Mineral Resource Estimate
Solwara 1 Project
Bismarck Sea
Papua New Guinea

for
Nautilus Minerals Inc

Canadian NI43-101 form F1

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY

Australian Commonwealth Scientific Industrial Research Organisation	CSIRO
Australian Institute of Mining and Metallurgy	AusIMM
Below mean sea level	BSL
Canadian Institute of Mining, Metallurgy and Petroleum	CIM
Canadian National Instrument 43-101	NI43-101
Centimetre	cm
Certified reference material	CRM
Cubic metre	m^3
Degree (survey)	º
Degrees Celsius	ºC
Diamond drillhole	DDH
Digital terrain model	DTM
Electromagnetic	EM
Golder Associates Pty Ltd	Golder
Gram	g
Grams per tonne	g/t
Greater than	>
Greater than or equal to	≥
Half absolute relative difference	HARD
Half relative difference	HRD
Hectare (10,000 m^2)	ha
Hour	hr
Induced polarization	IP
Inductively coupled plasma atomic emission spectrophotometry	ICPAES
Kilogram	kg
Kilometre	km
Kilowatt hours per tonne	kWh/t
Less than	<
Less than or equal to	≤
Low-pass filter	LPF
Metric tonne	t
Micrometre	µm
Millimetre	mm
Million	M
Million tonnes	Mt
Minute (survey)	′
Ocean deep drilling program	ODP
Ocean Floor Geophysics Inc	OFG
Ocean floor electromagnetic	OFEM
Ounce	oz
Parts per million	ppm
Percent	%
Papua New Guinea	PNG
Reverse circulation drillhole	RC
Remotely operated vehicle	ROV
Seafloor Massive Sulfide	SMS
Subsea Mining Tool	SMT
Second (survey)	"
Square kilometre	km^2
Square metre	m^2
United States dollars	US$
Volcanic hosted massive sulfide	VHMS

ITEM 3. SUMMARY

The Solwara 1 Seafloor Massive Sulfide (SMS) prospect is located in the Bismarck Sea, at latitude 3°.789 S and longitude 152°.094 E, some 35 nautical miles north of Rabaul (Figure 3-1). The prospect contains a substantial resource of massive base metal sulfides, gold and silver.

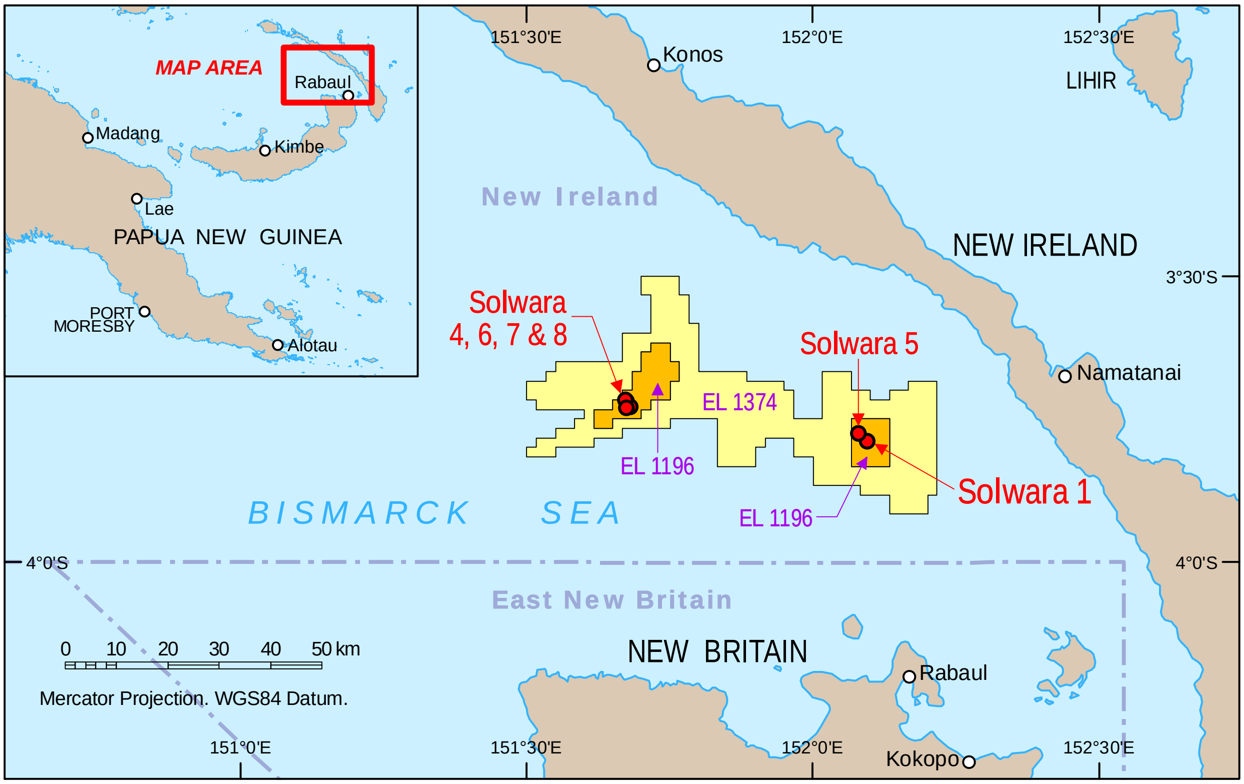


Figure 3-1 Solwara 1 location plan

Nautilus Minerals Niugini Ltd (a wholly owned subsidiary of Nautilus Minerals Inc) holds exploration title over the deposit and has been exploring the site since 2005.

The Solwara 1 deposit is a stratabound zone of massive and semi-massive sulfide mineralization that occurs on a sub-sea volcanic mound which extends about 150m to 200m above the surrounding seafloor. The average depth of the deposit is about 1550m below sea level. The slopes of the mound are relatively steep and interrogation of a coarse DTM (Digital Terrain Model) suggests slopes generally in the range of 15º to 30º but locally steeper. There are some flatter areas near the crests of the ridges where much of the deposit is located.

The sub-surface geological sequence at Solwara 1, from the top down, may be summarized as:

- Unconsolidated sediments. These typically comprise of dark grey clays and silts ranging in thickness from 0 to 2.7m, with an average of about 1.4m in the core holes drilled in 2007 (see below). Due to the softness and low cohesiveness of this material, core recovery is commonly low in this zone;

- Lithified sedimentary rocks. These typically comprise a layer of pale to dark grey, lithified volcanic sandstone varying from 0 - 5.4m thick and averaging 0.5m thick in the holes drilled in 2007. The lower parts of this layer are locally weakly lithified;

- Massive and semi-massive sulfide rocks. This is the main ore horizon and it varies in thickness from 0 – 18m in the holes drilled to date. Many holes terminated in massive or semi-massive sulfides and from these holes it may be inferred that the massive sulfide zone is greater than 18m thick in some locations. It consists mainly of pyrite and chalcopyrite, with variable amounts of anhydrite and barite. Locally, the interval may include patches of clay-rich altered volcanic material. The zone may be vuggy; and,

- Altered volcanic rocks. The footwall to the mineralization commonly consists of altered volcanic rocks in which most of the primary minerals have been altered to clays. These rocks are commonly weak and core recovery is commonly low in this zone.

Local variations are interpreted in this sequence. In addition, zones of relatively fresh lava rock form the lateral boundaries or locally overlie small areas of the mineralized zones.

Sulfide-rich chimneys are generally up to 10m in height, but have been recorded up to 15m high, and occur on the surface of the massive sulfide. The majority of chimneys occur in several discrete chimney 'fields' separated by unconsolidated sediments (and locally by volcanic flows). Scattered chimneys occur between the main fields.

There is localised hydrothermal activity at Solwara 1 where water generally up to 120ºC is discharged. The location of venting chimneys has been identified from video footage and this venting has been shown to be episodic. Investigations on fluid flow rates from chimneys and additional thermal data collection is ongoing.

The Solwara 1 project has been explored by ROV dive videos, bathymetric surveys, surface sampling and by core drilling. In 2006, 34 diamond core holes were drilled from the *DP Hunter* vessel from the surface. Core recovery was highly variable. Although the samples were generally not of sufficient quality for resource estimation, the drillholes demonstrated the presence of widespread massive sulfide mineralization. In addition to the core drilling data, chimney samples were collected from the seafloor. These also demonstrated high grade Cu, Au, Zn and Ag mineralization.

In 2007, Nautilus completed a 111 hole drilling program from the vessel *Wave Mercury* using drill rigs mounted on remote operated vehicles (ROVs) lowered onto the seabed. The core recovery averaged greater than 70% from the massive sulfide zone and clearly demonstrated the continuity of sulfide mineralisation across the Solwara 1 deposit. In addition over 80 chimney samples were collected. An extensive geotechnical testing program on drill core and chimney samples provided confidence on average density and geotechnical parameters of the mineralization at Solwara 1. Independent audit of the logging confirmed the widespread occurrence of significant chalcopyrite mineralization in the chimneys and drill core, broadly consistent with the Cu geochemical analyses.

Core and chimney samples were placed in sealed sample bags which were then packed sealed in large plastic boxes using tamperproof numbered cable ties. The boxes were dispatched to ALS Laboratory Group, an independent NATA certified, commercial laboratory, in Australia for customs and quarantine clearance, and geochemical analysis. Some consignments of the boxes were opened and inspected at ALS in Townsville by Golder staff. The samples were examined for any evidence of contamination of the sample bags or tampering; none was observed. Thereafter, the samples remained in the custody of ALS during preparation and analysis.

Cu, Ag, Pb and Zn were measured by ore-grade analysis using inductively coupled plasma atomic emission spectrophotometry (ICPAES) following an aqua regia digest. Au was analysed by fire assay using a 30g charge and an atomic absorption spectrophotometry finish. Due to the high sulfide content, the fire assay charges were reduced for many samples.

In addition to ALS internal quality control procedures, Nautilus carried out its own checks on laboratory performance by inserting duplicates, blanks, certified reference materials (CRM) and matrix-matched secondary reference material into each batch of samples.

There were some sporadic instances of minor contamination of samples during sample preparation but there was no evidence of systematic problems. The contamination levels and frequency pose only a minor risk to the resource estimate. The results of the duplicate sampling showed that the mineralisation is relatively inhomogeneous, which is consistent with the coarse grain size of the sulfide mineralization and the irregular nature of anhydrite distribution. The CRM results show that the analytical data is adequate for estimation of Inferred and Indicated Resources of Cu, Au, Ag and Zn. The results of the analysis of the secondary reference material supported the CRM results. In the author's opinion the sampling, sample preparation, security and analytical procedures were satisfactory for mineral resource estimation.

Over 600 dry bulk density measurements were made on core samples from the 2007 drilling program. A caliper method and a water displacement method based on Archimedes Principal, were used. Analysis of the paired results from the two methods showed that there was no significant difference between the results produced by the two methods. Dry bulk density values were measured for eight rock types. Nautilus measured the dry bulk density of 86 samples from 49 individual chimneys using a simple water displacement method, and checked these results with duplicate measurements using a second water displacement method based on Archimedes principal.

A program to drill and obtain representative samples for metallurgical assessment was designed. In all 24 holes were drilled for metallurgical assessment at sites chosen to provide a representative selection of material types. In addition, 28 chimney samples spread across the deposit, totalling 100 kg, were collected. The drill core and chimney samples were cleaned in fresh water, dried, vacuum sealed, placed in a nitrogen purged container, and shipped to Ammtec Laboratories (Ammtec) in Perth, Australia. At the time of writing the metallurgical testing is underway and test results are not available.

During the 2007 campaign, Nautilus successfully trialed and then deployed an ocean floor electromagnetic system over Solwara 1. The system is a controlled source method that measures electromagnetic fields associated with induced subsurface electrical currents. It was designed and built for the purpose of delineating areas of near-surface massive sulfides on the seafloor. The survey delineated a conductivity anomaly that correlates extremely well with the 2007 drillhole data and has been used to aid the interpretation of the geology.

The exploration work described in this report has enabled a 3-D geological model of the deposit to be constructed. Geological modelling was carried in two stages: (1) sectional interpretation followed by wireframing to form triangulated surfaces of the sub-chimney lithology; and (2) a floating circle approach to identify the base of chimneys.

To resolve differences between the drillhole collars and the final bathymetric surface, the drillholes were registered to the bathymetric surface prior to sectional interpretation.

Block grade estimation employed unfolding techniques and hard boundaries between stratigraphic domains. Due to the amount of core loss and the irregular sampling intervals compositing was not undertaken. However, to account for the variable sample lengths, samples were length-weighted during block grade estimation. Drillhole data used for resource estimation was capped at variable Cu, Au, Ag and Zn grades appropriate for the stratigraphic domain. Downhole and omni-planar correlograms were used to determine three-dimensional continuity of mineralisation. Cu, Au, Ag and Zn grades for 10 x 10 x 0.5m blocks were estimated by ordinary block kriging (OK).

Validation of the resource block model included: (1) on-screen visual comparisons with the drillhole data; (2) statistical checks between declustered data and OK estimates; and (3) an alternative inverse distance weighting estimate. No obvious errors or inconsistencies were observed. Vertical discontinuities that were observed were related to the interpreted stratigraphic contacts that were used as a hard boundaries during block grade estimation.

Table 3-1 shows the results of the resource estimation for the Solwara 1 Deposit as of 30th January 2008. The results are declared using a 4% Cu cut-off as advised by Nautilus Minerals.

Table 3-1 Mineral resource estimate for Solwara 1 at 4% Cu cut off

Class	Domain	Tonnes (kt)	Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)
Indicated	Massive sulfide	870	6.8	4.8	23	0.4
Inferred	Chimney	80	11	17	170	6
	Lithified Sediment	2	4.5	5.2	36	0.6
	Massive sulfide	1,200	7.3	6.5	28	0.4
	Inferred Total	1,300	7.5	7.2	37	0.8

Note: rounding may result in errors in reproducing the totals from the individual components shown in this table

The zone of mineralization classified as Indicated Mineral Resource was tested by drillholes spaced from less than 10 m to a maximum of approximately 50 m. Within this zone, most of the blocks were estimated in the first estimation pass and the core recovery in the intercepts used to estimate the blocks was generally greater than 70%. In the area classified as Inferred Mineral Resource the drillhole spacing ranges up to 200 m, but is generally less than 100 m, and the core recovery was more variable. At the present time all chimney material has been classified as Inferred. The main criteria for this lower classification is that chimney sampling was limited to pieces of chimney that could be broken off from the mounds and that the internal grades have not been suitably tested.

Golder considers that the following risks may materially influence the resource estimate:

- A significant number of drillholes ended in massive sulfide material. In such instances, and where no adjacent drillhole information was available from which the true thickness could be reasonably interpreted, the base of the drillhole was interpreted to be the base of the massive sulfides. The massive sulfide resource is therefore open at depth in some areas;

- Although a few drillhole intercepts in the basement zone exceeded the cut-off grade, material in this zone was excluded from the resource estimate as these widely spaced drillhole intercepts were erratic and their grade correlation was unclear;

- Drillhole intercepts in the unconsolidated sediment suggested that this zone contains some material above cut-off grade. Whilst this may be likely in the form of chimney rubble or interstitial sulfide precipitation, this material has been excluded from the resource estimate;

- No drillholes were located on the exposed chimney mounds, consequently, the block grade estimates for interpreted massive sulfide material below these mounds is based on holes drilled adjacent to these mounds. It is possible that the massive sulfide material beneath the chimney mounds may have a different mineralogical composition being closer to the interpreted mineralising fluid source;

- Average core loss of around 30% could result in estimation bias if the core loss was preferentially related to low or high grade material. Closed-spaced (<5m) drilling for metallurgical samples suggests that the probability of such preferential core loss is low;

- Significant lateral extrapolation of massive sulfide mineralisation to the boundaries of the EM anomaly was supported by all holes drilled in 2007. However, a large proportion of the Inferred Resource relies on this EM anomaly in areas that have not been tested by drilling. Furthermore, it is not possible to determine the thickness of the conductor sulfide material from the EM data, thus, the interpreted thickness of massive sulfide in areas distant to drilling is of low confidence; and

- The higher-grade chimney mounds have only essentially been surface sampled by breaking off protruding chimney pieces. The interpreted depth of the chimney mounds is based on an automated algorithm that produces a truncated bathymetry that is considered geologically reasonable. However, until these mounds are tested by drilling their grade, density and depth should be considered of low confidence. If the chimney mound/massive sulfide interface is not correctly positioned then the risk to the contained metal is considered to be low to moderate as the higher-grade/lower density chimney material would most likely be substituted by lower grade/higher density massive sulfide material.

Nautilus has advised Golder that previous preliminary scoping studies reported in 2006 indicate that the deposit has reasonable prospects for economic exploitation. Nautilus envisages a seafloor mining operation using a Seafloor Mining System involving a remote Seafloor Mining Tool (SMT) to disaggregate sulfide ore from the seafloor, a riser and lifting system to pump the ore to a surface vessel. US$63 million for design and construction of this tool was announced on 20th December 2007. Front end engineering design is in progress and it is expected that the SMT will sit on the seabed and will operate a cutter head with suction device for recovery of ore material. It is envisaged that the SMT will mine in 3 - 5m lifts and have the capacity to mine approximately 6,000 tonnes per day which will involve the crushing of a range of materials in order to reduce these to D_{80} less than or equal to 25mm for extraction to surface. On this basis and subject to further mine planning and economic evaluation, the qualified person is of the opinion that the following work is warranted:

- Infill drilling with the aim of converting Inferred Resources into Indicated Resources;

- Deeper drilling in the areas in which the massive sulfide zone remains open at depth, with the aim of identifying additional, deeper resources;

- Further EM surveying to the immediate west of Solwara 1 with the aim of extending the EM anomaly, which appears open to the west, and thereby generating additional drilling targets; and

- Further investigation of methods of geochemical analysis and reassaying of sample pulps in order to improve the accuracy and precision of the Ag and Zn analyses.

ITEM 4. INTRODUCTION AND TERMS OF REFERENCE

4.1 Terms of reference

Golder Associates Pty Ltd (Golder) was commissioned by Nautilus Minerals Inc (Nautilus) to assist with capture of geological and geotechnical data during a field program carried out aboard the ship, *Wave Mercury*, during 2007 with services including:

- Assist in establishing a set of procedures and data capture systems for geological and geotechnical logging;
- Establish a shipboard geotechnical laboratory, with facilities for unconfined compressive strength, point load, vane shear, and bulk density testing;
- Train Nautilus field geologists in the use of the geological and geotechnical logging systems and the geotechnical tests;
- Review and audit the logging and geotechnical test results; and
- Utilize the drillhole data, results of the electromagnetic (EM) survey, bathymetry and surface sampling data to construct a 3-D geological model of the Solwara 1 deposit.

Subsequently the terms of reference were extended to include provision of an independent Mineral Resource estimate compliant with Canadian National Instrument (NI) 43-101 in the format of NI43-101F1 for the Solwara 1 deposit.

4.2 Purpose of the Technical Report

This report is intended to be used by Nautilus subject to the terms and conditions of its contract with Golder. This contract permits Nautilus to file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to NI43-101, Standards of Disclosure for Mineral Projects. Any other use of this report by any third party is at that party's sole risk.

4.3 Sources of information and data

This Technical Report is based on information supplied to Golder by Nautilus, including a report titled 'Independent Technical Assessment of Sea Floor Massive Sulfide Exploration Tenements in Papua New Guinea, Fiji and Tonga', prepared for Nautilus by SRK Consulting, and other documents listed in Item 23.

4.4 Field involvement

Ian Lipton, a full-time employee of Golder, visited the Solwara 1 site from 10 – 24 June 2007, 22 – 29 July 2007 and 5 – 12 September 2007. During these visits he:

- Made independent observations of the geology, as presented by live video camera viewing of the seafloor and chimney fields and examination of the drill core;
- Trained Nautilus personnel in geological logging and sampling;
- Audited the geological logs, comparing the logs with the drill core;
- Trained Nautilus personnel in geotechnical testwork (including density) using core samples;
- Carried out measurements of bulk density of chimney samples;
- Obtained information from the third party responsible for survey control; and
- Observed the packing of samples for shipment to the geochemical laboratory in Australia.

4.5 Personnel

This Technical Report is based on information supplied to Golder by Nautilus. The work completed by Golder that is the subject of this NI43-101-compliant Technical Report was carried out primarily by the following persons:

Ian Lipton, FAusIMM, a full-time employee of Golder, is the Qualified Person responsible for the site visits, analysis of quality control data, geological interpretation and for the compilation this NI43-101-compliant Technical Report.

Andrew Richmond, MAusIMM, is a geostatistician and full-time employee of Golder, and carried out the statistical and geostatistical analysis of the data and completed the resource estimate as described in Item 19.

ITEM 5. RELIANCE ON OTHER EXPERTS

The author has relied upon other technical experts for opinions or statements for the following:

- Statements on the proposed development of the property, as presented in Section 3 were provided by Nautilus;

- Statements on the property tenure, location and ownership, exploration permits, and history as presented in Sections 6, 7, 8, 17 and elsewhere in this report, were provided by Nautilus and include information documented in Jankowski (2006);

- Statements on regional geology, deposit types, mineral processing and metallurgical testing, as presented in Sections 9, 10 and 18, were provided by Nautilus and include information documented in Jankowski (2006).

ITEM 6. PROPERTY DESCRIPTION AND LOCATION

6.1 Location of tenement

EL1196 is located in the Bismarck Sea between the islands of New Britain and New Ireland, in New Ireland Province, within the territorial waters of Papua New Guinea (Figure 3-1 and Figure 6.1). The tenement comprises 54 sub-blocks within two non-contiguous areas which together encompass an area of 185km^2. Informally, the areas are known as the Western and Eastern segments respectively. The Western segment contains 34 sub-blocks, with an extent of 116km^2, commencing at 3°37′ South, and 151°43′ East. The Eastern segment contains 20 sub-blocks, covering 69km^2, commencing at 3°45′ South, and 152°04′ East.

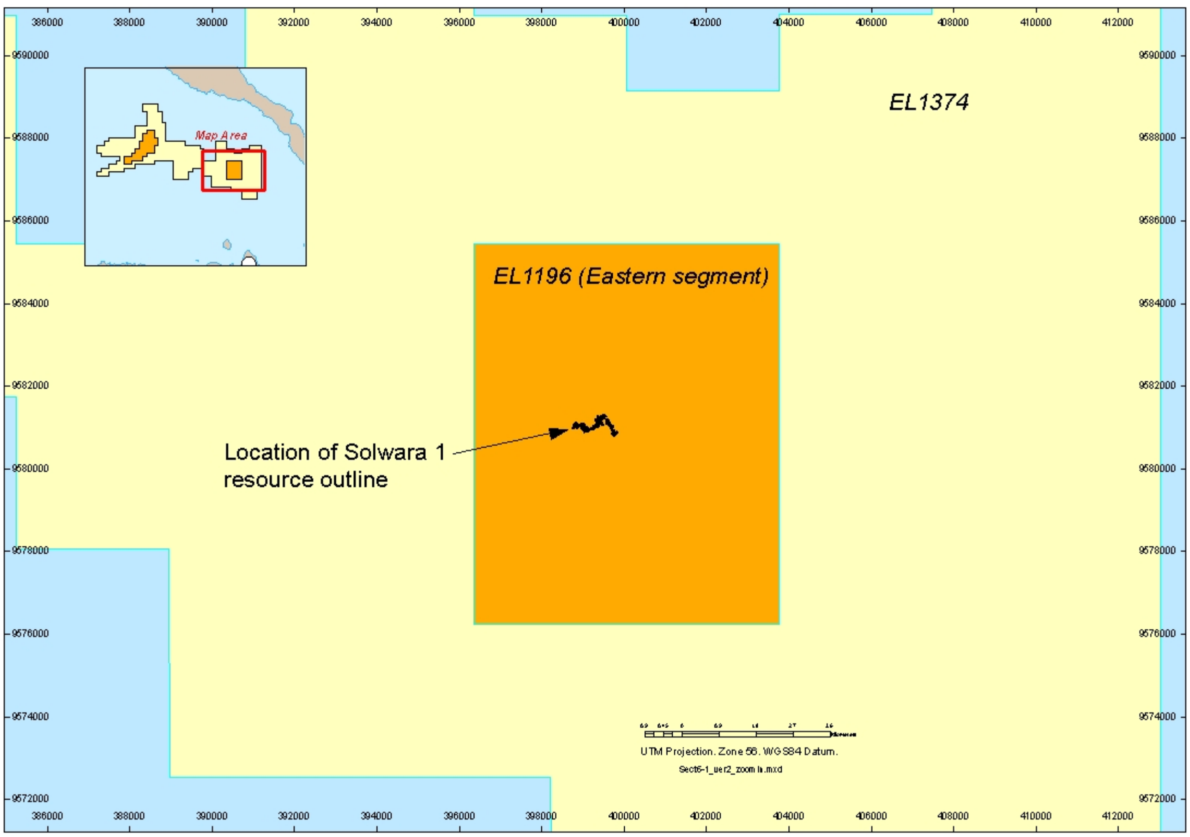


Figure 6-1 Location map of Eastern segment of EL1196

6.2 Tenement description

The Exploration Licence (EL) known as EL1196 was first granted on 27 November 1997 for a term of two years. EL1196 has undergone a number of statutory reductions during the life of the tenement, effectively reducing from the original size of 750 sub-blocks at 2546km^2, to below the minimum size for any further such reductions in accordance with the Mining Act 1992. The current area consists of two separate areas, the Western and Eastern segments (refer to Item 6-1).

EL 1196 is 100% owned by Nautilus Minerals Niugini, a 100% subsidiary of Nautilus Minerals Inc, and was first granted on the 28th November 1997. The tenement has been renewed on every consecutive anniversary date and is current to November 2009. The Solwara 1 deposit is located within the Eastern segment, and is the subject of this report. In addition to the Solwara 1 deposit, EL1196 contains four other known sulfide occurrences, Solwara's 4, 5, 6, 7, and 8 (Figure 6.1).

Subject to any agreement made under Section 17, of the Papua New Guinea Mining Act 1992, the Independent State of Papua New Guinea reserves the right to elect at any time, prior to the commencement of mining, to make a single purchase up to 30% equity interest in any mineral discovery arising from the license, at a price pro-rated to the accumulated exploration expenditure and then contribute to further exploration and development in relation to the lease on a pro-rata basis unless otherwise agreed.

6.3 Environmental studies

At the time of writing an Environmental and Social Impact Assessment (ESIA) is in progress based on data acquired in 2006 and 2007. The Solwara 1 environmental liabilities will be determined as part of the Environmental Impact Assessment (EIA) process, although to date there are no known environmental liabilities. When complete an Environmental and Social Impact Statement (ESIS) will be issued and submitted to the Department of Environment and Conservation. The ESIS will be available for public comment and public hearings. On approval the Department will issue an Environmental permit which is required before any mining work can commence. Throughout the process Nautilus has and will continue to engage in discussions with local and relevant community groups on the islands of New Britain, and New Ireland, and with the Department of Environment and Conservation in Port Moresby. Nautilus hold permits for collection of samples at Solwara 1 and dispatch of necessary material for testwork out of the country.

6.4 Royalties and other payments

The royalty payable to the State of PNG under the Papua New Guinea Mining (Royalties) Act 1992 is 2% of the net smelter return on all minerals produced. A further 0.25% royalty is payable to the MRA (Mineral Resource Authority).

6.5 Obligations

Nautilus is obliged to comply with all regulations associated with Papua New Guinea exploration permits.

ITEM 7. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

7.1 Accessibility and infrastructure

The Solwara 1 project area lies within tenement EL1196 located 35 nautical miles north of Rabaul in East New Britain (Figure 6.1). Rabaul is the main port of East New Britain Province, and has a population of 8,885 (2000 census). It is served by a small airport (located at Kokopo) with daily jet aircraft flights to Port Moresby, a natural harbour capable of docking large vessels, and a local network of roads, most of which are sealed. The harbour can accommodate vessels with a maximum draft of 10.2m and has in the past had the Queen Mary 2 dock at a gross tonnage of 150,000 tonnes. The port sits in a large caldera which was formed about 1400 years ago. The local Tavurvur volcano is periodically active with the most significant recent eruption being in 1994. The streets are cleaned of ash regularly and on rare occasions the airport has been closed.

Rabaul and East New Britain are relatively well served for roads, power and water. Nautilus is currently assessing a range of available options for plant and port requirements, and other associated functions (waste storage, labour, etc).

As the tenement does not include any habitable land and is not near coastal waters, there is no requirement to negotiate access rights from local landowners. Provincial administrations are supportive of Nautilus' activities.

7.2 Climate

The climate of PNG coastal waters is tropical, with high temperatures throughout the year. Temperatures are fairly consistent between 25 to 32°C. Rainfall is high in this area with up to about 160 inches per year. The Nautilus tenements in the Bismarck Sea can be operated all year round as the area is 4º south of the equator in a sheltered sea well outside the cyclone belt.

7.3 Physiography

EL1196 covers an area of moderately deep ocean, up to 2000m deep, within which there are a number of seafloor mounds rising up to 500m above the surrounding seafloor. The mounds are volcanic centres that are believed to be intermittently active, as indicated by thermal plumes and fresh volcanic rocks. The Solwara 1 deposit occurs on a small ridge on the flank of one of these volcanic centres. The top of the deposit is characterized by the presence of sulfide-rich 'chimneys' which can reach up to 15m in height. Some of the chimneys are still active and are venting hydrothermal fluids, but for the most part the chimney fields are inactive. A veneer of unconsolidated sediments covers much of the mound. Figure 7-1 shows bathymetric contours indicating the chimney mounds.

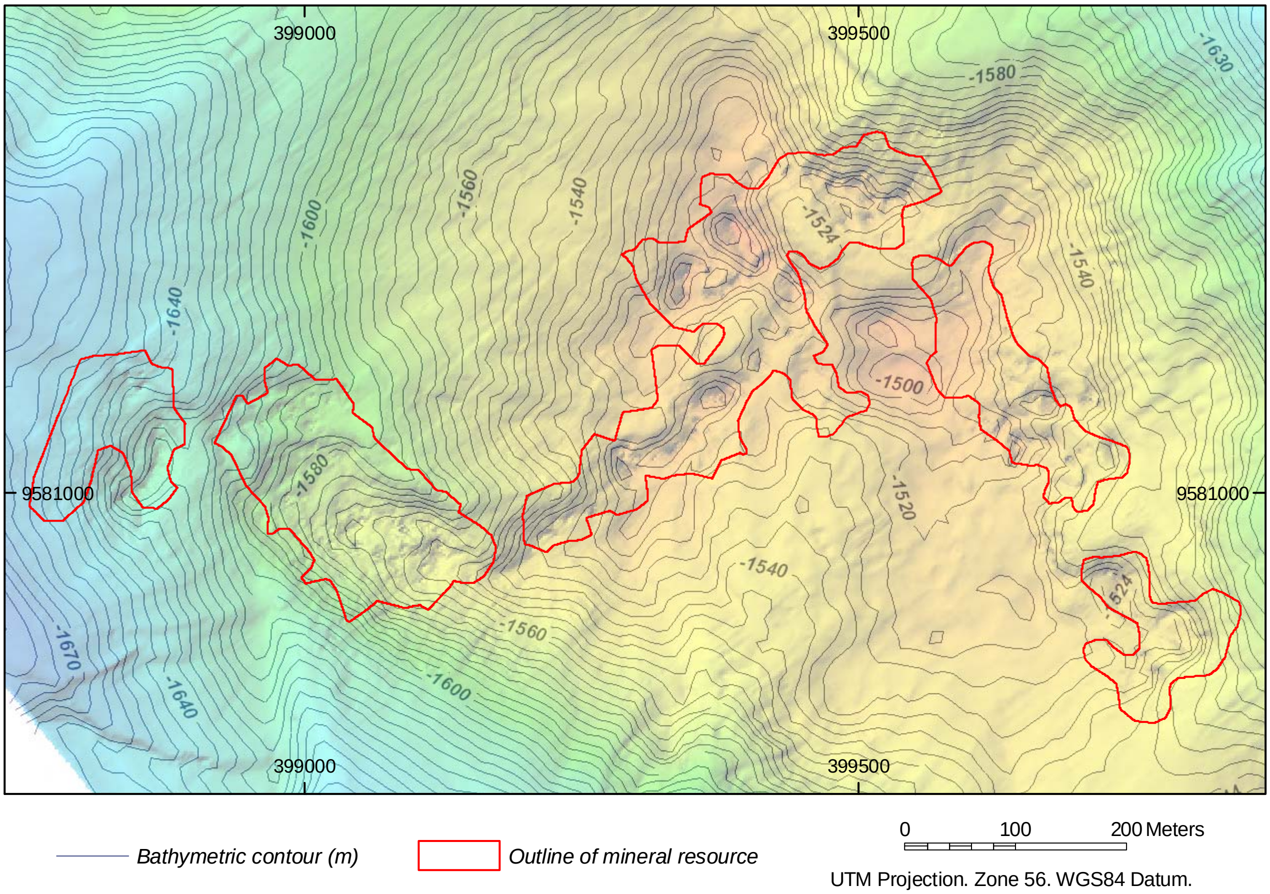


Figure 7-1 Plan showing bathymetric contours and outline of mineral resources

ITEM 8. HISTORY

8.1 Exploration and discovery

The first discovery of submarine hydrothermal sulfide deposits and black smokers in the southern Pacific Ocean was during 1985 when the US research vessel *RV Moana Wave* photographed seafloor sulfides at the Solwara 2 site in the Bismarck Sea (Figure 8.1). Since then, occurrences of submarine sulfides in the Bismarck and Solomon Seas, where Nautilus' PNG tenements are located, have been studied by research groups from many countries, including France, Germany, Canada, USA, Japan, Korea, UK and Australia. A brief summary of the research history is provided below, mostly from Jankowski (2006).

Research cruises have supplied detailed bathymetry of the Solwara 1, 2, 3 and 4 areas, and these areas have also been observed by manned submersible dives and numerous deep-tow video traverses. Dredging traverses were extensively employed during the various "PACMANUS" and "Binatang" research cruises, and it is estimated that, since 1991, Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO) has acquired several tonnes of sulfide samples from the Solwara 4 and Solwara 1 hydrothermal fields. Basic descriptions of dredge contents are recorded in the various cruise reports, which were compiled on board, prior to chemical analyses. Submersible and deep-tow video observations supplemented by the dredge reports have enabled researchers to compile and publish basic geological reconnaissance reports and maps of some of the hydrothermal fields. Analytical data were generally reported several years after the research cruises. The largest research database is contained in CSIRO Report 528R (Jankowski 2006), which presents data from about 100 of the almost 500 samples collected between 1991 and 1997 at the Solwara 4 and Solwara 1 hydrothermal fields.

The hydrothermal field of the Solwara 1 project area was first discovered by the CSIRO during the 1996 "PACMANUS III" cruise on the *RV Franklin* in the far eastern sector of the Eastern Manus Basin. The detection of an intense particulate plume during the "PACMANUS II" cruise in 1993 led the researchers to an isolated volcanic edifice, which is located on a deep (approx 1,700m below sea level (BSL)) platform of Pliocene sediments. The volcanic edifice extends NNW for 5km across two domes (North Su and South Su), and an adjacent ridge with a low knoll (Suzette, now known as Solwara 1).

The Solwara 1 Project was the target for exploration works in 2005 and 2006 by Placer Dome Inc (subsequently bought out by Barrick Gold Corporation (Barrick)) where ROV dive videos and bathymetric surveys revealed sulfide mounds and chimney fields surrounded by flatter areas with chimney debris, sulfide crusts, algal mats, and unconsolidated sediments. In 2005 Placer Dome collected dredge samples that averaged 15.5 g/t Au, 12.2% Cu, 256 g/t Ag and 4.2% Zn. In 2006, Placer Dome collected 49 sulfide samples averaging 15.5 g/t Au, 9.6% Cu, 139 g/t Ag, and 5.1% Zn, and drilled 34 diamond drillholes. This campaign returned significant sulfide intercepts up to 18m below the seabed, with a best intercept of 11.6m at 9.1 g/t Au, 13.1% Cu, and 13.6 g/t Ag. The drilling methodology employed in 2006 presented significant challenges for the ship-based drilling system and resulted in poor sample recovery (average of 47%). However, the 2006 Placer Dome campaign provided data that showed the deposit to be quite consistent. Chimney areas were shown to be underlain by massive to semi-massive sulfides (chalcopyrite rich); these pass into altered volcanics which are clayey in nature and generally difficult to drill. Between the chimney mounds, the drilling showed that the orebody is overlain by consolidated to unconsolidated sandy volcaniclastic sediments sometimes rich in sulfides. Outside the influence of the chimney mounds, fresh volcanics dominate. This information, together with the data collected by Nautilus in 2007, provided the framework of the geological interpretation. After sampling, the 2006 core was moved to Brisbane for storage in the Nautilus core shed.

Nautilus took over exploration work from Placer Dome in mid 2006 after Barrick bought out Placer Dome and then committed to an equity position in Nautilus.

In 2007 Nautilus conducted a six month field campaign over Solwara 1 during which further chimney sampling and a comprehensive diamond drilling program was completed using submersible drill rigs mounted on ROVs. This data was supplemented by a high resolution 20cm x 20cm bathymetric survey, and the world's first underwater EM campaign. Detailed environmental monitoring and sampling was also carried out to provide input into environmental assessment studies.

The 2007 campaign provided much more detail on the Solwara 1 seafloor massive sulfide deposit and confirmed the presence of high grade Cu and Au. A diamond drilling campaign of 1084m from 111 holes was completed, from which 1432 samples were sent for assay (including quality control samples). A total of 362 geotechnical tests were conducted on drill core samples on the ship together with over 680 density measurements. A further 90 geotechnical tests were also conducted within onshore laboratories. In addition, 127 chimney samples were collected. The results of the program allowed a detailed picture of the deposit geology to be developed and showed that the geology is consistent across the deposit (refer Item 10). Core recovery was difficult in some of the lithologies (in particular the overlying sediment and underlying altered volcanics) and this contributed to an overall recovery for the whole program of 59%. However, core recovery was generally much better in the massive sulfides, with an average recovery of 73%, significantly higher than the 2006 campaign. The half core from the 2007 campaign was stored in a refrigerated container at 2°C for future reference.

More information on the history and discovery of the fields in the Bismarck Sea can be found in Jankowski (2006).

8.2 Historical resource estimates

This is the first resource estimate for the Solwara 1 project.

8.3 Historical production

No mineral production has occurred at Solwara 1.

ITEM 9. GEOLOGICAL SETTING

This Item is taken largely from Jankowski (2006).

9.1 Geological background

Seafloor massive sulfide (SMS) accumulations are interpreted to be the modern day equivalent of ancient Volcanic Hosted Massive Sulfide (VHMS) deposits, such as Kuroko and Kidd Creek. Deep hydrothermal convection cells formed close to plate boundaries give rise to the formation of metal rich fluids deep within the earth's crust which rise upwards through volcanic and sedimentary units to the seafloor. Reduction in temperature and pressure as the hydrothermal fluids reach the seafloor and mix with cold seawater causes the metals contained in the fluids to precipitate as sulfides at the seafloor or within the substrate. The accumulation of sulfides around active hydrothermal vents results in the gradual development of sulfide-rich chimneys on the seafloor.

9.2 Geological setting

Solwara 1 is located within the Manus Basin, a back-arc basin bounded to the south by the active subduction zone of the New Britain Trench and to the north by the inactive subduction zone of the Manus Trench, formed at the convergence zone between the Australian Plate to the south and the Pacific Plate to the north (Figure 9-1). The Basin's major structures include the rapidly opening (~10cm/yr) Manus Spreading Center, and the rift zone of the Eastern Manus Basin bounded by two major W to NW transform faults (the Djaul and Weitin Faults – Figure 9.2), characterized by basaltic to dacitic volcanism. These faults further divide the Manus Basin into three sub-basins, referred to as the Eastern, Central and Western Manus Basins. The East Manus rift zone is in the Eastern Manus Basin, and hosts both the Solwara 1 and Solwara 4 Projects within EL1196.

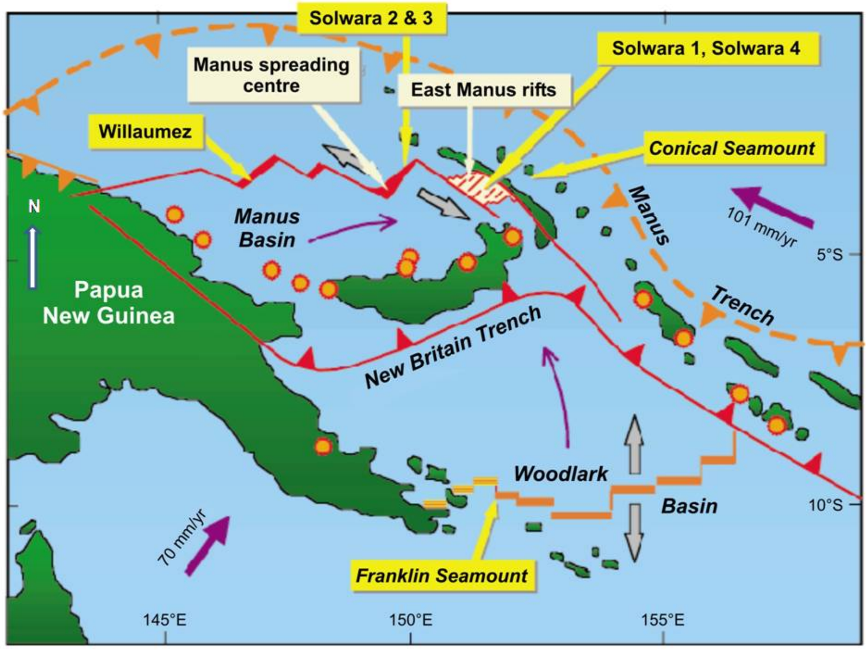


Figure 9-1 Summary map of the geological features and hydrothermal fields in eastern PNG

In EL1196 a series of prominent submarine volcanic edifices have been formed on the seafloor, extending en echelon across the trend of the rift. These edifices are the sites of active hydrothermal venting and associated deposition of SMS deposits.

