CCR Facility; Looking Northeast, 31 August 2022

Photograph 9: Site B CCR Facility – Reprofiled Slope at Haul Road Switchback, Looking West, 31 August 2022

Photograph 10: Site B CCR Facility – Repaired Erosion Area on east side of haul road, Looking North, 31 August 2022

Photograph 11: Site B CCR Facility – Repaired Erosion Area on east side of haul road, Looking Southeast, 31 August 2022

Photograph 12: Site B CCR Facility – Low Spot in haul road, Looking Northeast, 31 August 2022

Photograph 13: Site B CCR Facility – Haul Road, Looking South, 31 August 2022

Photograph 14: Site B CCR Facility North Extension Abutment Area, Looking North, 31 August 2022

Photograph 15: Site B CCR Facility – North and East Extension Toe Area, Looking East, 31 August 2022

Photograph 16: Site B CCR Facility North and East Extension Lower Bench, Looking East, 31 August 2022

Photograph 17: Site B CCR Facility East Toe Area, Looking East, 31 August 2022

Photograph 18: Site B CCR Facility – West Downstream Slope, Looking Southeast, 31 August 2022

Photograph 19: Site E CCR Facility – Overview from Site A CCR Facility; Looking West, 30 August 2022

Photograph 20: Site E CCR Facility – Downstream Slopes, Looking West, 31 August 2022

Photograph 21: Site E CCR Facility – Downstream Slope, Looking Southwest, 31 August 2022

Photograph 22: Site E CCR Facility - Erosion adjacent to the Surface Water Culvert, Looking South, 31 August 2022

Photograph 23: Site E CCR Facility – Partially Obstructed Surface Water Culvert, Looking North, 31 August 2022

APPENDIX B

2022 Site Inspection Records

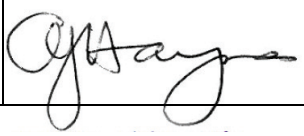
Client:	**Teck Coal Limited**	**By:**	**Martyn Willan, P.Eng. and Andy Haynes, P.Eng.**
Project:	**GHO 2022 CCR Facilities Annual Facility Performance Report**	**Date:**	**30 August 2022**
Location:	**Site A CCR Facility**		

GENERAL INFORMATION

Facility Type: Coarse Coal Refuse Facility

Weather Conditions:	Sunny	**Temp:**	20°C

INSPECTION ITEM	OBSERVATIONS/DATA	PHOTO	COMMENTS & OTHER DATA
1. PLATFORM			
1.1 Platform Elevation	1,740 m	1,3	Platform elevation from 2022 Skycatch RTK positioning drone mapping survey.
1.2 Surface Cracking	None Observed		
1.3 Unexpected Settlement	None Observed		
1.4 Lateral Movement	None Observed		
1.5 Other Unusual Conditions	None Observed		
2. SLOPE			
2.1 Slope Angle	1.9H:1V	1,2,3,4,5,6	
2.2 Signs of Erosion	Yes	1,5	Minor erosion rilling on unvegetated slopes at the east side.
2.3 Signs of Movement (Deformation)	None Observed		
2.4 Cracks	None Observed		
2.5 Seepage or Wet Areas	None Observed		
2.6 Vegetation Growth	Yes	1,2,3,4,5,6	
2.7 Other Unusual Conditions	No		
3. TOE AREA			
3.1 Seepage from Stockpile	None Observed	4,6	
3.2 Signs of Erosion	None Observed		
3.3 Signs of Turbidity in Seepage Water	None Observed		
3.4 Discoloration/Staining	None Observed		
3.5 Other Unusual Conditions	None Observed		

INSPECTION ITEM	OBSERVATIONS/DATA	PHOTO	COMMENTS & OTHER DATA
4. INSTRUMENTATION			
4.1 Piezometers	Yes		Two vibrating wire piezometers at the platform.
4.2 Settlement Cells	None		
4.3 Survey Monuments	None		
4.4 Accelerograph	None		
4.5 Inclinometer	None		
4.6 Weirs and Flow Monitors	None		
4.7 Data Logger(s)	No		
4.8 Other			
5. DOCUMENTATION			
5.1 Operation, Maintenance and Surveillance (OMS) Manual Exists	SP&P 1022 SP&P H1324 SP&P H1350		Update Required.
5.1.2 Reflects Current Conditions	No		
5.1.3 Date of Last Revision/Review	SP&P 1022 (17 October 2019), SP&P H1324 (26 March 2018), SP&P H1350 (4 April 2018)		
5.2 Emergency Preparedness Plan (EPP) Exists	NA		Included in Mine Emergency Response Plan
5.2.1 Reflects Current Conditions	NA		
5.2.2 Date of Last Revision	NA		
6. NOTES None			
Inspector's Signature		**Date:**	30 August 2022

