Appendix 13.12-A Telkwa Coal – Tenas Project Supplemental Geochemical Characterisation Report

TELKWA COAL LIMITED

Telkwa Coal – Tenas Project Supplemental Geochemical Characterization

Prepared for

Telkwa Coal Ltd.

Prepared by

SRK Consulting (Canada) Inc.
1CT027.007
February 2022

Telkwa Coal – Tenas Project
Supplemental Geochemical Characterization

February 2022

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Executive Summary

A comprehensive historical geochemical characterization program was completed for the Tenas Project located near the town of Telkwa, British Columbia for Manalta Coal Ltd. This program (Norecol Dames and Moore 1999) included geochemical testing of over 700 samples. However, this program had several limitations including:

- Total sulfur was used to calculate acid potential (i.e., sulfate was not measured and sulfide could not be estimated);
- Neutralization potential was determined using the Sobek-NP method;
- Total inorganic carbon content was not evaluated; and,
- Selenium data was limited in the solid-phase and kinetic testing program.

TCL retained SRK Consulting (Canada) Inc. to collect supplemental samples to calibrate the historic dataset to current methods. SRK reviewed the core and logs with TCL geologists in February 2018 and identified 173 samples for geochemical testing. During the geochemical testing program, TCL also collected and sent the following samples to the analytical lab for geochemical testing:

- Three samples of coarse processed rock;
- Four samples of fine processed rock;
- Five overburden samples collected from five test pits along the proposed Tenas Access Corridor that will be used for constructing the base and sub base portions of this road;
- Nine samples from four test pits in the vicinity of the Rail Infrastructure; and
- Two samples of rock material that will be used to construct the surfacing material for the Tenas Access Corridor.

The results are summarized as follows.

Drill Core Results

The results of the mine rock geochemical characterization showed that a strong correlation exists between total sulfur and sulfide and between Sobek-NP and modified-NP. Regression equations derived from correlating these parameters allows sulfide and modified-NP to be calculated in the historical dataset.

The mineralogical results confirmed the presence of iron carbonates in the mine rock samples. A strong positive relationship exists between modified-NP and calcium plus magnesium suggesting that modified-NP provides a reasonable estimate of the effective-NP. Based on this relationship, calcium and magnesium loadings under neutral conditions in humidity cells can be attributed to carbonate dissolution and the carbonate molar ratio was used to develop a site-specific NPR criterion for PAG mine rock of NPR≤1.2 for mine rock.

Use of the NPR indicates that acid generating potential is controlled by stratigraphic zones. This is consistent with the historical geochemical test results (Norecol Dame and Moore 1999). The following zones were identified to be PAG and NAG based on the zones' average bulk properties:

- **NAG** – Zones 1, 4, 5, 55, 6, 7 and 8; and
- **PAG** – Zones 1a and 2/3.

Elemental concentrations were compared to the average crustal abundance (Smith and Huyck 1999) to identify parameters that are elevated in the solid-phase. A parameter was screened as elevated if its concentration was greater than 10 times the average crustal abundances. The following elements were screened to be elevated in the solid-phase:

- 20% of arsenic analyses;
- 1% of phosphorus and selenium analyses; and
- 54% of sulfur analyses.

Loadings of the following parameters are expected to increase as pH decreases: acidity, sulfate, aluminum, cadmium, copper, iron, lead, nickel, strontium, and zinc. The concentrations of these parameters will be evaluated in the water and load balance that is currently being developed.

TCL proposes to store PAG rock under saturated conditions to limit sulfide oxidation. The sulfide oxidation rates in the humidity cell samples was used to estimate the lag time acid generation.

The evaluation indicated that for the average bulk properties of PAG rock, the lag time under laboratory conditions is typically about 7 years. A minimum lag time of 0.6 years is estimated for PAG rock units with minimum NPRs less than or equal to 0.1.

Overburden

All of the overburden samples had NPRs greater than two and were classified as NAG.

The following elements were screened to have concentrations greater than 10 times the average crustal abundances and were screened to be elevated in the solid-phase:

- +2 mm–25 mm fraction:
  - 67% (4 of 6 samples) of arsenic measurements; and
  - 17% (1 of 6 samples) of cadmium measurements.
- -2 mm fraction
  - 17% (1 of 6 samples) of arsenic and gold measurements; and,
  - 83% (5 of 6 samples) of tellurium measurements.

There were no elevated concentrations in the +25 mm fraction. A higher frequency of elevated parameters was observed in the +2–25 mm fraction in comparison to the -2 mm and +25 mm fractions.

Processed Rock

TCL provided three coarse and four fine processed rock samples to Maxxam Analytics for geochemical analysis. On fine processed rock was classified as NAG and the remaining samples were classified as PAG. All of the historical processed rock samples were PAG and TCL proposes to manage all processed rock as PAG.

Humidity cell testing was completed on the combined course and the combined fine processed rock (referred to as the 2018 fine reject) samples as well as a subsequent fine processed rock sample produced in 2019. The coarse processed rock sample became acidic after 68 weeks (i.e., 1.3 years) of testing. An associated increase of several constituent loadings also occurred as the pH decreased. The fine processed rock samples remained alkaline for the duration of the testing period and, following the initial flush of the sample, constituent loadings remained generally consistent for the duration of the testing period. Processed rock loadings were used to develop source terms that were carried forward into the water and load balance (SRK 2021).

As noted above, the coarse processed rock sample became acid generating after 1.3 years of testing. This represents a minimum lag time to acid generation of coarse processed rock since the test was completed under laboratory conditions. Depletion calculations on the 2018 processed rock sample indicate the sulfide in the sample will be depleted prior to the NP and the sample is classified as NAG. The 2019 fine processed rock sample is predicted to become acidic after 20 years under laboratory conditions.

Construction Materials

All construction material samples had low sulfur content and modified-NPs exceeding AP. As a result, all construction materials are NAG. No solid-phase concentrations were screened to be greater than 10 times the average crustal abundances in the construction samples

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1 Introduction

Telkwa Coal Ltd. (TCL) is currently preparing concurrent Environmental Assessment (EA), *Mines Act* (*MA*) and *Environmental Management Act* (*EMA*) Permit applications for the Tenas Project, located at the Telkwa Property, near the town of Telkwa, British Columbia (Figure 1). TCL proposes to mine coal using open pit methods. Mining and washing of coal will produce the following mine material streams that will need to be managed:

- Overburden;
- Mine rock; and,
- Processed rock.

Geochemical testing has previously been completed on more than 700 samples of the above materials (Norecol, Dames and Moore 1999). The historical dataset indicates that both potentially acid generating (PAG) and non-potentially acid generating (non-PAG) materials will be produced during operations and acid rock drainage potential is constrained by sedimentary packages, with acid potential increasing with proximity to coal seams.

The historical geochemical characterization was completed in the late 1990s. In comparison to state-of-the-art geochemical testing methods (e.g., MEND 2009) the historical dataset had several limitations. For example, sulfur speciation was not completed, and inorganic carbon content was not measured.

TCL retained SRK Consulting (Canada) Inc. to supplement the historical dataset with additional samples to address the following limitations in the historical results:

- Total sulfur was used to calculate acid potential (i.e., sulfate was not measured, and sulfide could not be estimated);
- Neutralization potential was determined using the Sobek-NP method;
- Total inorganic carbon content was not evaluated; and,
- Selenium data was limited in the solid-phase and kinetic testing program.

The objectives of the supplemental sampling were the following:

- Confirm the geochemical characteristics of mine materials to be produced during mining of the Tenas Project; and
- Develop a proxy for estimating sulfide and neutralization potential that could be used to calibrate the historical dataset to up-to-date methods.

This report provides the results of the supplemental geochemical characterization for the Tenas Project. Geochemical testing results from the historical dataset are also presented. Where statistical relationships could be confidently derived, the historical results were calibrated to up-to-date methods for input into the geochemical characterization

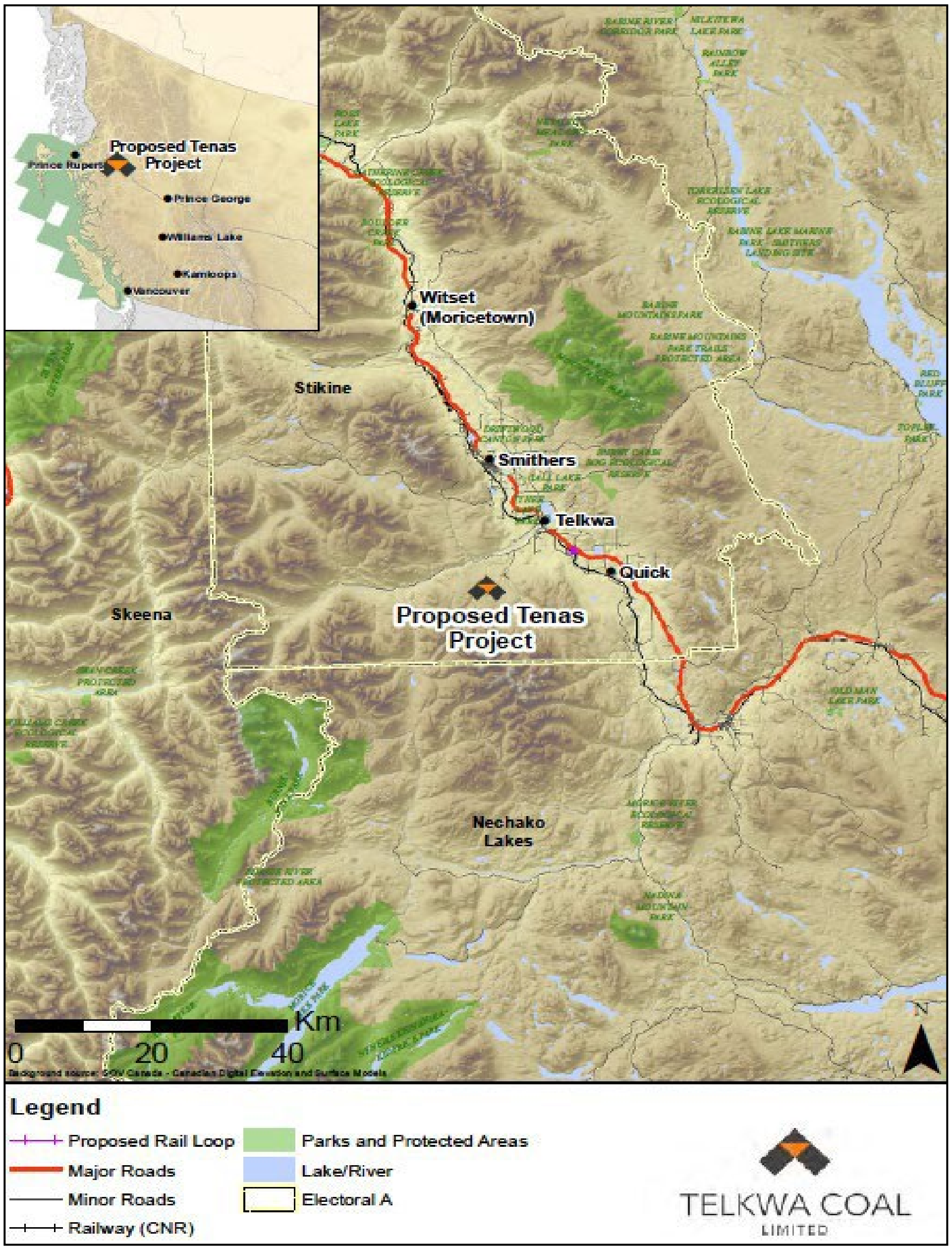


Figure 1. Location of the Tenas Coal Deposit, Telkwa Project

2 Project Background

2.1 Bedrock Geology

The Tenas project is located within the northeast/southwest trending Skeena Arch, which separates Jurassic-age sedimentary rocks of the Bowser Basin in the north from the Jurassic to Cretaceous-age sedimentary rocks of the Nechako Basin to the south. The coal-bearing sedimentary rock sequence of the Project is associated with the Lower Cretaceous age Skeena

Group, and unconformably overlies the Jurassic-age Hazelton volcanic group. A simplified stratigraphic column of the Tenas deposit is presented in Figure 2.

2.1.1 Jurassic Hazelton Volcanic Group

The volcanic rocks include andesite, trachyte, and basalt with associated tuffs and breccias.

2.1.2 Lower Cretaceous Skeena Group

The Lower Cretaceous Skeena Group includes marine and continental sediments interbedded with coal seams, often correlated over long lateral distances. It is subdivided into four units (Units I through IV) and a unit of undivided sediments overlying the four units (Figure 2).

The economic coal seams in the Tenas area are located in Coal Zone 1 of Unit I and includes two seams: C seam and 1 seam (upper and lower). Coal Zones 2 through 10, located in Unit III (Figure 2), are absent from the Tenas area. Units I through IV are summarized below.

Unit I (modified after Ledda, 1998)

The basal unit, Unit I, was deposited in a fluvial environment and, in the Telkwa Property, rests unconformably over the eroded Hazelton volcanic basement of Jurassic age. Because it was deposited over an undulating surface the Unit I stratigraphy has been observed to display variability in thickness, often over short lateral distances. This variability is most evident in the lower sedimentary assemblage, between the basement contact and the lowermost Unit I coals. As such, Unit I can be in excess of 100 m in thickness and consists mainly of conglomerate, sandstone, mudstone and coal.

Coals within this unit, collectively referred to as Coal Zone 1, formed in poorly drained backswamps and are characterized by lateral variation throughout the study area. The Unit I coals can consist of up to 12 individual seams that collectively contribute up to 11.9 m of coal to the unit's overall thickness. Sands and gravels were typically deposited in braided channels and bars while mudstones accumulated in floodplains. Indications are that there was periodic marine influence during deposition of the unit. Deposition of Unit I ended with a marine transgression and deposition of Unit II.

Unit II (Ledda, 1998)

Unit II was deposited within a deltaic / shallow marine environment and consists of up to 140 m of sandstone, silty mudstone and occasional thin coaly mudstone. Sands were deposited in distributary channels and mouth-bars while mudstones and silty mudstones accumulated in interdistributary bays. Thin discontinuous peat beds, none of which are of economic significance, accumulated in local salt marshes.

Unit III (modified after Ledda, 1998)

Unit III is indicative of the second regressive episode for the area and represents the deposition of the 2nd main coal-bearing stratigraphic sequence. The unit averages 85 m in thickness and is comprised of sandstone, siltstone, carbonaceous mudstone and thick, laterally extensive coal seams. Restricted nearshore marine, tidal flat and coastal swamp environments persisted throughout much of the deposition of Unit III. Sandstone units were deposited within tidal channels while interbedded sandstones and siltstones were deposited nearshore within intertidal environments. Mudstones are representative of tidal flat deposits. Significant marine influence during deposition of the entire unit is indicated.

Coal Zones 2 through 11 are represented in Unit III, collectively contributing to up to 17 coal seams of economic significance. The coal zones were likely formed in freshwater peat swamps, located landward of the tidal flat, somewhat isolated from influxes of brackish water. The presence of sulphur in some of the coal seams suggests, however, that the peat was infiltrated periodically by marine water. Thus, the major coal seams are interpreted to have formed from peat accumulated in a freshwater marsh that was proximal to a brackish environment. The Snuggedy Swamp of South Carolina is considered a modern analogue for the paleoenvironment in which Unit III was deposited.

2.1.3 Intrusions

Tertiary and Cretaceous-age porphyritic dykes and sills commonly intrude this sequence, the most notable of which includes a Tertiary granodiorite intrusion located on the north side of the Telkwa River. These intrusions are not present in the Tenas area.

2.1.4 Geological Structures

The sedimentary sequence in the Tenas area is folded into a syncline in which the gently (typically 10 to 20°) northeast-dipping western limb of the syncline subcrops on the western side of the pit area, while the moderately (40 to 45°) southwest-dipping eastern limb subcrops on the eastern side of the pit. Faulting is generally near-vertical, and can be subdivided into two main groups, one which strikes approximately northwest/southeast and the other which strikes approximately northeast/southwest.

2.2 Surficial Geology

The surficial geology in the Project area consists primarily of two types of deposits, glacial clay- or silt-rich till, and sand and glaciofluvial sand and gravel outwash. At upper elevations and south of the proposed pit, the terrain is mapped as having bedrock outcrops to a limited extent or thin mantles of clay- and silt-rich tills deposits, between 3 m and 10 m thick. North of the proposed pit and towards Tenas Creek and Goathorn Creek, drillholes report thin mantles of clay- and silt-rich tills deposits, between 3 m and 10 m thick underlain by a thick sand and gravel outwash deposit that can exceed 100 m.

Other types of deposits are present locally. Patches of glaciolacustrine deposits are scattered throughout the morainal landscape in low ridges and in depressions; the sediments comprise bedded and laminated mud, and minor sand and gravel (Clague 1984). Recent fluvial deposits form the narrow floodplains of Goathorn Creek and Tenas Creek, which are 40 m to 80 m deep incised into the subdued morainal landscape, and the wide floodplains of the Telkwa and Bulkley Rivers. The fluvial deposits range from extremely coarse, poorly sorted gravel on steep alluvial fans to moderately to well-sorted sand and mud on low-gradient floodplains (Clague 1984).

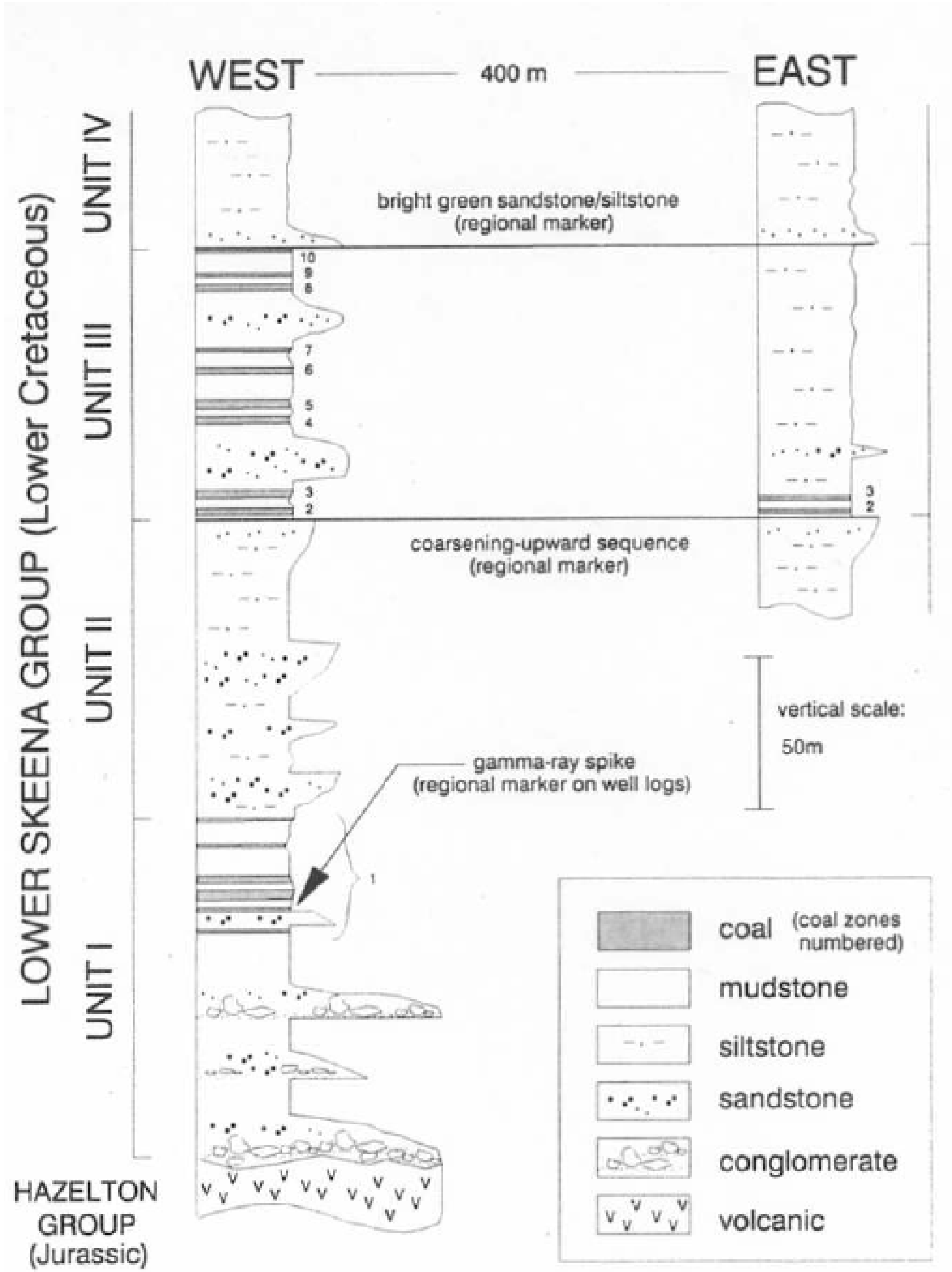


Figure 2: Stratigraphic Sequence of Lower Cretaceous Skeena Group Sediments. Source: Telkwa Coal Ltd.

2.3 Geochemical Testing

Norecol Dame and Moore (1999) completed a comprehensive geochemical characterization program of the Telkwa Mine for Luscar Coal Ltd. The geochemical characterization included geochemical testing of samples collected from Tenas, Telkwa North and Goathorn Deposits. TCL is only proposing to mine the Tenas deposit and the historical geochemical results for this deposit are summarized here.

Approximately 700 samples of mine rock and coal (including cleaning intervals) were collected continuously down drill holes in the proposed pit boundary of the Tenas deposit. Samples were submitted for the following analyses:

- Acid base accounting (total sulfur, Sobek-NP and paste pH);
- Laboratory kinetic tests including MEND humidity cell tests and column trickle tests; and
- On-site kinetic tests were also developed.

Due to the use of Sobek-NP, a neutralization potential ratio (NPR) cut-off three was used to characterize samples as PAG or NAG.

The historical geochemical testing results indicated the following:

- ARD potential is characterized according to stratigraphic “zones”, with zones being delineated by the coal seams;
- Zones can be classified as dominantly PAG or dominantly NAG but rock with acid rock drainage potential occurs in all zones;
- ARD potential is driven by sulphur content with Tenas zone medians varying from 0.6% to 1.7%; and
- Tenas NP zone medians varied from 30 to 42 kg $CaCO_3$/t.

Based on the acid base accounting results, Norecol Dames and Moore (1999) characterized the following zones as NAG or PAG:

- NAG: Zone 0 (overburden), Zone 1, Zone 4 and Zone 7/8; and
- PAG: Zone 1a, Zone 2/3, Zone 5, Zone 55 and Zone 6.

Process reject samples were also collected. ABA accounting of these samples indicated these materials were uniformly PAG.

The bulk element contents of the samples showed no enrichments above crustal values; however, there was only limited selenium data. Water samples collected from a seep downstream of a bulk sample site were used to evaluate metal leaching. The seeps were non-acidic and indicated metal concentrations indicative of pyrite weathering under basic weathering conditions. At sulphate concentrations typically in the hundreds of mg/L range, selenium concentrations were <0.0002 mg/L.

Based on the results, Norecol Dames and Moore (1999) concluded that ARD management will be required for the Tenas Project.

3 Summary of Mine Waste Management Plan

Mining of the Tenas deposit will produce mine rock and coal rejects (processed rock). Previous geochemical testing (Norecol Dames & Moore 1999) indicates that the processed rock and components of the mine rock will be potentially acid generating (PAG) and PAG management will be required. Management of mine rock and processed rock are summarized in the following sections.

3.1 Management of PAG Rock and Processed Rock

In advance of, and during mining, TCL proposes to progressively construct Management Ponds. The purpose of the ponds is to store PAG rock in saturated conditions to minimize sulfide oxidation, limiting acidic drainage from occurring. Three Management Ponds will be constructed. The East and West Management Ponds will be constructed near the north of the Tenas Pit and will consist of three connected cells (Figure 3). The North Management Pond will be external to the pit, located north of the West Management Pond.

PAG rock will first be placed in the North Management Pond (NMP). PAG rock will be progressively placed and then flooded so that exposure of PAG rock to atmospheric oxygen is minimized. TCL is proposing to place all PAG rock underwater before it becomes acid generating. The timing to the onset of acid generation is discussed in Section 6.2.7.

Once the storage capacity of the NMP has been reached, storage will begin in the East Management Pond and subsequently in West Management Pond. The Management Ponds will be maintained with a two-metre water cover.

3.2 Management of NAG Rock and Overburden

NAG rock will be used as to progressively backfill the open pit during operations. Some NAG rock will also be stored in the embankments and buttresses constructed for the various management ponds.

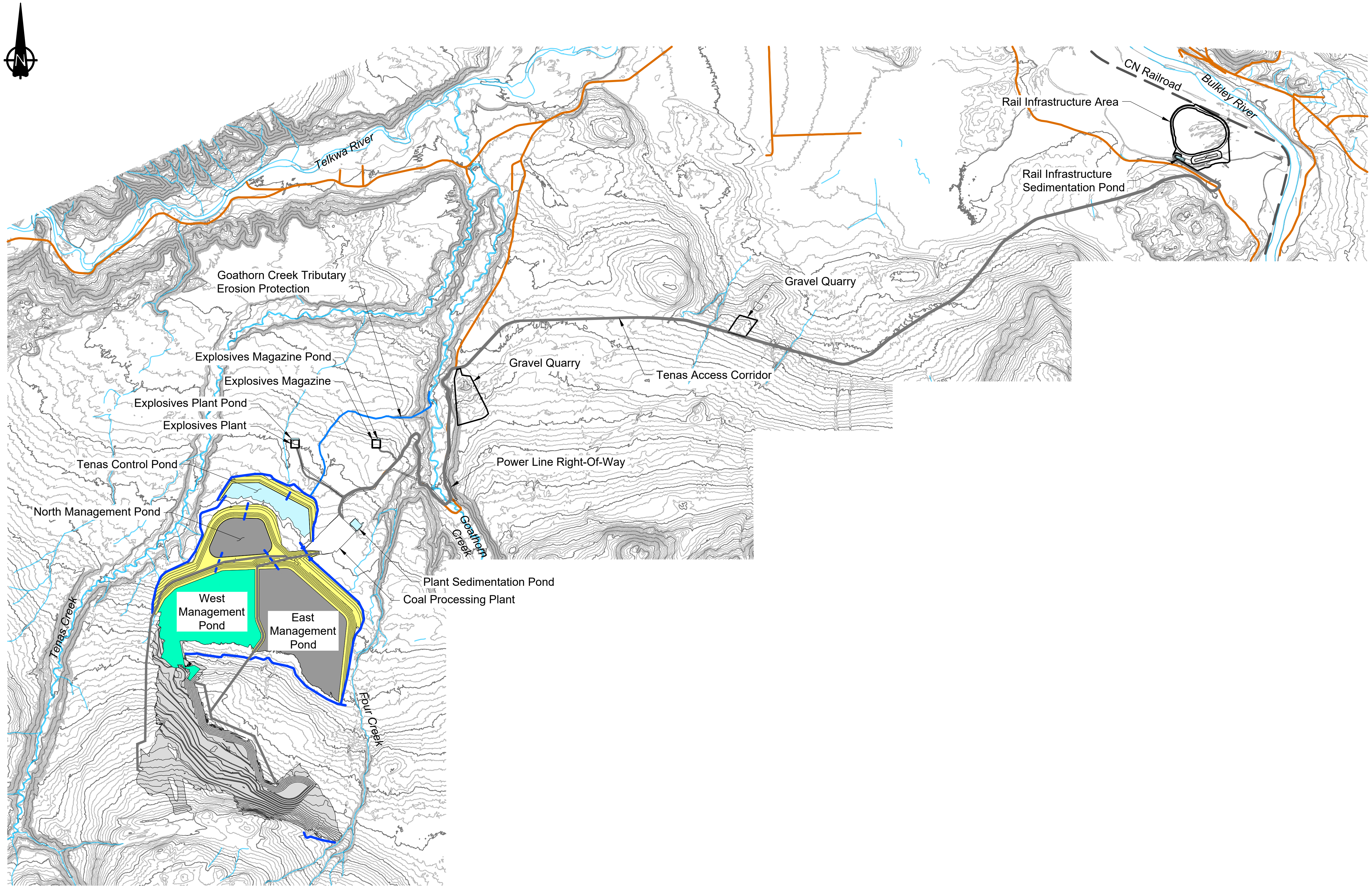
Overburden will be stored in the embankments and buttresses constructed for the various management ponds are used as cover material for NAG rock backfilled within the open pit or as cover material for the management ponds in the decommissioning and reclamation phase of the Project.

3.3 Processed Rock

Coarse and fine processed rock are expected to be PAG and will also be placed in the Management Ponds with mine rock (Figure 3).

3.4 Pit Walls

The majority of the open pit will be backfilled during operations at closure. However, a small portion of hanging wall will exist at closure. Meteoric water contacting the pit walls will report to a pit lake, which will subsequently drain northwards by gravity and mix with Management Pond water prior to discharging.



LEGEND

- Water Management Feature
- Spillway
- Existing Watercourse
- Existing Road
- Proposed Road
- Dams and Buttresses
- Sedimentation Pond
- Active Management Pond
- Backfill / NAG Pile
- Covered Inactive Management Pond

NOTES

1. Contours shown at 5.0m intervals.
2. All dimensions shown in meters unless otherwise stated.
3. Pile designs by SRK Consulting Ltd.

REFERENCE

NAD83 UTM Zone 9.

0m 500 1000 1500 2000

srk consulting

TELKWA COAL LIMITED

Environmental Assessment

Water Management Overview

SRK JOB NO.: 1CT027.007	Telkwa Coal	DATE: 2022/02/09	APPROVED: MKH
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4 Conceptual Geochemical Model

4.1 Management Ponds

Mining of the Tenas deposit will produce pyrite (FeS_2) bearing PAG mine rock. Under natural conditions, the pyrite is stable in bedrock where it is isolated from atmospheric oxygen. However, following blasting of the bedrock, pyrite in the mine rock will be exposed to atmospheric oxygen prior to being placed in the Management Ponds. Similarly, pyrite in processed rock will be oxygen unlimited once placed in the Reject Rock Piles prior to compaction and placement of the till covers on these facilities. Under these conditions, pyrite will oxidize in the presence of oxygen and water according to the following reaction:

$$FeS_{2\,(s)} + 3\tfrac{1}{2}O_{2\,(g)} + H_2O_{\,(l)} \leftrightarrow Fe^{2+}{}_{(aq)} + 2SO_4^{2-}{}_{(aq)} + 2H^+{}_{(aq)} \text{ (Rxn 1)}$$

As seen in Rxn 1, pyrite oxidation produces sulfate, iron and acidity. The iron liberated from the sulfide can subsequently oxidize to ferric iron in neutral pH water according to the following reaction:

$$Fe^{2+}{}_{(aq)} + \tfrac{1}{4}O_{2\,(g)} + 2\tfrac{1}{2}H_2O_{\,(l)} \leftrightarrow Fe(OH)_{3\,(s)} + 2H^+{}_{(aq)} \text{ (Rxn 2)}$$

The above reaction also produces acidity. Mineralogical testing indicates pyrite is the main sulfide mineral at the Tenas Project, Reactions 1 and 2 are plausible mechanisms for acid production in mine rock mined from the Tenas Pit or in processed rock produced from washing of coal.

Acidic conditions do not immediately form since acid production can be neutralized inthe presence of carbonate minerals according to the following reactions:

$$CaCO_{3(s)} + H^+{}_{(aq)} \leftrightarrow HCO_3^-{}_{(aq)} + Ca^{2+}{}_{(aq)} \text{ (Rxn 3)}$$

$$CaCO_{3(s)} + 2H^+{}_{(aq)} \leftrightarrow H_2CO_{3(aq)} + Ca^{2+}{}_{(aq)} \text{ (Rxn 4)}$$

Some metal carbonates (e.g., siderite and ankerite) offer limited buffering potential, since during dissolution, oxidation of the metal cation produces acidity, which offsets the neutralization produced from the carbonate ion. Buffering by Reactions 3 and 4 results in a lag time to the onset of acid generation. For example, acid conditions will not occur until carbonate minerals are consumed.

Acidity can also be neutralized through dissolution of oxyhydroxide and aluminosilicate minerals; however, due to the dissolution kinetics of these minerals, they often produce insufficient neutralization potential to produce neutral drainage (i.e., these minerals are more reactive under acidic conditions). A detailed assessment of the carbonate mineralogy is provided in Section 6.2.2 of this report. Carbonate minerals have been identified at the Tenas Project and Reactions 3 and 4 are considered to be the predominant neutralization reactions for the project.

TCL proposes to manage PAG rock through placement in the Management Ponds prior to becoming acidic, thereby lowering oxygen availability limiting the rates of Reaction 1.

4.2 Processed Rock

Based on the historic sample results, processed rock is expected to be PAG and oxidize according to Reaction 1. TCL proposes to place these materials in the Management Ponds to limit oxygen and water contact with these materials. Prior to placement in the Management Ponds, processed rock will oxidize producing soluble load by Reaction 1 that will flush from the processed rock during placement in the management Ponds. After the processed rock is placed in the Management Ponds, oxygen content will be limited, reducing the rate of Reaction 1.

4.3 NAG Mine Rock

NAG mine rock used as backfill or placed in the external NAG piles (Figure 3) will oxidize according to Reaction 1. However, as these materials contain more neutralization potential than acid generating potential, the sulfide will be consumed prior to the neutralization potential and acidic drainage from these materials will not occur. However, oxidation products will still be produced and will be flushed by water in contact with NAG rock. This load will mix with other mine site water sources prior to being used in the process plant or discharged from site.

4.4 Pit Wall Rock Runoff

At closure, a pit lake will form in the backfilled pit. A high wall will exist above the pit lake composed mainly of Zone 6 sedimentary rock. Based on the site specific criterion (see Section 6.2.6.1), this unit is NAG. The pit lake will be a mixture of wall rock runoff, direct precipitation and runoff from NAG backfill. The pit lake will drain by gravity and mix with the Management Pond before being discharged during closure.

4.5 Explosives Usage

Nitrogen load will be produced from explosives usage. The source of nitrogen comes from ammonium nitrate fuel oil (ANFO) during misfires or spillage during loading of blast holes or from incomplete detonation of ANFO. The wasted ANFO will report to the pit sumps and stored in mine rock. As ammonium nitrate (AN) is highly soluble, water in contact with wasted ANFO will dissolve AN producing ammonia, nitrite and nitrate.

5 Methods

5.1 Sample Selection

5.1.1 Drill Core

TCL completed five drill holes at the Tenas deposit in January 2018. Figure 4 present the location of the 2018 drill holes. Historical drill holes are also provided. Drilling was planned to be spatially representative of the pit and to ensure that all stratigraphic zones were sampled (e.g., not all holes encountered every zone).

Following completion of the drill holes, Stephen Day (SRK Geochemist) visited the site to inspect the core and select intervals for geochemical sampling. Intervals ranged from approximately

15 centimetres (cm) near coal seams up to nine metres (m) in interbeds. The average sample thickness was 2.1 m. Sample intervals are provided in Appendix A.

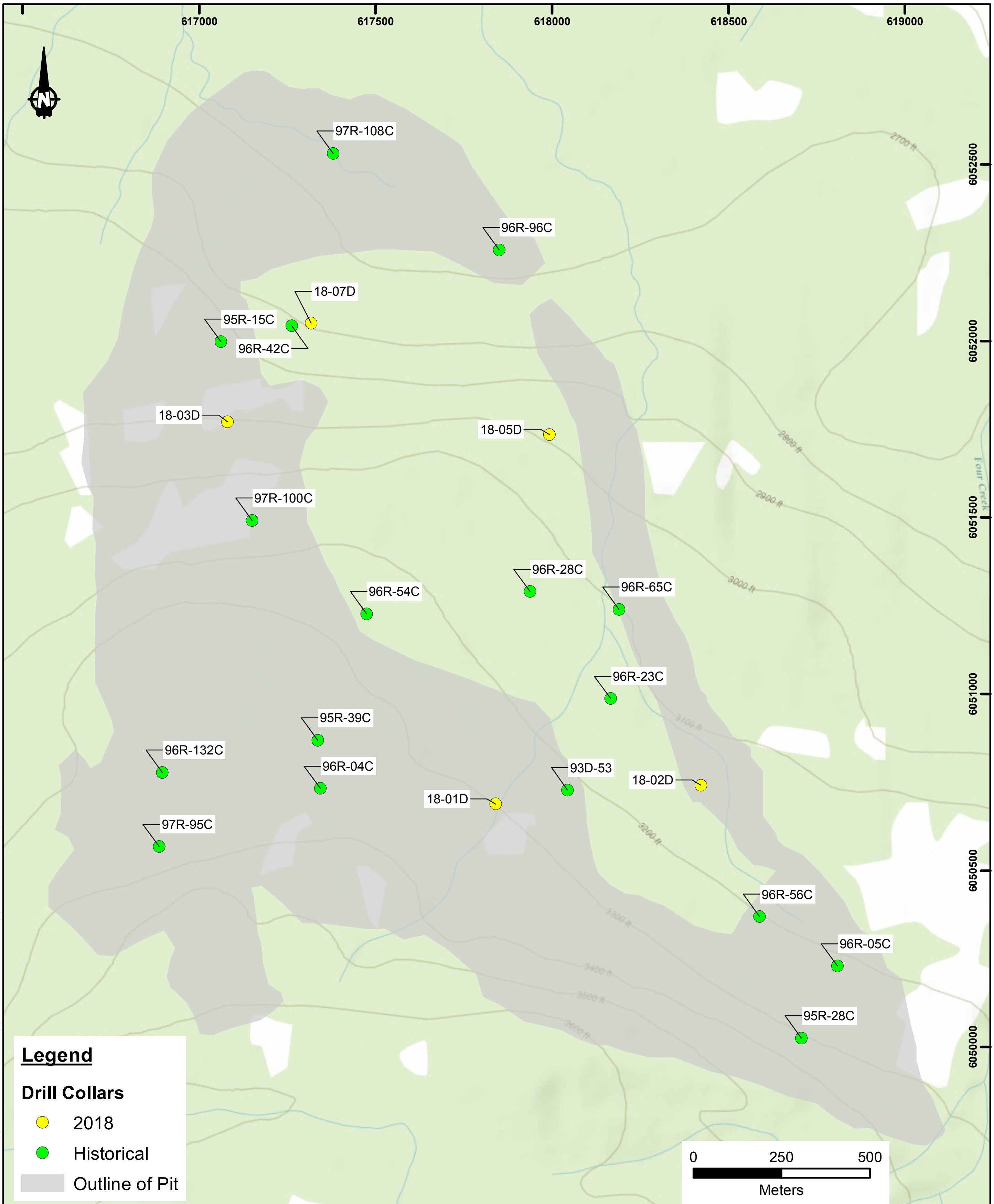
5.1.2 Overburden

Six overburden samples were collected from four test pits to characterize glacial materials planned to be removed by mining.

5.1.3 Other Sample Types

In addition to the drill core sample, TCL obtained the following samples for geochemical testing:

- Three samples of coarse processed rock;
- Four samples of fine processed rock;
- Five overburden samples collected from five test pits along the proposed Tenas Access Corridor that will be used for constructing the base and sub base portions of this road;
- Nine samples from four test pits in the vicinity of the Rail Infrastructure; and
- Two samples of rock material that will be used to construct the surfacing material for the Tenas Access Corridor.



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srk consulting

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Tenas Project Supplemental Geochemical Characterization

Location of Tenas Project Drillholes

Job No: 1CT027.007

Filename: Tenas_2CT025.005_drill_locations_rev02

TELKWA COAL

Date: February 2022

Approved: MKH

Figure: 4

5.2 Sample Analysis

All samples were shipped to Maxxam Analytics in Burnaby, British Columbia, for geochemical testing. The following sections provide the analysis completed on each sample type.

5.2.1 Drill Core

All drill core samples were analyzed for the following:

- Paste pH, paste conductivity, total sulfur, total carbon, total carbonate, sulfate by hydrochloric acid method, neutralization potential (standard Sobek and modified methods), total inorganic carbon, and trace element scan by ICP-MS following aqua regia digestion.

Two neutralization potential determinations (standard Sobek and modified ABA) were completed on the drill core samples to evaluate if the historical NP results, which were based on the standard Sobek method, could be corrected to the modified ABA method (MEND 1991).

A subset of samples was submitted for humidity cell testing and mineralogical analyses based on the results of the above analyses. With the exception of overburden (Zone 0), one humidity cell was selected from each interburden zone. Samples were selected to evaluate the timing to the onset of acid generation and bulk leaching content, in particular with respect to selenium and arsenic. Therefore, the sample selection was biased to samples that had one of the following:

- Samples that had higher sulfur contents and lower NP;
- Samples that had relatively elevated solid-phase selenium concentrations; or
- Samples that had elevated solid-phase arsenic concentrations.

Appendix B provides a list of the samples that were selected for HCT and a rationale for the selection of the sample.

Each sample selected for HCT was also submitted for mineralogical analysis.

An additional six samples were selected for mineralogical analysis from samples with modified-NP exceeding Sobek-NP to confirm the carbonate content of the samples (Appendix B) because the acid base accounting results indicated that modified-NP exceeded Sobek-NP in several samples with Sobek-NPs between 60 and 80 kg $CaCO_3$/tonne (see Section 6.2.4.1). It is possible that these unusual results are occurring because the selection of the acid normality for use in the sample digestion is based on an incorrect fizz rating and the short duration of the Sobek NP test in insufficient to digest all carbonate minerals present in the sample. Additionally, titration does not occur until the pH is less than 2.5 in the modified ABA test whereas the Sobek (1978) procedure only requires 3 millilitres (mL) of acid to be added. It is possible that insufficient acid was added in the Sobek NP determinations to digest all of the carbonate minerals.

5.2.2 Overburden Samples

A split of overburden samples was collected and evaluated for moisture content. Subsequently, samples were air dried and dry sieved into -2 mm, +2-25 mm and +25 mm fractions and weighed. A split of the +25 mm fraction was also wet sieved to -25 mm. The -2 mm and -25 mm fractions were analyzed for the following:

- Paste pH, total sulfur, total carbonate, sulfate by hydrochloric acid method, neutralization potential (Sobek and modified methods), total inorganic carbon, and trace element scan by ICP-MS following aqua regia digestion.

Only one sample had +25 mm grains (Maxxam, 2018, pers. comm.). Therefore, the +2-25 mm fraction was also analyzed for the geochemical tests in the above bullet.

5.2.3 Other Sample Types

The processed rock samples (fine and coarse), access road samples, and overburden samples collected from test pits in the vicinity of the Rail Infrastructure and along the proposed Tenas Access Corridor alignment were submitted for the following tests:

- Paste pH, total sulfur, total carbonate, sulfate by hydrochloric acid method, neutralization potential (Sobek and modified methods), total inorganic carbon, and trace element scan by ICP-MS following aqua regia digestion.

Three of the processed rock samples were also submitted for HCTs.

6 Results

6.1 Quality Assurance/Quality Control

SRK screened the static test and kinetic test results against its internal QA/QC procedures. Table 1 presents a summary of the QA/QC results for mine rock. While some data failed quality SRKs screening criteria, the number of failures is considered acceptable. Tables are not presented for other material types since the majority of the other tests passed the screening criteria. The one exception to this was one coarse reject sample (UI3970) had a fizz test rating not consistent with the measured NP.

Based on the number of samples collected versus those that failed SRK's QA/QC criteria, it is SRK's opinion that data quality is acceptable for the purpose of the Project.

