

Figure 12: XRD trace for sample U0403, with markers for the dominant minerals present

Qualitative chemical analysis of the amphibole

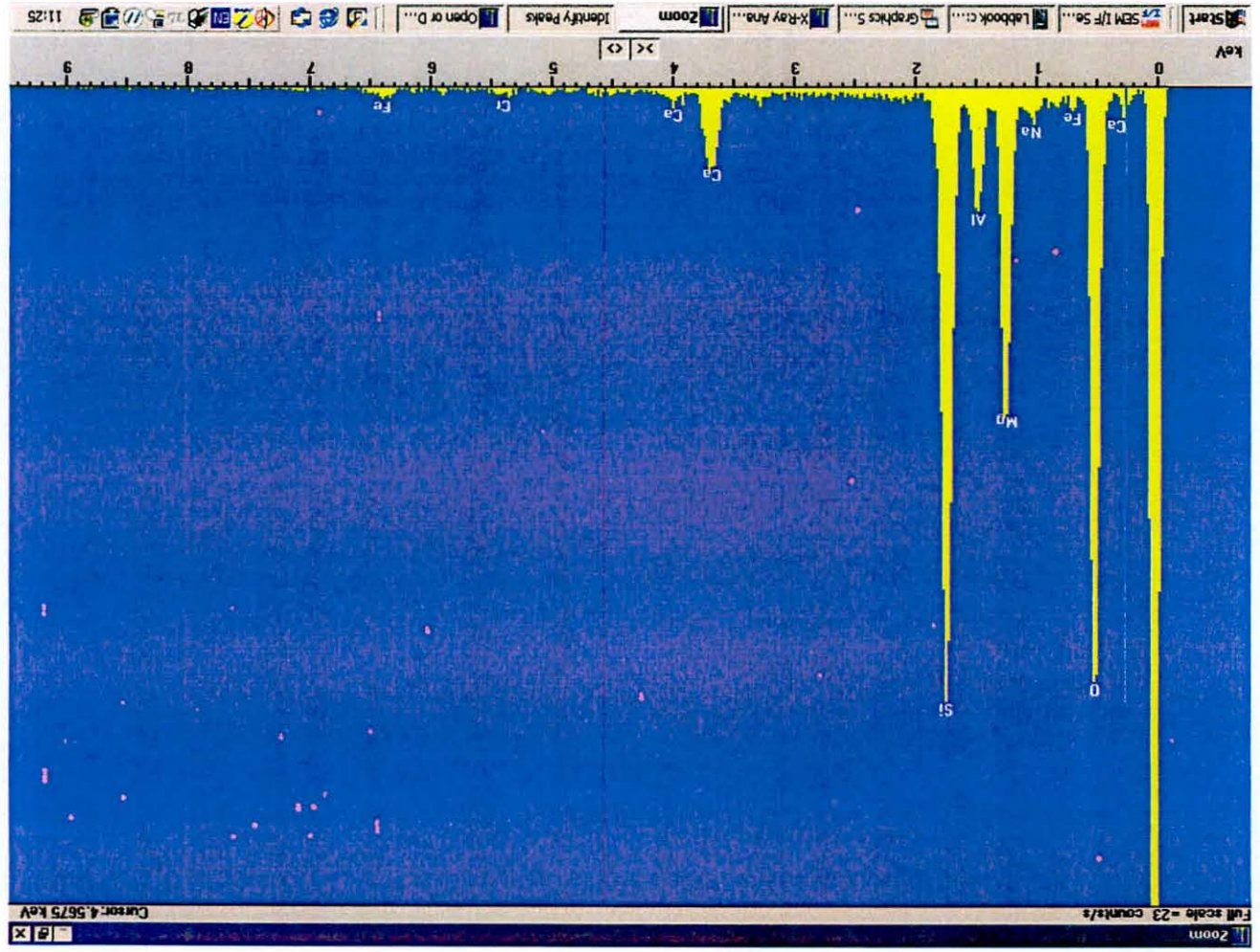
The nature of the amphibole was confirmed by electron microscopy, particularly because asbestos amphiboles have a distinctive chemistry. Selected grains of amphibole from sample B1614 were mounted on aluminium stubs and viewed using a Hitachi electron microscope. Qualitative chemical analysis was carried out using an ISIS energy dispersive X-ray analyser. The X-ray trace and peak markers from one amphibole grain are shown in Figure 13.

The amphibole is clearly a calcium-magnesium-aluminium variety, with sodium also present. Iron is only present in trace amounts. This chemistry is typical of the amphiboles pargasite and common hornblende. The lack of substantial iron coupled with the abundance of aluminium, rules out the common asbestos amphiboles (e.g. crocidolite, amosite, anthophyllite, actinolite, tremolite) as well as the serpentine mineral, chrysotile.

CONCLUSION

No fibrous minerals/asbestos have been observed in these samples.

Figure 13: Energy dispersive X-ray trace for amphibole from sample B1614



APPENDIX



TECHNICAL BULLETIN NUMBER 2011-604
June 2011

A SUMMARY ON THE AMPHIBOLITE SAMPLE COLLECTION

1 SUMMARY

Samples containing amphibolite were collected from the chips generated during Phase 1 exploration campaign. These were collected to test for fibrous minerals.

Six chip tray samples were collected from FCL001, FCL007, FCL010, FCL011 and FCL014. Of the six samples, three were collected from the fresh zone and three from the weathered zone (see Table 1).

Table 1: Summary of samples containing amphibolite

| Fresh Samples | | | | | | |
|---------------|----------|--------|-----------|-------------|------|-----|
| BHID | From (m) | To (m) | Sample No | Rock | MgO% | Fe% |
| FCL001 | 115 | 116 | B1387 | Amphibolite | 23.4 | 9.1 |
| FCL007 | 104 | 105 | B1611 | Amphibolite | 21.3 | 7.3 |
| FCL007 | 116 | 117 | B1614 | Amphibolite | 21.2 | 6.9 |

| Weathered Samples | | | | | | |
|-------------------|----------|--------|-----------|-------------|------|-----|
| BHID | From (m) | To (m) | Sample No | Rock | MgO% | Fe% |
| FCL010 | 13 | 14 | U0341 | Amphibolite | 13.3 | 7 |
| FCL011 | 15 | 16 | U0232 | Amphibolite | 12.5 | 8.7 |
| FCL014 | 50 | 51 | U0403 | Amphibolite | 23.6 | 7.4 |

In most instances, the amphibolite is within close proximity of the mineralised zone. In borehole FCL001, the amphibolite is a footwall to the Magnetite Quartz (MQ) intersected from 107m to 115m. The amphibolite was logged from 115m to 117m.

In borehole FCD007, the amphibolite is 6m away from the MQ intersected from depth of 91m to 98m. The amphibolite was intersected at 104m. The amphibolite intersected from 116m to 118m is a hangingwall to the MQ intersected at a depth of 118m.

The amphibolite sampled in FCD010 is a hangingwall to the MQ intersected from 15m to 23m. The amphibolite in FCD011 is between the MQ intersected from 13m to 15m, and the MQ intersected at 16m to 24m. The amphibolite in FCL014 is also between two MQ intersections.

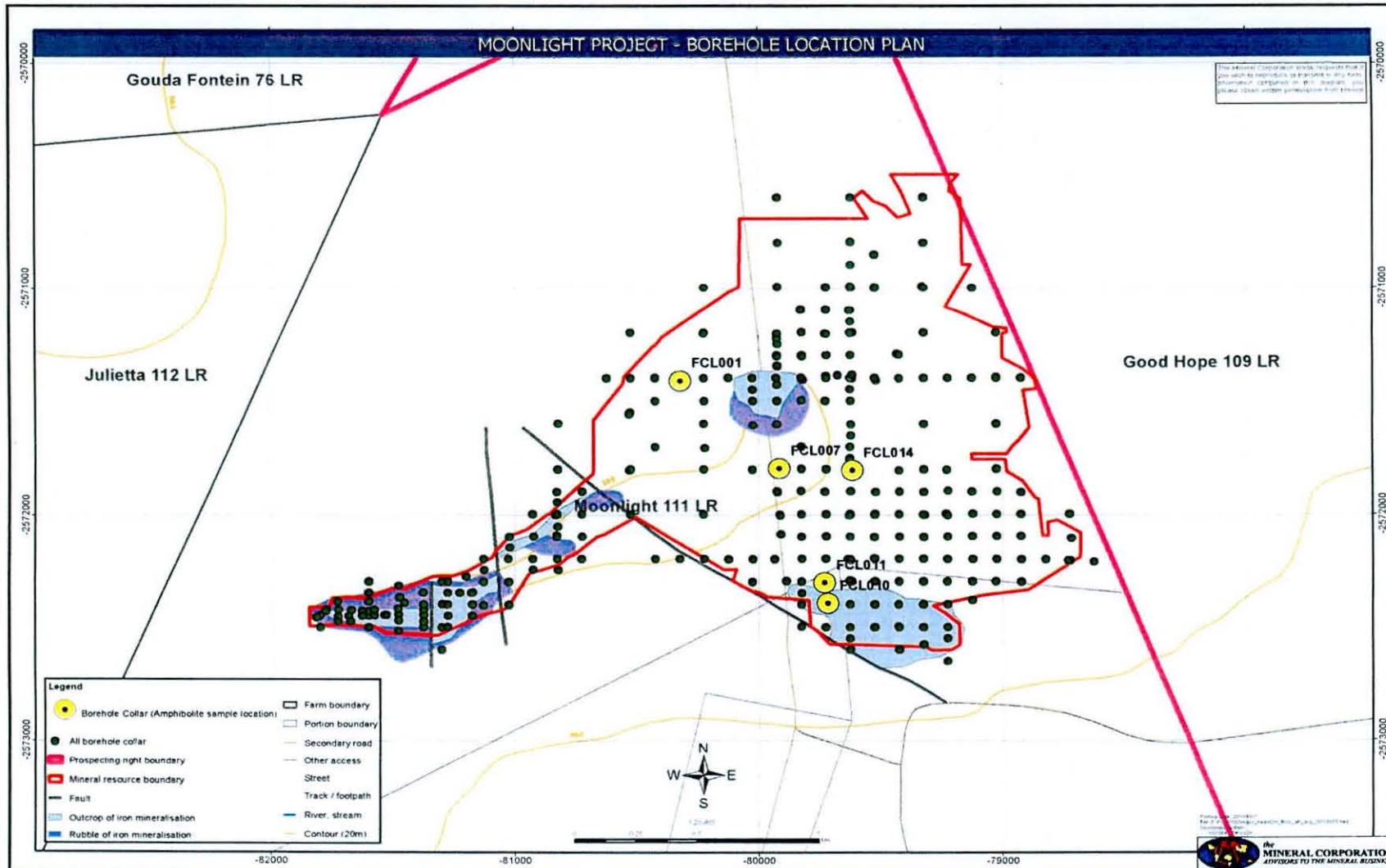


Figure1: Borehole location plan



WASTE CHARACTERISATION REPORT
FERRUM CRESCENT (PTY) LTD.
MOONLIGHT IRON ORE PROJECT – SOUTH AFRICA
JUNE 2011

Appendix D
SGS Factual Testing Report



SGS South Africa (Pty) Ltd

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Pier Chiti

AMEC MinProc

P O Box 62228

Bryanston

2021

RSA

TEST REPORT

Lab Ref LA104389
Client Ref **PHASE 1 - ANA2011-0090**
Project DEFAULT
Product Code SOLIDS

Status Final
Received 23/03/11
Reported 13/04/11

Samples 46
First Sample U0892
Last Sample WASTE ROCK
Pages 6

Notes

BOREHOLE ID:FCL004;FCL005;FCL006;FCL007;FCL008;FCL011;FCL013;
 FCL015FCL017;FCL018;FCL019;FCL022;FCL027;FCL028;
 FCL029;FCL031;FCL039;FCL046;FCL056;FCL058;FCL067;
 FCL068;FCL069;FCL070;FCL071;FCL072;FCL077;FCL081;
 FCL083;

Technical Signatory Name: *Signature:*

Technical Signatory Name: *Signature:*

Technical Signatory Name: *Signature:*

On behalf of: *SGS South Africa*

The results in the following analytical report pertain to this laboratory for preparation and/or analysis as requested by AMEC MinProc.

The analytical results reported herein refer to the samples as received and are based on a dry basis where applicable.

Please refer to Appendix A: Accredited methods & Appendix B: Non-accredited methods

Tests marked with an asterisk (*) in this certificate are included in the SANAS Accreditation Schedule for this Laboratory.



T0169

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Lab Ref LA104389
Client Ref **PHASE 1 - ANA2011-0090**
Project DEFAULT
Reported 13/04/11
Status Final
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TEST REPORT

| Scheme Units | WtRec | Total S* |
|------------------------|-------------|-------------|
| | WGH79 Kg | CSA06V % |
| Detection Limit | 0.01 | 0.01 |
| U0892 | 0.146 | <0.01 |
| U0951 | 0.146 | <0.01 |
| U0924 | 0.135 | 0.13 |
| U0018 | 0.140 | <0.01 |
| U0111 | 1.066 | <0.01 |
| 1611 | 0.140 | 0.12 |
| 1635 | 0.060 | 0.11 |
| 1574 | 0.154 | <0.01 |
| B1105 | 0.184 | <0.01 |
| U0232 | 0.337 | <0.01 |
| U0484 | 0.122 | <0.01 |
| U0483 | 0.203 | <0.01 |
| U0486 | 0.222 | 0.08 |
| U0547 | 1.052 | <0.01 |
| U0553 | 1.080 | <0.01 |
| U0166 | 1.102 | <0.01 |
| U0593 | 0.139 | <0.01 |
| U0564 | 0.135 | <0.01 |
| B1145 | 0.148 | <0.01 |
| B1191 | 1.012 | <0.01 |
| B1197 | 0.237 | <0.01 |
| E0466 | 1.276 | <0.01 |
| E0493 | 0.126 | <0.01 |
| E0505 | 0.141 | <0.01 |
| E0504 | 0.123 | <0.01 |
| 1503 | 0.163 | <0.01 |
| 476 | 0.169 | <0.01 |
| 1293 | 1.005 | <0.01 |
| E0182 | 0.152 | <0.01 |
| E0101 | 0.118 | <0.01 |
| E0097 | 1.030 | <0.01 |
| E0128 | 1.010 | <0.01 |
| E0132 | 0.176 | <0.01 |
| E0308 | 0.919 | <0.01 |
| E0327 | 1.185 | 0.08 |

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received / U.T.D. Unable To Determine

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Lab Ref LA104389
Client Ref **PHASE 1 - ANA2011-0090**
Project DEFAULT
Reported 13/04/11
Status Final
Page Page 3 of 6

TEST REPORT

| | WtRec | Total S* |
|------------|-------|----------|
| | WGH79 | CSA06V |
| | Kg | % |
| E0415 | 0.176 | <0.01 |
| E0564 | 1.144 | <0.01 |
| E0351 | 1.686 | <0.01 |
| E0354 | 1.454 | <0.01 |
| E0342 | 1.021 | <0.01 |
| E0297 | 1.312 | <0.01 |
| E0306 | 0.208 | <0.01 |
| E0457 | 1.051 | <0.01 |
| E0523 | 1.363 | <0.01 |
| E0525 | 0.143 | <0.01 |
| WASTE ROCK | - | <0.01 |
| B1105 | | <0.01 |
| EC327 | | 0.08 |
| EC525 | | <0.01 |
| NBM-1 | | 0.28 |
| NBM-1 | | 0.27 |
| BLANK | | <0.01 |
| BLANK | | <0.01 |

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received / U.T.D. Unable To Determine

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TEST REPORT**APPENDIX A - ACCREDITED METHODS**

| METHOD NUMBER | METHOD DESCRIPTION | SCHEME CODE |
|---------------------------------|--|--|
| ME-ZA-[MINANA]-[BYZ(FAS)]AN-001 | Au by Lead Fusion followed by Atomic Absorption analysis or Gravimetric analysis | FAALA01, FAALA01D, FAGLA01, FAGLA02, FAGLA03, FAGLA04, FAGLA05 |
| ME-ZA-[MINANA]-[BYZ(FAS)]AN-002 | Au, Pt, Pd by Lead Fusion followed by | FAI313 |
| ME-ZA-[MINANA]-[BYZ(FAS)]AN-003 | Pt, Pd, Rh, Ru, Ir by Nickel Sulphide, ICP-OES finish | FAI363 |
| ME-ZA-[MINANA]-[BYZ(XRF)]AN-001 | Major Element Oxides by Borate fusion XRF | XRF79V, XRF79C |
| ME-ZA-[MINANA]-[BYZ(XRF)]AN-002 | Base Metals by Potassium Pyrosulphate Fusion XRF | XRF77R |
| ME-ZA-[MINANA]-[BYZ(AAS)]AN-001 | Acid Soluble Cu and Ni by Acid digestion and analysis by AAS | AAS13C |
| ME-ZA-[MINANA]-[BYZ(LEC)]AN-001 | Total Sulphur and Carbon by Leco Combustion Infrared Detection | CSALA01, CSALA06 |
| ME-ZA-[MINANA]-[BYZ(ICM)]AN-001 | Total & Dissolved metals by ICP-OES & ICP-MS | ICP84T & IMS84T |
| ME-ZA-[MINANA]-[BYZ(XRF)]AN-003 | Uranium Oxide, pressed powder analysis using XRF spectrometer | XRF75G |
| ME-ZA-[MINANA]-[BYZ(FAS)]AN-005 | Rh by Pd fusion by ICP-OES finish | FAI353 |
| ME-ZA-[MINANA]-[BYZ(WET)]AN-001 | Chloride by Potentiometric titration | CLA27V |

- not analysed / -- element not determined / I.S. insufficient sample / L.N.R. listed not received / U.T.D. Unable To Determine

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TEST REPORT

APPENDIX B - NON-ACCREDITED METHODS

METHOD DESCRIPTION

Silver (Ag) by Fire Assay, gravimetric finish
Trace elements by pressed pellet, XRF
Sulphide Sulphur (S²⁻) by Leco
Elemental sulphur (S⁰) by gravimetric finish
Aqueous sulphate (SO₄) by Dionex
Sulphate (SO₄) on solids by Dionex
Carbonate (CO₃) by LECO
Graphite carbon by LECO
Organic carbon by LECO
pH determination
Conductivity (EC) determination
Total Hardness as CaCO₃ (calc from ICP Ca, Mg analyses)
Anions by IC (F, Cl, NO₂, NO₃, SO₄)
Ammonia (NH₃) by spectroquant
Phosphate (PO₄) by colourmetric analysis
Chemical Oxygen Demand (COD) by spectroquant
Suspended solids (TSS)
Total dissolved solids (TDS), gravimetric finish (180 °C)/Electrometric, conductivity meter
Alkalinity by titration
Chloride (Cl) by titration (solutions)
Chloride (Cl) by titration (solids)
Fluoride (F) by ISE (solutions)
Fluoride (F) by ISE (solids)
Acid Base Accounting (ABA)
Net acid generation (NAG) test (incl. S species)
Short term leach testing (ARLP, TCLP, SPLP, etc)
Deionised water (DI) leach (2 hours, L:S=10)
Cyanide (CN) species - Free, WAD & Total
Thiocyanate (SCN) by IC
Metals by AAS (solutions)
Gold (Au) in CN solutions by AAS
Silver (Ag) by acid digestion, AAS
Arsenic (As) by Aqua Regia digestion, AAS
Multi Acid digestion, AAS finish
Acid soluble Cu, Co by Sulphuric Acid leach, AAS
Aqua Regia digestion, ICP-OES finish
Multi Acid digestion, ICP-OES finish
Sodium Peroxide fusion, ICP-OES finish