Client:	**Teck Coal Limited**	**By:**	**Martyn Willan, P.Eng. and Andy Haynes, P.Eng.**
Project:	**GHO CCR 2022 Annual Facility Performance Report**	**Date:**	**31 August 2022**
Location:	**Site B CCR Facility**		

GENERAL INFORMATION

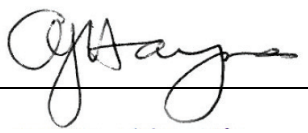
Facility Type: Coarse Coal Refuse Facility

Weather Conditions:	Sunny	**Temp:**	12°C

INSPECTION ITEM	OBSERVATIONS/DATA	PHOTO	COMMENTS & OTHER DATA
1. PLATFORM			
1.1 Platform Elevation	1,825 to 1,840 m	18	Platform elevation from 2022 Skycatch RTK positioning drone mapping survey.
1.2 Surface Cracking	None Observed		
1.3 Unexpected Settlement	None Observed		
1.4 Lateral Movement	None Observed		
1.5 Other Unusual Conditions	None Observed		
2. SLOPE			
2.1 Slope Angle	2.15H:1V	7,8,9,15,16, 18	
2.2 Signs of Erosion	Yes	9,10,11,15	Minor erosion rills on unvegetated slopes at the north and east sides. Repaired erosion area on east side of haul road.
2.3 Signs of Movement (Deformation)	None Observed		
2.4 Cracks	None Observed		
2.5 Seepage or Wet Areas	None Observed		
2.6 Vegetation Growth	Yes	7,8,18	Some benches vegetated.
2.7 Other Unusual Conditions	Yes	11,12	Low spot on haul road with ponding water slope over steepened due to minor undercutting from spray
3. TOE AREA			
3.1 Seepage from Stockpile	None Observed	8,14,15,17,1 8	
3.2 Signs of Erosion	None Observed		

INSPECTION ITEM	OBSERVATIONS/DATA	PHOTO	COMMENTS & OTHER DATA
3.3 Signs of Turbidity in Seepage Water	None Observed		
3.4 Discoloration/Staining	None Observed		
3.5 Other Unusual Conditions	-	14,17	Topsoil/organics appear to have been stripped during foundation preparation except for limited area at north east side
4. INSTRUMENTATION			
4.1 Piezometers	Yes		Four vibrating wire piezometers at the platform.
4.2 Settlement Cells	None		
4.3 Survey Monuments	None		
4.4 Accelerograph	None		
4.5 Inclinometer	None		
4.6 Weirs and Flow Monitors	None		
4.7 Data Logger(s)	No		
4.8 Other			
5. DOCUMENTATION			
5.1 Operation, Maintenance and Surveillance (OMS) Manual Exists	SP&P 1022 SP&P H1324 SP&P H1350		Update Required.
5.1.2 Reflects Current Conditions	No		
5.1.3 Date of Last Revision/Review	SP&P 1022 (17 October 2019), SP&P H1324 (26 March 2018), SP&P H1350 (4 April 2018)		
5.2 Emergency Preparedness Plan (EPP) Exists	NA		Included in Mine Emergency Response Plan
5.2.1 Reflects Current Conditions	NA		

6. NOTES
Recommendation for drone flights three times a year (freshet, prior to the annual inspection, and fall).

Inspector's Signature		**Date:**	31 August 2022

Client:	**Teck Coal Limited**	**By:**	**Martyn Willan, P.Eng. and Andy Haynes, P.Eng.**
Project:	**GHO 2022 CCR Annual Facility Performance Report**	**Date:**	**31 August 2022**
Location:	**Site E CCR Facility**		

GENERAL INFORMATION

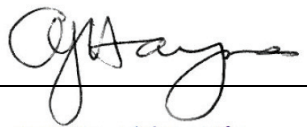
Facility Type: Coarse Coal Refuse Facility