Table 1. Summary of QA/QC Result Failures

QC Test	SRK QC Criteria	Results
paste pH		
Lab Duplicate (n=18)	For any samples, +/- 0.5 difference pH unit	All passed
Split Duplicate (n=17)	For any samples, +/- 0.5 difference pH unit	0.64
TIC		
Lab Blank for Total Carbon (n=6), no blank for TIC	<2X detection limit (DL)	All passed
Carbon balance (Total C > TIC) (n=173)	For samples > 10X the detection limit (DL), Total Carbon should be greater than Total Inorganic Carbon, if not the % difference should be within +/-20%	All passed
Lab Duplicate (TIC n=11, Total Carbon=6)	For samples > 10X the detection limit (DL), % RPD within +/-30%	All passed
Split Duplicate (TIC n=17, Total Carbon n=17)	For samples > 10X the detection limit (DL), % RPD within +/-30%	T18-03D A-010 - SPLIT DUP (Maxxam ID=TD4057) in Total Carbon has RPD=54%
Standard Reference Material for Total C (n=11), n=6 for TIC	Within specified tolerance ranges.	All passed
Total S & Total Sulphate		
Lab Blank (n=6 for Total S, n=0 for Total Sulphate)	<2X detection limit (DL)	All passed
Sulphur balance (total S > sulphate S) (n=173)	For samples > 10X the detection limit (DL), Total Sulphur should be greater than Total Sulphate, if not the % difference should be within +/-20%	All passed
Lab Duplicate (n=6 for Total S, n=9 for Total Sulphate)	For samples > 10X the detection limit (DL), % RPD within +/-30%	All passed
Split Duplicate (n=17 for Total S, n=17 for Total Sulphate)	For samples > 10X the detection limit (DL), % RPD within +/-30%	29521 - SPLIT DUP RPD% is 34%
Standard Reference Material (n=11 for Total S, n=2 for Total Sulphate)	Within specified tolerance ranges.	All passed
Modified NP		
NP consistent with paste pH (n=173)	Negative NP has paste pH <= 5	Samples T18-02D-A-016, 28674, 28677, 28683, 28687, 28691, 28692, 28700 have a positive NP while pH is below 5
Lab Duplicate (n=16) for NP, (n=16) for fizz test	% RPD better than +/-15% for NP>20 kg/t, % RPD better than +/- 20% for NP>10 kg/t, Difference within +/-5kg/t for NP<10 kg/t. Fizz test rating is the same.	All passed
Split Duplicate (n=17 for Total for fizz test, n=17 for NP)	% RPD better than +/-15% for NP>20 kg/t, % RPD better than +/- 20% for NP>10 kg/t, Difference within +/-5kg/t for NP<10 kg/t. Fizz test rating is the same.	T18-02D A-034 - SPLIT DUP (Maxxam ID=TD4015) and T18-03D A-010 - SPLIT DUP (Maxxam ID=TD4057) have RPD over 30% in NP
Fizz test rating with NP (n=173)	Max NP does not exceed fizz test rating	Samples T18-01D-A-002, T18-02D-A-019, 28661, 28670, 28670 - SPLIT DUP, 28685, 28694, 28704 exceed max NP values
Modified NP and TIC		
Comparison between Modified NP and TIC (n=173)	Check for trends/co-relation	TIC higher than NP
Metals		
Lab Blank (n=18)	<2X Detection Limit	All passed
Lab Duplicate (n=6)	For samples >10X detection limit (DL), % RPD within +/- 30%, ok 10% of metal scan failing.	All passed
Split Duplicate (n=107)	For samples >10X detection limit (DL), % RPD within +/- 30%, ok 10% of metal scan failing.	Less than 10% of metal scan failing
Standard Reference Material (n=24)	Within specified tolerance ranges.	All passed

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6.2 Drill Core Samples

The following sections present select acid base accounting (ABA) and element content results as they relate to acid generating potential. Mineralogical testing results are also presented. Results here are evaluated based on stratigraphic zones.

Detail ABA and elemental results are provided in Appendix C and D, respectively.

6.2.1 Elemental Content

To evaluate parameters that were elevated in the solid-phase and may have to the potential to leach, elemental concentrations were compared to the average crustal abundances (Smith and Huyck 1999). This dataset represents a general consensus of the overall crustal abundance and does not consider abundances in lithological units. An element was screened as enriched in the solid-phase if its concentration was greater than 10 times the average crustal abundances. The following elements were screened to be elevated in the solid-phase:

- 20% of arsenic analyses;
- 1% of phosphorus and selenium analyses; and
- 54% of sulfur analyses.

Detailed comparisons are provided in Appendix D. Trace element concentrations were not available for the historical results and the above percentages are based on the samples collected as part of the supplemental geochemistry characterization program.

An elevated solid-phase concentration does not necessarily imply it will be elevated in contact waters. The solid-phase screening is completed to flag parameters that need to be evaluated in other geochemical tests.

6.2.2 Mineralogy

Mineralogical results are provided in Table 2. Sample T18-02D-A-002 (Zone 2) reported 49% amorphous material (UBC 2019). Mineralogical results are normalized to 100% by convention which does not include amorphous material. As this can provide an overestimate of mineral species related to acid generation potential, mineral percentages for this sample were normalized to 100% considering the amorphous material was present in the samples. This approach was considered reasonable since sulfur and carbonate contents were more aligned with the acid base accounting results when sample T18-02D-A-002 was corrected for amorphous material content.

The samples are predominantly composed of quartz, plagioclase feldspar clay minerals Illite-Muscovite and Kaolinite. Kaolinite content increases with depth in the stratigraphic sequence with mineral content increasing to greater than 50% below Zone 5. Illite-Muscovite concurrently decreases with depth in the stratigraphic sequence and was not detected in the samples collected below Zone 55. Plagioclase feldspar content also decreases with depth and was only detected in one sample below Zone 5 suggesting that that the majority of feldspathic rockdeeper in the stratigraphic sequence has been weathered to kaolinite. Quartz content was generally consistent in all of the samples collected (Table 2).

Pyrite (FeS_2) and marcasite (FeS_2) were the only sulfide minerals detected in the XRD analysis. Pyrite was highest in the samples collected from Zone 2/3 (Table 2). Gypsum was the only other sulfur species detected in the XRD analysis in quantities less than 2.5% in the Zones 2/3, 5 and 6 samples.

The following carbonate minerals were detected in one or more samples: ankerite-dolomite ($Ca(Fe,Mg,Mn)(CO_3)_2$ – $CaMg(CO_3)_2$), calcite ($CaCO_3$), siderite ($FeCO_3$), siderite/calcian ($(Fe,Ca)CO_3$), dolomite ($CaMg_{0.75}Fe_{0.25}(CO_3)_2$), and ankerite ($CaCO_3.FeCO_3$). The mineralogical results indicate that iron carbonates are important and total inorganic carbon content may not be suitable for use as a direct proxy for neutralization potential.

The sulfide and carbonate mineralogical results, as they relate to acid potential and neutralization potential, are discussed in more detail in the following sections.

Table 2. X-Ray Diffraction Results

Mineral Name	Empirical Formula	Zone														
		1		1a		2/3		4		5		55	6		7	8
		28836	28661	T18-02D-A-011	T18-02D-A-004	T18-02D-A-016	T18-01D-A-002	28681	T18-02D-A-019	28684	T18-02D-A-021	T18-03D-A-006	28704	T18-02D-A-028	T18-02D-A-034	28711
Anatase	TiO_2	1.724	0.8	1.3	1.1	1.9	---	1.6	1.1	1.5	0.8	1.7	1.4	0.8	1.7	1.8
Ankerite- Dolomite	$Ca(Fe^{2+},Mg,Mn)(CO_3)_2 – CaMg(CO_3)_2$	---	20.7	---	14.0	---	39.8	---	11.9	---	23.8	---	---	23.1	---	---
Brookite	TiO_2	---	---	1.1	---	---	---	---	---	---	---	---	---	---	---	---
Calcite	$CaCO_3$	4.368	0.2	---	---	---	---	---	0.5	0.4	3.9	---	2.0	1.4	---	1.0
Clinochlore	$(Mg,Fe^{2+})_5Al(Si_3Al)O_{10}(OH)_8$	5.324	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cristobalite	SiO2	---	---	---	---	0.5	---	0.5	---	---	---	---	---	---	---	---
Dawsonite	$NaAl(CO_3)(OH)_2$	---	---	---	---	0.6	---	---	---	---	---	---	---	---	---	---
Gorceixite	$BaAl_3(PO_4)(PO_3OH)(OH)_6$	---	---	---	---	---	---		---	---	0.4		---	---		
Gypsum	$CaSO_4·2H_2O$	---	---	---	---	1.9	---	---	---	1.2	---	---	2.4	---	---	---
Illite-Muscovite	$K_{0.65}Al_{2.0}Al_{0.65}Si_{3.35}O_{10}(OH)_2$	18.808	12.1	14.7	15.2	21.2	---	12.2	6.0	16.0	5.2	2.2	---	---		
Kaolinite	$Al_2Si_2O_5(OH)_4$	15.681	10.9	16.1	14.7	22.2	24.5	22.2	25.3	25.9	19.5	57.9	49.6	53.8	56.4	63.5
Magnetite	Fe_3O_4	---	---	---	---	0.5	---	0.2	---	0.4	---	---	---	---	---	---
Marcasite	FeS_2	---	---	0.8	---	---	---	---	---	---	---	---	---	---	---	---
Plagioclase	$NaAlSi_3O_8 – CaAl_2Si_2O_8$	11.922	7.8	8.5	8.0	5.6	---	4.5	4.7	6.1	3.3	---	---	1.5	---	---
Pyrite	FeS_2	2.481	1	4.5	0.8	7.0	22.4	3.8	1.5	4.7	2.2	0.3	6.4	0.4	4.1	0.8
Quartz	SiO_2	36.399	33.5	42.1	34.7	35.5	13.3	34.9	31.3	39.1	28.0	37.3	29.1	17.7	36.1	28.8
Rutile	TiO_2	0.875	0.5	0.8	0.7	0.6	---	0.7	---	0.7	0.3	---	---	---	---	---
Siderite	$Fe^{2+}CO_3$	---	7.3	5.4	6.8	2.5	---	9.2	---	2.1	6.3	0.3	0.3	1.3	0.2	0.2
Siderite, calcian	$(Fe^{2+},Ca) CO_3$	2.028	5.2	1.1	4.0	---	---	7.4	6.6	---	6.3	---	---	---	---	---
Dolomite	$CaMg_{0.75}Fe_{0.25}(CO_3)_2$	---	---	3.5	---	---	---	---	11.1	---	---	---	---	---	1.6	2.7
Ankerite	$CaCO_3.FeCO_3$	0.389	---	---	---	---	---	2.8	---	2.0	---	0.3	8.9	---	---	1.3
Sum		99.999	100	100	100	100	100	100	100	100	100	100	100	100	100	100

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6.2.3 Sulfur Species

Table 5 provides a comparison of total sulfur to sulfide sulfur, calculated using the following equation (EQ1):

$$S^{2-} = S_{ICP} – S_{HCl} \text{ (EQ1)}$$

Equation 1 is used to estimate sulfide concentrations, rather than Leco sulfur minus acid soluble sulfur, because the S_{ICP} does not include organic sulfur species whereas Leco sulfur includes all sulfur species. Organic sulfur is present in coal deposits and therefore, Equation 1 is used to avoid overestimating the sulfide content.

As can be seen in Figure 5, the majority of the total sulfur is present as sulfide in all zones. Highest total sulfur concentrations typically occur in Zone 2/3 and in the footwall Zones 6 and 7 (Figure 5). Sulfate is generally low (average of 0.03%) in the samples as indicated based on the difference between S-ICP (open circles on Figure 5), which is a measure of sulfide plus sulfate, and the calculated sulfide concentrations using Equation 1. Sulfate concentrations increase at higher total sulfur concentrations; however, sulfide is still the dominant sulfur species. At higher total sulfur concentrations, larger deviations from the 1:1 line occur indicating the presence of organic sulfur, which is common in coal deposits.

A regression analysis of all samples indicates there is a strong correlation (i.e., r=0.99) between total sulfur and sulfide sulfur (Figure 5). Total sulfur can therefore be used as a proxy for estimating sulfide using the following mathematical relationship:

$$S^{2-}_{calculated} = 0.93 \times \text{Total-}S_{measured} - 0.02 \text{ (EQ2)}$$

Mineralogical analyses (Table 2) indicate pyrite is the predominant sulfur mineral in the samples. Based on estimated pyrite content, total sulfur calculated using the XRD results generally corresponds to the total sulfur by Leco (Figure 6). Therefore, use of Equation 2 to estimate sulfide sulfur is reasonable.

SXRD generally exceeds SLeco (Figure 6). This can occur because the XRD results are normalized to 100%. XRD does not detect amorphous phases and minerals at lower percentages and the normalization of detectable mineral species to 100% can result in an overestimation of the detectable species.

The calculated sulfide sulfur can subsequently be used to estimate AP by the following equation (EQ3):

$$AP = S^{2-}_{calculated} \times 31.25 \qquad \text{(EQ3)}$$

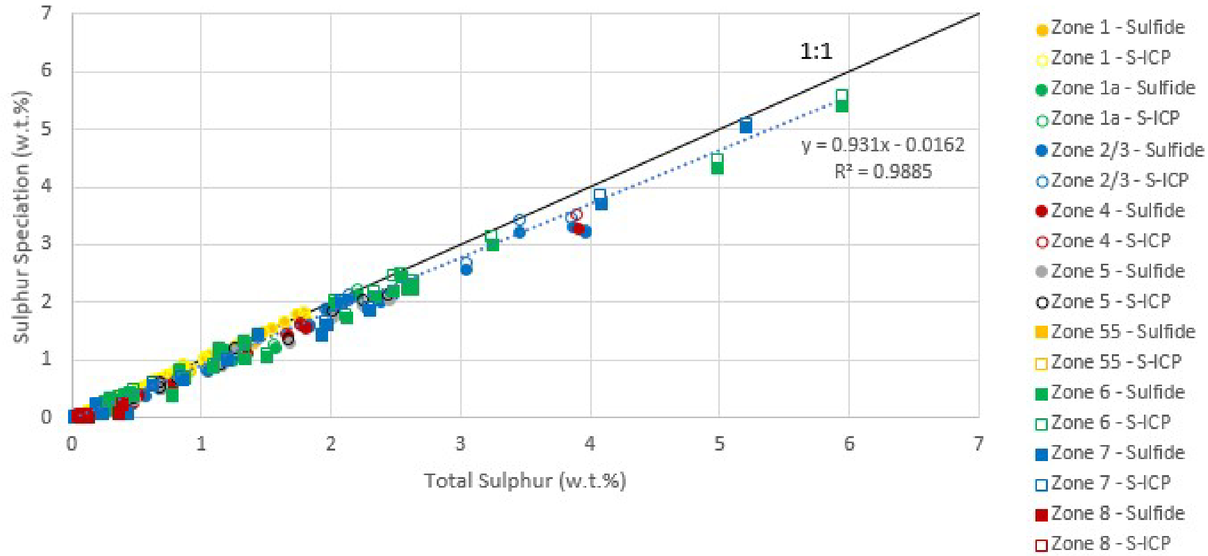

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Figure 5: Total Sulfur versus Sulfur by ICP and Calculated Sulfide Sulfur

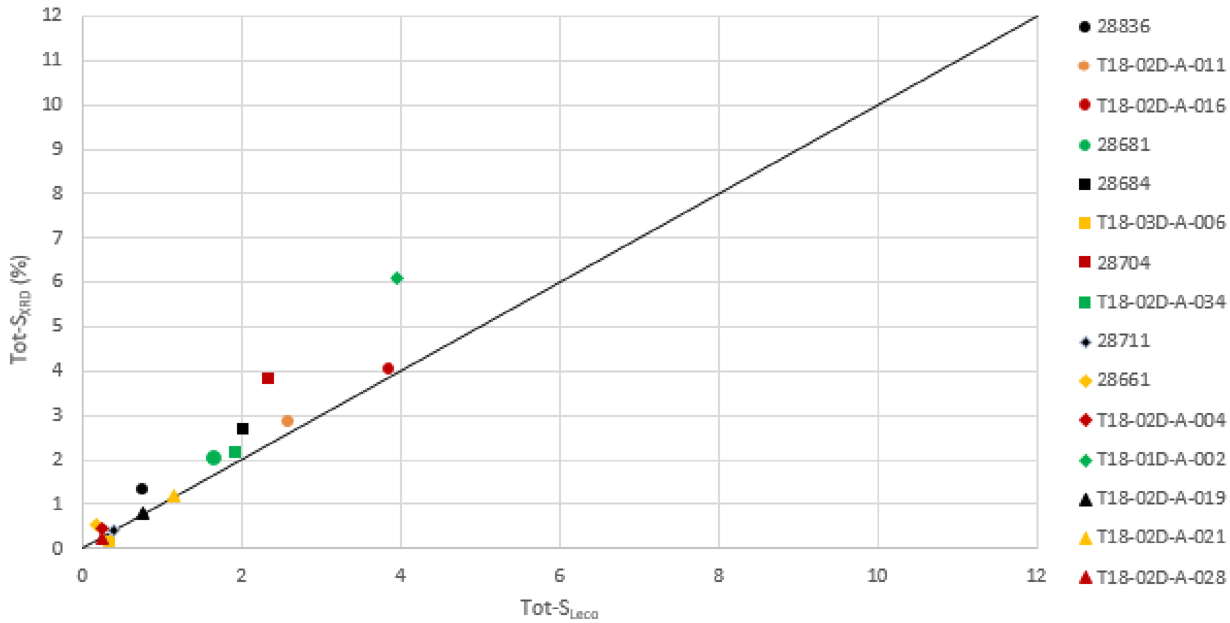

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Figure 6: Leco Sulfur versus XRD Sulfur

6.2.4 Neutralization Potential

Neutralization potential was estimated using the following three methods:

- MEND (1991) Modified NP determination;
- Sobek (1978) NP determination; and
- Estimated based on total inorganic carbonate (TIC) content.

The historical geochemical testing program (Norecol Dames & Moore 1999) used the Sobek (1978) method for determining NP. This method was included as part of the supplemental characterization program to evaluate if the historical NP results could be calibrated to the modified-NP method, which is more commonly used in current practice. The modified-NP method is preferred for the following reasons:

- The sample is not boiled which minimizes the extent of silicate-NP digestion, which is typically not readily reactive under ambient conditions;
- The initial pH of the solution must be less than 2.5 prior to titration to ensure dissolution of all available carbonates. The Sobek-NP method only requires 3 mL of acid be added to the sample regardless of the pre-titration pH; and
- The 24-hour testing period, in comparison to 3 hours in the Sobek (1978) method, provides sufficient time for oxidation of ferrous iron liberated through iron carbonate digestion.

Carbonate-NP (CNP) was estimated assuming that all the total inorganic carbon is present as calcium carbonate. A key objective of this approach was to determine if a relationship exists between measured-NP (i.e., modified-NP) and theoretical-NP estimated from TIC since measurement of TIC is more practical than other lab intensive methods under operating conditions.

Details of the NP determinations are presented in the following subsections.

6.2.4.1 Comparison of Sobek and Modified-NP Determinations

Modified-NP versus Sobek-NP is presented in Figure 7. Sobek NP generally exceeds modified-NP except in between values of approximately 60 to 80 kg CaCO3/t (Figure 7). As discussed in Section 5.2.1, these unusual results may be occurring as a result of the selection of the acid normality used in the sample digestion. Mineralogical testing was completed on the following six samples with modified-NP values exceeding Sobek-NP values: 28661 (Zone 1), T18-02D-A-004 (Zone 1a), T18-01-A-002 (Zone 2/3), T18-02D-A-019 (Zone 4), T18-02D-A-021 (Zone 5) and T18-02D-A-028.

The mineralogical results identified relatively high concentrations of ankerite-dolomite and siderite in these samples and lower relative concentrations of calcite and dolomite (Table 2). Calculation of CNP following iron carbonate correction using the method of Day (2009) indicates a strong positive correlation (r=0.97) exists between the modified-NP method and TIC estimated based on mineralogical results (TICFe-corrected) (Figure 8). Based on the agreement of these two approaches, including samples where modified-NP exceeds Sobek-NP, it is likely that the Sobek-NP is underestimated between 60 and 80 kg $CaCO_3$/t, likely as a result of insufficient acid addition during sample digestion.

A strong positive correlation (r=0.95) exists between Sobek-NP and modified-NP methods for samples where modified-NP does not exceed Sobek-NP. Modified-NP can be mathematically estimated from the following equation:

$$Modified_{NP}=0.8*Sobek_{NP}-2.6 \qquad (EQ4)$$

Although Modified-NP exceeds Sobek-NP between approximately 60 and 80 kg $CaCO_3$/t (Figure 7), Equation 4 was used to adjust the historical data since this will provide a conservative estimate of the corrected-NP (e.g., the corrected-NP would be higher if there was closer agreement between Sobek and modified-NP methods in this range).

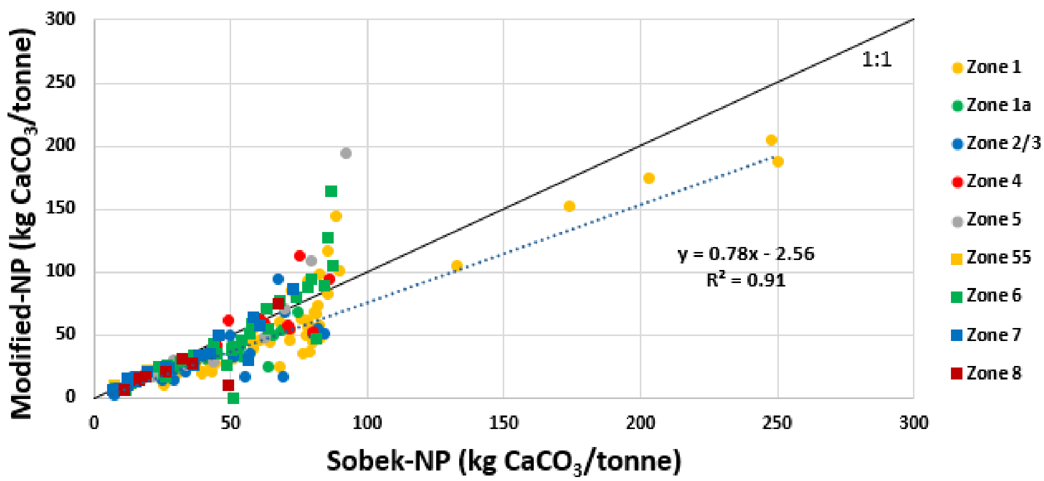

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Figure 7. Modified-NP versus Sobek-NP

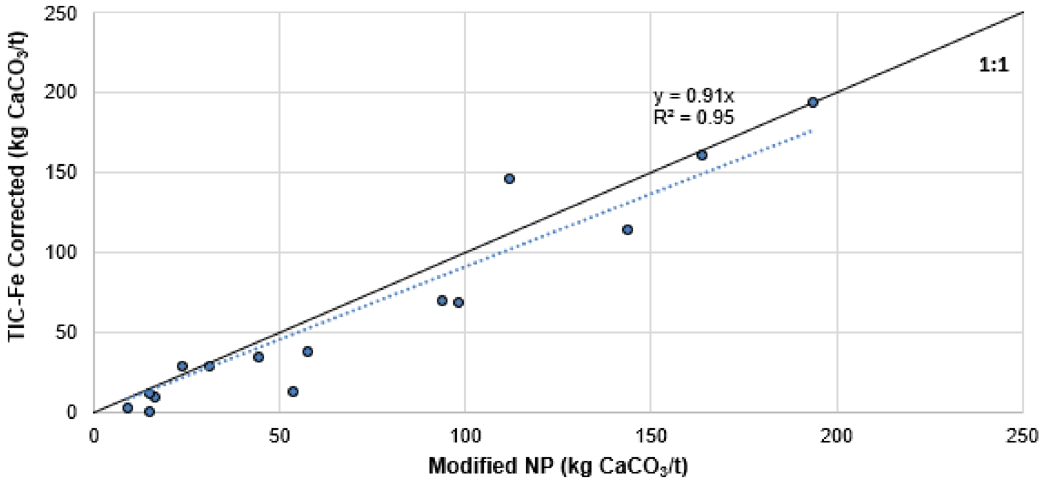

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Figure 8. Modified-NP versus $TIC_{Fe\text{-}corrected}$

6.2.4.2 Comparison of Carbonate-NP (CNP) and Modified-NP Determinations

Modified-NP versus CNP, estimated from total inorganic content (TIC), is presented in Figure 9. A positive correlation (r=0.74) exists between CNP and modified-NP. CNP exceeds modified-NP in almost all samples, indicating the presence of iron carbonates in the samples. This is consistent with the mineralogical results that identified the presence of iron carbonates (e.g., ankerite and siderite) to varying degrees in each of the stratigraphic zones (Table 2).

A strong correlation (r=0.94) exists between calcium plus magnesium (Ca+Mg), expressed in equivalent units (i.e., kg $CaCO_3$/t), and modified-NP (indicating that the modified-NP provides a reasonable estimate of effective-NP produced from dissolution of calcium and magnesium carbonates (Figure 10). There is more scatter in Zone 8 (footwall) samples indicating the presences of other calcium and magnesium bearing minerals in these samples.

The relationship between $TIC_{Fe\text{-}corrected}$ estimated using the mineralogical results can be used to correct total TIC concentrations measured by Leco. As noted in Section 6.2.4.1, a strong positive correlation exists between the modified-NP method and TIC (corrected for iron carbonates) estimated based on mineralogical results ($TIC_{Fe\text{-}corrected}$) (Figure 8). A strong correlation also exists between the TIC concentrations, estimated from XRD ($TIC_{XRD\text{-}total}$), to $TIC_{Fe\text{-}corrected}$ (Figure 11). This relationship indicates the carbonate-NP, or the effective-NP ($NP_{effective}$) can be estimated using the following equation (EQ5):

$$NP_{effective}(\text{kg } CaCO_3/t) = 0.56 \times TIC_{Leco}(\%) \times 83.3 \text{ (EQ5)}$$

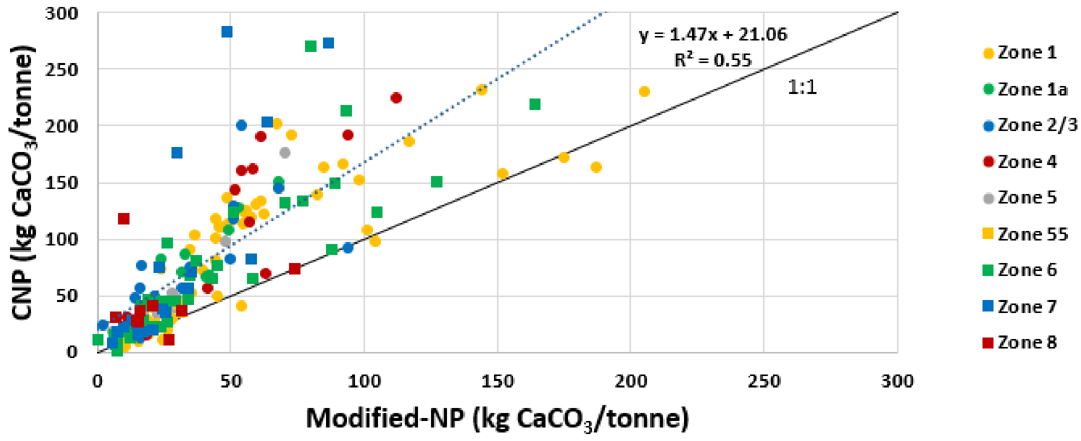

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Figure 9. Modified-NP versus CNP

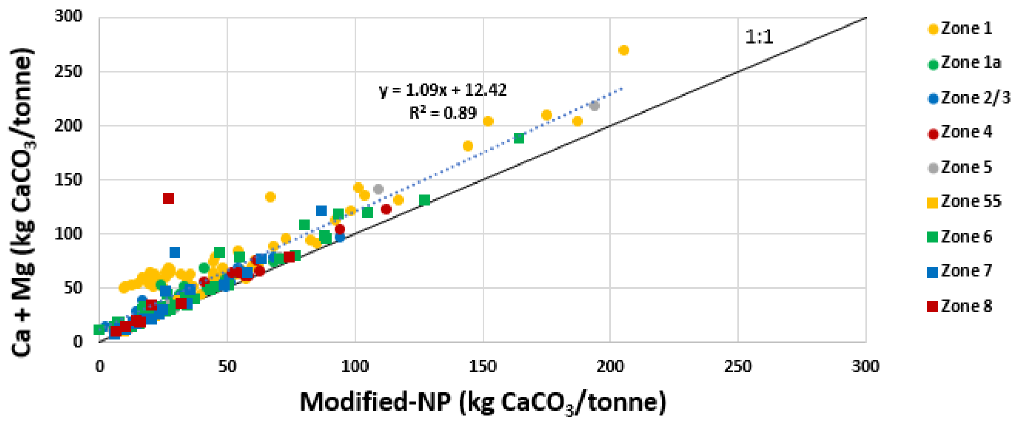

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Figure 10: Modified-NP versus Ca+Mg

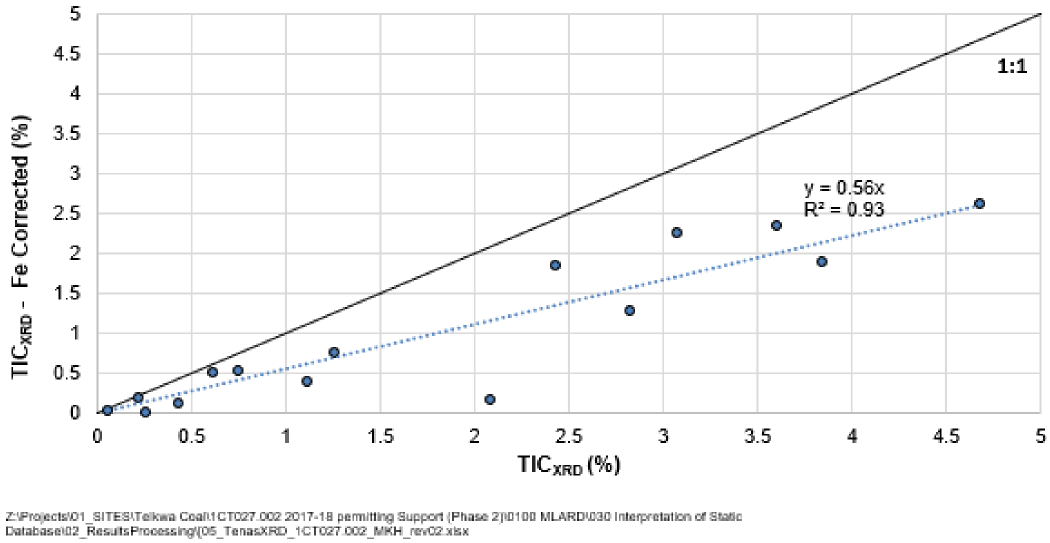

Figure 11: TIC_{XRD} versus TIC_{XRD}-Fe corrected

6.2.4.3 Summary of NP Determinations

Based on a comparison of the three NP determination approaches completed as part of the supplemental geochemistry program the following conclusions can be made:

- A positive correlation exists between modified-NP and Sobek-NP and the regression equation derived from this relationship can be used to "calibrate" the historic datasetto modified-NP methods;
- A strong positive correlation exists between modified-NP and calcium plus magnesium(in equivalent units) and modified-NP is interpreted to represent dissolution of calcium and magnesium carbonates (i.e., effective-NP); and
- Mineralogical results indicate there is a strong positive correlation between the modified-NP and TIC when corrected for the presence of iron carbonates. The mineralogical results can be used to estimate the effective-NP from analytical TIC measurements by Leco.

6.2.5 Constituent Leaching Potential

Loading rates calculated using the humidity cell results can be used to evaluate trends of elements to provide a qualitative indication of the leaching potential of these parameters. The loading rates can also be used to develop water and load balance input source terms to evaluate if constituent concentrations pose environmental risk when accounted for in the context of the proposed mine waste and water management strategies. The development of the source terms for use in the water and load balance are documented separately. Loadings are interpreted here to provide a qualitative interpretation of elemental leaching potential.

Nine mine rock humidity cells, one per zone, were initiated as part of the current study and were subsequently discontinued at different times once the objectives of the tests were achieved. One mine rock humidity cell sample (HC-10; Zone 6) and the blank QA/QC humidity cell test are ongoing. However, at the request of TCL, these tests have been temporarily paused after 130 and 140 weeks of testing, respectively, and are currently being preserved in cold storage in a nitrogen atmosphere to stop sulfide oxidation. Table 3 provides the test duration of the discontinued humidity cell tests.

Table 3. Humidity Cell Test Durations

Humidity Cell Number	Zone	Testing Duration (weeks)
HC 4	Zone 1	66
HC 5	Zone 1a	66
HC 6	Zone 2/3	106
HC 7	Zone 4	106
HC 8	Zone 5	66
HC 9	Zone 55	66
HC 11	Zone 7	66
HC 12	Zone 8	66
HC 13	Overburden	40

The historical dataset (Norecol Dames & Moore 1999) included five mine rock humidity cells composed of samples collected from test pits and drill holes. The sample depths were not provided in the historical dataset; however, a sample interval number was provided for some of the samples. Where it was possible to relate the sample interval number to the corresponding static test sample ID and stratigraphic zone from the historic drill hole logs, the historic humidity cells were considered as part of the current study. All other humidity cells were not interpreted. The following historical humidity cell test results from Norecol Dames & Moore (1999) were carried forward into the current study:

- Two humidity cells (HC-11 and HC-13) from Zone 1.
- One humidity cell for each of the following zones:
  - Zone 1a (HC-3);
  - Zone 2/3 (HC-5); and
  - Zone 4(HC-8).

Figure 12 provides a plot of the humidity cell pH and loadings for select parameters. Select parameters are defined as those that provide insight to acid generation potential (alkalinity, acidity and sulfate), were screened to be greater than 10 times the average crustal abundances (arsenic, phosphorus and selenium) or had increasing concentrations during the testing period (aluminum, cadmium, copper, iron, lead, nickel, strontium and zinc). The historical humidity cell results are presented in Figure 12 as dashed lines for comparison purposes.

With the exception of the Zone 2/3 and 5 humidity cells, all cells maintained alkaline pH values (Figure 12). The Zone 5 humidity cell has maintained a circumneutral pH near 7 and the Zone 2/3 pH decreased to a minimum of 2.2. during the testing period.

The Zone 2/3 humidity cell pH decreased to less than 4.5 after 18 weeks of testing and reached its minimum pH at week 47. The pH slightly increased after week 47, but maintained a pH less than 3 for the remainder of the testing period. As the pH decreased, there was an associated increase in several constituent loadings, including: acidity, sulfate, aluminum, cadmium, copper, iron, lead, nickel, strontium and zinc (Figure 12). The results suggest that if acidic drainage occurs from mine rock prior to placement of PAG rock in the Management Ponds, concentrations of these parameters will increase. After approximately 50 weeks of testing, several constituent loadings began to decrease and a decreasing trend in loadings was maintained until the end of the testing period, implying the mass inventory of these constituents is becoming depleted.

In all other cells, alkalinity loadings remained generally consistent during the testing period. Zone 5 had a slight initial decreasing trend in alkalinity but stabilized after approximately week 40.

Loadings of other constituents generally decreased following the initial flush of the cell in week 1 and maintained slight decreasing trend throughout the testing period (Figure 12). This generally occurs when the pH remains stable and the mass inventory is depleted through time. One exception was strontium in Zones 1a and 4. This constituent had an increasing trend these zones over the testing period.

The long-term steady state constituent concentrations were used to develop source terms, which were carried forward into a water and load balance to evaluate site facility and discharge water quality during operations and in post-operations. Details of the source term derivation and results of the water and load balance are documented in SRK (2021).

Consistent with 2018 humidity cell testing results, with the exception of the 2018 Zone 2/3 humidity cell test that is producing acidic drainage, the historical humidity cell tests maintained circumneutral to alkaline pH values throughout the 58-week testing period. Loadings of alkalinity, acidity, sulfate, nickel, strontium and zinc were similar to the loadings calculated from the 2018 humidity cell testing results. However, loadings of the following parameters were higher in the historical humidity cells: aluminum, arsenic, cadmium, copper, iron, lead, phosphorus and selenium. It is possible the loadings are higher in the historical humidity cell tests as a result of a smaller samples size (200 grams) being used in the test and the grain size of the sample being finer than <1/4”, resulting in additional flushing of the sample.

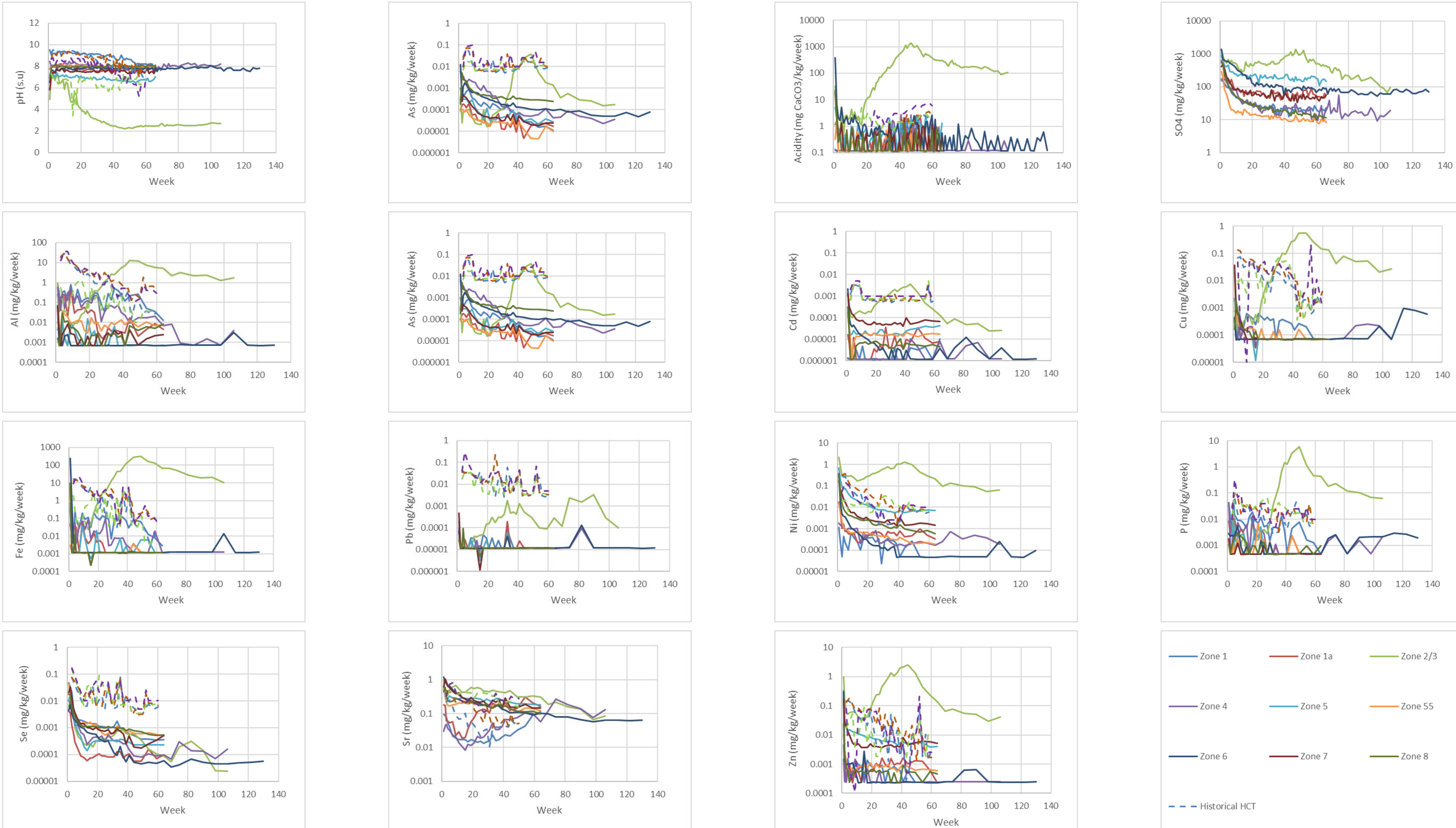

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Figure 12. Select Parameter Humidity Cell Loading Rates – Mine Rock Samples

6.2.6 Acid Generating Potential

The neutralization potential ratio (NPR), the ratio of the neutralization potential (NP) to the acid potential (AP) is used to classify mine waste materials as potentially acid generating (PAG), non-acid generating (NAG) or as having uncertain acid generating potential. The following sections provide the acid generating potential of the drill core samples.

6.2.6.1 Classification Criteria

Humidity cell test results can be used to calculate the carbonate molar ratio (CMR), which is the ratio of calcium and magnesium from carbonates to the sulphate production rate, expressed as follows:

$$\frac{(Ca+Mg)}{SO_4} \text{ mol/mol}$$

If it is determined that the calcium and magnesium loads in the humidity cell test are attributed to carbonate minerals, this ratio represents the site-specific NPR when the pH in the test is neutral. As discussed in Section 6.2.4.1, a strong positive correlation exists between NPXRD, following correction for iron carbonates, and modified-NP. In addition, a strong positive correlation exists between modified-NP and calcium plus magnesium (see Section 6.2.4.2). These lines of evidence provide confidence that the modified-NP is a measure of calcium and magnesium carbonate dissolution (i.e., the effective-NP). CMRs for the humidity cell tests were calculated based on the stable average non-acidic loading rates observed in humidity cell tests. Figure 13 provides a comparison of the CMR to the average sulfate release rate. This figure indicates there are very low CMRs at low sulfate production rates (e.g., Zone 1). This is indicative of cation exchange which is expected based on the presence of clay minerals illite-muscovite and kaolointe (Table 2) present in the samples. Figure 14 provides a plot of the CMR, accounting for cation exchange, versus the sulfate production rate. The CMRs in this figure indicate a site-specific NPR of 1.2 can be used to classify mine rock at the Tenas Project as PAG versus NAG. An NPR of 1.2 is therefore used as the classification criterion.

This classification criterion is specific to mine rock. An NPR of 2 was used to characterize all other materials (e.g., overburden, rejects, etc.) as NAG or PAG since insufficient kinetic data was available to confirm a lower NPR for these materials.

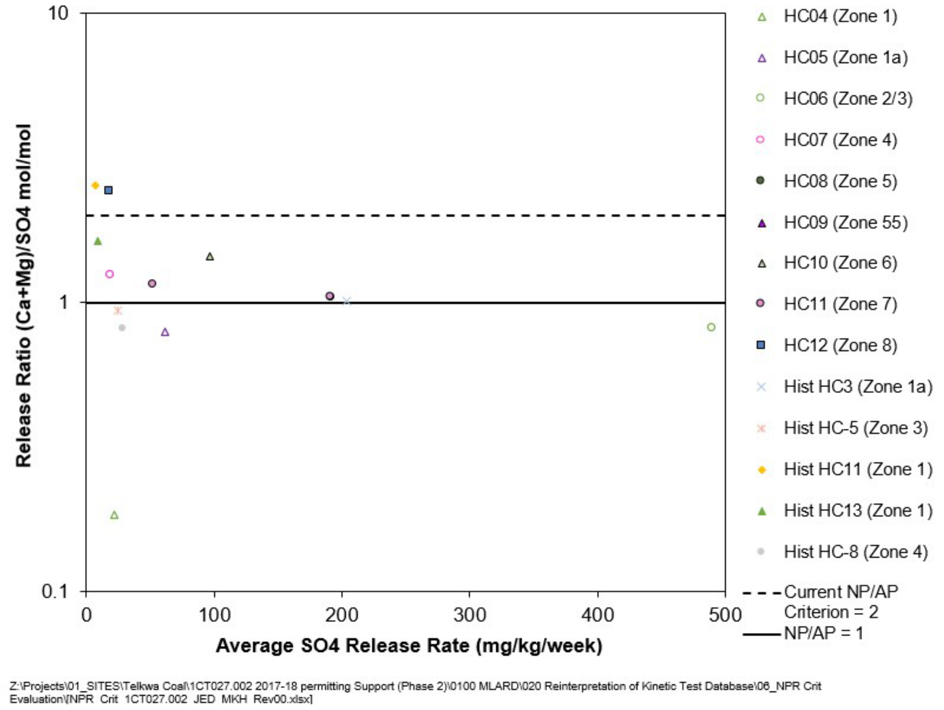

Figure 13. Carbonate Molar Ratios versus Sulfide Release Rates

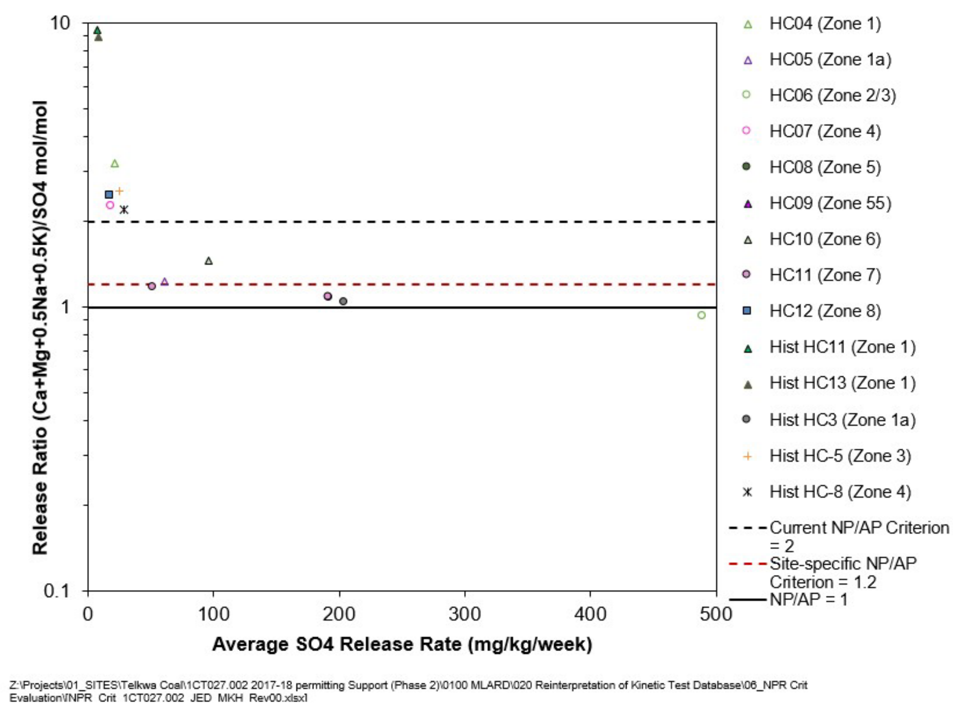

Figure 14: Carbonate Molar Ratios Accounting for Cation Exchange versus Sulfide Release Rates

It is standard convention to classify samples with an NPR less than 1 as PAG and samples between the PAG and NAG cut-offs (i.e., between 1 and 1.2 for this study) as having uncertain acid generating potential. Operationally, all rock having an NPR less than 1.2 will be managed as

PAG rock. Therefore, for simplicity, samples with an NPR less than 1.2 are characterized as PAG as part of this study.