SCHEME CODE

FAGLA02
XRF75G
CSA08V
CSA12V
CLA31V
CSA11V
CSA02V
CSA10V
CSA03V
ISE06T
ISE09V
ICP84B
CLA31V
CLA23V
CLA22V
CLA24V
PHY18V
ISE10V
CLA28V
CLA27V
CLA04E
ISE07W
ISELA01
CLA41V
CLA43V
CLA40V
Leach
CLA25V
CLA31V
AAS84T
SOL81T
AAS14E
AAS11C
AAS40D
AAS72C
ICP13E
ICP40D
ICP91B

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TEST REPORT

APPENDIX B - NON-ACCREDITED METHODS (continue)

METHOD DESCRIPTION

Semi quantitative ICP-OES +ICP-MS scan, Aqua Regia digestion
As, Hg, Se, Te by Aqua Regia digestion, ICP-MS finish
Multi Acid digestion, semi quantitative scan, ICP-OES + ICP-MS
Multi acid digestion, ICP-MS
Rare Earth Elements (REE) by Na₂O₂ fusion, ICP-MS
Free acid titration
Chloride (Cl) by manual titration (Metallurgical)
As 3+ by titration
As 5+ by calculation
Lime (CaO) by titration
Lime (CaO), calculation after AAS analysis
Ferrous (Fe²⁺) iron by titration (solids)
Ferrous (Fe²⁺) iron by titration (solutions)
Ferric (Fe³⁺) iron by diff (incl. Fe total, Fe²⁺) - solids
Ferric (Fe³⁺) iron by diff (incl. Fe total, Fe²⁺) - solutions
Iron (Fe) by titration (solids)
Tin (Sn) by titration (solids)
Zinc (Zn) by EDTA titration (solids)
Hexavalent chromium (Cr⁶⁺) in solutions
Manganese (Mn) by back titration
Vanadium (V) by titration
Chrome (Cr) by back titration
Relative Density/Specific Gravity (by Le Chatelier flask)
Bulk density
Relative Density/Specific Gravity (by Helium pycnometer)
Grain density
Moisture (105 °C)
Ash/LOI (1050 °C)

SCHEME CODE

ICM12B
IMS12Q
ICM40B
IMS40B
IMS90A
CLA15F
CLA26V
CLA32V
CLA32V
CLA07C
CLA07C
CLA34V
CLA34V
CLA34V
CLA35V
CLA35V
CON14V
CON12V
CLA21V
CON15V
CON16V
CON10B
PHY04V
PHY21V
PHY03V
PHY20V
PHY08D
PHY01K

- not analysed / - element not determined / I.S. insufficient sample / L.N.R. listed not received / U.T.D. Unable To Determine

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T0169



ANALYTICAL REPORT

CLIENT DETAILS

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Client: **AMEC Earth & Environmental**
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Halfway House
1685**

Telephone: **011 840 7454**
Facsimile: **011 514 0006**
Email: **pier.chiti@amec.com**
Project: **(Not specified)**
Order Number: **Phase 1-ENV2011-065**
Samples: **45**

LABORATORY DETAILS

Laboratory: **SGS South Africa (Pty) Limited**
Address: **259 Kent Avenue
Femdale, 2194**
Telephone: **+27 (0)11 781 5689**

Project Specialist: **Tasneem Tagari**
SGS Reference: **JB11-01420 R0**
Report Number: **0000000788**
Date Reported: **2011/05/10 09:00:03AM**

COMMENTS

Whilst SGS laboratories conform to ISO/IEC 17025 standards, results of analysis in this report fall outside of the current scope accreditation

Samples tested as received.

Analysis of sulphur and carbon species completed by SGS Analytical Services Booyens.

AP = acid potential = sulphide x 31.25. Where sulphide is reported as below the MDL, 0.01 is used for the calculation.

NP = neutralisation potential = $(50 \times N \text{ HCl} \times [\text{vol. HCl} - (N \text{ NaOH} / N \text{ HCl}) \times \text{vol. NaOH}]) / \text{sample mass}$

Net NP = NP - AP

PAG: Potentially acid generating, based on interpretation of ABA data alone.

PAN: Potentially acid neutralising, based on interpretation of ABA data alone.

U: Uncertain with respect to potential acid generation or neutralisation, based on interpretation of ABA data alone.

The Modified ABA test method merely provides an indication of the potential for acid generation. Whether or not acidic drainage will result depends on the mineralogy, the availability of each acid generating and neutralising mineral present, the physical characteristics of the material and the environmental setting.

SIGNATORIES

Sarah Newton

Technical Consultant

Tasneem Tagari

Project Specialist / Technical Signatory

ANALYTICAL REPORT

JB11-01420 R0

Client reference Phase 1-ENV2011-065

| | Sample Number | JB11-01420.001 | JB11-01420.002 | JB11-01420.003 | JB11-01420.004 | JB11-01420.005 |
|---|-------------------------|----------------|----------------|----------------|----------------|----------------|
| | Sample Name | U0892 | U0951 | U0924 | U0018 | U0111 |
| Parameter | Units | LOR | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | |
| Paste pH | No unit | 1.0 | 8.2 | 8.4 | 8.7 | 8.7 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | |
| Fizz Rating | - | - | 1 | 1 | 3 | 1 |
| Sample Weight | g | - | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | 20.00 | 20.00 | 40.70 | 20.00 |
| Normality of standardised NaOH | No unit | - | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | 17.60 | 17.90 | 26.00 | 19.10 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | 4.9 | 4.1 | 36 | 0.89 |
| | | | | | | |
| | Sample Number | JB11-01420.006 | JB11-01420.007 | JB11-01420.008 | JB11-01420.009 | JB11-01420.010 |
| | Sample Name | B1611 | B1636 | B1674 | B1105 | U0232 |
| Parameter | Units | LOR | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | |
| Paste pH | No unit | 1.0 | 9.1 | 8.4 | 8.1 | 8.9 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | |
| Fizz Rating | - | - | 1 | 1 | 1 | 1 |
| Sample Weight | g | - | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | 20.00 | 20.00 | 20.00 | 20.00 |
| Normality of standardised NaOH | No unit | - | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | 12.90 | 16.10 | 17.30 | 18.10 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | 17 | 8.8 | 5.7 | 3.5 |
| | | | | | | |
| | Sample Number | JB11-01420.011 | JB11-01420.012 | JB11-01420.013 | JB11-01420.014 | JB11-01420.015 |
| | Sample Name | U0484 | U0483 | U0486 | U0547 | U0553 |
| Parameter | Units | LOR | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | |
| Paste pH | No unit | 1.0 | 8.9 | 8.7 | 8.8 | 9.1 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | |
| Fizz Rating | - | - | 1 | 1 | 4 | 3 |
| Sample Weight | g | - | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | 20.00 | 20.00 | 40.00 | 20.00 |
| Normality of standardised NaOH | No unit | - | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | 16.50 | 17.50 | 19.10 | 15.70 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | 7.8 | 5.1 | 52 | 9.9 |

ANALYTICAL REPORT

JB11-01420 R0

Client reference Phase 1-ENV2011-065

| | | | Sample Number Sample Name | JB11-01420.016 U0186 | JB11-01420.017 U0593 | JB11-01420.018 U0584 | JB11-01420.019 B1146 | JB11-01420.020 B1181 |
|---|-------------------------|------------|------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Parameter | Units | LOR | | | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | | | |
| Paste pH | No unit | 1.0 | | 8.3 | 8.4 | 8.2 | 8.4 | 8.8 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | | | |
| Fizz Rating | - | - | | 1 | 1 | 1 | 3 | 1 |
| Sample Weight | g | - | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | | 0.103 | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 |
| Normality of standardised NaOH | No unit | - | | 0.106 | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | | 15.70 | 17.50 | 19.00 | 18.30 | 16.90 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | | 9.9 | 5.1 | 1.2 | 3.0 | 6.7 |

| | | | Sample Number Sample Name | JB11-01420.021 B1197 | JB11-01420.022 E0466 | JB11-01420.023 E0493 | JB11-01420.024 E0505 | JB11-01420.025 E0504 |
|---|-------------------------|------------|------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Parameter | Units | LOR | | | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | | | |
| Paste pH | No unit | 1.0 | | 9.2 | 8.2 | 8.2 | 7.8 | 8.4 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | | | |
| Fizz Rating | - | - | | 3 | 1 | 1 | 1 | 1 |
| Sample Weight | g | - | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | | 0.103 | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | | 49.00 | 20.00 | 20.00 | 20.00 | 20.00 |
| Normality of standardised NaOH | No unit | - | | 0.106 | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | | 39.90 | 18.70 | 17.80 | 18.90 | 18.60 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | | 2.0 | 1.9 | 4.3 | 1.4 | 2.2 |

| | | | Sample Number Sample Name | JB11-01420.026 E0503 | JB11-01420.027 E0476 | JB11-01420.028 E0293 | JB11-01420.029 E0182 | JB11-01420.030 E0101 |
|---|-------------------------|------------|------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Parameter | Units | LOR | | | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | | | |
| Paste pH | No unit | 1.0 | | 8.3 | 8.0 | 8.4 | 7.9 | 7.5 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | | | |
| Fizz Rating | - | - | | 1 | 1 | 1 | 1 | 1 |
| Sample Weight | g | - | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | | 0.103 | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 |
| Normality of standardised NaOH | No unit | - | | 0.106 | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | | 18.40 | 18.50 | 17.70 | 17.80 | 18.40 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | | 2.7 | 2.5 | 4.6 | 4.3 | 2.7 |

ANALYTICAL REPORT

JB11-01420 R0

Client reference Phase 1-ENV2011-065

| | Sample Number | JB11-01420.031 | JB11-01420.032 | JB11-01420.033 | JB11-01420.034 | JB11-01420.035 | |
|---|-------------------------|----------------|----------------|----------------|----------------|----------------|-------|
| | Sample Name | E0097 | E0128 | E0132 | E0308 | E0327 | |
| Parameter | Units | LOR | | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | | |
| Paste pH | No unit | 1.0 | 7.7 | 8.3 | 8.9 | 6.4 | 9.1 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | | |
| Fizz Rating | - | - | 1 | 1 | 1 | 1 | 1 |
| Sample Weight | g | - | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | 0.103 | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 |
| Normality of standardised NaOH | No unit | - | 0.106 | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | 18.60 | 17.70 | 16.50 | 18.90 | 16.80 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | 2.2 | 4.6 | 7.8 | 1.4 | 7.0 |

| | Sample Number | JB11-01420.036 | JB11-01420.037 | JB11-01420.038 | JB11-01420.039 | JB11-01420.040 | |
|---|-------------------------|----------------|----------------|----------------|----------------|----------------|-------|
| | Sample Name | E0415 | E0564 | E0351 | E0354 | E0342 | |
| Parameter | Units | LOR | | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | | |
| Paste pH | No unit | 1.0 | 9.4 | 9.4 | 6.7 | 6.2 | 9.1 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | | |
| Fizz Rating | - | - | 1 | 4 | 1 | 1 | 1 |
| Sample Weight | g | - | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | 0.103 | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | 20.00 | 94.10 | 20.00 | 20.00 | 20.00 |
| Normality of standardised NaOH | No unit | - | 0.106 | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | 15.20 | 27.60 | 19.30 | 19.10 | 16.80 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | 11 | 170 | 0.36 | 0.89 | 7.0 |

| | Sample Number | JB11-01420.041 | JB11-01420.042 | JB11-01420.043 | JB11-01420.044 | JB11-01420.045 | |
|---|-------------------------|----------------|----------------|----------------|----------------|----------------|-------|
| | Sample Name | E0297 | E0306 | E0457 | E0523 | E0525 | |
| Parameter | Units | LOR | | | | | |
| Paste pH and conductivity and 10% pH in soil Method: | | | | | | | |
| Paste pH | No unit | 1.0 | 7.8 | 7.7 | 7.6 | 8.7 | 8.9 |
| Neutralising Potential (NP) Method: AS4969 | | | | | | | |
| Fizz Rating | - | - | 1 | 1 | 1 | 2 | 1 |
| Sample Weight | g | - | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Normality of standardised HCl | No unit | - | 0.103 | 0.103 | 0.103 | 0.103 | 0.103 |
| Volume of HCl added | ml | - | 20.00 | 20.00 | 20.00 | 31.50 | 20.00 |
| Normality of standardised NaOH | No unit | - | 0.106 | 0.106 | 0.106 | 0.106 | 0.106 |
| Titre of NaOH | ml | - | 18.80 | 18.20 | 16.60 | 17.40 | 14.20 |
| NP as kg CaCO ₃ /T | kg CaCO ₃ /T | 0.10 | 1.7 | 3.3 | 2.2 | 35 | 14 |

METHOD SUMMARY

JB11-01420 R0

Client reference **Phase 1-ENV2011-065**

METHOD

METHODOLOGY SUMMARY

FOOTNOTES

| | | | |
|-----|---|-----|--|
| IS | Insufficient sample for analysis. | QFH | QC result is above the upper tolerance |
| LNR | Sample listed, but not received. | QFL | QC result is below the lower tolerance |
| * | This analysis is not covered by the scope of accreditation. | - | The sample was not analysed for this analyte |
| ^ | Performed by outside laboratory. | | |
| LOR | Limit of Reporting | | |
| ↑↓ | Raised or Lowered Limit of Reporting | | |

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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Metago Environmental Engineers (Pty) Ltd

APPENDIX B: GEOTECHNICAL INVESTIGATION OF THE TSF SITE

"Geotechnical Investigation Phase 1 Trial Pits", Hoppe Engineering Services, April 2011.

MOONLIGHT IRON ORE

GEOTECHNICAL INVESTIGATION

PHASE 1 TRIAL PITS

PREPARED BY MICHAEL HOPPE
HOPPE ENGINEERING SERVICES
408/320 ST KILDA RD
MELBOURNE VIC 3004
AUSTRALIA

13/04/2011

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MOONLIGHT IRON ORE TRIAL PITS PHASE 1

1. GENERAL

Hoppe Engineering Services were contracted by AMEC to undertake geotechnical investigations in the form of trial pits for the foundations of the mine infrastructure proposed for the Moonlight Iron Ore Project.

Trial pits were excavated at the positions indicated on the drawings attached in Appendix A. A Garmin eTrex GPS unit was used to verify the onsite locations giving an accuracy of +/- 1.5m. Where access was not available to the specified location for whatever reason the closest point possible was taken with all actual locations noted on the trial pit log sheets in Appendix B.

2. TRIAL PIT ACCESS ARRANGEMENTS

The Trial pit locations are located on three separate farms in the Marnitz area. Ferrum Crescent organised access with the property owners as required.

3. EQUIPMENT

A TLB wheeled backhoe was used for the excavation of the trial pits. This was provided by Ferrum Crescent for the necessary period to carry out the trial pits.

4. TRIAL PITS USING TLB

Trial pits were excavated as deep as possible only stopping due to refusal or the limits of the equipment.

As far as practicable, excavated layers of differing material was kept separate for identification, logging and sampling. This also allowed the material to be backfilled in line with the hole profile.

5. SAFE TRENCHING PROCEDURES

No trial pits were left open at the request of AMEC, Ferrum Crescent and the property owners.

Where access was required into the trial pits for observation and sampling, a safe working bench on 1.5m was provided. Where the pit reached 3m in depth a photo was taken from the safe bench height with the measuring tape extended from the top of the hole.

6. GROUNDWATER

As expected no groundwater was encountered in the trial pits. Recent heavy rains saturated the topsoil layer to a depth of 300-400mm below ground level. All holes were otherwise dry.

7. DESCRIPTION

Trial pits have been examined and logged by the as described by AMEC in accordance with internationally approved standards.

All loose material, dust and foreign matter was removed from the hole to allow the exposed surfaces to give a true representation of the insitu material. Geotechnical inspection and logging of the exposed surfaces was then carried out.

8. SAMPLING

To undertake laboratory testing each material type encountered, excluding topsoil, required two bulk samples to be obtained. The sample size requested was 40kg for a sandy material and 50kg for clayey material, of which no clayey material were encountered.

Where possible underlying rock samples were taken for reference with the geologists undertaking the bore hole core logging for the Moonlight Iron Ore Project. These samples can also be used as a reference if needed by AMEC.

Metago have been contracted to design the tailings storage facility and return water dam and as such requested one of their engineers to inspect the first three trial pits in that area. Steve Van Neikerk attended site to inspect trial pit number 24, 25 and 26. At Steve's request tray samples were taken for Metago in respect to their scope of works.

All bulk samples were bagged, sealed and clearly marked with the trial pit number and depth ready to be returned to the AMEC office in Johannesburg.

9. PHOTOGRAPHS

Once excavated, the hole was logged and photographed. For verification and future reference the profile and excavated stockpiles were photographed and have been labelled and attached to Appendix B with the trial pit profile logs.

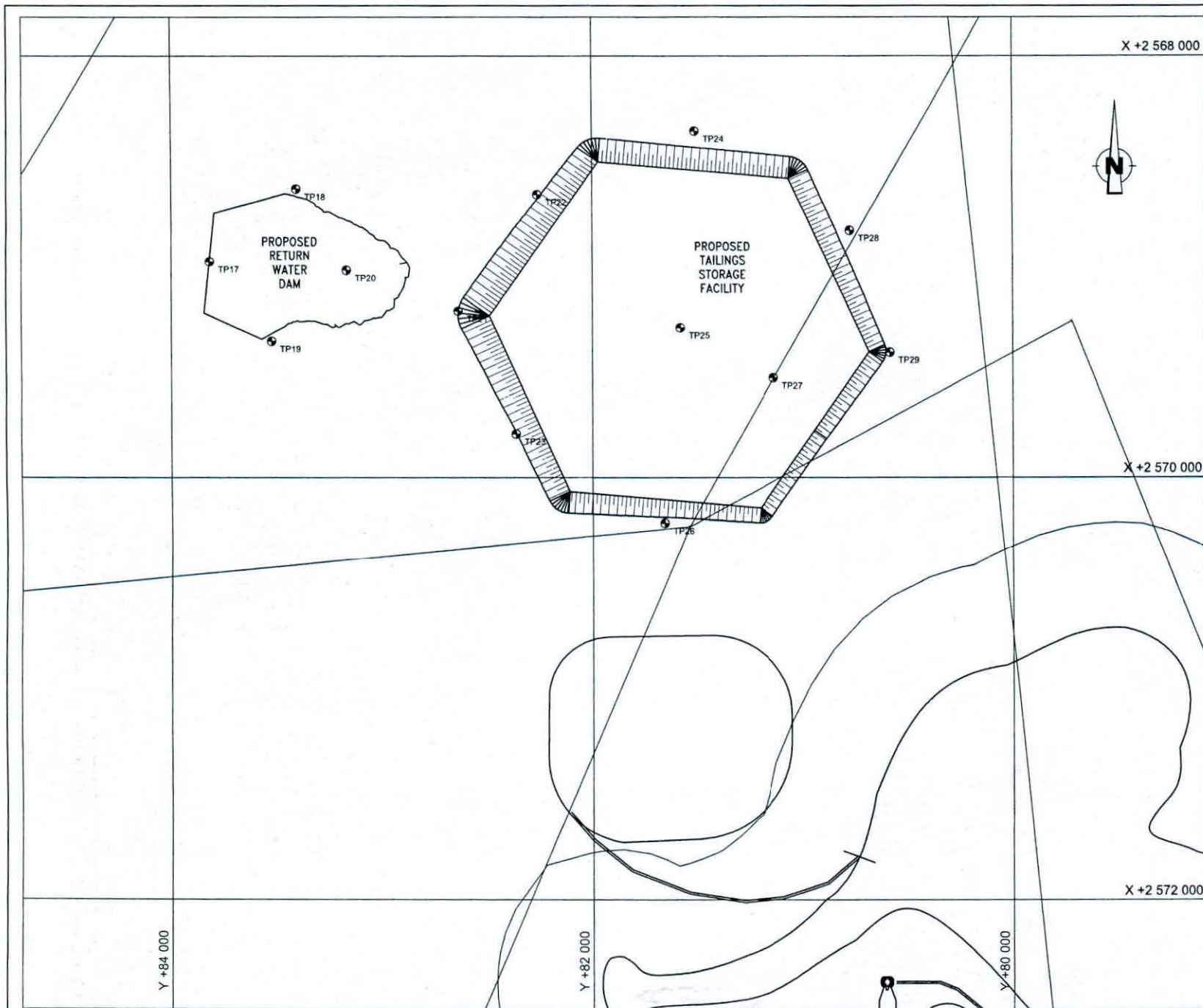
10. LOCATION

All actual trial pit locations were captured by GPS and noted on the profile logs for future reference. All trial pits were located as close as practical to the specified points however in some cases due to farm fences or heavily vegetated areas the points differ by up to 200m.