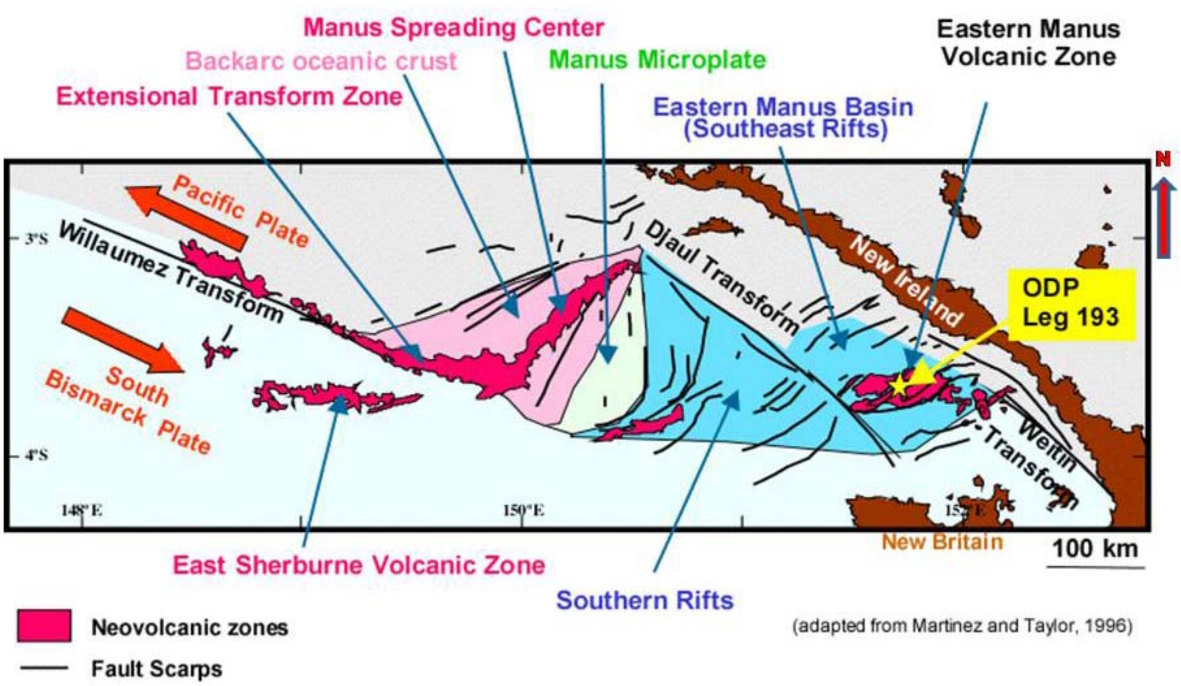


Figure 9-2 Summary map of tectonic features in Central and Eastern Manus Basin (note: OPD is Ocean Drilling Program)

The hydrothermal field containing Solwara 1 extends NNW for 5km across two domes (originally known as North Su and South Su) erupted above andesite lavas, and into a ridge with a low knoll (Solwara 1). The summits of North Su and South Su are 1,150 and 1,320m BSL respectively. The Solwara 1 deposit occurs at approximately 1,520m BSL. The volcanic rocks at the crests of the high knolls are extensively brecciated and altered, and carry widespread disseminations and stockworks of pyrite and covellite, as well as localised chimneys, mounds and sulfide breccias. Solwara 1 has exposures of both fresh and altered volcanics (Figure 9.3) with altered volcanics in the immediate vicinity of the deposit grading into fresh volcanics away from the deposit and the influence of the hydrothermal field, and several fields of chalcopyrite-rich massive sulfide chimneys. The latter are associated with massive to semi-massive sulfides in the substrate. Petrographic analysis has shown the volcanic rocks at Solwara 1 to be made up of andesites and dacites.

Chimney heights generally range from approximately 2m to 10m, but some chimneys have been observed up to 15m in height. A new bathymetry dataset was acquired in 2007 on a 20cm x 20cm grid. This dataset clearly defines individual chimneys and chimney mounds (Figure 9-4). An underwater EM survey, also carried out in 2007, shows the extent of sulfides around the chimneys (Figure 9-4 and Figure 9-5). The EM dataset also highlights areas to target for the further drilling to be conducted in 2008.

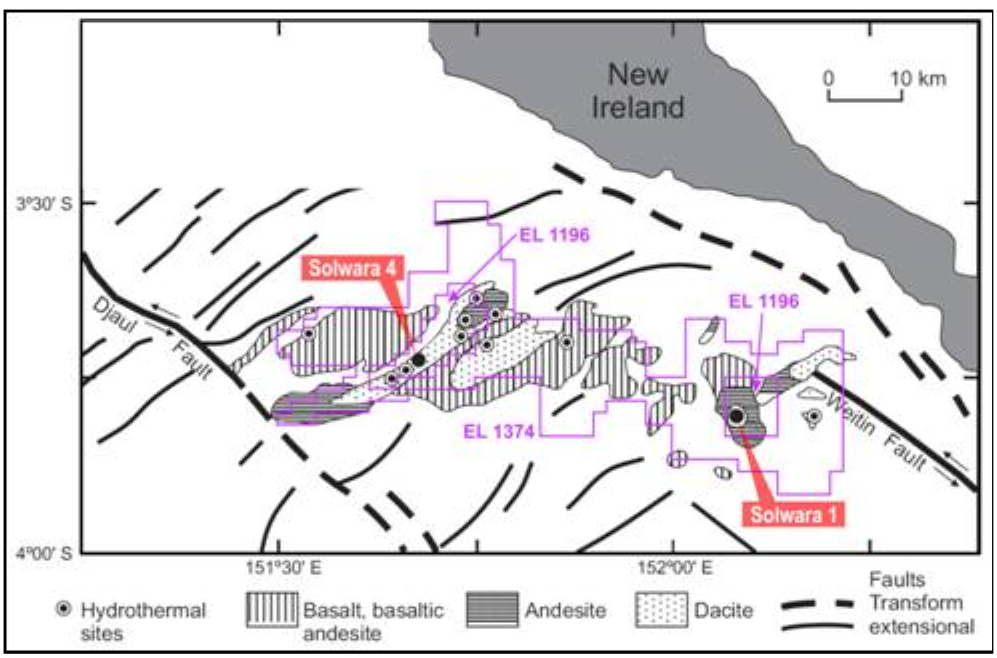


Figure 9-3 Seabed geology of the East Manus Basin (Figure from Jankowski (2006), adapted from Binns (2004))

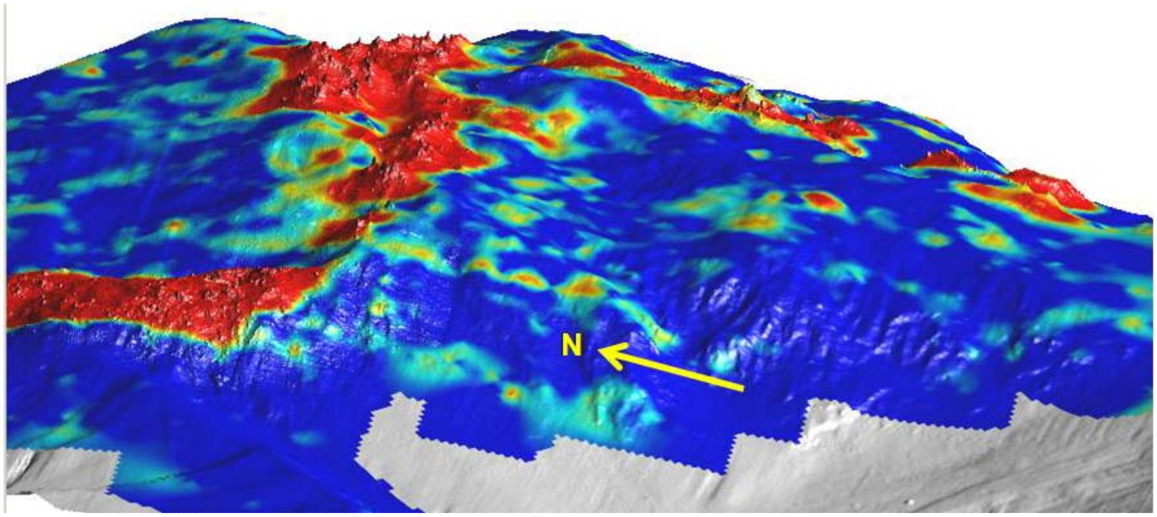


Figure 9-4 Perspective view of Solwara 1 from the 2007 bathymetry model, showing chimneys. The model is coloured by EM conductivity grading from high (red) down to low (blue)

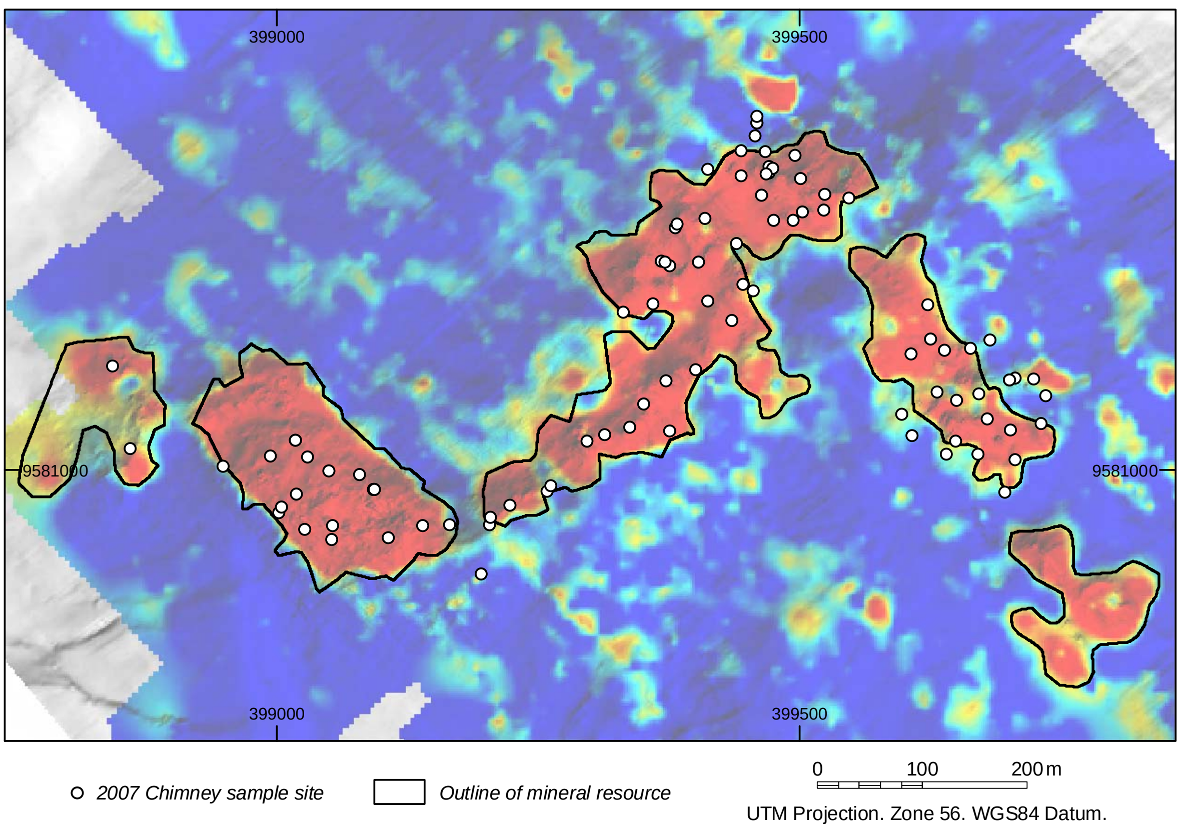


Figure 9-5 Plan of 2007 chimney sample locations and EM anomaly. The anomaly is coloured by conductivity grading from high (red) down to low (blue)

ITEM 10. DEPOSIT TYPES

10.1 VHMS deposits

Volcanic Hosted Massive Sulfides (VHMS) deposits form a major part of the world's reserves of copper, lead and zinc, as well as being producers of gold and silver. Over 700 VHMS deposits have been identified on land around the world. These deposits occur in rocks that range in age from the Archaean through to the Cainozoic, with notable examples being the deposits of the Iberian Pyrite Belt, Kidd Creek, Noranda in Canada, and Kuroko in Japan. Large et al. (2005) summarized the features common to ancient VHMS deposits, as follows:

- They are hosted in volcanic or volcano-sedimentary successions originally deposited under water;
- They are the same age as the host succession;
- The host rocks include volcanic or volcano-sedimentary facies and range in composition from basalt through andesite and dacite to rhyolite;
- Most deposits are hosted in thin volcaniclastic units (less than 100m thick) between major volcanic formations;
- The economic parts of the deposits typically comprise massive sulfide minerals, greater than 80% by volume. The principal sulfides are pyrite, sphalerite, chalcopyrite and galena;
- Massive sulfide lenses are commonly, but not always, aligned parallel to volcanic strata;
- Stringer (or stockwork) sulfide zones commonly underlie the massive sulfides and may contain economic Cu grades;
- Metal contents and metal ratios vary considerably. Deposits may be Cu-rich, Au-rich, Cu-Zn rich or polymetallic (Cu-Zn-Pb-Ag-Au) types; and
- Metals within sulfide deposits are typically vertically zoned, from Cu at the stratigraphic base to Zn, Pb, Ag, Au and Ba towards the top. However, there are many exceptions to this zonation pattern.

VHMS deposits within an individual geological domain tend to be spatially clustered with multiple deposits forming within a single stratigraphic interval. The localization of VHMS deposits at the prospect scale is strongly linked to the distribution of syn-volcanic extension faults. These extension faults were active during the formation of the deposits and created the permeability required to allow transport of the upward-migrating metal-laden fluids to reach either the seafloor or permeate through the immediate sub-seafloor.

The widely accepted genetic model for the formation of a VHMS deposit is based on the formation of deep-seated hydrothermal convection cells focussed around active submarine spreading ridges. Circulating seawater undergoes heating at depth and consequently leaches metals from the deep volcanic stratigraphy through which it passes. The circulating fluid may also mix with and entrain magmatic fluids sourced from crystallizing sub-volcanic intrusions. Finally the hot, metal-laden reduced hydrothermal fluid is expelled onto or immediately below the seafloor surface, where it cools via mixing with oxidized seawater and precipitates sulfides, sulfates and Fe-oxide minerals.

10.2 SMS deposits

Seafloor Massive Sulfide (SMS) deposits are recent deposits interpreted to be analogues of the ancient terrestrial VHMS deposits. SMS deposits are formed in extensional fault systems which facilitate the deep circulation of seawater via convection cells formed in response to increased heat flow associated with submarine volcanic activity. SMS deposits are recognised in the following tectonic settings:

- Divergent plate margins such as mid-ocean ridge spreading centres or spreading back arc basins (Solwara 1);
- Convergent plate margins such as island arcs or continental margins; or
- Intra-plate oceanic islands.

SMS deposits can be subdivided into three end member deposit styles, based on morphology (Large, 1992):

- Lens and blanket deposits which have a low aspect ratio with a dominant zinc-rich massive sulfide lens and subordinate stringer zone;
- Mound deposits which have a high aspect ratio, narrow and elongate massive sulfide with a well developed stringer zone; and
- Pipe and stringer deposits which have cross-cutting massive pyrite-chalcopyrite pipes or stringer zones with little or no stratiform Zn rich sulfide lenses.

Research into the formation of active "black smoker" SMS deposits has suggested the mechanism for sulfide accumulation. Rising metal and sulfide rich (Fe, Cu, Zn) high temperature acidic fluids mix with the surrounding low temperature alkaline seawater causing the sulfides to precipitate and form particle-rich "black smoker" plumes (Figure 10.1). The first stage of chimney growth is precipitation of a friable and porous anhydrite ($CaSO_4$) sheath or tube around the fluid path. Anhydrite precipitates from the seawater when it is heated to above 150°C (Dover, 2000). The tubes can grow as much as 30cm in one day. These anhydrite walls insulate hydrothermal fluids from the seawater resulting in high temperature deposition of an inner chalcopyrite zone. Horizontal flow of fluid continues across chimneys until pore spaces are filled with Cu Fe sulfides. As the outer layer of the walls cool to below 150°C the anhydrite starts to dissolve back into the seawater. Secondary silica (SiO_2), barite ($CaSO_4$), and calcite ($CaCO_3$) are known in high chimneys which tend to be quite fragile.

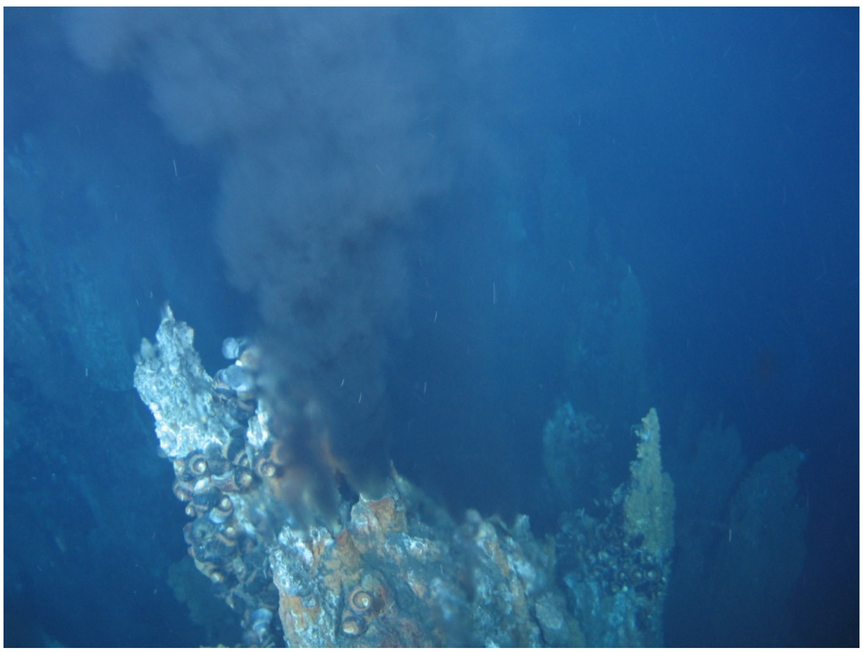
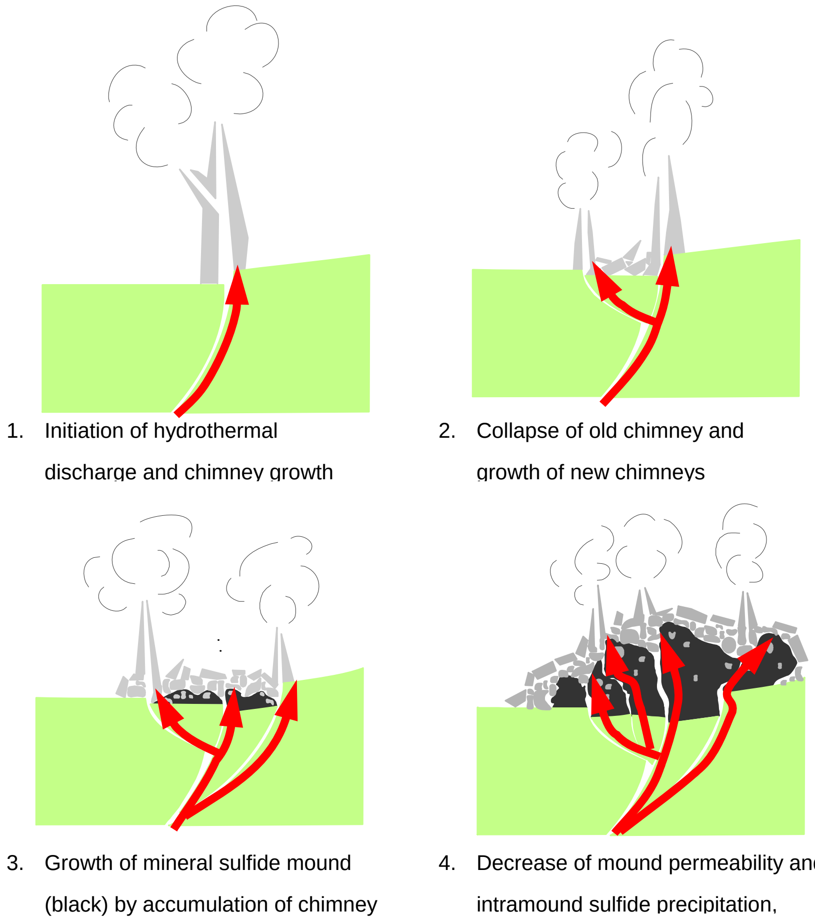


Figure 10-1 Black smoker from the Bismarck Sea

When hot fluids ultimately cease to flow through a black smoker chimney, the reaction of cold oxygenated seawater with exposed sulfides, facilitated by iron-oxidising bacteria converts the sulfides to oxyhydroxides, and the chimney matrix becomes soft and unstable. The development of chimney mounds is the result of the combined processes of 1) episodic flux of the hydrothermal vent fluid; 2) seafloor oxidation; and 3) collapse of the old chimney structures. This cyclical process has been interpreted to contribute to the formation of a metal-rich mound or layer on the seafloor. Through prolonged hydrothermal activity and decrease in permeability at the seafloor, precipitation, replacement and remobilization of sulfides is interpreted to occur within the substrate (Figure 10.2).



Red arrows illustrate the flow of hydrothermal fluids.

Figure 10-2 Schematic diagram showing hypothesis for the development of SMS mounds (Jankowski (2006))

10.3 Exploration techniques

Initial exploration revolved around research vessel cruises (refer Item 8) which located a number of chimney fields within the Bismarck Sea. Techniques employed during this early phase involved photographing the chimneys from submersibles, acquiring early bathymetry data, and using crude dredging techniques to sample the ocean floor. Twenty or so years on, the techniques have evolved to present a credible and robust exploration suite. First stages of exploration involve a detailed literature review followed by reconnaissance surveys over likely targets. Exploration tools for the reconnaissance surveys include:

- Shipborne Multi-Beam Echo Sounder (first arrivals data (bathymetry) and reflectivity data (seabed classifier));

- Shipborne Deep Tow Sidescan Sonar (reflectivity data); and

- Shipborne magnetic data.

On defining a deposit, the extent and type of deposit can be assessed by using ROV mounted equipment. These are unmanned submersibles attached to the ship by an umbilical. They are controlled remotely from an operating room aboard the ship and can search the seafloor by using powerful flood lights and high definition video cameras. They can be equipped with geophysical instruments such as:

- Multi-Beam Echo Sounder for hi resolution bathymetry;
- Electromagnetic and magnetic surveys; and
- Sub-bottom profiler seismic instruments.

In addition, ROV's can be equipped with two robotic 'arms' capable of lifting samples from the sea bed.

Details pertaining to the exploration of Solwara 1 can be found in Item 12. Further information on exploration techniques to be employed for SMS deposits can be found in Binns (2004).

ITEM 11. MINERALIZATION

11.1 The Solwara 1 deposit

Figure 11.1 below shows a cross-sectional interpretation through part of the Solwara 1 deposit with the EM (conductivity) profile presented across the top. Many of the drillholes ended in mineralization indicating potential to increase the resource at depth. The edge of the mineralization has been interpreted from the EM anomaly. The Solwara 1 deposit has been surveyed using a proprietary EM technique which effectively maps the extent and continuity of the massive sulfide mineralisation.

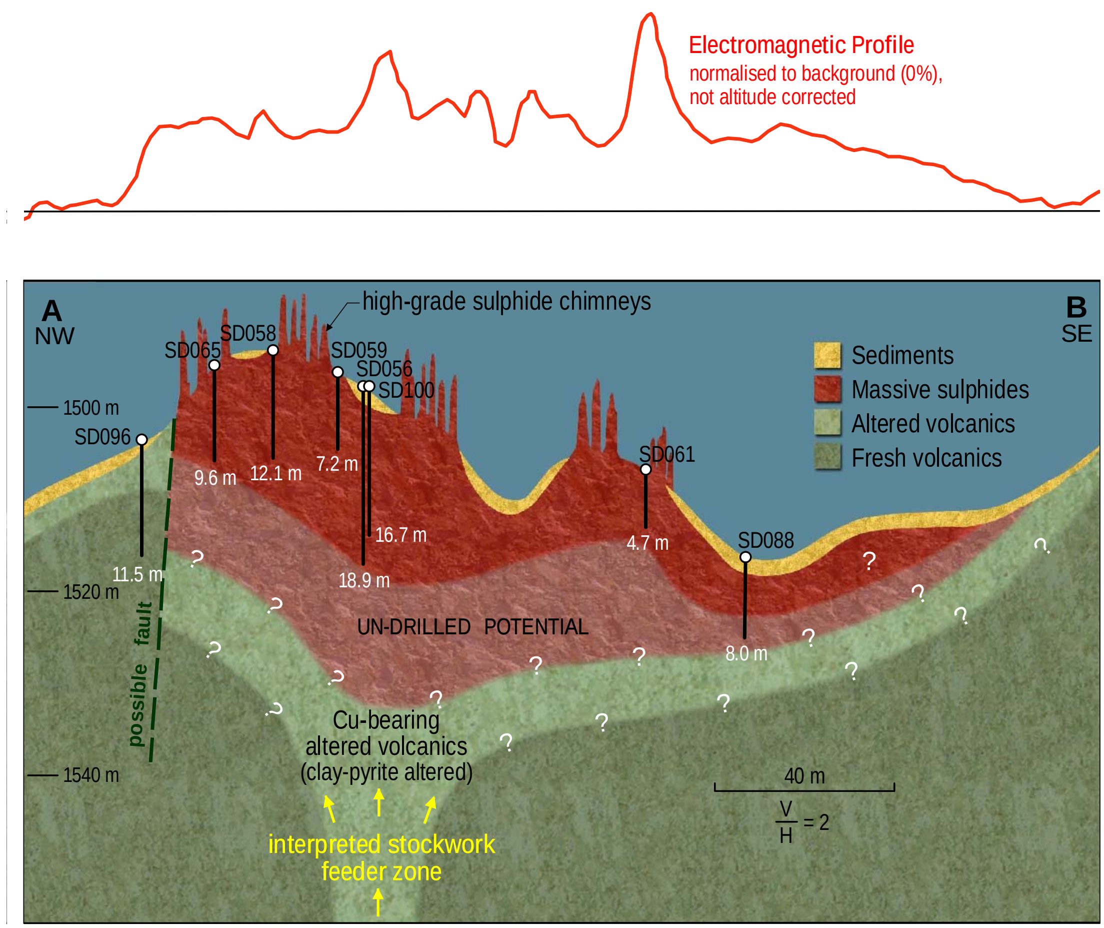


Figure 11-1 Schematic cross section interpretation through the central zone of Solwara 1

The Solwara 1 deposit is composed of several massive sulfide bodies over which fields of sulfide-rich chimneys are developed to a greater or lesser extent. Drill core and the EM anomaly indicate that the massive sulfide bodies are more laterally extensive than the main chimney fields. The massive sulfide zones and the main chimney fields occur in linear zones that appear to be related to the regional structural features.

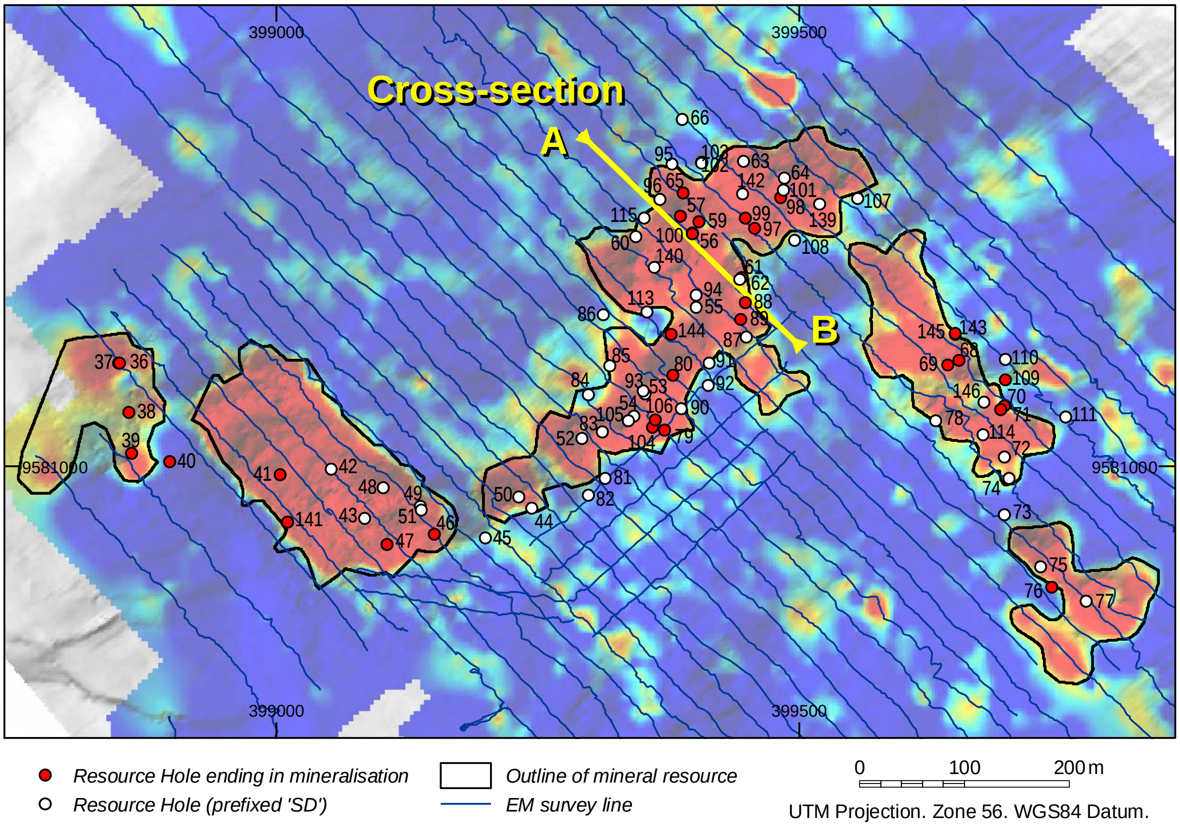
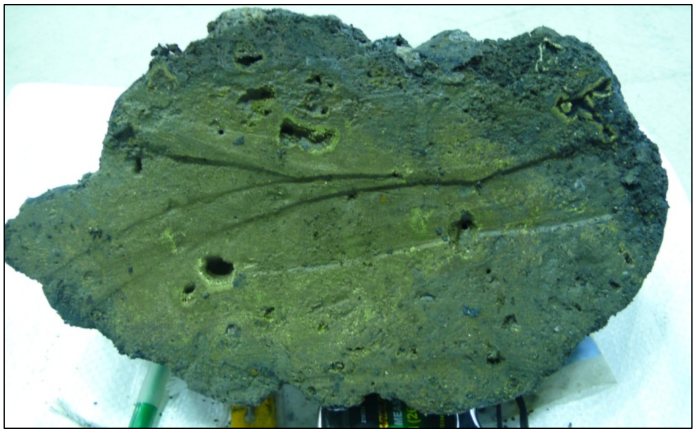
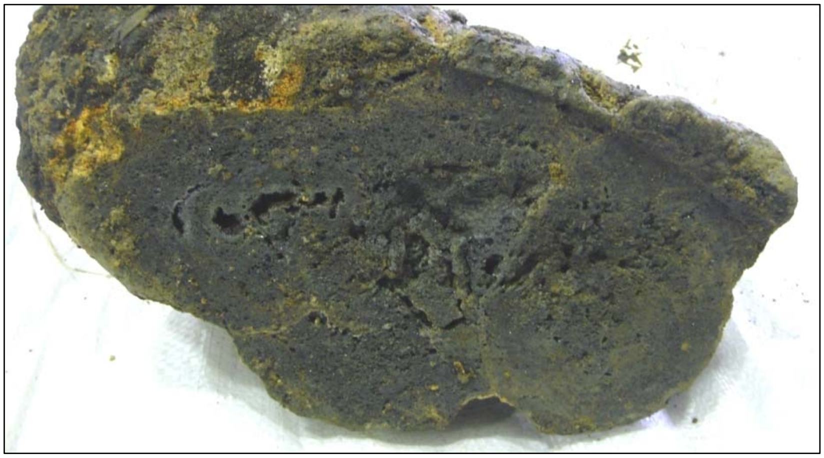


Figure 11-2 Plan showing EM anomaly and interpreted limit of mineralization. The anomaly is coloured by conductivity grading from high (red) down to low (blue)

The chimneys for the most part are composed of massive chalcopyrite and pyrite (Figure 11.3). Some chimneys are also rich in sphalerite but these are less abundant. Anhydrite and to a lesser extent barite, are also common. Older chimneys tend to have iron oxide crusts and can be friable. Where the chimney development is strongest, the chimneys appear to coalesce into distinct mounds. Fallen chimneys and chimney debris are commonly observed around the mounds. Scattered chimneys occur between the main fields.



A



B

A: Chalcopyrite dominant chimney (25% Cu, 0.27% Zn). B: Sphalerite dominant chimney (0.59% Cu, 33.8% Zn)

Figure 11-3 Photographs of slices through two chimneys

The sub-surface geological sequence at Solwara 1, from the top down, may be generalized as:

- Unconsolidated sediments. These typically comprise of dark grey clays and silts ranging in thickness from 0 to 2.7m, with an average of about 1.4m in the core holes drilled in 2007;

- Lithified sedimentary rocks. These typically comprise a distinctive layer of pale to dark grey, fine to medium grained volcaniclastic sandstone varying from 0 - 5.4m thick and averaging 0.5m thick in the holes drilled in 2007. Sometimes bedded or banded. It appears to contain quartz grains and lithic or tuffaceous fragments. Rounded worm burrows up to 1cm in diameter are common, sometimes showing replacement by chalcopyrite. Rare fragments of sulfide-rich chimneys were observed entrained within this unit. It is generally moderately to strongly lithified but may grade into softer sediments. It is locally well mineralized with chalcopyrite and sphalerite, particularly towards the base;

- Massive and semi-massive sulfide rocks. This is the main ore horizon and it varies in thickness from 0 – 18m in the holes drilled to date. Many holes terminated in massive sulfides and from these holes it may be inferred that the massive sulfide zone is greater than 18m thick in some locations. The massive sulfide zone consists mainly of pyrite and chalcopyrite. Chalcopyrite commonly dominates closer to the surface, but tends to diminish with depth where pyrite dominates. Pyrite is also seen to be the dominant sulfide towards the south east of the deposit. The sulfide orebody can be massive, vuggy, or porous, and is commonly a mixture of each. Anhydrite and barite occur in variable amounts disseminated through the sulfides or in veins, particularly towards the base of the zone. Locally, the zone may include patches of clay-rich altered volcanic material. Drillhole SD100 provides a good example of this zone (Figure 11-4); and

- Altered volcanic rocks. The footwall to the mineralization consists of altered volcanic rocks in which most of the primary minerals have been altered to clays or replaced or veined with anhydrite and disseminated pyrite. These rocks are commonly weak and core recovery is generally low in this zone. The contact between the base of the massive sulfide zone and the underlying altered volcanic rocks appears to be quite sharp.

There are interpreted to be local variations in this sequence but in general the geological sequence is remarkably consistent across the deposit. Drilling indicates that the massive sulfide zone is more laterally extensive than the main chimney mounds. The deposit is bounded laterally by relatively fresh lava, possibly with some faulted contacts.

There is localized hydrothermal activity at Solwara 1 where water generally up to 120ºC is discharged. The location of venting chimneys has been identified from video footage and this venting has been shown to be episodic. Investigations on fluid flow rates from chimneys and additional thermal data collection is ongoing.

Figure 11-4 Photograph of drill core from SD100

ITEM 12. EXPLORATION

12.1 Seafloor mapping

The seafloor at Solwara 1 has been extensively mapped in 2006 and 2007 by video camera fly-over using ROVs. The location of the ROV was continuously recorded by an on-board GPS system referenced to the GPS system aboard the *Wave Mercury*. Visibility was generally good and sufficient to easily identify hydrothermal chimneys and volcanic rocks. A map of the extent of the main chimney fields was compiled (Figure 12-1) from the video footage and was used to identify targets for core drilling.

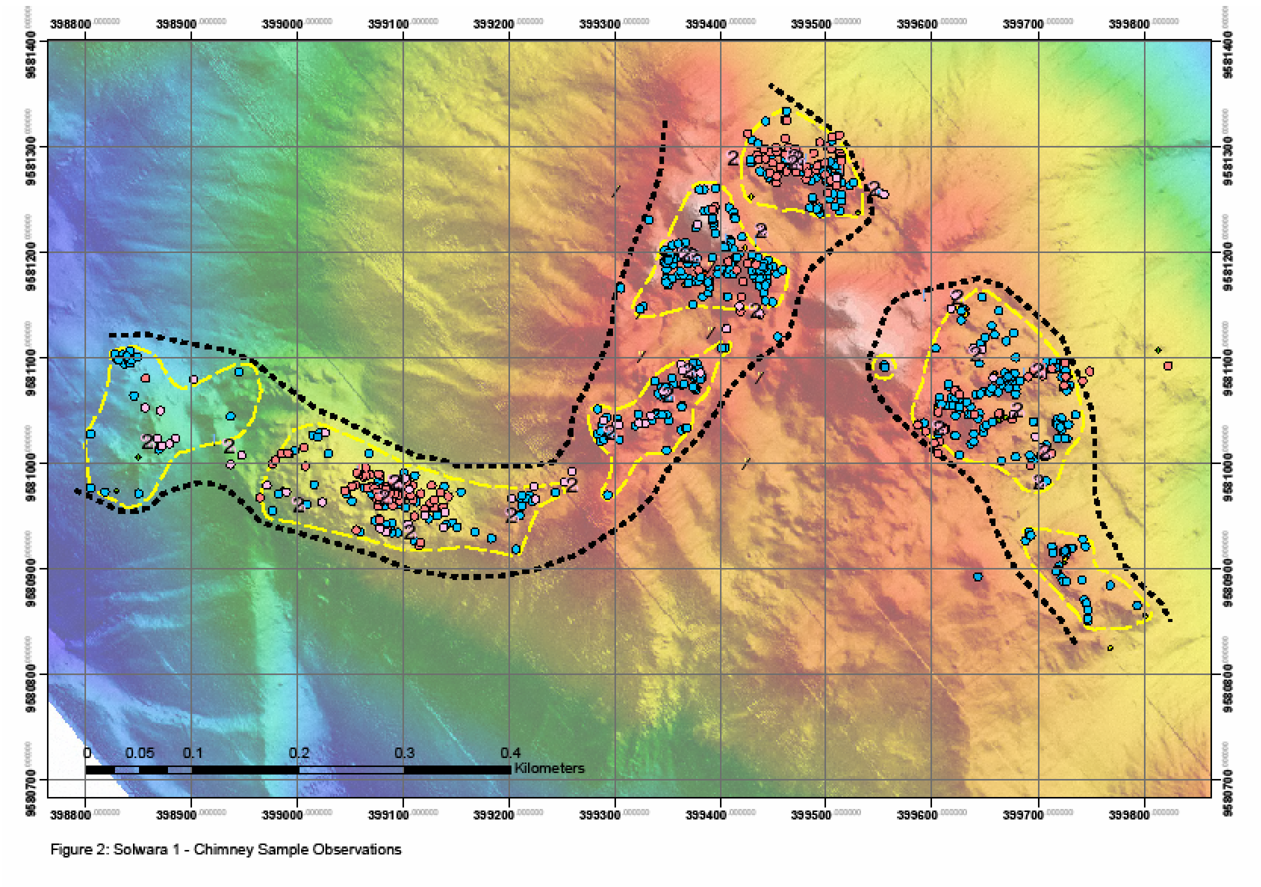
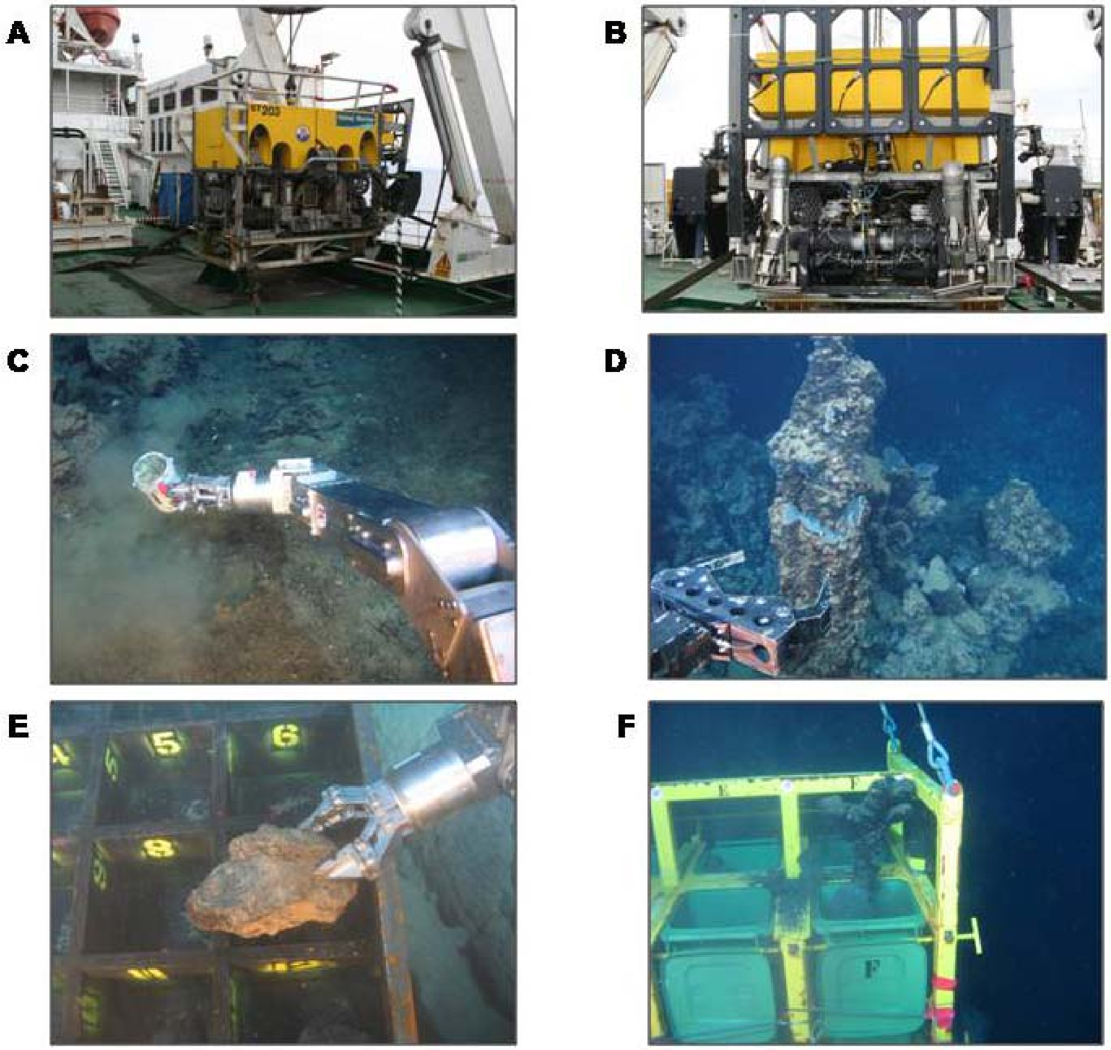


Figure 12-1 Plan of chimney observations

Circles=observations; yellow outlines=interpreted limit of main chimney fields; black=target zone for drilling in early 2007; shaded background = bathymetric surface coloured by elevation (blue=deepest)

12.2 Seafloor sampling

The observed chimney zones cover an area of around 90,000m^2. Due to the variable size of the chimneys and the impracticality of sampling very large chimneys it was not possible to sample chimneys on a regular grid. The 2007 sampling program was designed to collect at least one chimney sample from within a grid of 30m by 30m cells covering the main chimney fields.