6.2.6.2 Acid Generating Potential

Figure 15 provides a plot of the NPR versus acid potential (i.e., Sulfidex31.25) content. Historical samples, corrected using Equations 2 and 4, are presented as open symbols. All stratigraphic zones had PAG samples; however, a higher density of PAG samples occurs in Zones 1a, 2/3, 5, 6 and 7 (Figure 16). A higher density of NAG samples occurs in Zones 1, 4, 55 and 8 (Figure 17). The samples plotted in Figure 15 to Figure 17 cannot be weighted equally since sample lengths varied from a few centimetres to several metres (see Section 5.1.1). To evaluate the overall acid generating potential of stratigraphic zones, the modified-NP and AP were weighted to sample intercept lengths in each zone and summed to calculate a zonal average NPR. The weighted average NPRs for each zone are provided in Table 4.

As can be seen in Table 4, two (Zones 1a and 2/3) out of nine zones have average NPRs less than 1.2 and are classified as PAG, even though all zones, with the exception of Zone 1a, have a component of NAG rock (i.e., the NAG rock is included in the PAG estimates as part of the mine plan). Zones 1 and 8 are classified as NAG. Only the minimum NPR in zone 8 was PAG and the 5^{th} percentile NPRs were greater than 1.2. Zone 4 contains quantities of both PAG and NAG mine rock.

PAG rock in Zone 4 is generally limited to the western and northern areas of the pits (Appendix E). Samples from other areas in this pit were identified to be NAG. These zones were delineated in the mine plan when estimating quantities of PAG and NAG mine rock.

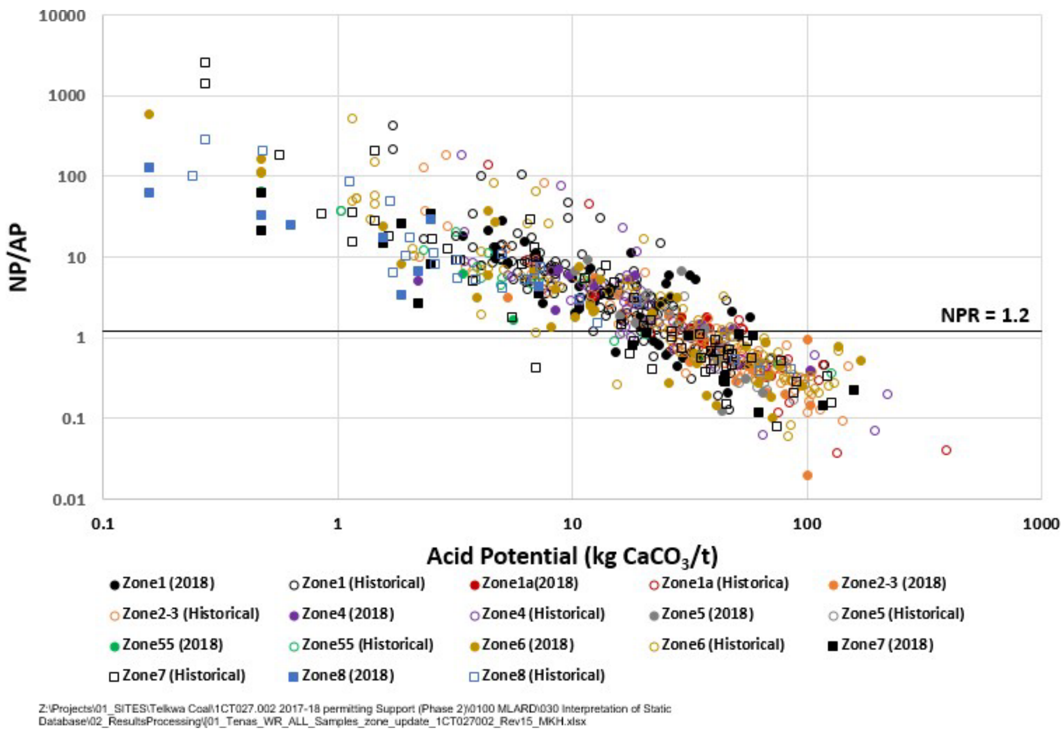

Figure 15: NPR versus Acid Potential

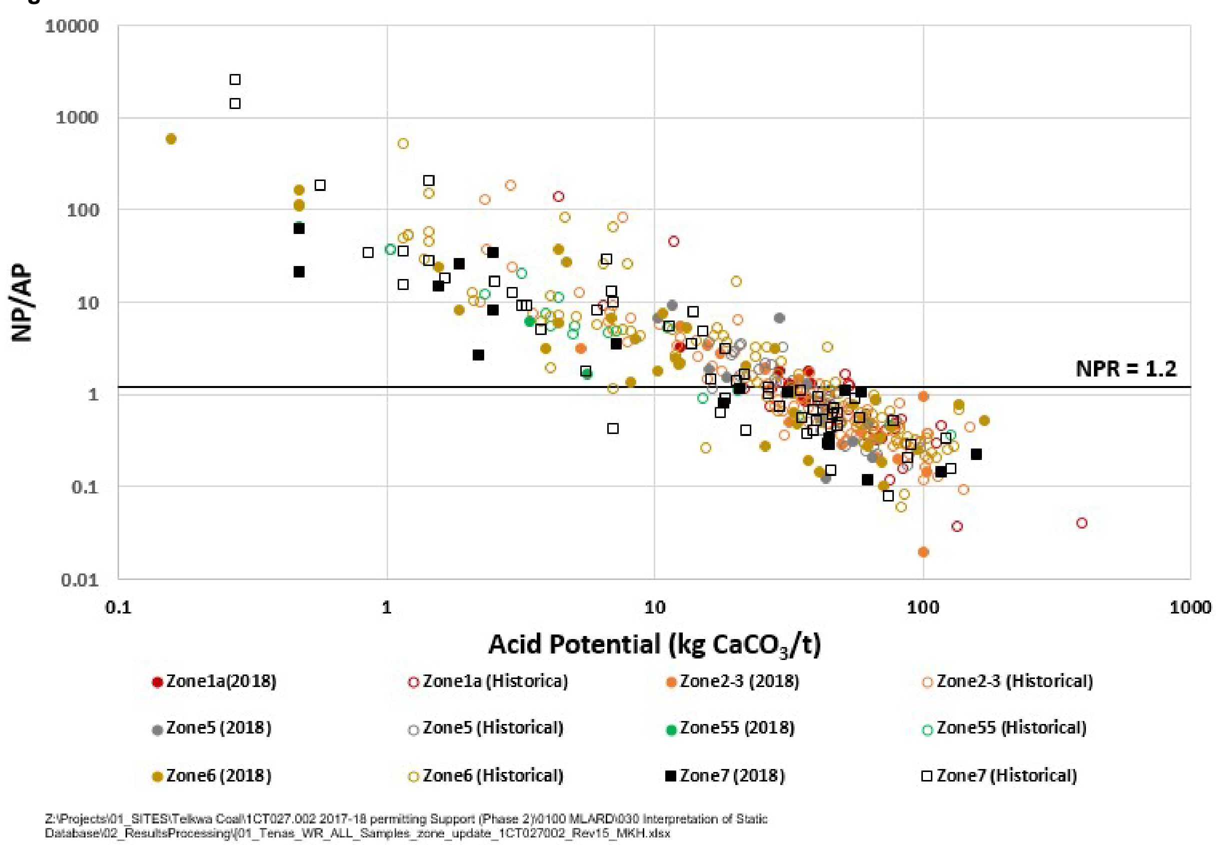

Figure 16: NPR versus Acid Potential – Zones 1a, 2/3, 5, 6 and 7

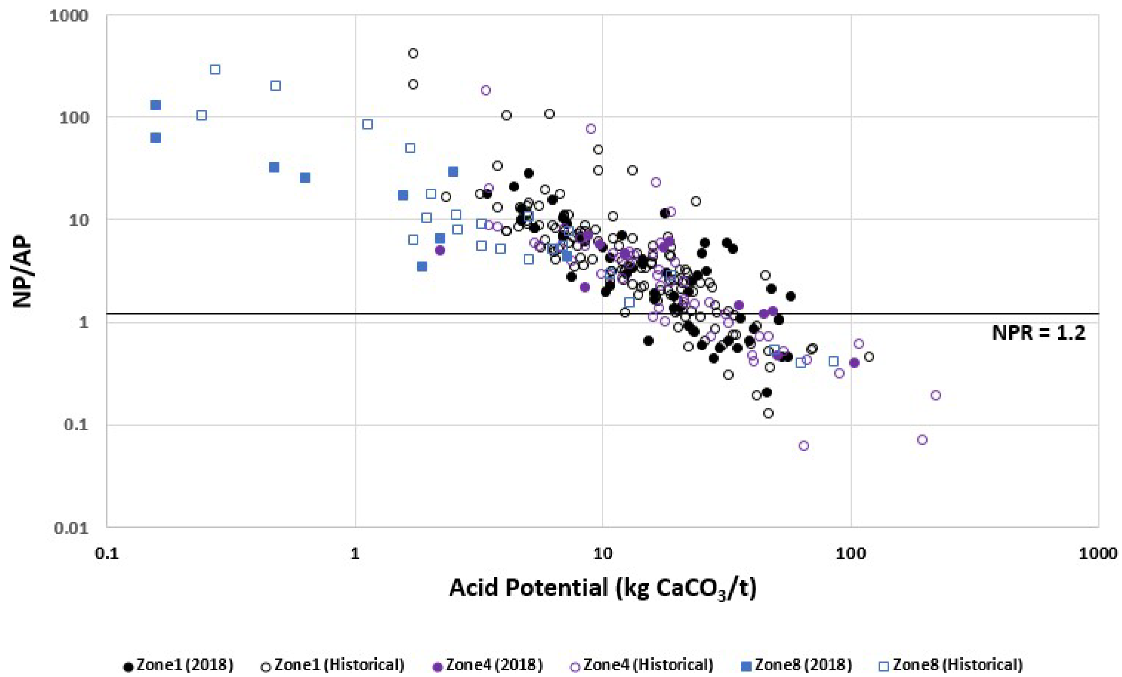

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Figure 17: NPR versus Acid Potential – Zones 1, 4, 55 and 8

Table 4: Weighted NPR by Stratigraphic Zone (shaded cells indicate an NPR≤1.2)

Zone	Minimum	P5	Average	P95	Max
1	1.7	2.6	3.2	6.6	8.8
1a	0.4	0.4	0.7	1.1	1.1
2/3	0.2	0.2	0.8	6.2	11
4	0.7	0.8	2.4	11	13
5	0.3	0.3	1.3	2.5	3.0
55	0.3	0.3	2.0	20	27
6	0.4	0.4	1.6	10	64
7	0.3	0.3	1.4	97	293
8	0.4	2.4	4.7	32	46

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6.2.7 Lag Times to the Onset to Acid Generation

A large volume of the mine rock to be mined at the Tenas Project is PAG (Section 6.2.6.2). As discussed in Section 3, PAG rock will be placed in Management Ponds and submerged to reduce the rate of oxidation of sulfides. This strategy requires PAG to be flooded prior to the onset of acid generating conditions. Therefore, the timing to the onset of acid generation is key to the proposed PAG management strategy. Another consideration to the placement of the PAG rock in the

Management Ponds is flushing of oxidation products prior to the onset of acid generating conditions. The timing of exposure of PAG rock to oxygen is directly proportional to the oxidative mass that will be flushed during placement, which can also degrade the water quality in the Management Ponds. Flushing of soluble oxidation products in the Management Ponds is addressed in the site water and load balance provided in SRK (2021).

The time or delay to onset of ARD (t_{onset}) depends on both the site-specific availability of reactive neutralization potential (NP*) and the rate at which reactive neutralization potential (R_{NP*}) is depleted. For PAG samples, the onset of acid generating conditions can be calculated using the following equation:

$$t_{onset} = NP^*/R_{NP^*} \quad \text{(EQ6)}$$

The rate at which carbonate is depleted is a function of the acid generation (sulfide oxidation) rate (R_S). In molar terms, the rate of carbonate depletion to sulfide depletion is the same as the NP/AP criterion for PAG rock ($\{NP^*/AP^*\}_{crit}$).

$$R_{NP^*}/R_S = \{NP^*/AP^*\}_{crit} \quad \text{(EQ7)}$$

Assuming a direct linear relationship between oxidation rate and sulfur content andconservatively a zero-order chemical reaction, then

$$R_S = k.AP^*_0 \quad \text{(EQ8)}$$

where k is the slope of the line and the rate constant; and AP_0 is the initial sulfide content. A non-zero intercept is implied because if no sulfide is present then the rate of sulfide oxidation is zero.

When equations 6, 7 and 8 are combined, the delay to onset is:

$$t_{onset} = \frac{\left(NP^*/AP^*\right)_0}{k.\left(NP^*/AP^*\right)_{crit}} \quad \text{(EQ 9)}$$

Therefore, the delay to onset is function of NP*/AP* of the sample, the overall rate of oxidation of sulphide (k) and the effectiveness of neutralization ($\{NP^*/AP^*\}_{crit}$). Longer delays are indicated for rock higher NP*/AP* assuming constant values for the two other factors.

The NP^*/AP^*_{crit} was assigned a value of 1.2 (see Section 6.2.6.1) and the overall oxidation of sulfide (k) (Figure 18) was estimated based on steady-state oxidation rates in the 2018 and historic humidity cell test results, and the static test sulfide concentrations for these samples. One historic humidity cell sample (Zone 4 HC-8) was excluded from the analysis since this sample had a sulfide oxidation rate that was atypical for a sample with a high sulfide concentration, which did not fit the trend of the other samples. The Zone 2/3 sample was also eliminated because the loading rate from this cell was representative of acidic conditions.

The onset to acid generation for PAG mine rock was estimated using Equation 9 and the range of weighted NPRs for each zone (Table 5). Based on the geographical distribution of PAG and NAG rock in Zone 4 (see Section 6.2.6.2), the PAG component of this zone is split out using an NPR of 1.2 to avoid bias (i.e., underestimation) in the depletion calculations in PAG areas of Zone

The evaluation indicates that for the average bulk properties of PAG rock, the lag time is approximately 7 years based on laboratory conditions. A minimum lag time of 0.6 years is estimated for PAG rock areas with minimum NPRs of 0.1.

It is important to note that lag times are estimated based on oxidation rates measured under laboratory conditions. The humidity cell testing is designed to accelerate weathering under controlled conditions. There are several factors that can reduce the oxidation rate under ambient conditions, including temperature differences and oxygen ingress into freshly blasted mine rock.

Therefore, the predicted lag times are considered to be conservative and overestimate the lag times that would be expected under field conditions.

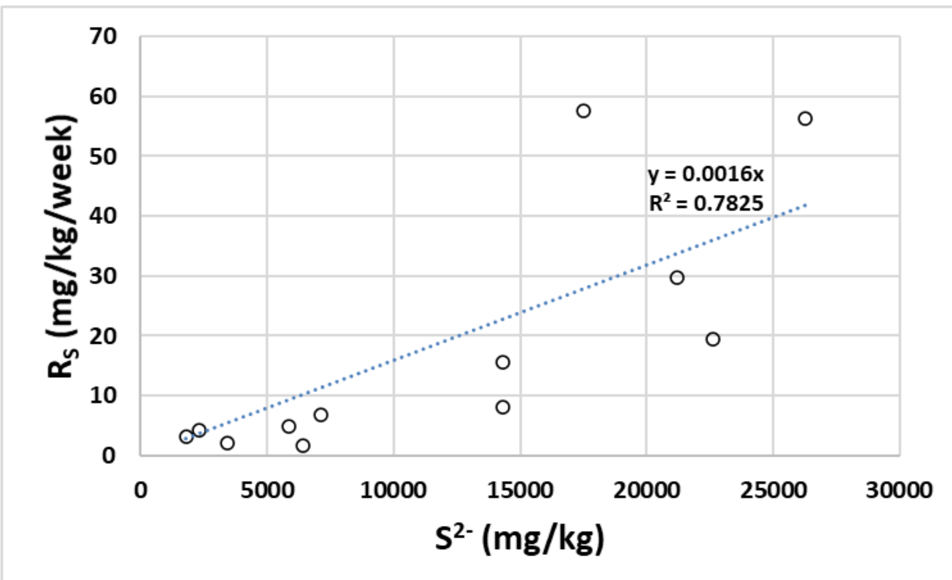

Figure 18: Sulfide Oxidation Rate vs. Sulfide Concentration

Table 5: Estimated Acid Generation Lag Times under Laboratory Conditions

Zone	Minimum	P5	Average	P95	Max
1	---	---	---	---	---
1a	4	4	8	12	12
2/3	2	2	8	---	---
4 (PAG)	0.6	2	7	9	9
4 (non-PAG)	---	---	---	---	---
5	3	4	---	---	---
55	3	4	---	---	---
6	4	5	---	---	---
7	3	3	---	---	---
8	4	---	---	---	---

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Note – lag time presented in years

6.3 Overburden Samples

Overburden samples were collected to evaluate the ML/ARD potential of these materials. Different size fractions were evaluated to determine if carbonate and sulfur minerals fractionate to inform blending studies should TCL decide to consider this management strategy in the future.

The following sections present the geochemical testing results for overburden samples. Detailed ABA and elemental content results are provided in Appendices F and G, respectively.

6.3.1 Grain Size

The mass of each mine rock size fraction following sieving is presented in Table 6. The + 2 mm–25 mm fraction represents the largest size fraction ranging from 74% to 83% of the samples. The -2 mm fraction represents the second largest size fraction ranging from 16% to 26% of the total sample. Only one sample (T18-10-S-BLK-02 9.0-9.5m) reported grains in the +25 mm fraction; however, this was a minor fraction (1.5%) of the entire sample (Table 6).

Table 6. Overburden Sample Size Fraction Masses and Percentages

Sample ID	+25mm (kg)	-25mm+2mm (kg)	-2mm (kg)	+25mm (%)	-25mm+2mm (%)	-2mm (%)
T18-03-S-SPT4 6.0-6.45m	0	0.661	0.137	0%	83%	17%
T18-10-S-SPT2 3.0-3.45m	0	0.569	0.169	0%	77%	23%
T18-13-S-SPT2 4.5-4.95m	0	0.639	0.222	0%	74%	26%
T18-13-S-SPT5 12.0-12.45m	0	0.521	0.185	0%	74%	26%
T18-10-S-BLK-02 9.0-9.5m	0.12	6.445	1.249	1.5%	82%	16%
T18-02-S SPT-14 6.0-6.45m	0	0.575	0.176	0%	77%	23%

6.3.2 Sulfide and Carbonate Mineral Fractionation

The distribution of sulfide sulfur and carbonate content by size fraction for the overburden samples are presented in Figure 19 and Figure 20, respectively. Only the -2 mm and +2 mm–25 mm fractions are presented since only one sample result was available from the +25 mm fraction.

A larger range in sulfide sulfur concentrations is seen in the +2 mm–25 mm fraction in comparison to the -2 mm fraction (Figure 19). The maximum concentration (0.19%) in the in

+2 mm–25 mm fraction is higher than the maximum in the -2 mm fraction (0.10) but the minimum, P05, mean, median concentrations are similar between these two size fractions (Figure 19) indicating that sulfide does not preferentially fractionate to one size fraction. The sulfide concentration (0.02%) in the +25 mm fraction is equal to the minimum in the other two fractions.

Similar to the sulfide concentrations, a larger TIC range of concentrations is seen in the +2 mm–25 mm fraction in comparison to the -2 mm fraction (Figure 20). The median concentrations are similar between the two populations, and it therefore cannot be concluded confidently that TIC fractionates in the overburden samples. The +25 mm sample had a TIC concentration of the 0.21%, which is comparable to the 25th percentile value in the +2 mm–25 mm fraction.

The NPR in the +2 mm–25 mm and the -2 mm was similar (Figure 21). The NPR ranged from 5.5 to 89 in the +2 mm–25 mm fraction and from 18 to 86 in the -2 mm fraction. All samples had NPRs greater than two and are therefore classified as NAG. The NPR of the sample from the +25 mm was 128 and is therefore, also classified as NAG.

6.3.3 Elemental Content

To identify parameters that were elevated in the solid-phase and may have to the potential to leach, elemental concentrations were compared to the average crustal abundances (Smith and Huyck (1999). The following elements were screened to have concentrations greater than 10 times the average crustal abundances and were screened to be elevated in the solid-phase (Appendix G):

- +2 mm–25 mm fraction:
  - 67% (4 of 6 samples) of arsenic measurements;
  - 17% (1 of 6 samples) of cadmium measurements; and
  - 33% (2 of 6 samples) of tellurium measurements.
- -2 mm fraction
  - 17% (1 of 6 samples) of arsenic and gold measurements; and,
  - 83% (5 of 6 samples) of tellurium measurements.

- There were no elevated concentrations in the +25 mm fraction

Detailed comparisons are provided in Appendix G. A higher frequency of elevated parameters was observed in the +2–25 mm fraction in comparison to the -2 mm and +25 mm fractions.

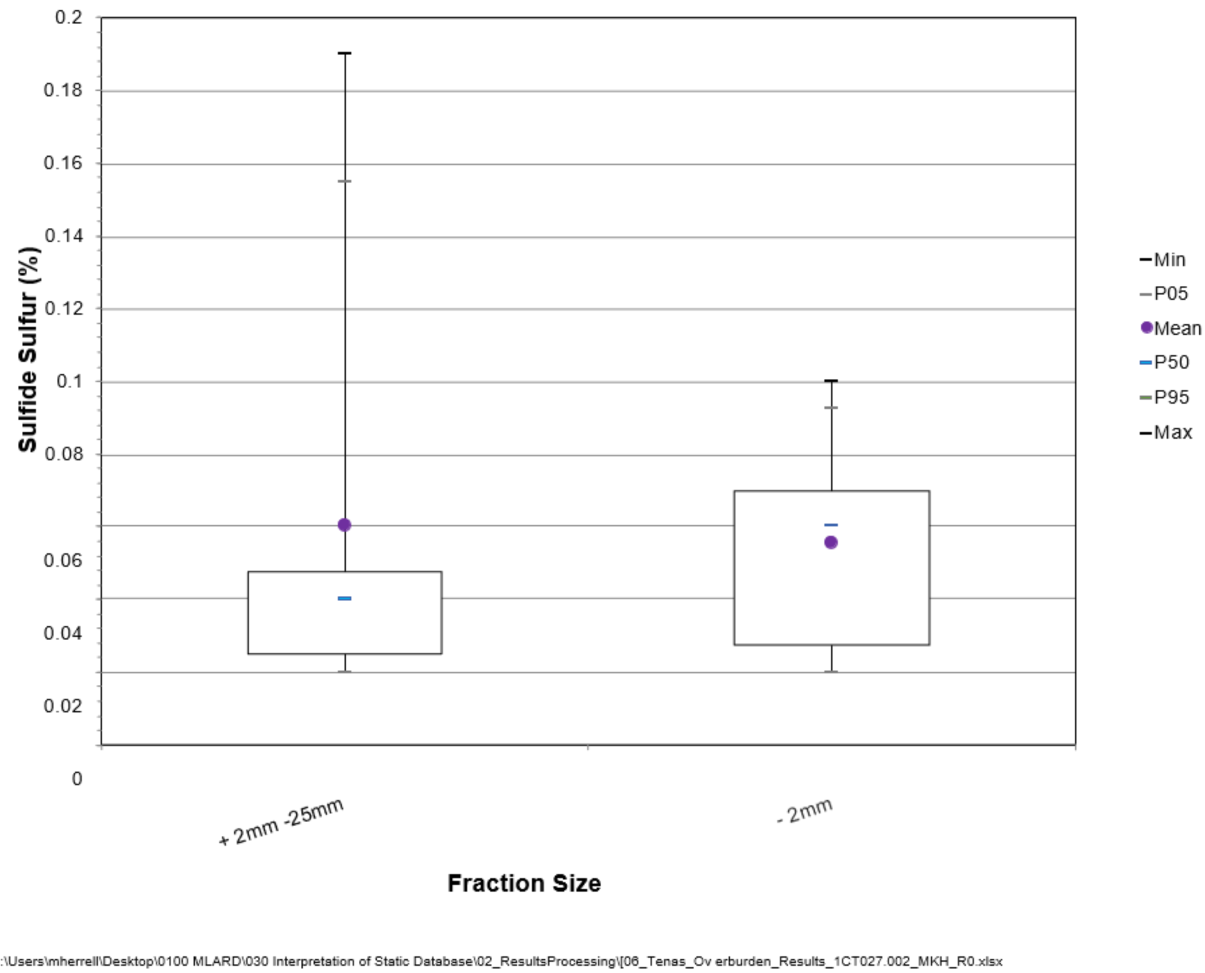

Figure 19: Sulphide Sulfur Size Fraction Box and Whisker Plot

Note: boxes represent the 25th and 75th percentiles. Whiskers provided the statistical spread on extrema and 5th and 95th percentiles

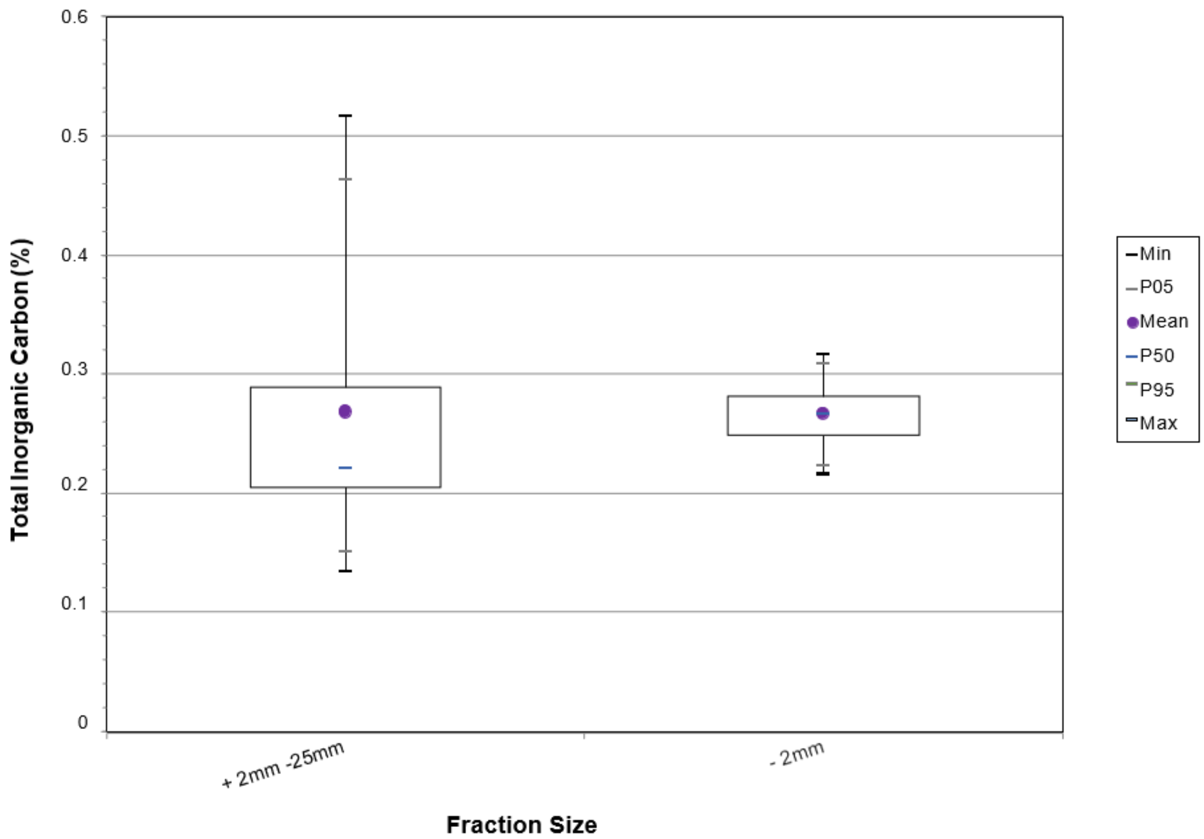

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Figure 20: Total Inorganic Carbon Fraction Box and Whisker Plot

Note: boxes represent the 25th and 75th percentiles. Whiskers provided the statistical spread on extrema and 5th and 95th percentiles.

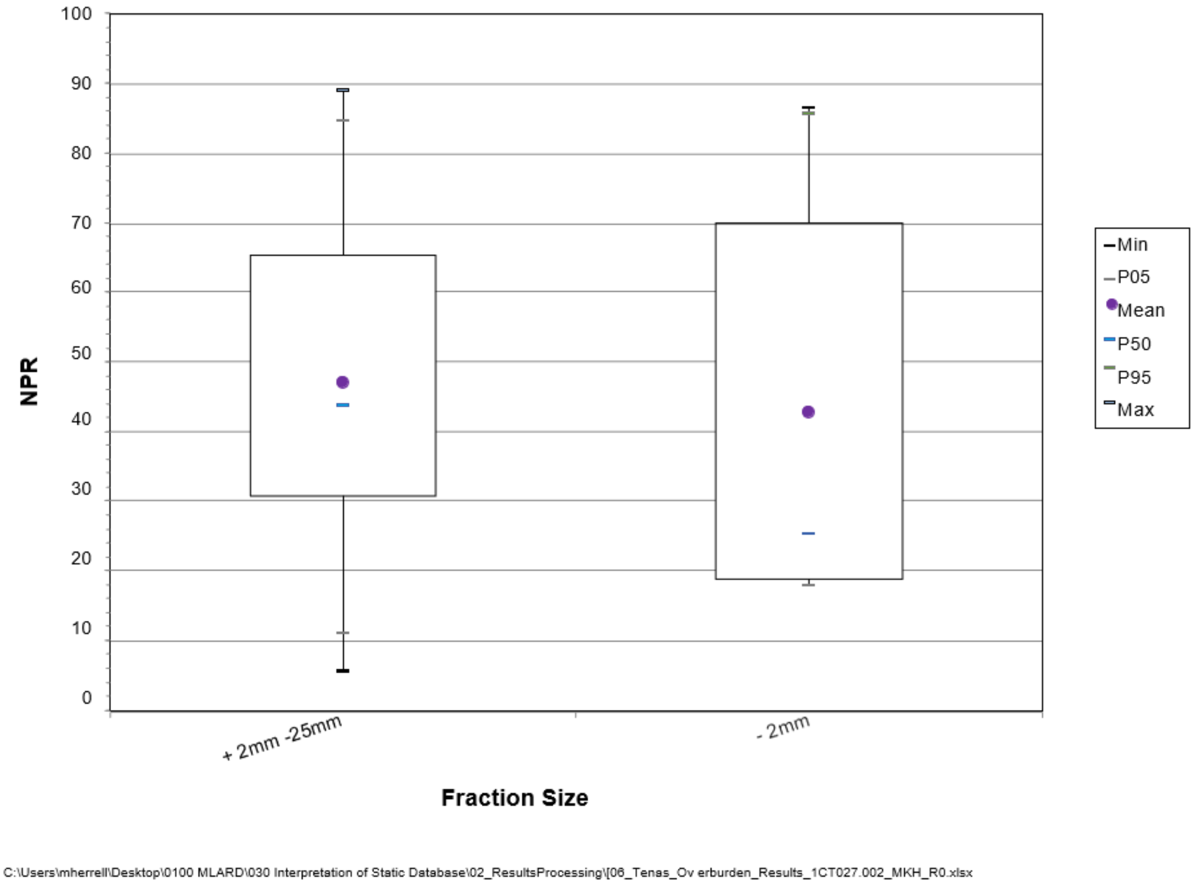

Figure 21: NPR Fraction Box and Whisker Plot

Note: boxes represent the 25th and 75th percentiles. Whiskers provided the statistical spread on extrema and 5th and 95th percentiles.

6.4 Other Sample Types

6.4.1 Processed Rock

TCL provided two samples of fine and coarse processed rock to Maxxam Analytics in 2018. Due to limited sample masses, the fine and coarse reject samples were combined into bulk fine and bulk coarse samples for humidity cell testing. Acid base accounting and elemental analyses were completed on the individual samples prior to the samples being combined. In 2019, TCL produced two additional fine and one coarse coal reject samples to confirm the findings of the 2018 samples. Two humidity cell tests (one of each coarse and fine processed rock) were initiated in 2018. The 2018 fine reject humidity cell test results indicated this sample was NAG, which is not consistent with the historical dataset (Norecol, Dames and Moore 1999) and a subsequent fine reject humidity sample was initiated in 2019.

The following sections present the coal reject geochemical test results. Detailed ABA and elemental analysis results are provided in Appendices H and I, respectively.

6.4.1.1 Mineralogy

One coarse reject sample was submitted for mineralogy by Rietveld XRD. Results of this analysis are provided in Table 7. The majority of the coarse processed rock were present as amorphous minerals. The majority of the crystalline phases were kaolinite and quartz. Sulfur is present in the sample as pyrite and iron carbonates ankerite and siderite were also detected. This implies that a component of the NP in the processed rock will not provide net neutralizing potential.

Table 7. Coarse Processed Rock XRD Results

Mineral	Relative %
Kaolinite	19.5
Quartz	10.8
Ankerite	2.3
Siderite	1.2
Pyrite	1.7
Amorphous	64.5

6.4.1.2 Acid Base Accounting

A summary of coal reject acid base accounting results is provided in Table 8. Sulfide concentrations in the coarse processed rock ranged from2.8 to 4.1% and from 1.9 to 3.9% in the fine processed rock. Nearly all of the total sulfur was present as sulfide, which calculated using EQ1 ranged from 1.8 to 3.4% in the fine processed rock and from 3.0 to 3.7 in the coarse processed rock. One coarse reject sample (UI3971) sulfide concentration (3.0%) was greater than the total sulfur concentration (2.8%), perhaps as a result of some organic sulfur being lost on ignition.

NP was higher in the fine processed rock (61 to 192 $CaCO_3$/t) in comparison to the coarse fraction (36 to 111 kg $CaCO_3$/t). With the exception of one coarse reject sample (UI3970), carbonate-NP was similar to the modified-NP indicating, that for most samples, the modified-NP provides a reasonable estimate of the effective-NP of the samples. The carbonate-NP in samples WT7431 and WP0671 was greater than the modified-NP indicating the presence of siderite in the sample. This was confirmed by mineralogy in the coarse processed rock (see Section 6.4.1.1) In addition, the carbonate-NP in sample UI3970 (56 kg $CaCO_3$/t) was approximately half of the modified-NP value of 111 kg $CaCO_3$/t.

Both coarse reject samples and all but one fine reject samples (UI3972) had NPR values less than two and are classified as PAG. Fine reject sample UI3972 had an NPR of 3.4 and is classified as NAG. Previous testing of reject samples (Norecol Dames and Moore 1999) indicated all reject samples are PAG and confirmed the classification of the majority of the reject samples as PAG. Even though one fine reject sample is NAG, TCL plans to manage all reject materials as PAG.

Table 8: Summary of Processed Rock Acid Base Accounting Results

Sample ID	Maxxam Sample ID	Description	Paste pH (s.u.)	Carbon Species (w.t.%)			Sulphur Species (w.t.%)				Potentials (kg $CaCO_3$/tonne)			Neutralization Potential Ratios	
				Total-C	Total Inorganic Carbon	CO_2	Total-S	Sulphate	S_{ICP}	Sulphide (S_{ICP} - SO_4)	AP (Sulphide)	CO_3-NP	Modified Sobek-NP	CO_3-NPR	Modified Sobek-NPR (Sulphide)
Fine Fraction															
183104	UI3972	Fine Processed Rock	7.8	25.9	2.3	8.6	1.9	0.02	1.8	1.8	57	196	192	3.4	3.4
182962	UI3973	Fine Processed Rock	7.6	16.0	1.8	6.7	2.7	0.02	2.7	2.7	84	151	157	1.8	1.9
TELKWA TAILINGS COMPOSITE	WT7431	Fine Processed Rock	7.6	21.6	2.3	8.6	3.9	0.07	3.5	3.4	109	194	158	1.8	1.4
TAILINGS	WP0672	Fine Processed Rock	6.2	43.2	0.8	3.1	3.0	0.05	3.1	3.0	95	71	61	0.7	0.6
Coarse Fraction															
183104	UI3970	Coarse Processed Rock	6.2	34.5	0.7	2.5	3.8	0.05	3.71	3.7	116	56	111	0.5	1.0
182962	UI3971	Coarse Processed Rock	6.8	33	0.4	1.4	2.8	0.03	3.1	3.0	96	32	36	0.3	0.4
JIG CCR	WP0671	Coarse Processed Rock	3.7	47	0.5	1.9	4.1	0.16	3.8	3.6	119	43	30	0.4	0.3

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6.4.1.3 Elemental Content

The seven tailings samples were compared to the average crustal abundances (Smith and Huyck (1999) to identify parameters that were elevated in the solid-phase. The following elements were screened to have concentrations greater than 10 times the average crustal abundances (Appendix I): sulfur and tellurium in all reject samples and arsenic and selenium in six of the seven samples. Coarse coal reject sample WP0671 was not elevated in arsenic and selenium.

6.4.1.4 Constituent Leaching Potential

Loading rates were calculated using the three humidity cell results to evaluate trends of elements to provide a qualitative indication of the leaching potential of these parameters. Figure 22 provides a plot of the humidity cell pH and loadings for the same select parameters identified for mine rock (Section 6.2.5). No new parameters were screened to be greater than the average crustal abundances in the coal reject samples an no additional constituents were included in the select parameter list.

The coal reject sample was tested for 140 weeks before being terminated. Although this sample became acidic and constituent concentrations are increasing, TCL plans to manage all processed rock as PAG and place them in the management pond before they become acidic. Therefore, the objective of this sample (i.e., to evaluate the lag time to the onset of acid generation) has been achieved. The 2018 and 2019 fine reject samples were tested for 74 and 55 weeks, respectively.

The pH of the coarse reject humidity cell sample remained circumneutral until a steep decline in pH began at week 68 in the testing period. The pH rapidly decreased to a pH of 4 and then continued to decrease at a slower rate. (Figure 22). A corresponding increase in several constituent loadings occurred as the pH decreased in the coarse coal reject sample (Figure 22).

The pH in the fine reject humidity cell samples remained alkaline for the duration of the testing period and constituent loadings were generally stable following the initial flush of the sample.

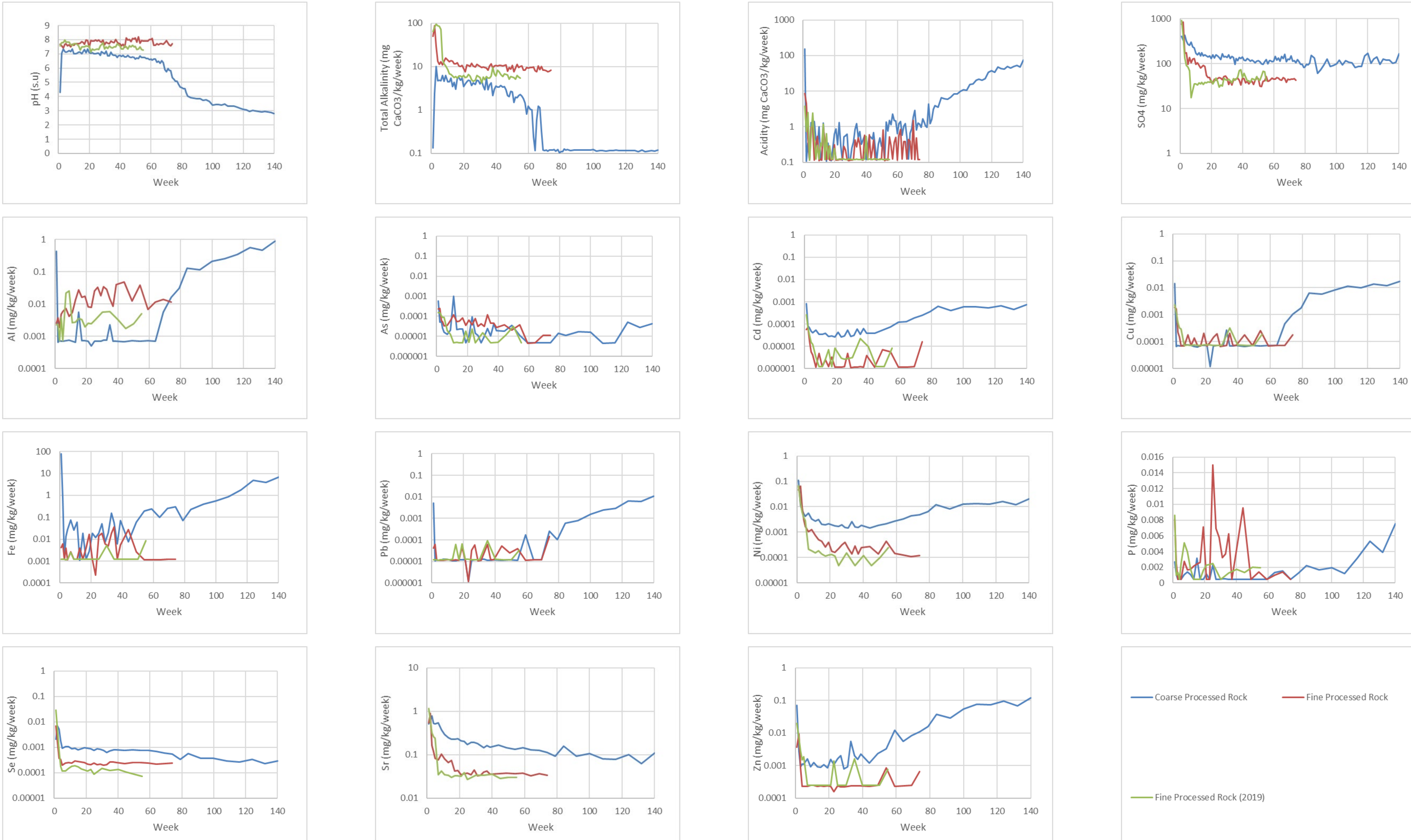

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Figure 22: Select Parameter Humidity Cell Loading Rates – Processed Rock

6.4.1.5 Lag Times to the Onset of Acid Generation

Processed rock will be placed in the Management Ponds with mine rock to limit oxidation of these materials. A key aspect of the mine plan is to have the processed rock submerged in the Management Ponds prior to the onset of acid generation. To test the efficacy of this management strategy, the humidity cell test results were used to estimate the timing to the onset of acid generation. The coarse coal reject sample became acidic after approximately 68 weeks (i.e., 1.3 years) of testing. This represents a minimum timeframe to the onset of acid generation of these materials because the test was conducted under laboratory conditions. Under ambient conditions, lag times will be longer since oxidation rates will be lower under field temperature.

The fine reject samples did not become acid generating during the testing period. Lag times to acidic conditions were calculated based on sulfide and NP depletion rates using sulfate, calcium and magnesium production rates in the humidity cell tests of these sample. The sulfide in the 2018 fine processed rock sample is predicted to be consumed prior to the NP in this sample, indicating this sample is NAG. Depletion calculations completed on the 2019 fine reject sample indicate this sample is PAG. However, the carbonate-NP is estimated to be depleted after 20 years under laboratory conditions, indicating there is a long lag time prior to fine processed rock becoming acid generating.

Although one sample of fine processed rock was classified as NAG based on the static and kinetic test results, TCL plans to manage all reject samples as PAG. Based on the timing to onset of acid generation of the coarse coal reject sample, it is recommended that the processed rock be placed in the Management Ponds within 1.3 years of being produced.

6.4.2 Construction Materials

TCL provided the following samples that will be used in construction of the haul road and the rail load out area:

- One sample representative of rock to be used to construct the haul road;
- Five test pit samples collected along the proposed alignment of the haul road; and
- Nine samples from four test pits in the area of the proposed Rail Infrastructure.

Due to similarities in their geochemical properties, as will be discussed below, these samples are collectively referred to here as construction materials. The following section provides a summary of the construction material results. Detailed acid base accounting and elemental results are provided in Appendices F and G, respectively.