11. BACKFILLING

All trial pits were backfilled prior to moving to the following location. Each hole was backfilled according to the profile that were excavated with the topsoil being spread over the top and smoothed out to encourage vegetation regrowth and eliminate any safety hazard.

**APPENDIX A
DRAWINGS:**



COORDINATE LIST
WGS84 - Lo29 (Gauss conform)

| GEOTECHNICAL TEST PIT LOCATIONS | | |
|---------------------------------|-----------|-------------|
| POINT | Y-COORD | X-COORD |
| CONST: | | |
| TP17 | 83817.440 | 2568980.078 |
| TP18 | 83405.033 | 2568632.234 |
| TP19 | 83523.846 | 2569357.431 |
| TP20 | 83167.406 | 2569019.885 |
| TP21 | 82637.487 | 2569214.434 |
| TP22 | 82260.744 | 2568657.944 |
| TP23 | 82363.487 | 2569793.982 |
| TP24 | 81512.159 | 2568354.847 |
| TP25 | 81582.316 | 2569293.795 |
| TP26 | 81659.069 | 2570213.257 |
| TP27 | 81138.593 | 2569531.109 |
| TP28 | 80773.449 | 2568829.408 |
| TP29 | 80583.944 | 2569411.082 |

COORDINATE LIST
WGS84 - Lo29 (Geographic)

| GEOTECHNICAL TEST PIT LOCATIONS | | |
|---------------------------------|---------------|--------------|
| POINT | LAT | LONG |
| CONST: | | |
| TP17 | -23°13'06.87" | 28°10'52.12" |
| TP18 | -23°12'55.64" | 28°11'06.69" |
| TP19 | -23°13'19.19" | 28°11'02.37" |
| TP20 | -23°13'08.29" | 28°11'14.97" |
| TP21 | -23°13'14.71" | 28°11'33.57" |
| TP22 | -23°12'56.69" | 28°11'46.92" |
| TP23 | -23°13'33.59" | 28°11'43.08" |
| TP24 | -23°12'46.97" | 28°12'13.31" |
| TP25 | -23°13'17.48" | 28°12'10.66" |
| TP26 | -23°13'47.35" | 28°12'07.78" |
| TP27 | -23°13'25.27" | 28°12'26.22" |
| TP28 | -23°13'02.40" | 28°12'39.20" |
| TP29 | -23°13'21.46" | 28°12'45.75" |





| TEST PIT LOCATIONS | | | |
|--------------------|----|----|----|
| 1 | 23 | 14 | 30 |
| 2 | 23 | 14 | 30 |
| 3 | 23 | 14 | 30 |
| 4 | 23 | 14 | 30 |
| 5 | 23 | 14 | 30 |
| 6 | 23 | 14 | 30 |
| 7 | 23 | 14 | 30 |
| 8 | 23 | 14 | 30 |
| 9 | 23 | 14 | 30 |
| 10 | 23 | 14 | 30 |
| 11 | 23 | 14 | 30 |
| 12 | 23 | 14 | 30 |
| 13 | 23 | 14 | 30 |
| 14 | 23 | 14 | 30 |
| 15 | 23 | 14 | 30 |
| 16 | 23 | 14 | 30 |

FOR INFORMATION ONLY




PLOTTED: 05-Apr-11 1:13 PM USER: BAXENDALE, GORDON
 SWGID: 05-Apr-11 1:13 PM

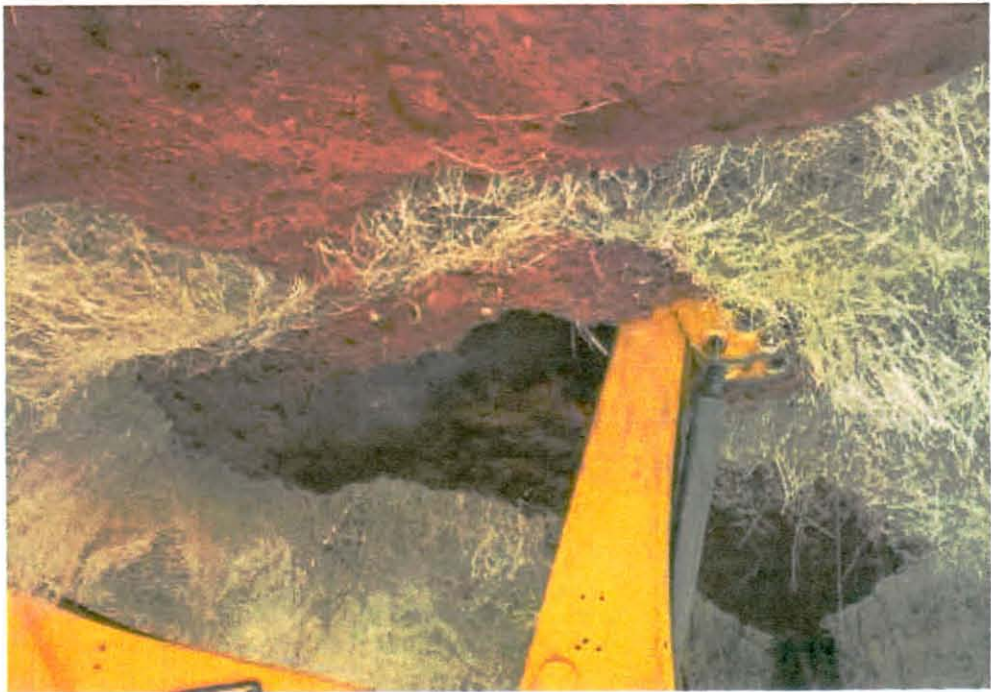
| | | | | | | | | | | | |
|-------------|---|--------------------|---|--|---|--|---|--|----|----|----|
| DRAWING No. | | REFERENCE DRAWINGS | | | | | | PROJECT APPR. BY DATE SCALE 1:10000 CLIENT FERRUM CRESCENT LTD | | | |
| | | | | 2004/01/08 950 000 © The drawings remain the property of AMEC (INDUSTRIAL) LIMITED and may not be copied or in any way reproduced without express written permission from AMEC. | | B G.B. 5.4.11 MAP POSITION UPDATED A G.B. 03.03.11 FOR INFORMATION ONLY | | DESIGN APPR. DESIGNED CHECKED | | | |
| | | | | | | No. BY DATE REVISION CHECKED APPROV. DRAWN G.BAXENDALE 03.03.2011 | | PROJECT No. S2159 DRG SIZE A1 DRAWING No. S2159-00000-05-121-004 REV No. B | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

APPENDIX B
TRIAL PIT LOGS AND PHOTOGRAPHS:



PROFILE LOG

| Project: | | Moonlight Iron Ore | | Trial Pit No. | | 1P01 | |
|---|--|---------------------|--------|--|----------------|---|-------|
| Location: | | Proposed Waste Dump | | Northings: Easting: Elevation: | | Project No.: Logged by: Date: | |
| | | | | S 23°14'30.6 E 28°12'19.3 972m | | M Hoppe 6-04-2011 | |
| Notes: | | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| Ground Level | | | | | | | |
| | | 1.0 | |  | 1.0 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | |
| | | 1.4 | |  | 0.4 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. | |
| Refusal | | 1.5 | |  | >0.1 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. | |
| | | | | | Bottom of hole | | 1.5 m |
| General Notes: <i>Hole dry and stable once below topsoil horizon</i> <i>A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm</i> GPS Accuracy of 3m | | | | | | | |
| Sampling: | | | | Equipment and Method: | | | |
| Where samples are indicated above in sand, 2 lots of 40kg taken | | | | Wheeled TLB | | | |
| Where samples are indicated above in rock, 10kg taken for ID only | | | | | | | |
| Samples were marked with the test pit no. and depth | | | | | | | |







PROFILE LOG

Trial Pit No.

TP02

Project: Moonlight Iron Ore

Northing: S 23-1435.5

Project No.:

Location: Proposed Waste Dump

Easting: E 28-1228.4

Logged by: M Hoppe

Notes:

Elevation: 978m

Date: 6/04/2011

Depth (m)

Sample

Legend

Thickness (m)

Description and Classification

Ground Level

| | | | | | |
|--|--|--|--|-----|---|
| | | | | 0.5 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
|--|--|--|--|-----|---|

| | | | | | |
|--|--|--|--|-----|---|
| | | | | 0.9 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
|--|--|--|--|-----|---|

| | | | | | |
|---------|-----|--|--|------|---|
| Refusal | 1.7 | | | >0.3 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
|---------|-----|--|--|------|---|

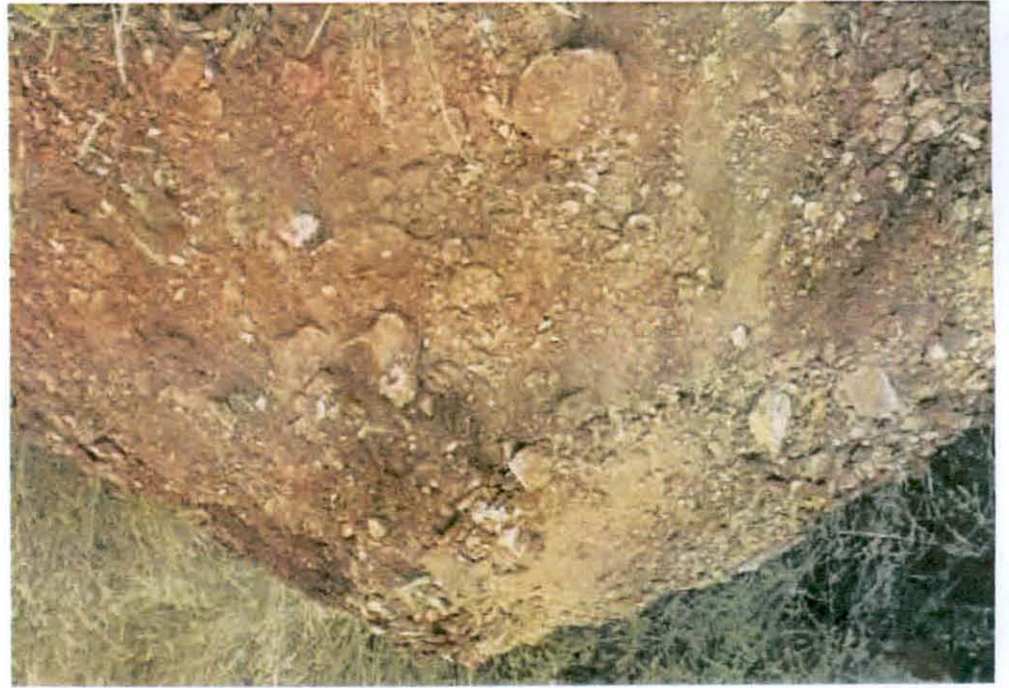
| | | | | | |
|----------------------|--|--|--|--|--|
| Bottom of hole 1.7 m | | | | | |
|----------------------|--|--|--|--|--|

General Notes:

*Hole dry and stable once below topsoil horizon**A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm**(GPS accuracy of 3m)*

| | |
|--|---|
| <u>Sampling:</u> Where samples are indicated above in sand. 2 lots of 40kg taken Where samples are indicated above in rock. 10kg taken for ID only Samples were marked with the test pit no. and depth | <u>Equipment and Method:</u> Wheeled TTB |
|--|---|






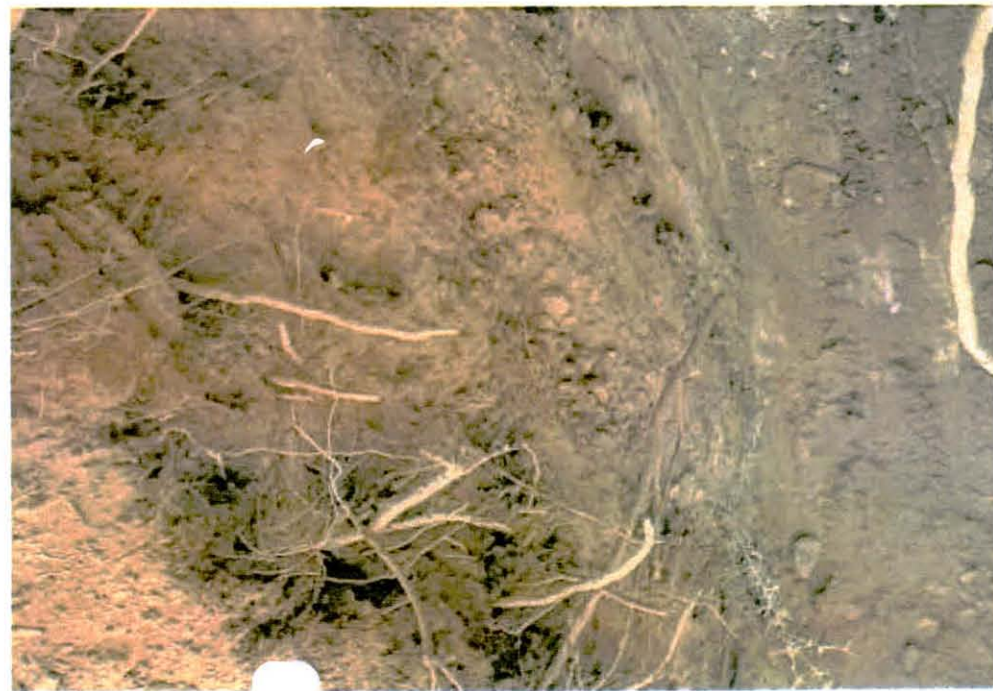
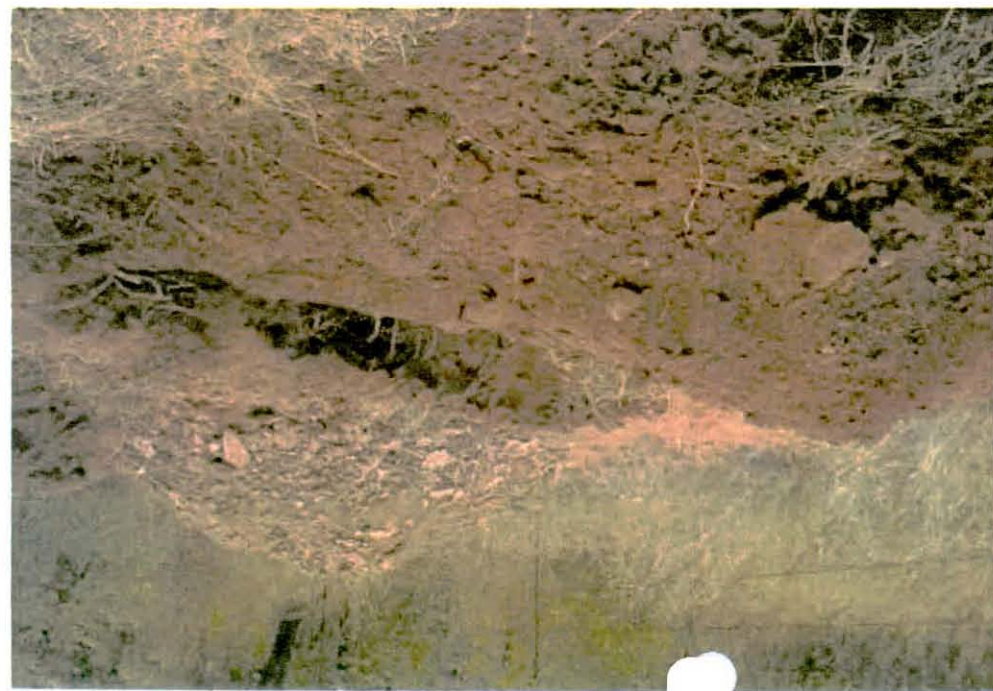
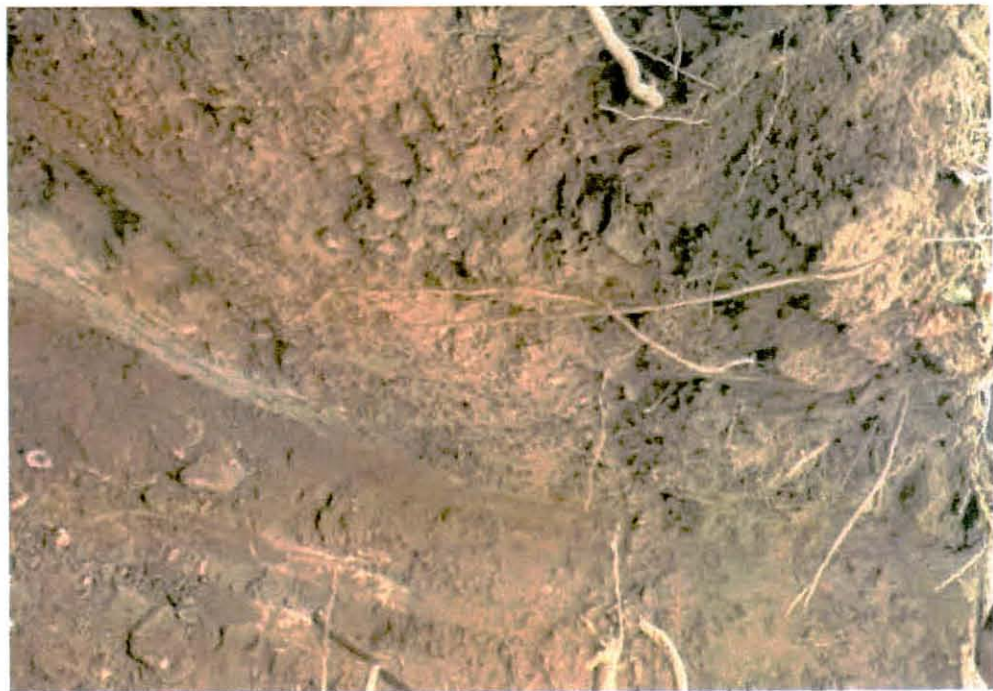
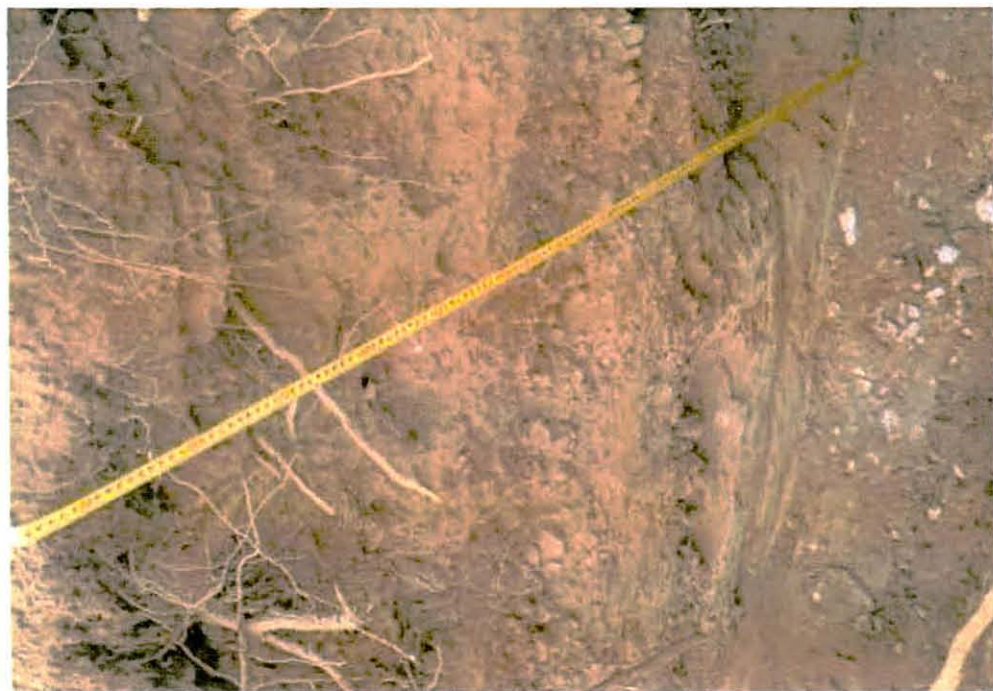