A: ROV mounted on board the *Wave Mercury* in the Bismarck Sea
B: Front end of ROV showing two sampling arms, the 7-function (left) used for small samples, and the 5-function (right) used for larger chimney samples
C: 7-function using a 'scoop' designed to sample loose rock and sediment
D: 5-function used to sample a chimney
E: Small samples were deposited in a 'geo-box' mounted on the ROV
F: Large chimney samples were deposited in a 'cage' containing bins

Figure 12-2 Photographs of chimney sampling equipment

ROVs fitted with robotic arms were used in 2006 and 2007 to collect samples of chimneys (Figure 12-2). The robotic arms were used to snap off chimneys of up to 0.5m in diameter. The samples were placed in an onboard sample box or large plastic bins (domestic garbage bins) mounted in a steel frame suspended separately from the ROV. Each box and bin was clearly labelled (numbered or lettered), so that the samples could be correctly identified when delivered to the deck of the ship.

12.3 Drilling

In 2006, 42 diamond core holes were drilled by a Seacore R100 Marine Drill mounted on the *DP Hunter* (Jankowski, 2006). This equipment was designed for ocean deep drilling (ODP) programs rather than the relatively short drillholes required for exploration of SMS deposits. Coring (61mm diameter) started at the seafloor surface; however recovery was generally very poor, averaging 41% with better core recovery in consolidated massive sulfide rather than the interbedded unconsolidated sulfidic sediments. Much of the recovered material was in a disaggregated state (broken pieces, loose sands and sludge). The recovery was somewhat better towards the end of the program as the operators became more experienced in drilling the substrate. Eight of the shallow holes had to be abandoned after the first few meters because of in-fill and collapse of unconsolidated sediments. Significant amounts or core were retrieved from 34 of the drillholes.

The core was geologically logged and sampled; sticks of competent core were cut in half with a diamond saw. Clays and disaggregated samples were manually split with a knife. The geochemical sampling demonstrated that significant Cu, Au and Ag mineralization, with minor Zn, was present within the massive sulfide deposit, however due to the poor recovery the geochemical analyses are not suitable for resource estimation. Nonetheless, the geological logs provided corroboration for the current interpretation of the geology of the Solwara 1 deposit, which was based primarily on the 2007 drillhole data.

In 2007, Nautilus completed a 111 hole drilling program from the *Wave Mercury* using ROVs lowered onto the seabed. The core recovery averaged >70% from the massive sulfide zone and clearly demonstrated the continuity of sulfide mineralogy across the Solwara 1 deposit. This program is described in more detail in Item 13, 14 and 15.

12.4 Geophysical Surveying

During the 2007 Bismarck Sea campaign, Nautilus Minerals successfully trialled and then deployed Ocean Floor Geophysics's (OFG) Ocean Floor Electromagnetic (OFEM) system over Solwara 1. OFEM was designed and built for the purpose of delineating areas of near-surface massive sulfides on the seafloor. OFEM is a novel system built by OFG with support from Nautilus Minerals and Teck Cominco Limited. It is a controlled source method that measures electromagnetic fields associated with induced subsurface electrical currents. The system is currently under a patent application that precludes complete disclosure of its design and operational specifications at this time.

The parameters for the OFEM survey were as follows:

- Survey Area: 1.33km^2;
- Survey Length: 37.7line-km;
- Normalized-Signal Range: 0.94 – 1.00; (Maximum Anomalous Amplitude: -6%);
- Noise Threshold: ±1%;
- Nominal Line Spacing: 100m, with infill to 50m;
- Nominal Depth of Investigation: Assumed to be approximately 5m. More work is needed to establish the limitations of the system.

Figure 11-2 illustrates the location of the Solwara 1 2007 OFEM Survey with respect to the bathymetry of the Solwara 1 mound. Together with the cross-section in Figure 11-1, it illustrates how well the OFEM responded to the shallow mineralization as defined by the 2006 and 2007 drilling campaigns.

Note that several lesser anomalies were detected away from the known sulfide accumulations. It is unclear whether they represent:

- Higher resistivity base metal mineralization (lower sulfide concentration or less favorable sulfide texture);
- Similar massive sulfide mineralization that is beneath shallow non-conductive overburden (volcanic or sediment); or,
- Instrument noise.

ITEM 13. DRILLING

13.1 2007 drilling program

In 2007 the ship *Wave Mercury* was used for an extensive program of field activities. The program included core drilling to define the mineral resource at Solwara 1. Two custom-built submersible drilling rigs were mounted on remote operated vehicles (ROVs). Each rig consisted of a conventional core barrel and drill rod system designed to produce core of 52mm diameter. The core barrels and drill rods were stored on board each drill rig in a carousel. Each rod was 1.5m in length and the configuration of carousel and rods allowed a maximum drilling depth of about 20m. The drilling operations were managed by Canyon Drilling Inc (Canyon). All operations were remotely controlled by Canyon drilling crews onboard the *Wave Mercury* via an umbilical cable. Video cameras mounted on the rigs and ROVs provided visual control of the program to the drilling crews and Nautilus operations room. At the end of each hole, the ROV and drill rig were returned to the deck, the core barrels were unloaded and the rig was serviced.

Survey control for ROV operations during the 2007 exploration drilling and sampling was provided by UTEC Survey Inc of Houston Texas. The ROV drill location was determined using a series of accumulative acoustic fixes using a Ranger Widebeam USBL system with data processed by the UTEC Navipac Navigation software. During the drilling operations accumulative acoustic fixes were taken every three hours. ROV locations on the seafloor were determined to be generally accurate to approximately +/- 1 – 3m which is satisfactory for estimation of the mineral resource.

The operation of the drill rigs, core retrieval and subsequent core handling by Nautilus was observed by Ian Lipton, Principal Geologist of Golder during three site visits (refer Section 4.4).

13.1.1 Observed drill set up and core handling

On retrieval of the ROV and drill rig from the seafloor, the core barrels were unloaded from the carousel. Each barrel and position on the carousel was individually numbered and the numbers were checked during unloading to ensure that the barrels were opened in the correct down-hole sequence.

Nautilus geologists received the core from the barrels opened by the Canyon drillers. When the split inner tube was opened the condition of the core and any natural breaks were noted. Any contaminating material (for example, mud containing gastropods) that may have fallen into the hole during the rod change was then removed. The length of the recovered interval was measured and recorded in a field notebook and on the Canyon drill report. The core was photographed in the drill split before being carefully transferred to the core trays. The core pieces were immediately reassembled in their *in-situ* configuration. Intervals of core loss were replaced with cylinders of polystyrene foam cut to the length of the lost core. The position of core loss was based on visual core inspection and discussion with the driller.

All holes were drilled vertical. Interpretation of the data indicates the mineralization has been deposited at or just below the seafloor. Therefore the drillhole intersections are interpreted to be close to perpendicular to the mineralization and therefore to represent true thicknesses. The target sample length of 1m was appropriate for the massive sulfide zone which forms the majority of the mineral resource and was commonly in the range 5 to 12m thick.

13.1.2 Results

The drilling program successfully tested part of the Solwara 1 deposit, with the system remaining open at depth in some areas and along strike to the west. The drillholes confirmed widespread massive sulfide mineralization beneath the chimney fields and also extending beyond the main chimney mounds. The massive sulfide mineralization consists dominantly of chalcopyrite and pyrite, with less common sphalerite. Significant gold and silver mineralization also occurs within the massive sulfides. The results of the drilling are more fully described in Items 14, 15, 16 and 19. A detailed description of the geology, as observed and interpreted largely from the 2007 drilling results, is presented in Item 11.

ITEM 14. SAMPLING METHOD AND APPROACH

14.1 Core sampling

The extent of the Solwara 1 deposit was initially inferred from previous exploration (refer Item 12) including mapping of chimney fields, bathymetric survey and the 2006 core drilling results. The 2007 drilling program was designed to test the inferred location of the deposit initially on a 50m by 50m grid, with subsequent infill to a 25m by 25m grid. At the end of the drilling program a strike length of approximately 1400m had been drilled to depths of up to 19m. The rugged terrain, particularly near the chimney mounds, prevented the location of the drillholes on a regular grid, however, over much of the deposit a final drillhole spacing of approximately 30m was achieved. A list of the drill hole samples from the 2007 drilling program, used for the mineral resource estimate, is presented in Appendix A.

14.1.1 Logging procedure

The geological logging was designed to capture in a consistent coded format the rock type, the physical characteristics of the core, the geological texture of the rock, the type, texture, grainsize and volume percentage of sulfides, etc. The information was entered into fields in a customized acQuire data entry screen on a tablet PC. Additional geological information was captured in the comments field, as required.

A simple set of lithological types was identified from drilling at Solwara 1 in 2006. New types were added, as required, with the approval of the Nautilus Geological Manager. Minor variations or the occurrence of short intervals of another rocktype (e.g., 30cm of volcanic sediments within a 5.5m interval of massive sulfides) were noted in the comments field. Core loss and natural cavities were also logged. The first letter of the code divided the lithological types into groups: H = hydrothermal rocks, V = volcanic rocks, S = sedimentary rocks. Valid codes are presented in Table 14-1:

Table 14-1 Lithology codes and descriptions

Lithology	Code	Description/comments
Massive sulfide	HMS	>50% sulfides. Commonly the gangue minerals are also hydrothermal (anhydrite, barite, clay). Note textural details (vuggy, brecciated, etc). Note details of host rock (if discernible) in the comments field.
Semi-massive sulfide	HSM	20-50% sulfides. Commonly the gangue minerals are also hydrothermal (anhydrite, barite, clay). Note textural details (vuggy, brecciated, etc). Note details of host rock (if discernible) in the comments field.

Sulfate-Sulfide	HSS	5-20% sulfides. Gangue components are apparently hydrothermal (anhydrite or barite +/- silica). Little or no clay. [If gangue is clay, consider the altered volcanics category (VA) or hydrothermally altered clay-rich rock (HSI)].
Fe-(Mn)-(Si) Oxides	HFE	Dominant Fe-oxide/oxyhydroxide, scarce sulfides. Only use for measurable intervals of red-brown ferruginous deposit, such as completely oxidized sulfides. Black Mn subordinate. Silica invisible in hand specimen. Probably rare as loggable units.
Mn-(Fe)-(Si) Oxides	HMN	Dominant Mn oxide minerals ('wad"). Only use for measurable intervals of soft, sooty black deposit. Red-brown Fe absent or subordinate. Silica invisible in hand specimen. Probably rare as loggable units, but Mn oxides may occur in minor amounts as coatings on sulfide grains close to seafloor.
Hydrothermally altered clay-rich rock	HSI	White to very pale grey or buff, "amorphous-looking" typically soft rock. A globular fabric (possibly opal lithospheres?) or granular texture (white and grey grains) is visible under a hand lens. Appears to be clay-rich but this may be colloidal silica? May contain minor anhydrite and fine grained disseminated pyrite. Protolith is undetermined. [Sulfide-sulfate rocks (HSS) tend to be crystalline and clay poor. Altered volcanics (VA) are more clayey and have relic volcanic textures such as pseudomorphs after phenocrysts or fragmental textures.]
Anhydrite- barite rock	HAB	Mixed anhydrite-barite dominated rock. Hard, crystalline, clay-poor. Anhydrite: typically coarse-grained crystalline, almost always bright white. Barite: hard to distinguish but typically greyer and finer grained than anhydrite. Notably dense (high density, but take sulfide abundance into account).
Anhydrite	HAN	Anhydrite dominated rock. Anhydrite is typically coarse-grained crystalline, vitreous lustre, almost always bright white. Notably dense (high density, but take sulfide abundance into account). Crystals (e.g. lining cavities) are thin blades rather than prisms.
Other hydrothermal rocks	H_Other	Other rocks of probable hydrothermal origin that do not fit into the above categories. Should be described in detail in the comments field.
Fresh volcanic	VF	Hard, black, often vesicular, low density compared to black massive sulfides. May be porphyritic, and usually show glassy to vitric or dull lustre. Possibly flow brecciated in some locations. Try to establish relationships to adjacent units (e.g. transition to altered volcanics; abruptly overlain/underlain by sediments, etc). Ignore minor weathering along fractures.
Partly-altered volcanic	VPA	Partly altered. Phenocrysts (if present) altered to clays, groundmass duller and may have clayey veinlets. Unlikely that these are commonly identified. If present then (1) slighty altered - only phenocrysts affected; (2) mildly altered -groundmass partly affected. May contain disseminated sulfides. Relatively hard, not completely altered to clays.

Altered volcanic	VA	Entire rock altered to soft clays. Evidence of volcanic origin provided by pseudomorphous or relic volcanic texture. May contain disseminated sulfides and veins of quartz, barite, sulfides etc. May not always be easy to distinguish from sedimentary clays (SCY) and hydrothermally altered clay-rich rock (HSI).
Mineralized volcanic breccia	VBM	Breccia of black, unaltered vesicular lava clasts within a sulfide matrix
V_Other	V_Other	Other rocks of probable volcanic origin that do not fit into the above categories. Should be described in detail in the comments field.
Lithified clastic sediment	SLI	Distinctive, generally dark, fine to medium grained clastic sediment. Sometimes bedded or laminated. Quartz grains, possible lithic or tuffaceous fragments. Rounded worm burrows up to 1cm in diameter. Generally strongly lithified (possibly silicified?) but may grade into softer sediments. Can be well mineralized (cpy-sph), particularly towards the base. Commonly underlain by HMS or HSM.
Volcaniclastic Sand	SVC	Plentiful grains (0.1 to 2mm) clearly visible with naked eye Typically unconsolidated volcaniclastic, with angular grains of plagioclase (white, with cleavage), pyroxene (black, with cleavage), and lithic volcanics. Generally barren, but note any sulfides present (particularly possible chimney fragments). Also note any "lapilli" horizons with large volcanic clasts (majority >5mm).
Sand - undifferentiated	SND	Unlithified. Plentiful grains (0.1 to 2mm) clearly visible with naked eye.
Silt	SLT	Grains rarely >0.1mm, mainly visible only with lens. Variable clay matrix present. Most silts are also volcaniclastic, but telling this requires microscopic study so don't try. Generally barren, but note any sulfides present (particularly possible chimney fragments).
Clay	SCY	Semi-consolidated, cohesive clay. Grains not detectable under the hand lens. May be difficult to distinguish from altered volcanics (VA). Unlikely to contain sulfides. May be laminated.
S_Other	S_Other	Other rocks of probable sedimentary origin that do not fit into the above categories. Should be described in detail in the comments field.
Core Loss	CL	Significant interval of core loss. For very small intervals of core loss within a larger sample interval, the Recovery data may be sufficient record of the lost core.
Cavity	CAV	Natural void, interpreted from drill site report and/or evidence from drill core (e.g., crystals lining cavity margins). It may only rarely be possible to identify cavities with confidence.

The geological and geotechnical logging and geochemical sampling were carried out on a lithological zone basis. All boundaries were defined by from and to depths. The zones may include part of a single drill run or cover several drill runs. The lithological zone boundaries were based on the following parameters having similar characteristics within a particular zone:

- rock type and mineralization; and
- core character (i.e., competent sticks, sand, mud).

A new lithological logging zone was defined when there was a significant change in either of these parameters, however, the logging intervals were generally no smaller than 50cm. The comments field was utilized to capture lithological variation or other geological detail. Within the lithological zones, geochemical sample boundaries were marked, down hole from the first marked boundary with a target sample length of 1.0m. At the bottom of the lithological zone the last interval was commonly not be exactly 1.00m long. In this case, intervals greater than 1.30m were split into two equal sample lengths.

After geological and geotechnical logging and mark up of sampling intervals, each core tray was individually photographed. An information board, showing project name, prospect name, hole name, tray number, depth from, depth to, date drilled and was placed next to the top of the core tray.

A Niton hand-held XRF analyser was used for preliminary assessment of the grade of the core samples. Readings, each of 20 seconds, were made on the circumference of the core at 10 points spaced evenly along the sample. The in-built averaging function on the Niton was used to calculate the average grades over the 10 readings. The average Cu, Zn and Pb analyses were recorded.

14.2 Core loss

Core recovery varied significantly between lithological units. The unconsolidated sediments on the seafloor that were seen in the video filming were rarely retrieved as core. It was assumed that core loss in the first core barrel could all be attributed to loss of unconsolidated sediments at the top of the drillhole; from the perspective of mineral resource estimation this is a conservative assumption.

Core recovery in the lithified sediments zone was highly variable and consequently the mineral resource within this zone was classified as Inferred.

In the massive sulfide zone the core recovered in the 2007 drilling program was commonly of excellent quality, forming long continuous sticks of core in the core barrel. The core was easily broken during manual handling, and in some drillholes there was evidence that some core had fallen back into the hole and been redrilled, resulting in some core loss. The core recovery in the massive sulfide zone, which forms the Indicated Resources and the majority of the Inferred Resources, averaged 73% in the massive sulfide zone. The core adjacent to the intervals of core loss was examined in each drillhole. There was no textural evidence (such as mineralogical banding, oxidation of sulfides or crystals formed in open spaces) that might be indicative of the presence of natural cavities in the rock. In a few cases, there was clay adjacent to the core loss interval but in general there was no evidence to suggest that the lost material was any different to the core either side. It was inferred that the core loss was due to the inherent weakness of the rock, which is a function of the high porosity of this zone.

14.3 Chimney sampling

Sampling of the chimney fields is described in Item 12.2. Figure 14-1 shows the location of the 133 samples which were used for resource estimation.

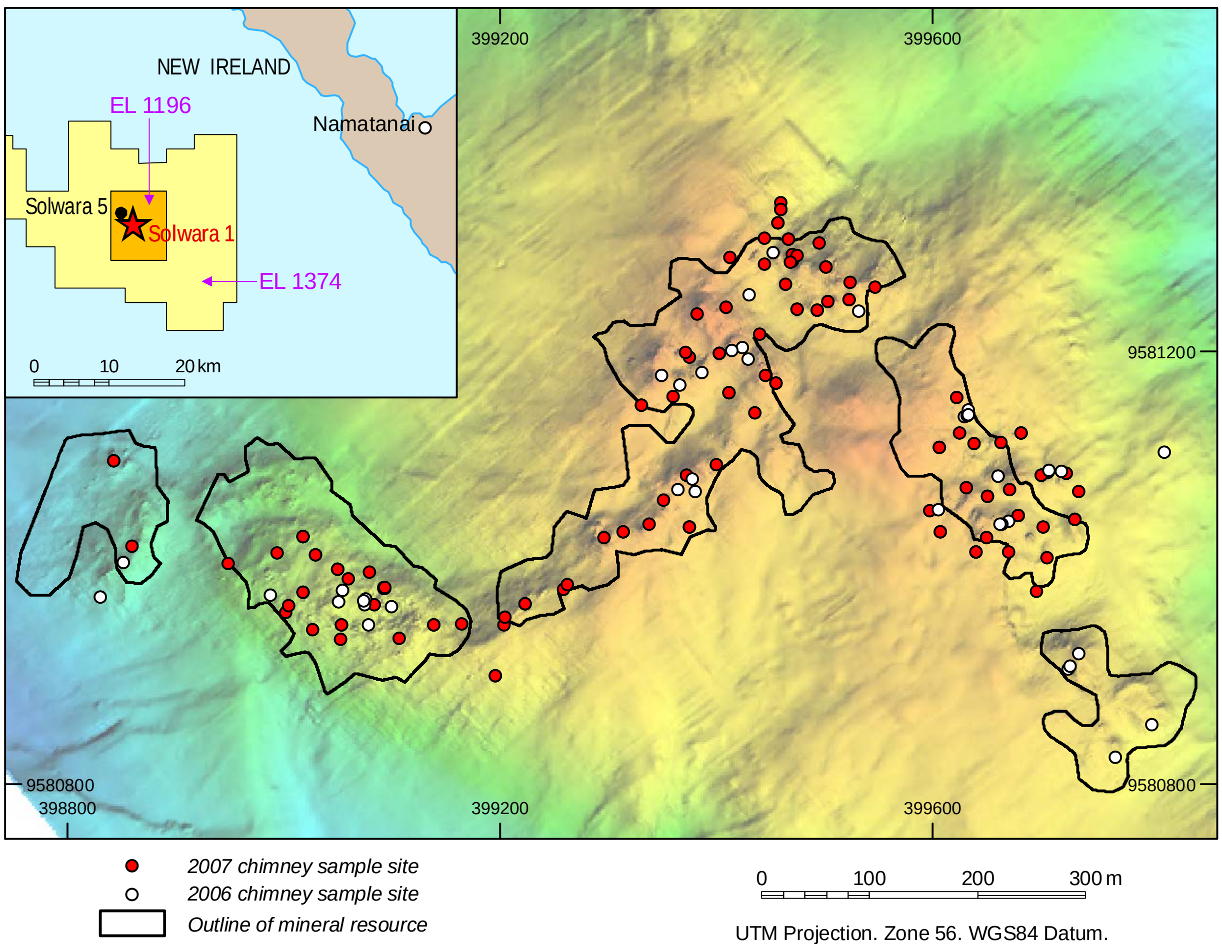


Figure 14-1 Plan showing location of chimney samples

Only thin chimneys and chimneys on the edges of chimney mounds could be sampled. The formation of the chimneys is believed to be a dynamic process that evolves over time with variations in the temperature and chemistry of the hydrothermal fluids and the permeability of the chimneys. There is therefore some uncertainty about how representative the chimney samples are of the mineralization within the thickest parts of the chimney mounds. As a consequence it was deemed appropriate to classify the chimney resource as Inferred Resource.

A list of the chimney samples used for the mineral resource estimate, is presented in Appendix A.

ITEM 15. SAMPLE PREPARATION, ANALYSES AND SECURITY

15.1 Sample collection and shipping

Geochemical sampling was carried out by Nautilus personnel after the on-board geotechnical testwork had been completed and the geotechnical test residues returned to the core trays.

The drill core was cut longitudinally in half with a diamond saw unless the core was very soft in which case a chisel or knife was used. The chimney samples were sliced radially with a power saw, to obtain a sample approximately 3cm thick through the full width of the chimney.

Each sample was placed in a labelled plastic sample bag and a sample ticket was stapled to the bag for reference. For odd numbered holes the right hand half of the core (looking up the core tray) was sampled, for even numbered holes the left hand half of the core was sampled.

Duplicate core samples were collected at a rate of 1 for every 10 regular samples. The duplicate sample interval was replaced in the core tray with a rectangular bar of polystyrene foam cut to the length of the duplicate sample and marked with the word "Duplicate" and the duplicate sample number.

Each of the sample bags was placed in a labelled vacuum sealer bag and heat sealed using a vacuum sealing machine.

At the end of the drillhole the following quality control samples were inserted into the batch:

- One Certified Reference Sample for every 10 regular samples;
- One Secondary Reference Sample for every 10 regular samples; and
- One blank sample for every 10 regular samples.

The sealed sample bags were then packed into large plastic boxes and the lids to the boxes were sealed using tamperproof numbered cable ties. The sealed boxes were photographed and weighed. All bags and boxes were clearly labeled and numbering details were recorded in spreadsheet. The boxes were dispatched to ALS Laboratory Group, an independent commercial laboratory, in Australia for customs and quarantine clearance, and geochemical analysis. As noted in Item 4.4, the author observed the packing of samples for shipment to the geochemical laboratory in Australia during the course of the site visits.

Some consignments of the boxes were opened and inspected at ALS Laboratory Group in Townsville by Golder staff. The samples were examined for any evidence of contamination of the sample bags or tampering; none was observed. Thereafter, the samples remained in the custody of ALS during preparation and analysis.

15.2 Sample preparation and analysis

Core and chimney samples from the 2007 program were analysed by ALS Laboratory Group in laboratories in Brisbane and Townsville. The laboratories are NATA certified.

The samples were dried and crushed to 70% passing 2mm in a jaw crusher. A rotary splitter was used to split 1kg which was then pulverised in a ring mill to better than 85% passing 75µm.

Cu, Ag, Pb and Zn were measured by ore-grade analysis using inductively coupled plasma atomic emission spectrophotometry (ICPAES) following an aqua regia digest. A number of stabilising compounds are used in the digestion to keep Cu, Zn, Pb and Ag in solution at high concentrations.

Au was analysed by fire assay using a 30g charge and an atomic absorption spectrophotometry finish. Due to the high sulfide content, the fire assay charges were reduced for many samples.

Al, As, Be, Bi, Ca, Cd, Co, Cr, Fe, K, Mg, Mn, Mo, Na, Ni, P, S, Sb, Sr, Ti, V, W, Hg, Se, Te and Li were analysed by ICPAES after a four acid digest and Ba was analysed by XRF.

ALS uses an extensive set of quality control procedures, including the use of blanks, duplicates and certified reference materials to monitor the quality of the sample preparation and analyses, and protocols for reanalysis of batches if results are unsatisfactory.

Nautilus carried out its own quality control procedures, including the insertion of duplicates, blanks, certified reference materials (CRM) and matrix-matched secondary reference material. The results of these procedures are presented in Item 16.

In the author’s opinion the sampling, sample preparation, security and analytical procedures were satisfactory for mineral resource estimation.

15.3 Bulk density

Bulk density measurements were required for estimation of the tonnage of the mineral resource and for evaluation of geotechnical parameters. Three methods were used to measure bulk density; an Archimedean method, the caliper method and a water displacement (overflow) method . Generally, both the Archimedean and caliper methods were used on each of the core samples collected for geotechnical testing. The Archimedean and overflow methods were used on the chimney samples prior dispatching them for geochemical analysis. This approach resulted in a substantial database of duplicate bulk density measurements on both core and chimney samples.

Over 600 dry bulk density measurements were made on core samples from the 2007 drilling program. Calipers were used to measure the dimensions of the core samples (and hence calculate the volume) prior to geotechnical testing. After testing, and if the samples had not failed by crumbling, a water displacement method based on Archimedes Principal, was used to obtain a second measurement of the volume of the samples. Archimedes Principal states that a solid submerged in a fluid will experience an upward force equal to the weight of fluid that it displaces. Thus, if the fluid is fresh water with a density of $1.00 t/m^3$, the volume of the displaced water, and hence the volume of the solid, is given by the difference between the weight of the solid in air and the weight of the solid in water. Assuming a density of $1.025 t/m^3$ for the seawater, the initially estimated of the volume of the solid must be reduced by 2.5%. The wet and dry masses of all samples were determined using a small electronic balance equipped with a 'live animal' function designed to compensate for movement of the balance. It was anticipated that this would reduce errors that might arise as a consequence of the movement of the ship. These measurements allowed the bulk density of the samples to be determined by two independent techniques.

A total of 86 measurements of dry bulk density were made on chimney samples collected during September 2007. The samples consisted of slices cut perpendicular to the chimney axis with a saw. Samples were generally in the range of 1.5 to 4.5kg. The volume of each sample was measured using two methods; firstly by collecting the overflow when the sample was lowered into a full bucket of water and secondly by a water displacement method based on Archimedes Principal. Unlike the small electronic scales, the electronic scales used to weigh the chimney samples in air did not have a 'live animal' function and consequently the measurements fluctuated due to the gentle pitching of the ship.

The methods used to measure bulk density are described in detail in Items 15.3.1 to 15.3.3.

15.3.1 Dry bulk density measurement Method A: Archimedean

Archimedean water displacement methods for measuring bulk density work on the principal that a solid submerged in water will experience an upward force (buoyancy) equal to the volume of water that the solid displaces. The upward force is measured as an apparent reduction in the mass of the sample when weighed in water. This method was used for core samples and also for chimney samples. The procedure was as follows:

- Saturate the sample by immersion in seawater. Agitate to remove trapped air;
- Remove the sample from the water, wipe any excess water off the surface quickly with a damp cloth. Weigh the sample in air (M_{wet});
- Transfer the sample to the basket in the bucket of fresh water. Determine the saturated submerged mass of the basket plus sample (M_{ss});

The Wet Bulk Density was calculated by:

$$\rho_{wet} = \frac{\text{Mass of saturated sample in air } (M_{wet})}{\text{Mass of saturated sample in air } (M_{wet}) - \text{Mass of saturated sample in water } (M_{ss})}$$

- Split the core in half, lengthwise. Return half to the core tray for geochemical sampling;
- Determine the moisture content (mc) of the half sample by drying overnight (or longer if necessary) in an oven.

The Dry Bulk Density (ρ_d) was calculated by:

$$\rho_d = \frac{\rho_{wet} \text{ x } 100}{100 + mc}$$

15.3.2 Dry bulk density measurement. Method B: Caliper method.

If the core is highly porous or vuggy, water displacement methods may underestimate the bulk volume (including the larger vughs) of the rock. In this case, if the core is in competent sticks and the diameter of the core is relatively uniform and there is no core loss, the caliper method may be preferred.

The procedure was as follows:

- Cut the ends of the core interval with a knife or a saw, perpendicular to the long axis of the core;
- Measure the maximum diameter of the core with a pair of calipers to the nearest 0.1mm. Do not put the points of the caliper jaws inside a cavity. The core should be measured at six points and averaged;
- Measure the length of the core (L) with a pair of calipers to the nearest 0.1mm;
- Measure the mass of the sample in air (M_{wet});

The Wet Bulk Density (ρ_w) was calculated by:

$$\rho_{wet} = \frac{M_{wet}}{\pi * r^2 * L}$$

- Split the core in half, lengthwise. Return half to the core tray for geochemical sampling;
- Determine the moisture content (mc) of the half sample by drying overnight (or longer if necessary) in an oven.

The Dry Bulk Density (ρ_d) was calculated by:

$$\rho_d = \frac{\rho_{wet} \times 100}{100 + mc}$$

15.3.3 Dry bulk density measurement Method C: Overflow method

The overflow method was used only for large irregular shaped slices of chimney material. The samples consisted of slices cut perpendicular to the chimney axis with a saw. Samples were generally in the range of 1.5 to 4.5kg. The procedure was as follows:

The following equipment is required:

- Electronic scales balance to weigh samples of up to 10kg. The limit of the balance should not exceed ±0.1% of the sample mass;
- For the overflow method: a perforated basket or wire sling that can be suspended in the bucket of water. Fill the bucket until it overflows through the pipe. Immerse the basket in the bucket of water. Collect the overflow water in a large measuring cylinder and measure the volume (V_{basket});
- For the displacement method: perforated basket that can be suspended in the bucket of water from beneath the electronic balance. The basket is suspended in water and the reading on the balance is set to zero;
- A metal tray in which the sample may be placed in an oven for drying. Weigh the empty metal tray (M_{tray});

The procedure is as follows:

- Fill a large bucket of water with an overflow pipe until it overflows through the pipe;
- Saturate the sample by immersion in seawater. Agitate to remove trapped air;
- Transfer the saturated sample to the basket and lower the basket into the bucket of water. Collect the overflow water in a large measuring cylinder or bucket and measure the volume ($V_{sample+basket}$);
- Remove the sample from the water place it immediately in the metal tray, before pore water has a chance to drain, and weigh on the electronic balance. Record the wet weight ($M_{wet\ sample\ +\ tray}$);
- Determine the moisture content (mc) of the half sample by drying overnight (or longer if necessary) in an oven.

The Wet Bulk Density (ρ_w) is calculated by:

Wet Bulk Density (ρ_{wet}) = ($M_{wet\ sample+tray}$ - M_{tray})./ ($V_{sample+basket}$ - V_{basket})

Moisture content (mc) = 100 * ($M_{wet\ sample+tray}$ – $M_{dry\ sample+tray}$) / ($M_{dry\ sample+tray}$ – M_{tray})

The Dry Bulk Density (ρ_d) was calculated by:

Dry Bulk Density (ρ_{dry}) = ($M_{dry\ sample+tray}$ - M_{tray})./ ($V_{sample+basket}$ - V_{basket})

Unlike the small electronic scales, the electronic scales used to weigh the chimney samples in air did not have a ‘live animal’ function and consequently the measurements fluctuated due to the gentle pitching of the ship. The read-out on the scales was observed for several seconds in order to estimate the average or mid-point reading.

15.3.4 Dry bulk density results

The bulk density data from the drill core was inspected and records with negative or very high calculated moisture content (greater than 50% moisture in massive sulfide samples) were rejected as probably invalid. A total of 13 records was rejected in this way. A further 3 records which appeared to have incorrectly recorded tray weights were also rejected. Records with moisture contents of up to 68% in clay rich silts were retained.

The paired results from the two methods used to measure the dry bulk density of the core samples (Archimedean and caliper) were compared in a scatter plot (Figure 15-1). The scatterplot shows that there is no significant difference between the results produced by the two methods. This is confirmed by calculation of the mean values (3.04tm^{-3} and 3.06tm^{-3}) and the standard deviations (0.62 and 0.63) of the 313 pairs of results. It was therefore inferred that the caliper method results (available for a total of 343 samples) could be assumed to be reliable.

The strong correlation between the two data sets and small amount of scatter between individual pairs of values indicates that use of the small electronic balance, using the live animal function, effectively accounted for movement of the ship.

The dry bulk density results for the core samples are summarized in Table 15-1.

Table 15-1 Summary of dry bulk density results for core samples

		Sulphide Rocks				Volcanic rocks		
	Lithified Sedimentary Rock	Massive Sulphides	Semi - Massive Sulphides	Sulphate Sulphides	Anhydrite barite rock	Highly Altered	Fresh	Non-lithified Sediments
	SLI	HMS	HSM	HSS	HAB	HSI	VF	SLT
No.	26	163	81	12	4	13	19	7
Mean	2.43	3.36	3.07	2.69	2.29	2.37	2.14	1.21
Std Dev	0.62	0.40	0.41	0.47	0.07	0.79	0.24	0.32
Max	3.38	4.39	3.85	3.39	2.36	3.70	2.97	1.85
Min	1.49	2.42	1.61	2.05	2.21	1.40	1.85	1.02

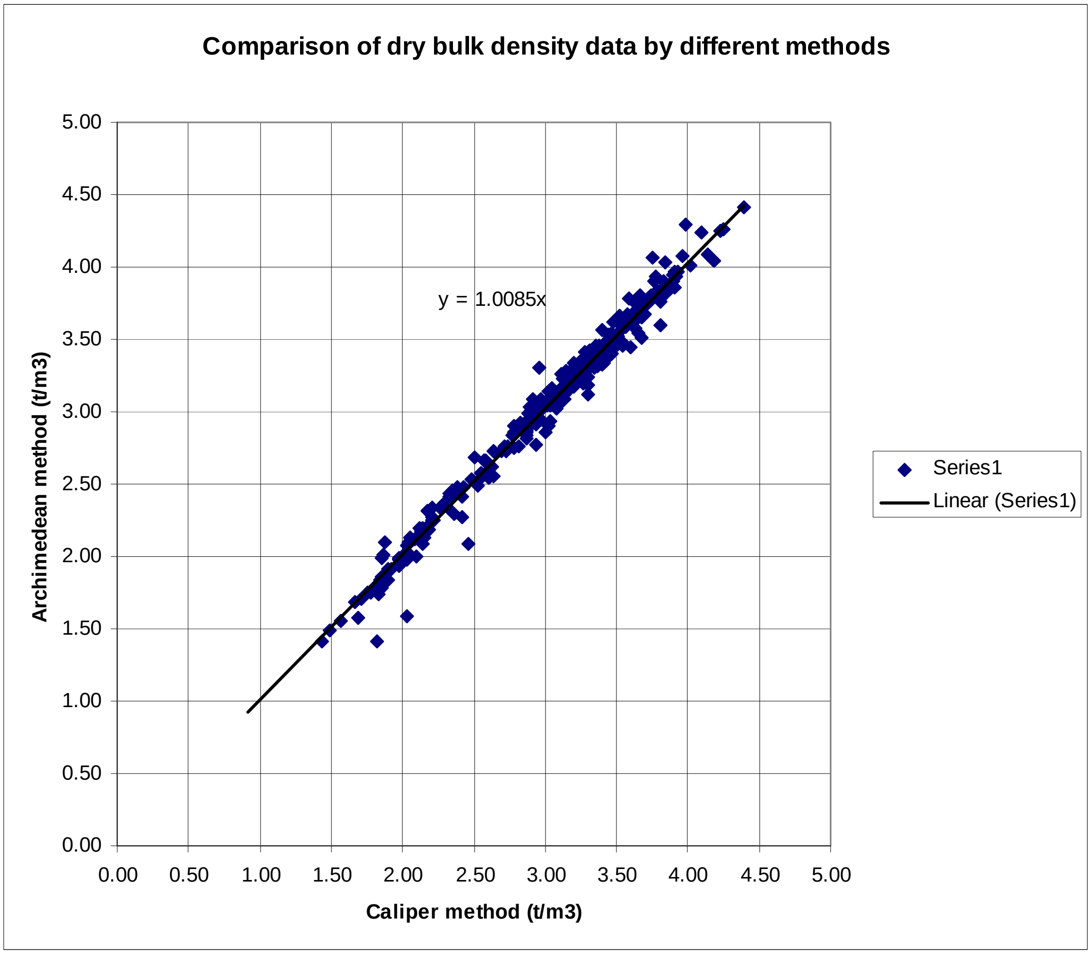


Figure 15-1 Comparison of dry bulk density data from drill core

A similar validation exercise was completed for the bulk density data for the chimney samples. Nautilus measured the dry bulk density of 86 samples from 49 individual chimneys using a simple water displacement method. Bulk density measurements on 51 of these samples were also carried out using a water displacement method based on Archimedes principal. The paired results from the two methods were compared in a scatter plot (Figure 15-2). The scatterplot shows that there was a small bias between the results produced by the two methods. This was confirmed by calculation of the mean values ($2.45tm^{-3}$ and $2.30tm^{-3}$). The average of the overflow method results was about 6% higher than the results from the Archimedean method. It was therefore decided that the results of the overflow method, which was less well-controlled than the Archimedean method, should be reduced by a factor of 6%. The standard deviations (0.34 and 0.42) of the chimney sample measurements are lower than for the core sample measurements, which is to be expected since the sample size is significantly larger.