6.4.2.1 Construction Material Results

Table 9 provides a summary of the construction material acid base accounting results. With the exception of one Rail Infrastructure sample (TP18-20 0.7-0.8), all of the samples had alkaline paste pH results. Total sulfur and sulfide were low in all of the samples. Sulfide was only detected in four out of 15 of the samples (Table 9) and was below detection in the remaining 11 samples.

Modified-NP exceeded carbonate-NP in all of the samples (Table 9). The NP far exceed the AP in all samples resulting in NPRs much greater than two (Table 9). Therefore, all of the construction materials are characterized as NAG.

Compared to 10 times the average crustal abundances (Smith and Huyck 1999), tellurium was observed to be enriched in the solid phase in 60% (9 of 15 samples) of the measurements.

Table 9: Summary of Construction Material Acid Base Accounting Results

Sample ID	Maxxam Sample ID	Sample Depth (m)			Paste pH (s.u.)	Carbon Species (w.t.%)			Sulphur Species (w.t.%)				Potentials (kg $CaCO_3$/tonne)			Neutralization Potential Ratios	
		From	To	Thickness		Total-C	Total Inorganic Carbon	CO_2	Total-S	Sulphate	S_{ICP}	Sulphide (S_{ICP} - SO_4)	AP (Sulphide)	CO_3-NP	Modified Sobek-NP	CO_3-NPR	Modified Sobek-NPR (Sulphide)
Quarry Sample																	
ROCK ROAD CONSTRUCTION	UU1350	---	---	---	8.8	0.2	0.1	0.36	<0.02	<0.01	<0.02	0.01	0	8	15	52	93
ROCK MATERIAL FOR ROADS	ZB0881	---	---	---	8.7	0.8	0.6	2.3	<0.02	<0.01	<0.02	0.01	0	53	45	339	289
Road Samples																	
T18-29	VH0513	---	---	---	8.1	1.0	0.35	1.3	0.03	<0.01	0.02	0.01	0	30	40	189	257
T18-32	VH0514	---	---	---	7.9	1.0	0.3	1.2	0.04	0.01	0.04	0.01	0	26	39	84	124
T18-35	VH0515	---	---	---	7.5	0.7	0.01	<0.08	<0.02	<0.01	<0.02	0.01	0	1	8	5.8	49
T18-36	VH0516	---	---	---	7.7	0.4	0.01	<0.08	0.02	<0.01	0.02	0.01	0	1	6	5.8	38
T18-39	VH0517	---	---	---	7.6	0.2	0.01	<0.08	0.04	<0.01	0.03	0.01	0	1	7	2.9	23
Rail Loop Samples																	
TP18-23, 1.3-1.4	VH0584	1.3	1.4	0.10	8.3	0.1	0.011	<0.08	<0.02	<0.01	<0.02	0.0	0	1	9	5.8	56
TP18-23, 2.6-2.7	VH0585	2.6	2.7	0.10	8.3	0.1	0.011	<0.08	<0.02	<0.01	<0.02	0.0	0	1	6	5.8	40
TP18-24 1.9-2.1	VH0586	1.9	2.1	0.20	8.5	0.1	0.011	<0.08	<0.02	<0.01	<0.02	0.0	0	1	7	5.8	45
TP18-24 1-1.2	VH0587	1	1.2	0.20	8.5	0.1	0.011	<0.08	<0.02	<0.01	<0.02	0.0	0	1	7	5.8	43
T18-25, 2.1-2.3	VH0588	2.1	2.3	0.20	8.5	0.1	0.011	<0.08	<0.02	<0.01	<0.02	0.0	0	1	9	5.8	57
T18-25 3.2-3.4	VH0589	3.2	3.4	0.20	8.7	0.1	0.011	<0.08	0.1	<0.01	<0.02	0.01	0	1	8	5.8	48
TP18-20 0.3-0.4	VH0590	0.3	0.4	0.10	7.1	0.4	0.011	<0.08	<0.02	<0.01	<0.02	0.01	0.2	1	7	6	46
TP18-20 0.7-0.8	VH0591	0.7	0.8	0.10	6.9	0.4	0.011	<0.08	<0.02	<0.01	<0.02	0.01	0	1	6	5.8	40
TP18-20 1.8-2.0	VH0592	1.8	2	0.20	8.3	0.1	0.011	<0.08	<0.02	<0.01	<0.02	0.01	0	1	5	5.8	33

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7 Summary

The following sections provide a summary of the supplemental geochemical test results for each sample type.

7.1 PAG Classification Criteria

Geochemical testing of drill core samples indicate there is a strong correlation between NP_{XRD}, following correction for iron carbonates, and modified-NP. In addition, a strong positive correlation exists between modified-NP and calcium plus magnesium. Therefore, the calcium and magnesium loads in the humidity cell test are attributed to carbonate dissolution under neutral conditions and the CMR was used to develop a site-specific NPR of 1.2 to classify mine rock as PAG or NAG. This NPR is specific to mine rock. An NPR of 2 was used to classify all other material types (e.g., processed rock) as PAG or NAG.

7.2 Drill Core

7.2.1 Sulfur Content

Geochemical testing of drill core samples indicate that the majority of the total sulfur is present as sulfide and a strong positive correlation exists between these two parameters. Therefore, the regression equation (Equation 2) can be used to calibrate the historical data set to sulfide concentrations to more accurately estimate acid potential. Additionally, this relationship can be used operationally.

7.2.2 Neutralization Potential

The mineralogical results indicate that iron carbonates are abundant in the drill core samples. Correction of the TIC for iron carbonates results in a strong positive correlation to the modified-NP and additionally, calcium plus magnesium is also strongly positively correlated to modified-NP indicating that the modified-NP provides a reasonable estimate of the effective-NP. The mineralogical results can be used to estimate the effective-NP from analytical TIC measurements by Leco.

A strong positive correlation exists between Sobek-NP and modified-NP and the regression equation (Equation 4) from correlating these parameters can be used to calculate modified-NP from the historical dataset.

7.2.3 Acid Generating Potential

Consistent with the historical geochemical characterization (Norecol, Dames and Moore 1999) the supplemental geochemical testing results indicate that acid generating potential is controlled by stratigraphic units. With the exception of zone 1, all units contain some component of PAG rock; however, when the bulk properties of each stratigraphic unit are considered, the following zones were identified to be PAG and NAG based on the average NPR in each zone:

- **NAG** – Zones 1, 4, 5, 55, 6, 7 and 8.

- **PAG** – Zones 1a and 2/3.

Based on the NPR criterion of 1.2, Zone 1 was the only zone with no PAG rock. During operations zone 1 can be treated operationally as NAG and zones 1a and 2/3 as PAG. The PAG potential of all other units will need to be determined through operational geochemical testing.

7.2.4 Leaching Potential

The following elements were screened to be elevated in the solid-phase:

- 20% of arsenic analyses;
- 1% of phosphorus and selenium analyses; and
- 54% of sulfur analyses.

The concentrations of these parameters will be evaluated in the water and load balance that is currently being developed.

7.2.5 Lag Time to Acid Generation

The sulfide oxidation rates in the humidity cell samples were used to estimate the lag time acid generation. The evaluation indicated that for the average bulk properties of PAG rock, the lag time varies from approximately 6.5 to 8.4 years under laboratory. A minimum lag time under laboratory conditions of 0.6 years is estimated for PAG rock units with minimum NPR of 0.1.

7.3 Overburden

Overburden samples were collected to evaluate the geochemical properties of these materials. Based on six samples collected from four test pits, a larger range was observed in sulfide and NP in the +2 mm–25 mm fraction in comparison to the -2 mm fraction. Based on the similarities to central statistics of the two samples sets, it cannot be concluded with confidence that sulfide and NP preferentially fractionate to one grain size. All of the samples and size fractions had NPRs greater than two and are characterized as NAG.

A higher frequency of elevated parameters was observed in the +2–25 mm fraction in comparison to the -2 mm and +25 mm fractions. The following elements were screened to have concentrations greater than 10 times the average crustal abundances and were screened to be elevated in the solid-phase:

- +2 mm–25 mm fraction:
  - 67% (4 of 6 samples) of arsenic measurements; and,
  - 17% (1 of 6 samples) of bismuth and cadmium measurements.
- -2 mm fraction
  - 17% (1 of 6 samples) of arsenic and gold measurements; and,

  - 83% (5 of 6 samples) of tellurium measurements
- There were no elevated concentrations in the +25 mm fraction.

7.4 Processed Rock

7.4.1 Acid Generating Potential

Acid base accounting results indicate that six out of the seven reject samples are PAG using an NPR criterion of 2.

Depletion calculations on the humidity cell tests indicate that NP will be consumed prior to sulfide in the coarse reject sample and the 2019 fine reject sample. Sulfide will be consumed prior to NP in the 2018 fine reject sample. These results indicate the coarse and 2019 reject samples are PAG and the 2018 fine reject sample is NAG. The historical results (Norecol Dames and Moore 1999) indicated that all processed rock were PAG. Based on the samples collected as part of this study and the historical testing results, TCL will manage all processed rock as PAG.

7.4.2 Leaching Potential

Arsenic, sulfur, selenium and tellurium were greater than 10 times the average crustal abundances (Smith and Huyck 1999). The coarse coal reject sample became acidic after 68 weeks of testing. An associated increase in several constituents was also observed to occur as the pH in this sample declined. TCL proposes to place processed rock in the Management Ponds prior to the onset of acid generation. If the processed rock is inundated with water prior to acid generation, increases in constituent loads associated with a decline in pH will not occur.

The pH in the fine tailings samples remained alkaline for the duration of the testing period. Loadings of all constituents decreased to steady-state conditions following the initial flush of the humidity cells.

The loadings from the humidity cells were used to develop source terms that are carried forward into the water and load balance for the project (SRK 2021).

7.4.3 Lag Time to Acid Generation

The coarse processed rock sample became acidic after 1.3 years of testing. This occurred under laboratory conditions and represents a minimum lag time to acid generation for coarse processed rock. The 2018 fine processed rock sample sulfide is predicted to be depleted prior to the NP confirming the NAG classification of this sample based on the ABA results. The 2019 fine processed rock sample is expected to become acidic; however, based on the humidity cell reaction rates, long lag times are expected (i.e., 20 years under laboratory conditions) prior to acid generation occurring.

7.5 Construction Materials

TCL provided the following construction material samples to Maxxam Analytics for geochemical testing:

- Two samples representative of rock to be used for surfacing material for the Tenas Access Corridor;
- Five test pit samples collected along the proposed alignment of the Tenas Access Corridor that represent material that will be used for base and sub base materials; and
- Nine samples from four test pits in the area of the proposed Rail Infrastructure.

All samples had lower sulfur content and modified-NPs exceeding AP. As a result, all construction materials are NAG.

Compared to 10 times the average crustal abundances (Smith and Huyck 1999), tellurium was observed to be enriched in the solid phase in 60% (9 of 15 samples) of the measurements

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Feb 9, 2022

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Corporate Consultant (Geochemistry)

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

SRK Consulting (Canada) Inc Engineers and Geoscientist BC Permit to Practice No: 1003655

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Appendix A – Sample Intervals for Static Testing

Hole-ID	Sample ID	Sample Type	From (m)	To (m)	Mass (kg)
T18-01D	T18-01D-A-001	ARD	9.98	12.03	27.42950096
T18-01D	T18-01D-A-002	ARD	12.03	13.29	16.85910791
T18-01D	T18-01D-A-003	ARD	13.29	15.8	33.58441337
T18-01D	T18-01D-A-004	ARD	15.8	17.2	18.73234212
T18-01D	T18-01D-A-005	ARD	17.2	21.31	54.99280436
T18-01D	T18-01D-A-006	ARD	21.89	22.08	2.54224643
T18-01D	T18-01D-A-007	ARD	24.7	24.84	1.873234212
T18-01D	T18-01D-A-008	ARD	24.84	27.7	38.2674989
T18-01D	T18-01D-A-009	ARD	27.7	30.1	32.11258649
T18-01D	T18-01D-A-010	ARD	30.1	33.7	48.16887973
T18-01D	T18-01D-A-011	ARD	33.7	36.53	37.86609157
T18-01D	T18-01D-A-012	ARD	38.52	39.2	9.098566172
T18-01D	T18-01D-A-013	ARD	40.3	43.93	48.57028706
T18-01D	T18-01D-A-014	ARD	43.93	44.39	6.15491241
T18-01D	T18-01D-A-015	ARD	44.75	47.2	32.78159871
T18-01D	T18-01D-A-016	ARD	47.2	50	37.46468424
T18-01D	T18-01D-A-017	ARD	50	50.72	9.633775946
T18-01D	T18-01D-A-018	ARD	51.02	53.2	29.16893273
T18-01D	T18-01D-A-019	ARD	53.2	56.2	40.14073311
T18-02D	T18-02D-A-001	ARD	8.35	12.03	49.23929928
T18-02D	T18-02D-A-002	ARD	12.03	15.3	43.75339909
T18-02D	T18-02D-A-003	ARD	15.3	18.58	43.88720153
T18-02D	T18-02D-A-004	ARD	18.58	21.3	36.39426469
T18-02D	T18-02D-A-005	ARD	21.3	24.3	40.14073311
T18-02D	T18-02D-A-006	ARD	24.3	27.3	40.14073311
T18-02D	T18-02D-A-007	ARD	27.3	28.8	20.07036655
T18-02D	T18-02D-A-008	ARD	28.8	30.3	20.07036655
T18-02D	T18-02D-A-009	ARD	30.3	32.88	34.52103047
T18-02D	T18-02D-A-010	ARD	32.88	33.94	14.18305903
T18-02D	T18-02D-A-011	ARD	33.94	36.86	39.07031356
T18-02D	T18-02D-A-012	ARD	36.86	39.3	32.64779626
T18-02D	T18-02D-A-013	ARD	39.3	41.75	32.78159871
T18-02D	T18-02D-A-014	ARD	41.75	45.18	45.89423819
T18-02D	T18-02D-A-015	ARD	45.18	48.3	41.74636243
T18-02D	T18-02D-A-016	ARD	48.3	48.76	6.15491241
T18-02D	T18-02D-A-017	ARD	50.44	50.5	0.802814662
T18-02D	T18-02D-A-018	ARD	50.5	52.8	30.77456205
T18-02D	T18-02D-A-019	ARD	52.8	54.3	20.07036655
T18-02D	T18-02D-A-020	ARD	54.3	58.08	50.57732372
T18-02D	T18-02D-A-021	ARD	58.08	60.3	29.7041425
T18-02D	T18-02D-A-022	ARD	60.3	63.3	40.14073311
T18-02D	T18-02D-A-023	ARD	63.3	66.3	40.14073311
T18-02D	T18-02D-A-024	ARD	66.3	67.8	20.07036655
T18-02D	T18-02D-A-025	ARD	67.8	68.56	10.16898572
T18-02D	T18-02D-A-026	ARD	75.62	78.3	35.85905491
T18-02D	T18-02D-A-027	ARD	78.3	79.35	14.04925659
T18-02D	T18-02D-A-028	ARD	79.35	79.54	2.54224643
T18-02D	T18-02D-A-029	ARD	79.54	80.72	15.78868836
T18-02D	T18-02D-A-030	ARD	79.54	84.3	63.6899632
T18-02D	T18-02D-A-031	ARD	84.3	84.53	3.077456205
T18-02D	T18-02D-A-032	ARD	84.53	86.64	28.23231562
T18-02D	T18-02D-A-033	ARD	86.64	87.48	11.23940527
T18-02D	T18-02D-A-034	ARD	87.48	88.8	17.66192257
T18-02D	T18-02D-A-035	ARD	88.8	90.3	20.07036655
T18-02D	T18-02D-A-036	ARD	90.3	90.93	8.429553953

Hole-ID	Sample ID	Sample Type	From (m)	To (m)	Mass (kg)
T18-02D	T18-02D-A-037	ARD	90.93	92.52	21.27458855
T18-02D	T18-02D-A-038	ARD	92.52	94.29	23.68303253
T18-02D	T18-02D-A-039	ARD	94.29	94.8	6.823924629
T18-02D	T18-02D-A-040	ARD	94.8	96.3	20.07036655
T18-02D	T18-02D-A-041	ARD	96.3	97.8	20.07036655
T18-02D	T18-02D-A-042	ARD	97.8	99.3	20.07036655
T18-02D	T18-02D-A-043	ARD	99.3	100.8	20.07036655
T18-02D	T18-02D-A-044	ARD	100.8	102.3	20.07036655
T18-02D	T18-02D-A-045	ARD	102.3	103.8	20.07036655
T18-02D	T18-02D-A-046	ARD	103.8	105.3	20.07036655
T18-02D	T18-02D-A-047	ARD	105.3	106.8	20.07036655
T18-02D	T18-02D-A-048	ARD	106.8	107.92	14.98587369
T18-02D	T18-02D-A-049	ARD	107.92	108.3	5.084492861
T18-02D	T18-02D-A-050	ARD	108.3	109.8	20.07036655
T18-02D	T18-02D-A-051	ARD	109.8	111.21	18.86614456
T18-02D	T18-02D-A-052	ARD	111.21	111.3	1.204221993
T18-02D	T18-02D-A-053	ARD	111.3	111.95	8.69715884
T18-02D	T18-02D-A-054	ARD	111.95	112.6	8.69715884
T18-02D	T18-02D-A-055	ARD	112.6	112.8	2.676048874
T18-02D	T18-02D-A-056	ARD	112.8	114.3	20.07036655
T18-02D	T18-02D-A-057	ARD	114.3	114.91	8.161949066
T18-02D	T18-02D-A-058	ARD	114.91	115.8	11.90841749
T18-02D	T18-02D-A-059	ARD	115.8	117.3	20.07036655
T18-02D	T18-02D-A-060	ARD	117.3	118.8	20.07036655
T18-02D	T18-02D-A-061	ARD	118.8	120.3	20.07036655
T18-02D	T18-02D-A-062	ARD	120.3	121.8	20.07036655
T18-02D	T18-02D-A-063	ARD	121.8	123.3	20.07036655
T18-02D	T18-02D-A-064	ARD	123.3	124.8	20.07036655
T18-03D	T18-03D-A-005	ARD	10.78	10.8	0.267604887
T18-03D	T18-03D-A-006	ARD	12.57	12.82	3.345061092
T18-03D	T18-03D-A-007	ARD	12.82	13.44	8.295751509
T18-03D	T18-03D-A-008	ARD	13.44	14.08	8.563356397
T18-03D	T18-03D-A-009	ARD	17.54	18.46	12.30982482
T18-03D	T18-03D-A-010	ARD	19.02	19.37	4.683085529
T18-03D	T18-03D-A-011	ARD	19.37	19.97	8.028146622
T18-03D	T18-03D-A-012	ARD	19.97	20.5	7.091529516
T18-03D	T18-03D-A-013	ARD	20.5	22.25	23.41542765
T18-03D	T18-03D-A-014	ARD	22.25	23.16	12.17602238
T18-03D	T18-03D-A-015	ARD	23.16	23.56	5.352097748
T18-03D	T18-03D-A-016	ARD	23.56	25	19.26755189
T18-03D	T18-03D-A-017	ARD	25	26.12	14.98587369
T18-03D	T18-03D-A-018	ARD	26.12	28	25.15485942
T18-03D	T18-03D-A-019	ARD	28	29.06	14.18305903
T18-03D	T18-03D-A-020	ARD	29.06	30	12.57742971
T18-03D	T18-03D-A-021	ARD	30	32.5	33.45061092
T18-03D	T18-03D-A-022	ARD	32.5	32.9	5.352097748
T18-03D	T18-03D-A-023	ARD	32.9	33.05	2.007036655
T18-03D	T18-03D-A-024	ARD	33.05	34.53	19.80276167
T18-03D	T18-03D-A-025	ARD	34.53	35.5	12.97883704
T18-03D	T18-03D-A-026	ARD	35.5	36.26	10.16898572
T18-03D	T18-03D-A-027	ARD	36.26	38.5	29.97174739
T18-03D	T18-03D-A-028	ARD	38.5	39.08	7.760541735
T18-03D	T18-03D-A-029	ARD	39.08	40.49	18.86614456
T18-03D	T18-03D-A-030	ARD	40.49	41.5	13.51404681
T18-03D	T18-03D-A-031	ARD	41.5	43	20.07036655

Hole-ID	Sample ID	Sample Type	From (m)	To (m)	Mass (kg)
T18-03D	T18-03D-A-032	ARD	43	44.4	18.73234212
T18-03D	T18-03D-A-033	ARD	44.4	46.4	26.76048874
T18-05D	28651	ARD	13.5	22.5	120.4221993
T18-05D	28652	ARD	22.5	23.2	9.366171059
T18-05D	28653	ARD	23.2	30.6	99.01380834
T18-05D	28654	ARD	30.6	33.5	38.80270867
T18-05D	28655	ARD	33.5	37.4	52.18295304
T18-05D	28656	ARD	37.4	38.9	20.07036655
T18-05D	28657	ARD	38.9	42.4	46.83085529
T18-05D	28658	ARD	42.4	46	48.16887973
T18-05D	28659	ARD	46	49.6	48.16887973
T18-05D	28660	ARD	49.6	53.2	48.16887973
T18-05D	28661	ARD	53.2	56.8	48.16887973
T18-05D	28662	ARD	56.8	59.6	37.46468424
T18-05D	28663	ARD	59.6	62.3	36.1266598
T18-05D	28664	ARD	62.3	65.3	40.14073311
T18-05D	28665	ARD	65.3	68.4	41.47875755
T18-05D	28666	ARD	68.4	71.4	40.14073311
T18-05D	28667	ARD	71.4	75.1	49.50690417
T18-05D	28668	ARD	75.1	78.6	46.83085529
T18-05D	28669	ARD	78.6	82.1	46.83085529
T18-05D	28670	ARD	82.1	85.6	46.83085529
T18-05D	28671	ARD	85.6	88.3	36.1266598
T18-05D	28672	ARD	88.3	91.4	41.47875755
T18-05D	28673	ARD	91.4	93.55	28.7675254
T18-05D	28674	ARD	93.55	94.25	9.366171059
T18-05D	28675	ARD	94.25	96.9	35.45764758
T18-05D	28676	ARD	96.9	99.2	30.77456205
T18-05D	28677	ARD	99.2	99.4	2.676048874
T18-05D	28678	ARD	101.6	101.9	4.014073311
T18-05D	28679	ARD	101.9	106.3	58.87307523
T18-05D	28680	ARD	106.3	108.7	32.11258649
T18-05D	28681	ARD	108.7	111.1	32.11258649
T18-05D	28682	ARD	111.1	111.3	2.676048874
T18-05D	28683	ARD	111.3	111.8	6.690122185
T18-05D	28684	ARD	111.8	112.3	6.690122185
T18-05D	28685	ARD	112.3	115.5	42.81678198
T18-05D	28686	ARD	115.5	118.7	42.81678198
T18-05D	28687	ARD	118.7	118.9	2.676048874
T18-05D	28688	ARD	126.2	126.4	2.676048874
T18-05D	28689	ARD	126.4	128.8	32.11258649
T18-05D	28690	ARD	128.8	131.2	32.11258649
T18-05D	28691	ARD	131.2	131.4	2.676048874
T18-05D	28704	ARD	131.4	132.2	10.7041955
T18-05D	28692	ARD	132.2	132.4	2.676048874
T18-05D	28693	ARD	132.4	133.2	10.7041955
T18-05D	28694	ARD	133.2	133.4	2.676048874
T18-05D	28695	ARD	133.4	134.4	13.38024437
T18-05D	28696	ARD	134.4	134.6	2.676048874
T18-05D	28697	ARD	134.6	135.3	9.366171059
T18-05D	28698	ARD	135.3	139.1	50.84492861
T18-05D	28699	ARD	139.1	139.3	2.676048874
T18-05D	28700	ARD	139.3	140.5	16.05629324
T18-05D	28705	ARD	140.5	141.2	9.366171059
T18-05D	28706	ARD	141.2	141.4	2.676048874

Hole-ID	Sample ID	Sample Type	From (m)	To (m)	Mass (kg)
T18-05D	28707	ARD	141.4	142.1	9.366171059
T18-05D	28708	ARD	142.1	142.5	5.352097748
T18-05D	28709	ARD	142.5	143.9	18.73234212
T18-05D	28710	ARD	143.9	144.1	2.676048874
T18-05D	28711	ARD	144.1	144.4	4.014073311
T18-05D	28712	ARD	144.4	147.4	40.14073311
T18-05D	28713	ARD	147.4	147.7	4.014073311
T18-05D	28714	ARD	147.7	150.4	36.1266598
T18-05D	28715	ARD	150.4	151.7	17.39431768
T18-05D	28716	ARD	151.7	154.8	41.47875755
T18-05D	28717	ARD	154.8	158	42.81678198
T18-07D	28836	ARD	6.9	10.4	46.83085529
T18-07D	28837	ARD	10.4	14.8	58.87307523
T18-07D	28838	ARD	14.8	18.3	46.83085529
T18-07D	28839	ARD	18.3	22.2	52.18295304
T18-07D	28840	ARD	22.2	26.1	52.18295304
T18-07D	28841	ARD	26.1	30	52.18295304
T18-07D	28842	ARD	30	33.9	52.18295304
T18-07D	28843	ARD	33.9	38.2	57.53505079
T18-07D	28844	ARD	38.2	42.3	54.85900192
T18-07D	28845	ARD	42.3	44.2	25.4224643
T18-07D	28846	ARD	44.2	49.8	74.92936847
T18-07D	28847	ARD	49.8	52.8	40.14073311
T18-07D	28848	ARD	52.8	57.15	58.20406301
T18-07D	28849	ARD	57.15	61.5	58.20406301
T18-07D	28850	ARD	61.5	63.4	25.4224643
T18-07D	29501	ARD	63.4	66.8	45.49283086
T18-07D	29502	ARD	66.8	69.6	37.46468424
T18-07D	29503	ARD	69.6	72.4	37.46468424
T18-07D	29504	ARD	72.4	75.6	42.81678198
T18-07D	28786	ARD	75.6	78.8	42.81678198
T18-07D	29505	ARD	78.8	84	69.57727072
T18-07D	29506	ARD	84	86.9	38.80270867
T18-07D	29507	ARD	86.9	92.2	70.91529516
T18-07D	29508	ARD	92.2	96.3	54.85900192
T18-07D	29509	ARD	96.3	104.7	112.3940527
T18-07D	29510	ARD	104.7	107.8	41.47875755
T18-07D	29511	ARD	107.8	111.1	44.15480642
T18-07D	29512	ARD	111.1	114.2	41.47875755
T18-07D	29513	ARD	114.2	117.4	42.81678198
T18-07D	29514	ARD	117.4	120.6	42.81678198
T18-07D	29515	ARD	120.6	123.8	42.81678198
T18-07D	29516	ARD	123.8	127.5	49.50690417
T18-07D	29517	ARD	127.5	129.3	24.08443987
T18-07D	29518	ARD	129.3	132.4	41.47875755
T18-07D	29519	ARD	132.4	133.8	18.73234212
T18-07D	29520	ARD	133.8	134	2.676048874
T18-07D	29521	ARD	134	134.6	8.028146622
T18-07D	29522	ARD	134.6	135.55	12.71123215
T18-07D	29523	ARD	135.55	135.6	0.669012218
T18-07D	29524	ARD	135.6	136.4	10.7041955
T18-07D	29525	ARD	136.4	137	8.028146622
T18-07D	29526	ARD	137	140.1	41.47875755
T18-07D	29527	ARD	140.1	140.5	5.352097748
T18-07D	29528	ARD	140.5	141.5	13.38024437

Hole-ID	Sample ID	Sample Type	From (m)	To (m)	Mass (kg)
T18-07D	29529	ARD	141.5	141.7	2.676048874
T18-07D	29530	ARD	141.7	143.6	25.4224643
T18-07D	29531	ARD	143.6	146	32.11258649
T18-07D	29532	ARD	146	146.5	6.690122185
T18-07D	29533	ARD	146.5	150.3	50.84492861
T18-07D	29534	ARD	150.3	153.7	45.49283086
T18-07D	29535	ARD	153.7	158.3	61.5491241

Appendix B – Phase II Sample Selection

Zone	Sample Number	Zone Check	Rock Type	Sample Selected for XRD	Sample Selected for HCT	Paste pH	Sulfide (%)	AP (kg CaCO3/t)	Mod-NP (kg $CaCO_3$/t)	Sobek-NP (kg CaCO3/t)	CO3-NP (kg CaCO3/t)	Carbonate/Mod-NP	NPR	As (ppm)	Se (ppm)	ARD Classification	Comments
1	28836	1	siltstone	x	x	8.24	0.71	22.1875	44.8	54.5	50	1.1	2.456338028	8.2	0.4	non-PAG	70th percentile S2- median NP 35% NPR 25th percentile As 95th percentile Se
	28661	1	siltstone	x		9.39	0.16	5	144	88.8	232	1.6	17.76	9.9	<0.1	non-PAG	Mod-NP>>>>Sobek-NP
1a	T18-02D-A-011	1A	mudstone	x	x	8.22	2.26	70.625	23.8	63.5	82	3.5	0.899115044	13.5	0.3	PAG	75th percentile S2- minimum mod-NP Median NPR median As and Se Can be used to estimate AG onset (neutral paste pH, low NP)
	T18-02D-A-004	1A	mudstone	x		9.59	0.2	6.25	98.3	82.3	153	1.6	13.168	14	0.1	non-PAG	Mod-NP>>>>Sobek-NP
2-3	T18-02D-A-016	3	mudstone	x	x	3.78	3.33	104.0625	8	18	30	3.7	0.172972973	29.8	0.3	PAG	95th percentile S2- Low NP 75th percentile As and Se
	T18-01D-A-002	2	mudstone	x		6.65	3.22	100.625	90.3	67.5	93	1.0	0.670807453	6.8	0.2	PAG	Mod-NP>>>>Sobek-NP
4	28681	4	siltstone	x	x	8.24	1.43	44.6875	54	71.5	161	3.0	1.6	75.5	<0.1	Uncertain	80th percentile S2- Median NP 35th percentile NPR 90th percentile As Minimum/median Se
	T18-02D-A-019	4	mudstone	x		8.88	0.59	18.4375	112	75.3	224	2.0	4.084067797	8.8	<0.1	non-PAG	Mod-NP>>>>Sobek-NP
5	28684	5	siltstone	x	x	6.13	1.75	54.6875	16.8	21.5	35	2.1	0.393142857	43.3	0.3	PAG	80th percentile S2- 20th percentile NP & NPR 80th percentile As 70th percentile Se
	T18-02D-A-021	5	bentonite layer	x		8.84	0.93	29.0625	194	92	348	1.8	3.165591398	9.7	<0.1	non-PAG	Mod-NP>>>>Sobek-NP
55	T18-03D-A-006	55	mudstone	x	x	7.68	0.18	5.625	9.3	7.5	8	0.9	1.333333333	1.4	<0.1	Uncertain	Uncertain ARD potential 70th percentile S2- Minimum NP Median As Minimum Se
6	28704	6	siltstone	x	x	5.98	2.12	66.25	58	57.8	65	1.1	0.87245283	55.5	0.4	PAG	PAG 80th percentile S2- 75th percentile NP 80th percentile As 75th percentile Se
	T18-02D-A-028	6	mudstone	x		9.24	0.14	4.375	164	87	219	1.3	19.88571429	1.4	<0.1	non-PAG	Mod-NP>>>>Sobek-NP
7	T18-02D-A-034	7	mudstone	x	x	6.51	1.43	44.6875	15	12.5	15	1.0	0.27972028	21	0.2	PAG	75th percentile S2- 30th percentile NP Mod NP>>>Sobek-NP 10th percentile NPR 80th percentile As 10th percentile Se
8	28711	8	siltstone	x	x	7.62	0.23	7.1875	31.5	32.5	36	1.1	4.52173913	28.1	0.4	non-PAG	60th percentile S2- 40th percentile NPNP>>>Sobek-NP 25th percentile NPR Maximum As 90th percentile Se