PROFILE LOG

TP03

| Project: | | Moonlight Iron Ore | | Trial Pit No. | | |
|---|--|---------------------|--------|---|---------------|---|
| Location: | | Proposed Waste Dump | | Project No. / Logged by: / Date: | | |
| Notes: | | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
| | | | | | | |
| | | Ground Level | | | | |
| | | 0.6 | |  | 0.6 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 300mm. (TOPSOIL) |
| | | 1.0 | |  | 0.4 | Very Stiff, Dry, Light Brown SILTY SAND with Black GRAVEL, Medium angular granitic sand. Subrounded biotite gneiss gravels. |
| | | 1.5 | |  | >0.5 | Fryable becoming Hard with depth, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| Refusal | | | | | | |
| | | Bottom of hole | | | | |
| | | 1.5 m | | | | |
| General Notes: | | | | | | |
| Hole dry and stable once below topsoil horizon | | | | | | |
| A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm | | | | | | |
| GPS Accuracy of 3m | | | | | | |
| Sampling: | | | | Equipment and Method: | | |
| Where samples are indicated above in sand, 2 lots of 40kg taken | | | | Wheeled TLB | | |
| Where samples are indicated above in rock, 10kg taken for ID only | | | | | | |
| Samples were marked with the test pit no. and depth | | | | | | |



| amec | | PROFILE LOG | | | Trial Pit No. | TP04 |
|---|--------------|--------------------------|---|--|--|-------|
| Project: Moonlight Iron Ore | | Northing: S 23° 13' 52.5 | | Project No.: | | |
| Location: Proposed Waste Dump | | Easting: E 28° 12' 54.0 | | Logged by: M Hoppe | | |
| | | Elevation: 976m | | Date: 6/04/2011 | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| | Ground Level | | | | | |
| | 0.6 | |  | 0.6 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | |
| | 1.5 | |  | 0.9 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. | |
| Refusal | 2.4 | |  | 0.9 | Very Stiff, Dry, Light Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. | |
| Bottom of hole | | | | | | 2.4 m |
| <p><i>General Notes:</i></p> <p>Hole dry and stable once below topsoil horizon</p> <p>A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm</p> <p>GPS Accuracy of 3m</p> | | | | | | |
| <p><u>Sampling:</u> Where samples are indicated above in sand, 2 lots of 40kg taken</p> <p>Where samples are indicated above in rock, 10kg taken for ID only</p> <p>Samples were marked with the test pit no. and depth</p> | | | | <p><u>Equipment and Method:</u></p> <p>Wheeled TLB</p> | | |








PROFILE LOG

Trial Pit No. TP05

| | | | | | |
|-----------|---------------------|------------|--------------|--------------|-----------|
| Project: | Moonlight Iron Ore | Northing: | S 23°1344.0 | Project No.: | |
| Location: | Proposed Waste Dump | Easting: | E 28°13'12.7 | Logged by: | M Hoppe |
| | | Elevation: | 970m | Date: | 6/04/2011 |

| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
|--------|-----------|--------|--------|---------------|--------------------------------|
|--------|-----------|--------|--------|---------------|--------------------------------|

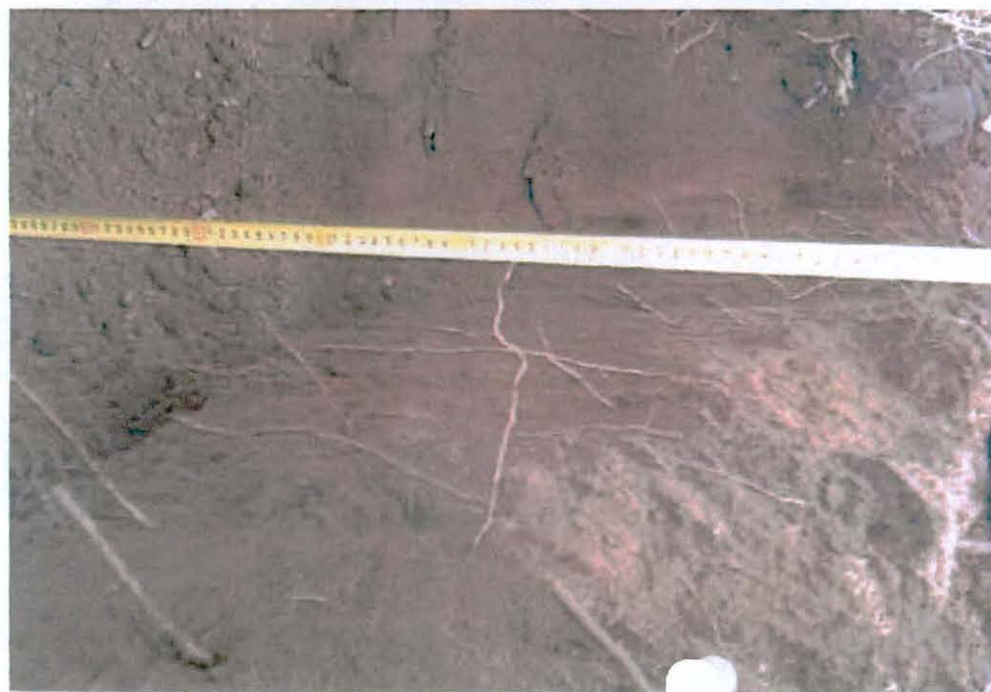
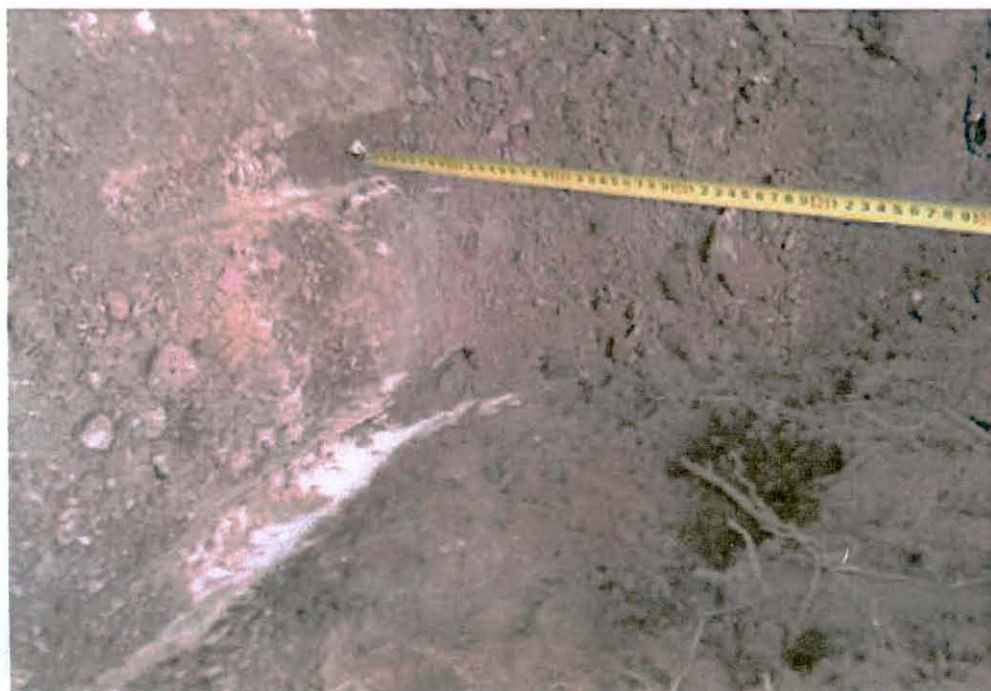
Ground Level

| | | | | | |
|---------|-----|--|--|------|---|
| | | |  | 0.8 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 0.8 | |  | 0.3 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| | 1.1 | |  | >0.1 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| Refusal | 1.2 | | | | |

Bottom of hole 1.2 m

General Notes:*Hole dry and stable once below topsoil horizon**A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm**GPS Accuracy of 3m*

| | |
|---|---|
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | Equipment and Method: Wheeled TTB |
|---|---|







PROFILE LOG

Trial Pit No.

TP06

Project: Moonlight Iron Ore

Northings: S 23°13'57.0

Project No.:

Location: Proposed Waste Dump

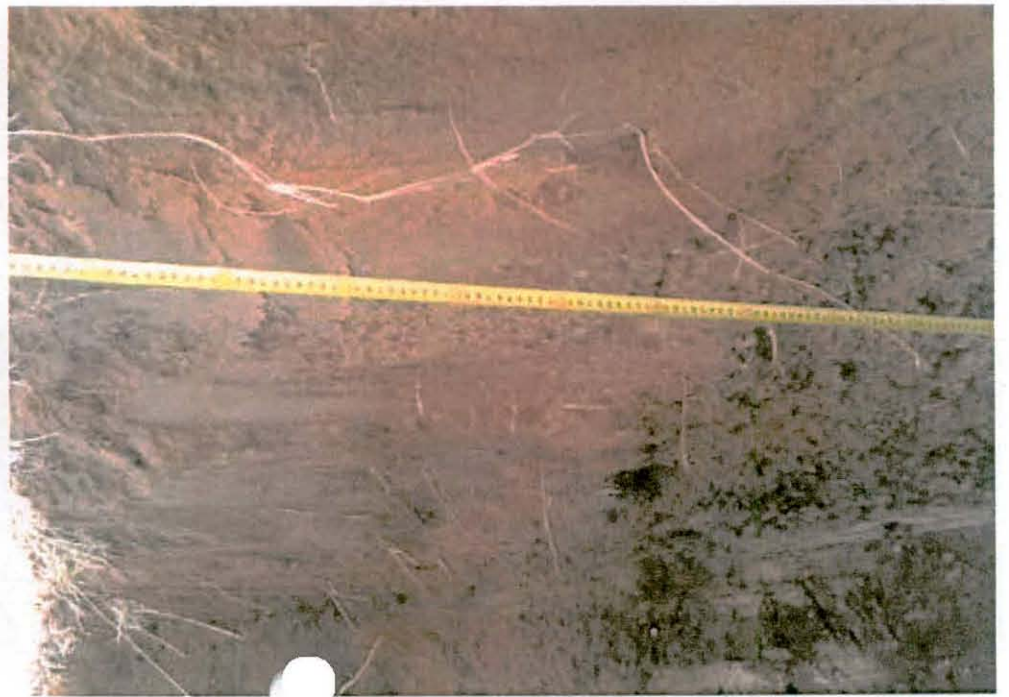
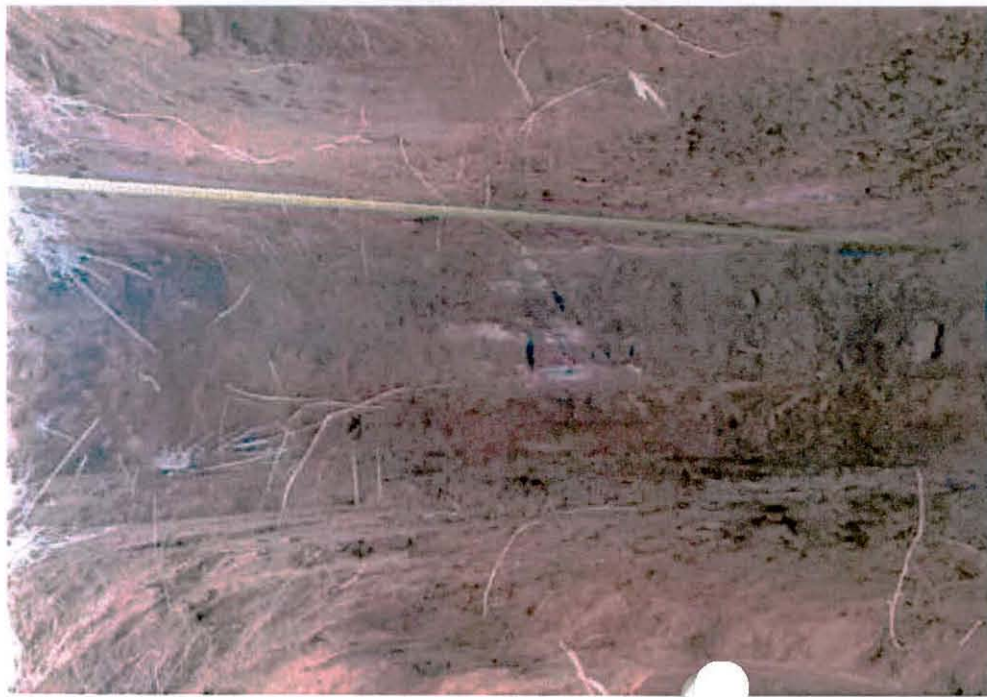
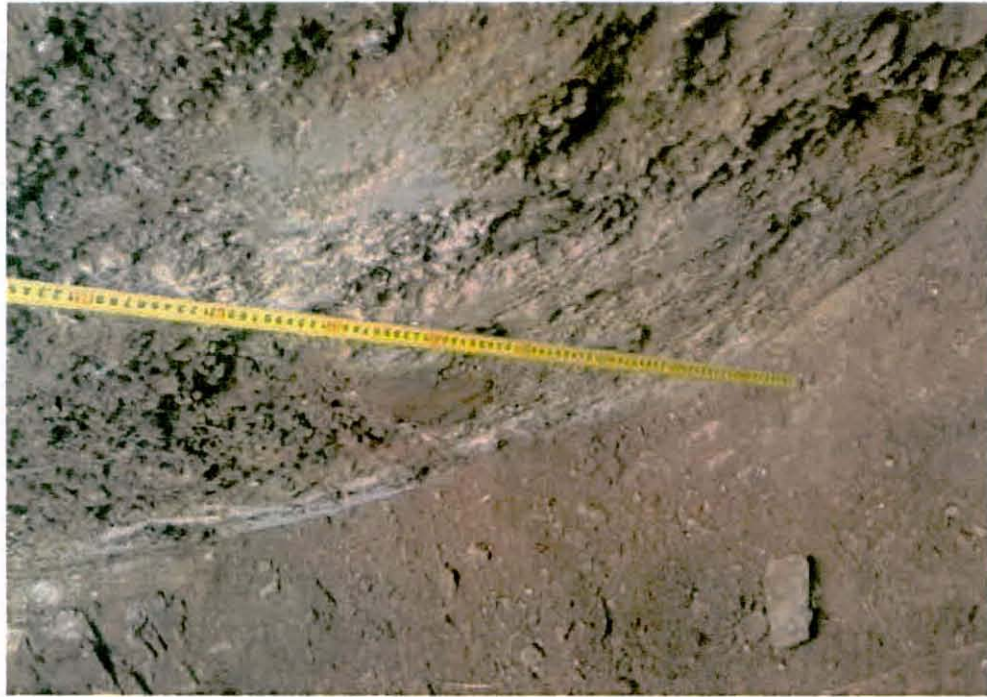
Eastings: E 28°13'13.0

Logged by: M Hoppe





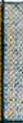
Elevation: 982m

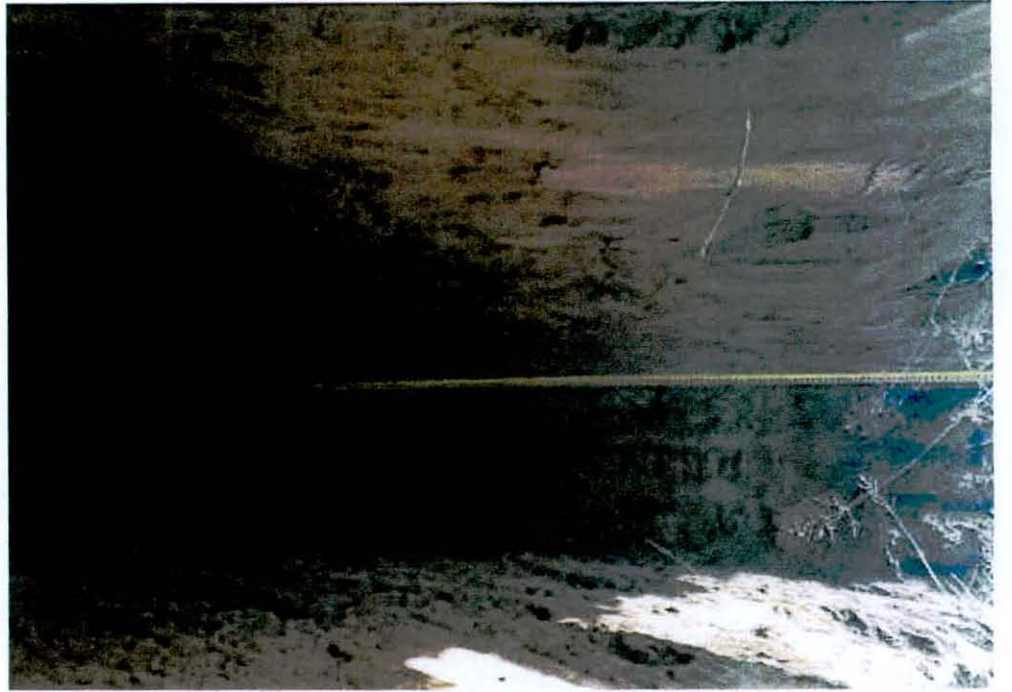
Date: 6/04/2011

| Notes | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
|---|-----------|--------|--------|---------------|--|
| Ground Level | | | | | |
| | 0.8 | | | 0.8 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 1.4 | | | 0.6 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| | 2.2 | | | 0.8 | Very Stiff, Dry, Light Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| Refusal | 2.2 | | | >0 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| Bottom of hole 2.2 m | | | | | |
| <p><i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m</p> | | | | | |
| <p>Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth</p> | | | | | <p>Equipment and Method: Wheeled TLB</p> |