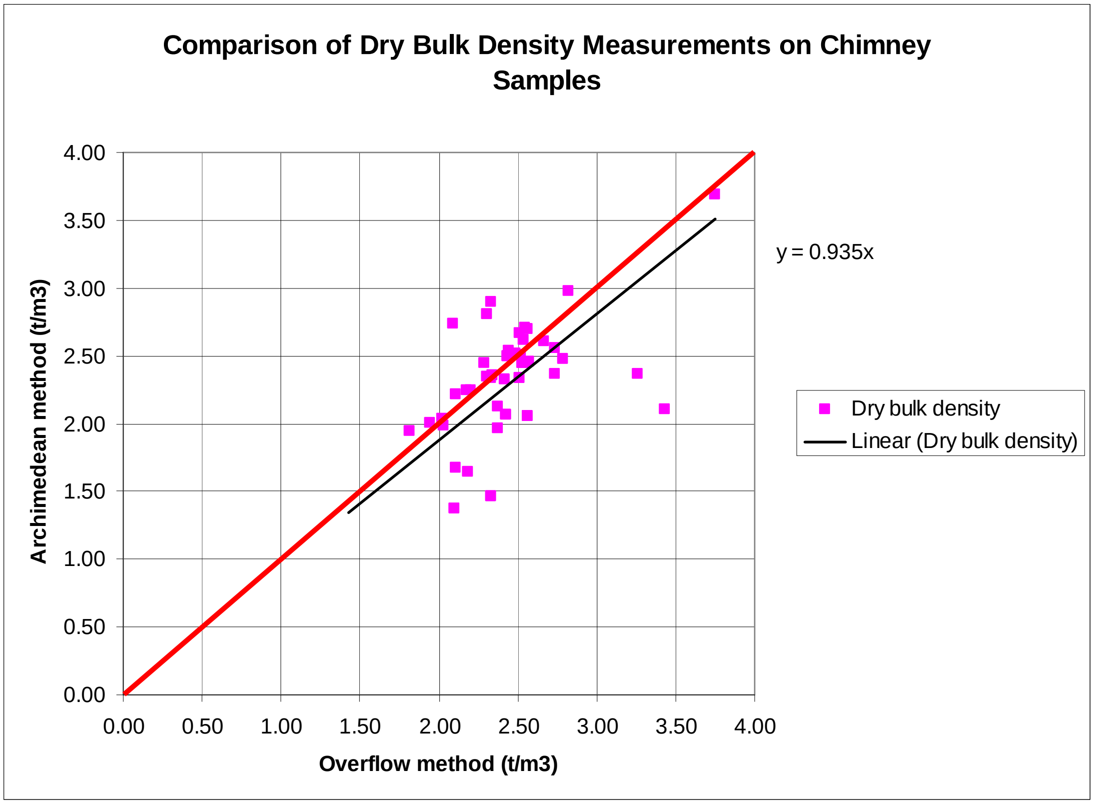


Figure 15-2 Comparison of dry bulk density data from chimney samples

The chimney samples contain some cavities greater than 5mm in diameter which penetrate into the sample and will not be correctly measured by water displacement methods. For each sample, a visual estimate of the proportion of such penetrative voids was made by the geologists. After correcting for the bias in the overflow data a further correction of -2.4% was made to the average bulk density estimate of the chimney samples to account for the average proportion of penetrative voids in these samples. This led to a final estimate of dry bulk density of the chimneys of 2.2tm^{-3}.

The strong correlation between the measurements using two different methods provides additional confidence in the dry bulk density data. In the author's opinion the dry bulk density data is satisfactory for mineral resource estimation.

ITEM 16. DATA VERIFICATION

The Solwara 1 drillhole and chimney data was verified by several means.

Independent audit of the logging confirmed the widespread occurrence of significant chalcopyrite mineralization in the chimneys and drill core, broadly consistent with the Cu geochemical analyses.

The location of the drillholes containing massive sulfide mineralization correlate closely with the results of the EM survey. The EM survey therefore, provides a high degree of confidence in the interpretation of the lateral extent of the massive sulfide mineralization.

Sample preparation and geochemical analyses were verified by the use of certified reference materials, secondary reference materials, blank samples and duplicate samples. These materials were submitted without marks which would identify their origin to the laboratory staff. They therefore provide quality control independent of the laboratory.

In view of the observations of copper mineralization in the core, the correlation between the hand-held XRF results and the laboratory geochemical analyses, the observed chain of custody of the samples from the ship to the independent laboratory, and the quality control samples, independent corroborative sampling was judged to be unnecessary.

16.1 CRM samples

Nine CRMs were selected for use as quality control samples in the program of geochemical analysis (Table 16-1). The materials are commercially prepared reference materials that were purchased from Geostats Pty Ltd, Fremantle Australia (samples with GBM prefix) and ORE Pty Ltd, Melbourne Australia (samples with OREAS prefix). They all consisted of sulfide-bearing rock. They were primarily chosen to cover a range of Cu and Au grades because these were expected to be the most valuable elements within the Solwara 1 deposit. The CRMs also provided certified values for Ag and Zn. A total of 84 CRMs were submitted within the batches of regular drill core samples.

Table 16-1 Certified Reference Materials

		Certified values			
Objective		Cu %	Au ppm	Ag ppm	Zn %
Primarily for Cu	GBM304-11	10.4011			0.0109
Primarily for Cu	GBM304-16	2.2721			0.0718
Primarily for Cu	GBM305-15	26.2422	**52.3*	**51.1*	0.1367
Primarily for Cu	GBM906-13	2.1862	**0.263*	3.74	0.3036
Primarily for Cu	GBM906-16	10.6807	**1.06*	19.17	0.4783
Primarily for Au and Cu	GBMS304-2	1.4325	6.04	5.1	0.0057
Primarily for Au and Cu	GBMS304-4	0.9698	5.67	3.4	0.0149
Primarily for Au	OREAS-10Pb		7.15		
Primarily for Au	OREAS-62Pb		11.33		

* Indicative value from single neutron activation analysis

The CRM results for Cu (Figure 16-1) were satisfactory with all except five results within ±5% of the certified values. The remaining five were within ±10% of the certified values.

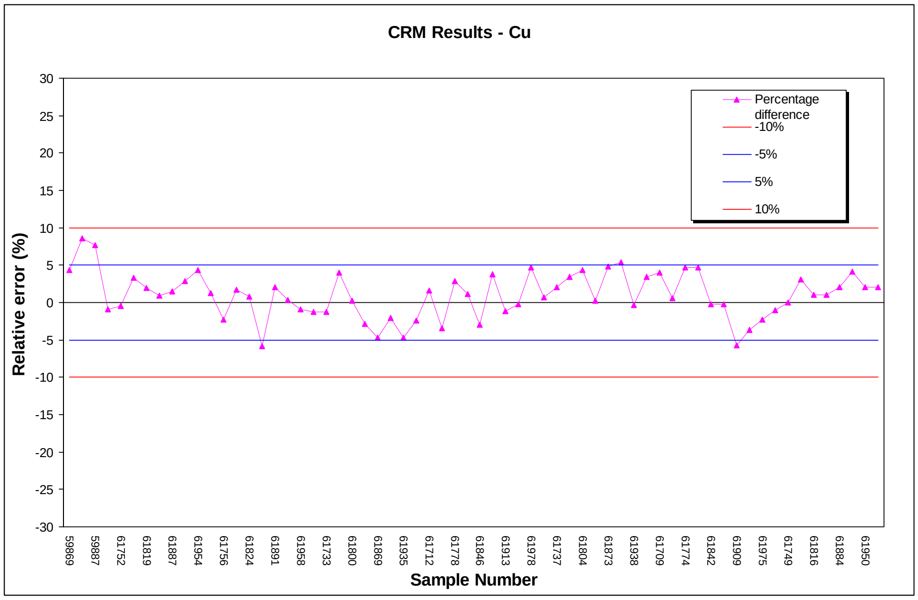


Figure 16-1 Cu results for CRMs

CRM results for Au (Figure 16-2) were not as good as for Cu but were satisfactory. Results for OREAS10Pb, OREAS62Pb and GBMS304-4 were generally with ±5% and all within ±10%, except for sample 61898 which has Au and Ag values consistent with mislabelling of OREAS62Pb as OREAS10Pb. Two results for GBMS304-2 were very poor (both from batch TV07084347). Several samples from this batch were reanalyzed but the reassays only differed from the original assays by an average of 2%. It was therefore concluded that no systematic error was present in the batch. These are the only (four) standards with certified values.

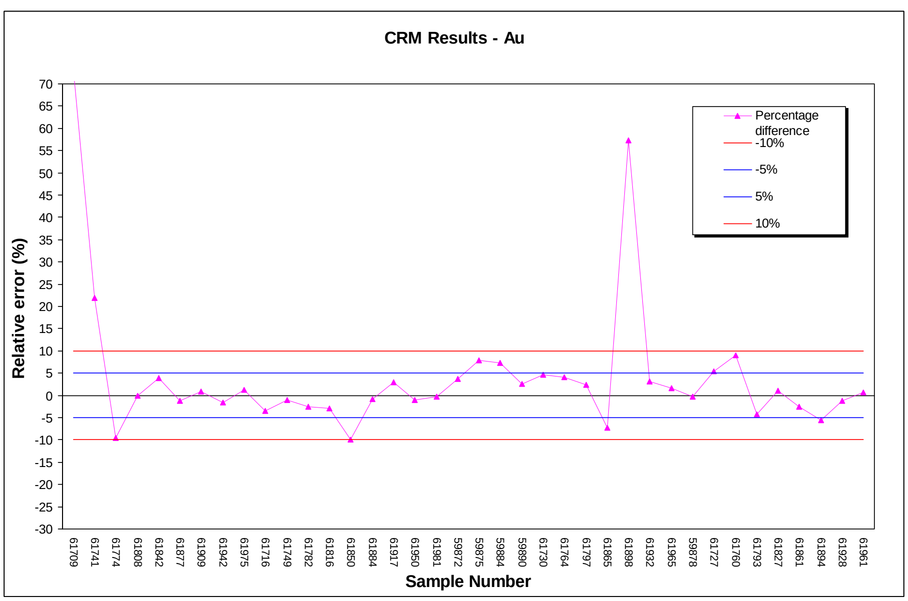


Figure 16-2 Au results for CRMs

CRM results for Zn were variable (Figure 16-3). Results for four of the CRMs were within ±10% of the certified value. A fifth, GBM906-16 returned results about 10% higher on average than the certified value. The results from two very low Zn grade CRMs showed very poor precision because they were close to the detection limit (0.01% Zn). Since Zn is of only minor economic interest in the Solwara 1 deposit the CRM results were deemed to be adequate for resource estimation.

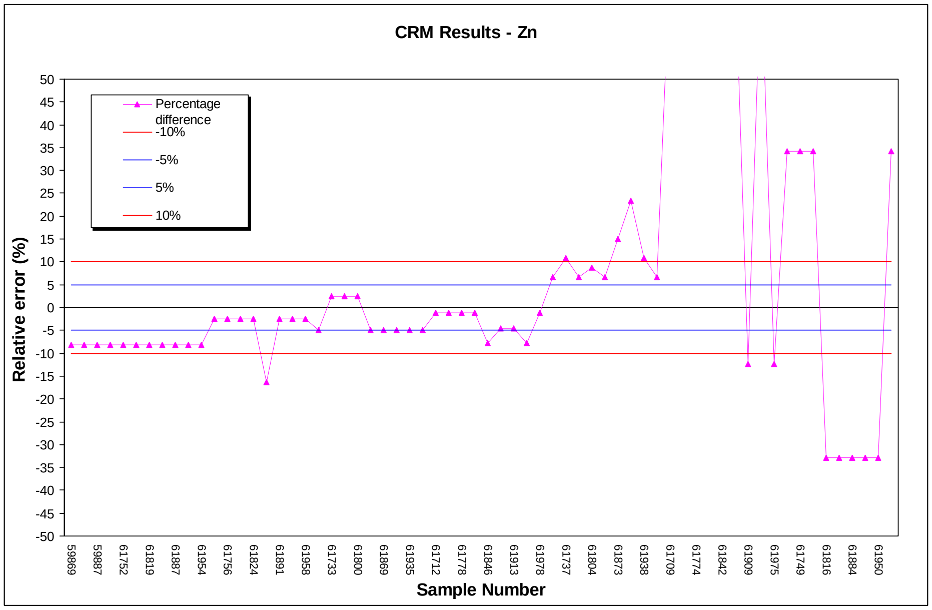


Figure 16-3 Zn results for CRMs

CRM results for Ag (Figure 16-4)were of relatively low precision due to proximity to the limit of detection (1ppm). The CRMs with the highest Ag grades (GBM906-16 with a certified value of 19.17g/t and GBM305-15 with an uncertified single result of 51.1ppm) performed the best but still showed poor precision and a possible high bias of about 5%.

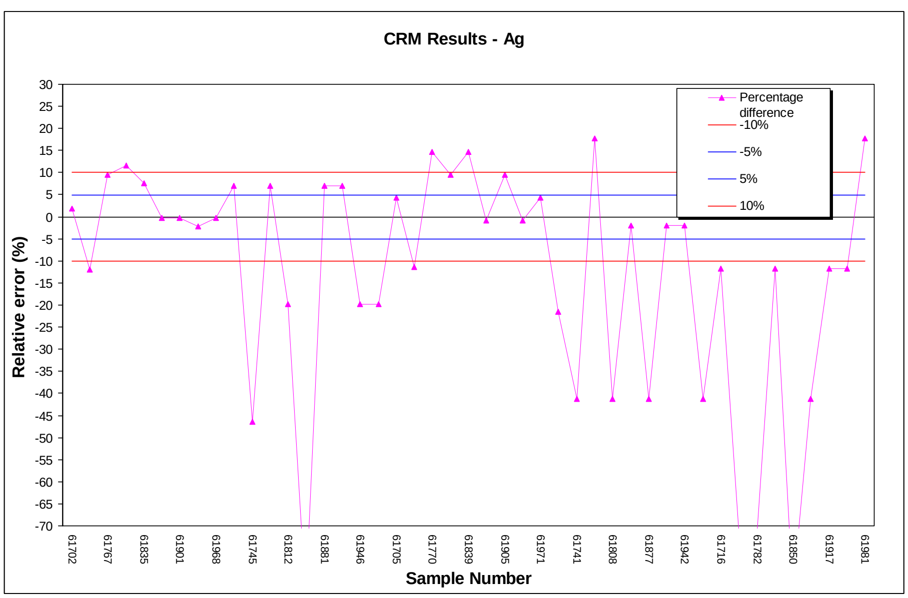


Figure 16-4 Ag results for CRMs

The CRM results show that the analytical data is adequate for estimation of Inferred and Indicated Resources of Cu, Au, Ag and Zn but that greater accuracy and precision will be required to define Measured Resources of Ag and Zn. This may entailed further analysis of sample pulps by alternative methods.

16.2 SRM samples

Nautilus commissioned the production of a pulverized homogenised composite of sulfidic material from Solwara 1 as a secondary reference material. The composite, known as NUSD, was made from approximately 100kg of coarse and pulp rejects from drillcore from the massive sulfide zone intersected in the 2006 drilling program. The preparation was conducted at HRL Testing in Albion, Queensland. The samples were stage crushed then pulverized to 90% passing at 75µm. The samples were then blended and split into 60g aliquots using a scoop.

Aliquots were submitted by Nautilus to five Australian laboratories to determine the average grades of the material. The laboratories were ALS Laboratories, Brisbane, Amdel Laboratories of Thebarton, UltraTrace Laboratories of Canning Vale, Becquerel Laboratories of Malaga and Standard and Reference Laboratories, also of Malaga. The first four laboratories analysed 5 samples. Standard and Reference Laboratories analyzed a single sample.

Standard and Reference Laboratories was chosen as an umpire laboratory in this program. The results are considered to be the most analytically reliable due to the use of classical chemistry. Copper was determined by short iodide, gold by fire assay with corrections for slag, crucible and cupel losses, silver by fire assay with corrections for cupel losses and referenced to pure proofs, zinc by multiple teams with separation from multiple analytical element groups and lead by hydrobromic/bromine digest with sulfate separation.

ALS, Amdel and Ultratrace all used similar methods for analysis. Gold was assayed using a 20 - 30g fire assay (lower charge weights were sometimes used to ensure proper dissolution of the gold in the high S matrix) and finished with ICP-OES in aqua regia digest. Base metals and silver were assayed using ICP-OES following a 4 acid digest with stabilizing compounds to combat precipitation.

Becquerel Laboratories used NAA for gold, silver and zinc. Copper and lead were determined by ICP-OES with a 4 acid digest.

Nautilus compiled the results of the analyses. Results that were clearly biased or of unacceptably high variability were discarded The averages of the remaining results was taken as the reference value. These were 5.11% Cu, 5.91g/t Au, 44ppm Ag and 1.71% Zn.

A total of 83 samples of NUSD were submitted within the batches of regular drill core samples.

The Cu results for NUSD (Figure 16-5) were satisfactory with all results within ±6% of the reference value and no bias.

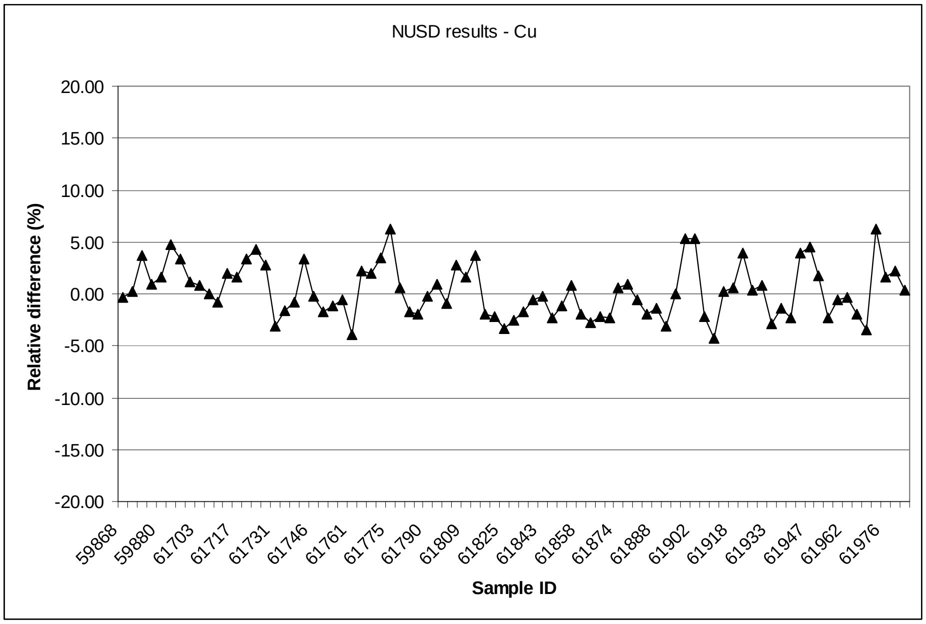


Figure 16-5 Cu results for NUSD

The Au results for NUSD (Figure 16-6) had lower precision than the Cu but were generally within ±10% of the reference value and showed a bias of less than 1%. They were deemed satisfactory for resource estimation.

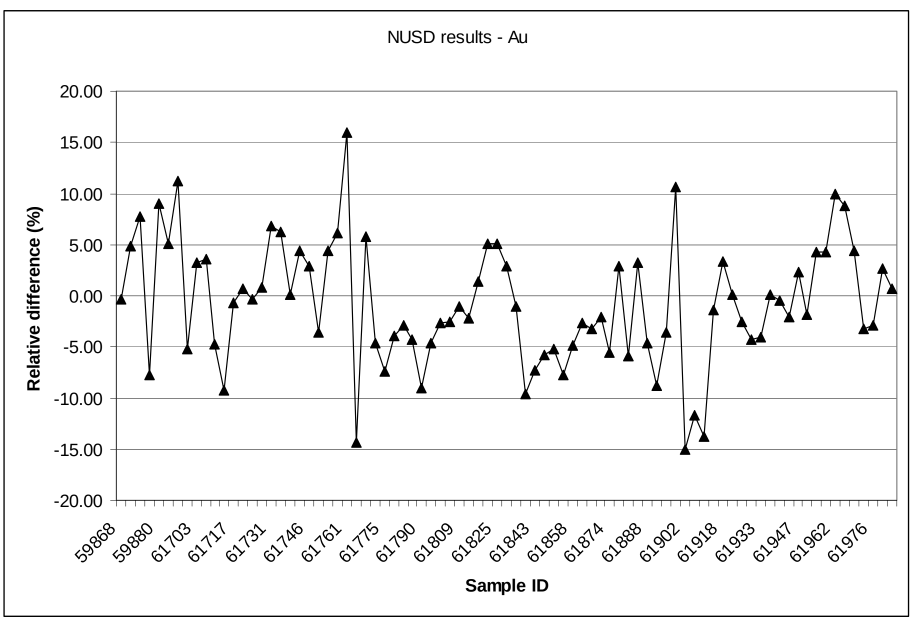


Figure 16-6 Au results for NUSD

The Ag results for NUSD (Figure 16-7) had lower precision than the Cu but were generally within +5% and -10% of the reference value. A low bias of 2.7%. was evident. The results were deemed satisfactory for resource estimation.

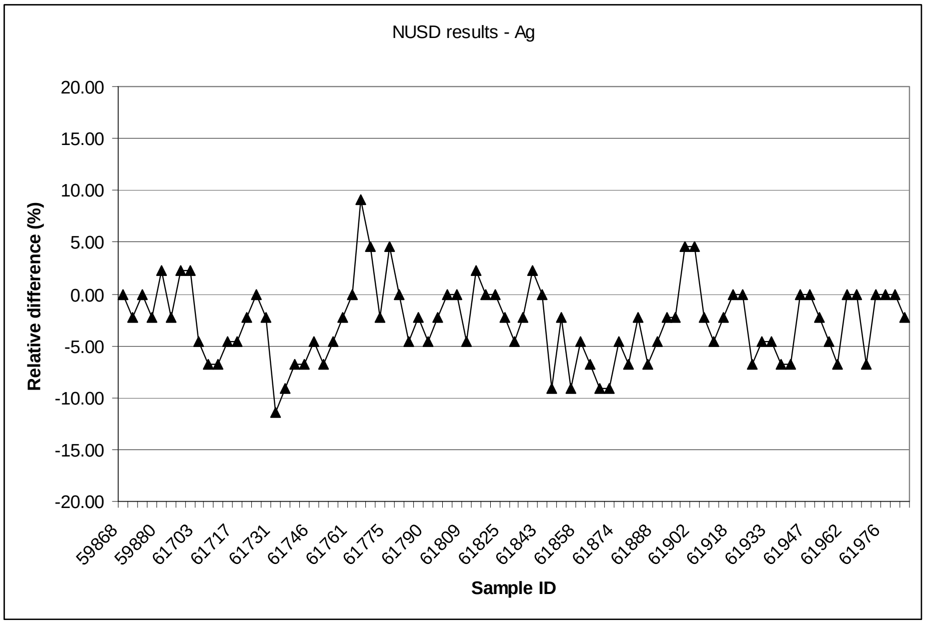


Figure 16-7 Ag results for NUSD

The Zn results for NUSD (Figure 16-8) had similar precision to the Cu and were generally within ±5% of the reference value. A low bias of 2.7%. was evident. The results were deemed satisfactory for resource estimation.

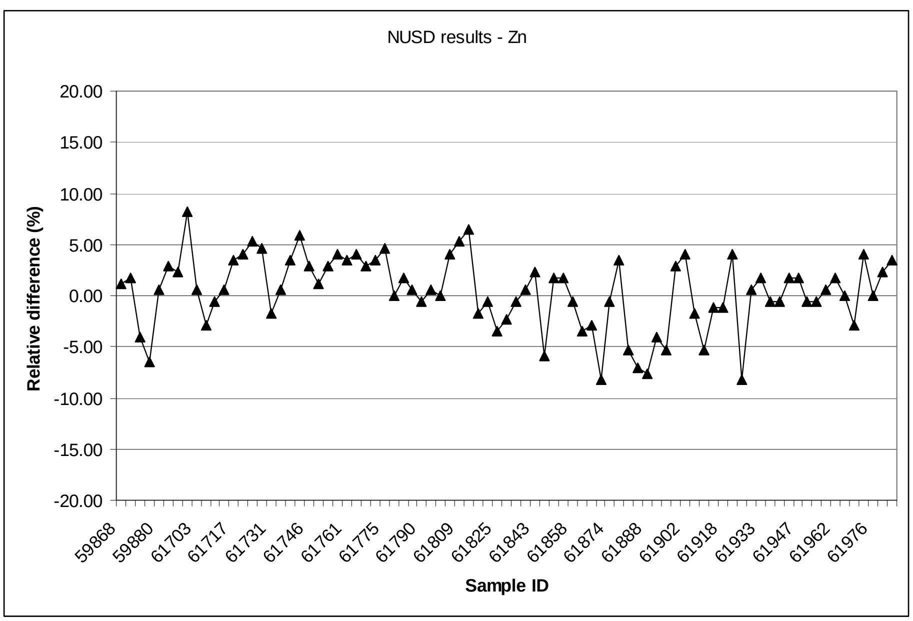


Figure 16-8 Zn results for NUSD

16.3 Duplicate samples

A total of 53 duplicate samples were obtained by collecting the second half of the core from the core trays. Each duplicate sample was submitted in the same batch as the original sample. The analytical results for the original and duplicate samples were compared using various scatter plots, half relative difference (HRD), and half absolute relative difference (HARD) plots. The HRD results show that there was no significant bias between the original and duplicate samples. The HARD values provide a measure of the precision or repeatability of the sampling. Ideally, in a relatively homogeneous type of deposit, Golder recommends a target of 90% of sample pairs having a HARD less than 10%. In the case of the Solwara 1 core sample duplicates, only about 73% of the Cu results and 69% of the Au results met this target. Only 50% of the HARD values for Ag and Zn met the ideal 10% target, partly due to the number of values close to the detection limit. Since most of the Cu and Au grades are well above the limit of detection it is inferred that the low precision of the duplicates is due to the inhomogeneity of the mineralization. This is consistent with the coarse grain size of the sulfide mineralization and the irregular nature of anhydrite distribution interstitial to the sulfide grains and in veins.

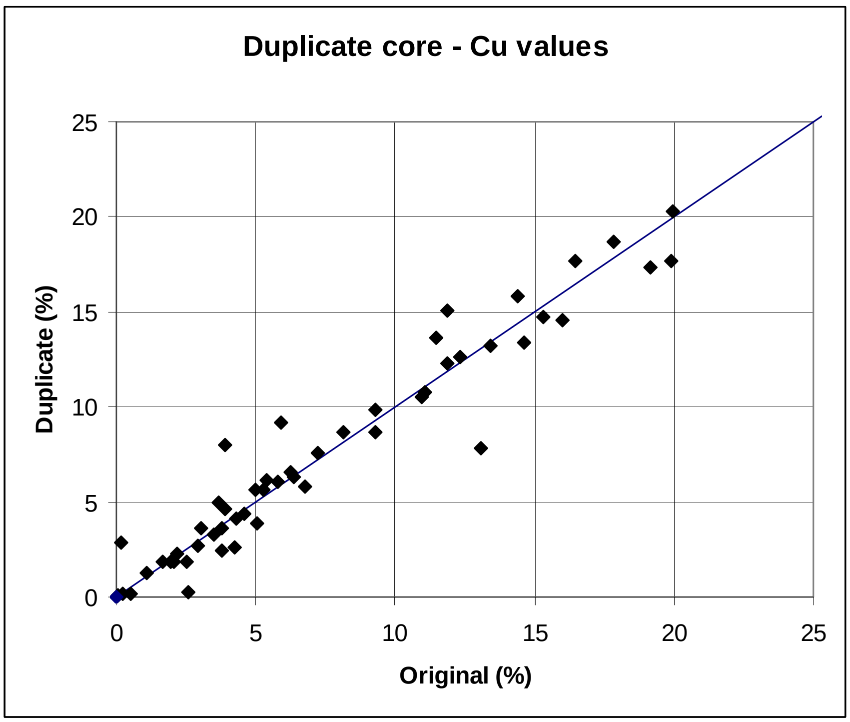


Figure 16-9 Scatterplot of Cu for duplicate core samples

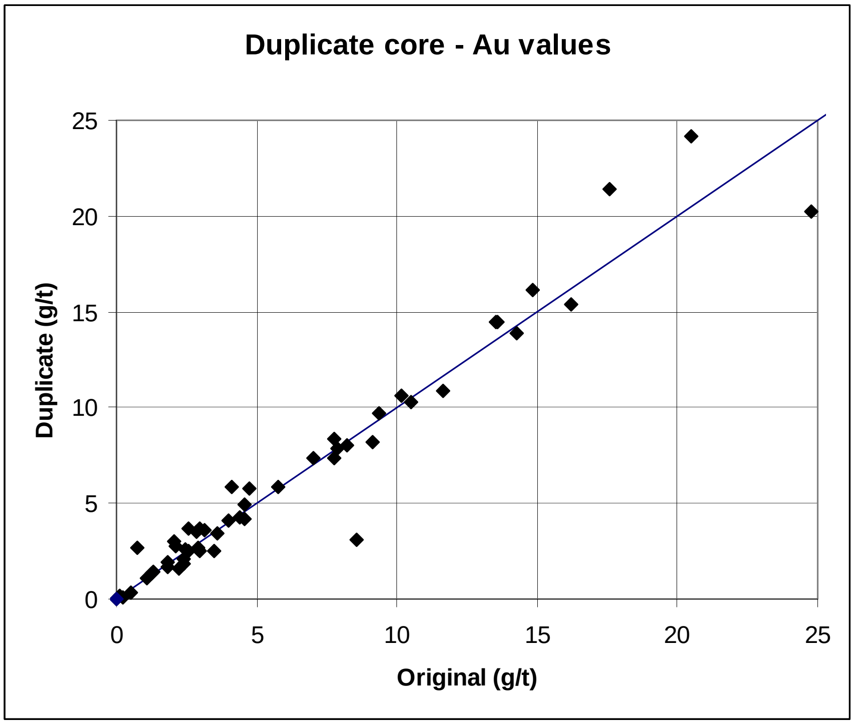


Figure 16-10 Scatterplot of Au for duplicate core samples

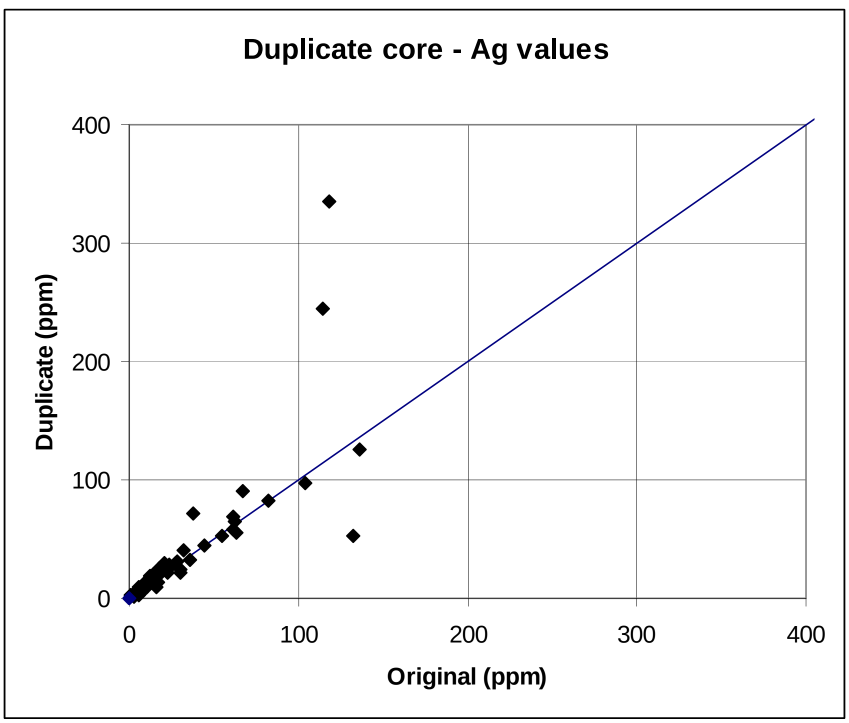


Figure 16-11 Scatterplot of Ag for duplicate core samples

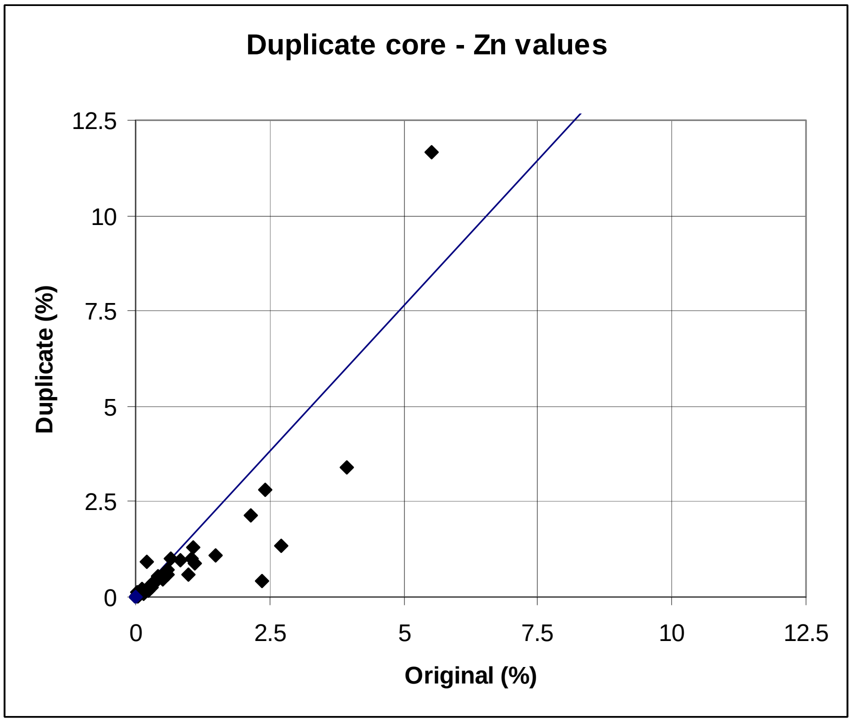


Figure 16-12 Scatterplot of Zn for duplicate core samples

A total of 66 duplicate samples of chimneys were obtained by collecting a second slice of chimney from adjacent to the original slice. Each duplicate sample was submitted in the same batch as the original sample. The analytical results for the original and duplicate samples were compared using various scatter plots, HRD, and HARD plots. There was no significant bias between the original and duplicate samples. Only about 68% of the Cu results and 67% of the Au results from the chimney sample duplicates had a HARD less than 10%. The precision of the Cu and Au analyses is similar to that of the core samples. For Ag and Zn, 65% and 62% of the pairs met the ideal 10% target; this is better than the results for the core samples at least partly because there were fewer values close to the detection limit. Consistent with the core samples, it is inferred that the low precision of the duplicates is due to the inhomogeneity of the mineralization.

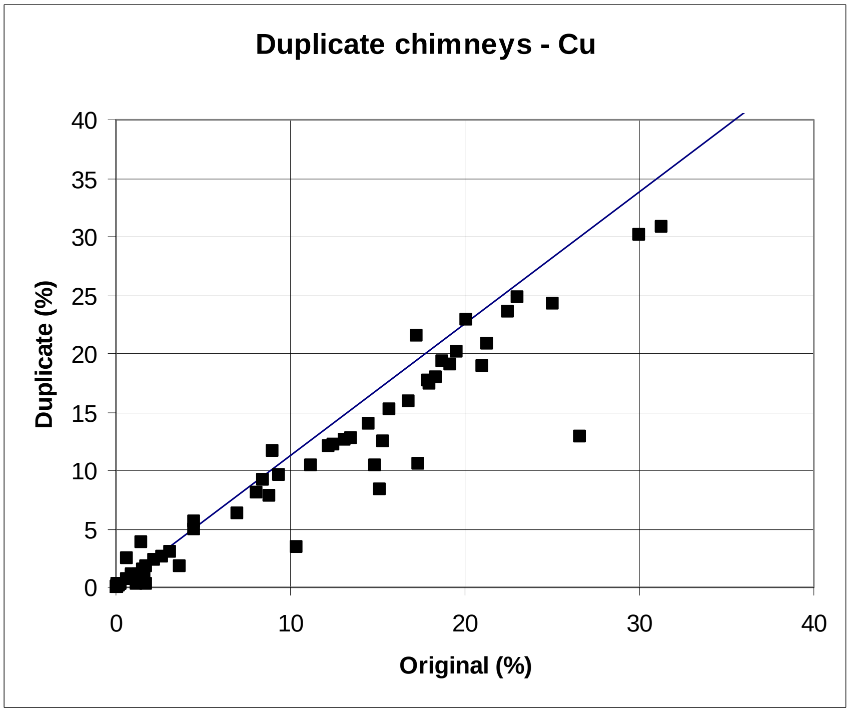


Figure 16-13 Scatterplot of Cu for duplicate chimney samples

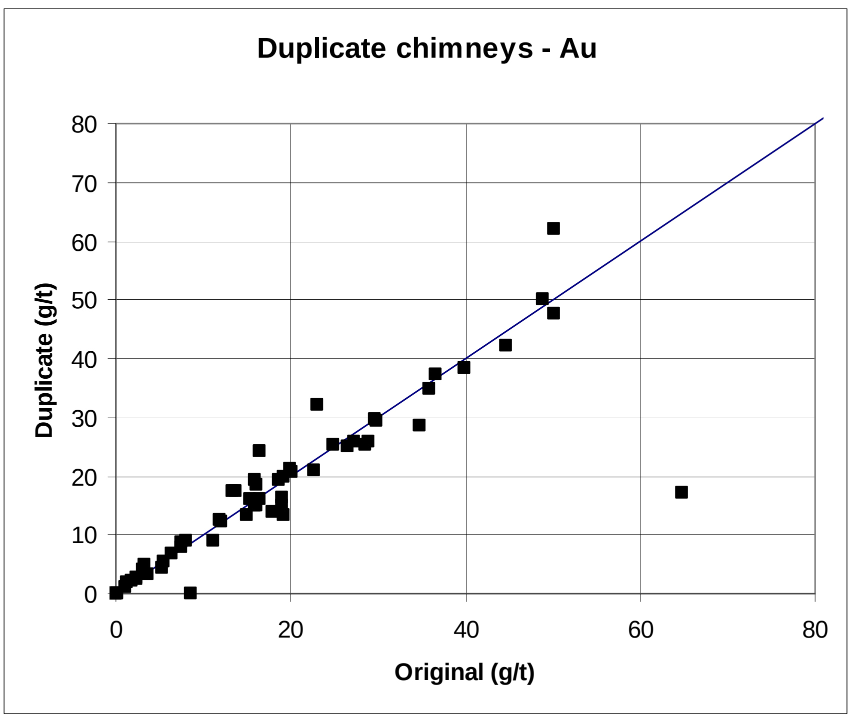


Figure 16-14 Scatterplot of Au for duplicate chimney samples

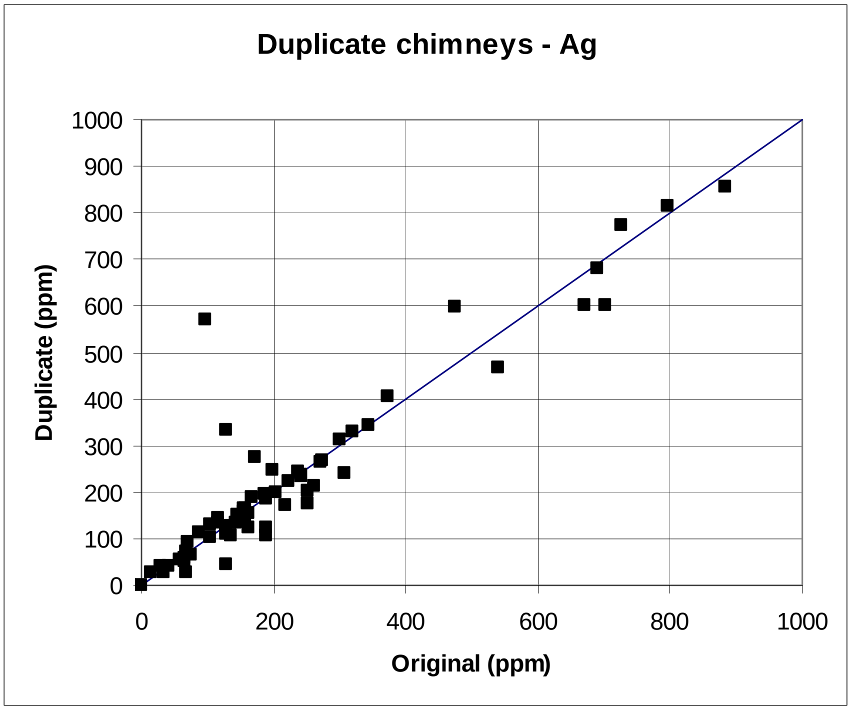


Figure 16-15 Scatterplot of Ag for duplicate chimney samples

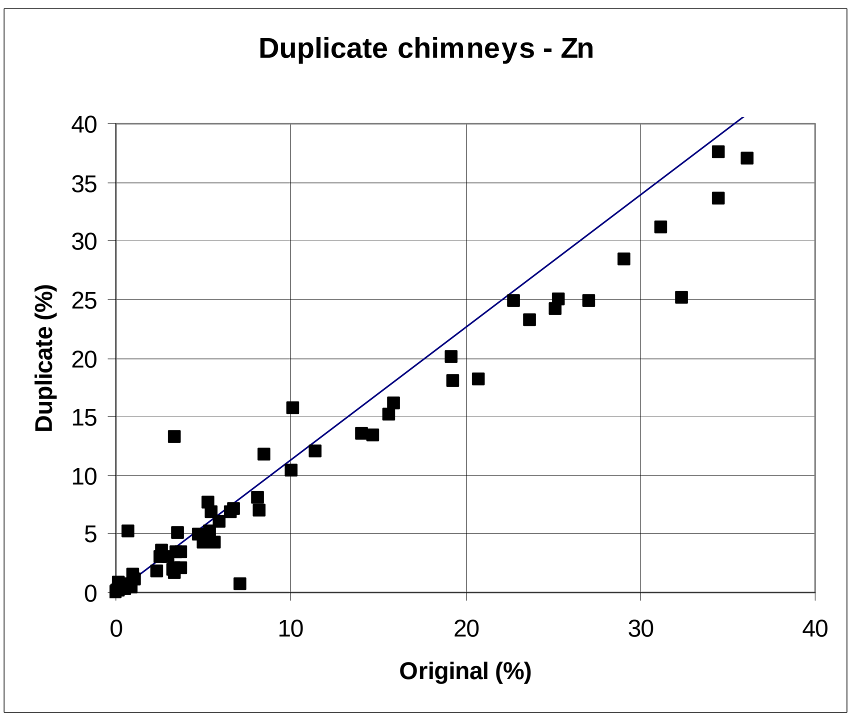


Figure 16-16 Scatterplot of Zn for duplicate chimney samples

16.4 Blank samples

Grey volcanic sand in 1kg bags was used as blank (i.e., unmineralized) samples. A total of 76 blank samples were inserted in the batches of regular drill samples.