Weather Conditions:	Sunny	**Temp:**	12°C

INSPECTION ITEM	OBSERVATIONS/DATA	PHOTO	COMMENTS & OTHER DATA
1. PLATFORM			
1.1 Platform Elevation	1,765 to 1,768 m	19	Platform elevation from 2022 Skycatch RTK positioning drone mapping survey.
1.2 Surface Cracking	None Observed		
1.3 Unexpected Settlement	None Observed		
1.4 Lateral Movement	None Observed		
1.5 Other Unusual Conditions	None Observed		
2. SLOPE			
2.1 Slope Angle	2.4H:1V	19,20,21,	
2.2 Signs of Erosion	None Observed		
2.3 Signs of Movement (Deformation)	None Observed		
2.4 Cracks	None Observed		
2.5 Seepage or Wet Areas	None Observed		
2.6 Vegetation Growth	Yes		Lower benches vegetated.
2.7 Other Unusual Conditions	None Observed		
3. TOE AREA			
3.1 Seepage from Stockpile	Yes	21	Seepage in defined surface water culverts
3.2 Signs of Erosion	None Observed		
3.3 Signs of Turbidity in Seepage Water	None Observed		
3.4 Discoloration/Staining	None Observed		
3.5 Other Unusual Conditions	None Observed	22,23	Erosion adjacent to the surface water culvert.

INSPECTION ITEM	OBSERVATIONS/DATA	PHOTO	COMMENTS & OTHER DATA
4. INSTRUMENTATION			
4.1 Piezometers	Yes		Two vibrating wire piezometers at the platform.
4.2 Settlement Cells	None		
4.3 Survey Monuments	None		
4.4 Accelerograph	None		
4.5 Inclinometer	None		
4.6 Weirs and Flow Monitors	None		
4.7 Data Logger(s)	No		
4.8 Other	-		
5. DOCUMENTATION			
5.1 Operation, Maintenance and Surveillance (OMS) Manual Exists	SP&P 1022 SP&P H1324 SP&P H1350		Update Required.
5.1.2 Reflects Current Conditions	No		
5.1.3 Date of Last Revision/Review	SP&P 1022 (17 October 2019), SP&P H1324 (26 March 2018), SP&P H1350 (4 April 2018)		
5.2 Emergency Preparedness Plan (EPP) Exists	NA		Included in Mine Emergency Response Plan
5.2.1 Reflects Current Conditions	NA		
5.2.2 Date of Last Revision	NA		

6. NOTES
Recommendation for drone flights three times a year (freshet, prior to the annual inspection, and fall).

Inspector's Signature		**Date:**	31 August 2022

APPENDIX C

VW Piezometer Data

Instrument	Material Mointored	Tip Elevation (m)	2022 Reading[a]		Historic Data[b]		Change from Historic Reading (m)
			Date	Piezometric Elevation (m)	Date	Piezometric Elevation (m)	
SP-97-1	CCR	1,708.06	2022-06-08	Dry[c]	2012-12-31	1,708.12	-0.84
SP-97-2	Foundation Till	1,706.91	2022-06-08	Dry[c]	2017-03-22	Dry[c]	-0.39
SP-04-1B	Till/CCR Interface	1,731.31	2022-06-08	1,735.49	2012-12-31	1,735.59	-0.10
SP-04-2B	Till/CCR Interface	1,715.07	2022-07-13	1,717.32	2017-03-22	1,717.38	-0.07
SP-08B-NW	Foundation Till	1,765.85	2022-06-08	1,776.19	2014-12-31	1,776.81	-0.62
SP-08B-SW	Foundation Till	1,771.80	2022-06-08	1,777.29	2014-05-26	1,778.80	-1.52
SP-04-1E[d]	Foundation Till	1,663.51	-	-	2012-12-31	1,665.59	-
SP-04-2E	Foundation Till	1,672.35	2022-07-13	1,675.56	2014-06-21	1,675.79	-0.23

Notes:
(a) Single reading in 2022 reporting period
(b) Most recent reading before 2022
(c) Negative pressure readings recorded indicating piezometer tip is dry. Piezometric levels cannot be determined from negative pressures
(d) No reading taken during 2022
(e) Elevations in Elk Valley Datum

CLIENT
TECK COAL LIMITED
GREENHILLS OPERATIONS
ELKFORD, BC

CONSULTANT

YYYY-MM-DD	2023-02-13
PREPARED	ZS
DESIGN	ZS
REVIEW	KA/MBW
APPROVED	AJH

PROJECT
GREENHILLS COARSE COAL REFUSE FACILITIES
2022 ANNUAL FACILITY PERFORMANCE REPORT

TITLE
CURRENT AND HISTORIC VW PIEZOMETER READINGS

PROJECT No.	Phase/Task/DOC.	Rev.	FIGURE
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