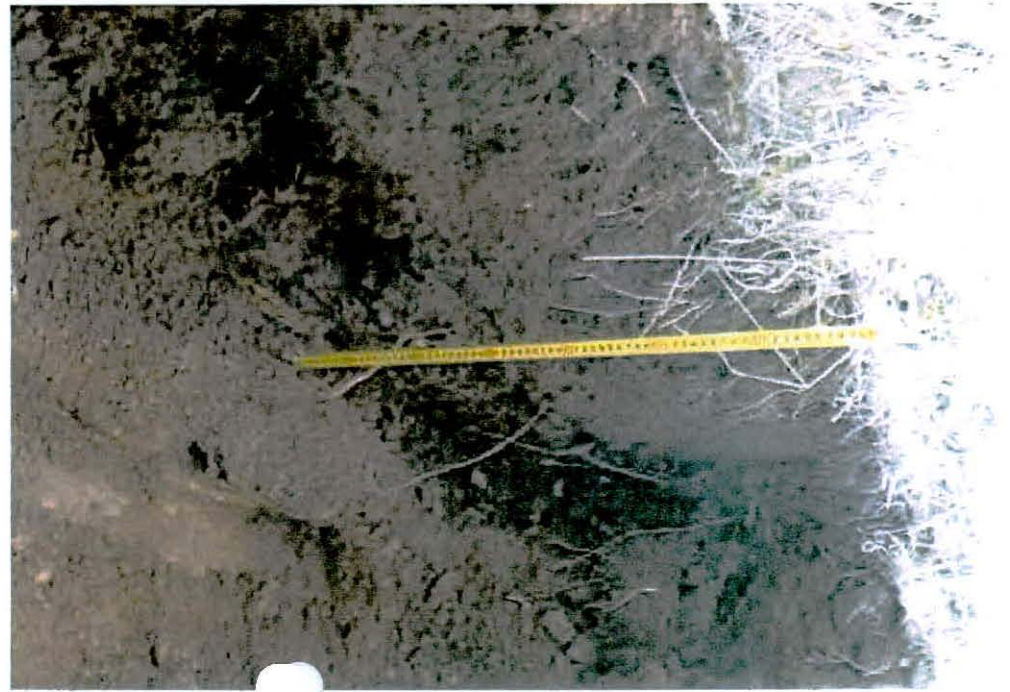
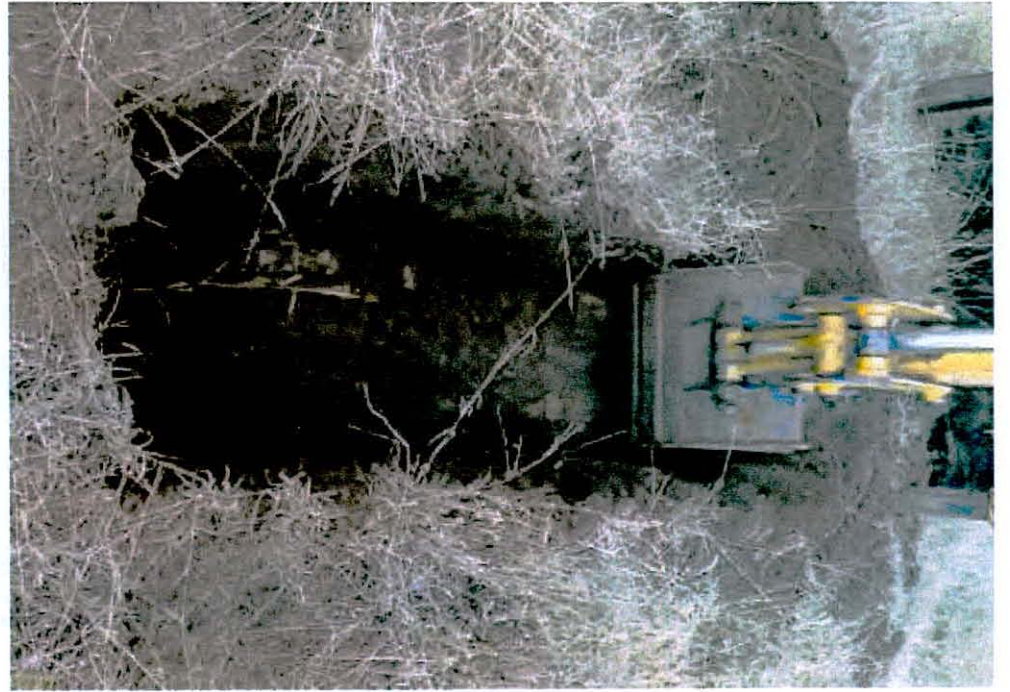
| amec | | PROFILE LOG | | | Trial Pit No. | TP07 |
|--|--------------|--|---|--|--|---|
| Project: Moonlight Iron Ore | | Northing: S 23-1527.0 | | Project No.: | | |
| Location: Proposed Waste Dump | | Easting: E 28-1343.9 | | Logged by: M Hoppe | | |
| | | Elevation: 964m | | Date: 7/04/2011 | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| | Ground Level | | | | | |
| | 0.9 | |  | 0.9 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | |
| | 1.5 |  |  | 0.6 | Stiff, Dry, Orangy Brown SILTY SAND. Medium angular granetic sand. | |
| | 2.0 | |  | 0.5 | Very Stiff, Dry, Light Brown SILTY SAND with Black GRAVEL. Medium angular granetic sand. Uniform subrounded biotite gneiss gravel. | |
| Refusal | 2.0 | |  | >0 | Hard, White weathered QUARTZ FELDSPAR. Transition conglomerate containing biotite | |
| | | | | Bottom of hole | | 2.0 m |
| General Notes: Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m | | | | | | |
| | | | | Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | | Equipment and Method: Wheeled TLB |





PROFILE LOG

| amec | | | | Trial Pit No. | TP08 |
|--|--------------|-------------------------|--------|---|---|
| Project: Moonlight Iron Ore | | Northings: S 23°15'15.0 | | Project No.: | |
| Location: Proposed Waste Dump | | Eastings: E 28°13'46.6 | | Logged by: M Hoppe | |
| | | Elevation: 968m | | Date: 7/04/2011 | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
| | Ground Level | | | | |
| | 0.5 | | | 0.5 | Weak, Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| Refusal | 0.6 | | | >0.1 | Hard, Mottled Reddish Brown with Black weathered gneiss SANDSTONE conglomerate with biotite gravels. |
| Bottom of hole 0.6 m | | | | | |
| General Notes: | | | | | |
| Hole dry and stable once below topsoil horizon | | | | | |
| A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm | | | | | |
| GPS Accuracy of 3m | | | | | |
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | | | | Equipment and Method: Wheeled TLB | |





PROFILE LOG

Trial Pit No. **TP09**

Project: Moonlight Iron Ore
Location: Proposed Waste Dump

Northing: S 23 15 22.0
Easting: E 28 13 26.0
Elevation: 967m





Project No.:
Logged by: M Hoppe
Date: 7/04/2011

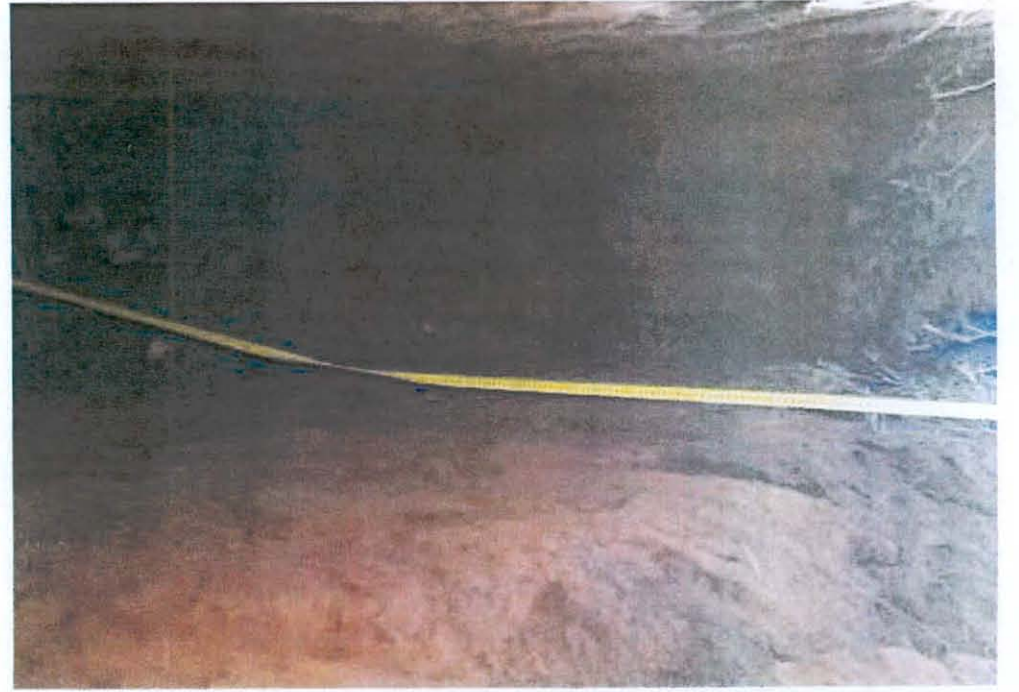
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
|--|--------------|--------|--------|---------------|---|
| | Ground Level | | | | |
| | 0.6 | | | 0.6 | Weak, Orangy Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 1.1 | | | 0.5 | Stiff, Dry, Orangy Brown SILTY SAND. Medium angular granitic sand. |
| | 1.5 | | | 0.4 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| Refusal | 1.8 | | | >0.3 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| Bottom of hole | | | | | |
| 1.8 m | | | | | |
| <i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS accuracy of 3m | | | | | |
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | | | | | Equipment and Method: Wheeled TLB |








PROFILE LOG

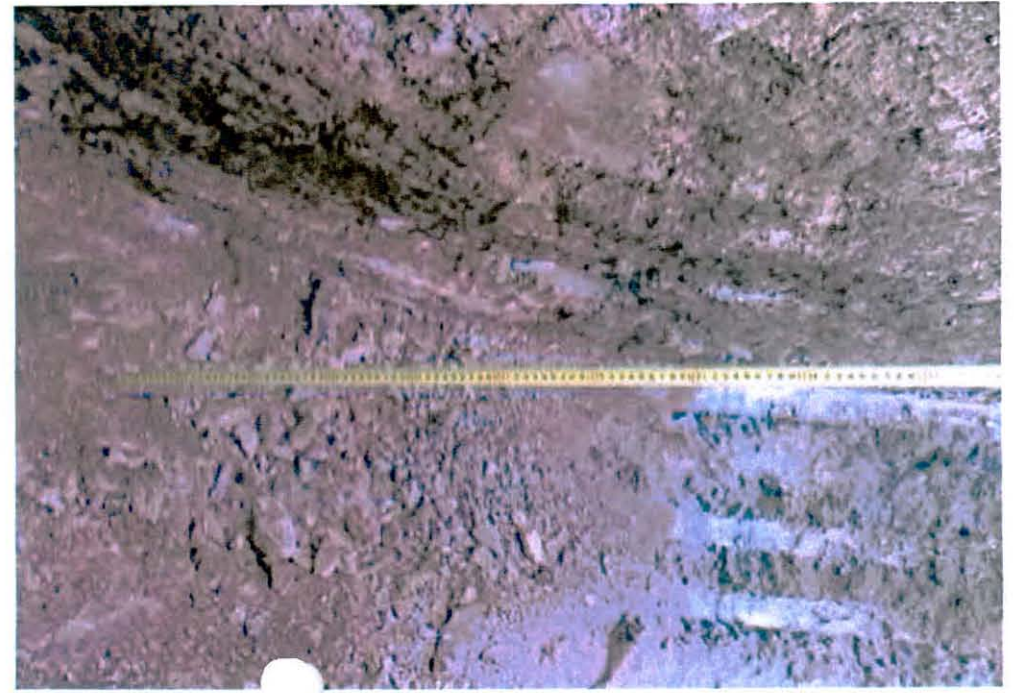
| Project: Moonlight Iron Ore | | Trial Pit No. | | TP10 | |
|--|--------------|--|--|---|---|
| Location: Proposed Waste Dump | | Northings: S 23 15 22.2 Eastings: E 28 13 11.0 Elevation: 968m | | Project No.: Logged by: M Hoppe Date: 7/04/2011 | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
| | Ground Level | | | | |
| | 0.4 | |  | 0.4 | Weak, Oranga Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 1.8 | |  | 1.4 | Stiff, Dry, Oranga Brown SILTY SAND Medium angular granitic sand. |
| | 2.1 | |  | 0.3 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| Refusal | 2.2 | |  | >0.1 | Hard, Red, Oranga and White extremely weathered gneiss SANDSTONE. |
| Bottom of hole | | | | | 2.2 m |
| General Notes: Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m | | | | | |
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | | | Equipment and Method: Wheeled TTB | | |





PROFILE LOG

| Project: | | Moonlight Iron Ore | | Trial Pit No. | | TP11 | |
|---|--------------|---------------------|--|--|---|---|--|
| Location: | | Proposed Waste Dump | | Northing: S 23°15'04.0 Easting: E 28°12'49.5 Elevation: 969m | | Project No.: Logged by: M Hoppe Date: 7/04/2011 | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | | |
| | Ground Level | | | | | | |
| | 0.6 | |  | 0.6 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | | |
| | | |  | 1.4 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. | | |
| Refusal | 2.0 | |  | -0.0 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. | | |
| | | | | Bottom of hole | | 2.0 m | |
| <i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m | | | | | | | |
| <i>Sampling:</i> | | | | <i>Equipment and Method:</i> | | | |
| Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | | | | Wheeled TTB | | | |








PROFILE LOG

Trial Pit No. TP12

| | | | | | |
|-----------|---------------------|------------|--------------|--------------|-----------|
| Project: | Moonlight Iron Ore | Northing: | S 23°15'15.0 | Project No.: | |
| Location: | Proposed Waste Dump | Easting: | E 28°12'46.0 | Logged by: | M Hoppe |
| | | Elevation: | 973m | Date: | 7/04/2011 |

| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
|--------|-----------|--------|--------|---------------|--------------------------------|
|--------|-----------|--------|--------|---------------|--------------------------------|

Ground Level

| | | | | | |
|---------|-----|--|--|------|--|
| | | | | | |
| | 1.1 | |  | 1.1 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 1.5 | |  | 0.4 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granite sand. Uniform subrounded biotite gneiss gravel. |
| Refusal | 1.8 | |  | >0.3 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| | | | | | |

Bottom of hole 1.8 m

General Notes:

Hole dry and stable once below topsoil horizon

A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm

GPS Accuracy of 3m

Sampling:

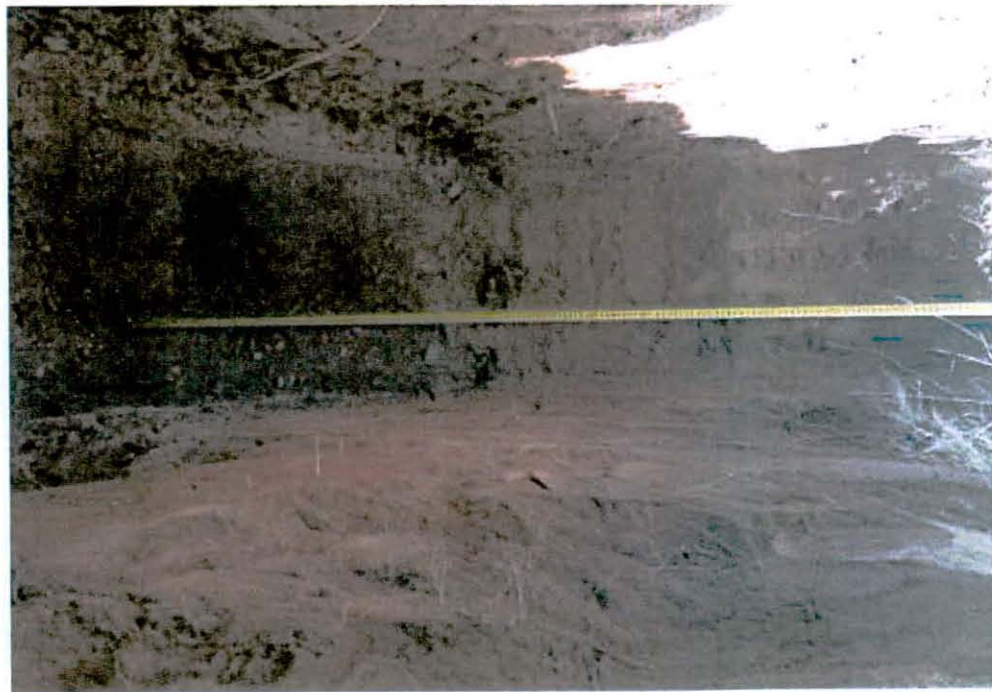
Where samples are indicated above in sand, 2 lots of 40kg taken




Where samples are indicated above in rock, 10kg taken for ID only

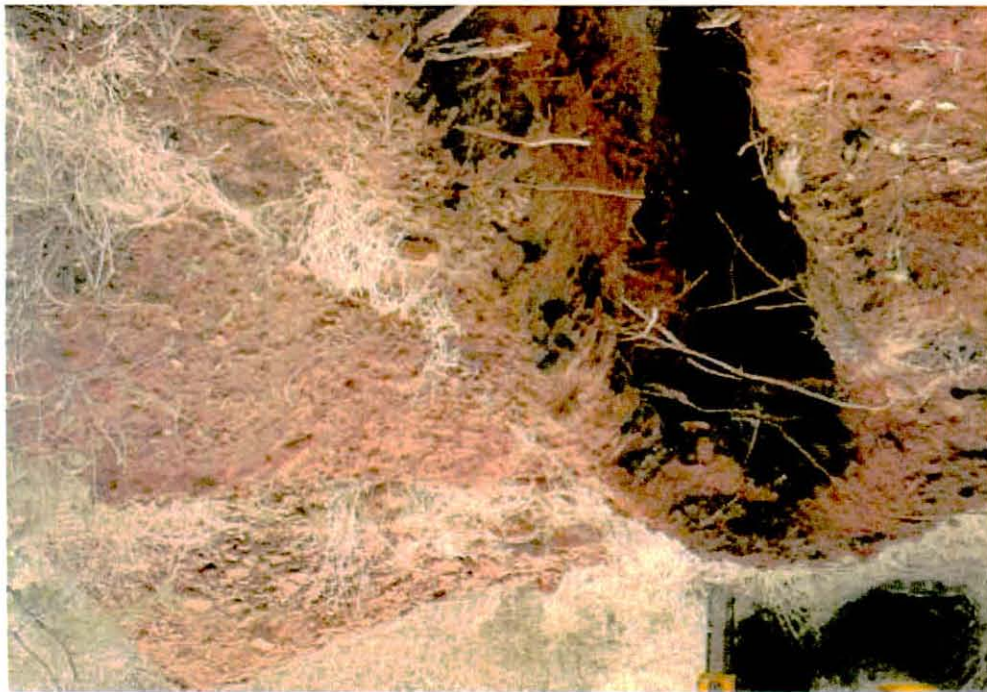
Samples were marked with the test pit no. and depth

Equipment and Method:

Wheeled TLB



| amec | | PROFILE LOG | | | Trial Pit No. | TP13 |
|--|--------------|---|--|--------------------|---|-------|
| Project: Moonlight Iron Ore | | Northing: S 23°15'00.0 | | Project No.: | | |
| Location: Proposed Transfer Station | | Easting: E 28°12'40.0 | | Logged by: M Hoppe | | |
| | | Elevation: 975m | | Date: 6/04/2011 | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| | Ground Level | | | | | |
| | 0.8 | |  | 0.8 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | |
| | 1.3 | |  | 0.5 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. | |
| Refusal | 1.8 | |  | >0.5 | Fryable becoming Hard with depth. Red, Orange and White extremely weathered gneiss SANDSTONE. | |
| Bottom of hole | | | | | | 1.8 m |
| <p><i>General Notes:</i></p> <p><i>Hole dry and stable once below topsoil horizon</i></p> <p><i>A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm</i></p> <p><i>GPS Accuracy of 3m</i></p> | | | | | | |
| <u>Sampling:</u> | | Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | | | <u>Equipment and Method:</u> Wheeled TLB | |





| amec | | PROFILE LOG | | | Trial Pit No. | TP14 |
|---|-----|-------------------------|--------|---------------------|-----------------------|---|
| Project: Moonlight Iron Ore | | Northing: S 23°15'22.5" | | Project No.: | | M Hoppe Lagged by: Date: 8/04/2011 |
| Location: Proposed Plant Site | | Easting: E 28°12'31.1" | | Lagged by: Date: | | |
| Notes: | | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
| Ground Level | | | | | | |
| | 1.0 | | | | 1.0 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 1.4 | | | | 0.4 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| Refusal | 1.5 | | | | >0.1 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| Bottom of hole | | | | | | |
| 1.5 m | | | | | | |
| General Notes: Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m | | | | | | |
| Sampling: | | | | | Equipment and Method: | |
| Where samples are indicated above in sand, 2 lots of 40kg taken | | | | | Wheeled TTB | |
| Where samples are indicated above in rock, 10kg taken for ID only | | | | | | |
| Samples were marked with the test pit no. and depth | | | | | | |