Five blanks were recognizably contaminated with Cu-Au bearing sulfides; as indicated by elevated levels of Cu, As, Co, Mo, S and Au (and). Zn, Ag and Pb were close to the detection limit. Other elements in these samples were consistent with the typical chemistry of the blank material. The blank samples show that there were some sporadic instances of minor contamination of samples during sample preparation but there is no evidence of systematic problems. The contamination levels and frequency pose only a minor risk to the resource estimate.

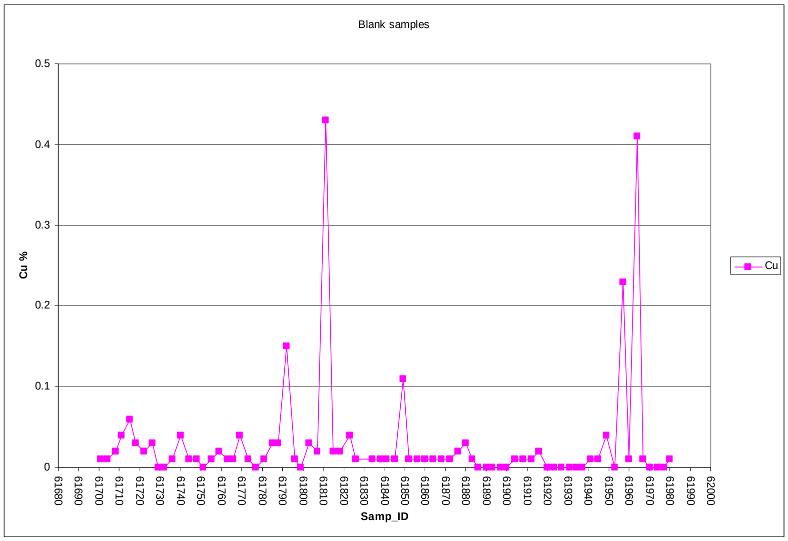


Figure 16-17 Cu results for blank samples

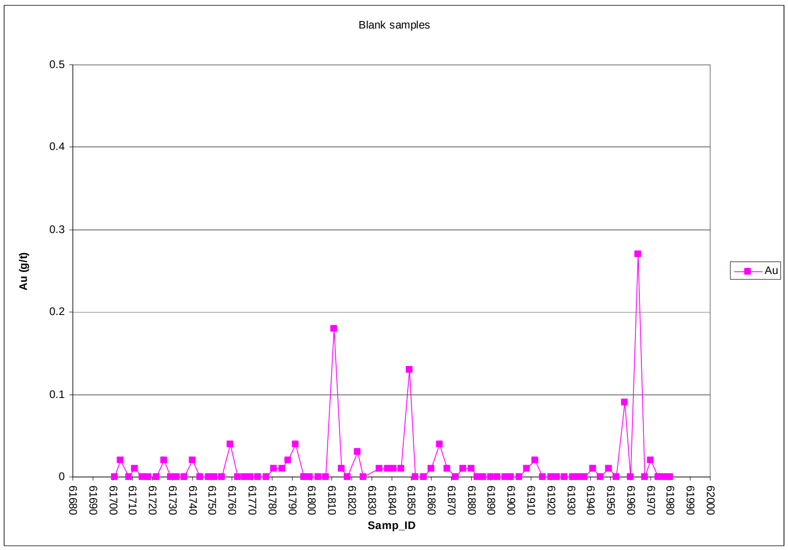


Figure 16-18 Au results for blank samples

ITEM 17. ADJACENT PROPERTIES

EL 1196 is surrounded by EL 1374, which is also held 100% by Nautilus Minerals Niugini. EL 1374 is in turn surrounded by tenements held by Nautilus and Bismarck Mining (Figure 17.1).

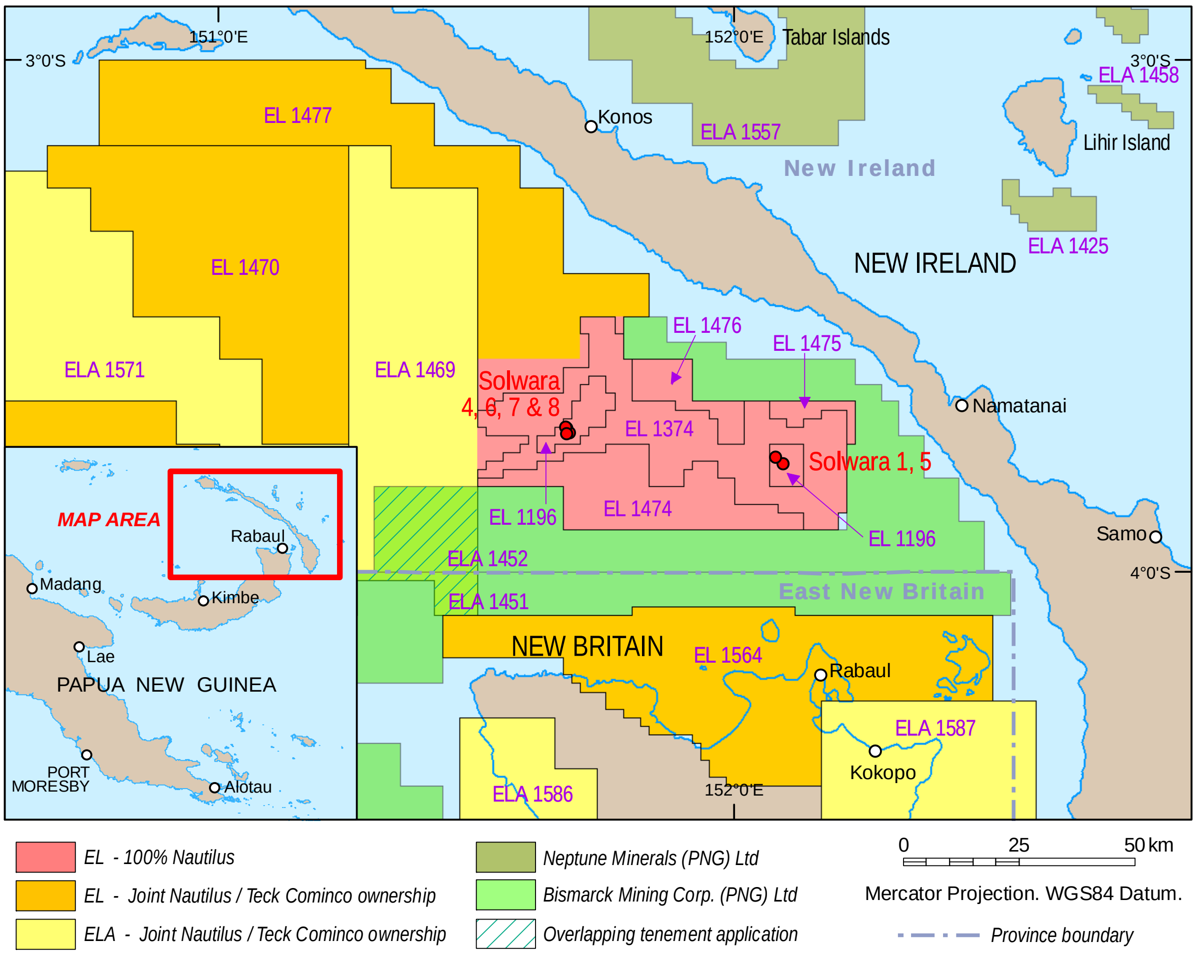


Figure 17-1 Properties adjacent to EL1196

The author is not aware of any information from adjacent properties that is material to the Solwara 1 deposit.

ITEM 18. MINERAL PROCESSING AND METALLURGICAL TESTING

18.1 2007 field sample collection

Geological logging of the drillholes showed the geology over the Solwara 1 deposit to be quite consistent with an obvious hangingwall horizon, massive sulfide horizon, and footwall horizon. A representative set of 29 holes was selected for identification of ore types based on mineralogical and physical properties (Figure 18.1) from across the deposit to determine the different material types (holes in logging order - SD077, SD075, SD074, SD069, SD038, SD039, SD041, SD043, SD047, SD046, SD052, SD079, SD054, SD080, SD062, SD053, SD056, SD059, SD065, SD063, SD064, SD105, SD106, SD096, SD088, SD083, SD085, SD093, SD100). Eight different material types were identified (Table 18.1) with material types 2, 3 and 4 representing the massive sulfide horizon. The material types are illustrated in Figures 18.2 to 18.9.

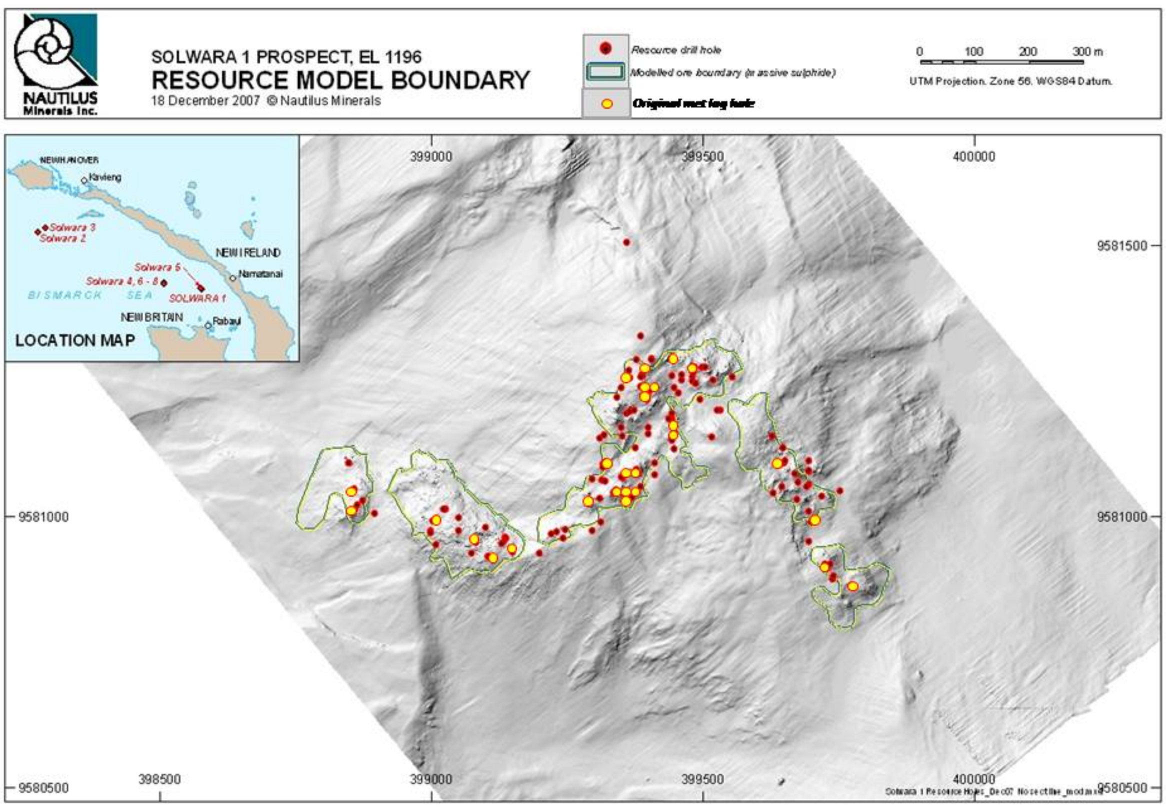


Figure 18-1 Location of holes selected for detailed metallurgical logging

Table 18-1 Material type categories –metallurgical samples

No.	MATERIAL TYPE DESCRIPTION	Kg SAMPLE COLLECTED
1	cpy-py-spl mineralization as veins, blebs, clasts, breccias and disseminations within sedimentary units above the massive sulfide horizon	132
2	Vuggy and porous cpy-py mineralization within the massive sulfide horizon	322
3	Dense massive sulfide (cpy-py), rare vughs; can be banded. Main part of massive sulfide horizon	137
4	Brecciated massive to semi-massive sulfide, cpy-py	313
5	Dominant anhydrite/barite overprint, veins within altered footwall volcanics. py-cpy. Transition zone between massive sulfide horizon and footwall.	74
6	cpy-py mineralization with anhydrite overprint and veins within altered footwall volcanic rocks. Transition zone between massive sulfide horizon and footwall.	24
7	Altered brecciated footwall volcanics with disseminated and vein py-cpy	87
8	Altered basaltic volcanics brecciated with blebs and disseminated py-cpy	23

cpy – chalcopyrite, py – pyrite, -spl – sphalerite

Figure 18-2 Examples of material type 1

SD105: Silicified lithic sediment with pyrite, chalcopyrite filling worm burrows.

SD038: Banded pyrite, chalcopyrite filling worm tubes and along bedding planes.

Figure 18-3 Examples of material type 2

SD064: Vuggy porous pyrite, chalcopyrite skeletal ore.

SD077: Banded and vuggy pyrite rich ore, minor chalcopyrite.

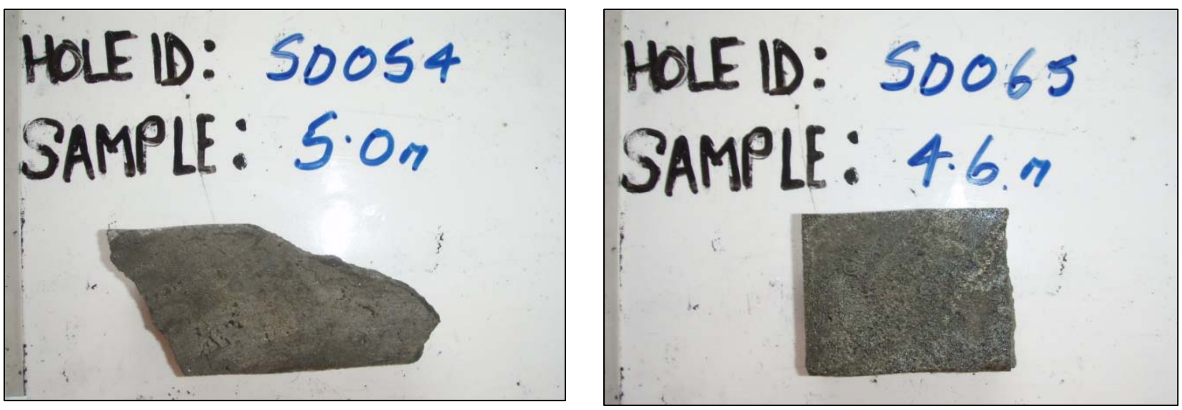


Figure 18-4 Examples of material type 3

SD054: Massive pyrite mostly with some chalcopyrite

SD065: Massive chalcopyrite with pyrite.

Figure 18-5 Example of material type 4

Brecciated matrix supported pyrite, chalcopyrite ore.

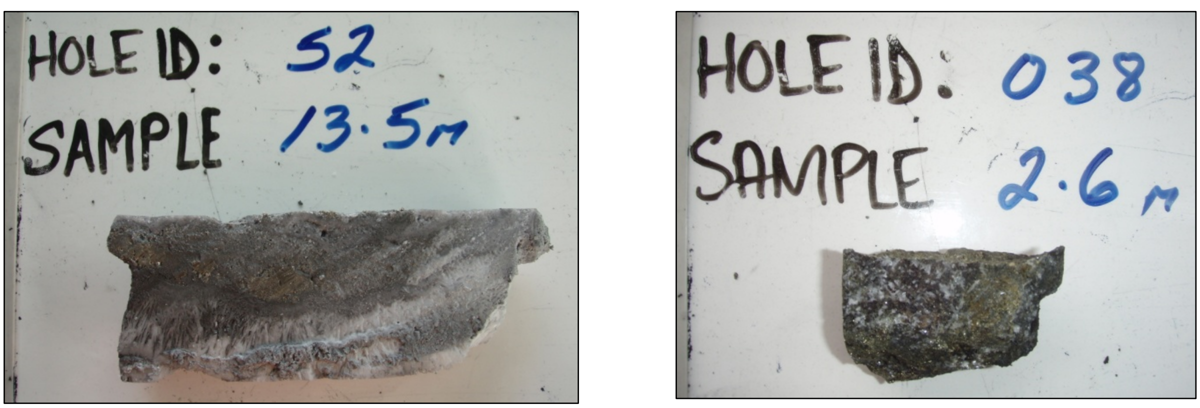


Figure 18-6 Examples of material type 5

SD052: Anhydrite vein and disseminated pyrite. Contains sphalerite.

SD038: Disseminated anhydrite and pyrite ore.

Figure 18-7 Example of material type 6

Minor pyrite and chalcopyrite disseminations with disseminated anhydrite in altered basal volcanics.

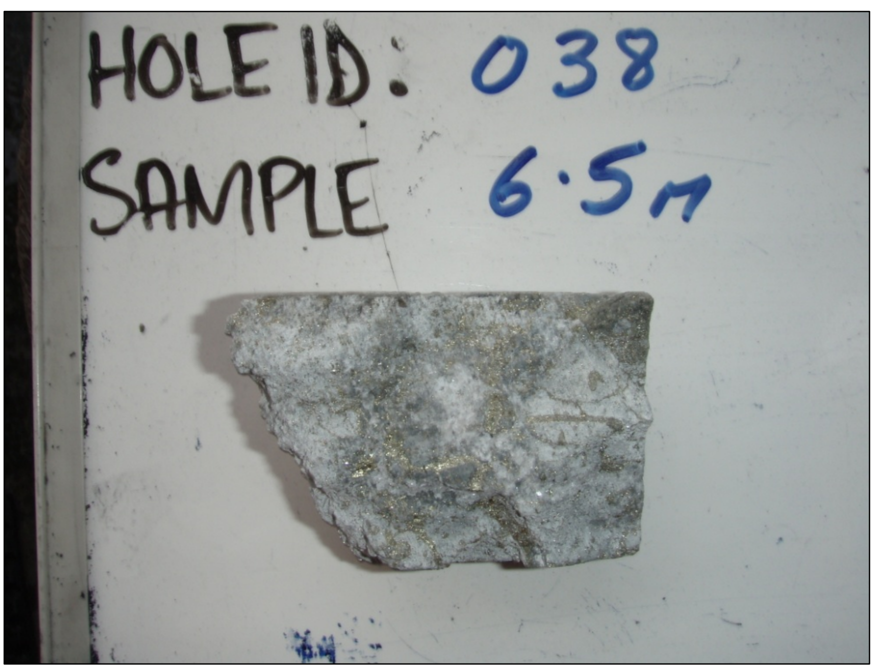


Figure 18-8 Example of material type 7

Brecciated clay altered volcanic with vein and disseminated pyrite.

Figure 18-9 Example of material type 8

Altered brecciated volcanic rock with pyrite mineralization and disseminated and cavity fill anhydrite (< 10%).

A program to drill and obtain representative samples for metallurgical assessment was designed. In all 24 holes were drilled for metallurgical assessment (Figure 18.10). The holes were carefully selected to be drilled at sites already drilled in order to provide a set of material types with relative proportions as close as possible to those indicated by the re-logging. The metallurgical drillholes were logged for lithology and material type. In addition, 28 chimney samples spread across the deposit, totalling 100kg, were collected (Figure 18.11). These were categorized as material type 9 (low zinc) or material type 10 (high zinc). These sites were selected to provide a representative geographic spread across the deposit and to provide zinc rich and copper rich material (as indicated by analysis with a hand-held XRF instrument).

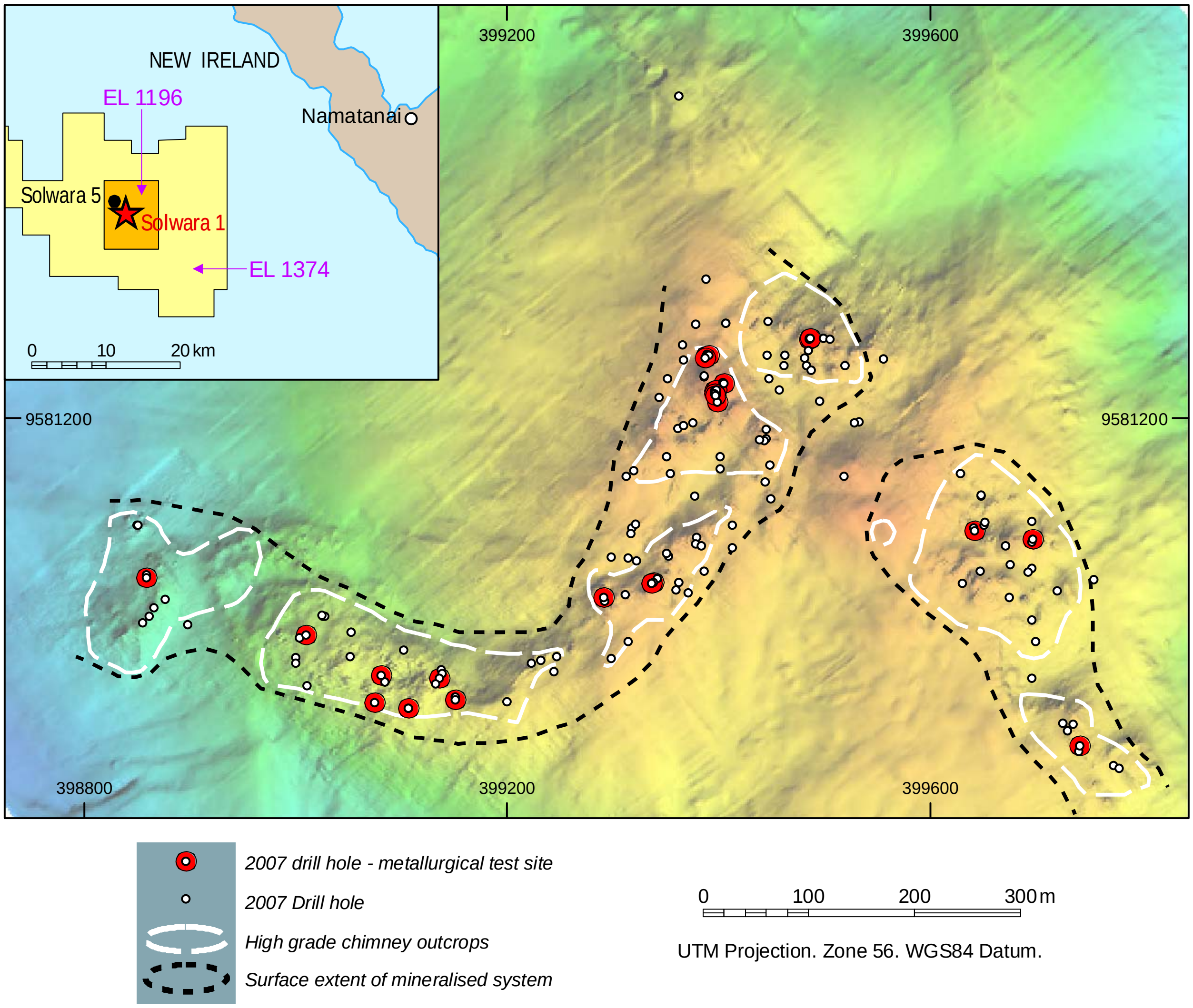


Figure 18-10 Location of drill sites for metallurgical testing 2007

The drill core and chimney samples were cleaned in fresh water, dried, vacuum sealed, placed in a nitrogen purged container, and shipped to Ammtec Laboratories (Ammtec) in Perth, Australia. Drill samples were dispatched as whole core. The samples were processed by Ammtec. The drill samples were first crushed and screened and a 100g sample obtained for geochemical analysis. The remaining sample was then tested for their metallurgical performance. Chimney samples did not undergo any sub sampling proceeding straight to metallurgical testing. At the time of writing the testing is currently underway and test results are not available.

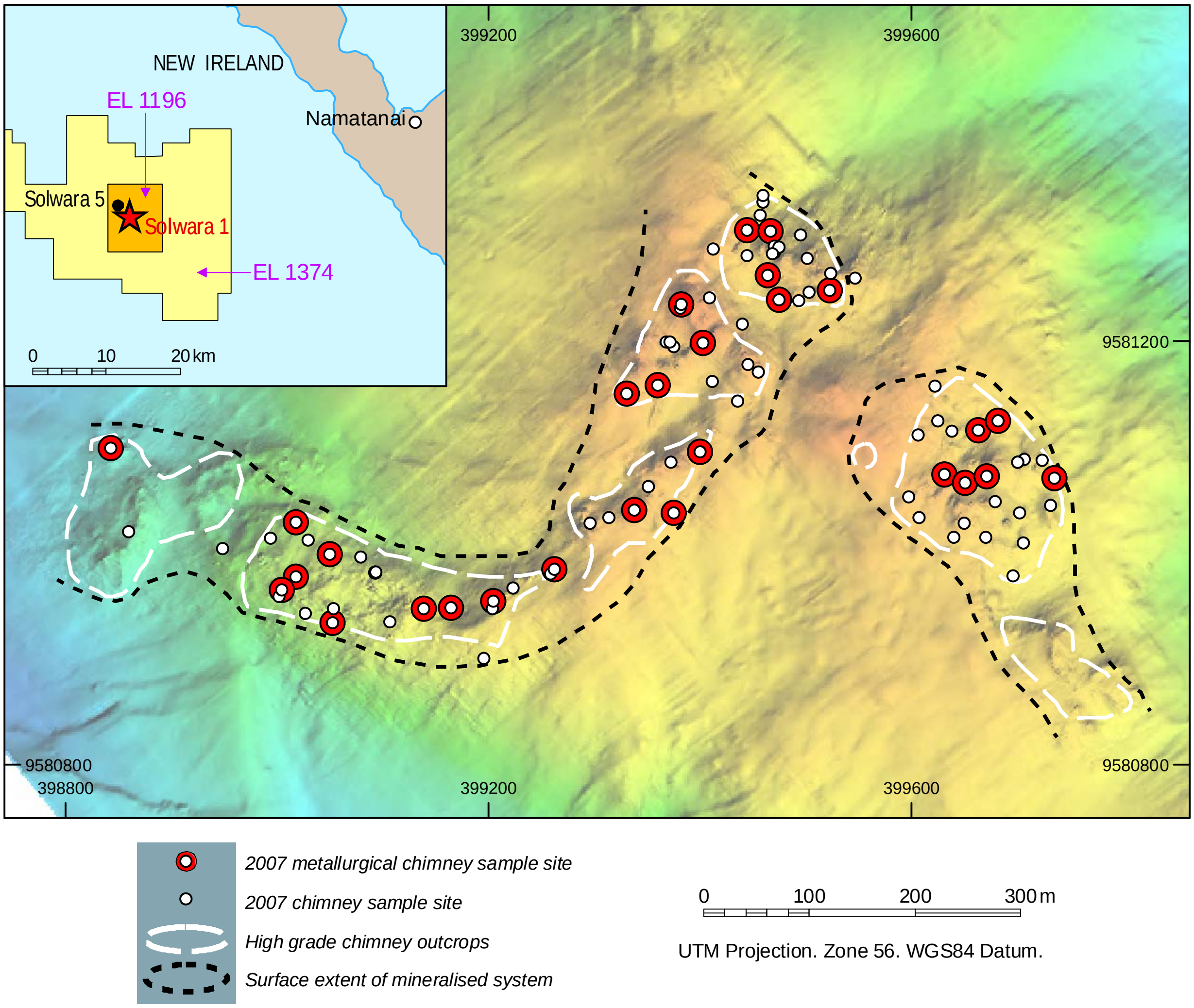


Figure 18-11 Location of chimney metallurgical test sites (2007)

ITEM 19. MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

19.1 Geological modelling

Geological modelling of the Solwara 1 SMS deposit was carried in two stages:

1. sectional interpretation followed by wire-framing to form triangulated surfaces of the sub-chimney lithology; and

2. a floating circle approach to identify the base of chimneys.

Drillholes were registered to the bathymetric data prior to sectional interpretation.

19.1.1 Sectional interpretation

The substrate beneath the chimneys was divided for resource estimation purposes into a stratigraphic sequence of unconsolidated sediments (ULS), lithified sediments (LS), massive sulfide (MS), and basement (BAS). Each logged interval within a hole was assigned to a stratigraphic unit based on the logged lithology with simultaneous on-screen checks for validation purposes.

A cross sectional interpretation of the geology was carried out based on the following observations and interpretations:

1. Chimneys and chimney mounds are comprised of massive sulfides;

2. ULS cover the entire deposit except for high relief areas. Flat areas or valleys were interpreted to contain thicker intervals of unconsolidated sediment. In general, between data points and high relief areas an ULS thickness of 1.8m, the average ULS thickness in the drillholes, was adopted;

3. LS was interpreted to be present as a thin zone widespread across much of the deposit. Where lithified sediments were not present in a drillhole the LS unit was pinched out around the drillhole by modelling the lower surface of the LS to be coincident with base of the unconsolidated sediments. This situation commonly occurred beneath the larger chimney mounds, where holes adjacent to the mound cored straight into massive sulfides;

4. The EM conductor anomaly was interpreted to define the outer limits of the massive sulfide deposit. It correlates very well with observed massive sulfide drillhole intersections. The EM anomaly is not a guide to the base metal grades of the massive sulfides;

5. The 2006 drillholes were used to supplement the geological interpretation. The logs from the 2006 were treated with caution, especially in drillholes where the core recovery was low;

6. Fresh and / or altered volcanics underlay the entire deposit; and

7. Faulting is not interpreted to play a significant part in the morphology of the deposit.

To facilitate the modelling process, the stratigraphic horizons were digitized as strings on North-South sections at 12.5m intervals from 398,750E to 399,850E (Figure 19-1). Strings were "snapped" to drillholes unless the confidence in the drillhole was determined to be low (e.g., for the 2006 drillholes). Where limited drillhole information was available, the stratigraphic interpretation and bathymetry from adjacent sections was considered during the interpretation. Stratigraphic assignment of core loss intervals was based on the core above and below the core loss interval. A generally conservative approach to modelling the MS unit was adopted; core loss above the first down-hole intersection of massive or semi-massive sulfides was assumed to be either LS or ULS, core loss below the deepest intersection of massive or semi-massive sulfides was assumed to be altered volcanic rocks of the BAS. This avoided the risk of over-estimating the thickness of the MS zone in the drillholes.

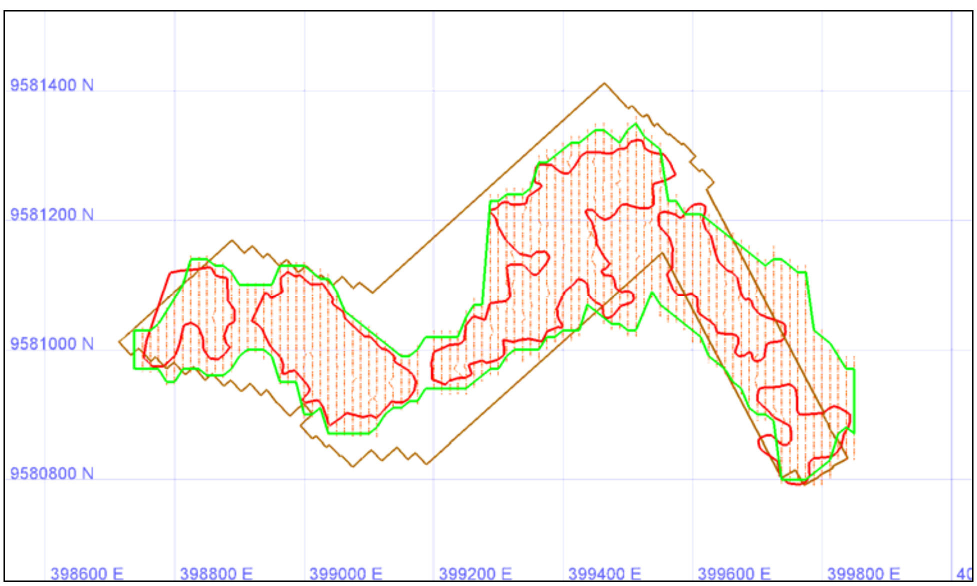


Figure 19-1 Data limits and section lines

Brown line = 20cm by 20cm bathymetry limits; red line = EM anomaly; green line = resource boundary; broken red lines = section lines.

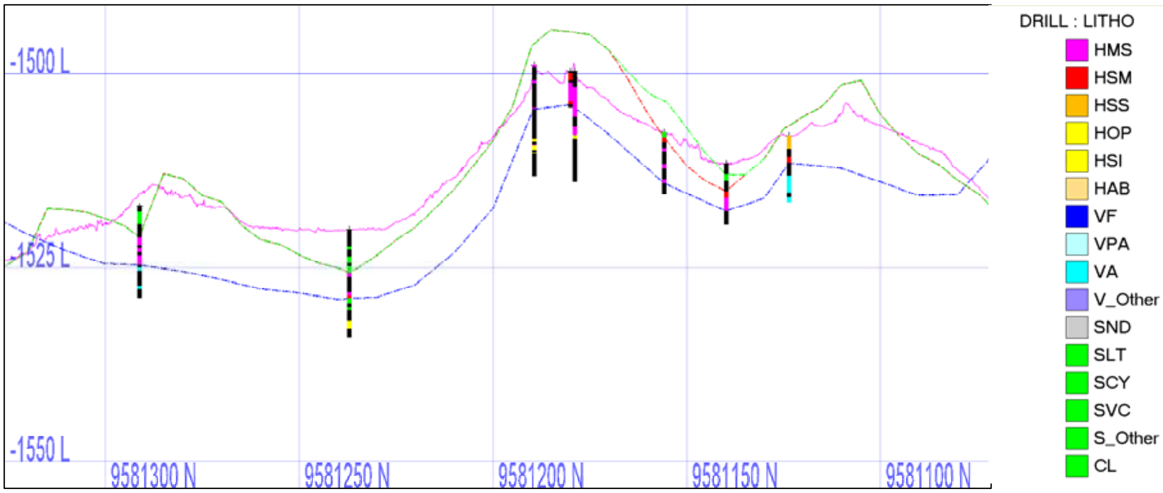


Figure 19-2 Representative section showing stratigraphic interpretation

19.1.2 Chimney interpretation

The chimney zone was interpreted using an automated floating circle algorithm that identified either local chimney peaks or sulfide mounds and created a surface beneath the base of the chimney mounds (Figure 19-3). This new surface is referred to in this report as the truncated bathymetry, with the chimney domain representing the area between the original and truncated bathymetry. The chimney domain contained 36,500m^3 of material.

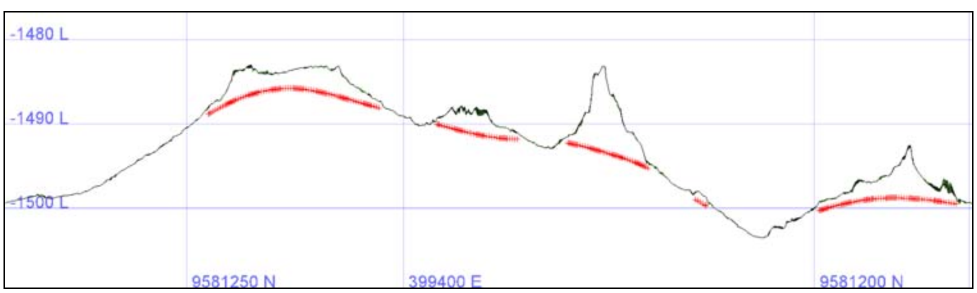


Figure 19-3 Representative section showing original (solid line) and truncated (crosses) bathymetry

The truncated bathymetry was estimated solely from the 20cm by 20cm bathymetric data. Due to the limited extent of this high resolution data it is possible that the chimney volume material is conservatively estimated. In particular, there appears to be two small sulfide mounds that straddle the high and low resolution bathymetry in the southeast corner of the deposit that may not be fully accounted for by the approach used.

Figure 19-4 shows screen captures of the original and truncated bathymetry. In the bottom right-hand corner of the lower screen capture of the truncated bathymetry the linear artefact is the contact between the higher (20cm by 20cm) and lower (1m by 1m) resolution bathymetry.

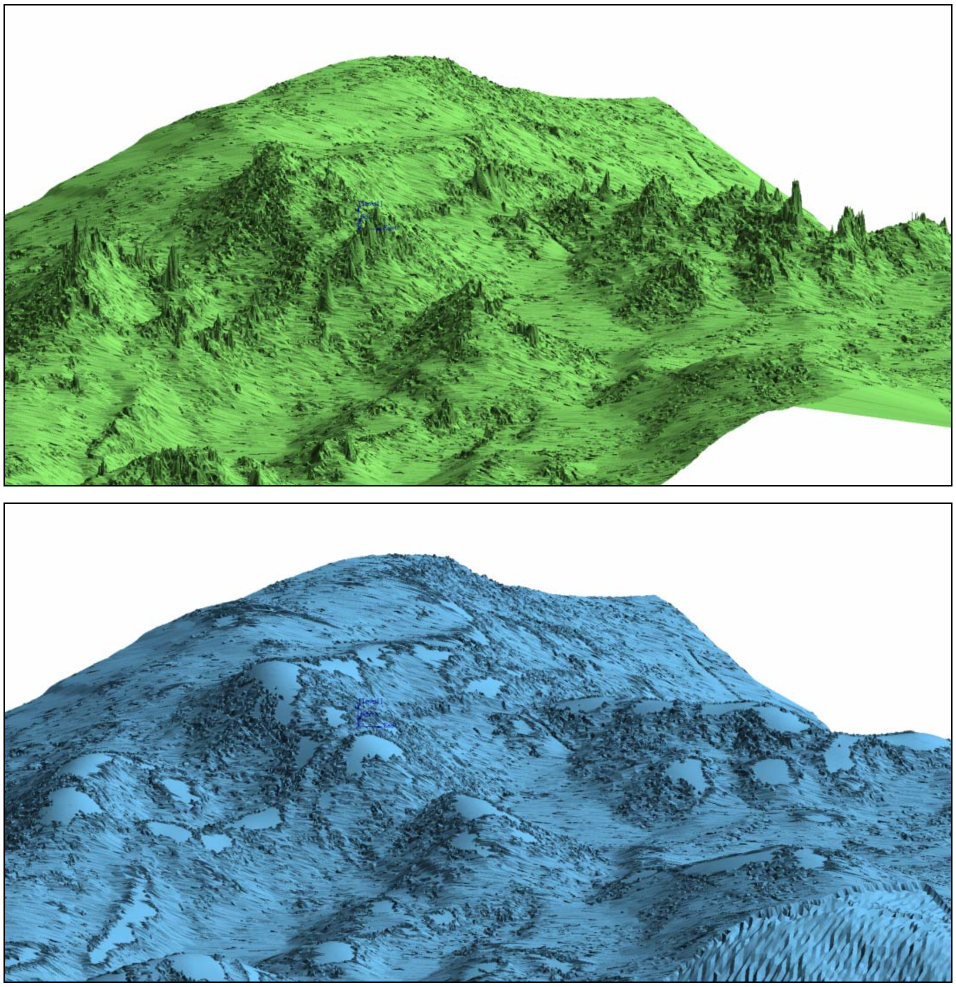


Figure 19-4 Perspective view of original (top) and truncated (bottom) bathymetry

Alternate chimney domain volumes were estimated independently by Nautilus using two additional methods:

1. A grid-based method in which a Low-Pass Filter (LPF) was applied to the gridded result using a fast fourier-transform. The implementation of the LPF produced a new grid that contained only long-wavelength features (i.e., the chimneys were removed, subject to the "strength" of the filter), which was then subtracted from the original bathymetric grid to produce a grid solely of the chimneys. In those areas where the LPF is above the true bathymetric level, the difference is reset to 0. The results of six LPFs with cut-off wavelengths varying from 5m through 30m in 5m increments were examined and are shown in Figure 19-5 and Table 19-1.

2. A line-based method in which artificial lines separated by 20cm were extracted from the grid into a database. These pseudo-lines were then filtered using a Non-Linear Filter designed to remove short-wavelength features such as chimneys. Although the process is automatic, each line required careful quality control and the method was deemed too time consuming. However, it indicated that the 20m wavelength in the grid-based method appeared to produce the most reasonable result.

The alternate chimney volume of 38,000m^3 derived by Nautilus supports the 36,500m^3 derived by Golder which was used for resource estimation. The variability of chimney volume results in Table 19-1 is mostly related to the definition of the base of the chimney mound and not to the identification of individual chimneys.