Appendix C – ABA Results

Drill Hole	Sample Number	Maxxam Sample ID	Sample Depth (m) From	To	Thickness	ABA Zone	Class	Lithology	Paste pH (su)	Paste EC (us/cm)	Carbon Species (w.t.%) Total-C	Total Inorganic Carbon	CO2	CO3	Sulphur Species (w.t.%) Total-S	Sulphate	SICP	Sulphide (Total - SO4)	Sulphide (SICP - SO4)	Potentials (kg CaCO3/tonne) AP (Total Sulphur)	AP (Sulphide)	CO3-NP	Sobek-NP	Modified Sobek-NP	Neutralization Potential Ratios CO3-NPR	Sobek-NPR (Total Sulphur)	Modified Sobek-NPR (Total Sulphur)	Sobek-NPR (Sulphide)	Modified Sobek NPR (Sulphide)	Mine Plan Inputs Sulphide-S	AP	NP	NPR
T18-02D	T18-02D-A-001	TD3978	8.35	12.03	3.68	1	waste	MDST	8.8	709	2.8	1.2	4.5	6.1	0.23	0.02	0.19	0.21	0.17	7.2	5.3	101	64	45	14	8.9	6.2	12	8.4	0.2	5.3	45	8.4
T18-02D	T18-02D-A-002	TD3979	12.03	15.3	3.27	1	waste	MDST	9.1	955	3.4	1.3	4.9	6.7	0.21	0.01	0.16	0.2	0.15	6.6	4.7	111	61	46	17	9.3	6.9	13	9.7	0.2	4.7	46	9.7
T18-02D	T18-02D-A-003	TD3980	15.3	18.58	3.28	1	waste	MDST	9.5	1020	3.7	2.0	7.3	9.9	0.19	0.02	0.16	0.17	0.14	5.9	4.4	166	78	92	28	13	16	18	21	0	4	92	21
T18-02D	T18-02D-A-004	TD3981	18.58	21.3	2.72	1	waste	MDST	9.6	1040	3.9	1.8	6.7	9.1	0.26	0.01	0.21	0.25	0.2	8.1	6.3	153	82	98	19	10	12	13	16	0	6	98	16
T18-02D	T18-02D-A-005	TD3983	21.3	24.3	3	1	waste	MDST	8.9	1230	3.8	1.3	4.9	6.6	0.43	0.02	0.36	0.41	0.34	13	11	111	72	46	8.2	5.3	3.4	6.8	4.3	0.3	10.6	46.0	4.3
T18-02D	T18-02D-A-006	TD3984	24.3	27.3	3	1	waste	MDST	8.8	1770	2.7	1.5	5.6	7.6	0.55	0.02	0.48	0.53	0.46	17	14	126	72	54	7.3	4.2	3.1	5.0	3.7	0.5	14.4	53.8	3.7
T18-05D	28651	TH0788	13.5	22.5	9	1	waste	SLST	8.4	2210	2.2	0.89	3.25	4.4	0.42	0.05	0.39	0.37	0.34	13	11	74	68	24	5.6	5.2	1.8	6.4	2.3	0.3	10.6	24.0	2.3
T18-05D	28652	TH0789	22.5	23.2	0.7	1	waste	SLST	8.1	3350	2.8	1.1	4.0	5.4	1.4	0.09	1.4	1.3	1.3	44	40	91	77	34	2.1	1.7	0.78	1.9	0.85	1.29	40.31	34.3	0.85
T18-05D	28653	TH0790	23.2	30.6	7.4	1	waste	SLST	9.2	2040	3.3	1.7	6.4	8.7	0.8	0.04	0.81	0.76	0.77	25	24	145	81	68	5.8	3.2	2.7	3.4	2.8	0.8	24.1	68.0	2.8
T18-05D	28654	TH0791	30.6	33.5	2.9	1	waste	SLST	9.5	2080	3.4	1.6	6.0	8.2	0.19	0.02	0.17	0.17	0.15	5.9	4.7	136	83	48	23	14	8.1	18	10	0	4.7	48	10
T18-05D	28655	TH0792	33.5	37.4	3.9	1	waste	SLST	9.4	1690	2.9	1.3	4.6	6.3	0.41	0.02	0.42	0.39	0.4	13	13	104	79	37	8.1	6.2	2.8	6.3	2.9	0.4	12.5	36.5	2.9
T18-05D	28656	TH0793	37.4	38.9	1.5	1	waste	SLST	9.5	1480	2.8	1.4	5.0	6.9	0.33	0.02	0.34	0.31	0.32	10	10	114	82	55	11	7.9	5.3	8.2	5.5	0.3	10.0	54.5	5.5
T18-05D	28657	TH0794	38.9	42.4	3.5	1	waste	SLST	9.3	1700	2.7	1.6	5.7	7.8	0.5	0.03	0.49	0.47	0.46	16	14	130	68	59	8.3	4.3	3.8	4.7	4.1	0.5	14.4	59.3	4.1
T18-05D	28658	TH0795	42.4	46	3.6	1	waste	SLST	8.0	1510	2.7	1.5	5.5	7.5	0.63	0.02	0.6	0.61	0.58	20	18	124	80	55	6.3	4.1	2.8	4.4	3.034482759	0.58	18.125	55	3.0
T18-05D	28659	TH0796	46	49.6	3.6	1	waste	SLST	9.5	1500	2.8	1.7	6.1	8.3	0.86	0.02	0.86	0.84	0.84	27	26	139	85	83	5.2	3.2	3.1	3.2	3.1	0.8	26.3	82.5	3.1
T18-05D	28660	TH0797	49.6	53.2	3.6	1	waste	SLST	9.4	1420	2.9	1.4	5.2	7.1	0.45	0.02	0.44	0.43	0.42	14	13	118	80	45	8.4	5.7	3.2	6.1	3.4	0.4	13.1	44.5	3.4
T18-05D	28661	TH0799	53.2	56.8	3.6	1	waste	SLST	9.4	1350	4.3	2.8	10.2	14	0.19	0.02	0.18	0.17	0.16	5.9	5.0	232	89	144	39	15	24	18	29	0.16	5	144	29
T18-05D	28662	TH0800	56.8	59.6	2.8	1	waste	SLST	9.4	1300	3.2	1.6	5.9	8.0	0.17	0.01	0.16	0.16	0.15	5.3	4.7	133	79	61	25	15	11	17	13	0	5	61	13
T18-05D	28663	TH0801	59.6	62.3	2.7	1	waste	SLST	9.3	1360	3.1	1.4	5.0	6.9	0.25	0.02	0.24	0.23	0.22	7.8	6.9	114	78	49	15	10.0	6.3	11	7.1	0.2	6.9	49	7.1
T18-05D	28664	TH0802	62.3	65.3	3	1	waste	SLST	9.4	1220	3.0	1.5	5.4	7.3	0.12	0.01	0.12	0.11	0.11	3.8	3.4	122	76	62	32	20	17	22	18	0	3	62	18
T18-05D	28665	TH0803	65.3	68.4	3.1	1	waste	SLST	9.2	1300	3.2	1.5	5.5	7.5	0.28	0.02	0.28	0.26	0.26	8.8	8.1	126	78	56	14	8.9	6.4	9.6	6.9	0.3	8.1	56.0	6.9
T18-05D	28666	TH0804	68.4	71.4	3	1	waste	SLST	9.2	1310	4.1	2.4	8.9	12.1	0.26	0.02	0.25	0.24	0.23	8.1	7.2	202	81	67	25	10	8.2	11	9.3	0.2	7.2	67	9.3
T18-05D	28667	TH0805	71.4	75.1	3.7	1	waste	SLST	9.3	1300	4.4	2.3	8.5	11.5	0.25	0.02	0.24	0.23	0.22	7.8	6.9	192	82	73	25	10	9.3	12	11	0	6.9	73	11
T18-05D	28668	TH0806	75.1	78.6	3.5	1	waste	SLST	9.2	1790	3.6	2.0	7.2	9.8	0.44	0.02	0.4	0.42	0.38	14	12	164	73	85	12	5.3	6.2	6.1	7.1	0.4	11.9	84.8	7.1
T18-05D	28669	TH0807	78.6	82.1	3.5	1	waste	SLST	8.5	1840	2.8	1.4	5.3	7.2	0.78	0.02	0.75	0.76	0.73	24	23	119	83	57	4.9	3.4	2.4	3.6	2.5	0.7	22.8	57.3	2.5
T18-05D	28670	TH0808	82.1	85.6	3.5	1	waste	SLST	9.1	1710	3.4	2.2	8.2	11.2	0.89	0.03	0.83	0.86	0.8	28	25	187	86	117	6.7	3.1	4.2	3.4	4.7	0.8	25.0	117.0	4.7
T18-07D	28836	TH0854	6.9	10.4	3.5	1	waste	MDST	8.2	1400	2.0	0.59	2.18	3.0	0.74	0.02	0.73	0.72	0.71	23	22	50	55	45	2.1	2.4	1.9	2.5	2.0	0.7	22.2	44.8	2.0
T18-01D	T18-01D-A-002	TD3951	13.6	14	0.4	2	1	C	6.7	89	67	1.1	4.1	5.6	4.0	0.02	3.2	3.9	3.2	124	101	93	68	90	0.75	0.55	0.73	0.67	0.9	3.22	100.63	90.3	0.9
T18-01D	T18-01D-A-001	TD3950	12.38	13.6	1.22	2	waste	MDST	6.8	1701	4.3	0.67	2.47	3.4	2.4	0.06	2.1	2.3	2.0	74	63	56	51	32	0.76	0.69	0.43	0.8	0.5	2.03	63.44	31.8	0.5
T18-02D	T18-02D-A-012	TD3990	36.86	39.3	2.44	2	waste	SLST	8.5	1140	4.8	0.58	2.12	2.9	2.5	0.02	2.2	2.5	2.2	77	67	48	29	14	0.62	0.38	0.18	0.44	0.21	2.15	67.19	14.0	0.21
T18-02D	T18-02D-A-013	TD3991	39.3	41.75	2.45	2	waste	SLST	8.2	877	18	0.35	1.3	1.8	1.8	0.02	1.6	1.8	1.6	57	50	30	25	15	0.52	0.43	0.25	0.5	0.29	1.59	49.69	14.5	0.29
T18-05D	28673	TH0812	91.4	93.97	2.57	2	waste	MDST	6.8	2920	4.2	0.59	2.16	2.9	2.1	0.07	2.1	2.1	2.1	67	64	49	34	21	0.74	0.5	0.32	0.52	0.33	2.06	64.38	21.0	0.33
T18-05D	28674	TH0813	93.97	94.61	0.64	2	waste	C	3.4	710	67	0.15	0.56	0.76	3.0	0.11	2.7	2.9	2.6	95	81	13	14	15	0.13	0.15	0.15	0.17	0.18	2.58	80.63	14.5	0.18
T18-01D	T18-01D-A-006	TD3955	18.70	19.000	0.3	3	1	C	8.7	824	2.8	0.92	3.38	4.6	0.24	0.02	0.19	0.22	0.17	7.5	5.3	77	69	17	10	9.2	2.2	13	3.1	0.2	5.3	17	3.1
T18-01D	T18-01D-A-003	TD3952	14.00	15.8	1.8	3	waste	MDST	8.3	865	3.3	0.67	2.47	3.4	1.2	0.02	1.0	1.1	1.0	36	32	56	56	16	1.5	1.5	0.44	1.8	0.51	1.01	31.56	16.0	0.51
T18-01D	T18-01D-A-004	TD3953	15.8	17.2	1.4	3	waste	MDST	8.5	871	3.1	1.5	5.7	7.7	1.3	0.02	1.1	1.3	1.1	40	34	129	84	51	3.2	2.1	1.3	2.5	1.5	1.1	34.4	50.8	1.5
T18-01D	T18-01D-A-005	TD3954	17.2	18.70	1.5	3	waste	MDST	8.4	824	4.7	1.4	5.2	7.1	1.0	0.02	0.85	1.0	0.83	33	26	118	80	51	3.6	2.5	1.6	3.1	2.0	0.8	25.9	51.0	2.0
T18-01D	T18-01D-A-007	TD3956	19.000	21.31	2.31	3	waste	MDST	8.7	829	5.6	2.4	8.8	12.0	0.67	0.02	0.52	0.65	0.5	21	16	200	82	54	9.6	3.9	2.6	5.2	3.5	0.5	15.6	54.0	3.5
T18-02D	T18-02D-A-014	TD3992	41.75	45.18	3.43	3	waste	MDST	9.3	1120	4.7	1.7	6.4	8.7	0.56	0.01	0.41	0.55	0.4	18	13	144	70	68	8.3	4.0	3.9	5.6	5.4	0.4	12.5	67.8	5.4
T18-02D	T18-02D-A-015	TD3994	45.18	48.3	3.12	3	waste	MDST	9.1	855	4.3	0.98	3.6	4.9	0.7	0.01	0.57	0.69	0.56	22	18	82	50	50	3.7	2.3	2.3	2.8	2.8	0.6	17.5	49.5	2.8
T18-02D	T18-02D-A-016	TD3995	48.3	48.76	0.46	3	waste	MDST	3.8	2900	6.6	0.36	1.31	1.8	3.9	0.13	3.5	3.7	3.3	121	104	30	18	8	0.25	0.15	0.07	0.17	0.08	3.33	104.06	8.0	0.08
T18-05D	28675	TH0814	94.61	96.9	2.29	3	waste	MDST	7.5	1400	5.1	0.52	1.92	2.6	2.0	0.03	1.9	1.9	1.9	61	58	44	30	23	0.71	0.49	0.37	0.51	0.39	1.87	58.44	22.8	0.39
T18-05D	28676	TH0815	96.9	97.61	0.71	3	waste	SLST	6.6	2950	8.5	0.91	3.33	4.5	2.0	0.1	2.0	1.9	1.9	64	60	76	57	34	1.2	0.9	0.54	0.96	0.57	1.92	60.0	34.3	0.57
T18-05D	28677	TH0816	97.61	99.97	2.36	3	waste	SLST	3.4	2360	7.6	0.29	1.07	1.5	3.5	0.2	3.4	3.3	3.2	108	101	24	7.3	-0.3	0.23	0.068	-0.003	0.072	-0.003	3.23	100.938	-0.30	-0.003
T18-01D	T18-01D-A-008	TD3957	22.89	27.7	4.81	4	waste	MDST	9.0	910	4.1	2.3	8.4	11.5	0.7	0.02	0.58	0.68	0.56	22	18	192	86	94	8.8	3.9	4.3	4.9	5.4	0.6	17.5	93.8	5.4
T18-01D	T18-01D-A-009	TD3958	27.7	30	2.3	4	waste	MDST	7.8	1593	10	1.7	6.3	8.6	1.3	0.04	1.2	1.3	1.1	42	35	144	80	52	3.4	1.9	1.2	2.3	1.5	1.1	35.3	51.8	1.5
T18-02D	T18-02D-A-017	TD3996	50.44	50.5	0.06	4	waste	MDST	7.8	1520	10	0.19	0.68	0.93	0.47	0.03	0.3	0.44	0.27	15	8.4	15	19	18	1.1	1.3	1.2	2.2	2.2	0.3	8.4	18.3	2.2
T18-02D	T18-02D-A-018	TD3997	50.5	52.8	2.3	4	waste	MDST	9.2	790	3.5	2.0	7.2	9.7	0.51	0.01	0.4	0.5	0.39	16	12	163	63	58	10	3.9	3.7	5.2	4.8	0.4	12.2	58.3	4.8
T18-02D	T18-02D-A-019	TD3998	52.8	54.3	1.5	4	waste	MDST	8.9	1110	4.3	2.7	9.9	13.4	0.77	0.01	0.6	0.76	0.59	24	18	224	75	112	9.3	3.1	4.7	4.1	6.1	0.6	18.4	112.0	6.1
T18-02D	T18-02D-A-020	TD3999	54.3	58.08	3.78	4	waste	MDST	9.2	1710	4.3	0.83	3.03	4.1	1.8	0.03	1.6	1.8	1.6	56	49	69	61	63	1.2	1.1	1.1	1.2	1.3	1.6	48.8	62.8	1.3
T18-05D	28678	TH0817	101.97	102.17	0.2	4	waste	SLST	8.6	968	5.4	0.37	1.34	1.8	0.12	0.01	0.08	0.11	0.07	3.8	2.2	30	13	11	8.1	3.5	2.9	6.1	5.0	0.1	2.2	11.0	5.0
T18-05D	28679	TH0818	102.17	106.3	4.13	4	waste	SLST	9.5	1270	3.0	1.4	5.1	6.9	0.32	0.02	0.33	0.3	0.31	10	9.7	115	71	57	12	7.1	5.7	7.3	5.9	0.3	9.7	56.8	5.9
T18-05D	28680	TH0819	106.3	108.7	2.4	4	waste	SLST	9.5	946	3.9	2.3	8.4	11.5	0.29	0.01	0.29	0.28	0.28	9.1	8.8	191	63	61	21	7.0	6.8	7.2	7.0	0.3	8.8	61.3	7.0
T18-05D	28681	TH0821	108.7	111.1	2.4	4	waste	SLST	8.2	1310	4.9	1.9	7.1	9.6	1.7	0.03	1.5	1.6	1.4	52	45	161	72	54	3.1	1.4	1.0	1.6	1.2	1.4	44.7	54.0	1.2
T18-05D	28682	TH0822	111.1	111.9	0.8	4	waste	MDST	8.1	1460	5.2	0.45	1.65	2.2	1.8	0.03	1.7	1.7	1.6	55	51	38	28	24	0.68	0.51	0.43	0.55	0.47	1.62	50.63	23.8	0.47
T18-05D	28683	TH0823	111.9	112.1	0.2	4	waste	C	3.7	1780	52	0.68	2.49	3.4	3.9	0.21	3.5	3.7	3.3	122	103	57	45	41	0.46	0.37	0.34	0.44	0.4	3.3	103.13	41.0	0.4
T18-01D	T18-01D-A-010	TD3959	30	33.7	3.7	5	waste	SLST	8.1	889	2.2	0.64	2.33	3.2	0.68	0.02	0.61	0.66	0.59	21	18	53	44	28	2.5	2.1	1.3	2.4	1.5	0.6	18.4	27.8	1.5
T18-01D	T18-01D-A-011	TD3961	33.7	36.39	2.69	5	waste	SLST	8.0	953	2.6	0.39	1.44	2.0	0.82	0.02	0.69	0.8	0.67	26	21	33	34	26	1.3	1.3	1.0	1.6	1.2	0.7	20.94	25.5	1.2
T18-02D	T18-02D-A-021	TD4000	58.08	60.3	2.22	5	waste	SLST	8.8	831	6.0	4.2	15.3	21	1.2	0.01	0.94	1.1	0.93	36	29	348	92	194	9.7	2.6	5.4	3.2	6.7	0.9	29.1	194.0	6.7
T18-02D	T18-02D-A-022	TD4001	60.3	63.3	3	5	waste	SLST	9.0	1030	2.4	0.48	1.77	2.4	0.68	0.02	0.53	0.66	0.51	21	16	40	29	29	1.9	1.4	1.4	1.8	1.8	0.5	15.9	29.3	1.8
T18-02D	T18-02D-A-023	TD4002	63.3	66.3	3	5	waste	SLST	9.2	577	3.9	2.1	7.7	10.6	0.48	0.02	0.35	0.46	0.33	15	10	176	70	71	12	4.6	4.7	6.7	6.8	0.3	10.3	70.5	6.8
T18-02D	T18-02D-A-024	TD4003	66.3	67.8	1.5	5	waste	SLST	7.6	1030	5.1	0.41	1.49	2.0	1.7	0.02	1.4	1.7	1.3	52	42	34	24	23	0.65	0.46	0.44	0.58	0.55	1.33	41.56	22.8	0.55
T18-02D	T18-02D-A-025	TD4005	67.8	68.56	0.76	5	waste	SLST	5.3	1780	5.0	0.27	0.98	1.34	2.4	0.06	2.1	2.4	2.1	76	64	22	14	14	0.29	0.18	0.18	0.21	0.21	2.06	64.38	13.5	0.21
T18-03D	T18-03D-A-005	TD4051	10.5	10.8	0.3	5	waste	MDST	6.4	1470	3.5	0.56	2.07	2.8	2.2	0.06	2.0	2.2	2.0	70	62	47	33	30	0.67	0.48	0.43	0.54	0.49	1.98	61.88	30.3	0.49
T18-05D	28684	TH0824	112.1	112.6	0.5	5	waste	SLST	6.1	2660	5.2	0.42	1.55	2.1	2.0	0.1	1.9	1.9	1.8	63	55	35	22	17	0.56	0.34	0.27	0.39	0.31	1.75	54.69	16.8	0.31
T18-05D	28685	TH0825	112.6	115.5	2.9	5	waste	SLST	9.2	674	6.6	4.5	16.4	22	0.44	0.02	0.39	0.42	0.37	14	12	372	80	109	27	5.8	7.9	6.9	9.4	0.4	11.6	109.0	9.4
T18-05D	28686	TH0826	115.5	119.3	3.8	5	waste	SLST	8.1	865	4.8	1.2	4.3	5.8	1.3	0.02	1.2	1.2	1.2	39	37	98	63	48	2.5	1.6	1.2	1.7	1.3	1.2	36.9	47.8	1.3
T18-05D	28687	TH0827	119.3	119.5	0.2	5	waste	SLST	4.8	1810	6.5	0.22	0.82	1.12	1.4	0.07	1.5	1.4	1.4	45	43	19	8.3	5.3	0.42	0.19	0.12	0.19	0.12	1.39	43.44	5.3	0.12
T18-03D	T18-03D-A-010	TD4056	18.6	19.4	0.8	6	1	C	8.3	228	5.3	0.15	0.55	0.75	0.2	<0.01	0.13	0.2	0.13	6.3	3.9	13	13	13	2.0	2.0	2.0	3.3	3.2	0.1	3.9	12.5	3.2
T18-03D	T18-03D-A-011	TD4058	19.4	19.6	0.2	6	1	C	8.3	474	34	0.32	1.17	1.6	0.77	0.01	0.4	0.76	0.39	24	12	27	27	26	1.1	1.1	1.1	2.2	2.1	0.4	12.2	26.0	2.1
T18-03D	T18-03D-A-022	TD4070	32.25	32.65	0.4	6	8	SHC	7.6	662	30	0.18	0.66	0.9	1.3	0.02	1.3	1.3	1.3	42	41	15	12	6.0	0.36	0.28	0.14	0.29	0.15	1.31	40.94	6.0	0.15
T18-01D	T18-01D-A-012	TD3962	38.52	40.71	2.19	6	waste	FLT	7.6	1890	13	1.5	5.5	7.4	5.0	0.12	4.5	4.9	4.4	156	136	124	87	105	0.8	0.56	0.67	0.64	0.77	4.35	135.94	105.0	0.77
T18-01D	T18-01D-A-013	TD3963	40.71	43.93	3.22	6	waste	MDST	8.7	928	5.2	1.8	6.6	8.9	1.1	0.03	0.92	1.1	0.89	34	28	149	85	89	4.4	2.5	2.6	3.0	3.2	0.9	27.8	88.8	3.2
T18-01D	T18-01D-A-014	TD3964	43.93	44.75	0.82	6	waste	MDST	8.9	424	5.3	4.0	14.8	20	0.27	0.01	0.23	0.26	0.22	8.4	6.9	336	82	47	40	9.7	5.6	12	6.8	0.2	6.9	47	6.8
T18-02D	T18-02D-A-026	TD4006	75.62	78.3	2.68	6	waste	SLST	8.3	592	2.6	0.93	3.39	4.6	0.87	0.02	0.72	0.85	0.7	27	22	77	54	45	2.8	2.0	1.6	2.5	2.0	0.7	21.9	44.8	2.0
T18-02D	T18-02D-A-027	TD4007	78.3	79.35	1.05	6	waste	SLST	6.8	1100	3.7	0.54	1.98	2.7	2.6	0.03	2.3	2.6	2.2	81	70	45	30	24	0.56	0.37	0.29	0.43	0.34	2.23	69.69	23.8	0.34
T18-02D	T18-02D-A-028	TD4008	79.35	79.54	0.19	6	waste	MDST	9.2	345	5.5	2.6	9.6	13.1	0.26	0.01	0.15	0.25	0.14	8.1	4.4	219	87	164	27	11	20	20	37	0	4	164	37
T18-02D	T18-02D-A-029	TD4009	79.54	80.72	1.18	6	waste	MDST	6.3	1730	7.3	0.79	2.89	3.9	2.1	0.06	1.8	2.1	1.8	66	55	66	44	43	1.0	0.66	0.65	0.8	0.79	1.75	54.69	43.0	0.79
T18-03D	T18-03D-A-009	TD4055	17.5	18.6	1.1	6	waste	MDST	7.2	1370	5.0	0.55	2.03	2.8	1.3	0.05	1.1	1.3	1.0	42	33	46	37	34	1.1	0.89	0.81	1.1	1.0	1.0	32.5	33.8	1.0
T18-03D	T18-03D-A-012	TD4059	19.6	20.5	0.9	6	waste	MDST	8.8	590	2.1	0.29	1.06	1.4	0.1	0.01	0.07	0.09	0.06	3.1	1.9	24	16	16	7.7	5.0	5.0	8.3	8.3	0.1	1.9	15.5	8.3
T18-03D	T18-03D-A-013	TD4060	20.5	22.25	1.75	6	waste	MDST	8.7	630	3.3	0.96	3.53	4.8	0.09	0.01	0.06	0.08	0.05	2.8	1.6	80	51	37	29	18	13	32	24	0	2	37	24
T18-03D	T18-03D-A-014	TD4061	22.25	23.16	0.91	6	waste	MDST	9.6	623	5.1	3.6	13.4	18	0.04	0.01	<0.05	0.03	0.015	1.3	0.47	304	64	55	243	51	44	136	116	0	0	55	116
T18-03D	T18-03D-A-015	TD4062	23.16	23.56	0.4	6	waste	MDST	9.4	802	5.1	1.5	5.5	7.4	0.08	0.01	<0.05	0.07	0.015	2.5	0.47	124	57	51	50	23	20	122	108	0	0	51	108
T18-03D	T18-03D-A-016	TD4063	23.56	25	1.44	6	waste	MDST	9.6	897	5.1	2.6	9.4	12.8	0.07	0.02	<0.05	0.05	0.005	2.2	0.16	214	79	94	98	36	43	508	598	0	0	94	598
T18-03D	T18-03D-A-017	TD4064	25	26.12	1.12	6	waste	MDST	9.6	701	4.6	1.6	5.9	8.0	0.08	0.01	<0.05	0.07	0.015	2.5	0.47	134	68	77	54	27	31	145	164	0	0	77	164
T18-03D	T18-03D-A-018	TD4065	26.12	28	1.88	6	waste	MDST	7.4	1900	3.0	0.54	1.99	2.7	0.45	0.05	0.45	0.4	0.4	14	13	45	32	28	3.2	2.3	2.0	2.5	2.2	0.4	12.5	27.8	2.2
T18-03D	T18-03D-A-019	TD4066	28	29.06	1.06	6	waste	MDST	7.8	2350	2.8	1.6	5.8	7.9	0.47	0.07	0.49	0.4	0.42	15	13	133	63	70	9.0	4.3	4.8	4.8	5.4	0.4	13.1	70.3	5.4
T18-03D	T18-03D-A-020	TD4067	29.06	30	0.94	6	waste	MDST	8.5	1120	3.5	0.81	2.97	4.0	0.26	0.02	0.29	0.24	0.27	8.1	8.4	68	45	34	8.3	5.5	4.2	5.3	4.1	0.3	8.4	34.3	4.1
T18-03D	T18-03D-A-021	TD4069	30	32.25	2.25	6	waste	MDST	8.7	1100	3.8	0.56	2.06	2.8	0.29	0.02	0.35	0.27	0.33	9.1	10	47	26	19	5.2	2.8	2.1	2.5	1.8	0.3	10.3	18.8	1.8
T18-05D	28688	TH0828	126.6	126.8	0.2	6	waste	MDST	8.0	583	6.0	0.22	0.8	1.09	0.29	0.02	0.28	0.27	0.26	9.1	8.1	18	14	11	2.0	1.5	1.2	1.7	1.4	0.3	8.1	11.0	1.4
T18-05D	28689	TH0829	126.8	128.8	2	6	waste	MDST	8.1	729	2.1	0.55	2.01	2.7	0.4	0.03	0.41	0.37	0.38	13	12	46	33	29	3.7	2.6	2.3	2.7	2.5	0.4	11.9	29.3	2.5
T18-05D	28690	TH0830	128.8	131.6	2.8	6	waste	MDST	6.7	1300	8.0	0.62	2.27	3.1	2.5	0.04	2.5	2.5	2.5	79	77	52	37	34	0.65	0.46	0.43	0.47	0.44	2.46	76.88	33.8	0.44
T18-05D	28691	TH0832	131.6	131.9	0.3	6	waste	MDST	3.0	1400	59	0.17	0.62	0.85	2.6	0.13	2.4	2.5	2.2	82	70	14	13	8	0.17	0.15	0.1	0.18	0.11	2.24	70.0	8.0	0.11
T18-05D	28704	TH0843	131.9	132.2	0.3	6	waste	C	6.0	1170	42	0.78	2.84	3.9	2.3	0.07	2.2	2.3	2.1	73	66	65	58	58	0.89	0.79	0.8	0.87	0.88	2.12	66.25	58.0	0.88
T18-05D	28692	TH0833	132.2	132.5	0.3	6	waste	P	3.0	3320	4.3	0.14	0.51	0.7	2.5	0.25	2.5	2.2	2.2	78	69	12	51	-2	0.15	0.66	0	0.74	0	2	69	-2.3	0
T18-05D	28693	TH0834	132.5	132.85	0.35	6	waste	C	5.7	365	75	0.26	0.97	1.32	1.5	0.06	1.1	1.4	1.1	47	33	22	20	21	0.47	0.42	0.44	0.59	0.63	1.06	33.13	20.8	0.63
T18-05D	28694	TH0835	132.85	133.6	0.75	6	waste	MDST	9.1	483	5.1	1.8	6.6	9.1	0.18	0.02	0.17	0.16	0.15	5.6	4.7	151	86	127	27	15	23	18	27	0	5	127	27
T18-05D	28695	TH0836	133.6	134.4	0.8	6	waste	MDST	8.7	776	5.2	3.2	11.9	16	0.37	0.02	0.36	0.35	0.34	12	11	270	74	80	23	6.4	6.9	7.0	7.5	0.3	10.6	80.0	7.5
T18-05D	28696	TH0837	134.4	135	0.6	6	waste	MDST	6.6	2610	11	1.1	4.0	5.5	5.9	0.17	5.6	5.8	5.4	186	170	91	79	88	0.49	0.42	0.47	0.46	0.52	5.43	169.69	87.8	0.52
T18-05D	28697	TH0838	135	135.8	0.8	6	waste	C	5.6	1030	61	0.28	1.01	1.4	3.2	0.11	3.1	3.1	3.0	101	95	23	24	24	0.23	0.23	0.24	0.25	0.25	3.03	94.69	24.0	0.25

Drill Hole	Sample Number	Maxxam Sample ID	Sample Depth (m)			ABA Zone	Class	Lithology	Paste pH (su)	Paste EC (us/cm)	Carbon Species (w.t.%)				Sulphur Species (w.t.%)					Potentials (kg CaCO3/tonne)					Neutralization Potential Ratios					Mine Plan Inputs			
			From	To	Thickness						Total-C	Total Inorganic Carbon	CO2	CO3	Total-S	Sulphate	SICP	Sulphide (Total - SO4)	Sulphide (SICP - SO4)	AP (Total Sulphur)	AP (Sulphide)	CO3-NP	Sobek-NP	Modified Sobek-NP	CO3-NPR	Sobek-NPR (Total Sulphur)	Modified Sobek-NPR (Total Sulphur)	Sobek-NPR (Sulphide)	Modified Sobek NPR (Sulphide)	Sulphide-S	AP	NP	NPR
T18-07D	29516	TH0888	123.8	127.5	3.7	6	waste	MDST	8.2	1720	9.0	0.34	1.24	1.7	2.0	0.04	2.0	2.0	2.0	63	62	28	26	17	0.44	0.41	0.27	0.42	0.28	1.99	62.19	17.3	0.28
T18-07D	29517	TH0889	127.5	129.3	1.8	6	waste	SLST	8.6	1280	3.0	1.2	4.3	5.8	0.19	0.03	0.17	0.16	0.14	5.9	4.4	97	49	26	16	8.2	4.4	11	6.0	0.1	4.4	26	6.0
T18-07D	29518	TH0890	129.3	132.4	3.1	6	waste	SST	8.3	1550	3.3	0.49	1.8	2.5	1.1	0.04	1.1	1.1	1.1	35	34	41	26	17	1.2	0.74	0.47	0.77	0.48	1.09	34.06	16.5	0.48
T18-07D	29519	TH0891	132.4	133.8	1.4	6	waste	MDST	8.2	1290	2.9	0.11	0.4	0.55	1.1	0.02	1.2	1.1	1.2	36	38	9.1	8.5	7.3	0.26	0.24	0.2	0.23	0.19	1.2	37.5	7.3	0.19
T18-07D	29520	TH0892	133.8	134	0.2	6	waste	C	8.4	1130	3.2	0.09	0.33	0.45	0.83	0.02	0.84	0.81	0.82	26	26	7.5	9.5	7.0	0.29	0.37	0.27	0.37	0.27	0.82	25.63	7.0	0.27
T18-07D	29521	TH0893	134	134.6	0.6	6	waste	C	7.3	790	48	0.022	0.08	0.109	2.6	0.03	2.3	2.6	2.3	82	72	1.8	8.0	7.3	0.022	0.097	0.089	0.11	0.1	2.29	71.563	7.3	0.1
T18-03D	T18-03D-A-028	TD4076	37.8	38.1	0.3	7	8	MDST	9.0	552	4.1	0.27	1.0	1.4	0.02	0.01	<0.05	0.01	0.015	0.63	0.47	23	12	10	36	19	16	26	21	0	0	10	21
T18-01D	T18-01D-A-015	TD3965	44.75	47.2	2.45	7	waste	MDST	8.8	428	6.8	2.1	7.8	10.6	0.11	0.01	<0.05	0.1	0.015	3.4	0.47	176	56	30	51	16	8.6	120	63	0	0.5	30	63
T18-02D	T18-02D-A-030	TD4010	80.72	84.3	3.58	7	waste	MDST	7.3	1240	4.3	0.46	1.67	2.3	0.85	0.04	0.7	0.81	0.66	27	21	38	26	24	1.4	0.98	0.91	1.3	1.2	0.7	20.63	24.3	1.2
T18-02D	T18-02D-A-031	TD4011	84.3	84.53	0.23	7	waste	MDST	7.8	1090	9.3	0.99	3.63	4.9	2.0	0.03	1.7	1.9	1.6	61	51	83	61	58	1.3	0.99	0.94	1.2	1.1	1.6	50.94	57.5	1.1
T18-02D	T18-02D-A-032	TD4012	84.53	86.64	2.11	7	waste	MDST	8.2	669	2.5	0.68	2.49	3.4	1.2	0.01	1.0	1.2	1.0	38	31	57	38	34	1.5	1.0	0.91	1.2	1.1	1.0	31.25	34.0	1.1
T18-02D	T18-02D-A-033	TD4013	86.64	87.48	0.84	7	waste	MDST	7.1	1220	5.0	2.4	9.0	12.2	2.3	0.03	1.9	2.3	1.9	72	59	204	58	64	2.9	0.81	0.89	0.99	1.1	1.9	58.75	63.5	1.1
T18-02D	T18-02D-A-034	TD4014	87.48	89	1.52	7	waste	MDST	6.5	913	27	0.18	0.66	0.9	1.9	0.03	1.5	1.9	1.4	60	45	15	13	15	0.25	0.21	0.25	0.28	0.34	1.43	44.69	15.0	0.34
T18-03D	T18-03D-A-023	TD4071	32.65	32.9	0.25	7	waste	MDST	6.7	1750	2.0	0.85	3.1	4.2	5.2	0.05	5.1	5.2	5.1	163	158	70	43	36	0.43	0.26	0.22	0.27	0.22	5.06	158.13	35.5	0.22
T18-03D	T18-03D-A-024	TD4072	32.9	34.53	1.63	7	waste	MDST	8.6	550	17	0.3	1.1	1.5	0.62	0.03	0.61	0.59	0.58	19	18	25	13	15	1.3	0.66	0.75	0.71	0.8	0.58	18.13	14.5	0.8
T18-03D	T18-03D-A-025	TD4073	34.53	35.5	0.97	7	waste	MDST	9.4	447	6.7	3.4	12.4	17	0.06	0.01	0.07	0.05	0.06	1.9	1.9	283	45	49	151	24	26	24	26	0	2	49	26
T18-03D	T18-03D-A-026	TD4074	35.5	36.26	0.76	7	waste	MDST	8.8	676	7.3	0.42	1.53	2.1	0.18	0.02	0.25	0.16	0.23	5.6	7.2	35	36	26	6.2	6.5	4.5	5.1	3.5	0.2	7.2	25.5	3.5
T18-03D	T18-03D-A-027	TD4075	36.26	37.8	1.54	7	waste	MDST	9.1	430	13	0.9	3.31	4.5	0.07	0.01	0.06	0.06	0.05	2.2	1.6	75	28	23	34	13	11	18	15	0	2	23	15
T18-05D	28698	TH0839	135.8	139.1	3.3	7	waste	SLST	6.7	1610	4.2	0.34	1.23	1.7	1.4	0.04	1.5	1.4	1.4	45	45	28	15	13	0.63	0.34	0.29	0.34	0.29	1.43	44.69	12.8	0.29
T18-05D	28699	TH0840	139.1	139.9	0.8	7	waste	SLST	5.3	1830	4.3	0.21	0.78	1.06	2.1	0.06	2.1	2.0	2.0	65	62	18	9.3	7.3	0.27	0.14	0.11	0.15	0.12	1.99	62.19	7.3	0.12
T18-05D	28700	TH0842	139.9	140.9	1	7	waste	C	3.8	1500	51	0.22	0.8	1.09	4.1	0.12	3.9	4.0	3.7	128	117	18	17	17	0.14	0.13	0.13	0.14	0.15	3.74	116.88	17.0	0.15
T18-05D	28705	TH0844	140.9	141.2	0.3	7	waste	MDST	8.8	392	12	3.3	12.1	16	0.19	0.02	0.1	0.17	0.08	5.9	2.5	274	73	87	46	12	15	29	35	0	3	87	35
T18-05D	28706	TH0845	141.2	142.1	0.9	7	waste	MDST	8.0	341	21	0.11	0.39	0.53	0.24	0.01	0.08	0.23	0.07	7.5	2.2	8.9	6.8	5.8	1.2	0.91	0.77	3.1	2.7	0.1	2.19	5.8	2.7
T18-02D	T18-02D-A-035	TD4016	89	90.3	1.3	8	waste	MDST	8.6	581	4.0	0.31	1.15	1.6	0.08	0.01	<0.05	0.07	0.015	2.5	0.47	26	17	15	10	6.6	6.1	35	33	0	0.5	15	33
T18-02D	T18-02D-A-036	TD4017	90.3	90.93	0.63	8	waste	MDST	8.8	417	3.9	0.33	1.22	1.7	0.11	0.01	0.08	0.1	0.07	3.4	2.2	28	16	15	8.1	4.7	4.2	7.5	6.6	0.1	2.2	14.5	6.6
T18-02D	T18-02D-A-037	TD4018	90.93	92.52	1.59	8	waste	MDST	9.0	532	8.7	0.44	1.61	2.2	0.12	<0.01	<0.05	0.12	0.02	3.8	0.63	37	19	16	9.8	5.1	4.3	30	26	0	0.6	16	26
T18-05D	28708	TH0847	142.6	143	0.4	8	waste	MDST	7.9	661	2.3	0.37	1.36	1.9	0.09	0.01	0.07	0.08	0.06	2.8	1.9	31	11	6.5	11	3.9	2.3	5.9	3.5	0.1	1.9	6.5	3.5
T18-05D	28709	TH0848	143	143.9	0.9	8	waste	MDST	8.5	724	3.0	0.49	1.79	2.4	0.05	0.02	<0.05	0.03	0.005	1.6	0.16	41	26	21	26	17	13	168	131	0	0	21	131
T18-05D	28710	TH0849	143.9	144.1	0.2	8	waste	MDST	7.6	496	2.7	0.13	0.47	0.64	0.08	0.03	0.08	0.05	0.05	2.5	1.6	11	36	27	4.3	14	11	23	17	0	2	27	17
T18-05D	28711	TH0850	144.1	144.4	0.3	8	waste	MDST	7.6	538	23	0.43	1.59	2.2	0.39	0.01	0.24	0.38	0.23	12	7.2	36	33	32	3.0	2.7	2.6	4.5	4.4	0.2	7.2	31.5	4.4
T18-05D	28712	TH0851	144.4	148	3.6	8	waste	MDST	8.1	464	2.6	1.4	5.2	7.1	0.06	0.02	<0.05	0.04	0.005	1.9	0.16	118	49	10	63	26	5.3	316	64	0	0.2	10	64
T18-05D	28713	TH0852	148	148.2	0.2	8	waste	C	8.7	329	43	0.88	3.24	4.4	0.36	0.01	0.09	0.35	0.08	11	2.5	74	68	74	6.5	6.0	6.6	27	30	0	2.5	74	30
T18-03D	T18-03D-A-006	TD4052	12.57	12.82	0.25	55	waste	MDST	7.7	694	14	0.1	0.37	0.5	0.33	0.02	0.2	0.31	0.18	10	5.6	8.4	7.5	9.3	0.82	0.73	0.9	1.3	1.7	0.2	5.63	9.3	1.7
T18-03D	T18-03D-A-007	TD4053	12.82	13.44	0.62	55	waste	MDST	8.6	479	3.1	0.5	1.84	2.5	0.07	0.01	<0.05	0.06	0.015	2.2	0.47	42	33	30	19	15	14	70	65	0	0	30	65
T18-03D	T18-03D-A-008	TD4054	13.44	14.9	1.46	55	waste	MDST	8.2	381	14	0.31	1.14	1.6	0.22	0.01	0.12	0.21	0.11	6.9	3.4	26	19	22	3.8	2.8	3.1	5.6	6.3	0.1	3.4	21.5	6.3
T18-02D	T18-02D-A-007	TD3985	27.3	28.8	1.5	1a	waste	MDST	8.8	2170	2.2	0.88	3.21	4.4	1.3	0.02	1.2	1.2	1.1	39	36	73	58	40	1.9	1.5	1.0	1.6	1.1	1.1	35.6	39.5	1.1
T18-02D	T18-02D-A-008	TD3986	28.8	30.3	1.5	1a	waste	MDST	8.8	2150	2.0	0.82	3.02	4.1	1.2	0.03	1.1	1.2	1.0	39	32	69	50	42	1.8	1.3	1.1	1.6	1.3	1.0	31.9	41.8	1.3
T18-02D	T18-02D-A-009	TD3987	30.3	32.88	2.58	1a	waste	MDST	8.5	2810	2.5	1.3	4.7	6.5	1.6	0.05	1.3	1.5	1.2	49	38	108	65	49	2.2	1.3	1.0	1.7	1.3	1.2	38.4	49.3	1.3
T18-02D	T18-02D-A-010	TD3988	32.88	33.94	1.06	1a	waste	MDST	8.9	1980	2.8	1.5	5.6	7.7	1.1	0.02	0.95	1.1	0.93	36	29	128	69	53	3.6	1.9	1.5	2.4	1.8	0.9	29.1	53.0	1.8
T18-02D	T18-02D-A-011	TD3989	33.94	36.86	2.92	1a	waste	MDST	8.2	1670	7.0	0.99	3.62	4.9	2.6	0.03	2.3	2.6	2.3	81	71	82	64	24	1.0	0.78	0.29	0.9	0.34	2.26	70.63	23.8	0.34
T18-05D	28671	TH0810	85.6	88.3	2.7	1a	waste	SLST	8.3	2350	4.6	1.8	6.7	9.1	1.3	0.05	1.2	1.3	1.2	41	37	151	75	68	3.7	1.8	1.6	2.0	1.8	1.2	37.2	68.0	1.8
T18-05D	28672	TH0811	88.3	91.4	3.1	1a	waste	SLST	5.3	2460	12	0.49	1.79	2.4	2.2	0.08	2.2	2.1	2.2	69	67	41	26	23	0.59	0.38	0.33	0.39	0.33	2.15	67.19	22.5	0.33
T18-07D	28837	TH0855	10.4	14.8	4.4	1a	waste	MDST	8.7	2100	2.7	0.49	1.8	2.5	1.6	0.04	1.7	1.6	1.6	51	51	41	59	54	0.8	1.1	1.1	1.1	1.1	1.6	50.9	54.0	1.1
T18-07D	28838	TH0856	14.8	18.3	3.5	1a	waste	SLST	8.5	2440	1.8	0.13	0.48	0.65	1.8	0.05	1.7	1.8	1.7	57	53	11	32	25	0.19	0.57	0.43	0.62	0.47	1.68	52.5	24.5	0.47
T18-07D	28839	TH0857	18.3	22.2	3.9	1a	waste	SLST	8.8	1300	1.2	0.38	1.4	1.9	1.3	0.03	1.3	1.2	1.3	40	39	32	37	26	0.8	0.93	0.66	0.94	0.67	1.25	39.06	26.0	0.67
T18-07D	28840	TH0858	22.2	26.1	3.9	1a	waste	SLST	8.6	1550	1.1	0.28	1.01	1.4	0.74	0.03	0.74	0.71	0.71	23	22	23	30	21	0.99	1.3	0.89	1.3	0.92	0.71	22.19	20.5	0.92
T18-07D	28841	TH0859	26.1	30	3.9	1a	waste	SLST	8.4	1160	1.4	0.22	0.82	1.12	1.0	0.03	0.98	1.0	0.95	32	30	19	26	17	0.58	0.81	0.51	0.88	0.56	0.95	29.69	16.5	0.56
T18-07D	28842	TH0860	30	33.9	3.9	1a	waste	SLST	9.0	1810	1.2	0.19	0.71	0.97	1.2	0.04	1.2	1.1	1.1	37	35	16	31	20	0.44	0.83	0.53	0.87	0.56	1.12	35.0	19.5	0.56
T18-07D	28843	TH0861	33.9	38.2	4.3	1a	waste	SLST	8.3	1920	1.2	0.071	0.26	0.35	1.5	0.02	1.5	1.5	1.5	46	46	5.9	13	9.5	0.13	0.29	0.21	0.29	0.21	1.48	46.25	9.5	0.21
T18-07D	28844	TH0862	38.2	42.3	4.1	1a	waste	FLT	8.4	1120	1.3	0.24	0.87	1.19	1.0	0.03	1.1	0.99	1.0	32	32	20	28	21	0.62	0.88	0.67	0.87	0.66	1.03	32.19	21.3	0.66
T18-07D	28845	TH0863	42.3	44.2	1.9	1a	waste	SLST	9.0	1370	1.1	0.14	0.52	0.71	0.86	0.02	0.92	0.84	0.9	27	28	12	26	12	0.44	0.97	0.46	0.92	0.44	0.9	28.13	12.3	0.44
T18-07D	28846	TH0865	44.2	49.8	5.6	1a	waste	SST	9.0	1530	1.1	0.35	1.28	1.7	0.68	0.03	0.68	0.65	0.65	21	20	29	37	28	1.4	1.7	1.3	1.8	1.4	0.7	20.3	27.8	1.4
T18-07D	28847	TH0866	49.8	52.8	3	1a	waste	SLST	8.4	1740	1.3	0.31	1.15	1.6	0.65	0.02	0.64	0.63	0.62	20	19	26	36	27	1.3	1.8	1.3	1.9	1.4	0.6	19.4	27.0	1.4
T18-07D	28848	TH0867	52.8	57.15	4.35	1a	waste	SLST	9.2	1760	1.3	0.068	0.25	0.34	0.52	0.02	0.51	0.5	0.49	16	15	5.7	26	10	0.35	1.6	0.63	1.7	0.67	0.49	15.31	10.3	0.67
T18-07D	28849	TH0868	57.15	61.5	4.35	1a	waste	SLST	9.2	1550	1.4	0.12	0.45	0.61	0.8	0.02	0.82	0.78	0.8	25	25	10	25	15	0.41	0.98	0.6	0.98	0.6	0.8	25.0	15.0	0.6
T18-07D	28850	TH0869	61.5	63.4	1.9	1a	waste	FLT	8.5	2180	3.1	1.9	6.9	9.5	0.91	0.04	0.86	0.87	0.82	28	26	158	174	152	5.6	6.1	5.3	6.8	5.9	0.8	25.6	152.0	5.9
T18-07D	29501	TH0870	63.4	66.8	3.4	1a	waste	MDST	8.7	1660	1.8	0.34	1.24	1.7	0.77	0.03	0.78	0.74	0.75	24	23	28	39	19	1.2	1.6	0.79	1.7	0.81	0.75	23.44	19.0	0.81
T18-07D	29502	TH0871	66.8	69.6	2.8	1a	waste	SLST	8.8	1330	2.8	1.3	4.7	6.4	1.6	0.02	1.6	1.5	1.5	48	48	107	90	101	2.2	1.8	2.1	1.9	2.1	1.5	48.1	101.0	2.1
T18-07D	29503	TH0872	69.6	72.4	2.8	1a	waste	SLST	8.6	1290	1.9	0.23	0.86	1.17	1.7	0.02	1.8	1.7	1.8	54	56	20	42	26	0.36	0.78	0.48	0.76	0.46	1.79	55.94	26.0	0.46
T18-07D	29504	TH0873	72.4	75.6	3.2	1a	waste	SST	8.7	1270	2.8	1.2	4.3	5.8	1.8	0.02	1.8	1.8	1.8	56	57	98	133	104	1.7	2.4	1.9	2.3	1.8	1.8	56.9	104.0	1.8
T18-07D	28786	TH0874	75.6	78.8	3.2	1a	waste	SST	8.2	980	3.6	2.1	7.6	10.4	1.1	0.01	1.1	1.1	1.1	33	33	173	203	175	5.2	6.1	5.2	6.1	5.2	1.1	33.4	175.0	5.2
T18-07D	29505	TH0876	78.8	84	5.2	1a	waste	SLST	8.6	1110	1.9	0.45	1.66	2.3	0.54	0.02	0.54	0.52	0.52	17	16	38	44	28	2.2	2.6	1.6	2.7	1.7	0.5	16.3	27.5	1.7
T18-07D	29506	TH0877	84	86.9	2.9	1a	waste	SLST	8.7	1160	3.4	2.0	7.2	9.8	1.0	0.02	1.0	1.0	1.0	32	32	164	250	187	5.1	7.8	5.8	7.9	5.9	1.0	31.6	187.0	5.9
T18-07D	29507	TH0878	86.9	92.2	5.3	1a	waste	SLST	8.9	800	4.1	2.8	10.2	14	0.6	0.02	0.59	0.58	0.57	19	18	231	248	205	12	13	11	14	12	1	18	205	12
T18-07D	29508	TH0879	92.2	96.3	4.1	1a	waste	SLST	8.6	975	1.8	0.42	1.53	2.1	0.55	0.02	0.54	0.53	0.52	17	16	35	51	32	2.0	3.0	1.8	3.2	1.9	0.5	16.3	31.5	1.9
T18-07D	29509	TH0880	96.3	104.7	8.4	1a	waste	SLST	8.4	977	2.2	0.47	1.72	2.3	0.27	0.02	0.26	0.25	0.24	8.4	7.5	39	39	21	4.6	4.7	2.4	5.2	2.7	0.2	7.5	20.5	2.7
T18-07D	29510	TH0881	104.7	107.8	3.1	1a	waste	MDST	8.5	1160	2.7	0.63	2.3	3.1	0.63	0.02	0.64	0.61	0.62	20	19	52	51	35	2.7	2.6	1.8	2.6	1.8	0.6	19.4	35.3	1.8
T18-07D	29511	TH0882	107.8	111.1	3.3	1a	waste	MDST	8.5	1080	2.9	0.98	3.59	4.9	0.18	0.01	0.18	0.17	0.17	5.6	5.3	82	59	44	15	10	7.9	11	8.3	0.2	5.3	44	8.3
T18-07D	29512	TH0883	111.1	114.2	3.1	1a	waste	MDST	8.4	1160	2.5	0.47	1.72	2.3	0.34	0.02	0.35	0.32	0.33	11	10	39	43	21	3.7	4.1	2.0	4.2	2.0	0.3	10.3	20.8	2.0
T18-07D	29513	TH0884	114.2	117.4	3.2	1a	waste	MDST	8.4	1210	2.4	0.8	2.92	4.0	0.4	0.02	0.42	0.38	0.4	13	13	66	54	41	5.3	4.3	3.3	4.3	3.3	0.4	12.5	40.8	3.3
T18-07D	29514	TH0885	117.4	120.6	3.2	1a	waste	MDST	8.3	1630	2.3	1.0	3.8	5.2	1.2	0.02	1.2	1.1	1.2	36	37	87	54	33	2.4	1.5	0.91	1.5	0.9	1.17	36.56	32.8	0.9
T18-07D	29515	TH0887	120.6	123.8	3.2	1a	waste	MDST	8.3	1250	2.0	0.86	3.14	4.3	1.2	0.02	1.2	1.2	1.2	37	37	71	41	31	1.9	1.1	0.84	1.1	0.86	1.17	36.56	31.3	0.86