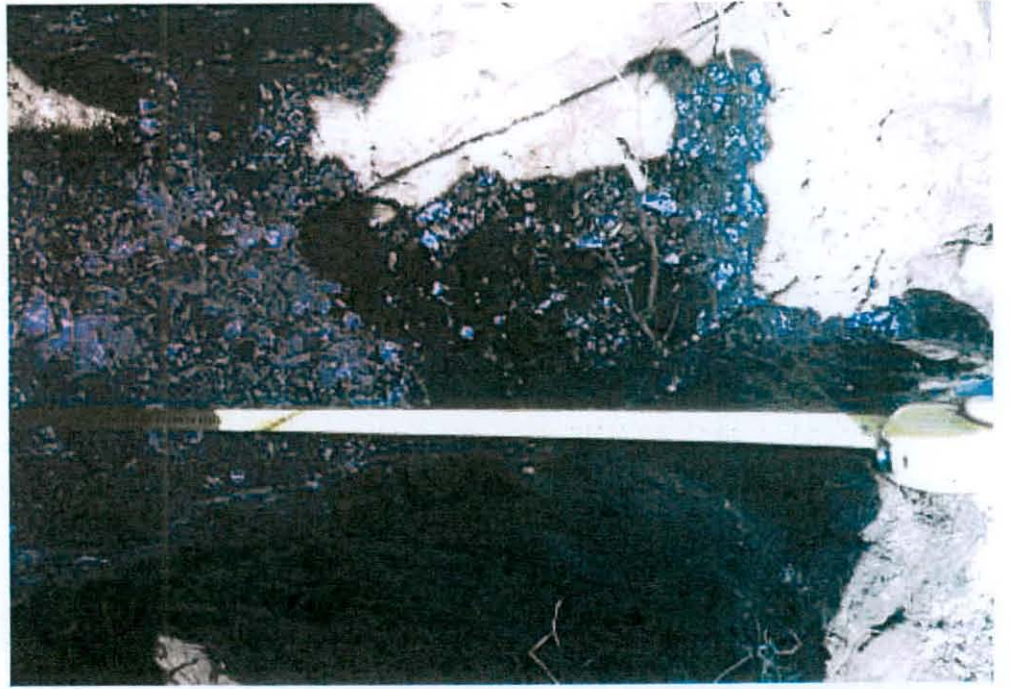


PROFILE LOG

| Project: | | Moonlight Iron Ore | | Trial Pit No. | | TP15 | |
|---|--------|--|---------------|---|--|---------------------------------------|--|
| Location: | | Proposed Plant Site | | Project No.: | | Logged by: M Hoppe Date: 8/04/2011 | |
| Notes: | | Ground Level | | Description and Classification | | | |
| Depth (m) | Sample | Legend | Thickness (m) | | | | |
| | |  | 0.4 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist (for top 400mm). (TOPSOIL) | | | |
| Refusal | |  | >0.2 | Hard, White weathered QUARTZ FELDSPAR | | | |
| | | | | Bottom of hole | | 0.6 m | |
| <i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m | | | | | | | |
| <i>Sampling:</i> | | | | <i>Equipment and Method:</i> | | | |
| Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth | | | | Wheeled TLB | | | |



| amec | | PROFILE LOG | | | | Trial Pit No. | TP16 |
|---|--------------|--|--|--|---|---------------|------|
| Project: Moonlight Iron Ore | | Northing: S 23°15'33.0 Easting: E 28°12'18.0 Elevation: 965m | | Project No: Logged by: M Hoppe Date: 8/04/2011 | | | |
| Location: Proposed Plant Site | | | | | | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | | |
| | Ground Level | | | | | | |
| | | |  | 0.4 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | | |
| Refusal | 0.7 | |  | >0.3 | Hard, White weathered QUARTZ FELDSPAR. Fryable at top becoming harder with depth. | | |
| | | | | | | | |
| | | | | Bottom of hole 0.7 m | | | |
| <p><i>General Notes:</i> <i>Hot dry and stable once below topsoil horizon</i> <i>A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm</i> <i>GPS Accuracy of 3m</i></p> | | | | | | | |
| <u>Sampling:</u> | | | | <u>Equipment and Method:</u> | | | |
| Where samples are indicated above in sand. 2 lots of 40kg taken | | | | Wheeled TLB | | | |
| Where samples are indicated above in rock. 10kg taken for ID only | | | | | | | |
| Samples were marked with the test pit no. and depth | | | | | | | |





PROFILE LOG




TP17

Trial Pit No.

| | | | | |
|-----------|---------------------------|------------------------|--------------|-----------|
| Project: | Moonlight Iron Ore | Northing: S 23°13'08.9 | Project No.: | |
| Location: | Proposed Return Water Dam | Easting: E 28°10'48.2 | Logged by: | M Hoppe |
| | | Elevation: 937m | Date: | 8/04/2011 |

| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
|--------|-----------|--------|--------|---------------|--------------------------------|
|--------|-----------|--------|--------|---------------|--------------------------------|

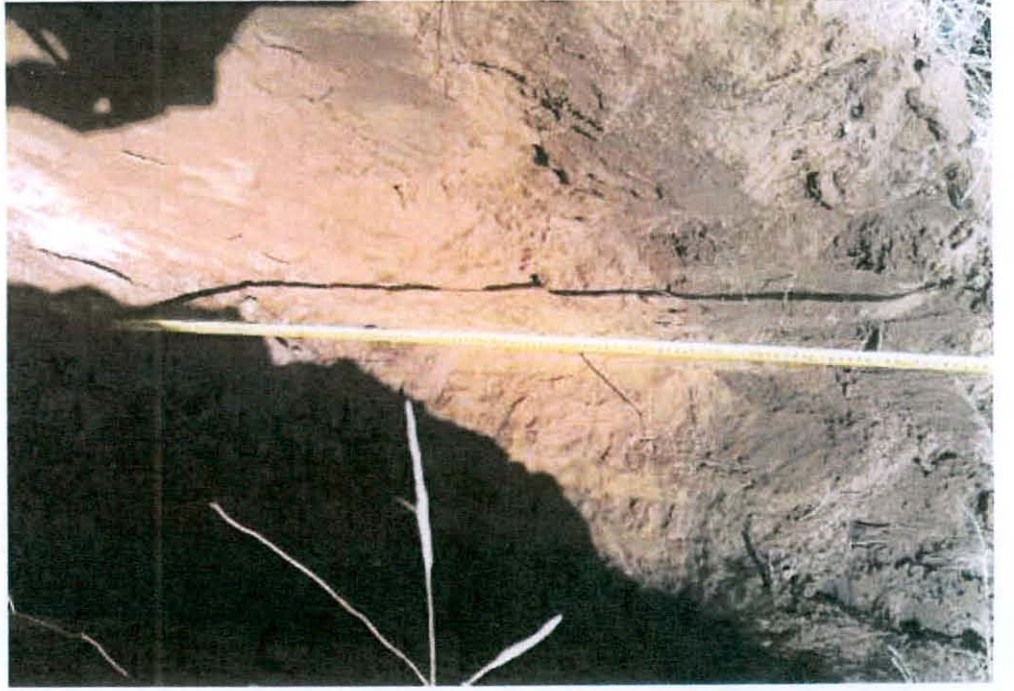
Ground Level



| | | | | | |
|---------|-----|--|--|------|---|
| | | |  | 0.7 | Weak, Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 0.7 | |  | 0.5 | Still Dry, Oranga Brown SILTY SAND. Medium angular granetic sand. |
| | 1.2 | |  | >0.1 | Hard, White weathered QUARTZ FELDSPAR. |
| Refusal | 1.3 | | | | |

| | | | | | |
|----------------|--|--|--|--|--|
| Bottom of hole | | | | | |
| 1.3 m | | | | | |

General Notes:*Hole dry and stable once below topsoil horizon**A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm**GPS Accuracy of 5m*

| | |
|---|---|
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago | Equipment and Method: Wheeled TTB |
|---|---|



| amec | | PROFILE LOG | | | Trial Pit No. | TP18 |
|---|--------------|------------------------|---|--|---|------|
| Project: Moonlight Iron Ore | | Northing: S 23°12'54.6 | | Project No.: | | |
| Location: Proposed Return Water Dam | | Easting: E 28°11'06.3 | | Logged by: M Hoppe | | |
| | | Elevation: 950m | | Date: 8/04/2011 | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| | Ground Level | | | | | |
| | 0.7 | |  | 0.7 | Weak, Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | |
| Refusal | 0.9 | |  | >0.2 | Hard, White weathered QUARTZ FELDSPAR | |
| | | | | Bottom of hole | 0.9 m | |
| <p><i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m</p> | | | | | | |
| <p><u>Sampling:</u> Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago</p> | | | | <p><u>Equipment and Method:</u> Wheeled TLB</p> | | |





PROFILE LOG

Trial Pit No. TP19

Project: Moonlight Iron Ore
Location: Proposed Return Water Dam

Northings: S 23°13'20.2
Eastings: E 28°11'03.7
Elevation: 944m

Project No:
Logged by: M Hoppe
Date: 8/04/2011

Notes: Depth (m) Sample Legend Thickness (m) Description and Classification

Ground Level

| | | | | |
|--|-----|--|-----|---|
| | 0.4 | | 0.4 | Weak, Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
|--|-----|--|-----|---|

| | | | | |
|---------|-----|--|------|---------------------------------------|
| Refusal | 0.5 | | >0.1 | Hard, White weathered QUARTZ FELDSPAR |
|---------|-----|--|------|---------------------------------------|

Bottom of hole 0.5 m

General Notes:

Hole dry and stable once below topsoil horizon

A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm

GPS Accuracy of 3m

Sampling:

Where samples are indicated above in sand, 2 lots of 40kg taken

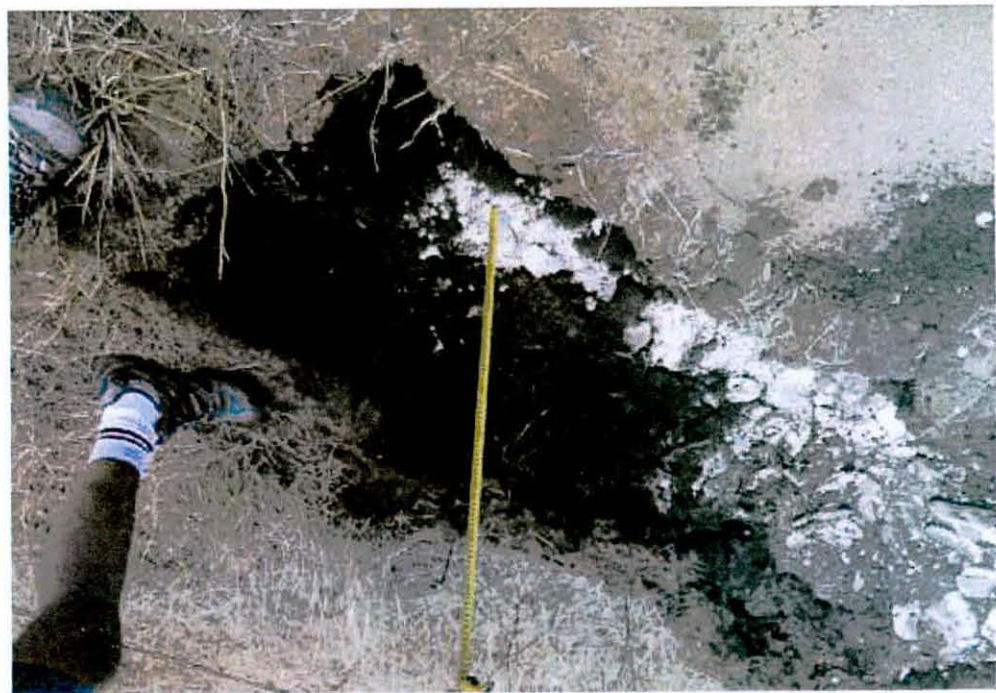
Where samples are indicated above in rock, 10kg taken for ID only

Samples were marked with the test pit no. and depth

Sample tray taken for Metago



Equipment and Method:

Wheeled TLB







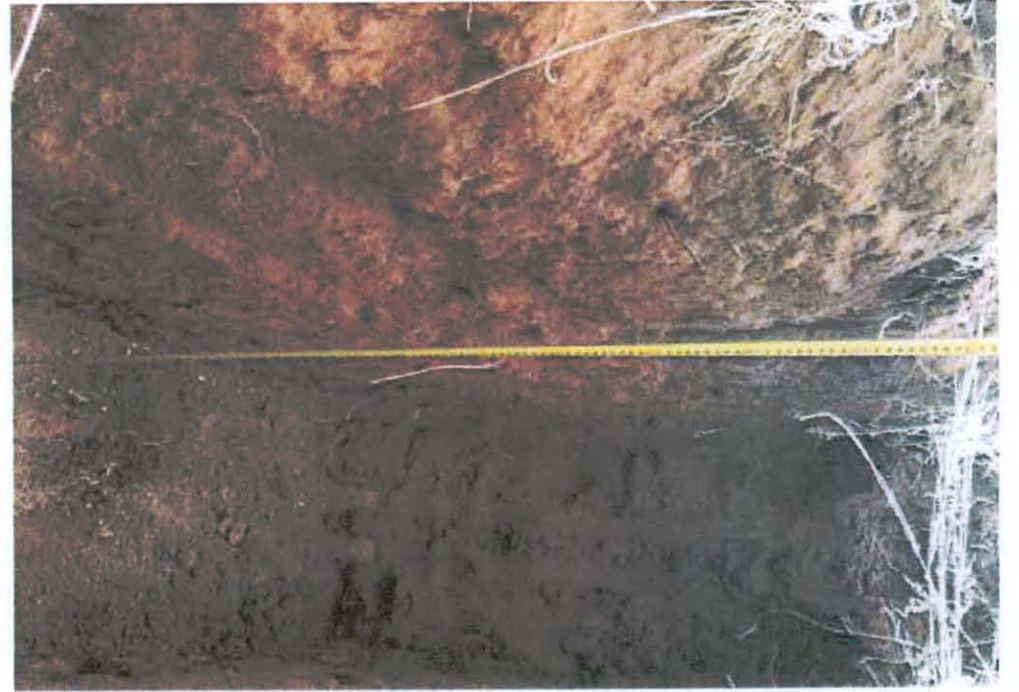


PROFILE LOG

| Project: Moonlight Iron Ore | | Trial Pit No. | | TP20 |
|--|--------|--|---|---|
| Location: Proposed Return Water Dam | | Northings: S 23°13'06.5 | | Project No.: |
| Notes: | | Easting: E 28°11'14.7 | | Logged by: M Hoppe |
| Depth (m) | Sample | Legend | Elevation: 943m | Date: 8/04/2011 |
| Ground Level | | Description and Classification | | |
| 1.0 | |  | 1.0 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 300mm. (TOPSOIL) |
| 1.5 | |  | 0.5 | Stiff, Dry, Orangy Brown SILTY SAND. Medium angular granitic sand. |
| Refusal | | | >0 | Hard, Mottled Reddish Brown with Black weathered gneiss SANDSTONE conglomerate with biotite gravels. |
| | | Bottom of hole 1.5 m | | |
| <i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 5m | | | | |
| <i>Sampling:</i> Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago | | | <i>Equipment and Method:</i> Wheeled TLB | |







| amec | | | | PROFILE LOG | | Trial Pit No. | TP21 |
|---|--|------------------------------------|--------|---|--|---|------|
| Project: | | Moonlight Iron Ore | | Northings: S 23°13'14.1 | | Project No.: | |
| Location: | | Proposed Tailings Storage Facility | | Easting: E 28°11'33.1 | | Logged by: M Hoppe | |
| Notes: | | Depth (m) | Sample | Legend | Thickness (m) | Date: 8/04/2011 | |
| | | Ground Level | | | | Description and Classification | |
| | | 0.9 | |  | 0.9 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 300mm. (TOPSOIL) | |
| | | 1.2 | |  | 0.3 | Stiff, Dry, Orange Brown SILTY SAND. Medium angular granitic sand. | |
| | | 1.4 | |  | 0.2 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. | |
| Refusal | | 1.7 | |  | >0.3 | Hard, Mottled Reddish Brown with Black weathered gneiss SANDSTONE conglomerate with biotite gravels. | |
| | | | | | | Bottom of hole 1.7 m | |
| <p><i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS accuracy of 3m</p> | | | | | | | |
| <p><u>Sampling:</u> Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago</p> | | | | | <p><u>Equipment and Method:</u> Wheeled TUB</p> | | |





PROFILE LOG

| Project: Moonlight Iron Ore | | Trial Pit No. TP22 | | | |
|--|-----------|---|---|---------------|--|
| Location: Proposed Tailings Storage Facility | | Northing: S 23°12'59.3 Easting: E 28°11'51.0 Elevation: 954m | Project No.: M Hoppe Logged by: M Hoppe Date: 8/04/2011 | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
| Ground Level | | | | | |
| | 1.0 | |  | 1.0 | Weak, Orangy Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 1.4 |  |  | 0.4 | Stiff, Dry, Orangy Brown SILTY SAND. Medium angular granetic sand. |
| Refusal | 1.7 | |  | >0.3 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| Bottom of hole | | | | | |
| 1.7 m | | | | | |
| <i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS accuracy of 3m | | | | | |
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago | | | Equipment and Method: Wheeled TTB | | |





PROFILE LOG

Trial Pit No. **TP23**

| | | | | | |
|--|------------------|------------------------|---------------|---|---|
| Project: Moonlight Iron Ore | | Northing: S 23°13'21.9 | | Project No: | |
| Location: Proposed Tailings Storage Facility | | Easting: E 28°11'37.9 | | Logged by: M Hoppe | |
| | | Elevation: 954m | | Date: 8/04/2011 | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
| | Ground Level | | | | |
| | | | | 0.7 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| Refusal | 0.7 0.8 | | | >0.1 | Hard, White weathered QUARTZ FELDSPAR |
| Bottom of hole 0.8 m | | | | | |
| General Notes: Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m | | | | | |
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago | | | | Equipment and Method: Wheeled TLB | |








PROFILE LOG

Trial Pit No. **TP24**

Project: **Moonlight Iron Ore** Northing: **S 23-1245.9**
 Location: **Proposed Tailings Storage Facility** Easting: **E 28-1209.4**
 Elevation: **965m**

Project No.:
 Logged by: **M Hoppe**
 Date: **7/04/2011**

| Notes | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification |
|----------------|--------------|--------|--|---------------|--|
| | Ground Level | | | | |
| | 0.9 | |  | 0.9 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL.) |
| | 1.5 | |  | 0.6 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand Uniform subrounded biotite gneiss gravel. |
| Refusal | 1.9 | |  | >0.4 | Friable becoming Hard with depth. Red, Orange and White extremely weathered gneiss SANDSTONE. |
| Bottom of hole | | | | | 1.9 m |