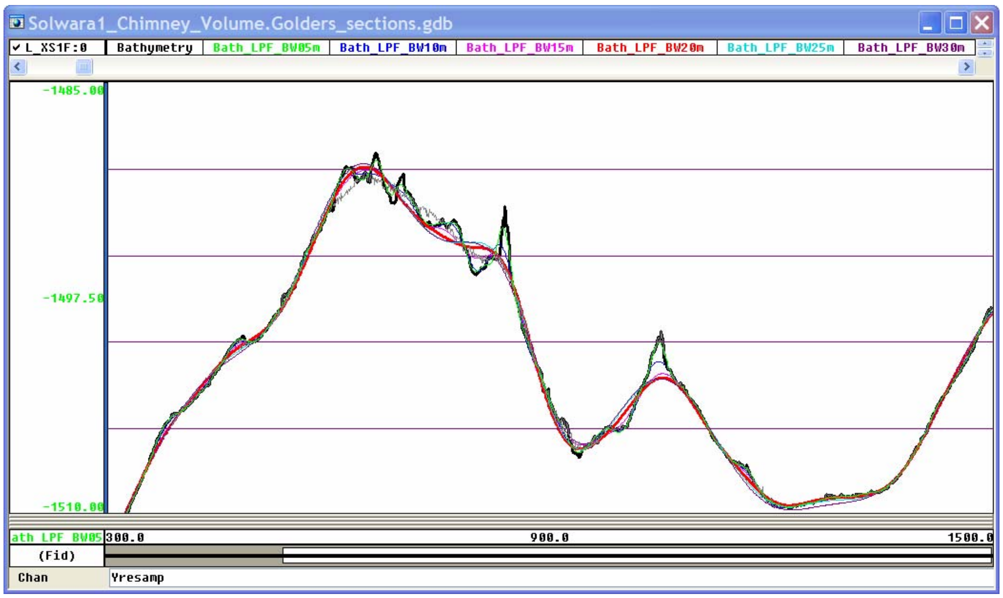


Figure 19-5 Low pass filters of various wavelength relative to bathymetry

Green=5m; Blue = 10m; Magenta = 15m; Red = 20m; Cyan = 25m; Purple = 30m

Table 19-1 Low pass filter chimney volumes for various wavelength

LPF wavelength (m)	Chimney volume (m^3)
5	9,300
10	17,000
15	26,800
20	38,000
25	49,100
30	60,500

19.1.3 Block modelling

A computer block model was constructed by filling between the wireframed surfaces to the base of the chimneys with 10m by 10m by 0.5m blocks. The block model dimensions are shown in Table 19-2. Sub-blocking was not employed, with whole blocks assigned to geological domains on a maximum proportion basis. The proportion of the block below the base of the chimneys (truncated bathymetry) was retained for resource volumetric/tonnage calculations.

The horizontal block dimensions represent around 1/3rd of the average drillhole spacing within the Indicated Resource areas. In less well drilled areas this block size could lead to over-smoothing of the block grade estimates. The vertical block dimension of 0.5m is considered suitable when compared to the average sample length and enables all mining extraction scenarios to be investigated. In general the block size was appropriate for filling between the stratigraphic surfaces.

Table 19-2 Block model dimensions

Dimension	Minimum	Maximum	Size (m)	Number
X	398,700mE	399,850mE	10	115
Y	9,580,750mN	9,581,450mN	10	70
Z	-1,750mRL	-1,470mRL	0.5	560

Whole blocks containing an estimate of the local chimney volume (proportion) were superimposed on top of the sub-chimney model (Figure 19-6). In other words, the block model was designed to represent accurately the lithological unit volumes rather than appear aesthetically pleasing. Note that in Figure 19-6, the proportion values are strongly influenced by the rise and fall of the bathymetric surfaces in the third dimension (i.e., into the page). The block model was extended to 50m below the bathymetric surface. No discrepancies between the stratigraphic surfaces and block model domain codes were observed.

Isopach maps for each domain were constructed as part of the block model validation, as shown in Figure 19-7. Note that:

- thicker massive sulfide zones correspond closely to more intense chimney development; and
- unconsolidated sediment is absent to very thin over the high relief chimney zones.

Proportion below truncated bathymetry

Block domains

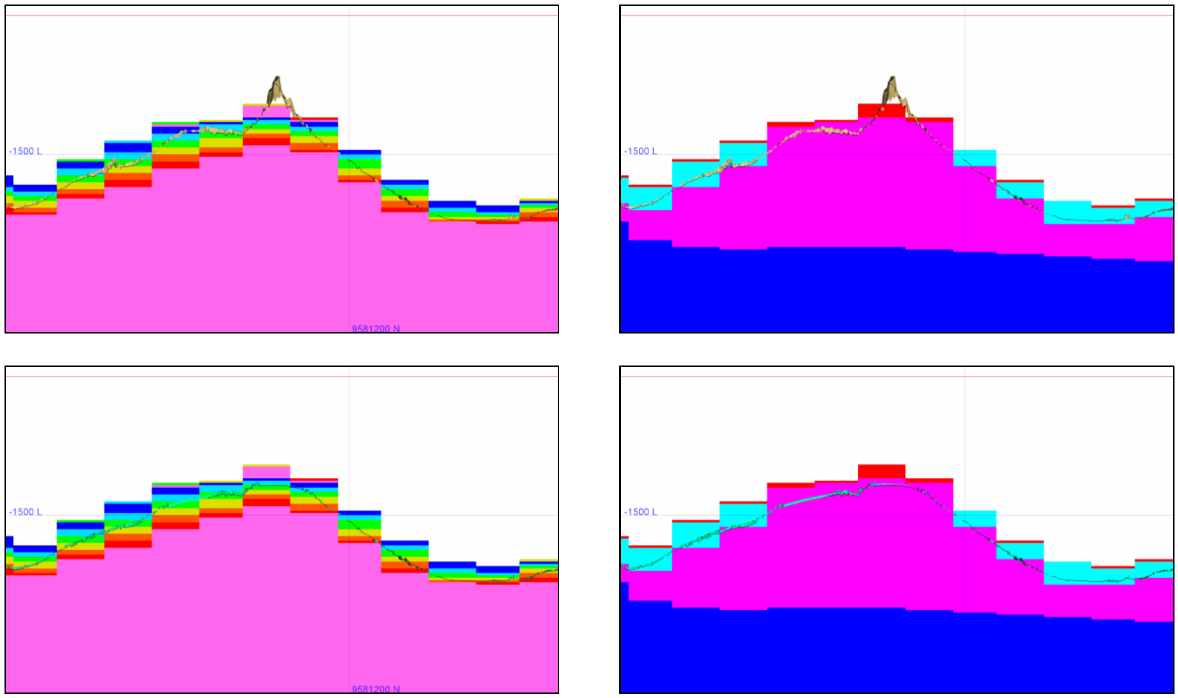


Figure 19-6 Representative section through block model

Domains: red = chimney; cyan = unconsolidated sediments; magenta = sulfide; dark blue = basement

Proportions: magenta = 1.0; other = <1.0

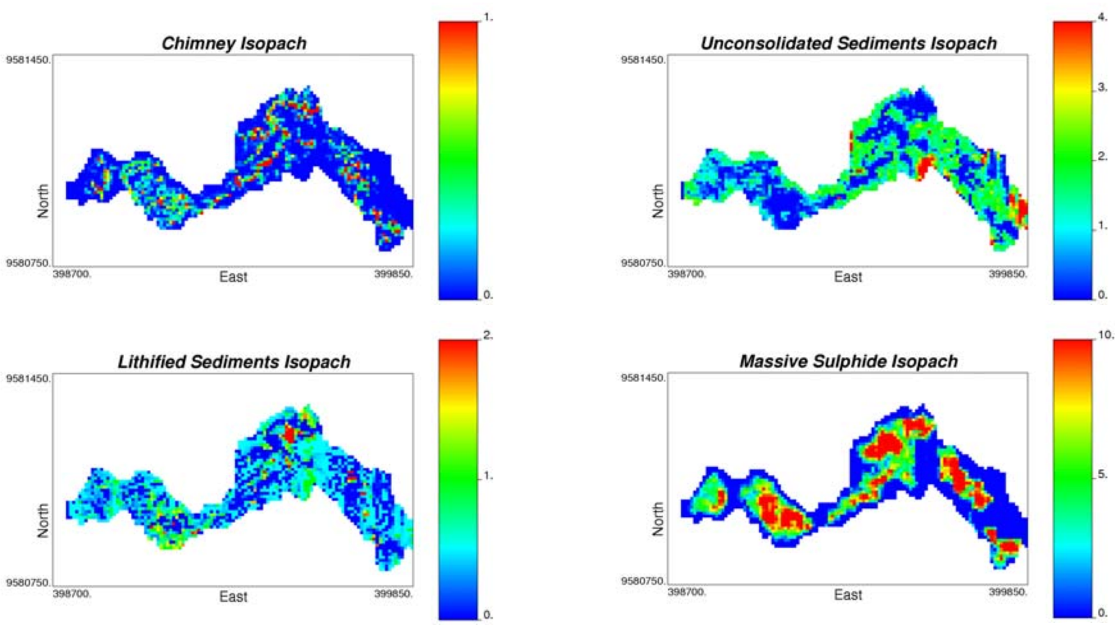


Figure 19-7 Isopach maps of domains in block model

19.2 Resource estimation database

Block grade estimation was undertaken in the sub-chimney domains using only information from the 2007 drilling program. This estimation database included 111 diamond core drillholes with the "SD" prefix (Table 19-3). Only surface chimney samples (Table 19-4) were used for block grade estimation in the chimney domain.

HOLEID	UTM_56S_ DGPS_X	UTM_56S_ DGPS_Y	UTM_56S_ DGPS_Z	DEPTH	HOLEID	UTM_56S _DGPS_X	UTM_56S_ DGPS_Y	UTM_56S _DGPS_Z	DEPTH
SD036	398848.82	9581098.91	-1630.28	2.50	SD092	399412.67	9581077.05	-1510.83	5.37
SD037	398849.62	9581098.63	-1630.07	2.96	SD093	399350.24	9581071.59	-1505.34	14.43
SD038	398858.15	9581051.41	-1615.65	13.63	SD094	399401.24	9581163.67	-1515.84	7.39
SD039	398860.93	9581012.18	-1609.01	5.57	SD095	399378.00	9581288.82	-1500.27	4.79
SD040	398896.87	9581004.22	-1614.07	2.81	SD096	399366.51	9581254.73	-1498.37	11.48
SD041	399002.79	9580991.76	-1572.05	9.22	SD097	399456.85	9581226.91	-1520.29	3.95
SD042	399051.59	9580997.39	-1563.23	8.94	SD098	399481.50	9581256.74	-1512.02	8.87
SD043	399083.91	9580950.22	-1557.21	7.81	SD099	399447.61	9581237.14	-1520.13	13.86
SD044	399243.74	9580959.51	-1521.75	6.10	SD100	399397.82	9581222.40	-1490.30	16.68
SD045	399199.58	9580931.63	-1529.81	2.70	SD101	399484.59	9581263.86	-1512.86	1.72
SD046	399150.61	9580935.42	-1543.50	13.20	SD102	399406.67	9581290.18	-1500.87	1.91
SD047	399105.51	9580925.56	-1551.58	9.50	SD103	399406.15	9581289.30	-1500.96	2.16
SD048	399101.67	9580979.90	-1555.40	14.88	SD104	399359.43	9581037.49	-1510.51	1.83
SD049	399136.96	9580961.95	-1552.77	17.21	SD105	399336.07	9581043.04	-1503.76	17.00
SD050	399231.37	9580970.25	-1524.47	10.13	SD106	399362.08	9581044.62	-1509.02	10.35
SD051	399137.75	9580958.52	-1551.77	13.25	SD107	399555.45	9581255.90	-1514.81	4.92
SD052	399291.80	9581026.19	-1504.70	16.67	SD108	399495.52	9581216.06	-1516.97	2.26
SD053	399352.01	9581069.56	-1504.98	15.23	SD109	399696.58	9581082.35	-1520.35	10.83
SD054	399341.39	9581047.57	-1502.83	17.21	SD110	399696.70	9581101.95	-1525.28	4.87
SD055	399400.78	9581151.62	-1517.06	6.78	SD111	399754.72	9581046.82	-1545.82	12.75
SD056	399397.30	9581223.27	-1490.20	18.88	SD112	399485.87	9581274.42	-1508.32	16.40
SD057	399386.25	9581238.97	-1483.06	3.14	SD113	399353.55	9581147.22	-1509.89	9.21
SD058	399386.26	9581239.98	-1483.02	10.63	SD114	399675.13	9581029.74	-1519.22	12.31
SD059	399403.90	9581233.97	-1490.62	7.15	SD115	399351.51	9581236.98	-1502.54	4.75
SD060	399343.21	9581219.43	-1502.14	18.05	SD116	399387.95	9581258.83	-1494.87	14.23
SD061	399444.30	9581179.96	-1499.66	4.73	SD117	399404.40	9581232.97	-1491.31	4.15
SD062	399442.87	9581178.87	-1499.68	14.30	SD118	399150.00	9580933.04	-1543.78	12.72
SD063	399446.19	9581291.14	-1517.03	11.89	SD119	399106.28	9580924.90	-1551.25	10.18
SD064	399485.63	9581275.54	-1508.37	19.50	SD120	399134.91	9580953.21	-1550.06	6.71
SD065	399388.55	9581260.67	-1492.91	9.58	SD121	399080.35	9580956.20	-1557.68	15.55
SD066	399387.36	9581331.68	-1503.20	5.06	SD122	399074.04	9580930.47	-1562.72	12.68
SD067	399650.59	9581098.32	-1519.76	4.75	SD123	399290.84	9581030.46	-1505.69	16.42
SD068	399652.10	9581101.45	-1520.12	9.60	SD124	399338.03	9581044.20	-1503.46	17.03
SD069	399641.57	9581096.33	-1518.24	7.57	SD125	399395.84	9581225.39	-1490.02	8.64
SD070	399695.94	9581057.49	-1527.11	0.90	SD126	399398.33	9581215.38	-1492.67	8.54
SD071	399692.72	9581054.47	-1526.90	12.90	SD127	399642.07	9581093.65	-1519.15	17.50
SD072	399696.02	9581008.56	-1529.19	15.12	SD128	399696.86	9581085.09	-1520.49	18.70
SD073	399696.04	9580953.84	-1536.03	3.56	SD129	399742.10	9580889.88	-1520.68	15.03
SD074	399699.97	9580988.13	-1531.79	8.42	SD130	398857.88	9581049.07	-1614.78	12.05
SD075	399730.37	9580904.09	-1515.60	14.13	SD131	399009.37	9580994.86	-1571.62	11.06
SD076	399740.83	9580884.22	-1522.32	9.71	SD132	399336.34	9581043.26	-1504.14	19.82
SD077	399774.10	9580871.28	-1526.86	13.93	SD133	399486.36	9581275.71	-1508.02	10.97
SD078	399630.44	9581043.37	-1508.72	12.28	SD134	399390.36	9581259.21	-1495.38	2.84
SD079	399370.92	9581034.74	-1512.10	6.95	SD135	399387.23	9581257.23	-1493.85	15.63
SD080	399378.52	9581086.72	-1495.50	13.17	SD136	399397.12	9581226.21	-1489.84	1.21
SD081	399314.04	9580988.45	-1509.65	4.56	SD137	399395.91	9581222.98	-1490.92	14.53
SD082	399297.96	9580972.22	-1509.52	3.59	SD138	399397.07	9581221.38	-1490.98	8.50
SD083	399311.15	9581032.88	-1504.72	8.73	SD139	399519.50	9581250.05	-1510.81	16.91
SD084	399297.59	9581068.05	-1514.80	4.43	SD140	399360.83	9581190.17	-1505.37	14.79
SD085	399317.95	9581096.19	-1508.07	8.70	SD141	399010.29	9580946.82	-1574.95	6.68
SD086	399312.22	9581144.70	-1503.73	6.63	SD142	399445.24	9581259.77	-1519.51	5.31
SD087	399449.04	9581123.60	-1508.04	8.52	SD143	399648.70	9581126.24	-1521.11	10.13
SD088	399447.96	9581155.85	-1507.63	7.99	SD144	399376.94	9581126.22	-1519.52	5.71
SD089	399443.81	9581139.85	-1511.61	7.86	SD145	399648.58	9581126.85	-1521.10	8.24
SD090	399386.32	9581054.62	-1512.38	14.50	SD146	399676.04	9581061.55	-1520.62	6.28
SD091	399413.05	9581098.89	-1511.26	6.67					

Table 19-3 Drillhole collar coordinates

SAMPLEID	SiteNo	UTM_56S_ DGPS_X	UTM_56S_ DGPS_Y	Z	SAMPLEID	SiteNo	UTM_56S_ DGPS_X	UTM_56S_ DGPS_Y	Z
58505	SSU_07_CH_006	399059.0	9580990.0	-1567.0	59744	SOL1_07_CH_069	399049.5	9580999.0	-1582.0
58506	SOL1_07_CH_001	399607.0	9581033.0	-1503.0	59746	SOL1_07_CH_070a	399052.2	9580933.3	-1588.2
58508	SSU_07_CH_008	399083.0	9580966.0	-1548.0	59748	SOL1_07_CH_070b	399052.6	9580946.7	-1586.9
58542	SOL1_07_CH_002	399706.0	9581088.0	-1500.0	59750	SOL1_07_CH_071	399026.0	9580942.7	-1595.5
58543	SOL1_07_CH_003	399470.0	9581284.0	-1500.0	59752	SOL1_07_CH_072	399017.7	9580977.2	-1597.5
58544	SOL1_07_CH_004	399700.5	9581086.0	-1500.0	59754	SOL1_07_CH_073	399004.2	9580964.6	-1596.7
58545	SOL1_07_CH_005	399470.0	9581290.0	-1500.0	59756	SOL1_07_CH_074	399028.8	9581012.2	-1577.0
58546	SOL1_07_CH_006	399474.0	9581289.0	-1500.0	59758	SOL1_07_CH_075	398993.4	9581013.4	-1600.0
58547	SOL1_07_CH_007	399468.0	9581283.0	-1500.0	59760	SOL1_07_CH_076a	399017.5	9581028.7	-1603.2
58548	SOL1_07_CH_008	399412.0	9581288.0	-1500.0	59762	SOL1_07_CH_076b	399017.5	9581028.7	-1603.2
58549	SOL1_07_CH_009	399700.0	9581086.0	-1500.0	59764	SOL1_07_CH_077	398842.5	9581099.0	-1657.9
58550	SOL1_07_CH_010	399092.0	9580981.0	-1500.0	59766	SOL1_07_CH_078	399624.7	9581125.0	-1533.7
58551	SOL1_07_CH_011	399092.0	9580981.5	-1500.0	59768	SOL1_07_CH_079	399605.8	9581111.1	-1529.5
58553	SOL1_07_CH_013	399092.5	9580981.0	-1500.0	59770	SOL1_07_CH_080a	399662.6	9581115.9	-1540.7
58554	SOL1_07_CH_014	399092.5	9580981.5	-1500.0	59772	SOL1_07_CH_080b	399681.8	9581124.5	-1547.4
58556	SOL1_07_CH_017	399696.0	9580978.4	-1533.3	59774	SOL1_07_CH_081	399630.9	9581074.5	-1532.7
58557	SOL1_07_CH_018	399706.0	9581009.7	-1529.9	59776	SOL1_07_CH_082a	399650.1	9581066.4	-1533.7
58558	SOL1_07_CH_019	399678.6	9581048.5	-1519.4	59778	SOL1_07_CH_082b	399670.7	9581072.4	-1538.3
58559	SOL1_07_CH_020	399638.2	9581114.9	-1517.4	59780	SOL1_07_CH_083	399723.5	9581087.4	-1544.4
58560	SOL1_07_CH_021	399622.0	9581157.7	-1510.8	59782	SOL1_07_CH_084	399735.3	9581070.9	-1550.1
58561	SOL1_07_CH_022	399546.6	9581260.4	-1512.1	59784	SOL1_07_CH_085	399730.9	9581044.5	-1544.7
58562	SOL1_07_CH_025	399374.9	9581195.4	-1503.9	59786	SOL1_07_CH_086	399701.6	9581037.8	-1547.2
58563	SOL1_07_CH_027	399435.0	9581143.4	-1509.7	59788	SOL1_07_CH_087	399649.1	9581027.8	-1535.0
58564	SOL1_07_CH_028	399371.8	9581085.6	-1499.6	59790	SOL1_07_CH_088	399669.8	9581014.8	-1545.9
58565	SOL1_07_CH_029	399350.7	9581062.9	-1506.3	59792	SOL1_07_CH_089	399639.6	9581014.9	-1527.2
58566	SOL1_07_CH_030	399295.8	9581027.5	-1509.1	59794	SOL1_07_CH_090	399597.3	9581053.3	-1530.9
58567	SOL1_07_CH_031	399258.0	9580979.5	-1515.1	PNGSW2001	SUZ_Surf_002	399725.4	9580906.0	-1522.8
58568	SOL1_07_CH_032	399203.2	9580947.2	-1533.5	PNGSW2002	SUZ_Surf_003	399726.8	9580909.0	-1519.7
58569	SOL1_07_CH_033	399106.1	9580935.0	-1553.1	PNGSW2003	SUZ_Surf_005	399386.0	9581181.0	-1511.0
58570	SOL1_07_CH_034	399000.9	9580959.0	-1577.4	PNGSW2004	SUZ_Surf_007	399366.0	9581169.0	-1512.5
58571	SOL1_07_CH_035	398859.3	9581020.3	-1610.6	PNGSW2005	SUZ_Surf_009	399377.0	9581082.0	-1503.0
58572	SOL1_07_CH_036	398947.7	9581003.6	-1593.4	PNGSW2006	SUZ_Surf_010	399054.0	9580979.0	-1500.0
58573	SOL1_07_CH_023	399439.4	9581216.5	-1512.5	PNGSW2007	SUZ_Surf_011	399078.0	9580947.0	-1500.0
59674	SOL1_07_CH_037	399443.8	9581305.5	-1593.5	PNGSW2008	SUZ_Surf_012	399099.0	9580964.0	-1562.0
59676	SOL1_07_CH_038	399466.6	9581304.4	-1548.2	PNGSW2009	SUZ_Surf_013	398987.0	9580975.0	-1581.0
59678	SOL1_07_CH_039a	399459.0	9581332.4	-1549.4	PNGSW2011	SUZ_Surf_014	398830.0	9580973.0	-1623.0
59680	SOL1_07_CH_039b	399459.0	9581332.4	-1549.4	PNGSW2014	SUZ_Surf_019	399349.0	9581178.0	-1504.0
59682	SOL1_07_CH_039c	399458.9	9581338.6	-1553.3	PNGSW2016	SUZ_Surf_018	399605.0	9581054.0	-1500.0
59684	SOL1_07_CH_040	399456.9	9581319.9	-1550.5	PNGSW2017	SUZ_Surf_021	399769.0	9580824.0	-1535.0
59686	SOL1_07_CH_041	399495.1	9581301.3	-1544.2	PNGSW2018	SUZ_Surf_026	399735.0	9580920.0	-1516.0
59688	SOL1_07_CH_042	399500.8	9581278.8	-1519.0	PNGSW2019	SUZ_Surf_025	399633.0	9581142.0	-1521.0
59690	SOL1_07_CH_043	399523.6	9581264.1	-1526.8	PNGSW2021	SUZ_Surf_028	399660.0	9581085.0	-1520.0
59692	SOL1_07_CH_044a	399493.0	9581239.1	-1535.9	PNGSW2022	SUZ_Surf_027	399629.0	9581140.0	-1516.0
59694	SOL1_07_CH_044b	399502.6	9581247.0	-1529.3	PNGSW2023	SUZ_Surf_022	399802.0	9580855.0	-1550.0
59696	SOL1_07_CH_045	399522.7	9581248.2	-1528.0	PNGSW2025	SUZ_Surf_020	399707.0	9581090.0	-1526.0
59698	SOL1_07_CH_046	399463.5	9581262.6	-1542.3	PNGSW2027	SUZ_Surf_030	399632.0	9581141.0	-1521.0
59700	SOL1_07_CH_047	399474.8	9581239.2	-1542.9	PNGSW2028	SUZ_Surf_031	399662.0	9581040.0	-1501.0
59702	SOL1_07_CH_048	399443.9	9581281.2	-1539.0	PNGSW2029	SUZ_Surf_032	399664.0	9581040.0	-1505.0
59704	SOL1_07_CH_049	399408.8	9581240.9	-1514.3	PNGSW2031	SUZ_Surf_033	399670.0	9581043.0	-1508.0
59706	SOL1_07_CH_050	399382.3	9581235.5	-1510.6	PNGSW2051	SUZ_Surf_006	399414.2	9581201.0	-1505.7
59708	SOL1_07_CH_051	399402.6	9581199.1	-1519.0	PNGSW2052	SUZ_Surf_015	399452.0	9581292.0	-1523.0
59710	SOL1_07_CH_052	399370.9	9581199.2	-1523.6	PNGSW2053	SUZ_Surf_017	399719.0	9581089.0	-1533.0
59712	SOL1_07_CH_053	399455.1	9581171.1	-1527.6	PNGSW2054	SUZ_Surf_020	399707.0	9581090.0	-1526.0
59714	SOL1_07_CH_054	399445.3	9581177.9	-1520.1	PNGSW2056	SUZ_Surf_023	398851.0	9581005.0	-1613.0
59716	SOL1_07_CH_055	399411.3	9581161.8	-1539.0	PNGSW2057	SUZ_Surf_024	399633.0	9581146.0	-1520.0
59718	SOL1_07_CH_056	399359.4	9581158.9	-1532.8	PNGSW2058	SUZ_Surf_029	399660.0	9581085.0	-1520.0
59720	SOL1_07_CH_057	399330.6	9581150.8	-1528.6	PNGSW2059	SUZ_Surf_034	399429.0	9581193.0	-1502.0
59722	SOL1_07_CH_058	399399.6	9581095.5	-1446.4	PNGSW2061	SUZ_Surf_035	399424.0	9581204.0	-1500.0
59724	SOL1_07_CH_059	399374.9	9581037.3	-1535.2	PNGSW2065	SUZ_Surf_036	399050.0	9580968.0	-1561.0
59726	SOL1_07_CH_060	399337.3	9581040.8	-1506.5	PNGSW2068	SUZ_Surf_037	399073.0	9580969.0	-1558.9
59728	SOL1_07_CH_061	399313.4	9581033.4	-1527.8	PNGSW2069	SUZ_Surf_038	399075.0	9580971.0	-1558.2
59730	SOL1_07_CH_062	399261.7	9580984.4	-1546.3	PNGSW2072	SUZ_Surf_039	399074.0	9580966.0	-1560.1
59732	SOL1_07_CH_063	399222.8	9580966.3	-1550.9	PNGSW2074	SUZ_Surf_040	399430.0	9581253.0	-1522.6
59734	SOL1_07_CH_064	399203.8	9580954.2	-1557.1	PNGSW2077	SUZ_Surf_041	399531.0	9581238.0	-1524.8
59736	SOL1_07_CH_065	399138.6	9580946.9	-1563.5	PNGSW2079	SUZ_Surf_042	399380.0	9581071.0	-1513.0
59738	SOL1_07_CH_066	399164.4	9580947.9	-1578.3	PNGSW2081	SUZ_Surf_043	399364.0	9581072.0	-1511.0
59742	SOL1_07_CH_068	399078.4	9580995.6	-1581.4					

Table 19-4 Chimney sample coordinates

19.3 Compositing

Due to the amount of core loss and the irregular sampling intervals compositing was not undertaken. However, to account for the variable sample lengths, samples were length-weighted during block grade estimation. The minimum and maximum sample lengths were 0.09m and 1.85m respectively, with an average of 0.76m. Figure 19-8 shows a histogram of the sample lengths.

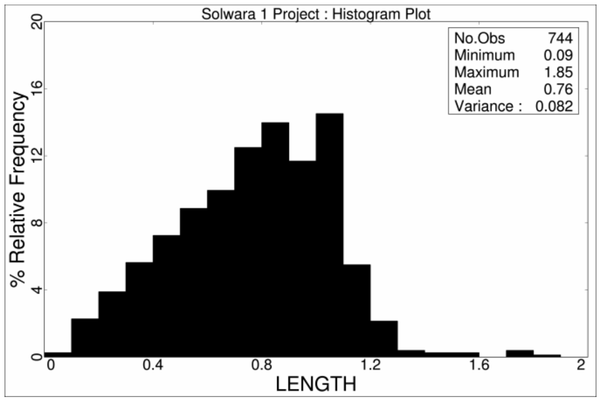


Figure 19-8 Histogram of sample lengths

Figure 19-9 shows scatter plots of Cu, Au, Ag and Zn grades versus sample length. These plots indicate the correlation between grades and sample length is low, supporting the decision not to composite the samples but rather to use their lengths for weighting during block grade estimation.

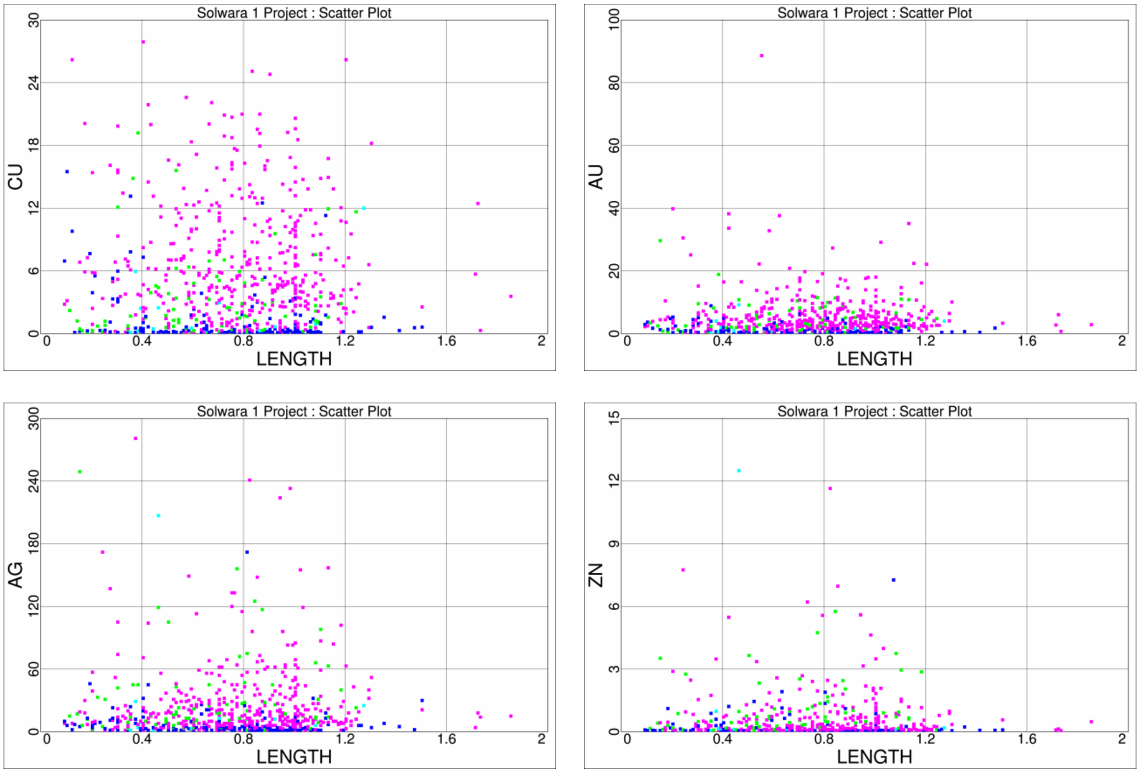


Figure 19-9 Scatter plots of grade versus sample length

19.4 Statistical analysis

Both the diamond drilling and surface chimney sampling were observed to be clustered. To account for the influence of clustered data (i.e., represent reasonably the univariate sample statistics), Golder generated sample declustering weights by cell declustering with a 25m by 25m horizontal cell dimension. Summary univariate statistics are shown in Table 19-5.

The declustered univariate statistics were used to validate the kriged block model. It is important to note that the declustered statistics do not account for extrapolation within or at the margins of the resource area.

Cumulative probability plots for Ag, Au, Cu and Zn by flagged estimation domain are shown in Figure 19-10 and Figure 19-11. These cumulative probability plots were used determine the high grade cuts that needed to be applied to sample grade values for block grade estimation, as shown in Table 19-6. High grade cuts were identified from “breaks” in the essentially straight lines in the higher-grade parts of these plots.

Table 19-5 Declustered summary statistics

Element	Domain	No. Obs.	Min.	Max.	Mean	Variance	CV
Cu	200	20	0.03	11.9	1.04	4.72	2.09
(%)	300	113	0.01	19.1	2.84	12.4	1.24
	400	481	0.01	27.8	7.01	35.4	0.85
	500	249	0.005	15.4	1.05	5.72	2.28
	600	137	0.04	25	10.50	64.8	0.77
Au	200	13	0.01	8.86	1.07	1.64	1.19
(g/t)	300	84	0.04	29.3	3.38	14.0	1.11
	400	442	0.01	88.3	5.98	47.8	1.16
	500	176	0.01	8.57	0.85	2.23	1.75
	600	137	0.01	40	14.91	98.6	0.67
Ag	200	13	0.5	206	7.09	493	3.13
(g/t)	300	85	0.5	556	26.06	2325	1.85
	400	442	0.5	1500	35.12	4832	1.98
	500	198	0.5	171	6.31	268	2.60
	600	137	10	300	151.7	6466	0.53
Zn	200	15	0.005	12.45	0.35	1.78	3.85
(%)	300	91	0.005	5.71	0.71	1.12	1.50
	400	449	0.005	17.5	0.67	2.08	2.16
	500	197	0.005	7.22	0.18	0.40	3.59
	600	126	0.05	20	5.85	42.3	1.11

Table 19-6 High grade cuts

Zone	Domain Code	Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)
UCS	200	10	5	40	2
LS	300	7	10	120	4
MS	400	20	30	200	4
Base	500	10	6	50	1
Chimney	600	25	40	300	20

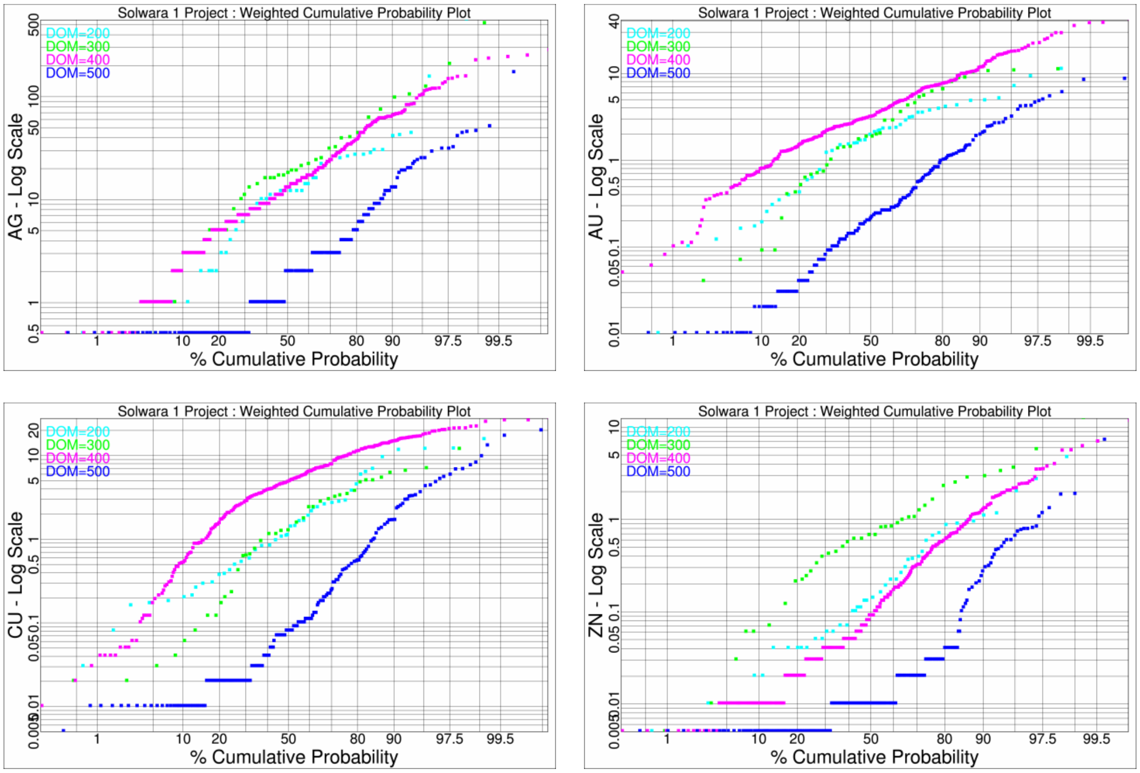


Figure 19-10 Cumulative probability plots for sub-chimney domains

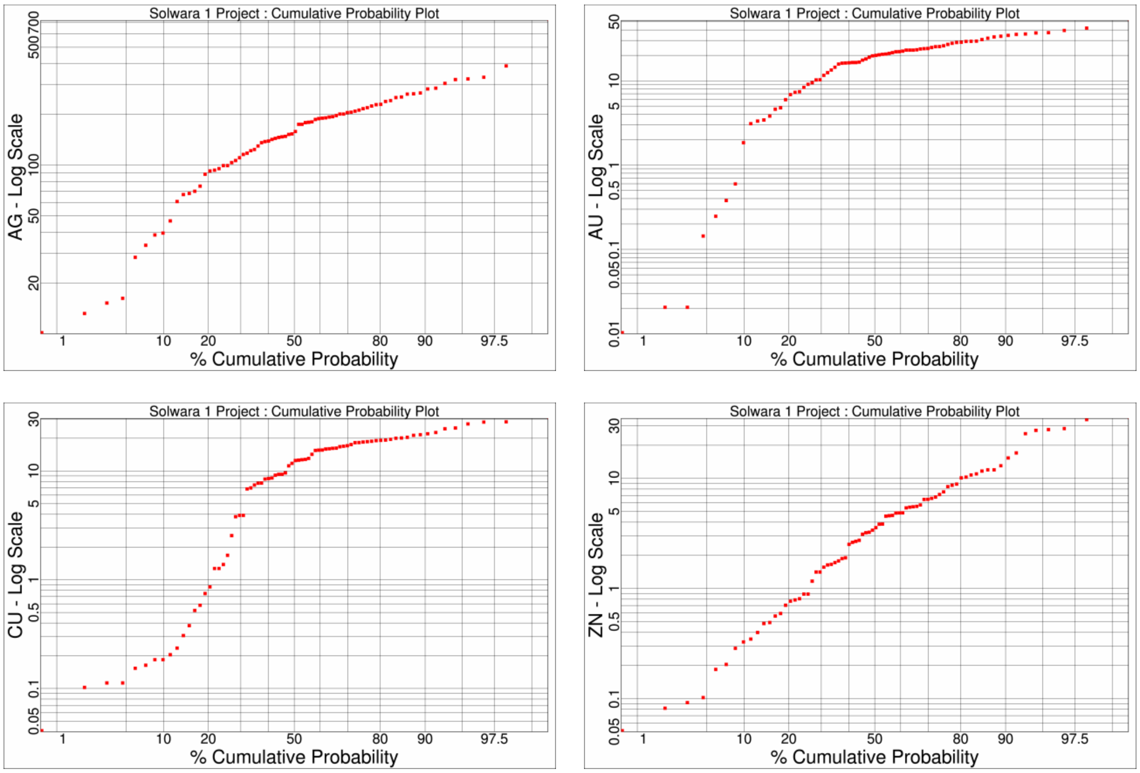


Figure 19-11 Cumulative probability plots for chimney domain

19.5 Bulk density

Measurements of dry bulk density were determined on samples of drill core and chimneys, as described in Item 15-3. The average dry bulk density values were assigned to each block in the model using its stratigraphic domain, as presented in Table 19-7. The average experimental dry bulk density for the massive sulfide mineralization was 3.4t/m^3 and for the semi-massive was 3.1t/m^3. The dry bulk density value of 3.0t/m^3 applied to the MS zone includes a conservative allowance for the possibility that some of the zones of core loss may be due to higher than normal clay content or greater than average porosity.

Table 19-7 Dry bulk density values assigned to stratigraphic domains

Zone	Domain code	Dry bulk density (t/m^3)
UCS	200	1.2
LS	300	2.4
MS	400	3.0
Basement (altered volcanics)	500	2.2
Chimney	600	2.2

19.6 Unfolding

In instances where stratigraphic units have been subjected to folding, or where the mineralization continuity does not follow a planar orientation along strike or down dip, standard methods of variography and interpolation using linear vectors in space often do not provide a good representation of continuity. One way to account for this would be to subdivide the deposit into domains of almost constant dip orientation and perform variography for each domain independently. However, this would probably result in very few sample pairs for some domains. An alternative method, which ensures maximum correlation, uses an unfolding plane to relate samples from adjacent drillholes.

Following the definition of 3D surface models (wireframes) representing the geological interpretation, a folded surface can be defined that follows the footwall, hangingwall, or median points of each zone or domain. Alternatively, a separate surface that follows the maximum (minimum) tenor of mineralization within a wireframe can be defined. These surfaces may be modelled in 3D to create a series of unfolding surfaces about which both the data sets and the block model can be considered to be unfolded for the purpose of variography and grade estimation. The unfolding method enables the spatial relationships between geological samples to be correctly represented. For example, by unfolding using a surface, all the sample points that are equidistant from that surface become related for the purpose of estimating grades into blocks that are also equidistant from that surface.