Appendix D – Results from Elemental Analysis

Hole-ID	Sample ID	Maxxam Sample ID	nple Depth (m) From	To	ABA Zone	Sample Type	Lithology	Al	As	Au	B	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg
								%	ppm	ppb	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppb
T18-01D	T18-01D-A-001	TD3950	12.38	13.6	2	waste	MDST	0.48	12.3	1.5	<20	158	0.37	0.76	0.71	23.9	18.2	45.7	3.39	1.3	270
T18-01D	T18-01D-A-002	TD3951	13.6	14	2	coal	C	0.07	6.9	0.5	<20	36.5	0.13	2.23	0.38	14.4	5.6	16.6	2.97	1.5	180
T18-01D	T18-01D-A-003	TD3952	14	15.8	3	waste	MDST	0.58	5.3	0.3	<20	285	0.21	0.26	0.13	11.5	20.4	30.7	3.45	1.4	70
T18-01D	T18-01D-A-004	TD3953	15.8	17.2	3	waste	MDST	0.54	11.7	0.5	<20	268	0.19	0.87	0.08	17.3	24.4	32.8	6.53	1.5	78
T18-01D	T18-01D-A-005	TD3954	17.2	18.7	3	waste	MDST	0.51	13.1	<0.2	<20	299	0.2	0.91	0.09	20	18.7	35.9	5.25	1.4	64
T18-01D	T18-01D-A-006	TD3955	18.7	19	3	coal	C	0.54	9	1.1	<20	324	0.23	0.81	0.09	19.7	11.7	45.2	2.87	1.3	17
T18-01D	T18-01D-A-007	TD3956	19	21.31	3	waste	MDST	0.67	8	2	<20	287	0.19	1.38	0.06	35.7	15.8	40.6	9.1	1.7	31
T18-01D	T18-01D-A-008	TD3957	22.89	27.7	4	waste	MDST	0.7	10.2	0.5	<20	274	0.16	2.61	0.04	20.3	17.7	33.8	6.73	1.6	34
T18-01D	T18-01D-A-009	TD3958	27.7	30	4	waste	MDST	0.55	19	0.3	<20	220	0.18	1.12	0.09	36.6	15.9	35	7.3	1.6	111
T18-01D	T18-01D-A-010	TD3959	30	33.7	5	waste	SLST	0.53	11.9	1.5	<20	200	0.21	0.84	0.06	23.4	18	33.3	2.2	1.5	59
T18-01D	T18-01D-A-011	TD3961	33.7	36.39	5	waste	SLST	0.5	13.5	0.2	<20	177	0.2	0.7	0.04	18.8	17.8	33.4	1.89	1.6	75
T18-01D	T18-01D-A-012	TD3962	38.52	40.71	6	waste	FLT	0.4	22.7	0.7	<20	98.9	0.22	3.66	0.12	20.3	19.3	42.6	5.73	1.3	247
T18-01D	T18-01D-A-013	TD3963	40.71	43.93	6	waste	MDST	0.49	8.3	<0.2	<20	198	0.18	2.69	0.06	18	13.4	34.7	4.9	1.3	67
T18-01D	T18-01D-A-014	TD3964	43.93	44.75	6	waste	MDST	0.53	2.2	<0.2	<20	148	0.1	1.33	0.14	9.8	18.2	29.3	14.2	1.3	24
T18-01D	T18-01D-A-015	TD3965	44.75	47.2	7	waste	MDST	1.82	2.5	<0.2	<20	440	0.08	2.38	0.28	32	31.4	64.8	8.15	4.2	26
T18-02D	T18-02D-A-001	TD3978	8.35	12.03	1	waste	MDST	0.47	11.1	0.5	<20	131	0.21	1.09	0.1	20.2	22.4	47.8	3.52	1.4	88
T18-02D	T18-02D-A-002	TD3979	12.03	15.3	1	waste	MDST	0.51	11.8	<0.2	<20	162	0.24	1.05	0.09	24.8	26.1	53.5	3.82	1.4	71
T18-02D	T18-02D-A-003	TD3980	15.3	18.58	1	waste	MDST	0.55	10.6	0.4	<20	164	0.2	2.53	0.08	19.4	28.1	44.6	4.29	1.4	41
T18-02D	T18-02D-A-004	TD3981	18.58	21.3	1	waste	MDST	0.57	14	0.2	<20	165	0.22	2.76	0.1	19.5	28.9	49.4	4.24	1.7	52
T18-02D	T18-02D-A-005	TD3983	21.3	24.3	1	waste	MDST	0.52	12.7	0.6	<20	167	0.29	0.84	0.09	31.5	25.6	58.4	4.4	1.4	81
T18-02D	T18-02D-A-006	TD3984	24.3	27.3	1	waste	MDST	0.5	10.1	0.8	<20	191	0.14	0.91	0.1	12	15.1	33	5.07	1	53
T18-02D	T18-02D-A-007	TD3985	27.3	28.8	1	waste	MDST	0.54	18.5	1.2	<20	213	0.12	0.81	0.08	14.9	10.9	36.2	3.52	1.2	91
T18-02D	T18-02D-A-008	TD3986	28.8	30.3	1	waste	MDST	0.66	14.9	0.3	<20	216	0.14	1.04	0.06	11.3	12	36.6	2.99	1.6	49
T18-02D	T18-02D-A-009	TD3987	30.3	32.88	1	waste	MDST	0.49	21.3	0.5	<20	184	0.09	0.98	0.14	11.8	17.8	23.7	4.86	1	201
T18-02D	T18-02D-A-010	TD3988	32.88	33.94	1	waste	MDST	0.52	16	<0.2	<20	153	0.08	0.96	0.07	15.4	30.9	18.6	5.9	1.3	50
T18-02D	T18-02D-A-011	TD3989	33.94	36.86	1	waste	MDST	0.43	14.1	0.5	<20	107	0.12	0.96	0.16	25.5	24.4	26.4	4.51	1.3	159
T18-02D	T18-02D-A-012	TD3990	36.86	39.3	2	waste	SLST	0.43	12.4	<0.2	<20	119	0.22	0.24	0.03	19.5	17.7	39.3	3.5	1.2	144
T18-02D	T18-02D-A-013	TD3991	39.3	41.75	2	waste	SLST	0.32	5.3	<0.2	<20	103	0.22	0.27	0.14	15.2	12.6	36.4	2.25	1	121
T18-02D	T18-02D-A-014	TD3992	41.75	45.18	3	waste	MDST	0.46	8.3	<0.2	<20	142	0.16	1.46	0.05	17.3	19.8	29.1	5	1.1	48
T18-02D	T18-02D-A-015	TD3994	45.18	48.3	3	waste	MDST	0.44	12.2	0.3	<20	133	0.17	0.99	0.05	21.7	22.6	32.1	3.07	1.2	61
T18-02D	T18-02D-A-016	TD3995	48.3	48.76	3	waste	MDST	0.56	27.8	1.1	<20	110	0.27	0.49	0.1	24.8	17.9	33	3.71	1.5	257
T18-02D	T18-02D-A-017	TD3996	50.44	50.5	4	waste	MDST	0.46	0.4	1.3	<20	154	0.17	0.53	0.03	0.9	8.7	38.9	0.48	0.9	<5
T18-02D	T18-02D-A-018	TD3997	50.5	52.8	4	waste	MDST	0.51	12.6	1.4	<20	166	0.17	1.15	0.05	20.1	14.8	35.7	6.28	1.1	37
T18-02D	T18-02D-A-019	TD3998	52.8	54.3	4	waste	MDST	0.49	8.7	1.2	<20	171	0.13	2.85	0.05	19.2	17.3	27	6.68	1.2	42
T18-02D	T18-02D-A-020	TD3999	54.3	58.08	4	waste	MDST	0.47	12.7	0.8	<20	146	0.16	1.82	0.06	17.7	13.3	32.9	2.54	1.2	181
T18-02D	T18-02D-A-021	TD4000	58.08	60.3	5	waste	SLST	0.39	9.9	0.5	<20	199	0.15	5.78	0.04	14.7	22.8	18.7	6.88	1	63
T18-02D	T18-02D-A-022	TD4001	60.3	63.3	5	waste	SLST	0.45	10.8	1.8	<20	154	0.23	0.75	0.05	20.6	14.3	34.6	1.62	1.4	35
T18-02D	T18-02D-A-023	TD4002	63.3	66.3	5	waste	SLST	0.39	9.9	0.5	<20	132	0.17	1.34	0.02	15.7	18.2	24.8	7.12	1.1	43
T18-02D	T18-02D-A-024	TD4003	66.3	67.8	5	waste	SLST	0.38	10.6	1.1	<20	104	0.21	0.5	0.09	16.3	12.3	34	2.3	1.1	90
T18-02D	T18-02D-A-025	TD4005	67.8	68.56	5	waste	SLST	0.43	12.5	0.3	<20	94.7	0.19	0.36	0.07	19.2	17.7	28.8	2.65	1.3	167
T18-02D	T18-02D-A-026	TD4006	75.62	78.3	6	waste	SLST	0.48	13.2	1.4	<20	158	0.27	1	0.05	20.2	18.9	52.1	2.93	1.4	76
T18-02D	T18-02D-A-027	TD4007	78.3	79.35	6	waste	SLST	0.45	14.1	0.9	<20	130	0.28	0.52	0.09	21.8	16.2	53.4	3.26	1.2	162
T18-02D	T18-02D-A-028	TD4008	79.35	79.54	6	waste	MDST	0.44	1.6	<0.2	<20	99	0.22	4.82	0.11	2.1	2.8	10	2.09	1.2	17
T18-02D	T18-02D-A-029	TD4009	79.54	80.72	6	waste	MDST	0.4	19.3	0.5	<20	116	0.16	1.13	0.09	18	12.2	32.9	3.15	1.2	108
T18-02D	T18-02D-A-030	TD4010	80.72	84.3	7	waste	MDST	0.45	7.5	<0.2	<20	135	0.15	0.65	0.05	14.5	10.2	29.9	1.63	1.4	47
T18-02D	T18-02D-A-031	TD4011	84.3	84.53	7	waste	MDST	0.41	5.1	<0.2	<20	109	0.15	1.51	0.06	13.8	11.3	27.5	3.19	1.2	102
T18-02D	T18-02D-A-032	TD4012	84.53	86.64	7	waste	MDST	0.46	8.1	0.8	<20	119	0.2	0.69	0.03	15.5	12	38.2	2.75	1.3	69
T18-02D	T18-02D-A-033	TD4013	86.64	87.48	7	waste	MDST	0.44	21.9	0.4	<20	118	0.16	1.17	0.05	16	15.7	30	10.1	1.3	250
T18-02D	T18-02D-A-034	TD4014	87.48	89	7	waste	MDST	0.36	22.2	<0.2	<20	73	0.19	0.42	0.53	13	7.4	51.9	1.6	1.1	122
T18-02D	T18-02D-A-035	TD4016	89	90.3	8	waste	MDST	0.6	3.2	<0.2	<20	79.5	0.14	0.49	0.38	18.3	8.2	63.6	0.96	1.8	20
T18-02D	T18-02D-A-036	TD4017	90.3	90.93	8	waste	MDST	0.49	12.8	<0.2	<20	78.4	0.25	0.42	0.08	22.9	9.8	39.7	1.06	1.6	32
T18-02D	T18-02D-A-037	TD4018	90.93	92.52	8	waste	MDST	0.49	2	0.2	<20	78.8	0.15	0.48	0.49	17.1	6.7	52.3	1.46	1.5	43
T18-03D	T18-03D-A-005	TD4051	10.5	10.8	5	waste	MDST	0.47	13.8	<0.2	<20	121	0.23	0.76	0.07	22.2	27.7	36.3	3.06	1.4	197
T18-03D	T18-03D-A-006	TD4052	12.57	12.82	55	waste	MDST	0.36	1.3	<0.2	<20	99.8	0.21	0.21	1.32	10	7.6	64.6	0.43	0.8	22
T18-03D	T18-03D-A-007	TD4053	12.82	13.44	55	waste	MDST	0.54	0.6	<0.2	<20	127	0.16	0.9	0.62	16.5	23.6	58.8	1.09	1.4	26
T18-03D	T18-03D-A-008	TD4054	13.44	14.9	55	waste	MDST	0.41	2	<0.2	<20	98.1	0.26	0.49	0.15	9.4	13.8	28.3	0.78	1.2	54
T18-03D	T18-03D-A-009	TD4055	17.5	18.6	6	waste	MDST	0.51	18.8	1.5	<20	155	0.31	0.85	0.08	24.7	29.7	56.1	2.38	1.5	308
T18-03D	T18-03D-A-010	TD4056	18.6	19.4	6	coal	C	0.53	0.5	0.8	<20	90.2	0.3	0.36	0.12	1.6	2.1	11.7	0.33	1.3	39
T18-03D	T18-03D-A-011	TD4058	19.4	19.6	6	coal	C	0.3	3.1	<0.2	<20	100	0.12	0.69	0.11	12.6	5.2	37.9	0.62	1	61
T18-03D	T18-03D-A-012	TD4059	19.6	20.5	6	waste	MDST	0.45	2.9	<0.2	<20	162	0.15	0.36	0.12	17.4	12.1	57.7	0.82	1.2	28
T18-03D	T18-03D-A-013	TD4060	20.5	22.25	6	waste	MDST	0.49	2.3	<0.2	<20	177	0.12	0.89	0.22	19.1	21.9	40.9	2.79	1.3	23
T18-03D	T18-03D-A-014	TD4061	22.25	23.16	6	waste	MDST	0.56	1.8	<0.2	<20	152	0.07	1.7	0.1	18	24.2	23.5	13	1.4	8
T18-03D	T18-03D-A-015	TD4062	23.16	23.56	6	waste	MDST	0.49	3.7	0.2	<20	170	0.13	1.29	0.19	21.2	25.7	33.3	4.55	1.2	25
T18-03D	T18-03D-A-016	TD4063	23.56	25	6	waste	MDST	0.72	4.1	1.9	<20	188	0.12	3.14	0.16	24	28	26	6.98	1.6	27
T18-03D	T18-03D-A-017	TD4064	25	26.12	6	waste	MDST	0.4	2.2	1.1	<20	148	0.12	1.93	0.11	12.9	38.5	20.7	4.32	0.9	23
T18-03D	T18-03D-A-018	TD4065	26.12	28	6	waste	MDST	0.53	11.1	1.1	<20	256	0.17	0.62	0.08	22	19.8	35.1	2.11	1.4	57
T18-03D	T18-03D-A-019	TD4066	28	29.06	6	waste	MDST	0.49	9.6	1.7	<20	187	0.08	1.87	0.06	16	34.9	22.7	4.71	1	53
T18-03D	T18-03D-A-020	TD4067	29.06	30	6	waste	MDST	0.5	6.1	<0.2	<20	256	0.15	0.6	0.11	18.2	16.1	36.4	2.91	1.2	49
T18-03D	T18-03D-A-021	TD4069	30	32.25	6	waste	MDST	0.47	6.5	0.5	<20	273	0.26	0.27	0.29	16.4	10.8	42	2.18	1.1	43
T18-03D	T18-03D-A-022	TD4070	32.25	32.65	6	8	SHC	0.36	7.7	1.3	<20	153	0.21	0.24	0.6	18.1	8.2	69.5	1.53	1.7	127
T18-03D	T18-03D-A-023	TD4071	32.65	32.9	7	waste	MDST	0.42	215	0.8	<20	74.8	0.09	0.75	0.39	32.8	43.8	41.9	6.32	1.3	81
T18-03D	T18-03D-A-024	TD4072	32.9	34.53	7	waste	MDST	0.39	3.9	0.4	<20	153	0.17	0.26	0.66	17	12.8	61.5	1.31	1.2	58
T18-03D	T18-03D-A-025	TD4073	34.53	35.5	7	waste	MDST	0.43	3.9	0.7	<20	146	0.13	1.1	0.32	17.3	21.1	43.9	13.2	1.1	27
T18-03D	T18-03D-A-026	TD4074	35.5	36.26	7	waste	MDST	1.51	6.9	<0.2	<20	252	0.11	1.57	0.42	27.8	26.3	70.8	1.51	3.3	54
T18-03D	T18-03D-A-027	TD4075	36.26	37.8	7	waste	MDST	0.44	1	<0.2	<20	149	0.13	0.53	0.55	14.6	12.1	67.2	3.22	1.4	39
T18-03D	T18-03D-A-028	TD4076	37.8	38.1	7	8	MDST	0.47	1.7	0.7	<20	166	0.14	0.21	0.65	12.1	8.1	63.1	0.94	1.1	22
T18-05D	28651	TH0788	13.5	22.5	1	waste	SLST	0.98	6	0.6	<20	201	0.36	0.8	0.08	16.3	26.2	44.4	3.31	3.1	68
T18-05D	28652	TH0789	22.5	23.2	1	waste	SLST	0.75	19.3	0.4	<20	220	0.1	0.99	0.2	12.9	23.9	18.3	3.9	1.8	373
T18-05D	28653	TH0790	23.2	30.6	1	waste	SLST	0.64	12.8	<0.2	<20	170	0.27	1.72	0.07	19.4	32.3	45.3	4.26	2.3	117
T18-05D	28654	TH0791	30.6	33.5	1	waste	SLST	0.54	10.6	<0.2	<20	169	0.26	1.16	0.08	20.3	32.3	47.8	4.23	2.1	52
T18-05D	28655	TH0792	33.5	37.4	1	waste	SLST	0.56	9.9	<0.2	<20	184	0.29	0.8	0.08	22.3	29.7	54.9	3.78	1.9	83
T18-05D	28656	TH0793	37.4	38.9	1	waste	SLST	0.49	7.4	<0.2	<20	175	0.23	1.09	0.06	19	34	33.8	3.93	1.8	65
T18-05D	28657	TH0794	38.9	42.4	1	waste	SLST	0.49	8.4	<0.2	<20	164	0.2	1.28	0.07	19.2	34.7	29.6	3.95	1.7	81
T18-05D	28658	TH0795	42.4	46	1	waste	SLST	0.52	8.5	0.6	<20	169	0.22	1.22	0.05	18.3	32.8	37.2	4.07	1.8	102
T18-05D	28659	TH0796	46	49.6	1	waste	SLST	0.51	9.9	<0.2	<20	158	0.17	2.09	0.06	18.9	31.3	26.8	3.62	1.6	136
T18-05D	28660	TH0797	49.6	53.2	1	waste	SLST	0.46	9.8	<0.2	<20	160	0.21	1.09	0.07	21	30.1	40.7	4.09	1.5	112
*Screening Criteria								800	20	40	100	4300	2	300	1.8	250	2000	600	500	170	800

Sample ID	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Se	Sr	Te	Th	Ti	Tl	U	V	W	Zn
	%	ppm	%	ppm	ppm	%	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
T18-01D-A-001	0.14	1.4	0.6	403	1.14	0.051	52.7	0.016	89.8	2.15	0.38	11.1	<0.1	74.5	0.12	1.5	<0.001	0.08	0.3	24	<0.05	166
T18-01D-A-002	0.02	<0.5	1	168	0.5	0.014	19.6	0.001	42.9	3.12	0.86	6	0.2	204	0.12	0.2	0.006	0.02	0.2	66	<0.05	44.3
T18-01D-A-003	0.17	1.4	0.5	278	0.57	0.111	23.2	0.012	22	1.11	0.06	10.5	<0.1	59.9	0.09	0.8	<0.001	0.03	0.4	25	<0.05	89
T18-01D-A-004	0.15	2.7	0.95	941	0.91	0.101	38.9	0.017	14.7	1.24	0.03	12.7	0.2	89.2	0.07	0.9	<0.001	0.03	0.3	36	<0.05	107
T18-01D-A-005	0.14	1.9	0.8	1700	1.36	0.093	37.4	0.027	15.5	0.87	0.07	11.8	0.1	94.1	0.13	0.6	<0.001	0.03	0.4	34	<0.05	111
T18-01D-A-006	0.15	2.7	0.45	3110	0.48	0.129	28	0.021	14	0.2	0.05	14.2	0.2	88.3	0.08	1.5	<0.001	0.03	0.2	31	<0.05	98.8
T18-01D-A-007	0.16	3.3	0.85	2900	1.51	0.118	51.8	0.053	15.2	0.57	0.06	20.6	0.4	112	0.05	1.3	<0.001	0.02	0.3	62	<0.05	130
T18-01D-A-008	0.15	2.8	0.97	2130	0.61	0.109	36.9	0.042	11.3	0.64	0.04	14.6	0.2	122	0.02	2	<0.001	0.03	0.3	49	<0.05	95.8
T18-01D-A-009	0.13	2	0.89	1290	3.23	0.103	64	0.036	20.5	1.28	0.11	14.9	0.6	95.6	0.03	0.7	<0.001	0.06	0.4	51	<0.05	109
T18-01D-A-010	0.14	1.3	0.45	395	1.29	0.082	45.2	0.016	14.4	0.61	0.04	11.2	0.2	80.9	0.07	1.1	<0.001	0.03	0.3	30	<0.05	117
T18-01D-A-011	0.14	1.1	0.37	499	0.91	0.067	31.5	0.016	11.1	0.75	0.04	10.9	0.1	73.4	0.05	0.7	<0.001	0.03	0.4	28	<0.05	112
T18-01D-A-012	0.12	2.4	0.69	275	7.09	0.04	54.1	0.012	15.5	4.45	0.23	10.4	0.5	140	0.13	0.8	<0.001	0.2	0.3	32	<0.05	104
T18-01D-A-013	0.12	1.9	0.72	735	0.39	0.059	24.5	0.038	12.2	0.96	0.04	12.2	0.2	118	0.05	0.6	<0.001	0.04	0.3	29	<0.05	93.8
T18-01D-A-014	0.09	2.9	1.23	3160	1.23	0.06	13.4	0.062	17.9	0.23	0.05	10.6	0.2	88	<0.02	0.6	<0.001	0.1	0.3	42	<0.05	90.1
T18-01D-A-015	0.08	14.1	0.59	1250	1.85	0.068	36.7	0.76	12.3	0.04	0.15	16.8	0.2	470	0.04	1.2	0.006	0.05	0.5	79	<0.05	137
T18-02D-A-001	0.15	2.9	0.8	645	0.66	0.096	54.3	0.051	13.2	0.2	0.1	10	0.2	72.9	0.1	4	<0.001	0.05	0.4	30	<0.05	110
T18-02D-A-002	0.17	2.7	0.82	849	0.9	0.197	74.7	0.046	14.4	0.17	0.09	10.6	0.1	71	0.07	4.1	<0.001	<0.02	0.4	35	<0.05	113
T18-02D-A-003	0.16	3.8	1.21	963	0.57	0.194	58.3	0.082	12.9	0.16	0.09	10.9	<0.1	132	0.07	3.9	<0.001	<0.02	0.4	36	<0.05	104
T18-02D-A-004	0.16	4.8	1.3	869	0.68	0.205	58.2	0.081	13.4	0.22	0.09	11.2	0.1	162	0.06	4.3	<0.001	0.02	0.5	39	<0.05	108
T18-02D-A-005	0.16	2.4	0.96	626	1.84	0.226	92.6	0.039	17.1	0.37	0.12	12.6	0.3	77.5	0.11	4	<0.001	0.04	0.4	45	<0.05	137
T18-02D-A-006	0.16	1.4	1	440	0.18	0.324	23.5	0.017	6.87	0.49	0.03	13.8	0.3	85.8	0.08	1.2	<0.001	0.02	0.4	33	<0.05	98.9
T18-02D-A-007	0.15	0.8	0.59	194	0.4	0.34	22.6	0.019	12.3	1.16	0.04	14.3	0.6	89	0.05	0.6	<0.001	0.04	0.3	31	<0.05	96
T18-02D-A-008	0.18	0.5	0.6	177	0.26	0.359	15.2	0.008	9	1.12	0.02	13.2	0.4	98.7	0.08	0.7	<0.001	0.05	0.2	27	<0.05	92.3
T18-02D-A-009	0.18	1.3	0.84	291	1.55	0.325	30.8	0.025	9.53	1.32	0.06	12.5	0.3	118	0.03	0.4	<0.001	0.13	0.4	30	<0.05	91.9
T18-02D-A-010	0.19	1.3	0.98	383	0.82	0.272	21.6	0.004	7.88	1.04	0.03	11.8	0.4	86.1	<0.02	0.4	<0.001	0.05	0.2	32	<0.05	84.3
T18-02D-A-011	0.13	0.8	0.7	584	1.49	0.203	37.3	0.003	14.5	2.29	0.07	11.2	0.3	78.6	0.04	0.3	<0.001	0.08	0.2	31	<0.05	127
T18-02D-A-012	0.14	0.6	0.55	317	1.69	0.202	41.9	0.002	13.5	2.13	0.06	10.4	0.3	43.8	0.08	0.4	<0.001	0.05	0.4	24	<0.05	102
T18-02D-A-013	0.11	0.7	0.35	144	1.12	0.159	31	0.003	16.6	1.63	0.07	7.8	<0.1	53.7	0.1	0.4	<0.001	0.03	0.3	23	<0.05	84.3
T18-02D-A-014	0.14	2.1	1.04	1020	0.41	0.212	35.9	0.015	11.8	0.43	0.04	10.9	<0.1	83.9	0.04	0.8	<0.001	0.02	0.2	31	<0.05	91.7
T18-02D-A-015	0.14	1.3	0.66	1190	0.43	0.2	39.6	0.005	11.3	0.61	0.05	11	0.2	79.9	0.09	0.5	<0.001	<0.02	0.2	35	<0.05	111
T18-02D-A-016	0.15	2.2	0.31	392	1.44	0.168	66	0.07	19.2	3.35	0.09	9.5	0.3	74.5	0.11	0.9	<0.001	0.05	0.5	29	<0.05	93.3
T18-02D-A-017	0.13	<0.5	0.2	128	0.08	0.23	2.6	0.006	5.42	0.32	<0.02	6.8	<0.1	46.9	0.11	0.2	<0.001	<0.02	0.1	18	<0.05	19
T18-02D-A-018	0.14	2.4	0.79	2230	0.59	0.223	26.7	0.023	8.53	0.41	0.04	16	0.1	96.4	0.08	0.5	<0.001	<0.02	0.2	59	<0.05	85.9
T18-02D-A-019	0.13	2.6	1.28	1740	0.68	0.189	36.4	0.029	10.3	0.66	0.05	14	<0.1	180	0.08	0.7	<0.001	0.02	0.2	52	<0.05	88.3
T18-02D-A-020	0.14	0.7	0.49	401	1.13	0.188	36.9	0.004	12.8	1.63	0.07	10.4	0.3	164	0.07	0.4	<0.001	0.09	0.2	29	<0.05	95.9
T18-02D-A-021	0.12	1.9	1.82	1470	0.44	0.1	30.8	0.016	9.36	0.99	0.06	9.5	<0.1	180	0.08	0.8	<0.001	0.03	0.3	46	<0.05	82.8
T18-02D-A-022	0.15	0.7	0.31	211	1.09	0.119	40.9	0.003	12.4	0.57	0.06	10.2	0.2	65	0.07	0.5	<0.001	0.02	0.3	25	<0.05	121
T18-02D-A-023	0.12	2	1.11	1460	1	0.09	31.6	0.019	10.5	0.38	0.06	11.5	0.3	84.4	0.09	0.6	<0.001	0.02	0.3	46	<0.05	93.4
T18-02D-A-024	0.12	0.6	0.36	231	1.6	0.071	31.9	0.002	10.6	1.49	0.05	11.7	0.2	49.2	0.12	0.4	<0.001	0.02	0.4	27	<0.05	112
T18-02D-A-025	0.12	0.5	0.25	232	0.86	0.054	40.5	0.002	12.2	2.18	0.05	9.8	0.2	38	0.02	0.4	<0.001	0.03	0.3	24	<0.05	115
T18-02D-A-026	0.14	1.7	0.67	270	1.83	0.043	54.2	0.007	11.9	0.77	0.08	11.5	0.2	92.3	0.09	0.9	<0.001	0.03	0.5	35	<0.05	114
T18-02D-A-027	0.14	1	0.49	198	1.51	0.043	76.4	0.002	16.9	2.31	0.1	10.4	0.2	61	0.11	0.6	<0.001	0.05	0.4	30	<0.05	111
T18-02D-A-028	0.04	8.6	1.66	155	1	0.032	1.8	0.002	13.1	0.16	0.04	5.6	<0.1	242	0.05	1.6	<0.001	0.04	1.1	4	<0.05	55.6
T18-02D-A-029	0.12	1.3	0.5	268	0.85	0.045	26	0.002	11.5	1.85	0.07	13	0.3	79.4	0.06	0.3	<0.001	0.06	0.2	29	<0.05	114
T18-02D-A-030	0.12	0.7	0.34	84	1.38	0.056	17	0.001	9.96	0.73	0.06	12.7	0.1	84	0.06	0.3	<0.001	0.02	0.3	24	<0.05	111
T18-02D-A-031	0.11	1.3	0.67	132	1.01	0.052	22.8	<0.001	10.5	1.76	0.07	11.7	0.1	117	0.1	0.4	<0.001	0.04	0.2	30	<0.05	75.8
T18-02D-A-032	0.13	0.9	0.47	134	0.53	0.062	28.2	0.001	10.9	1.13	0.03	14.3	0.3	77.6	0.06	0.3	<0.001	0.04	0.2	29	<0.05	114
T18-02D-A-033	0.12	3	1.17	649	1.53	0.058	27.9	0.005	9.63	1.99	0.09	12.3	0.2	85.5	0.07	0.7	<0.001	0.11	0.3	41	<0.05	69.6
T18-02D-A-034	0.08	0.7	0.2	81	1.6	0.065	20.5	0.001	29.6	1.56	0.2	8.6	0.2	50.1	0.07	0.7	<0.001	0.05	0.7	27	<0.05	115
T18-02D-A-035	0.08	1	0.17	251	0.28	0.082	20.1	0.004	12.5	0.04	0.06	9.3	<0.1	62.5	0.1	0.2	<0.001	0.03	0.2	34	<0.05	142
T18-02D-A-036	0.1	0.7	0.23	343	0.24	0.078	33.6	0.002	13.1	0.08	0.06	10.5	0.1	50.5	0.03	0.4	<0.001	<0.02	0.2	31	<0.05	94.4
T18-02D-A-037	0.08	0.7	0.18	549	0.28	0.084	12.5	0.002	13.3	0.04	0.07	9.2	<0.1	50.1	0.02	0.2	<0.001	<0.02	0.2	40	<0.05	157
T18-03D-A-005	0.12	0.8	0.48	290	0.6	0.036	46.9	0.006	15.7	2.02	0.08	13.4	0.3	65.1	0.06	0.7	<0.001	0.2	0.3	53	<0.05	137
T18-03D-A-006	0.08	0.5	0.14	52	0.31	0.037	9.8	<0.001	30.6	0.19	0.1	8.5	<0.1	42.5	0.12	0.6	<0.001	0.06	0.3	30	<0.05	197
T18-03D-A-007	0.1	2.3	0.39	131	0.96	0.044	21.5	0.001	29.7	0.05	0.05	13.7	0.3	88.4	0.04	0.9	<0.001	0.03	0.2	50	<0.05	189
T18-03D-A-008	0.1	0.9	0.29	41	0.2	0.034	13.6	0.001	12.1	0.12	0.05	8.9	0.2	57.4	0.03	0.6	<0.001	<0.02	0.2	35	<0.05	89
T18-03D-A-009	0.15	1.3	0.5	94	2.63	0.059	94.9	0.004	18.1	1.18	0.15	13.2	0.4	76.1	0.04	0.9	<0.001	0.17	0.4	48	<0.05	126
T18-03D-A-010	0.03	2.2	0.13	16	1.18	0.058	2.6	0.001	26.8	0.14	0.05	2.9	0.1	41.9	<0.02	1.9	<0.001	0.06	0.8	3	<0.05	38.7
T18-03D-A-011	0.06	<0.5	0.29	58	1.09	0.078	9.4	<0.001	14	0.42	0.22	10.9	<0.1	58.1	0.09	0.3	0.001	0.05	0.2	25	<0.05	58.5
T18-03D-A-012	0.11	0.6	0.22	162	0.32	0.13	21.9	<0.001	25.3	0.08	0.07	14.5	<0.1	87.2	0.1	0.4	<0.001	0.03	0.2	37	<0.05	136
T18-03D-A-013	0.12	1.2	0.45	845	0.36	0.125	20.2	0.01	13.8	0.06	0.03	13.7	<0.1	111	0.03	0.8	<0.001	<0.02	0.2	53	<0.05	141
T18-03D-A-014	0.1	3.6	0.88	4230	0.33	0.108	13.9	0.132	10.7	0.03	0.03	12.9	<0.1	115	0.05	0.8	0.001	<0.02	0.3	74	<0.05	103
T18-03D-A-015	0.1	2.2	0.53	4270	0.4	0.127	15.2	0.045	13.8	0.06	0.06	11.7	<0.1	112	<0.02	0.8	<0.001	0.02	0.4	63	<0.05	130
T18-03D-A-016	0.13	3.2	0.97	2970	0.59	0.129	22	0.201	14.2	0.06	0.07	10.1	<0.1	174	0.04	0.8	0.002	0.03	0.3	53	<0.05	134
T18-03D-A-017	0.11	2.6	0.8	1480	0.2	0.11	12.7	0.021	14.1	0.06	0.05	11	<0.1	142	0.05	0.7	<0.001	0.02	0.3	48	<0.05	118
T18-03D-A-018	0.15	1	0.38	441	0.36	0.204	24.5	0.011	13	0.49	0.04	12.5	0.1	123	0.08	0.6	<0.001	0.04	0.2	40	<0.05	118
T18-03D-A-019	0.12	3.2	0.74	1070	0.31	0.158	18.9	0.04	13.7	0.53	0.04	10	<0.1	171	0.07	1.1	<0.001	0.09	0.4	50	<0.05	101
T18-03D-A-020	0.15	1.2	0.47	864	0.39	0.22	19.1	0.013	10.6	0.3	<0.02	12.9	0.2	119	0.04	0.5	<0.001	0.02	0.2	40	<0.05	103
T18-03D-A-021	0.16	1.1	0.36	774	0.43	0.223	20	0.006	13.9	0.36	0.03	12.6	0.6	110	0.16	0.6	<0.001	0.05	0.3	32	<0.05	134
T18-03D-A-022	0.11	<0.5	0.2	115	2.02	0.136	25.9	<0.001	32.8	1.5	0.16	10.8	0.4	79.4	0.08	0.3	0.001	0.08	0.2	68	<0.05	123
T18-03D-A-023	0.11	1.9	0.75	507	18.6	0.098	50.6	0.006	54	5.13	0.48	11.7	0.9	115	0.05	0.4	<0.001	0.34	0.2	40	<0.05	178
T18-03D-A-024	0.11	<0.5	0.29	252	0.98	0.136	25.4	0.001	34.4	0.64	0.1	10.1	0.5	77.6	0.06	0.3	<0.001	0.06	0.3	59	<0.05	168
T18-03D-A-025	0.11	3.6	0.63	2630	0.54	0.109	18.3	0.054	24.2	0.08	0.06	13.8	0.2	84.7	0.1	0.4	0.001	0.04	0.2	92	<0.05	137
T18-03D-A-026	0.13	6.3	0.22	457	1.25	0.173	38.7	0.503	18	0.24	0.1	16.5	0.4	185	0.09	1	0.004	0.1	0.3	84	<0.05	163
T18-03D-A-027	0.1	2.4	0.32	685	0.42	0.144	14.5	0.013	17.5	0.06	0.06	14.2	0.4	82.8	0.08	0.4	<0.001	0.02	0.2	51	<0.05	129
T18-03D-A-028	0.13	0.8	0.18	206	0.21	0.163	10.8	0.002	23.6	0.03	0.07	11.4	0.3	80.6	0.11	0.2	<0.001	0.04	0.1	37	<0.05	163
28651	0.23	3.3	0.91	417	0.51	0.27	48.9	0.035	13.3	0.41	<0.02	9.3	<0.1	66	0.07	3.9	<0.001	0.03	0.4	33	<0.05	120
28652	0.28	3.3	0.8	366	0.95	0.411	36.2	0.028	6.87	1.45	0.03	8.4	0.3	66.2	0.05	1.8	<0.001	0.25	0.5	26	<0.05	93.7
28653	0.22	2.6	1.13	1250	0.84	0.232	57.1	0.044	13.7	0.86	0.05	9.2	<0.1	71.4	0.06	4.2	<0.001	0.04	0.4	41	<0.05	112
28654	0.2	3.2	0.98	897	0.59	0.213	59.9	0.049	13.7	0.18	0.03	9.4	<0.1	57	0.08	4.7	<0.001	0.02	0.5	44	<0.05	99.5
28655	0.21	3.1	0.78	530	0.66	0.231	58.7	0.042	16.4	0.43	0.04	9.1	<0.1	57.4	0.05	4.7	<0.001	0.03	0.5	42	<0.05	121
28656	0.19	3.8	0.94	502	0.43	0.215	47.6	0.038	11.5	0.34	0.04	9.7	<0.1	60.6	0.04	3.5	<0.001	0.03	0.5	41	<0.05	94.5
28657	0.19	3.6	0.94	516	0.47	0.207	47.8	0.038	12.8	0.51	0.05	9.8	<0.1	64.8	0.04	3.6	<0.001	0.04	0.5	40	<0.05	94.8
28658	0.2	3.2	0.91	513	0.54	0.216	52.6	0.043	11.6	0.63	0.04	10.3	<0.1	65	0.06	3.9	<0.001	0.04	0.5	40	<0.05	100
28659	0.17	3.6	1.02	518	0.5	0.195	53	0.052	12.6	0.88	0.08	10.5	<0.1	94.4	0.05	4	<0.001	0.05	0.4	35	<0.05	96.7
28660	0.18	3.1	0.92	533	0.6	0.21	61.8	0.052	12.2	0.45	0.08	10.8	<0.1	63.7	0.07	4.3	<0.001	0.04	0.5	39	<0.05	105
*Screening Criteria	260	65	210	9000	20	240	800	1	160	0.5	1.5	50	0.9	3500	0.01	100	5	10	30	1500	10	700

Notes:

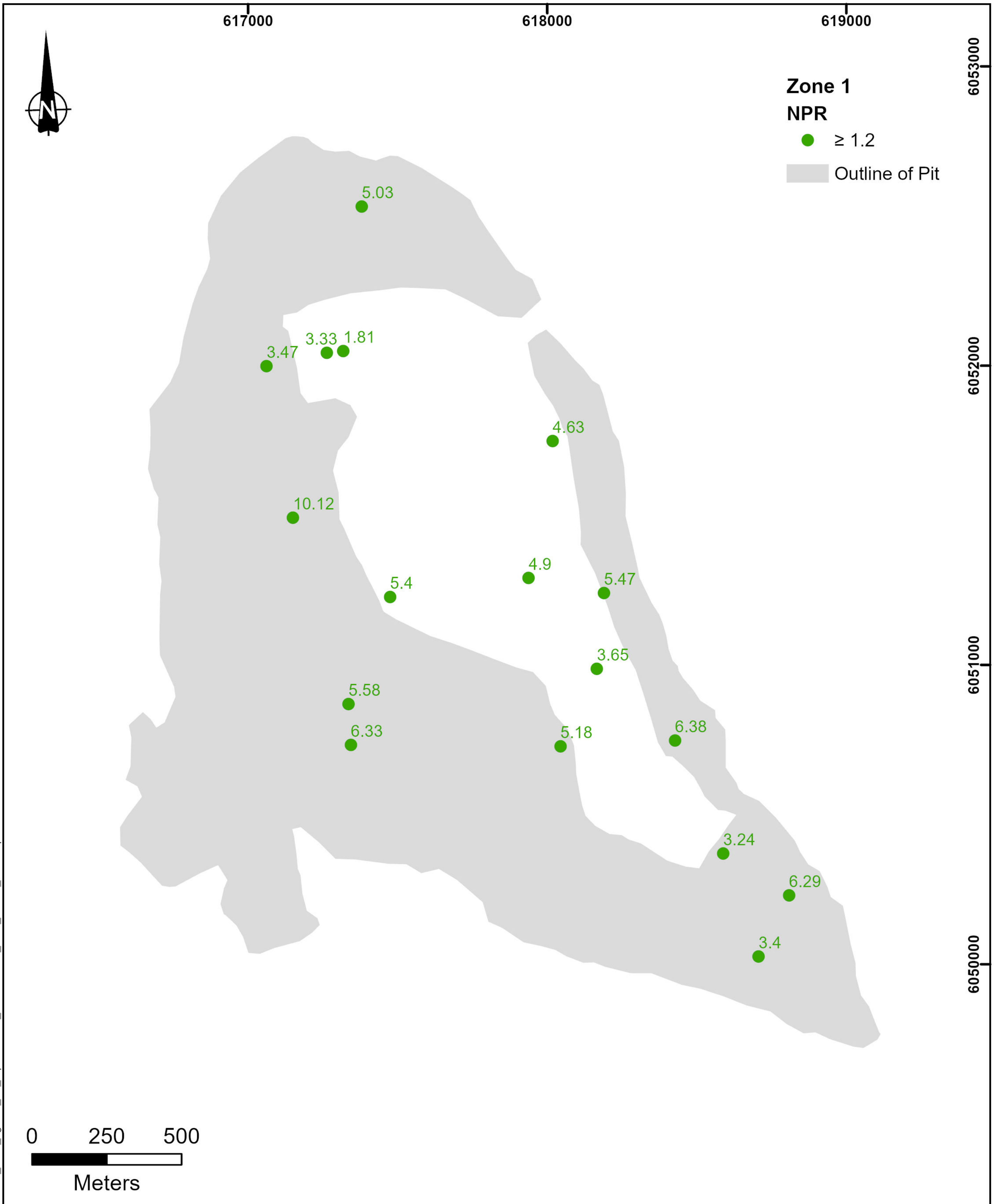
*Screening criteria corresponds to 10 times the average crustal abundance from (Smith and Huyck, 1999)