General Notes:

Hole dry and stable once below topsoil horizon

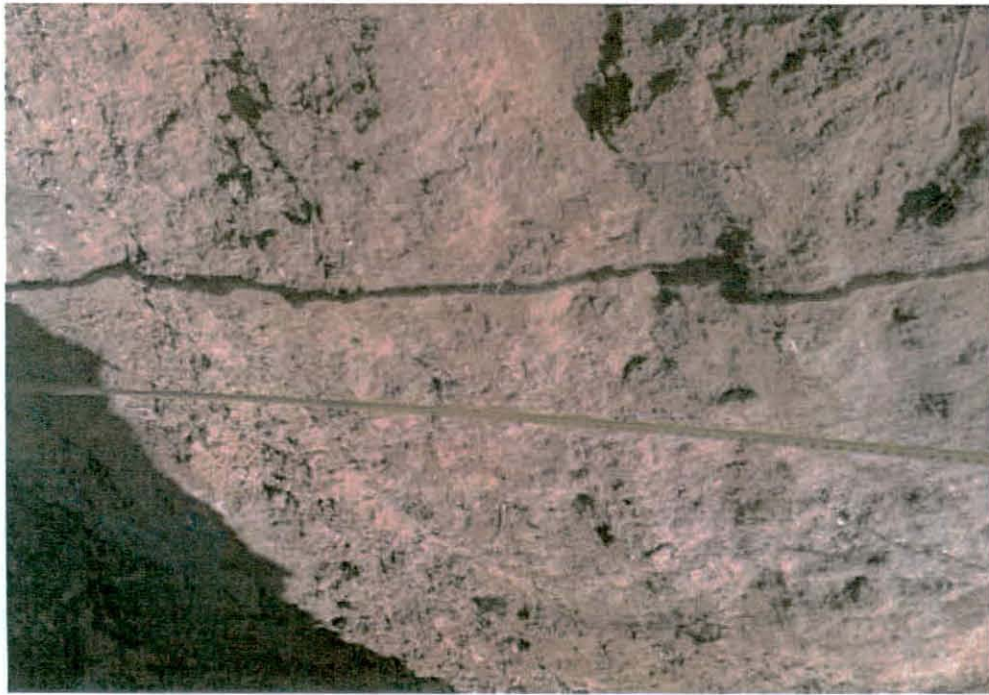
A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm



GPS Accuracy of 3m

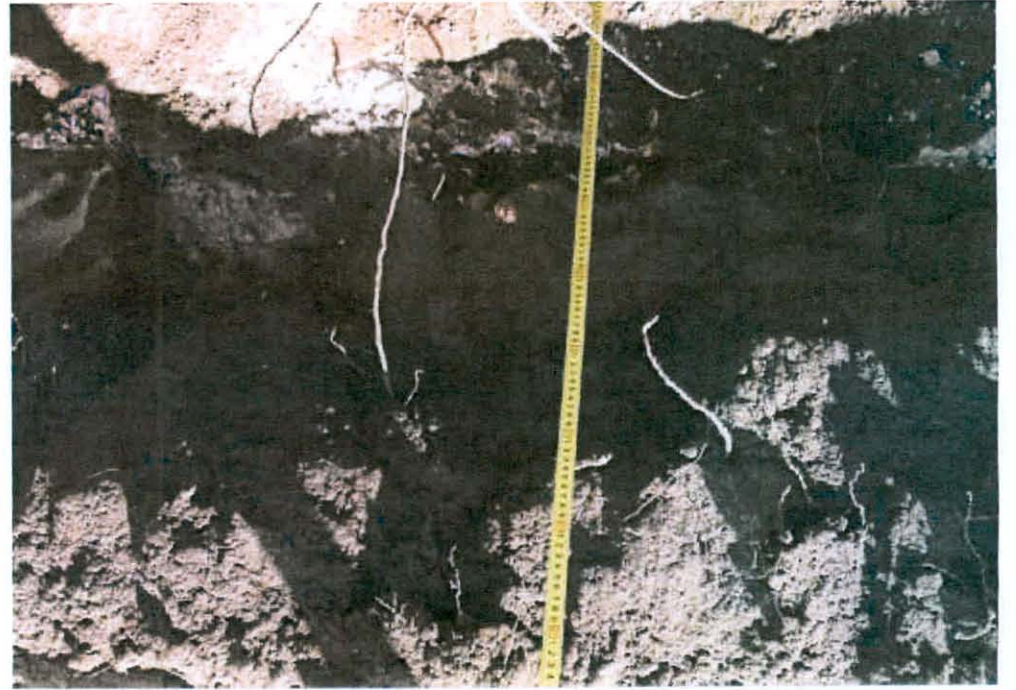
Test pit inspected by Metago engineer Steve Van Niekerk

Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken
 Where samples are indicated above in rock, 10kg taken for ID only
 Samples were marked with the test pit no. and depth
 Metago engineer retrieved sample tray

Equipment and Method:
 Wheeled TLB






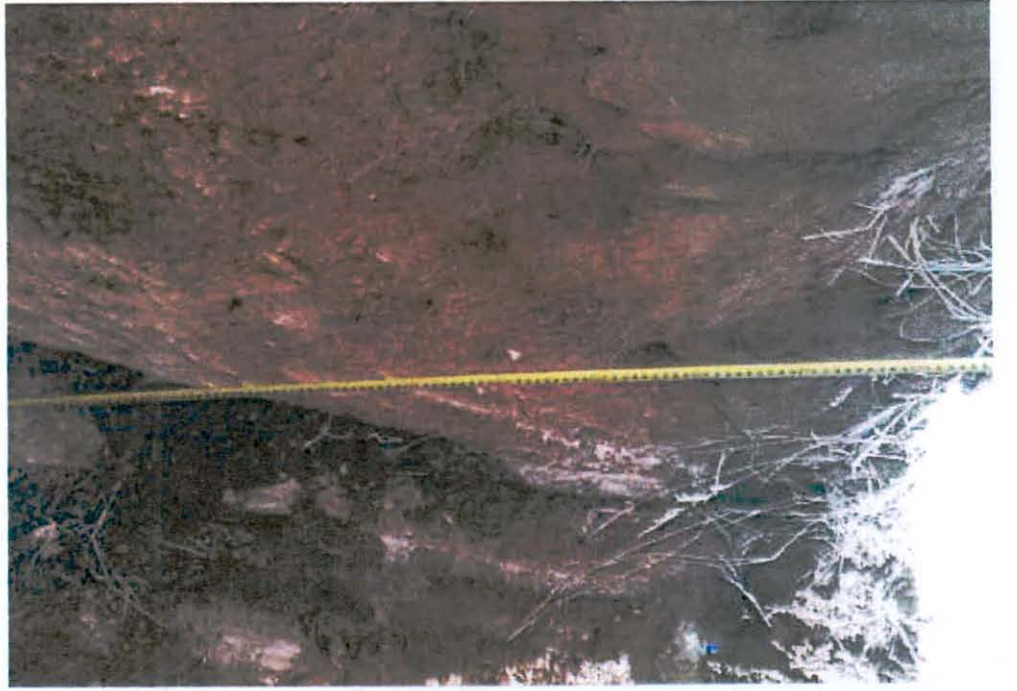
| amec | | PROFILE LOG | | | Trial Pit No. | TP25 |
|--|--------------|------------------------|---|--|---|------|
| Project: Moonlight Iron Ore | | Northing: S 23°13'17.5 | | Project No.: | | |
| Location: Proposed Tailings Storage Facility | | Easting: E 28°12'10.7 | | Logged by: M Hoppe | | |
| | | Elevation: 963m | | Date: 7/04/2011 | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| | Ground Level | | | | | |
| | 0.7 | |  | 0.7 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | |
| Refusal | 1.0 | |  | >0.3 | Hard, White weathered QUARTZ FELDSPAR | |
| | | | | Bottom of hole 1.0 m | | |
| <p><i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m Test pit inspected by Metago engineer Steve Van Niekerk</p> | | | | | | |
| <p><u>Sampling:</u> Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Metago engineer retrieved sample tray</p> | | | | <p><u>Equipment and Method:</u> Wheeled FLB</p> | | |





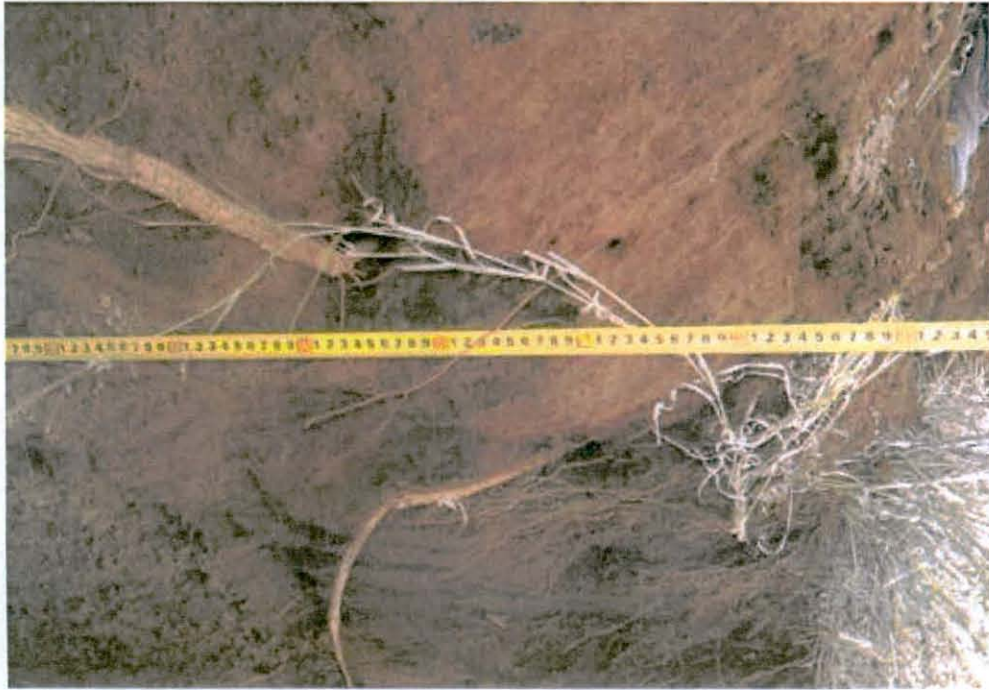


PROFILE LOG

| Project: | | Moonlight Iron Ore | | Trial Pit No. | | TP26 | |
|--|--|------------------------------------|--------|---|---------------|---|--|
| Location: | | Proposed Tailings Storage Facility | | Northing: Easting: Elevation: | | Project No.: Logged by: Date: | |
| Notes: | | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| Ground Level | | | | | | | |
| | | 0.7 | |  | 0.7 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL.) | |
| | | 1.3 | |  | 0.6 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. | |
| Refusal | | 1.8 | |  | >0.5 | Fryable becoming Hard with depth. Red, Orange and White extremely weathered gneiss SANDSTONE. | |
| | | | | | | Bottom of hole | |
| | | | | | | 1.8 m | |
| <i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m Test pit inspected by Metago engineer Steve Van Niekerk | | | | | | | |
| <i>Sampling:</i> Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Metago engineer retrieved sample tray | | | | <i>Equipment and Method:</i> Wheeled TLB | | | |



| amec | | PROFILE LOG | | | Trial Pit No. | TP27 |
|--|-----------|------------------------|---|---|--|------|
| Project: Moonlight Iron Ore | | Northing: S 23°13'29.6 | | Project No.: | | |
| Location: Proposed Tailings Storage Facility | | Easting: E 28°12'32.9 | | Logged by: M Hoppe | | |
| | | Elevation: 967m | | Date: 8/04/2011 | | |
| Notes: | Depth (m) | Sample | Legend | Thickness (m) | Description and Classification | |
| Ground Level | | | | | | |
| | 0.7 | |  | 0.7 | Weak, Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | |
| | 2.3 | | | 1.6 | Dry, Stiff, Grey Brown extremely weathered QUARTZ FELDSPAR with Granite sands. | |
| | 3.0 | |  | 0.7 | Moist cool feeling. Moderately Weak Greyish White with Green specs (Potassium?) FELDSPAR. Can break with sharp hit on the ground. Becomes stiffer/harder with depth. | |
| | | | | | Bottom of hole 3.0 m | |
| General Notes: <i>Hole dry and stable once below topsoil horizon</i> <i>A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm</i> <i>GPS Accuracy of 3m</i> | | | | | | |
| Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago | | | | Equipment and Method: Wheeled TLB | | |





PROFILE LOG

Trial Pit No. TP28




Project: Moonlight Iron Ore
Location: Proposed Tailings Storage Facility

Project No.: S 23-13/04:4
Lagged by: M Hoppe
Date: 8/04/2011

Northings: E 28-12/41.0
Easting: 966m
Elevation:

Notes: Depth (m) Sample Legend Thickness (m) Description and Classification

Ground Level

| | | | | | |
|---------|-----|--|---|------|--|
| | | |  | 0.6 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) |
| | 0.6 | |  | 0.6 | Stiff, Dry, Reddish Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| | 1.2 | |  | 0.5 | Very Stiff, Dry, Light Brown SILTY SAND with Black GRAVEL. Medium angular granitic sand. Uniform subrounded biotite gneiss gravel. |
| Refusal | 1.7 | | | >0.1 | Hard, Red, Orange and White extremely weathered gneiss SANDSTONE. |
| | 1.8 | | | | |



Bottom of hole 1.8 m

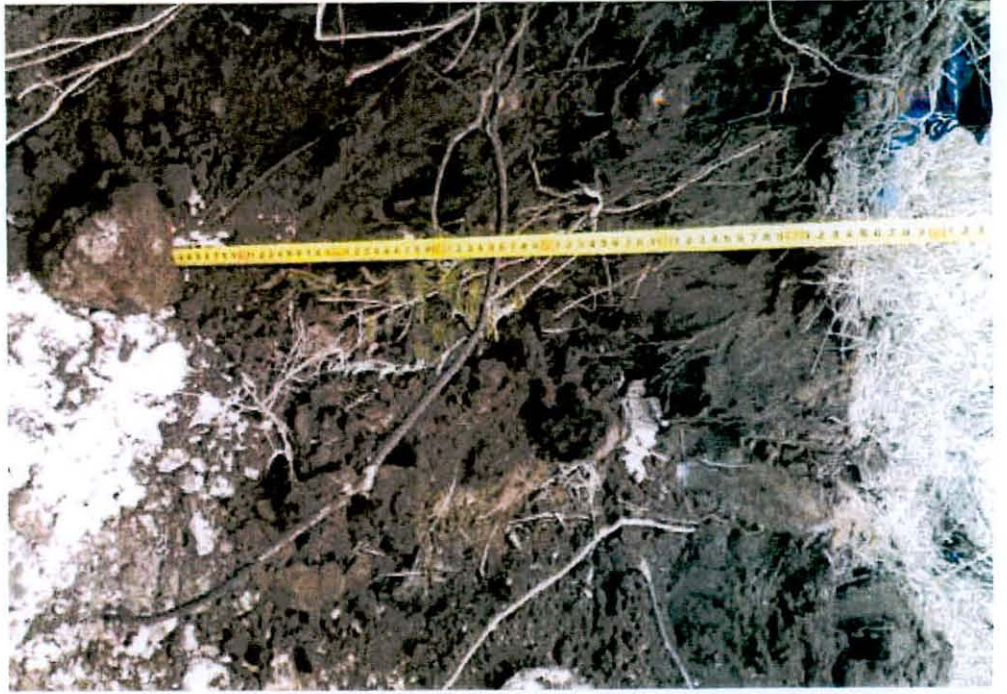
General Notes:
Hole dry and stable once below topsoil horizon
A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm
GPS Accuracy of 3m

Sampling: Where samples are indicated above in sand, 2 lots of 40kg taken
Where samples are indicated above in rock, 10kg taken for ID only
Samples were marked with the test pit no. and depth
Sample tray taken for Metago

Equipment and Method:
Wheeled TLB



| amec | | | | PROFILE LOG | | Trial Pit No. | TP29 |
|---|--------------|--|--|--|---|--|------|
| Project: Moonlight Iron Ore | | Northing: S 23°13'26.7 Easting: E 28°12'53.2 Elevation: 971m | | Project No.: | | M Hoppe Logged by: Date: 8/04/2011 | |
| Location: Proposed Tailings Storage Facility | | Thickness (m) | | Description and Classification | | | |
| Notes: | Depth (m) | Sample | Legend | | | | |
| | Ground Level | | | | | | |
| | | |  | 0.5 | Weak, Reddish Brown SILTY SAND. Abundance of organic materials and roots. Rich earthy aroma. Moist for top 400mm. (TOPSOIL) | | |
| Refusal | 0.5 0.6 | |  | >0.1 | Hard, White weathered QUARTZ FELDSPAR | | |
| | | | | | | | |
| | | | | | | | |
| | | | | Bottom of hole | | | |
| | | | | 0.6 m | | | |
| <p><i>General Notes:</i> Hole dry and stable once below topsoil horizon A recent large rain event of 50mm has moistened the topsoil layer to a depth of 300-400mm GPS Accuracy of 3m Hole was in very thick scrub and not able to get closer to the specified point</p> | | | | | | | |
| <p><u>Sampling:</u> Where samples are indicated above in sand, 2 lots of 40kg taken Where samples are indicated above in rock, 10kg taken for ID only Samples were marked with the test pit no. and depth Sample tray taken for Metago</p> | | | | <p><u>Equipment and Method:</u> Wheeled TUB</p> | | | |



APPENDIX C: GEOTECHNICAL LABORATORY TEST RESULTS

Laboratory test results, undertaken by Civilab Testing Laboratories in May 2011, include:

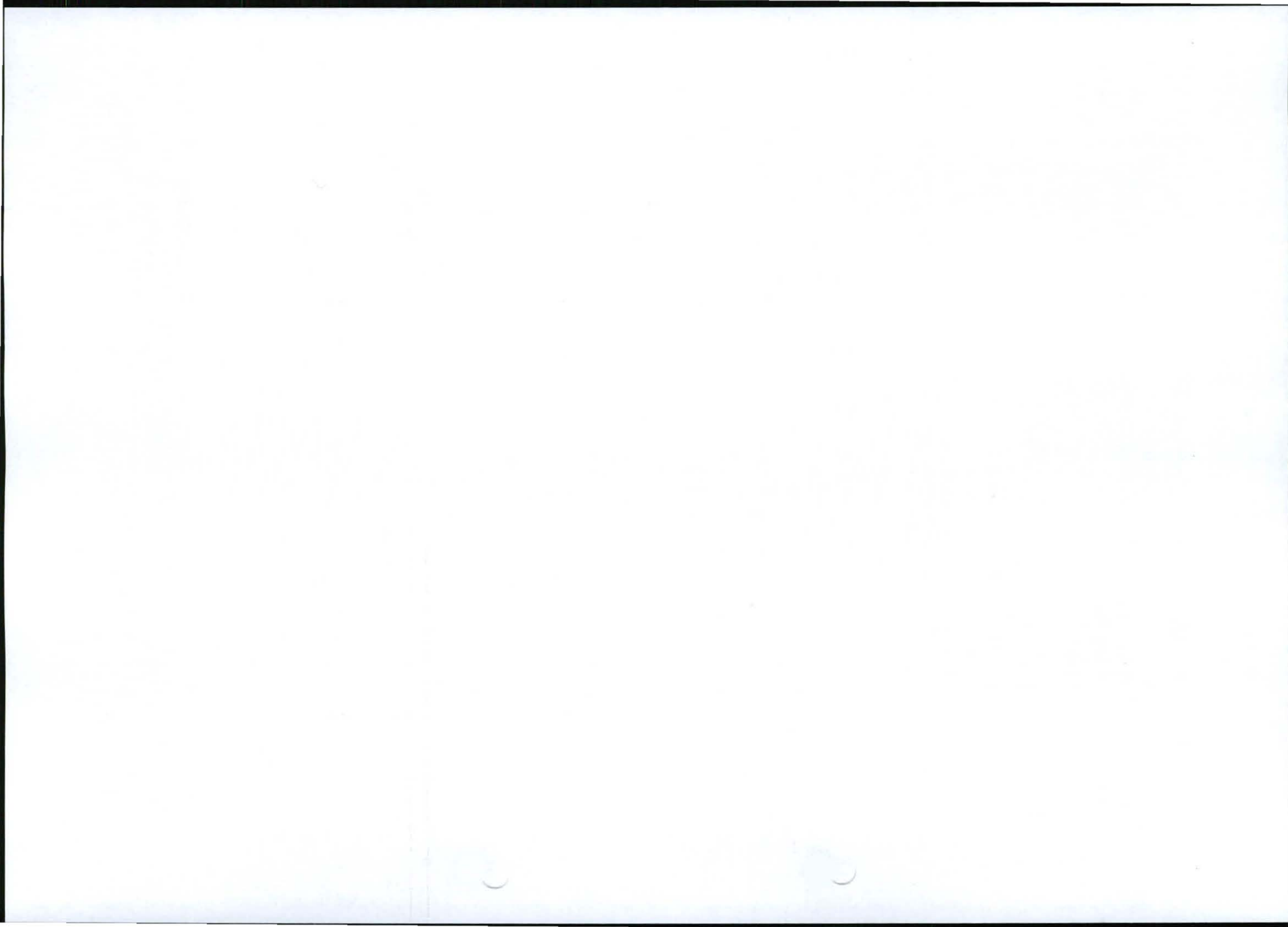
Foundation Indicator Test Data

Moisture Density Relationship

Triaxial Test Results

Falling Head Permeability Test Results

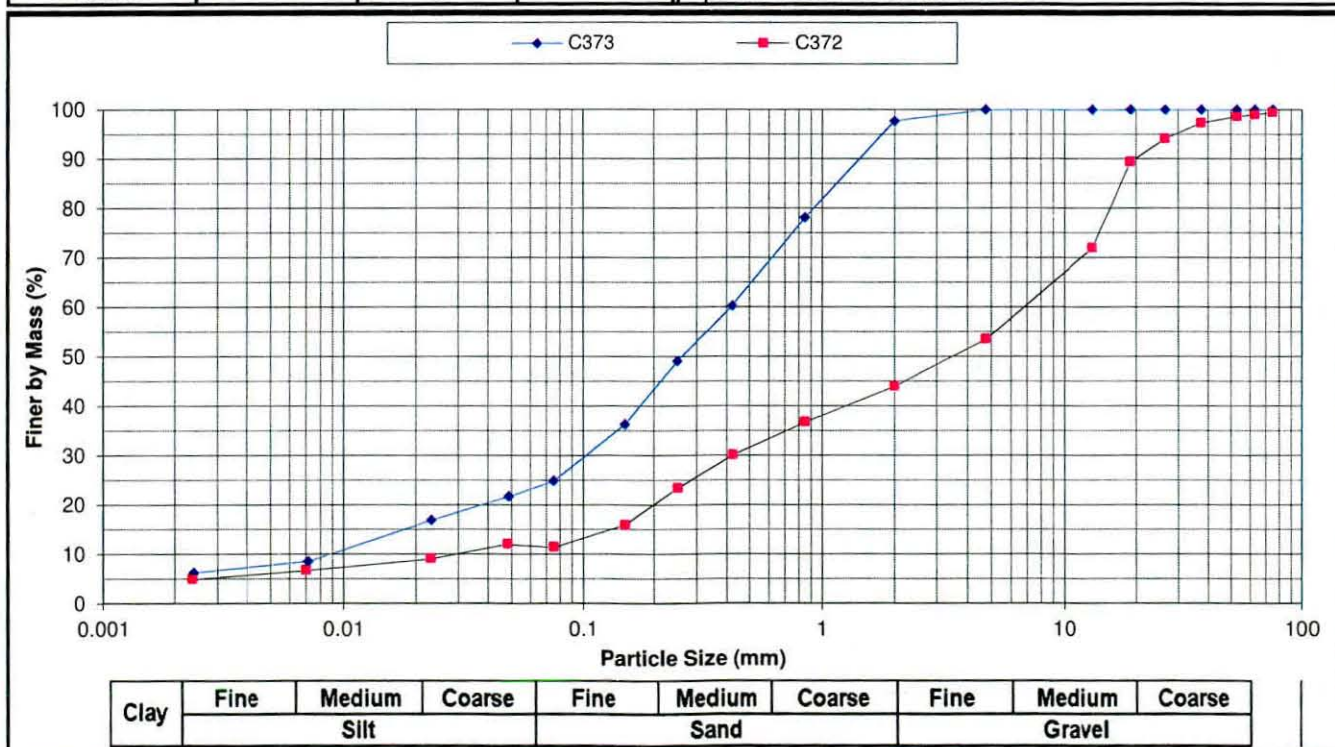
Dispersive Test Results (Crumb, Double Hydrometer and Pinhole)



Foundation Indicator Test Data

| | | | |
|-------------|------------------|------|-------------|
| Project | MOONLIGHT | | |
| Project No. | 1039/F02/05/2011 | Date | 19 May 2011 |

| Sample No. | C373 | C372 | | Sample No. | C373 | C372 | |
|----------------|----------|-----------|-----------|--|------------|------------|--|
| Field Ref. No. | TP 22 | TP 27 | | %Gravel | 2 | 56 | |
| Depth | - | - | | %Sand | 75 | 32 | |
| Sieve size | %Passing | % Passing | % Passing | %Silt | 17 | 7 | |
| 75 | 100 | 99 | | %Clay | 6 | 5 | |
| 63 | 100 | 99 | | NMC % | Not Tested | Not Tested | |
| 53 | 100 | 99 | | Liquid Limit | 16 | 41 | |
| 37.5 | 100 | 97 | | Plasticity Index | 8 | 18 | |
| 26.5 | 100 | 94 | | Linear Shrink. | 3.5 | 7. | |
| 19.0 | 100 | 89 | | Overall P.I. | 5 | 5 | |
| 13.2 | 100 | 72 | | Grading Modulus | 1.17 | 2.15 | |
| 4.75 | 100 | 53 | | H.R.B. | A-2-4 (0) | A-2-7 (0) | |
| 2.00 | 98 | 44 | | Unified | SC | GP-GC | |
| 0.85 | 78 | 37 | | Weston swell (%) at 1 kPa | | | |
| 0.425 | 60 | 30 | | Analysis as per method D422 of ASTM of 1985 The results reported relate only to the samples tested. Documents may only be reproduced or published in their full context. | | | |
| 0.250 | 49 | 23 | | | | | |
| 0.150 | 36 | 16 | | | | | |
| 0.075 | 25 | 11 | | | | | |
| 0.04 | 20 | 11 | | | | | |
| 0.02 | 16 | 9 | | | | | |
| 0.006 | 8 | 6 | | | | | |
| 0.002 | 6 | 5 | | | | | |



Remarks:

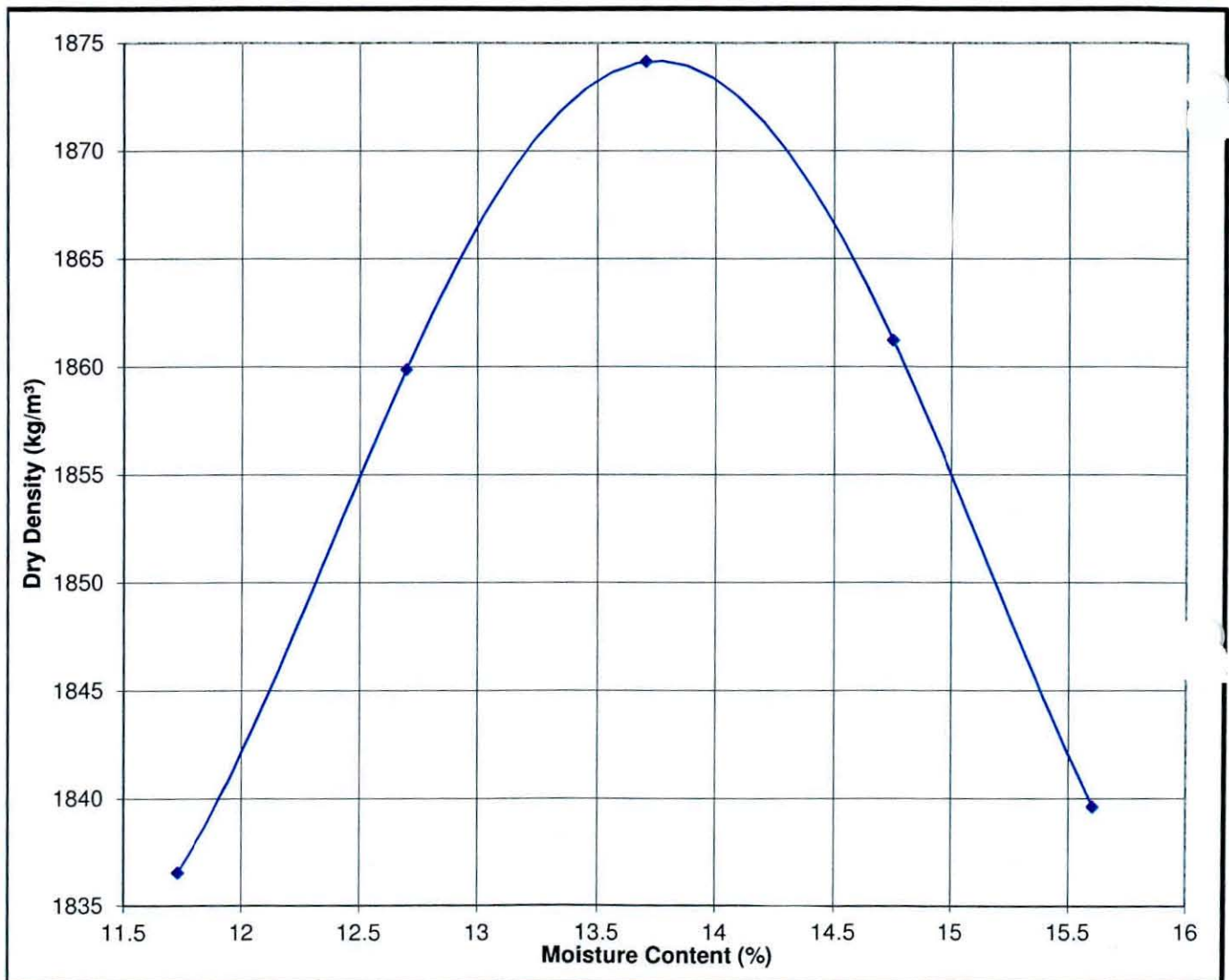
Moisture Density Relationship

| | | | |
|------------------|------------------|------------------|-------------|
| Project: | MOONLIGHT | | |
| Project No.: | 1039/F02/05/2011 | Date: | 10 May 2011 |
| Field Reference: | TP 27 | Laboratory Ref.: | C372 |
| Depth (m): | - | Remarks: | Untreated |
| Description: | - | | |

Compactive Effort: Mod. AASHTO

| | | | | | | | | | |
|-----------------------------------|------|------|------|------|------|--|--|--|--|
| Percent Water Content (%): | 12.7 | 13.7 | 14.7 | 11.7 | 15.6 | | | | |
| Dry Density (kg/m ³): | 1860 | 1874 | 1861 | 1837 | 1840 | | | | |

| | | | |
|-----------------------------|------------------------------|----------------------------------|---------------|
| Maximum Dry Density: | 1874 kg/m³ | Optimum Moisture Content: | 13.8 % |
|-----------------------------|------------------------------|----------------------------------|---------------|



Analysis according to Method A7 of TMH1 of 1986.
 The results relate only to the samples tested.
 This report may only be reproduced or published in its full context.
 Remarks:

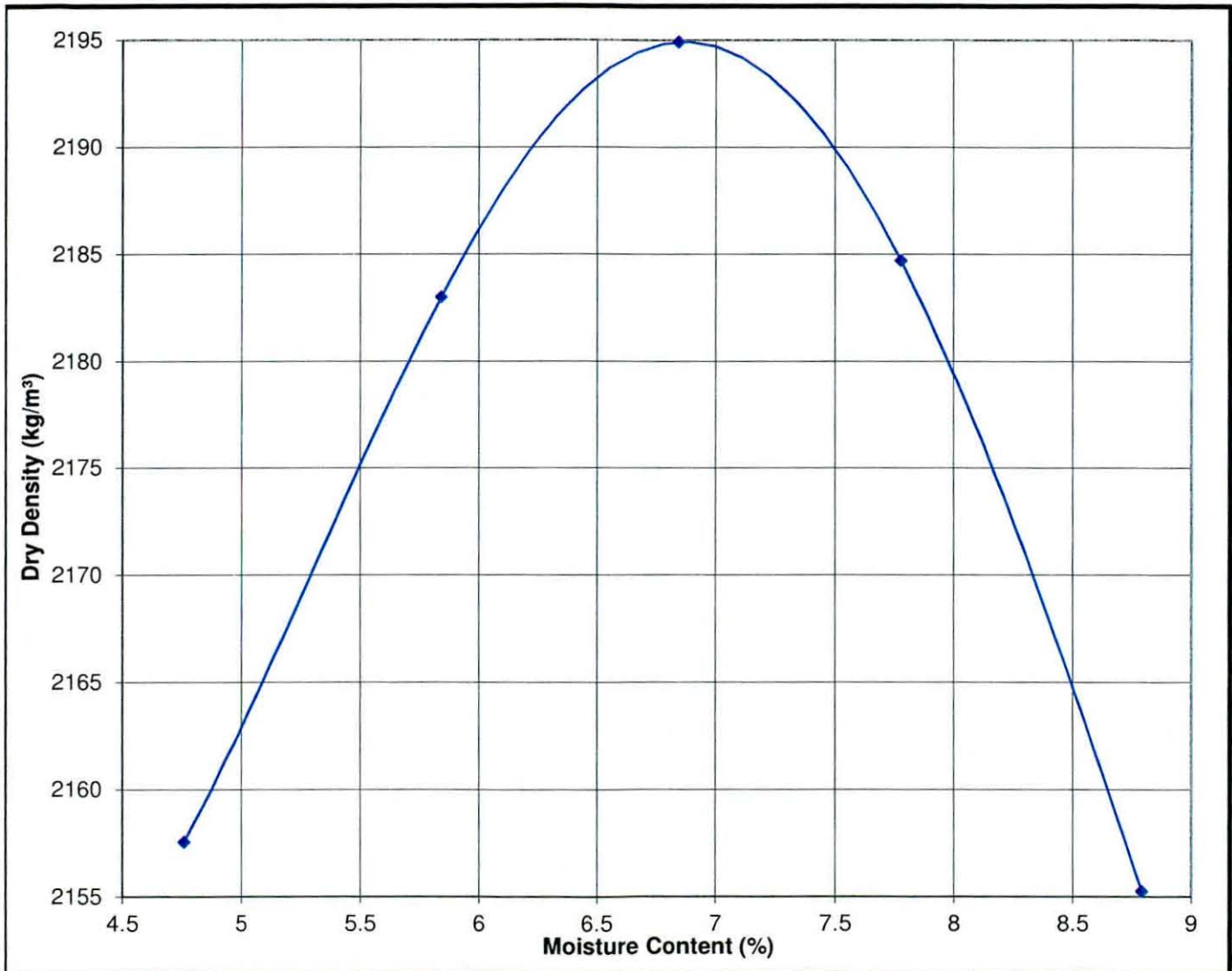
Moisture Density Relationship

| | | | |
|------------------|------------------|------------------|-------------|
| Project: | MOONLIGHT | | |
| Project No.: | 1039/F02/05/2011 | Date: | 10 May 2011 |
| Field Reference: | TP 22 | Laboratory Ref.: | C373 |
| Depth (m): | - | Remarks: | Untreated |
| Description: | - | | |

Compactive Effort: Mod. AASHTO

| | | | | | | | | |
|-----------------------------------|------|------|------|------|------|--|--|--|
| Percent Water Content (%): | 7.8 | 8.8 | 6.8 | 5.8 | 4.8 | | | |
| Dry Density (kg/m ³): | 2185 | 2155 | 2195 | 2183 | 2158 | | | |

Maximum Dry Density: 2195 kg/m³ **Optimum Moisture Content:** 6.9 %



Analysis according to Method A7 of TMH1 of 1986.
 The results relate only to the samples tested.
 This report may only be reproduced or published in its full context.
 Remarks:

Triaxial Compression Test Results

| | | | |
|----------------------|-------------------------|--------------------|-------------------|
| Project: | MOONLIGHT | Date Tested: | 26/05/2011 |
| Batch No.: | 1039/F02/05/2011 | Laboratory Number: | C372 |
| Field Sample Number: | TP 27 | Depth (m): | - |

This test was carried out in accordance with BS 1377:Part 8:1990 Clause 4,5,6,7

Remarks: A Consolidated Undrained test on a remoulded sample tested saturated.

SATURATION DATA

Test No. 1

| | | | |
|------------------------------------|---|------------------------------|-------|
| Saturation method: | Alternating increments of cell- & back pressure | | |
| Pressure increments applied (kPa): | 50,70,100,100,100 | Differential pressure (kPa): | 10.0 |
| Final cell pressure (kPa): | 453.0 | Final back pressure (kPa): | 443.0 |
| | | Final B parameter: | 0.95 |

CONSOLIDATION DATA

| | | | | | | | | |
|-------------------------------|-----------|----------------------------|----------------------|----------------------------|-----------------|------------|--------------|---------------------|
| Effective cons. Stress (kPa): | 49.5 | t100 (minutes): | 30 | Side drains fitted: | No | | | |
| | Height mm | Diameter mm | Area mm ² | Moisture Content % | Dry Unit Weight | Void Ratio | Saturation % | Specific Gravity |
| INITIAL (Before saturation) * | 100.00 | 50.00 | 1963.50 | 8.2 | 1.770 | 0.6787 | 36 | 2.971 Determined |
| CONSOLIDATED | 99.72 | 49.86 | 1952.56 | 22.8 | 1.785 | 0.6647 | 102 | |
| FINAL (After shear) | 92.75 | 51.70 | 2099.31 | 22.8 | 1.785 | 0.6647 | 102 | |
| Initial pore pressure (kPa): | 444.0 | Final pore pressure (kPa): | 443.8 | Pore pressure dissipation: | 20% | | | |

*: Measured dimensions; all other dimensions are calculated.

SHEAR DATA

| | |
|-----------------------------------|---|
| Rate of strain (%/hour): | 9 |
| Initial pore pressure (kPa): | 443.5 |
| Initial effective stress (kPa): | 49.5 |
| Failure Criterion: | Max. Effective Principle Stress Ratio |
| Axial strain at failure (%): | 1.82 |
| Deviator stress (kPa): | 133.4 |
| Excess pore pressure (kPa): | 25.0 |
| Effective principle stress ratio: | 6.442 |
| Deviator stress corrections: | Membrane correction: 1.14 kPa |
| | Principle Stresses (kPa) |
| | σ_1 σ_1' σ_3 σ_3' |
| | 182.9 157.9 49.5 24.5 |