The unfolding process allows for variable plunge and dip directions and essentially reduces the variogram search directions to two dimensions. The major and semi-major axes are now defined as the directions of greatest continuity within the plane of unfolding. When the unfolding technique is employed, the plunge and dip orientations are not relevant in the definition of the major directions of continuity.

Due to the variable orientation of the mineralization at Solwara, unfolding was employed for resource modelling in the sub-chimney domains. The following interpreted surfaces across the deposit were adopted for unfolding:

The ULS was unfolded to the base of ULS;

The LS was unfolded to the top of MS;

The MS was unfolded to the top of MS; and

The BAS was unfolded to the base of MS.

19.7 Variography

Golder investigated potential spatial anisotropy for the grade variables in question by variographic analysis. Correlograms were selected for analysis as they are robust when erratic grades are present. The correlograms used here are inverted (1 – correlogram) to present like variograms with an expected sill value of 1.0.

There was insufficient data to generate correlogram maps to assess directional anisotropy in the unfolded plane. Downhole and omniplane experimental correlograms were modelled for Cu, Au, Ag and Zn for the massive sulfide and basement domains to provide parameters for kriging, and are shown in Figure 19-12 and Figure 19-13. Omniplane correlograms represent the average correlogram within the unfolded plane. Due to insufficient data points, the MS correlograms were assumed for the chimney, ULS and LS domains.

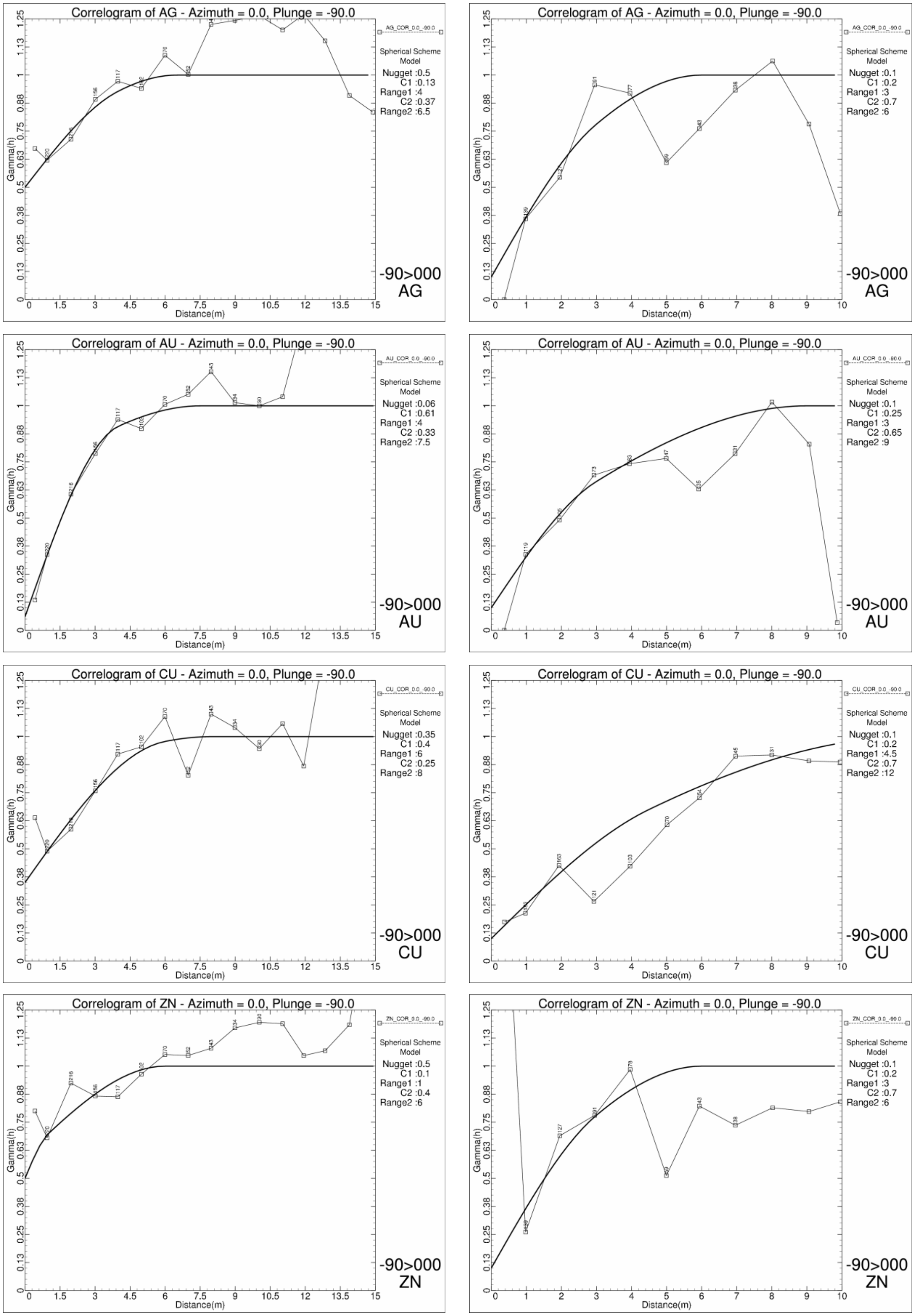


Figure 19-12 Downhole correlograms: (left) massive sulfide; (right) basement

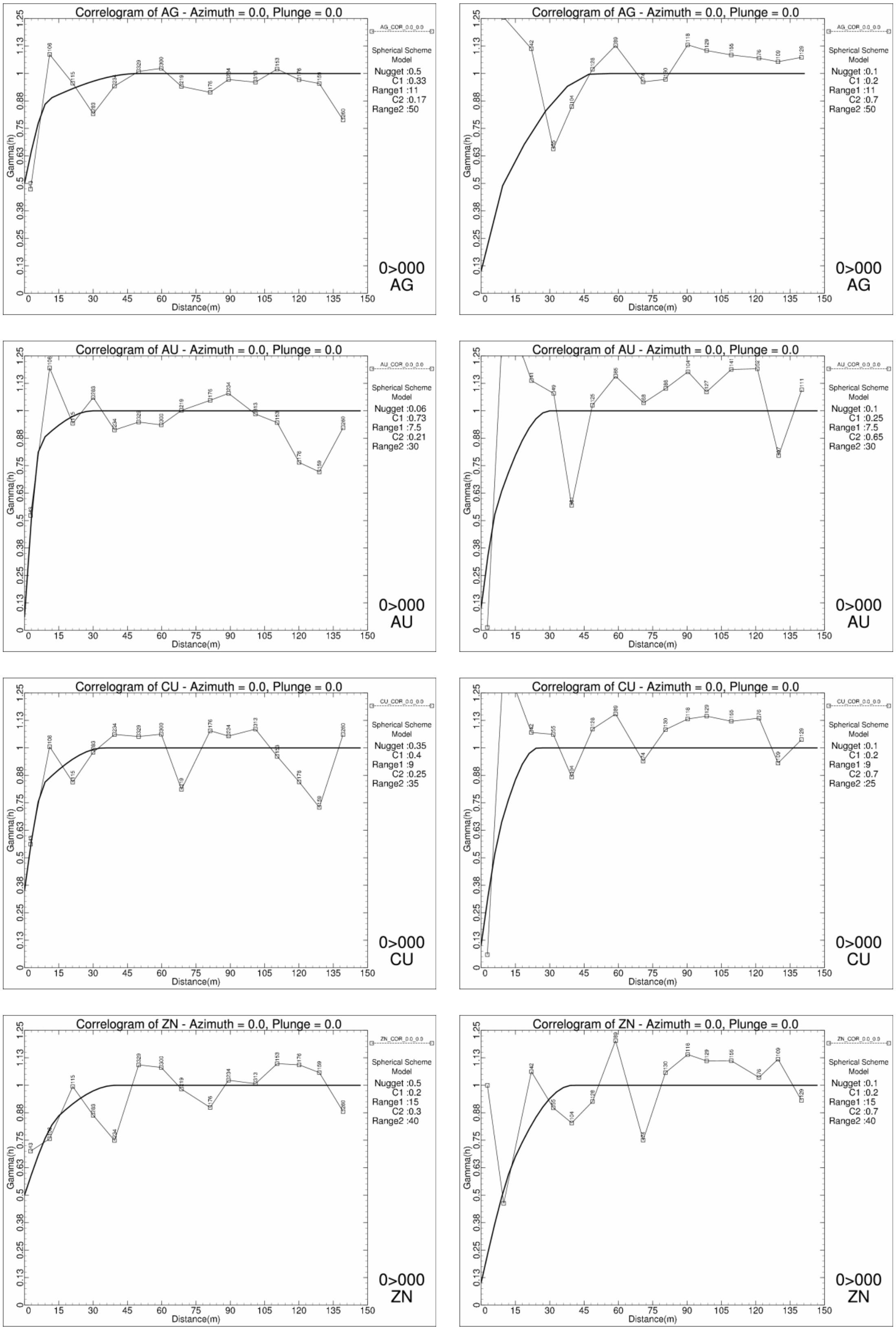


Figure 19-13 Omniplane correlograms: (left) massive sulfide; (right) basement

19.8 Grade interpolation

Block grade values were estimated by ordinary kriging (OK) for Cu, Au, Ag and Zn using unfolding. The estimation plan included:

- Two pass search strategy with search ranges of 50m in the unfolded plane and 3m vertically for the 1st pass, and 500m and 5m for the 2nd pass;
- Minimum of 7 and a maximum of 12 samples for the 1st pass, and 1 and 12 for the 2nd pass;
- Maximum of three samples per drillhole;
- Block discretisation of 4 by 4 by 1 (X, Y, Z);
- Samples were selected only from the corresponding resource estimation domain, i.e. hard boundaries between the stratigraphic horizons; and
- OK weights were subsequently weighted by sampled length then re-standardized to one.

For a large number of blocks, the effective search range was substantially reduced by the constraints on the total number of samples and number per drillhole. A small number of blocks in some domains were not estimated. These non-estimated blocks were sufficiently distant from any drillholes that they are considered unsuitable for classification even as an inferred resource.

19.9 Model validation

Golder carried out the following block model validation checks:

1. On-screen visual comparisons with the drillhole data;
2. Statistical checks between declustered data and OK estimates, shown in Table 19-8; and
3. An alternative inverse distance weighting (IDW) estimate for comparison purposes.

No obvious errors or inconsistencies were observed. Vertical discontinuities that were observed were related to the interpreted stratigraphic contacts that were used as a hard boundaries during block grade estimation.

Table 19-8 shows the declustered sample and block mean grade values for OK and IDW. Note that, the OK block mean estimates tend to be lower than the corresponding declustered sample mean grade values. However, as the OK and IDW estimates are similar, these differences are considered to be mainly the result of extrapolation into the peripheral regions of the deposit that tend to be of lower grade.

Table 19-8 Block model mean grades

Element	Domain	Sample	OK	IDW
Cu	200	1.04	1.97	1.87
(%)	300	2.84	2.51	2.67
	400	7.01	6.37	6.39
	500	1.05	0.47	0.66
	600	10.5	11.1	11.1
Au	200	1.07	1.61	1.50
(g/t)	300	3.38	3.92	3.95
	400	5.98	5.29	5.30
	500	0.85	0.45	0.60
	600	14.9	17.0	16.9
Ag	200	7.09	10.8	8.83
(g/t)	300	26.1	32.3	32.3
	400	35.1	23.6	23.5
	500	6.31	3.35	3.70
	600	151.7	170.1	169.4
Zn	200	0.35	0.25	0.19
(%)	300	0.71	1.01	1.02
	400	0.67	0.38	0.38
	500	0.18	0.07	0.08
	600	5.85	5.89	5.90

The number of drill core samples and the core recovery in the unconsolidated sediment zone are very low. Furthermore, the sample statistics and block estimates for this zone were found to be inconsistent with the grades of unconsolidated sediment samples that were collected by spearing methods for environmental purposes. In view of this, the ULS material was excluded from the resource estimate.

19.10 Resource classification

Resource classification considered a number of issues:

- Good geological continuity was observed. The stratigraphic sequence was consistent across the deposit, except for a small area intersected by two adjacent drillholes where a lava flow appears to overly the massive sulfide;
- The mineralization outcrops over significant areas of the deposit and the presence of chimneys suggests that the lateral extent of massive sulfide development has been appropriately modeled;
- High resolution 20cm by 20cm bathymetry covers the majority of the resource area with 1m by 1m horizontal resolution in some peripheral parts;

- A strong EM anomaly that is interpreted to indicate the presence of near surface sulfide mineralization is consistent with all drillhole intersections;
- Core recovery averaged 73% in the massive sulfide zone, which forms the Indicated Resource (Figure 19-14) and the majority of the Inferred Resource. Core recovery in the units above and below the massive sulfide zone was lower and highly variable, hence these zones are classified as Inferred Resource;
- Although a few drillhole intercepts in the basement zone exceeded the cut-off grade, material in this zone was not classified for the resource estimate as these widely spaced drillhole intercepts were highly erratic and the continuity of grades was unclear; and
- There were insufficient drill hole samples in the unconsolidated sediment for resource estimation. Consequently, this material has been excluded from the resource.

The zone of mineralization classified as Indicated Resource was tested by drillholes spaced from less than 10m to a maximum of approximately 50m. Within this zone, most of the blocks were estimated in the first estimation pass and the core recovery in the intercepts used to estimate the blocks was generally greater than 70%. In the area classified as Inferred Resource the drillhole spacing ranges up to 200m, but is generally less than 100m, and the core recovery was more variable. At the present time all chimney material has been classified as Inferred. The main criteria for this lower classification is that chimney sampling was limited to pieces of chimney that could be broken off from the mounds and that the grades within the mounds are therefore not estimated with confidence.

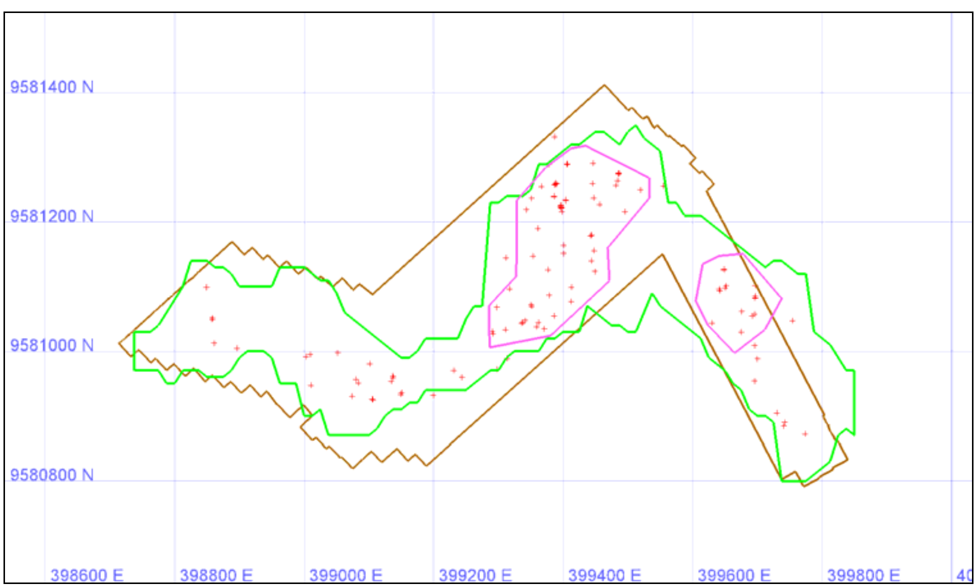


Figure 19-14 Indicated resource area

Brown line = 20cm by 20cm bathymetry limits; magenta line = Indicated Resource limit; green line = resource boundary.

19.11 Resource estimate

The Mineral Resource estimate for the Solwara 1 massive sulfide is shown in Table 19-9. The resource is declared for a 4% copper cut-off grade, which Nautilus indicates is comfortably above those indicated by previous preliminary scoping studies reported in 2006.

Table 19-9 Mineral resource estimate for Solwara 1 at 4% Cu cut off

Class	Domain	Tonnes (kt)	Cu (%)	Au (g/t)	Ag (g/t)	Zn (%)
Indicated	Massive sulfide	870	6.8	4.8	23	0.4
Inferred	Chimney	80	11	17	170	6
	Lithified Sediment	2	4.5	5.2	36	0.6
	Massive sulfide	1,200	7.3	6.5	28	0.4
	Inferred Total	1,300	7.5	7.2	37	0.8

Note: rounding may result in errors in reproducing the totals from the individual components shown in this table

19.12 Resource estimate risks

Golder considers that the following risks and uncertainties may materially influence the resource estimate:

- A significant number of drillholes ended in massive sulfide material. In such instances, and where no adjacent drillhole information was available from which the true thickness could be reasonably interpreted, the base of the drillhole was interpreted to be the base of the massive sulfides. The massive sulfide resource is therefore open at depth in some areas.

- Although a few drillhole intercepts in the basement zone exceeded the cut-off grade, material in this zone was excluded from the resource estimate as these widely spaced drillhole intercepts were erratic and their grade correlation was unclear;

- Drillhole intercepts in the unconsolidated sediment suggested that this zone contains some material above cut-off grade. Whilst this may be likely in the form of chimney rubble or interstitial sulfide precipitation, this material has been excluded from the resource estimate;

- No drillholes were located on top of the exposed chimney mounds, consequently, the block grade estimates for interpreted massive sulfide material below these mounds is based on holes drilled adjacent to these mounds. It is possible that the massive sulfide material beneath the chimney mounds may have a different mineralogical composition being closer to the interpreted source of the mineralizing fluid;

- Average core loss of around 30% could result in estimation bias if the core loss was preferentially related to low or high grade material. Closed-spaced (<5m) drilling for metallurgical samples suggests that the probability of such preferential core loss is low;

- Significant lateral extrapolation of massive sulfide mineralization to the boundaries of the EM anomaly was supported by all holes drilled in 2007. However, a large proportion of the Inferred Resource relies on this EM anomaly in areas that have not been tested by drilling. The EM provides no information on base metal grades. Furthermore, it is not possible to determine the thickness of the conductor sulfide material from the EM data, thus, the interpreted thickness of massive sulfide in areas distant to drilling is of low confidence. The EM anomaly is open at the western end of the deposit; and

- The higher-grade chimney mounds have only essentially been surface sampled by breaking off protruding chimney pieces. The interpreted depth of the chimney mounds is based on an automated algorithm that produces a truncated bathymetry that is considered geologically reasonable. However, until these mounds are tested by drilling, their grade, density and depth should be considered of low confidence. If the chimney mound/massive sulfide interface is not correctly positioned then the risk to the contained metal is considered to be low to moderate as the higher-grade/lower density chimney material would most likely be substituted by lower grade/higher density massive sulfide material.

ITEM 20. OTHER RELEVANT DATA AND INFORMATION

The author is not aware of any other relevant data or information, the omission of which would make this report misleading.

ITEM 21. INTERPRETATION AND CONCLUSIONS

In the author's opinion the data acquired during 2006 and 2007 has provided the basis for a reasonable interpretation of the geology of the Solwara 1 deposit and to demonstrate the continuity of massive sulphide mineralisation. Golder has modelled the geology and estimated an Indicated and Inferred Mineral Resource for the Solwara 1 project using appropriate industry practices in accordance with Canadian National Instrument 43-101.

ITEM 22. RECOMMENDATIONS

The work to date at Solwara 1 has demonstrated the presence of massive sulfide mineralization and has been sufficient to define Indicated and Inferred Resources. Nautilus has advised Golder that previous preliminary scoping studies reported in 2006 indicate that the deposit has reasonable prospects for economic exploitation. On this basis and subject to further mine planning and economic evaluation, the qualified person is of the opinion that the following work is warranted:

- Infill drilling with the aim of converting Inferred Resources into Indicated Resources;
- Deeper drilling in the areas in which the massive sulfide zone remains open at depth, with the aim of identifying additional, deeper resources;
- Further EM surveying to the immediate west of Solwara 1 with the aim of extending the EM anomaly, which appears open to the west, and thereby generating additional drilling targets; and
- Further investigation of methods of geochemical analysis and reassaying of sample pulps in order to improve the accuracy and precision of the Ag and Zn analyses.

Nautilus has advised that the 2008 work program for the project, with a budget of US$9M, includes progressing these recommendations. The 2008 program will be contingent upon the development of wireline drilling technology to drill deeper holes.

ITEM 23. REFERENCES

Binns, R A, 2004, Eastern Manus Basin, Papua New Guinea: guides for volcanogenic massive sulfide exploration from a modern seafloor analogue, CSIRO Explores, 2, 59-80.

C L Van Dover, 2000, The Ecology of Deep-Sea Hydrothermal Vents, Princeton University Press.

Jankowski 2006. Independent Technical Assessment of Sea Floor Massive Sulfide Exploration Tenements in Papua New Guinea, Fiji and Tonga, Report prepared for Nautilus Minerals Incorporated, prepared by SRK Consulting, Document No. NAT002, December 2006.

Large R R, Australia volcanic-hosted massive sulfide deposits: feature, styles and genetic models. Economic Geology, May 1992, v87, No. 3, pp471-510.

Large, R R, Gifkins, C C, Herrmann, W: Altered volcanic rocks: A guide to description and interpretation, Centre for Ore deposit Research, University of Tasmania, 2005.

ITEM 24. DATE

This report is based on work carried out for Nautilus from February 2007 through to the 20th December 2007.

ITEM 25. QUALIFIED PERSON CERTIFICATES

Mr Ian Lipton
Golder Associates Pty. Ltd.
611 Coronation Drive, Toowong, Queensland, 4066, Australia
Tel: +61-7-3721-5400, ilipton@golder.com.au

I, Ian Thomas Lipton, BSc (Hons), FAusIMM, do hereby certify that:

I am a Principal Geologist with Golder Associates Pty Ltd, and have been so since November 2001.

I graduated with a degree in BSc (Hons) Geological Sciences from the University of Birmingham, UK in 1981. I have worked as a geologist for a total of 26 years since my graduation from university.

I am a Fellow of the Australasian Institute of Mining and Metallurgy.

I have read the definitions of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.

I am responsible for preparation of the technical report titled 'Mineral Resource Estimate, Solwara 1 Project, Bismarck Sea, Papua New Guinea' and dated 1st February 2008 (the "Technical Report") relating to the Solwara 1 deposit, except Item 19, and with reliance on other experts as noted in Section 4. I have visited the property between 10 – 24 June 2007, 22 – 29 July 2007 and 5 – 12 September 2007.

I have had prior involvement with the property that is the subject of the Technical Report. The nature of my involvement has been in providing advice on sampling, data management, quality assurance/quality control and resource estimation to Nautilus Minerals Inc.

I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

I am independent of the issuer applying all of the tests in Section 1.4 of National Instrument 43-101.

I have read National Instrument 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.

I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 1st day of February 2008

[Signed]

________________________________ Ian Thomas Lipton, FAusIMM, BSc (Hons)

Dr Andrew Richmond
Golder Associates Pty. Ltd.
611 Coronation Drive, Toowong, Queensland, 4066, Australia
Tel: +61-7-3721-5400
arichmond@golder.com.au

I, Dr Andrew Richmond, am employed as a Consulting Geostatistician with Golder Associates Pty Ltd. and have been so since February 2004.

I am a Member of the Australasian Institute of Mining and Metallurgy (111459). I graduated from The University of Queensland with a Bachelor of Science (Honours) degree in Geology in 1988 and a Master of Science in Geostatistics in 1999, and from the University of London (Imperial College of Science, Technology and Medicine) in 2004 with a Diploma of Imperial College and a Doctor of Philosophy.

I have practiced my profession on a continuous basis since 1988.

As a result of my qualifications and experience, I am a Qualified Person as defined in NI43-101.

I am responsible for the mineral resource estimation that is reported in Item 19 of the technical report titled 'Mineral Resource Estimate, Solwara 1 Project, Bismarck Sea, Papua New Guinea' and dated 1st February 2008 (the "Technical Report") relating to the Solwara 1 deposit. I have not visited the Solwara 1 Project.

I have had prior involvement with the property that is the subject of the Technical Report. The nature of my involvement has been in providing advice on resource estimation to Nautilus Minerals Inc.

I am not aware of any material fact or material change with respect to the subject matter of this technical report which is not reflected in the technical report, and that the omission to disclose would make this report misleading.

I am independent of Nautilus Minerals Inc. in accordance with Section 1.4 of National Instrument 43-101.

I have read National Instrument 43-101 and Form 43-101 F and Item 19 has been completed in compliance with same.

I consent to the filing of the Technical Report. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 1st day of February 2008

[signed]

Dr Andrew Richmond, MAusIMM, BSc(Hons), MSc, DIC, PhD

Appendix A

Lists of Drill Hole and Chimney Samples

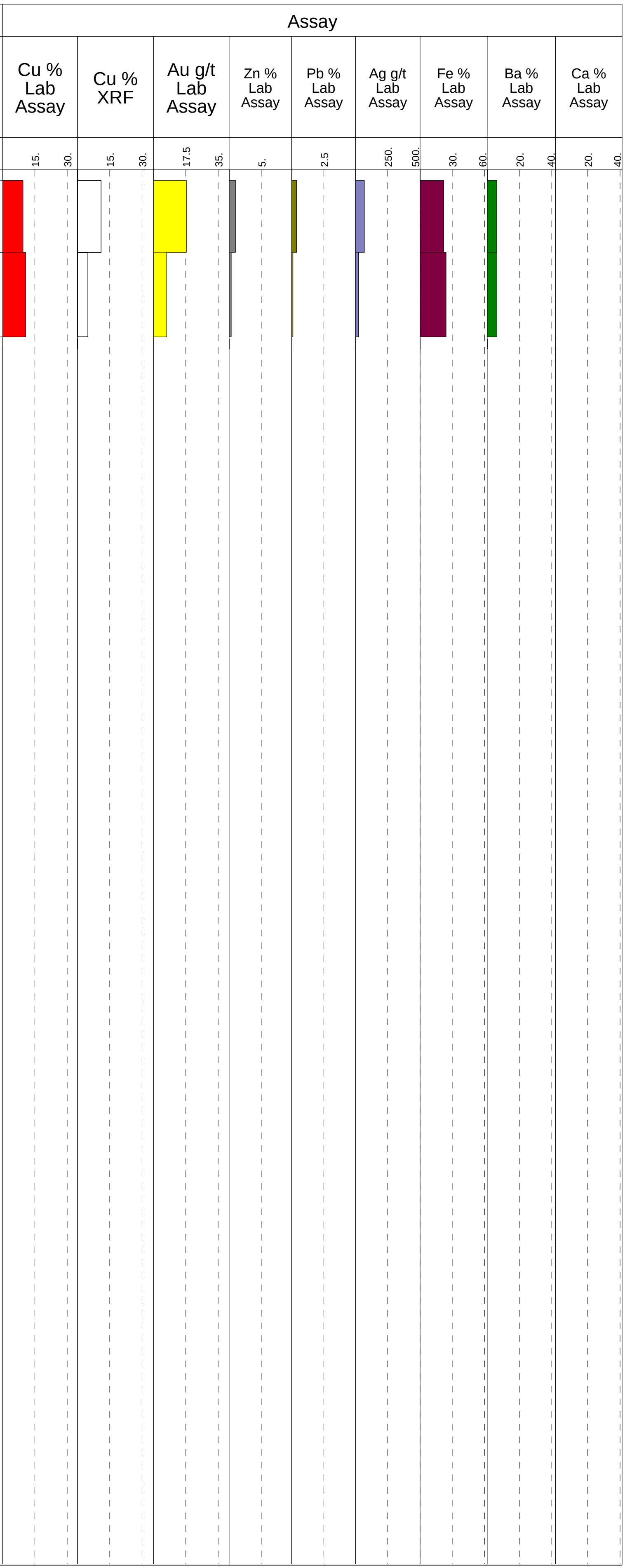
Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD036
ProjectCode: Manus
Date Drilled: 15/06/2007

East: 398848.82
North: 9581098.91
RL/Elevation: -1630.28
Depth: 2.5

From	To	Lithology	Ore Type	Domain	Sample ID
0.15	1.15	**Massive sulfide (HMS)**	1	Sulphide	58611
1.15	2.33	**Massive sulfide (HMS)**	2	Sulphide	58612



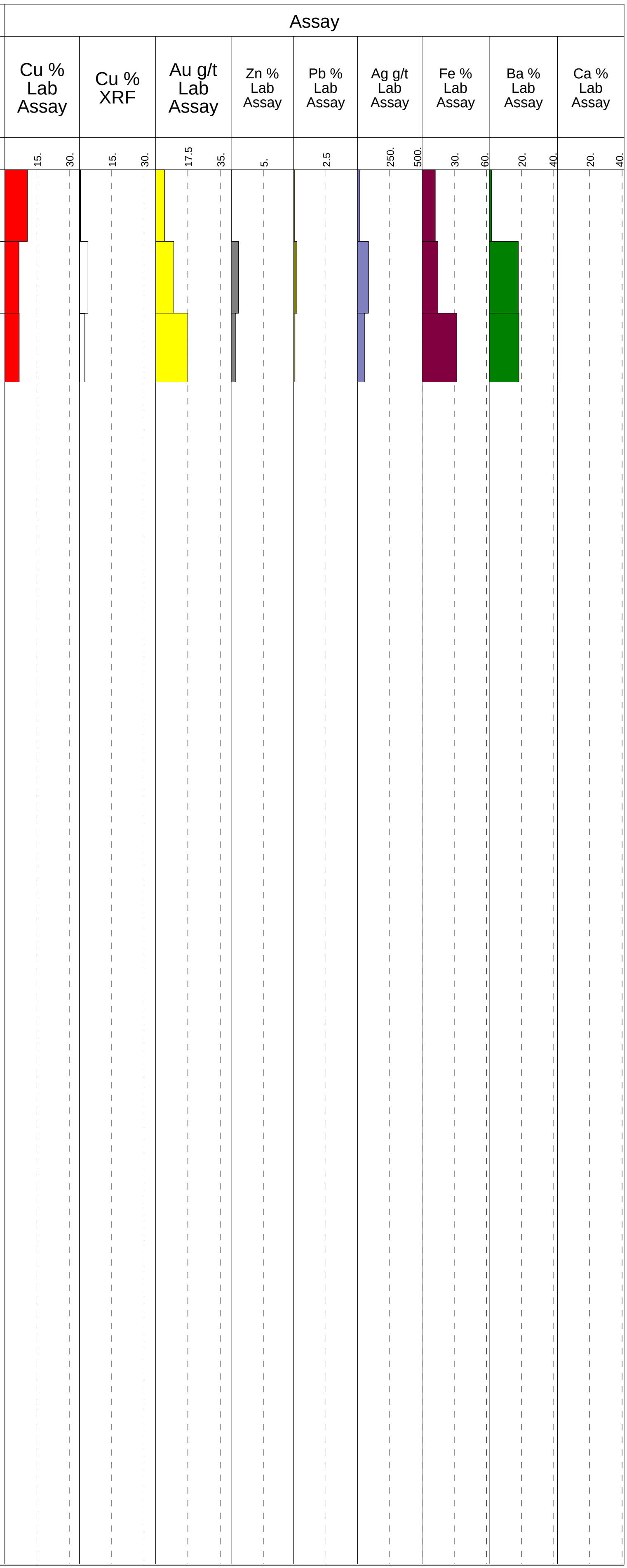
Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD037
ProjectCode: Manus
Date Drilled: 15/06/2007

East: 398849.62
North: 9581098.63
RL/Elevation: -1630.07
Depth: 2.96

Depth	From	To	Lithology		Ore Type	Domain	Sample ID
	0.00	1.00	**Fe-(Mn)-(Si) Oxides (HFE)**		1	*Sulphide*	58613
	1.00	2.00	**Massive sulfide (HMS)**		2	*Sulphide*	58614
	2.00	2.96	**Semi-massive sulfide (HSM)**		3	*Sulphide*	58615



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

UTM 56S
WGS 84
Date Printed: 7/12/2007

Nautilus Minerals

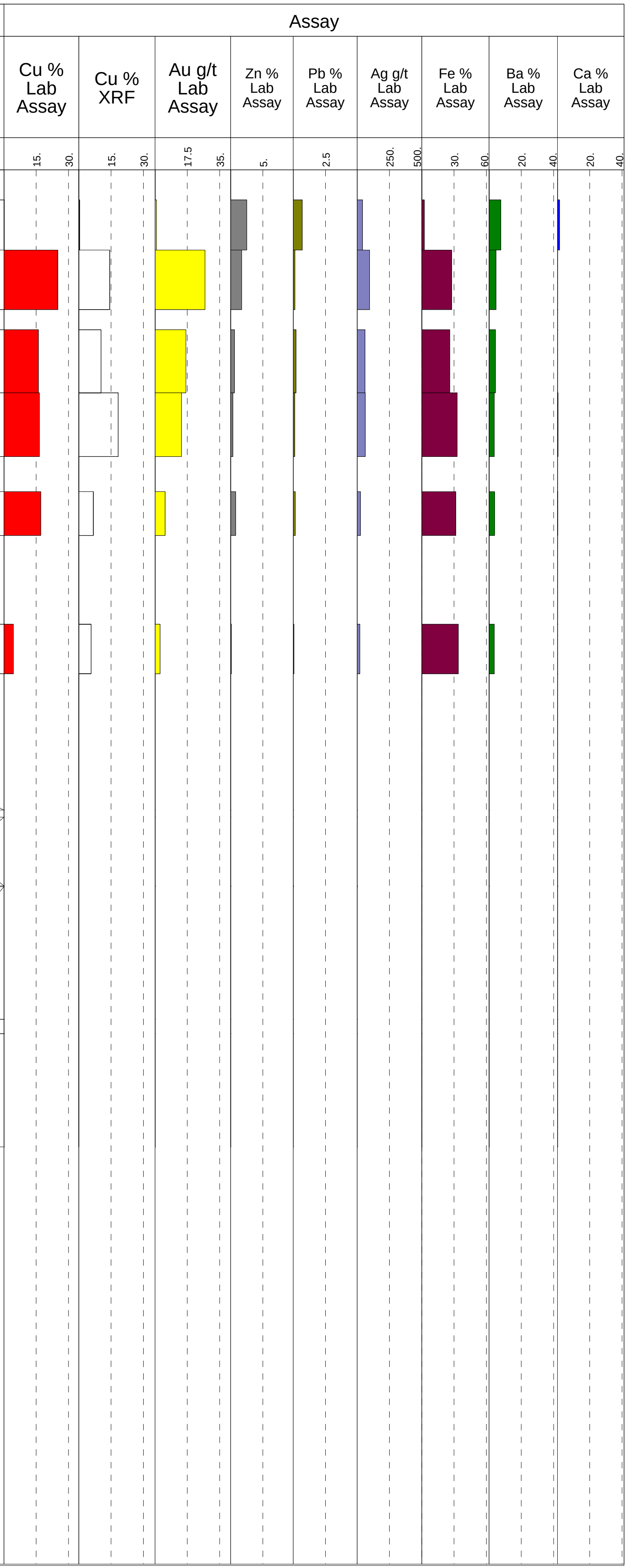
HoleID: SD038
ProjectCode: Manus
Date Drilled: 17/06/2007

East: 398858.15
North: 9581051.41
RL/Elevation: -1615.65
Depth: 13.63

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.42	Core loss	1	Uncon Sed	NS003
0.42	1.12	Hydrothermally altered clay-rich rock (HSI)	1	Lithified Sed	58616
1.12	1.95	Massive sulfide (HMS)	1	Sulphide	58617
1.95	2.23	Core loss	5	Sulphide	NS004
2.23	3.11	Semi-massive sulfide (HSM)	5	Sulphide	58618
3.11	4.00	Semi-massive sulfide (HSM)	3	Sulphide	58619
4.00	4.49	Core loss	7	Basement	NS004A
4.49	5.10	Anhydrite (HAN)	7	Basement	58623
5.10	6.34	Core loss	7	Basement	NS005
6.34	7.03	Anhydrite (HAN)	7	Basement	58624
7.03	8.93	Core loss	7	Basement	NS005A
8.93	9.03	Hydrothermally altered clay-rich rock (HSI)	7	Basement	NS005B
9.03	9.99	Core loss	7	Basement	NS005C
9.99	10.00	Hydrothermally altered clay-rich rock (HSI)	7	Basement	NS005D
10.00	11.85	Core loss	7	Basement	NS005E
11.85	12.05	Hydrothermally altered clay-rich rock (HSI)	7	Basement	NS005F
12.05	13.63	Core loss	7	Basement	NS006

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD039

ProjectCode: Manus

Date Drilled: 18/06/2007

East: 398860.93

North: 9581012.18

RL/Elevation: -1609.01

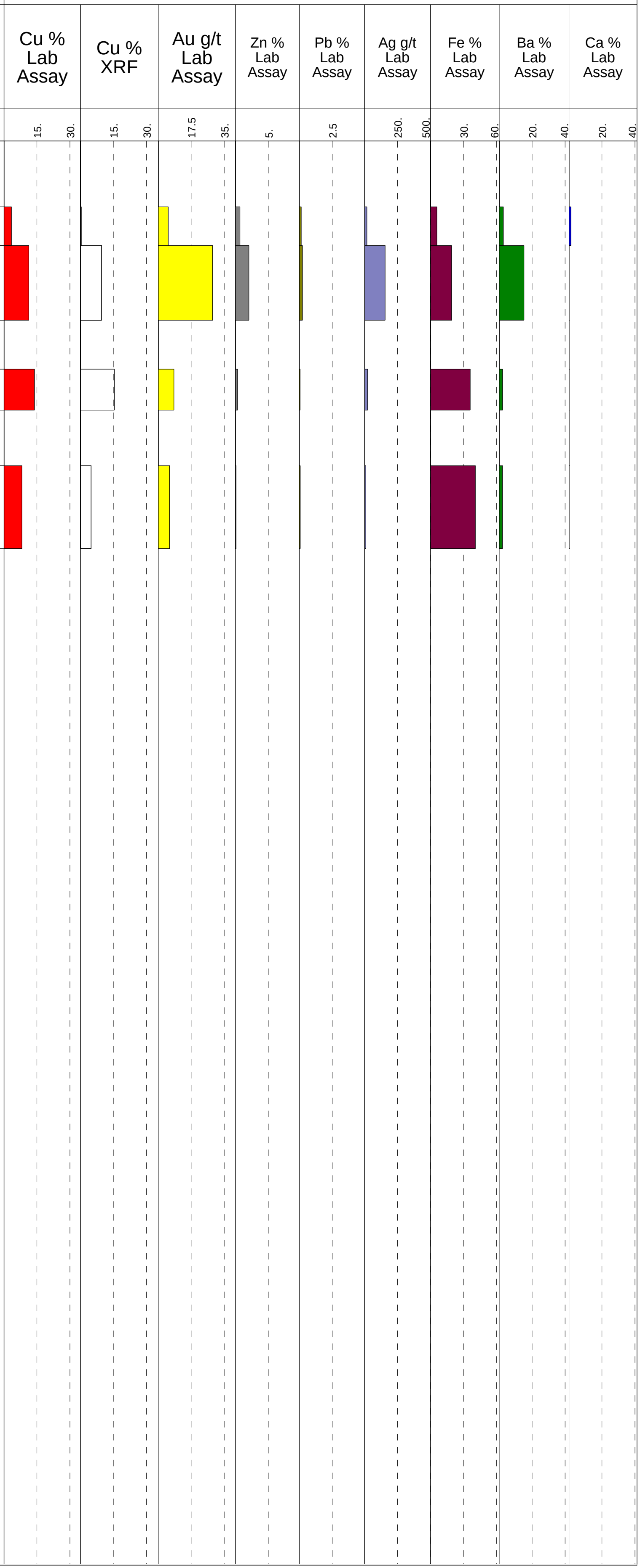
Depth: 5.57

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.90	**Core loss**		Uncon Sed	NS007
0.90	1.43	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58625
1.43	2.45	**Semi-massive sulfide (HSM)**	1	Sulphide	58626
2.45	3.12	**Core loss**		Sulphide	NS008
3.12	3.68	**Semi-massive sulfide (HSM)**	2	Sulphide	58627
3.68	4.44	**Core loss**		Sulphide	NS009
4.44	5.57	**Semi-massive sulfide (HSM)**	2	Sulphide	58628

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



Nautilus Minerals

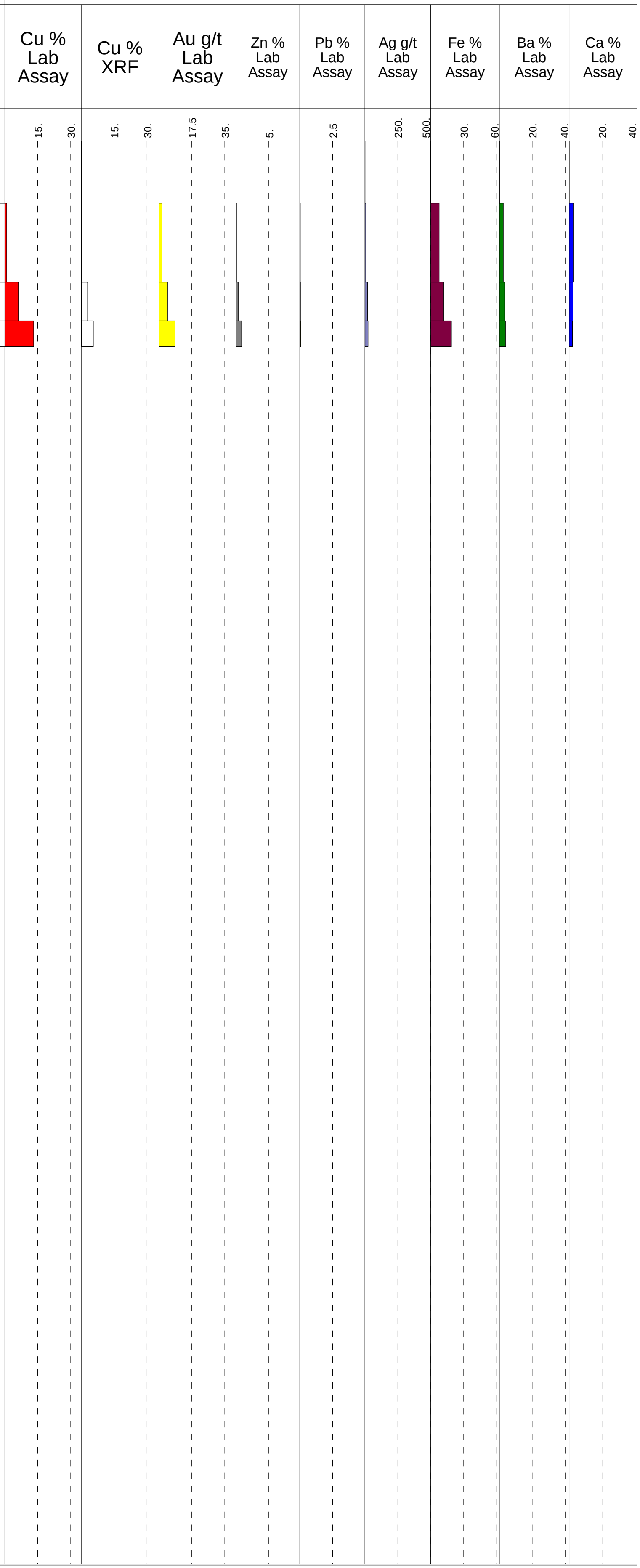
UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD040
ProjectCode: Manus
Date Drilled: 19/06/2007

East: 398896.87
North: 9581004.22
RL/Elevation: -1614.07
Depth: 2.81

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.85	**Core loss**		*Uncon Sed*	NS009A
0.85	1.93	**Clay (SCY)**	1	*Uncon Sed*	58629
1.93	2.46	**Silt (SLT)**	1	*Lithified Sed*	58629a
2.46	2.81	**Fresh volcanic (VF)**	0	*Basement*	58630

Assay



NAUTILUS Minerals Inc.