Hole-ID	Sample ID	Maxxam Sample ID	Sample Depth (m) From	To	ABA Zone	Sample Type	Lithology	Al	As	Au	B	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Se	Sr	Te	Th	Ti	Tl	U	V	W	Zn
								%	ppm	ppb	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppb	%	ppm	%	ppm	ppm	%	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
T18-05D	28661	TH0799	53.2	56.8	1	waste	SLST	0.61	10.4	<0.2	<20	171	0.14	4.36	0.05	15.2	42.1	28.4	5.17	1.7	45	0.18	3.3	1.78	872	0.49	0.177	46	0.074	9.16	0.19	0.03	10.3	<0.1	155	0.04	3.3	<0.001	0.02	0.4	43	<0.05	85.9
T18-05D	28662	TH0800	56.8	59.6	1	waste	SLST	0.51	9.2	<0.2	<20	177	0.18	1.28	0.05	16.4	29.9	36.3	4.56	1.6	54	0.18	3	1.06	717	0.47	0.204	51.1	0.047	11.6	0.17	0.05	12.1	<0.1	76.7	0.04	3.5	<0.001	0.03	0.4	41	<0.05	101
T18-05D	28663	TH0801	59.6	62.3	1	waste	SLST	0.53	10	<0.2	<20	180	0.22	1.17	0.07	19.4	25.4	46.7	3.74	1.7	82	0.18	2.8	0.83	783	0.61	0.215	57.1	0.038	14.7	0.25	0.03	10.7	<0.1	78.2	0.05	3.4	<0.001	0.03	0.4	36	<0.05	107
T18-05D	28664	TH0802	62.3	65.3	1	waste	SLST	0.51	10	<0.2	<20	166	0.22	1.39	0.08	23	28.3	42.8	4.03	1.6	59	0.17	3	0.91	872	0.7	0.201	61.5	0.047	12.8	0.12	0.04	11.3	<0.1	86.7	0.04	3.9	<0.001	0.02	0.4	38	<0.05	107
T18-05D	28665	TH0803	65.3	68.4	1	waste	SLST	0.51	11.3	<0.2	<20	163	0.23	1.29	0.06	19.1	26.8	46.9	3.84	1.5	82	0.17	2.7	0.84	789	0.55	0.199	55.7	0.041	11.4	0.27	0.07	10.4	<0.1	82.4	0.05	3.3	<0.001	0.03	0.4	35	<0.05	106
T18-05D	28666	TH0804	68.4	71.4	1	waste	SLST	0.55	13.3	<0.2	<20	160	0.24	3.08	0.06	20.9	29.5	40.2	4.46	1.4	94	0.16	3.7	1.4	951	0.78	0.181	68.2	0.053	12	0.25	0.07	10.9	<0.1	162	0.03	3.9	<0.001	0.04	0.5	41	<0.05	101
T18-05D	28667	TH0805	71.4	75.1	1	waste	SLST	0.49	13.2	<0.2	<20	159	0.26	1.63	0.05	19.8	26.9	48.4	5.98	1.5	70	0.15	2.9	1.35	982	0.81	0.189	62.8	0.064	12.2	0.24	0.1	14.3	<0.1	122	0.08	3.4	<0.001	0.03	0.4	55	<0.05	108
T18-05D	28668	TH0806	75.1	78.6	1	waste	SLST	0.61	9.6	<0.2	<20	190	0.21	1.77	0.08	14.4	17.8	42.7	4.86	1.4	54	0.17	2.7	1.17	570	0.46	0.244	36.4	0.033	9.42	0.42	0.04	11.7	<0.1	158	0.05	1.6	<0.001	0.02	0.4	38	<0.05	101
T18-05D	28669	TH0807	78.6	82.1	1	waste	SLST	0.6	10.8	<0.2	<20	190	0.1	0.94	0.04	10.8	14.3	26.6	4.51	1.3	55	0.17	0.7	0.88	318	0.22	0.32	17.1	0.005	7.27	0.8	<0.02	14.1	<0.1	87.6	0.03	0.4	<0.001	0.03	0.2	40	<0.05	91.4
T18-05D	28670	TH0808	82.1	85.6	1	waste	SLST	0.7	15.3	<0.2	<20	212	0.11	3.23	0.07	9.2	14.2	25.1	4	1.6	48	0.16	1	1.25	333	0.41	0.238	16.4	0.034	7.82	0.84	<0.02	12	<0.1	190	0.05	0.6	<0.001	0.03	0.5	37	<0.05	79.3
T18-05D	28671	TH0810	85.6	88.3	1	waste	SLST	0.49	14.1	<0.2	<20	163	0.08	1.29	0.09	12.5	25.2	13.2	5.97	1.3	54	0.18	1.4	1.03	387	1.87	0.254	18.1	0.007	6.72	1.32	<0.02	11.7	<0.1	118	0.03	0.5	<0.001	0.06	0.3	37	<0.05	91.3
T18-05D	28672	TH0811	88.3	91.4	1	waste	SLST	0.44	17.4	<0.2	<20	117	0.21	0.5	0.08	16	16.2	28.3	2.89	1.4	135	0.13	<0.5	0.39	202	5.36	0.165	31.1	0.001	12.7	2.21	0.06	10.5	<0.1	57.6	<0.02	0.3	<0.001	0.09	0.8	27	<0.05	91.7
T18-05D	28673	TH0812	91.4	93.97	2	waste	MDST	0.44	21.3	<0.2	<20	129	0.21	0.54	0.02	19.5	18.9	33.4	3	1.4	114	0.14	0.6	0.48	272	0.68	0.16	43.2	0.002	13.9	2.11	0.04	10.3	<0.1	68.2	0.03	0.4	<0.001	0.04	0.3	24	<0.05	112
T18-05D	28674	TH0813	93.97	94.61	2	coal	C	0.18	58.8	<0.2	<20	58.6	0.12	0.63	0.02	2.8	3.8	10.4	2.09	1.3	116	0.02	3	0.19	40	0.9	0.027	4.8	0.075	9.41	2.75	0.17	3	<0.1	117	0.06	1.4	0.004	0.05	0.7	13	<0.05	10.3
T18-05D	28675	TH0814	94.61	96.9	3	waste	MDST	0.51	38.7	<0.2	<20	157	0.17	0.61	0.04	20.6	16.7	31.8	2.78	1.4	85	0.15	0.7	0.42	224	0.69	0.192	36.4	0.004	11.4	1.99	<0.02	10.1	<0.1	60.9	0.06	0.3	<0.001	0.05	0.2	22	<0.05	109
T18-05D	28676	TH0815	97.45	97.61	3	coal	SLST	0.5	50	<0.2	<20	151	0.2	0.66	0.05	20.9	21.8	28	4.32	1.5	90	0.15	0.8	0.73	514	0.7	0.144	43.7	0.007	11.7	2.08	<0.02	11.8	0.3	63	0.05	0.3	<0.001	0.03	0.3	35	<0.05	106
T18-05D	28677	TH0816	97.61	99.97	3	waste	SLST	0.46	99.7	<0.2	<20	102	0.27	0.11	0.07	22.1	14.1	31	3.92	1.6	194	0.15	0.5	0.29	323	1.81	0.154	57.7	0.002	16	3.54	0.04	7.5	0.5	38.4	0.06	0.3	<0.001	0.05	0.3	24	<0.05	93.8
T18-05D	28678	TH0817	101.97	102.17	4	waste	SLST	0.6	49.3	<0.2	<20	289	0.22	0.26	0.05	36.2	9.1	50.6	1.3	1.5	26	0.17	2	0.18	1920	2.1	0.249	50.3	0.007	11.4	0.09	<0.02	9.8	<0.1	58.2	0.07	0.3	<0.001	<0.02	0.3	28	<0.05	226
T18-05D	28679	TH0818	102.17	106.3	4	waste	SLST	0.62	35.8	<0.2	<20	263	0.18	1.47	0.03	20.1	14.9	41.1	3.95	1.5	27	0.17	2.2	0.61	2650	0.47	0.215	30.2	0.021	11.5	0.33	<0.02	14.3	<0.1	94	0.04	0.9	<0.001	<0.02	0.3	42	<0.05	96.9
T18-05D	28680	TH0819	106.3	108.7	4	waste	SLST	0.61	29.7	<0.2	<20	227	0.16	1.21	0.02	14.6	18.1	30.5	7.91	1.6	28	0.16	2.4	1.13	1520	0.32	0.169	21.8	0.026	9.1	0.3	0.03	15.8	<0.1	106	0.04	0.8	<0.001	<0.02	0.3	58	<0.05	83.5
T18-05D	28681	TH0821	108.7	111.1	4	waste	SLST	0.49	78.9	<0.2	<20	190	0.16	1.04	0.05	17	14.9	29.6	7.14	1.3	62	0.13	1.6	0.93	1280	1.39	0.149	26.9	0.013	9.93	1.62	0.06	13.9	<0.1	71.8	0.05	0.4	<0.001	0.04	0.3	48	<0.05	87
T18-05D	28682	TH0822	111.1	111.9	4	waste	MDST	0.45	30.8	<0.2	<20	179	0.19	0.69	0.08	15	12	29.5	2.29	1.2	109	0.12	0.6	0.32	344	1.62	0.145	27.2	0.009	13.1	1.73	0.05	11.6	<0.1	60.9	0.06	0.3	<0.001	0.06	0.4	32	<0.05	121
T18-05D	28683	TH0823	111.9	112.1	4	coal	C	0.14	89.4	<0.2	<20	46.4	0.08	1.47	0.12	5.1	18.4	8.58	3.58	0.8	226	0.02	1.7	0.47	352	4.4	0.02	17.2	0.083	4.15	3.52	0.43	3.9	0.4	127	0.02	0.4	0.003	0.08	0.4	27	<0.05	25
T18-05D	28684	TH0824	112.1	112.6	5	waste	SLST	0.44	45.6	0.6	<20	164	0.27	0.49	0.03	21.6	16.4	31.5	2.53	1.3	118	0.14	0.5	0.32	228	0.67	0.123	43.9	0.005	14.4	1.92	0.04	10.9	0.3	49.7	0.06	0.4	<0.001	0.06	0.2	24	<0.05	115
T18-05D	28685	TH0825	112.6	115.5	5	waste	SLST	0.43	35.3	0.9	<20	162	0.16	3	0.02	12.2	18.8	19.7	12	1.1	33	0.1	2.6	1.61	4530	0.47	0.09	26.8	0.06	8.45	0.41	0.09	12.1	<0.1	139	0.06	0.9	0.001	0.02	0.3	52	<0.05	72.2
T18-05D	28686	TH0826	115.5	119.3	5	waste	SLST	0.4	42.6	0.8	<20	147	0.23	1.12	0.04	20.2	15.6	29.7	3.88	1.3	119	0.11	1.4	0.61	851	0.5	0.083	43.3	0.01	14.4	1.25	0.05	12.9	0.4	67.2	0.04	0.6	<0.001	0.03	0.3	38	<0.05	118
T18-05D	28687	TH0827	119.3	119.5	5	waste	SLST	0.41	61.4	0.5	<20	144	0.25	0.22	0.05	22.7	12.1	35.3	1.84	1.2	116	0.11	0.6	0.17	194	0.75	0.075	40.4	0.01	13.2	1.42	0.08	9.6	0.4	38	0.05	0.4	<0.001	0.04	0.3	23	<0.05	137
T18-05D	28688	TH0828	126.6	126.8	6	waste	MDST	0.4	26.7	<0.2	<20	227	0.31	0.37	<0.01	6.6	8.9	42.3	0.59	1	31	0.13	<0.5	0.15	42	0.87	0.055	13.9	0.001	4.42	0.26	0.06	6.1	0.2	43.6	0.08	0.6	<0.001	0.03	0.3	23	<0.05	32.7
T18-05D	28689	TH0829	126.8	128.8	6	waste	MDST	0.47	82.3	1.2	<20	229	0.32	0.87	0.06	16.4	17	58	1.24	1.4	57	0.14	1.2	0.31	155	1.11	0.051	55.6	0.012	11.3	0.4	0.13	11.3	0.4	64	0.09	0.9	<0.001	0.05	0.3	26	<0.05	135
T18-05D	28690	TH0830	128.8	131.6	6	waste	MDST	0.38	66.9	0.5	<20	164	0.25	0.97	0.16	15.5	15	50.7	2.93	1.1	133	0.11	1	0.42	223	1.38	0.055	39.6	0.006	23.6	2.48	0.17	11.2	0.3	67	0.07	0.6	<0.001	0.12	0.3	25	<0.05	123
T18-05D	28691	TH0832	131.6	131.9	6	coal	MDST	0.16	64.9	<0.2	<20	61.5	0.16	0.43	0.14	8	3.4	15.4	1.89	0.8	120	0.02	<0.5	0.16	46	2.21	0.021	8.2	<0.001	15.7	2.47	0.22	7.6	<0.1	40.6	0.06	0.8	0.001	0.03	0.2	13	<0.05	22.5
T18-05D	28704	TH0843	131.9	132.2	6	waste	C	0.23	53	0.8	<20	62	0.14	1.87	0.1	5.3	5.8	11.4	2.14	1.1	121	0.02	2.3	0.43	51	1.23	0.02	3	0.002	12	2.12	0.15	3.9	0.4	57	<0.02	1	0.002	0.06	0.5	11	<0.05	36.4
T18-05D	28692	TH0833	132.2	132.5	6	coal	P	0.56	79.6	<0.2	<20	124	0.17	0.25	0.04	19.5	10.5	37.8	2.7	2	105	0.14	<0.5	0.14	80	2.25	0.075	21.7	0.016	12.2	2.53	0.04	9	0.4	50.4	0.04	0.7	<0.001	0.11	0.2	19	<0.05	82.2
T18-05D	28693	TH0834	132.5	132.85	6	waste	C	0.08	18.4	<0.2	<20	13	0.05	0.83	<0.01	1.7	2.2	5.79	0.88	0.3	57	<0.01	0.8	0.17	34	0.36	0.008	2.1	0.074	2.28	1.17	0.04	3	0.1	44.4	<0.02	0.5	0.002	<0.02	0.2	8	<0.05	7.4
T18-05D	28694	TH0835	132.85	133.6	6	coal	MDST	0.44	12.6	0.2	<20	193	0.14	3.59	0.02	5.4	14.1	20.5	1.85	1.4	13	0.1	0.8	1.02	245	0.36	0.067	7.2	0.011	7.09	0.18	0.02	10.9	0.2	129	0.03	1.8	<0.001	<0.02	0.3	32	<0.05	88.1
T18-05D	28695	TH0836	133.6	134.4	6	waste	MDST	0.61	19.3	<0.2	<20	192	0.12	2.44	<0.01	12.3	12.2	19.8	8.96	1.5	20	0.12	1.6	1.15	2720	1.07	0.073	11.8	0.069	6.46	0.37	0.04	10.8	0.4	96.9	0.02	0.7	<0.001	<0.02	0.4	35	<0.05	58.6
T18-05D	28696	TH0837	134.4	135	6	waste	MDST	0.44	79.8	0.6	<20	57.3	0.12	2.56	0.1	19.3	10.7	25	5.97	1.2	383	0.1	<0.5	0.84	216	6.45	0.065	30.3	0.001	16.9	5.75	0.12	10.2	0.7	92.2	0.03	0.1	<0.001	0.19	0.4	33	<0.05	54.2
T18-05D	28697	TH0838	135	135.8	6	coal	C	0.09	49.6	<0.2	<20	25.6	0.13	1.02	0.03	1.4	4.4	8.83	2.32	0.7	136	0.02	<0.5	0.1	23	2.98	0.014	2.8	<0.001	8.56	3.08	0.13	1.8	<0.1	26.4	<0.02	0.2	0.002	0.04	0.1	6	<0.05	5.8
T18-05D	28698	TH0839	135.8	139.1	7	waste	SLST	0.52	17.7	0.4	<20	142	0.23	0.37	0.08	20.5	13.9	37.4	2.14	1.7	107	0.13	<0.5	0.24	129	1.37	0.094	26	0.001	13.9	1.48	0.05	12.5	0.4	53.9	0.07	0.2	<0.001	0.06	0.5	25	<0.05	108
T18-05D	28699	TH0840	139.1	139.9	7	waste	SLST	0.49	28.9	<0.2	<20	129	0.24	0.23	0.11	23.6	10.5	38.9	2.39	1.6	106	0.12	<0.5	0.19	118	4.44	0.099	31.6	0.001	14.6	2.11	0.06	10.4	0.3	53.2	0.04	0.3	<0.001	0.08	1.5	24	<0.05	117
T18-05D	28700	TH0842	139.9	140.9	7	coal	C	0.2	68.8	<0.2	<20	40.4	0.17	0.6	0.29	9.6	3.3	33.4	3.01	1.1	290	0.04	<0.5	0.18	57	5	0.038	16.3	<0.001	20.4	3.73	0.3	6.1	0.3	31.4	0.06	0.4	0.002	0.2	0.4	40	<0.05	59.1
T18-05D	28705	TH0844	140.9	141.2	7	waste	MDST	0.59	8.6	<0.2	<20	84.1	0.09	2.27	0.51	8.5	31.5	43.8	9.05	1.6	6	0.08	2.2	1.57	1290	0.43	0.049	11.9	0.086	25.3	0.11	0.1	11.9	0.4	80.3	0.02	0.7	0.002	<0.02	0.3	88	<0.05	141
T18-05D	28706	TH0845	141.2	142.1	7	waste	MDST	0.62	3.1	<0.2	<20	86.5	0.18	0.16	0.1	10	2.9	46.4	0.29	1.9	29	0.05	1.1	0.08	30	1.06	0.076	9.6	0.002	12.2	0.08	0.08	5.7	0.3	39.2	0.02	0.5	0.002	<0.02	0.5	27	<0.05	60.5
T18-05D	28707	TH0846	142.1	142.6	7	coal	C	0.23	1	<0.2	<20	35.6	0.1	0.74	0.06	3.4	5.2	22.9	0.09	1	25	0.03	<0.5	0.09	25	0.84	0.039	3.3	<0.001	10.7	0.09	0.05	4	0.3	24.4	<0.02	<0.1	0.003	<0.02	0.1	76	<0.05	27.4
T18-05D	28708	TH0847	142.6	143	8	waste	MDST	0.54	16.7	0.3	<20	116	0.15	0.26	0.26	13.5	14.8	48.9	1.57	1.7	26	0.09	1.2	0.09	360	1.2	0.111	23.4	0.003	21.4	0.07	0.12	8.8	0.3	42.8	0.04	0.2	<0.001	0.06	0.2	47	<0.05	132
T18-05D	28709	TH0848	143	143.9	8	waste	MDST	1.36	13.6	0.6	<20	138	0.15	1.1	0.46	30.9	19.4	83.2	1.58	3.5	25	0.1	5.1	0.17	382	2.67	0.099	39.5	0.267	21.2	0.05	0.14	12.4	0.5	99.1	0.12	1.2	0.003	0.06	0.5	49	<0.05	158
T18-05D	28710	TH0849	143.9	144.1	8	waste	MDST	3.97	21.2	1	<20	297	0.07	5.27	0.33	66.4	49	91.4	0.18	7.6	27	0.05	16.8	0.05	30	5.87	0.095	83.3	1.94	14.5	0.08	0.31	24.5	0.3	719	0.11	2	0.013	0.15	1.4	71	<0.05	136
T18-05D	28711	TH0850	144.1	144.4	8	waste	MDST	0.51	26.5	<0.2	<20	84.6	0.14	1.05	0.5	9.5	5.5	49.8	0.53	1.6	63	0.09	<0.5	0.26	78	0.67	0.095	16.4	0.021	25.3	0.24	0.22	6.9	0.4	52.2	0.06	0.2	0.001	0.1	0.2	81	<0.05	150
T18-05D	28712	TH0851	144.4	148	8	waste	MDST	0.68	6.1	<0.2	<20	105	0.13	0.27	0.15	19.1	13.8	52	6.12	1.6	14	0.1	3.5	0.19	1060	0.13	0.094	19.4	0.027	19.8	0.05	0.07	13.1	0.2	50.6	0.06	0.5	<0.001	0.05	0.1	54	<0.05	111
T18-05D	28713	TH0852	148	148.2	8	coal	C	0.32	3.5	<0.2	<20	49.2	0.12	2.35	0.35	10.9	4.6	50.4	0.52	1	20	0.05	0.6	0.51	138	0.66	0.055	10	0.003	12.1	0.1	0.13	10.9	0.1	61.8	0.05	0.1	0.003	<0.02	0.2	75	<0.05	96.3
T18-07D	28836	TH0854	6.9	10.4	1	waste	MDST	2.12	8.3	<0.2	<20	315	0.15	1.77	0.1	13.7	28.4	47.6	3.61	5.5	43	0.24	4.4	0.86	346	0.21	0.254	35.5	0.039	9.23	0.76	0.02	10.4	0.4	140	0.04	2.2	<0.001	0.04	0.5	49	<0.05	114
T18-07D	28837	TH0855	10.4	14.8	1	waste	MDST	2.02	13.2	<0.2	<20	273	0.15	2.14	0.28	12.7	36.2	46.8	3.51	4.8	95	0.24	5.7	0.75	294	2.11	0.371	46.8	0.046	11.6	1.72	0.07	10.6	1.9	166	0.06	2.5	<0.001	0.08	1	43	<0.05	156
T18-07D	28838	TH0856	14.8	18.3	1	waste	SLST	1.97	18.9	<0.2	<20	254	0.13	0.92	0.42	13.1	37.2	27.2	3.89	4.1	86	0.29	8.3	0.72	228	1.91	0.477	29.4	0.068	9.57	1.74	0.06	8.8	1	154	<0.02	3.4	<0.001	0.17	0.8	34	<0.05	130
T18-07D	28839	TH0857	18.3	22.2	1	waste	SLST	2.06	12.7	<0.2	<20	261	0.08	0.9	0.07	15.2	53.5	17.1	4.49	4.7	120	0.27	6.3	0.93	308	1.17	0.319	39.7	0.047	9.68	1.34	0.06	8	0.3	109	0.02	2.1	0.002	0.14	0.4	42	<0.05	94.4
T18-07D	28840	TH0858	22.2	26.1	1	waste	SLST	2.22	7.8	1.3	<20	285	0.19	0.71	0.06	17.3	53.5	27.6	4.06	6.1	70	0.28	5.9	1.02	319	0.27	0.312	48.8	0.037	9.6	0.76	0.03	8.3	<0.1	94.8	0.03	3.1	0.003	0.05	0.3	50	<0.05	102
T18-07D	28841	TH0859	26.1	30	1	waste	SLST	2.36	8.1	0.7	<20	278	0.26	0.59	0.11	19.8	60.9	39.7	4.44	6.8	111	0.27	6.9	1.12	356	0.6	0.281	66.1	0.039	12.6	1.08	0.05	8.2	<0.1	84.6	<0.02	4.3	0.004	0.06	0.4	54	<0.05	115
T18-07D	28842	TH0860	30	33.9	1	waste	SLST	2.39	8.4	0.7	<20	287	0.26	0.82	0.1	21	61	37	4.21	7.1	122	0.29	7.9	1.07	345	0.43	0.279	70.5	0.09	13.8	1.24	0.07	8.3	<0.1	99.8	0.06	4.2	0.005	0.07	0.4	53	<0.05	118
T18-07D	28843	TH0861	33.9	38.2	1	waste	SLST	2.29	11.3	0.5	<20	256	0.33	0.34	0.07	23	62.7	51.5	4.21	7.1	147	0.29	5.5	1.03	390	1.43	0.296	79.1	0.053	17.6	1.62	0.07	8.2	0.1	87.5	0.07	5.5	0.003	0.07	0.4	54	<0.05	128
T18-07D	28844	TH0862	38.2	42.3	1	waste	FLT	2.25	8.7	1.7	<20	320	0.3	0.84	0.09	18.8	56.8	43.3	3.95	6.7	104	0.3	5.8	1.02	389	0.71	0.303	64.4	0.045	13.6	1.17	0.04	8.4	<0.1	106	0.05	5.1	0.003	0.06	0.4	50	<0.05	119
T18-07D	28845	TH0863	42.3	44.2	1	waste	SLST	2.28	6.8	1.2	<20	286	0.3	0.38	0.07	19.4	52.6	43.8	3.99	6.8	61	0.28	6.2	1.05	317	0.67	0.302	67.5	0.039	13.7	0.94	0.04	7.9	<0.1	86.2	0.04	4.6	0.003	0.06	0.4	49	<0.05	118
T18-07D	28846	TH0865	44.2	49.8	1	waste	SST	1.97	6	0.2	<20	295	0.18	1.09	0.07	16.7	57.3	20	3.6	5.3	91	0.25	7	0.97	379	0.29	0.28	51.7	0.045	11.6	0.7	0.08	8	<0.1	105	<0.02	3.8	0.003	0.08	0.4	43	<0.05	109
T18-07D	28847	TH0866	49.8	52.8	1	waste	SLST	2.13	5.8	<0.2	<20	302	0.23	1.06	0.09	16.8	54.9	27.2	3.69	5.8	80	0.26	7.3	1.02	346	0.27	0.309	54.2	0.062	12.2	0.68	0.06	8.1	<0.1	112	<0.02	4	0.003	0.05	0.4	45	<0.05	112
T18-07D	28848	TH0867	52.8	57.15	1	waste	SLST	2.34	7.5	0.5	<20	310	0.32	0.35	0.11	20.9	55	44.4	3.6	6.4	87	0.27	6.3	1.05	297	0.43	0.335	68.2	0.039	15.8	0.55	0.05	8.8	<0.1	95.9	0.03	4.4	0.002	0.06	0.4	50	<0.05	133
T18-07D	28849	TH0868	57.15	61.5	1	waste	SLST	2.27	8.7	0.9	<20	282	0.35	0.5	0.09	19.9	48.3	47.4	3.85	5.9	81	0.26	5.2	1.03	340	0.6	0.32	65	0.049	15.2	0.87	0.06	8.5	0.1	94.6	0.07	4.6	0.002	0.07	0.3	49	<0.05	122
T18-07D	28850	TH0869	61.5	63.4	1	waste	FLT	1.66	14.2	0.3	<20	345	0.12	7.02	0.14	14.4	35.8	25.7	3.12	3.6	106	0.32	10.8	0.7	879	1.19	0.378	42.1	0.033	13.7	1.01	0.03	8.3	0.2	190	<0.02	2.3	<0.001	0.11	0.4	31	<0.05	103
T18-07D	29501	TH0870	63.4	66.8	1	waste	MDST	1.98	8.6	1.3	<20	307	0.21	0.67	0.1	15.1	46.3	37.5	3.81	5.4	84	0.28	4.9	0.92	392	0.64	0.327	42.4	0.04	9.98	0.83	0.03	9.3	0.2	110	<0.02	3.5	0.002	0.07	0.5	43	<0.05	119
T18-07D	29502	TH0871	66.8	69.6	1	waste	SLST	2	13.1	0.3	<20	193	0.19	3.89	0.11	18.5	60.4	41.1	4.78	6.3	100	0.21	5.6	1.12	1070	0.99	0.197	61.4	0.068	13.5	1.6	0.09	9.5	<0.1	141	0.07	4.7	0.004	0.04	0.4	58	<0.05	89.1
T18-07D	29503	TH0872	69.6	72.4	1	waste	SLST	2	14.3	1.1	<20	210	0.27	1.03	0.09	21.6	63.6	54.3	4.34	7	154	0.23	4.8	0.94	703	1.03	0.219	75.5	0.06	16.1	1.83	0.14	9.2	0.1	85.2	0.06	5.3	0.005	0.07	0.4	58	<0.05	113
T18-07D	29504	TH0873	72.4	75.6	1	waste	SST	1.69	14.8	<0.2	<20	200	0.29	3.92	0.12	19.8	54.7	45	4.04	5.9	138	0.21	5.3	0.93	985	1.23	0.199	66.3	0.069	15.2	1.85	0.16	8.3	<0.1	144	0.05	4.7	0.004	0.06	0.4	50	<0.05	94.9
T18-07D	28786	TH0874	75.6	78.8	1	waste	SST	1.61	9.7	0.5	<20	213	0.18	6.77	0.08	17	51.5	35.2	4.17	5.7	71	0.2	5.2	0.99	829	0.54	0.172	55.1	0.054	10.6	1.12	0.08	8.2	0.2	129	0.09	3.8	0.004	0.06	0.4	49	<0.05	89.1
T18-07D	29505	TH0876	78.8	84	1	waste	SLST	2.06	9.4	1.2	<20	254	0.25	0.77	0.1	23.6	62.6	50.6	4.43	7.1	111	0.24	5	1.09	554	0.55	0.213	75.8	0.043	19.4	0.57	0.05	9.8	<0.1	82.5	0.04	4.2	0.004	0.05	0.4	60	<0.05	119
T18-07D	29506	TH0877	84	86.9	1	waste	SLST	1.59	9.5	0.8	<20	219	0.19	6.61	0.08	20.1	52.9	36	3.82	5.5	143	0.22	4.6	0.95	640	0.61	0.183	68.1	0.054	13.5	1.12	0.1	8.4	<0.1	151	<0.02	3.5	0.004	0.07	0.4	48	<0.05	93.6
T18-07D	29507	TH0878	86.9	92.2	1	waste	SLST	1.47	8.7	<0.2	<20	206	0.18	9.35	0.06	19.3	45.8	34	3.69	5.3	108	0.19	5.6	0.87	714	0.59	0.177	62.5	0.053	11.8	0.67	0.08	8.2	<0.1	153	0.05	3.6	0.003	0.05	0.4	47	<0.05	86.4
T18-07D	29508	TH0879	92.2	96.3	1	waste	SLST	1.76	10.3	0.2	<20	235	0.21	1.07	0.06	22	61.4	41.8	3.7	6.5	105	0.23	4.8	0.88	438	0.72	0.193	70.5	0.056	12.8	0.58	0.09	9.6	<0.1	85.7	<0.02	4.6	0.004	0.06	0.4	57	<0.05	123
T18-07D	29509	TH0880	96.3	104.7	1	waste	SLST	1.76	12.3	0.4	<20	221	0.24	0.71	0.1	21.7	58.2	52.8	3.83	6.3	95	0.21	4.7	0.89	634	0.68	0.203	75.3	0.05	14	0.27	0.09	10.1	0.2	80.5	0.1	4.2	0.003	0.05	0.4	56	<0.05	122
T18-07D	29510	TH0881	104.7	107.8	1	waste	MDST	1.65	16.8	<0.2	<20	222	0.26	1.12	0.11	25.4	56.1	59.4	3.94	5.8	239	0.21	4.7	0.87	1010	0.89	0.194	92.9	0.053	16.8	0.65	0.19	10.2	<0.1	89.7	0.04	4.4	0.004	0.15	0.3	54	<0.05	126
T18-07D	29511	TH0882	107.8	111.1	1	waste	MDST	1.66	12.1	0.7	<20	221	0.25	1.37	0.1	22	56.4	56.1	4.8	6	84	0.2	5.9	0.98	822	0.7	0.19	79.7	0.059	14.3	0.19	0.08	11.5	<0.1	93.6	0.03	4.5	0.004	0.03	0.4	63	<0.05	121
T18-07D	29512	TH0883	111.1	114.2	1	waste	MDST	1.73	13.5	1	<20	250	0.3	0.74	0.11	23.1	55.3	61.7	3.89	6	87	0.21	5.8	0.81	593	0.81	0.202	78.4	0.057	15.2	0.35	0.11	10.5	<0.1	88	0.08	5.3	0.003	0.04	0.4	59	<0.05	128
T18-07D	29513	TH0884	114.2	117.4	1	waste	MDST	1.64	12	0.4	<20	243	0.26	1.46	0.09	20.1	45.3	53.8	4.08	5.3	64	0.22	5.3	0.8	618	0.67	0.235	59.5	0.049	13.3	0.43	0.05	11	<0.1	107	0.05	3.8	0.002	0.04	0.4	56	<0.05	117
T18-07D	29514	TH0885	117.4	120.6	1	waste	MDST	1.26	13	<0.2	<20	305	0.1	0.87	0.08	11.3	21.2	28.7	5.08	2.8	70	0.24	3.1	0.73	390	0.78	0.345	23.7	0.023	9.08	1.29	<0.02	11.1	<0.1	129	0.03	1.4	<0.001	0.06	0.4	41	<0.05	92.9
T18-07D	29515	TH0887	120.6	123.8	1	waste	MDST	1.32	15.6	0.3	<20	310	0.14	0.78	0.08	12.9	17.3	37.4	4.73	3.4	61	0.22	2.9	0.63	307	0.3	0.343	19.4	0.026	10.1	1.33	<0.02	13.3	<0.1	133	0.09	1.5	<0.001	0.05	0.3	47	<0.05	92.3
T18-07D	29516	TH0888	123.8	127.5	6	waste	MDST	1.15	12.8	0.2	<20	199	0.12	0.7	0.08	16.5	25.2	28	3.42	2.8	217	0.21	2.6	0.38	242	0.97	0.274	25.1	0.017	12	2.15	0.02	9.4	<0.1	111	<0.02	1.4	<0.001	0.09	0.3	29	<0.05	78.9
T18-07D	29517	TH0889	127.5	129.3	6	waste	SLST	1.02	5	<0.2	<20	319	0.11	0.64	0.06	14.4	20.5	22.3	4.65	2.3	35	0.21	2.6	0.71	572	0.29	0.324	16.3	0.019	7.68	0.18	<0.02	9.5	<0.1	128	0.02	1	<0.001	<0.02	0.1	26	<0.05	92.4
T18-07D	29518	TH0890	129.3	132.4	6	waste	SST	1.13	12.6	0.6	<20	296	0.09	0.59	0.07	21.7	29.5	21.6	3.07	2.5	153	0.18	1.7	0.4	600	0.41	0.315	29.5	0.018	14.8	1.16	0.02	8.7	<0.1	122	0.03	0.8	<0.001	0.1	0.2	25	<0.05	108
T18-07D	29519	TH0891	132.4	133.8	6	waste	MDST	1.23	11.3	<0.2	<20	288	0.18	0.25	0.07	19	24.5	38.7	2.29	3.2	88	0.21	1.9	0.33	228	0.6	0.287	28.6	0.018	12.8	1.25	<0.02	9	<0.1	109	0.02	1.5	<0.001	0.05	0.2	27	<0.05	100
T18-07D	29520	TH0892	133.8	134	6	coal	C	1.21	7.3	0.7	<20	298	0.19	0.23	0.06	17.9	22.6	40.3	1.97	3.1	60	0.21	2.3	0.32	115	0.21	0.29	25.7	0.017	9.25	0.88	<0.02	9.3	<0.1	114	0.04	1.5	<0.001	0.05	0.2	27	<0.05	138
T18-07D	29521	TH0893	134	134.6	6	coal	C	0.53	5	1.6	<20	117	0.27	0.28	0.52	14.7	13.4	51	1.98	1.8	180	0.08	4.1	0.13	44	1.91	0.108	17.5	0.003	22.6	2.2	0.19	6.3	0.3	47.5	0.07	1.6	0.003	0.05	0.4	71	<0.05	120
*Screening Criteria								800	20	40	100	4300	2	300	1.8	250	2000	600	500	170	800	260	65	210	9000	20	240	800	1	160	0.5	1.5	50	0.9	3500	0.01	100	5	10	30	1500	10	700

Notes:

*Screening criteria corresponds to 10 times the average crustal abundance from (Smith and Huyck, 1999)

Appendix E – ARD Maps



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Supplemental Geochemical Characterization

Zone 1 ARD

Job No: 1CT017.007

Filename: Tenas_1CT017.007_ABA_Zone1_rev02

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Date:	Approved:	Figure:
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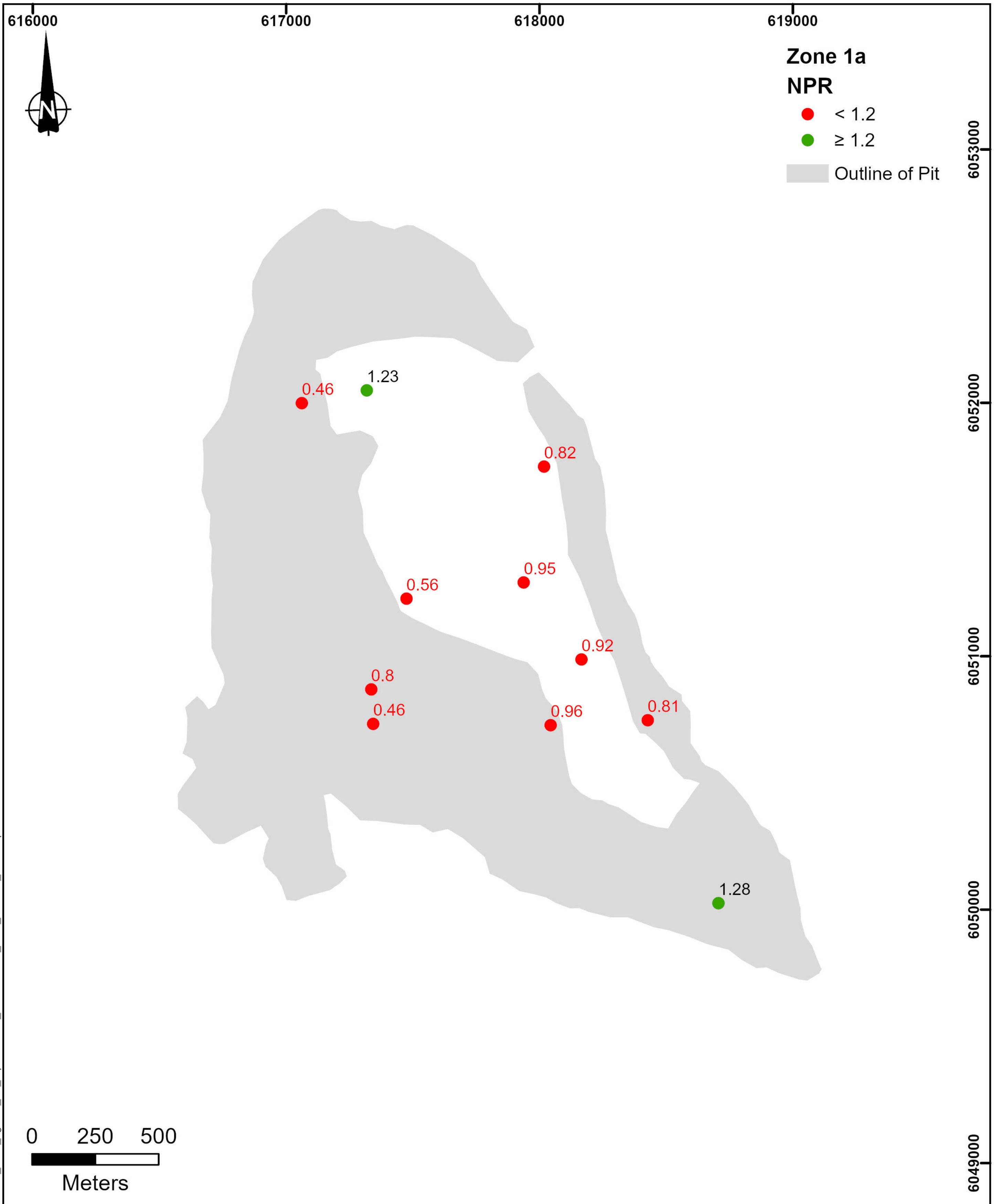

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Supplemental Geochemical Characterization

Zone 1a ARD

Job No: 1CT017.007

Filename: Tenas_1CT017.007_ABA_Zone1a_rev02

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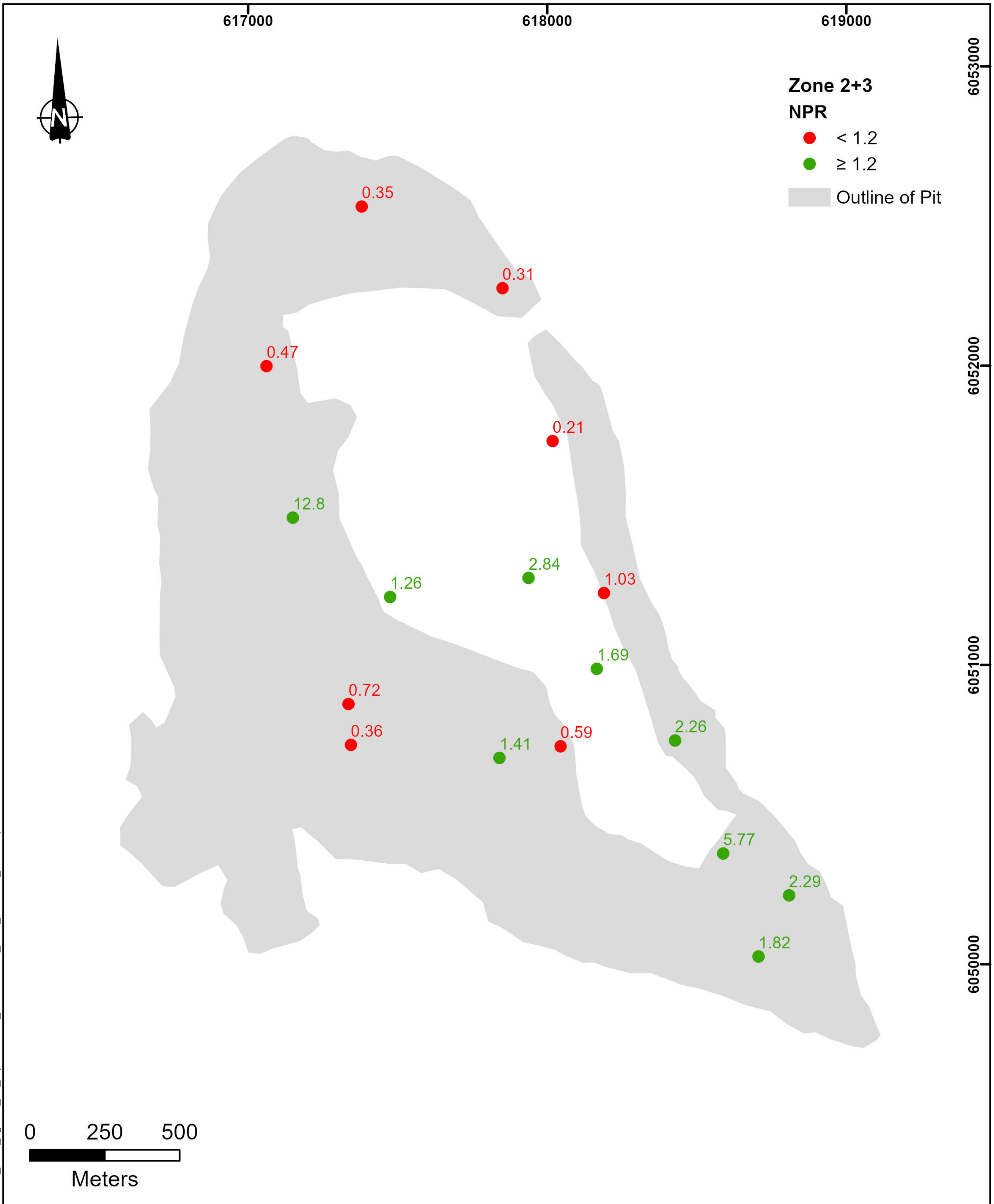
Date: Feb 2022

Approved: MKH

Figure: E-2



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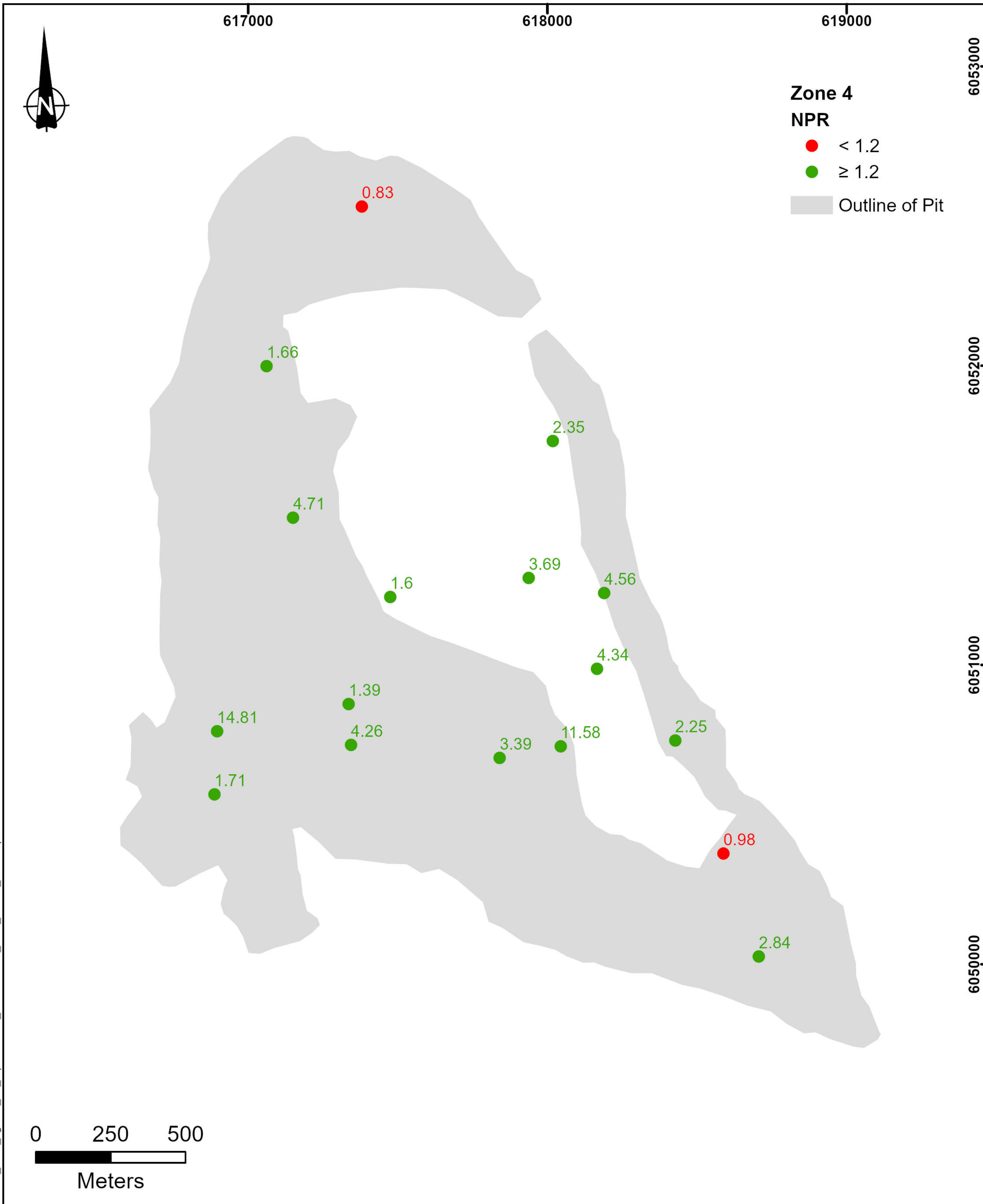
srk consulting	ALLEGIANCE COAL LIMITED	Tenas Project Supplemental Geochemical Characterization		
		Zone 2-3 ARD		
Job No: 1CT017.007 Filename: Tenas_1CT017.007_ABA_Zone2-3_rev02	ALLEGIANCE COAL	Date: Feb 2022	Approved: MKH	Figure: E-3



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Supplemental Geochemical Characterization

Zone 4 ARD

Job No: 1CT017.007

Filename: Tenas_1CT017.007_ABA_Zone4_rev02

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Figure: E-4

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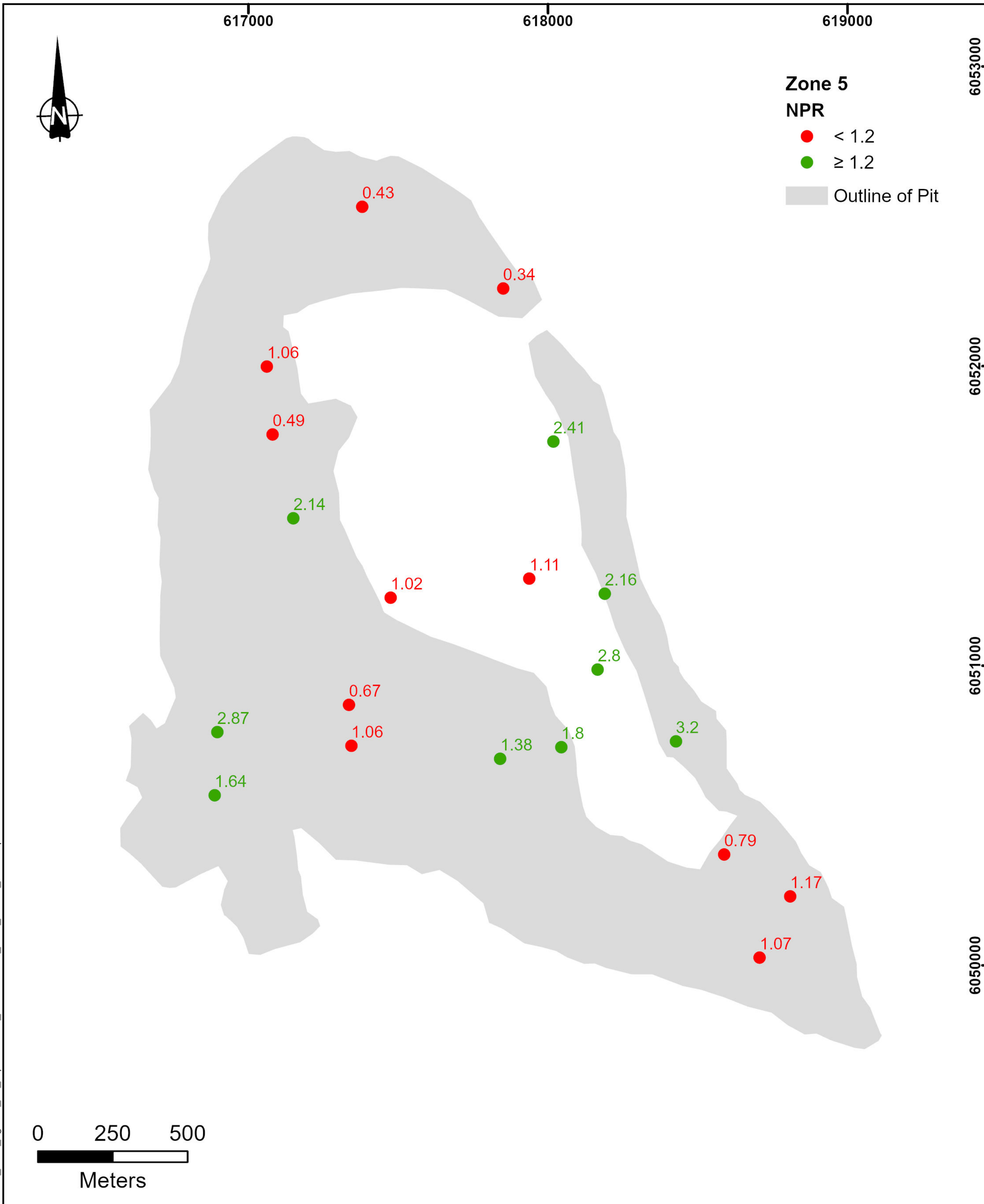

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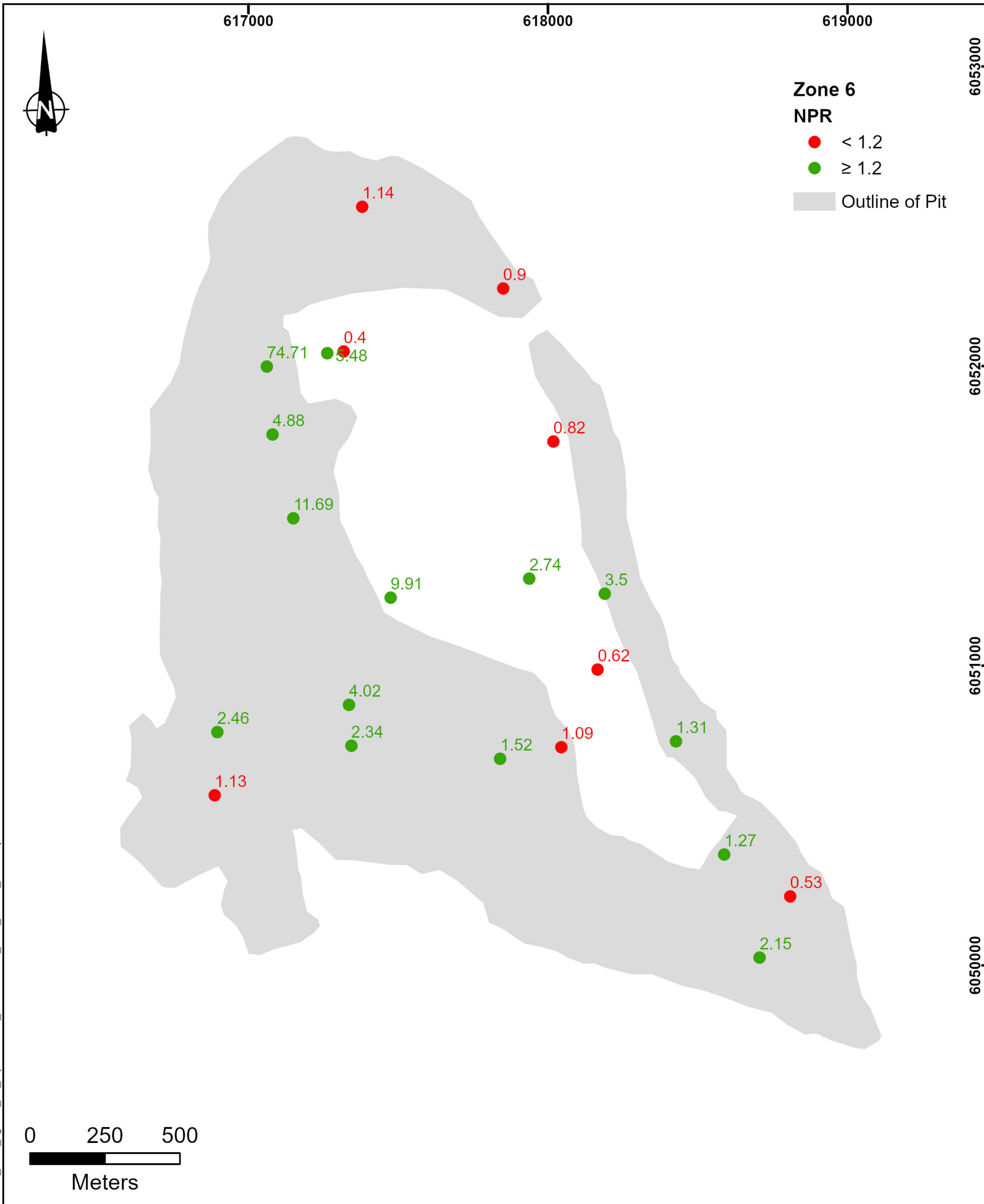

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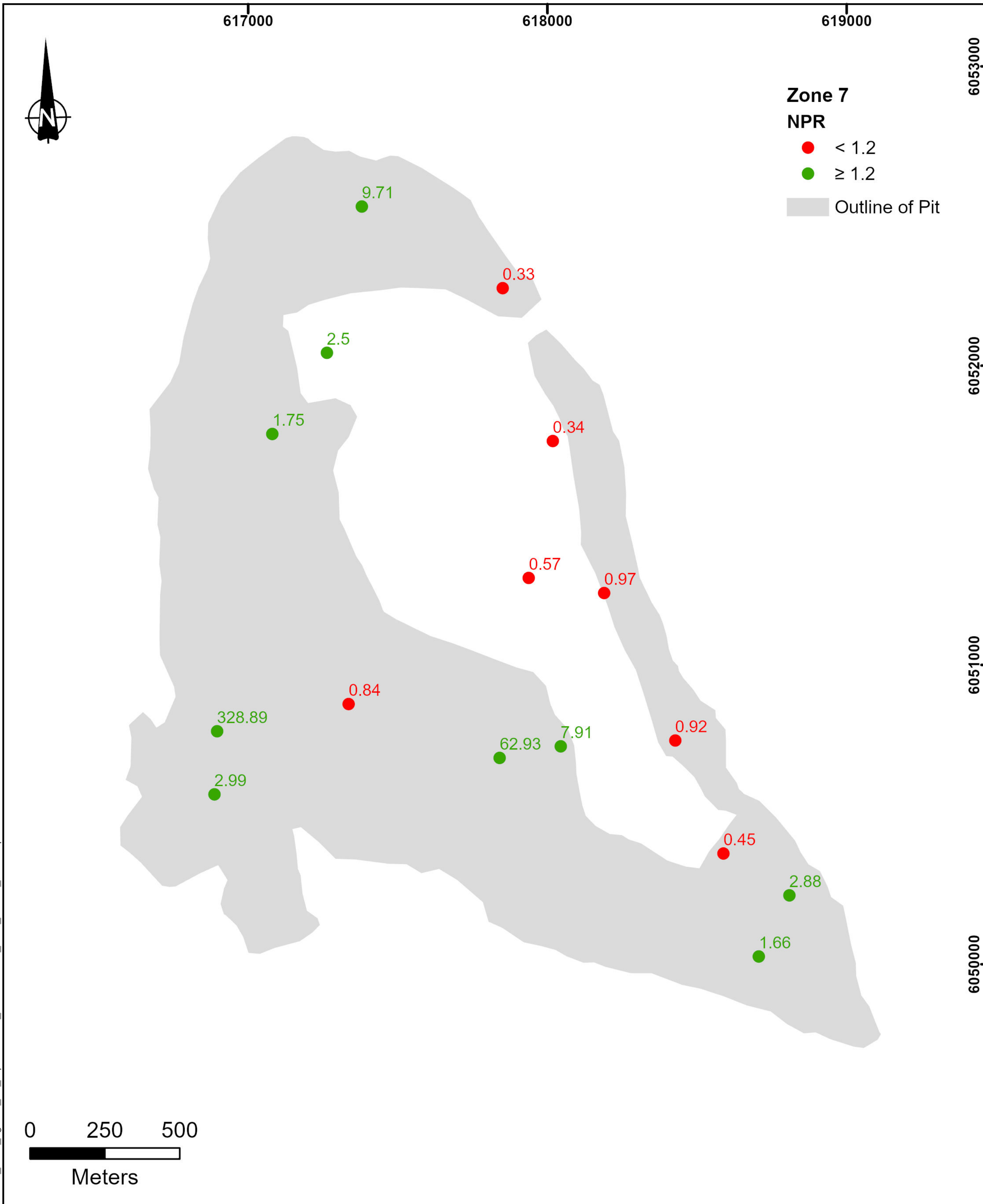
srk consulting	ALLEGIANCE COAL LIMITED	Tenas Project Supplemental Geochemical Characterization		
		Zone 6 ARD		
Job No: 1CT017.007 Filename: Tenas_1CT017.007_ABA_Zone6_rev02	ALLEGIANCE COAL	Date: Feb 2022	Approved: MKH	Figure: E-6



srk consulting	ALLEGIANCE COAL LIMITED	Tenas Project Supplemental Geochemical Characterization
		Zone 7 ARD
Job No: 1CT017.007 Filename: Tenas_1CT017.007_ABA_Zone7_rev02	ALLEGIANCE COAL	Date: Feb 2022 · Approved: MKH · Figure: E-7

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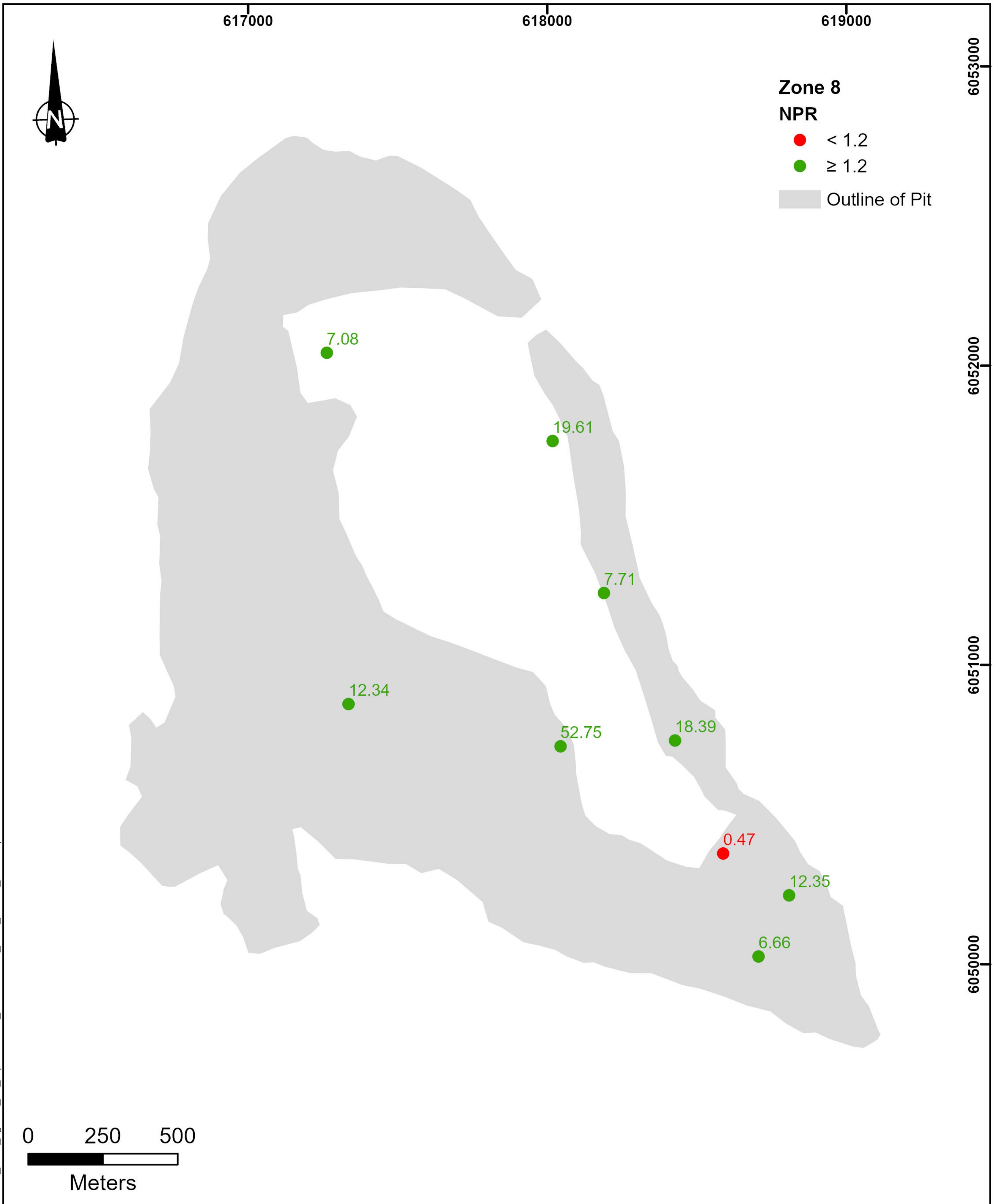

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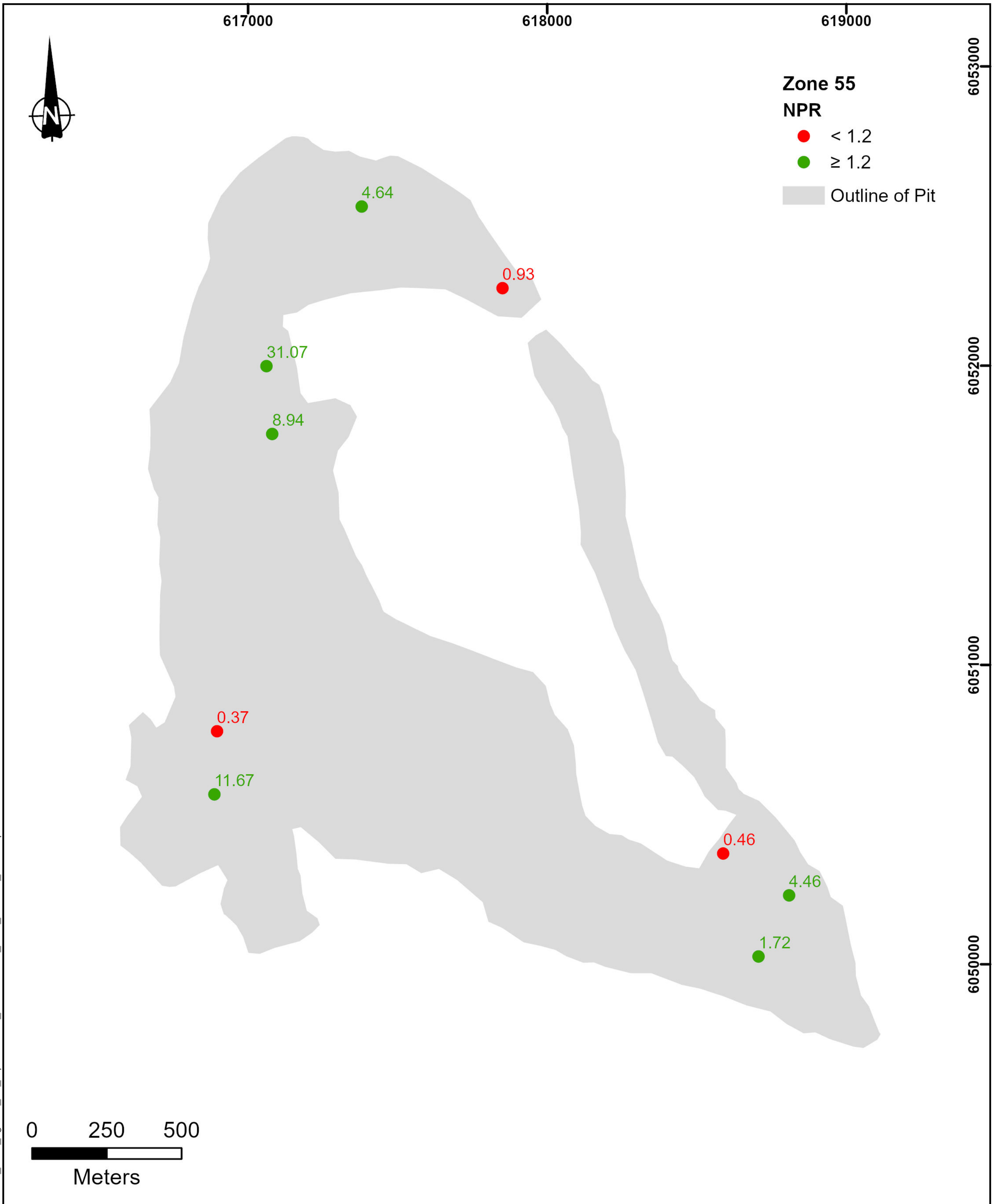
Zone 8 ARD

Job No: 1CT017.001 Filename: Tenas_1CT017.007_ABA_Zone8_rev02	ALLEGIANCE COAL	Date: Feb 2022	Approved: MKH	Figure: E-8



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Supplemental Geochemical Characterization

Zone 55 ARD

Job No: 1CT017.007

Filename: Tenas_1CT017.007_ABA_Zone55_rev02

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Date:	Approved:	Figure:
Feb 2022	MKH	E-9

Appendix F – Overburden ABA Results

Sample ID	Maxxam Sample ID	Sample Depth (m)			Lithology	Paste pH (s.u.)	Paste EC (uS/cm)	Carbon Species (w.t.%)			Sulphur Species (w.t.%)								Potentials (kg $CaCO_3$/tonne)					Neutralization Potential Ratios				
		From	To	Thickness				Total-C	Total Inorganic Carbon	CO_2	Total-S	Sulphate	S_{ICP}	Total-S (DL)	Sulphate (DL)	S_{ICP} (DL)	Sulphide (Total - SO_4)	Sulphide (S_{ICP} - SO_4)	AP (Total Sulphur)	AP (Sulphide)	CO_3-NP	Sobek-NP	Modified Sobek-NP	CO_3-NPR	Sobek-NPR (Total Sulphur)	Modified Sobek-NPR (Total Sulphur)	Sobek-NPR (Sulphide)	Modified Sobek-NPR (Sulphide)
+25mm fraction																												
+25MM - T18-10-S-BLK-02 9.5	UJ3985	9	9.5	0.50	Overburder	8.8	158	---	0.21	0.77	<0.02	0.01	<0.02	0.01	0.01	0.02	0.00	0.01	0.31	0.31	18	40	33	56.04	128.0	104.0	128.0	104.0
+2mm-25mm fraction																												
+2MM - T18-03-S-SPT4 6.0-6.45	UJ3987	6	6.45	0.45	Overburder	7.9	816	---	0.23	0.84	0.2	0.02	0.2	0.2	0.02	0.2	0.2	0.2	6	5	19	37	29	3.6	6.1	4.93	6.9	5.52
+2MM - T18-10-S-SPT2 3.0-3.45	UJ3988	3	3.45	0.45	Overburder	8.1	376	---	0.2	0.7	0.0	0.01	0.0	0.0	0.01	0.02	0.0	0.0	1	0	17	33	28	53.9	35.2	29.7	105.6	89.0
+2MM - T18-13-S-SPT2 4.5-4.95	UJ3989	4.5	4.95	0.45	Overburder	8.2	693	---	0.3	1.1	0.0	0.01	0.04	0.04	0.01	0.04	0.0	0.03	1	1	26	45	39	27.4	35.8	30.8	47.8	41.1
+2MM - T18-13-S-SPT5 12.0-12.45	UJ3990	12	12.45	0.45	Overburder	8.3	532	---	0.21	0.78	<0.02	<0.01	<0.02	0.01	0.005	0.02	0.01	0.02	0.3	0.5	18	40	34	38	127.4	107.2	85	71.5
+2MM - T18-10-S-BLK-02 9.0-9.5	UJ3991	9	9.5	0.50	Overburder	8.5	398	---	0.1	0.5	0.04	<0.01	0.04	0.04	0.005	0.04	0.04	0.04	1	1	11	34	30	10.2	27.0	23.8	30.9	27.2
+2MM - T18-02-S SPT-14 6.0-6.45m	UJ3993	6	6.45	0.45	Overburder	8.3	437	---	0.5	1.9	0.05	<0.01	0.05	0.05	0.005	0.05	0.05	0.05	2	1	43	67	66	30.6	42.8	41.9	47.5	46.6
-2mm fraction																												
-2MM - T18-03-S-SPT4 6.0-6.45	TO9565	6	6.45	0.45	Overburder	8.0	747	0.8	0.3	1.0	0.07	0.02	0.07	0.07	0.02	0.07	0.05	0.05	2	2	22	39	28	13.8	17.7	12.9	24.8	18.1
-2MM - T18-10-S-SPT2 3.0-3.45	TO9566	3	3.45	0.45	Overburder	8.3	383	0.9	0.2	0.9	0.02	0.01	<0.02	0.02	0.01	0.02	0.01	0.01	1	0	20	36	26	65.5	57.6	41.6	115.2	83.2
-2MM - T18-13-S-SPT2 4.5-4.95	TO9567	4.5	4.95	0.45	Overburder	8.0	2010	1	0.3	1.2	0.1	0.05	0.1	0.1	0.05	0.10	0.0	0.050	3	2	26	43	32	16.9	17.0	12.9	27.2	20.7
-2MM - T18-13-S-SPT5 12.0-12.45	TO9568	12	12.45	0.45	Overburder	8.3	580	0.4	0.22	0.79	<0.02	0.01	<0.02	0.01	0.01	0.02	0.0	0.01	0	0	18	39	27	57.5	123.2	86.4	123.2	86.4
-2MM - T18-10-S-BLK-02 9.0-9.5	TO9570	9	9.5	0.50	Overburder	8.2	717	0.7	0.27	1.0	0.04	0.02	0.05	0.04	0.02	0.05	0.02	0.03	1	1	23	41	28	24.3	32.4	22.4	43.2	29.9
-2MM - T18-02-S SPT-14 6.0-6.45m	TO9571	6	6.45	0.45	Overburder	8.1	875	0.9	0.3	1.0	0.06	0.02	0.07	0.06	0.02	0.07	0.04	0.05	2	2	24	41	28	15.1	21.8	14.9	26.1	17.9
Bulk Samples																												
ORIGINAL - T18-03-5-SPT2	TV0022	3	3.45	0.45	Overburder	8.2	276	0.6	0.19	0.7	<0.02	0.01	<0.02	0.01	0.01	0.02	0.0	0.01	0	0	16	53	23	50.9	168.0	74.56	168.0	74.6
ORIGINAL - T18-03-5-SPT6	TV0175	10.5	10.95	0.45	Overburder	8.4	336	1	0.4	1.6	0.1	0.01	0.1	0.1	0.01	0.1	0.1	0.1	3	3	36	32	37	12.78	10.08	11.68	11.2	12.98
ORIGINAL - T18-03-5-SPT5	TV0176	7.5	7.95	0.45	Overburder	8.4	483	0.8	0.4	1.4	0.1	0.01	0.09	0.09	0.01	0.09	0.1	0.08	3	3	32	48	38	12.7	17.1	13.4	19.2	15.1
Duplicates																												
+25MM - T18-10-S-BLK-02 9.5 Split Dup	UJ3986	9	9.5	0.50	Overburder	8.9	161	---	0.2	0.7	<0.02	0.01	<0.02	0.01	0.01	0.02	0.0	0.01	0.3	0.31	16	38	33	51	121	105.0	121	105
+2MM - T18-10-S-BLK-02 9.0-9.5 Split Dup	UJ3992	9	9.5	0.50	Overburder	8.5	436	---	0.1	0.5	0.05	<0.01	0.05	0.05	0.005	0.05	0.05	0.05	1.6	1.4	12	35	29	8	22.1	18.2	25	20.3
-2MM - T18-13-S-SPT5 12.0-12.45 SPLIT DUP	TO9569	12	12.45	0.45	Overburder	8.2	771	0.4	0.2	0.8	<0.02	0.01	<0.02	0.01	0.01	0.02	0.0	0.01	0.3	0.3	17	38	27	55	122.6	85.8	123	85.8

Appendix G – Overburden and Construction Rock Elemental Concentrations and Comparison to 10x Average Crustal Abundances

Sample ID	Maxxam Sample ID	Sample Depth (m) From	Sample Depth (m) To	Lithology	Al %	As ppm	Au ppb	B ppm	Ba ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppb
+25mm fraction																		
+25MM - T18-10-S-BLK-02 9.5	UJ3985	9	9.5	Overburden	2.62	15.3	0.3	<20	128	0.38	2.2	0.35	24.3	49	15.8	4.48	5.5	7
+2mm-25mm fraction																		
+2MM - T18-03-S-SPT4 6.0-6.45	UJ3987	6	6.45	Overburden	1.92	300	0.6	<20	245	6.15	1.42	3.05	14.5	41	73.5	3.89	5.3	38
+2MM - T18-10-S-SPT2 3.0-3.45	UJ3988	3	3.45	Overburden	2.07	35.3	0.5	<20	270	0.9	1.34	0.65	16.6	52.4	46.4	4.32	6.1	52
+2MM - T18-13-S-SPT2 4.5-4.95	UJ3989	4.5	4.95	Overburden	1.92	22.1	<0.2	<20	253	0.46	1.85	0.38	15.4	42.2	41.9	3.72	5.6	49
+2MM - T18-13-S-SPT5 12.0-12.45	UJ3990	12	12.45	Overburden	2.19	15.7	1.7	<20	241	0.37	1.79	0.37	16	37.7	43.6	3.94	6.1	30
+2MM - T18-10-S-BLK-02 9.0-9.5	UJ3991	9	9.5	Overburden	1.81	12.6	0.3	<20	181	0.2	1.42	0.22	17	45.8	36.9	3.8	5.3	30
+2MM - T18-02-S SPT-14 6.0-6.45m	UJ3993	6	6.45	Overburden	1.74	22.9	<0.2	<20	227	0.46	2.77	0.59	13.9	43.6	39.4	3.31	4.8	38
-2mm fraction																		
-2MM - T18-03-S-SPT4 6.0-6.45	TO9565	6	6.45	Overburden	1.88	13.4	<0.2	<20	193	0.29	1.5	0.3	14.5	48.4	44.2	3.61	4.9	52
-2MM - T18-10-S-SPT2 3.0-3.45	TO9566	3	3.45	Overburden	1.96	14	0.3	<20	225	0.17	1.31	0.27	14.9	48.1	43.7	3.79	5.2	55
-2MM - T18-13-S-SPT2 4.5-4.95	TO9567	4.5	4.95	Overburden	2.06	14.3	0.6	<20	259	0.15	1.73	0.39	14.7	38.6	48.8	3.7	5.2	36
-2MM - T18-13-S-SPT5 12.0-12.45	TO9568	12	12.45	Overburden	2.32	13.2	0.6	<20	233	0.16	1.62	0.28	16.9	39.5	46.3	3.86	5.7	31
-2MM - T18-10-S-BLK-02 9.0-9.5	TO9570	9	9.5	Overburden	2.02	10.2	<0.2	<20	193	0.14	1.5	0.23	15.1	36.1	43.2	3.66	5.3	41
-2MM - T18-02-S SPT-14 6.0-6.45m	TO9571	6	6.45	Overburden	1.98	41.4	273	<20	227	0.15	1.47	0.3	16.2	45.3	48.2	3.7	5.3	53
Bulk Samples																		
ORIGINAL - T18-03-5-SPT2	TV0022	3	3.45	Overburden	1.92	12.1	<0.2	<20	219	0.13	1.27	0.4	15.3	43.9	39.4	3.82	6	25
ORIGINAL - T18-03-5-SPT6	TV0175	10.5	10.95	Overburden	1.61	12.2	1.2	<20	198	0.11	1.71	0.36	14.3	37.7	31.6	3.45	5.1	74
ORIGINAL - T18-03-5-SPT5	TV0176	7.5	7.95	Overburden	1.7	10.5	0.2	<20	234	0.11	1.94	0.22	13.9	35.3	38.2	3.38	5	42
Duplicates																		
+25MM - T18-10-S-BLK-02 9.5 Split Dup	UJ3986	9	9.5	Overburden	2.67	17	1.1	<20	124	0.39	2.19	0.3	24.3	48.3	16	4.45	5.5	<5
+2MM - T18-10-S-BLK-02 9.0-9.5 Split Dup	UJ3992	9	9.5	Overburden	1.94	15	<0.2	<20	216	0.26	1.48	0.29	15.9	48.5	44.8	3.84	5.7	52
-2MM - T18-13-S-SPT5 12.0-12.45 SPLIT DUP	TO9569	12	12.45	Overburden	2.41	14.1	1.6	<20	228	0.15	1.65	0.26	16.4	43	48.1	3.97	6.1	38
Quarry Sample																		
ROCK ROAD CONSTRUCTION	UU1350	---	---		0.33	3.1	0.5	10	129	0.04	0.54	0.09	5.6	85.8	13.6	1.65	1.4	111
ROCK MATERIAL FOR ROADS	ZB0881	---	---	Overburden	0.27	5.9	0.3	<20	219	<0.02	1.45	0.03	5.6	77.3	9.59	1.62	1.1	9
Road Samples																		
T18-29	VH0513	---	---		1.72	10.2	1.6	10	217	0.12	1.74	0.3	11.7	37.8	30.3	3.63	4.6	37
T18-32	VH0514	---	---		2.45	9	0.8	10	213	0.12	1.78	0.2	14.3	37.1	37.6	4.45	5.6	38
T18-35	VH0515	---	---		1.78	8.7	0.3	10	225	0.16	0.53	0.21	12	45.2	30.5	3.89	6.1	23
T18-36	VH0516	---	---		1.7	8.4	0.9	10	248	0.19	0.52	0.35	15.1	45.3	32.5	4.78	5.6	16
T18-39	VH0517	---	---		1.74	9	1.2	10	210	0.13	0.52	0.7	13.6	48.1	37.9	4.13	5.5	19
Rail Loop Samples																		
TP18-23, 1.3-1.4	VH0584	1.3	1.4		1.84	4.1	0.8	10	110	0.05	0.8	0.13	13.8	56.5	31	3.98	6.5	9
TP18-23, 2.6-2.7	VH0585	2.6	2.7		1.68	4.6	3.5	10	85.8	0.04	0.55	0.1	9.6	53	23.9	3.91	5.6	9
TP18-24 1.9-2.1	VH0586	1.9	2.1		1.39	5.9	2	10	224	0.04	0.51	0.14	9.9	60.8	20	3.64	5.5	10
TP18-24 1-1.2	VH0587	1	1.2		1.47	5.2	2.1	10	121	0.06	0.56	0.14	9.7	54.7	18.3	3.49	6.1	14
T18-25, 2.1-2.3	VH0588	2.1	2.3		1.4	6.4	0.9	10	151	0.06	0.68	0.13	11.8	66.3	21.9	3.85	6.2	7
T18-25 3.2-3.4	VH0589	3.2	3.4		1.4	5.9	0.5	10	148	0.06	0.51	0.14	11.4	48.2	28.7	3.5	6.1	13
TP18-20 0.3-0.4	VH0590	0.3	0.4		1.55	8	0.3	10	180	0.08	0.56	0.14	11.6	39.8	29.1	3.31	5	31
TP18-20 0.7-0.8	VH0591	0.7	0.8		1.58	7.5	1	10	185	0.09	0.55	0.13	11.7	30.5	26	3.26	4.9	23
TP18-20 1.8-2.0	VH0592	1.8	2		1.15	5.5	0.8	10	168	0.04	0.42	0.07	9.1	42	14.5	3.18	4.9	9
***Screening Criteria**					800	20	40	100	4300	2	300	1.8	250	2000	600	500	170	800

Sample ID	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P %	Pb ppm	S %	Sb ppm	Sc ppm	Se ppm	Sr ppm	Te ppm	Th ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
+25mm fraction																						
+25MM - T18-10-S-BLK-02 9.5	0.05	8.7	1.76	1470	0.39	0.166	48.1	0.074	10.2	<0.02	0.25	7	<0.1	79	<0.02	1.6	0.179	0.03	1	111	<0.1	78.7
+2mm-25mm fraction																						
+2MM - T18-03-S-SPT4 6.0-6.45	0.12	8.4	0.95	971	0.87	0.054	28.3	0.076	16.2	0.19	1.11	8.1	0.4	90.7	0.04	1.8	0.061	0.06	0.5	71	<0.1	336
+2MM - T18-10-S-SPT2 3.0-3.45	0.13	9.5	1	1040	0.85	0.032	39.3	0.084	15.9	0.02	0.57	10.1	<0.1	83.5	<0.02	1.7	0.049	0.06	0.5	71	<0.1	143
+2MM - T18-13-S-SPT2 4.5-4.95	0.11	9	1.03	966	0.59	0.052	29.1	0.078	13.2	0.04	0.51	9.3	<0.1	115	<0.02	1.5	0.078	0.06	0.5	75	<0.1	108
+2MM - T18-13-S-SPT5 12.0-12.45	0.14	9.3	1.01	965	0.44	0.054	28.3	0.07	11.8	<0.02	0.52	10.3	0.2	112	<0.02	1.8	0.067	0.06	0.5	77	<0.1	98.6
+2MM - T18-10-S-BLK-02 9.0-9.5	0.09	12.9	1.13	834	0.6	0.081	40.7	0.104	8.42	0.04	0.44	7.1	<0.1	86.4	<0.02	1.6	0.09	0.06	0.5	82	<0.1	82
+2MM - T18-02-S SPT-14 6.0-6.45m	0.1	8	0.84	2490	0.65	0.055	27	0.064	14.4	0.05	0.5	8	<0.1	99.9	0.04	1.5	0.064	0.05	0.5	63	<0.1	96.1
-2mm fraction																						
-2MM - T18-03-S-SPT4 6.0-6.45	0.13	8.2	0.86	865	0.7	0.048	30.2	0.072	31.8	0.07	0.39	8.5	<0.1	94.9	0.03	1.7	0.066	0.08	0.5	67	<0.05	105
-2MM - T18-10-S-SPT2 3.0-3.45	0.16	8.3	0.9	843	0.89	0.04	32.3	0.074	15.8	<0.02	0.35	8.8	<0.1	79.2	0.04	1.8	0.053	0.06	0.5	68	<0.05	109
-2MM - T18-13-S-SPT2 4.5-4.95	0.14	8.5	0.99	851	0.56	0.092	27.1	0.07	26	0.1	0.51	9.9	<0.1	109	0.04	1.6	0.084	0.06	0.5	75	<0.05	110
-2MM - T18-13-S-SPT5 12.0-12.45	0.15	8.8	0.98	837	0.47	0.06	28.2	0.063	29.5	<0.02	0.44	10.7	<0.1	110	0.04	1.7	0.075	0.07	0.5	82	<0.05	103
-2MM - T18-10-S-BLK-02 9.0-9.5	0.14	8.7	0.94	1040	0.65	0.055	27.9	0.065	10.6	0.05	0.27	9.8	<0.1	96.7	<0.02	1.7	0.063	0.06	0.6	70	<0.05	88.9
-2MM - T18-02-S SPT-14 6.0-6.45m	0.16	8.8	0.92	1020	0.71	0.048	33.5	0.069	12.7	0.07	0.31	10.2	<0.1	93.8	0.05	1.8	0.06	0.06	0.5	69	<0.05	100
Bulk Samples																						
ORIGINAL - T18-03-5-SPT2	0.13	8.3	0.89	957	0.65	0.03	28.9	0.075	10.5	<0.02	0.3	9.6	<0.1	67.8	0.02	1.7	0.058	0.06	0.4	68	<0.05	110
ORIGINAL - T18-03-5-SPT6	0.13	8.9	0.73	869	0.95	0.044	27.3	0.066	12	0.1	0.39	9.6	<0.1	89.4	0.02	1.9	0.027	0.07	0.7	54	<0.05	92.4
ORIGINAL - T18-03-5-SPT5	0.13	10.4	0.79	889	0.76	0.061	19.4	0.067	9.3	0.09	0.31	9.7	<0.1	120	0.03	2.1	0.095	0.06	0.7	70	<0.05	88
Duplicates																						
+25MM - T18-10-S-BLK-02 9.5 Split Dup	0.05	8.9	1.79	1490	0.39	0.164	50.2	0.076	10.5	<0.02	0.28	7	<0.1	80.8	<0.02	1.6	0.18	0.03	0.9	112	<0.1	78.7
+2MM - T18-10-S-BLK-02 9.0-9.5 Split Dup	0.13	8.7	1.02	1060	0.67	0.07	30.7	0.07	10	0.05	0.52	9.9	<0.1	101	0.03	1.6	0.078	0.06	0.5	76	<0.1	94.2
-2MM - T18-13-S-SPT5 12.0-12.45 SPLIT DUP	0.17	8.9	1	858	0.43	0.068	29	0.063	25	<0.02	0.4	11.3	<0.1	109	0.03	1.7	0.077	0.07	0.5	82	<0.05	106
Quarry Sample																						
ROCK ROAD CONSTRUCTION	0.17	15.5	0.1	486	0.93	0.035	10.6	0.044	3.33	0.01	0.12	4.8	0.05	21	0.01	8	0.022	0.06	1	28	0.05	49.7
ROCK MATERIAL FOR ROADS	0.14	14.7	0.44	523	0.71	0.028	9.8	0.04	4.11	<0.02	0.12	5.1	<0.1	106	<0.02	7.1	0.017	0.05	1.3	27	0.2	33
Road Samples																						
T18-29	0.12	6.7	0.75	834	0.73	0.054	24.5	0.061	7.63	0.02	0.42	9.1	0.05	106	0.02	2	0.041	0.07	0.4	66	0.05	76.4
T18-32	0.15	6.5	1.09	742	0.57	0.087	34.7	0.068	7.27	0.04	0.27	9.1	0.05	128	0.02	1.7	0.032	0.06	0.4	74	0.05	82.6
T18-35	0.2	6	0.82	953	1.2	0.059	18.4	0.042	7.26	0.01	0.52	8.5	0.1	36.6	0.04	1.4	0.069	0.19	0.3	71	0.2	81.6
T18-36	0.16	5.6	1.01	1100	0.95	0.06	19.3	0.065	6.84	0.02	0.76	9.5	0.05	29	0.01	1.4	0.094	0.12	0.4	93	0.2	98.2
T18-39	0.16	6.8	0.96	992	1.06	0.06	23	0.068	7.32	0.03	0.65	8.9	0.05	27.9	0.01	1.5	0.089	0.11	0.4	86	0.1	98.7
Rail Loop Samples																						
TP18-23, 1.3-1.4	0.08	5.2	1.23	944	0.43	0.06	15.9	0.073	3.83	0.01	0.3	7	0.05	23.6	0.01	1	0.127	0.03	0.4	89	0.05	101
TP18-23, 2.6-2.7	0.08	5.2	0.95	874	0.43	0.049	12	0.063	4.38	0.01	0.43	7.5	0.05	24.3	0.01	0.9	0.116	0.04	0.3	82	0.05	91.7
TP18-24 1.9-2.1	0.2	5.7	0.86	820	0.5	0.06	13.8	0.072	4.34	0.01	0.36	7.4	0.05	26.9	0.02	1.1	0.109	0.08	0.4	72	0.05	100
TP18-24 1-1.2	0.11	6.4	0.88	827	0.4	0.077	13	0.066	4.25	0.01	0.31	7.3	0.05	24.7	0.01	1.2	0.099	0.04	0.4	74	0.05	92.7
T18-25, 2.1-2.3	0.12	6.8	0.88	904	0.62	0.071	13.3	0.122	4.89	0.01	0.54	8.9	0.05	26.8	0.05	1.3	0.121	0.05	0.4	86	0.05	103
T18-25 3.2-3.4	0.09	7.2	0.86	879	0.45	0.077	13.7	0.078	5.14	0.01	0.36	7.1	0.05	27.4	0.03	1.3	0.102	0.06	0.3	72	0.05	92.5
TP18-20 0.3-0.4	0.09	8.9	0.67	913	0.51	0.04	21.5	0.057	7.19	0.01	0.37	7.8	0.05	42.8	0.02	1.5	0.084	0.06	0.6	76	0.05	67.6
TP18-20 0.7-0.8	0.08	8.8	0.7	524	0.54	0.035	19.3	0.062	7.56	0.01	0.38	7.4	0.05	40.2	0.03	1.5	0.079	0.06	0.6	78	0.05	67.9
TP18-20 1.8-2.0	0.07	6.2	0.73	587	0.48	0.037	11.1	0.068	4.44	0.01	0.4	6.3	0.05	21	0.02	1.1	0.085	0.03	0.4	65	0.05	78.1
***Screening Criteria**	260	65	210	9000	20	240	800	1	160	0.5	1.5	50	0.9	3500	0.01	100	5	10	30	1500	10	700

*Screening criteria corresponds to 10 times the average crustal abundance from (Smith and Huyck, 1999)

Appendix H – Tailings ABA Results

Sample ID	Maxxam Sample ID	Description	Paste pH (s.u.)	Carbon Species (w.t.%)			Sulphur Species (w.t.%)								Potentials (kg $CaCO_3$/tonne)					Neutralization Potential Ratios				
				Total-C	Total Inorganic Carbon	CO_2	Total-S	Sulphate	S_{ICP}	Total-S (DL)	Sulphate (DL)	S_{ICP} (DL)	Sulphide (Total - SO_4)	Sulphide (S_{ICP} - SO_4)	AP (Total Sulphur)	AP (Sulphide)	CO_3-NP	Sobek-NP	Modified Sobek-NP	CO_3-NPR	Sobek-NPR (Total Sulphur)	Modified Sobek-NPR (Total Sulphur)	Sobek-NPR (Sulphide)	Modified Sobek-NPR (Sulphide)
Fine Fraction																								
183104	UI3972	Fine Processed Rock	7.8	25.9	2.3	8.6	1.9	0.02	1.8	1.9	0.02	1.83	1.9	1.8	60	57	196	220	192	3.4	3.7	3.2	3.8	3.4
182962	UI3973	Fine Processed Rock	7.6	16.0	1.8	6.7	2.7	0.02	2.7	2.66	0.02	2.7	2.6	2.7	83	84	151	163	157	1.8	2.0	1.9	1.9	1.9
TELKWA TAILINGS COMPOSITE	WT7431	Fine Processed Rock	7.6	21.6	2.3	8.6	3.9	0.07	3.5	3.9	0.07	3.50	3.9	3.4	123	109	194	---	158	1.8	---	1.3	---	1.4
TAILINGS	WP0672	Fine Processed Rock	6.2	43.2	0.8	3.1	3.0	0.05	3.1	3.0	0.05	3.05	2.9	3.0	93	95	71	---	61	0.7	---	0.7	---	0.6
Coarse Fraction																								
183104	UI3970	Coarse Processed Rock	6.2	34.5	0.7	2.5	3.79	0.05	3.71	3.79	0.05	3.71	3.74	3.7	118	116	56	63	111	0.5	0.5	0.9	0.5	1.0
182962	UI3971	Coarse Processed Rock	6.8	33	0.4	1.4	2.8	0.03	3.1	2.8	0.03	3.07	2.8	3.0	87	96	32	38	36	0.3	0.4	0.4	0.4	0.4
JIG CCR	WP0671	Coarse Processed Rock	3.7	47	0.5	1.9	4.1	0.16	3.8	4.1	0.16	3.80	4.0	3.6	128	119	43	---	30	0.4	---	0.2	---	0.3

Appendix I – Tailings Results

Sample ID	Maxxam Sample ID	Description	Al	As	Au	B	Ba	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg
			%	ppm	ppb	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm
Fine Fraction																
183104	UI3972	Fine Processed Rock	0.47	38.5	1.1	10	115	0.1	6.14	0.2	2.8	14	78.4	2.63	1	0.19
182962	UI3973	Fine Processed Rock	0.54	102	0.7	10	119	0.2	5.61	0.3	2.7	16	95.9	2.96	1	0.41
TELKWA TAILINGS COMPOSITE	WT7431	Fine Processed Rock	0.52	21.8	0.1	10	183	0.21	7.11	0.29	7.9	20.8	75	4.25	1.3	0.261
TAILINGS	WP0672	Fine Processed Rock	0.32	11.8	0.1	10	69.9	0.16	2.4	0.3	6.7	12.9	43.7	3.2	1.1	0.214
Coarse Fraction																
183104	UI3970	Coarse Processed Rock	0.39	70.5	0.9	10	68	0.2	2.07	0.2	2	5	19.9	3.35	0.5	0.37
182962	UI3971	Coarse Processed Rock	0.42	95.4	0.25	10	79	0.2	1.4	0.1	1.6	3	14.5	2.56	0.5	0.19
JIG CCR	WP0671	Coarse Processed Rock	0.19	16.4	0.1	10	61.3	0.2	1.01	0.12	3.7	6	17.7	3.71	0.7	0.34
*Screening Criteria			800	20	40	100	4300	2	300	1.8	250	2000	600	500	170	0.8

Sample ID	Maxxam Sample ID	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Se	Sr	Te	Th	Ti	Tl	U	V	W	Zn
		%	ppm	%	ppm	ppm	%	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
Fine Fraction																							
183104	UI3972	0.04	5	1.32	251	5.1	0.008	10.4	0.168	20.6	1.83	0.3	16.8	1.7	176	0.1	2.1	0.001	0.05	0.8	23	0.6	74
182962	UI3973	0.03	3	0.65	205	6	0.006	10.2	0.172	13.9	2.7	0.5	19.3	1.7	198	0.1	1.8	0.001	0.1	0.7	20	2.3	71
TELKWA TAILINGS COMPOSITE	WT7431	0.06	3.6	0.84	257	4.8	0.011	22.2	0.115	18.2	3.5	0.37	25.7	1.2	270	0.09	2.3	0.0005	0.38	1.1	26	0.6	101
TAILINGS	WP0672	0.04	2.5	0.63	231	4.06	0.009	13.4	0.093	21.6	3.05	0.34	19.6	1.1	86.1	0.08	1.5	0.0005	0.04	0.7	19	0.2	57.4
Coarse Fraction																							
183104	UI3970	0.04	3	0.48	139	3.8	0.024	5.2	0.048	16.3	3.71	0.4	6.6	1	70	0.1	4.5	0.0005	0.1	0.9	12	0.05	31
182962	UI3971	0.03	2	0.18	56	3.1	0.035	5.8	0.038	13.9	3.07	0.2	4.5	1.2	60	0.1	2.4	0.0005	0.1	0.6	11	0.05	26
JIG CCR	WP0671	0.02	1	0.38	307	3.39	0.004	7.1	0.007	16.2	3.8	0.25	5.9	0.8	36.8	0.08	1.7	0.0005	0.06	0.4	9	0.05	19.2
*Screening Criteria		260	65	210	9000	20	240	800	1	160	0.5	1.5	50	0.9	3500	0.01	100	5	10	30	1500	10	700

Notes:
*Screening criteria corresponds to 10 times the average crustal abundance from (Smith and Huyck, 1999