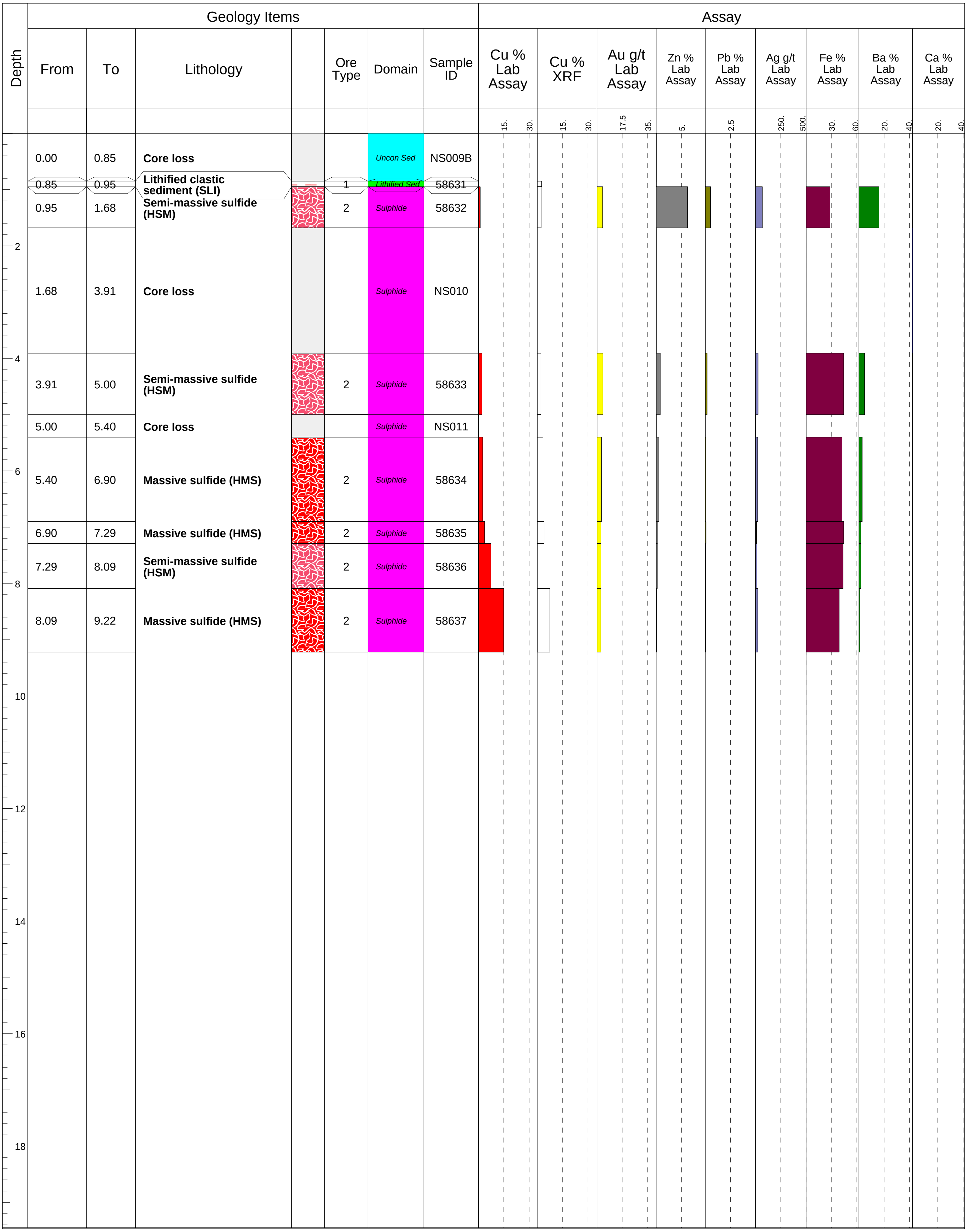
UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD041
ProjectCode: Manus
Date Drilled: 20/06/2007

East: 399002.79
North: 9580991.76
RL/Elevation: -1572.05
Depth: 9.22

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.85	**Core loss**		Uncon Sed	NS009B
0.85	0.95	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58631
0.95	1.68	**Semi-massive sulfide (HSM)**	2	Sulphide	58632
1.68	3.91	**Core loss**		Sulphide	NS010
3.91	5.00	**Semi-massive sulfide (HSM)**	2	Sulphide	58633
5.00	5.40	**Core loss**		Sulphide	NS011
5.40	6.90	**Massive sulfide (HMS)**	2	Sulphide	58634
6.90	7.29	**Massive sulfide (HMS)**	2	Sulphide	58635
7.29	8.09	**Semi-massive sulfide (HSM)**	2	Sulphide	58636
8.09	9.22	**Massive sulfide (HMS)**	2	Sulphide	58637



NAUTILUS Minerals Inc.

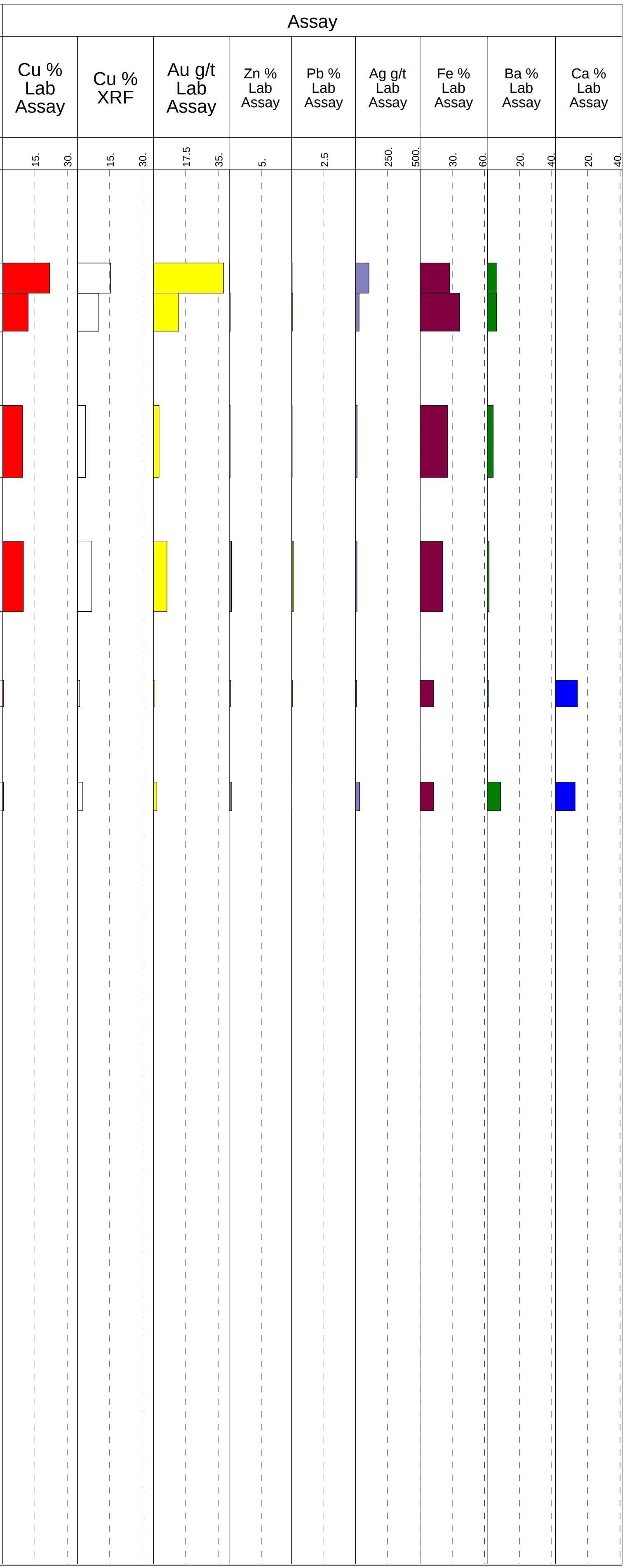
UTM 56S
WGS 84
Date Printed: 7/12/2007

Nautilus Minerals

HoleID: SD042
ProjectCode: Manus
Date Drilled: 21/06/2007

East: 399051.59
North: 9580997.39
RL/Elevation: -1563.23
Depth: 8.94

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.30	**Core loss**		Uncon Sed	NS012
1.30	1.72	**Semi-massive sulfide (HSM)**	2	Sulphide	58638
1.72	2.25	**Semi-massive sulfide (HSM)**	2	Sulphide	58639
2.25	3.29	**Core loss**		Sulphide	NS013
3.29	4.29	**Massive sulfide (HMS)**	2	Sulphide	58640
4.29	5.18	**Core loss**		Sulphide	NS014
5.18	6.16	**Semi-massive sulfide (HSM)**	4	Sulphide	58641
6.16	7.12	**Core loss**		Basement	NS015
7.12	7.49	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58642
7.49	8.54	**Core loss**		Basement	NS016
8.54	8.94	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58643



Nautilus Minerals

NAUTILUS Minerals Inc.

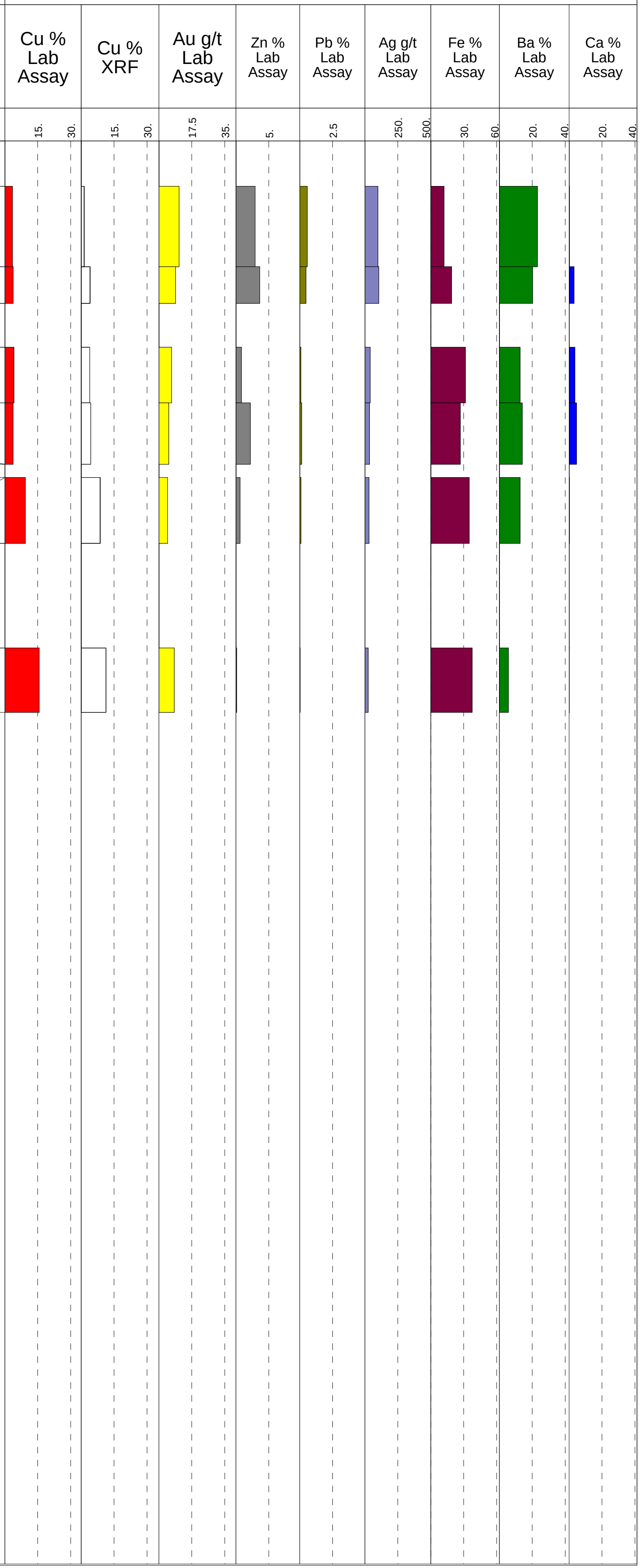
UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD043
ProjectCode: Manus
Date Drilled: 22/06/2007

East: 399083.91
North: 9580950.22
RL/Elevation: -1557.21
Depth: 7.81

Depth	From	To	Lithology	Ore Type	Domain	Sample ID
	0.00	0.62	**Core loss**		Uncon Sed	NS017
	0.62	1.72	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58644
2	1.72	2.22	**Lithified clastic sediment (SLI)**	4	Lithified Sed	58645
	2.22	2.82	**Core loss**		Lithified Sed	NS018
	2.82	3.58	**Massive sulfide (HMS)**	4	Sulphide	58646
4	3.58	4.42	**Massive sulfide (HMS)**	4	Sulphide	58647
	4.42	4.60	**Core loss**		Sulphide	NS018A
	4.60	5.50	**Massive sulfide (HMS)**	4	Sulphide	58648
6	5.50	6.93	**Core loss**		Sulphide	NS019
	6.93	7.81	**Massive sulfide (HMS)**	2	Sulphide	58649
8						
10						
12						
14						
16						
18						

Assay



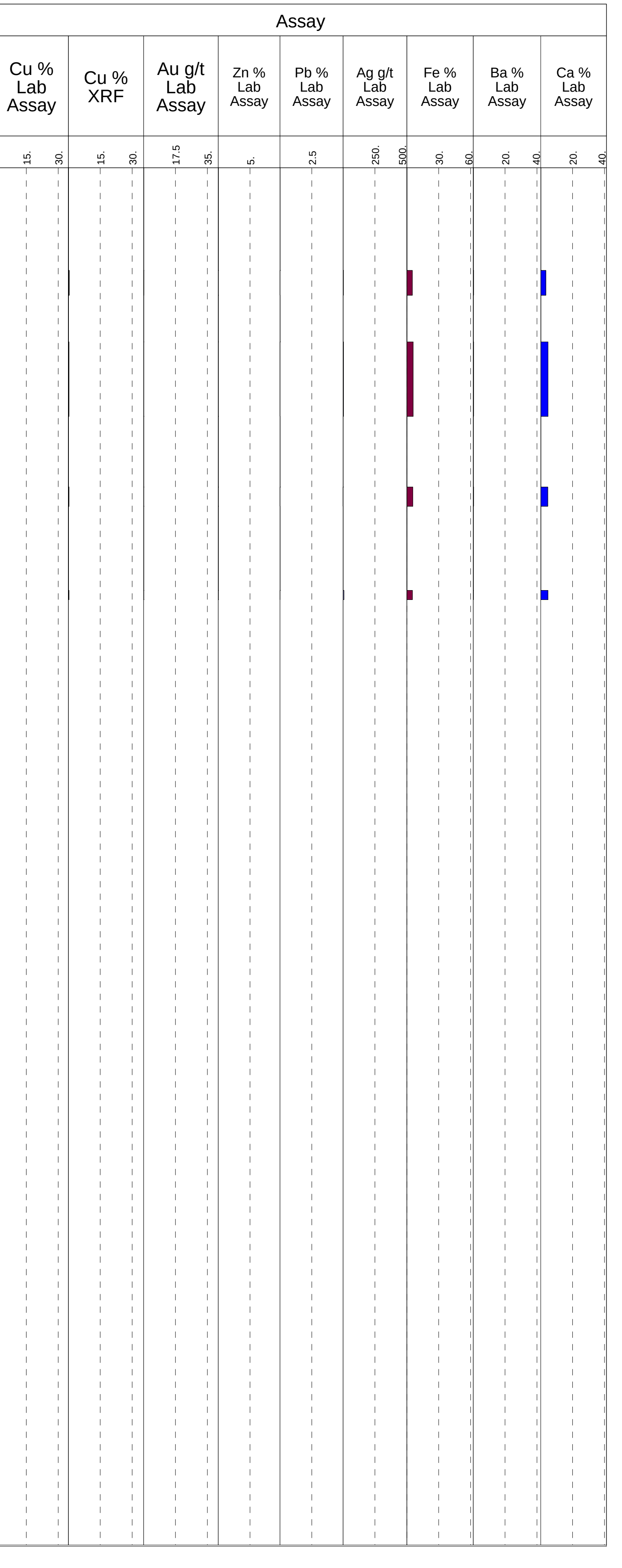
Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD044
ProjectCode: Manus
Date Drilled: 23/06/2007

East: 399243.74
North: 9580959.51
RL/Elevation: -1521.75
Depth: 6.1

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.45	**Core loss**		Uncon Sed	NS019B
1.45	1.80	**Fresh volcanic (VF)**	0	Basement	58650
1.80	2.46	**Core loss**		Basement	NS020
2.46	3.51	**Fresh volcanic (VF)**	0	Basement	58651
3.51	4.51	**Core loss**		Basement	NS021
4.51	4.78	**Fresh volcanic (VF)**	0	Basement	58652
4.78	5.97	**Core loss**		Basement	NS022
5.97	6.10	**Fresh volcanic (VF)**	0	Basement	58653



Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD045
ProjectCode: Manus
Date Drilled: 23/06/2007

East: 399199.58
North: 9580931.63
RL/Elevation: -1529.81
Depth: 2.7

Depth	From	To	Lithology		Ore Type	Domain	Sample ID	Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
								15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.
						Unknown										
	0.20	2.70	**Core loss**			*Unknown*	NS022A									

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD046
ProjectCode: Manus
Date Drilled: 24/06/2007

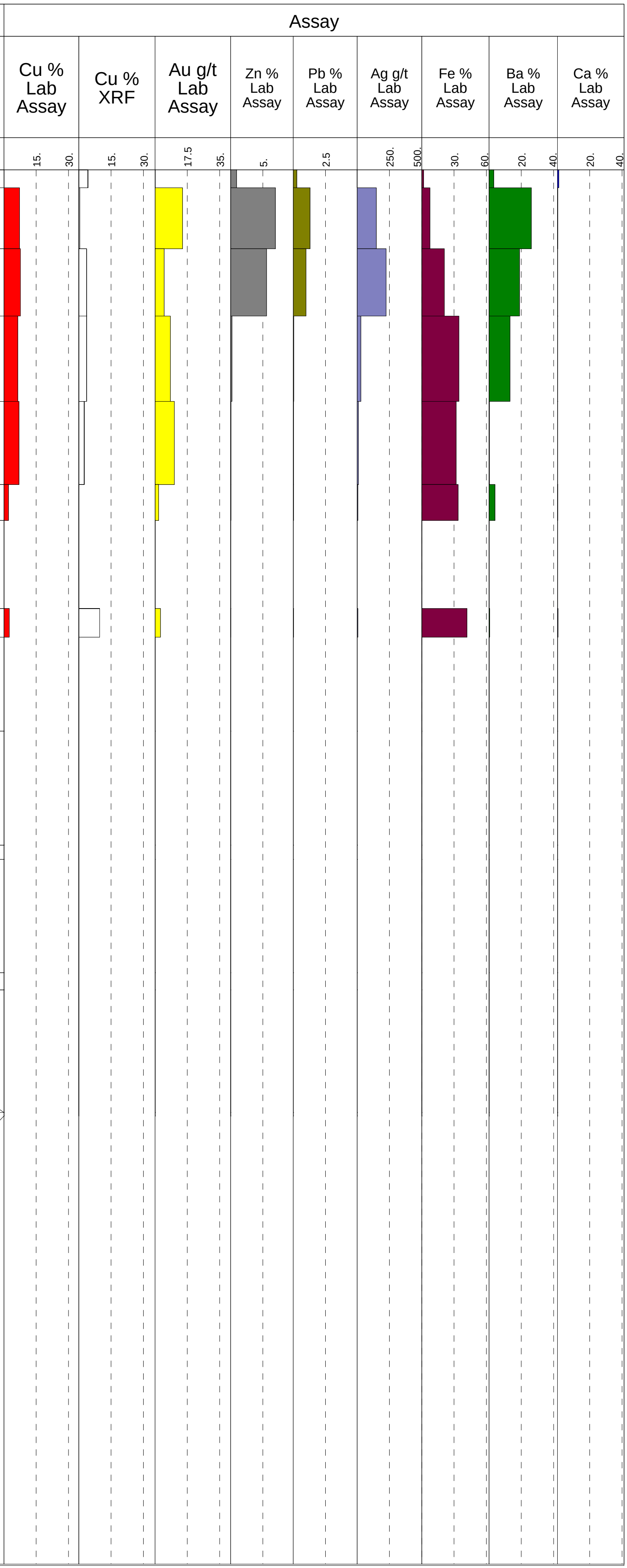
East: 399150.61
North: 9580935.42
RL/Elevation: -1543.5
Depth: 13.2

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.25	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58655
0.25	1.10	**Semi-massive sulfide (HSM)**	1	Sulphide	58903
1.10	2.04	**Semi-massive sulfide (HSM)**	1	Sulphide	58656
2.04	3.23	**Semi-massive sulfide (HSM)**	1	Sulphide	58657
3.23	4.39	**Semi-massive sulfide (HSM)**	3	Sulphide	58658
4.39	4.89	**Hydrothermally altered clay-rich rock (HSI)**	5	Sulphide	58659
4.89	6.12	**Core loss**		Sulphide	NS024
6.12	6.52	**Semi-massive sulfide (HSM)**	5	Sulphide	58660
6.52	7.83	**Core loss**		Sulphide	NS025
7.83	9.42	**Core loss**		Sulphide	NS026
9.42	9.62	**Semi-massive sulfide (HSM)**	5	Sulphide	NS026B
9.62	11.20	**Core loss**		Sulphide	NS028
11.20	11.44	**Semi-massive sulfide (HSM)**	5	Sulphide	NS028B
11.44	13.15	**Core loss**		Sulphide	NS029
13.15	13.20	**Semi-massive sulfide (HSM)**	5	Sulphide	NS029B

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

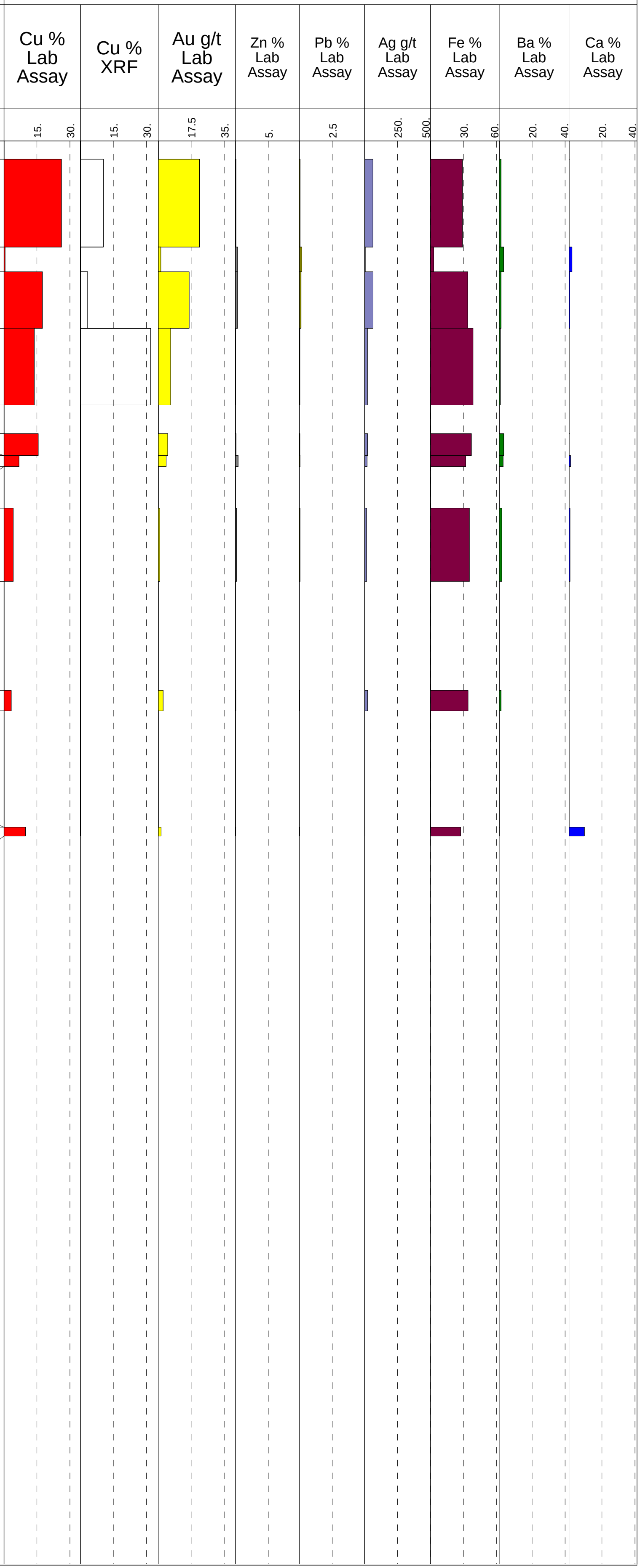
HoleID: SD047
ProjectCode: Manus
Date Drilled: 25/06/2007

East: 399105.51
North: 9580925.56
RL/Elevation: -1551.58
Depth: 9.5

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.25	**Core loss**		*Uncon Sed*	NS024B
0.25	1.45	**Massive sulfide (HMS)**	1	*Sulphide*	58662
1.45	1.79	**Lithified clastic sediment (SLI)**	0	*Sulphide*	58663
1.79	2.56	**Massive sulfide (HMS)**	1	*Sulphide*	58664
2.56	3.61	**Massive sulfide (HMS)**	1	*Sulphide*	58665
3.61	4.00	**Core loss**	0	*Sulphide*	NS024C
4.00	4.30	**Massive sulfide (HMS)**	2	*Sulphide*	58666
4.30	4.45	**Semi-massive sulfide (HSM)**	2	*Sulphide*	58667
4.45	5.02	**Core loss**		*Sulphide*	NS024D
5.02	6.02	**Semi-massive sulfide (HSM)**	7	*Sulphide*	58668
6.02	7.51	**Core loss**		*Basement*	NS025B
7.51	7.79	**Hydrothermally altered clay-rich rock (HSI)**	7	*Basement*	58669
7.79	9.38	**Core loss**		*Basement*	NS025C
9.38	9.50	**Hydrothermally altered clay-rich rock (HSI)**	7	*Basement*	58670

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

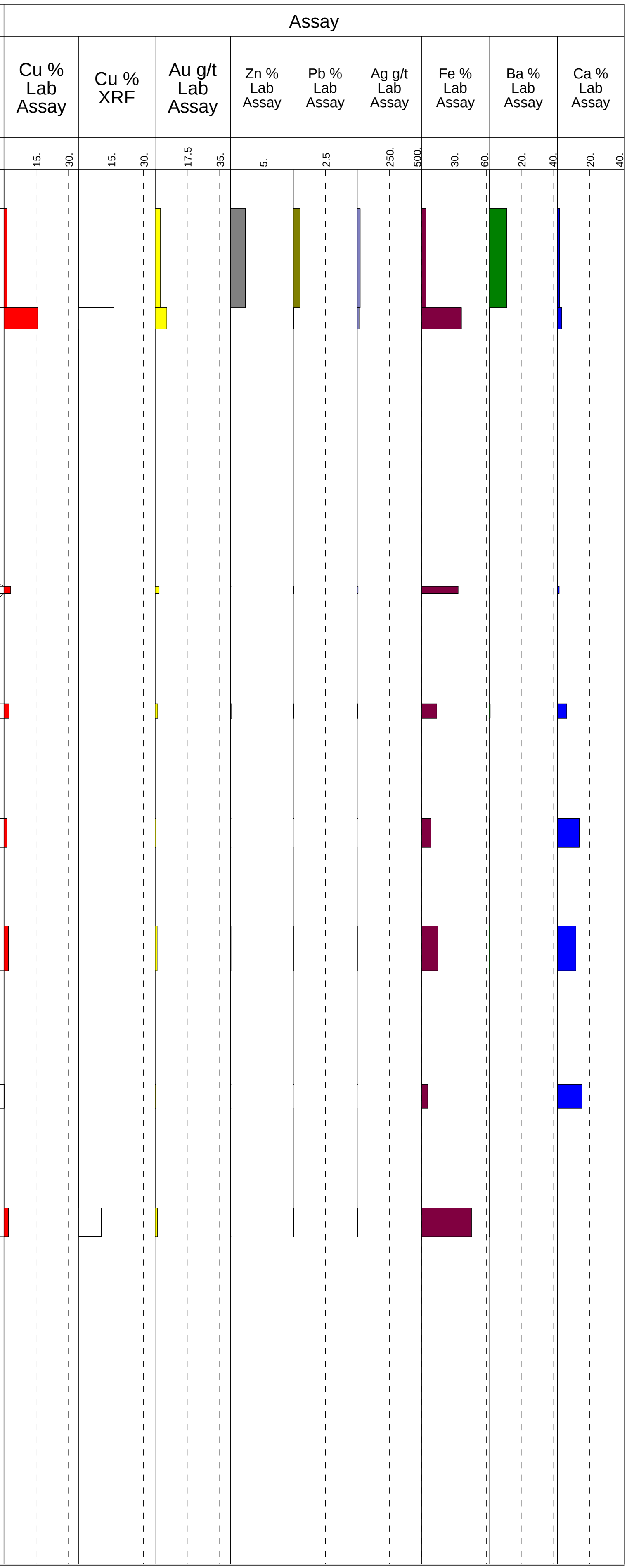
HoleID: SD048
ProjectCode: Manus
Date Drilled: 26/06/2007

East: 399101.67
North: 9580979.9
RL/Elevation: -1555.4
Depth: 14.88

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.54	**Core loss**		Uncon Sed	NS140
0.54	1.92	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58925
1.92	2.22	**Semi-massive sulfide (HSM)**	4	Sulphide	58926
2.22	5.81	**Core loss**		Sulphide	NS141
5.81	5.91	**Hydrothermally altered clay-rich rock (HSI)**	7	Sulphide	58927
5.91	7.45	**Core loss**		Sulphide	NS142
7.45	7.65	**Hydrothermally altered clay-rich rock (HSI)**	7	Sulphide	58928
7.65	9.05	**Core loss**		Sulphide	NS143
9.05	9.45	**Hydrothermally altered clay-rich rock (HSI)**	7	Sulphide	58932
9.45	10.55	**Core loss**		Sulphide	NS144
10.55	11.17	**Hydrothermally altered clay-rich rock (HSI)**	7	Sulphide	58929
11.17	12.76	**Core loss**		Sulphide	NS145
12.76	13.09	**Hydrothermally altered clay-rich rock (HSI)**	7	Sulphide	58930
13.09	14.48	**Core loss**		Sulphide	NS146
14.48	14.88	**Semi-massive sulfide (HSM)**	2	Sulphide	58931

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD049
ProjectCode: Manus
Date Drilled: 26/06/2007

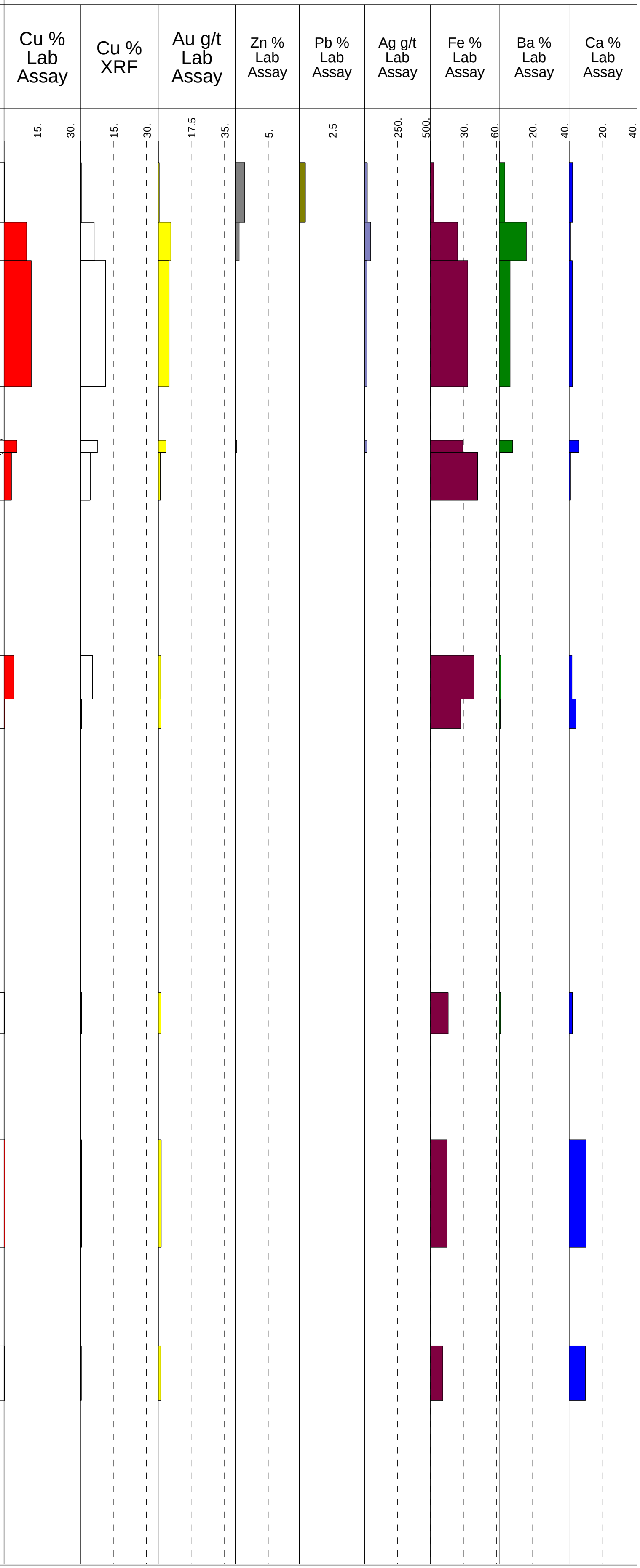
East: 399136.96
North: 9580961.95
RL/Elevation: -1552.77
Depth: 17.21

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.30	**Core loss**		Uncon Sed	NS146A
0.30	1.11	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58676
1.11	1.64	**Semi-massive sulfide (HSM)**	4	Sulphide	58677
1.64	3.36	**Semi-massive sulfide (HSM)**	4	Sulphide	58678
3.36	4.09	**Core loss**		Sulphide	NS146B
4.09	4.26	**Semi-massive sulfide (HSM)**	4	Sulphide	58679
4.26	4.91	**Semi-massive sulfide (HSM)**	4	Sulphide	58680
4.91	7.03	**Core loss**		Sulphide	NS031B
7.03	7.63	**Semi-massive sulfide (HSM)**	4	Sulphide	58681
7.63	8.03	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58682
8.03	11.64	**Core loss**		Basement	NS032
11.64	12.20	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58683
12.20	13.65	**Core loss**		Basement	NS033
13.65	15.12	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58684
15.12	16.47	**Core loss**		Basement	NS034
16.47	17.21	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58685

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



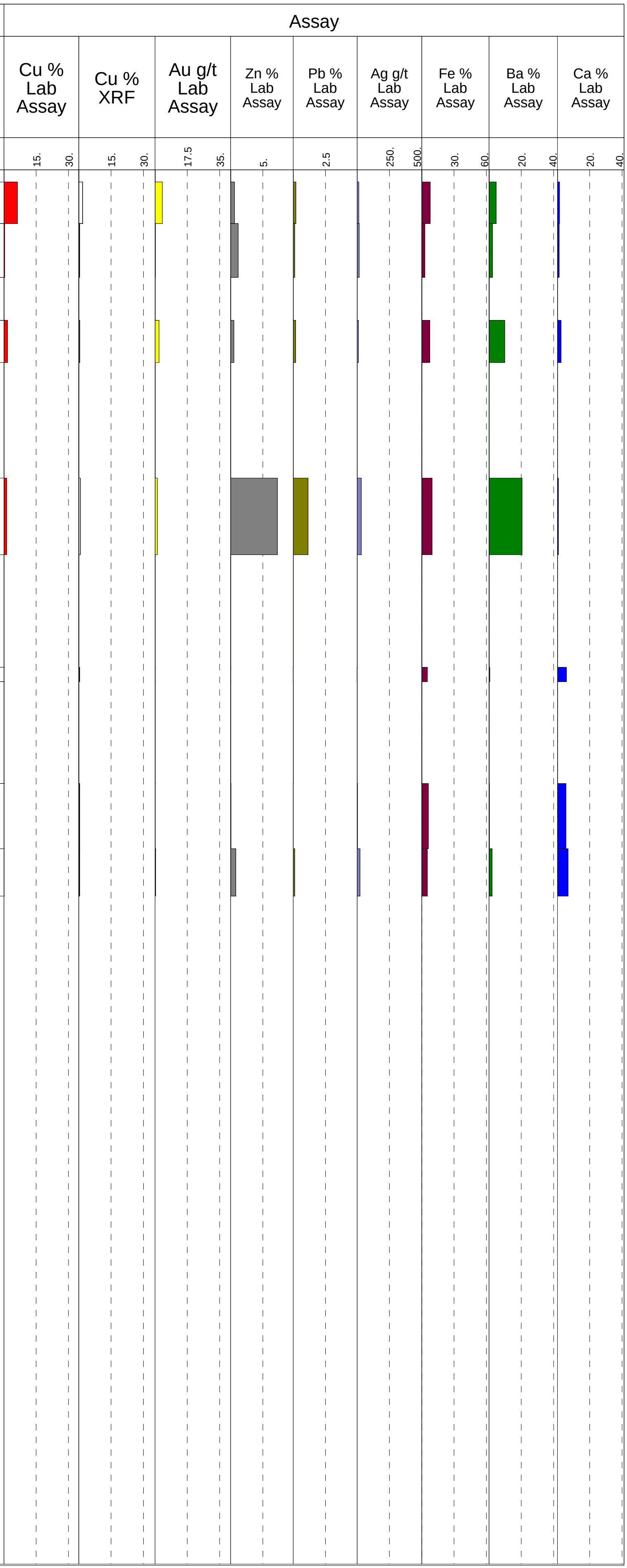
UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD050
ProjectCode: Manus
Date Drilled: 27/06/2007

East: 399231.37
North: 9580970.25
RL/Elevation: -1524.47
Depth: 10.13

From	To	Lithology	Ore Type	Domain	Sample ID
0.17	0.75	**Lithified clastic sediment (SLI)**	1	Uncon Sed	58951
0.75	1.50	**Clay (SCY)**	0	Uncon Sed	58952
1.50	2.10	**Core loss**		Uncon Sed	NS147
2.10	2.69	**Fresh volcanic (VF)**	0	Basement	58953
2.69	4.30	**Core loss**		Basement	NS148
4.30	5.37	**Altered volcanic (VA)**	0	Basement	58954
5.37	6.94	**Core loss**		Basement	NS149
6.94	7.14	**Fresh volcanic (VF)**	0	Basement	58955
7.14	8.56	**Core loss**		Basement	NS150
8.56	9.47	**Fresh volcanic (VF)**	0	Basement	58956
9.47	10.13	**Altered volcanic (VA)**	0	Basement	58957



Nautilus Minerals

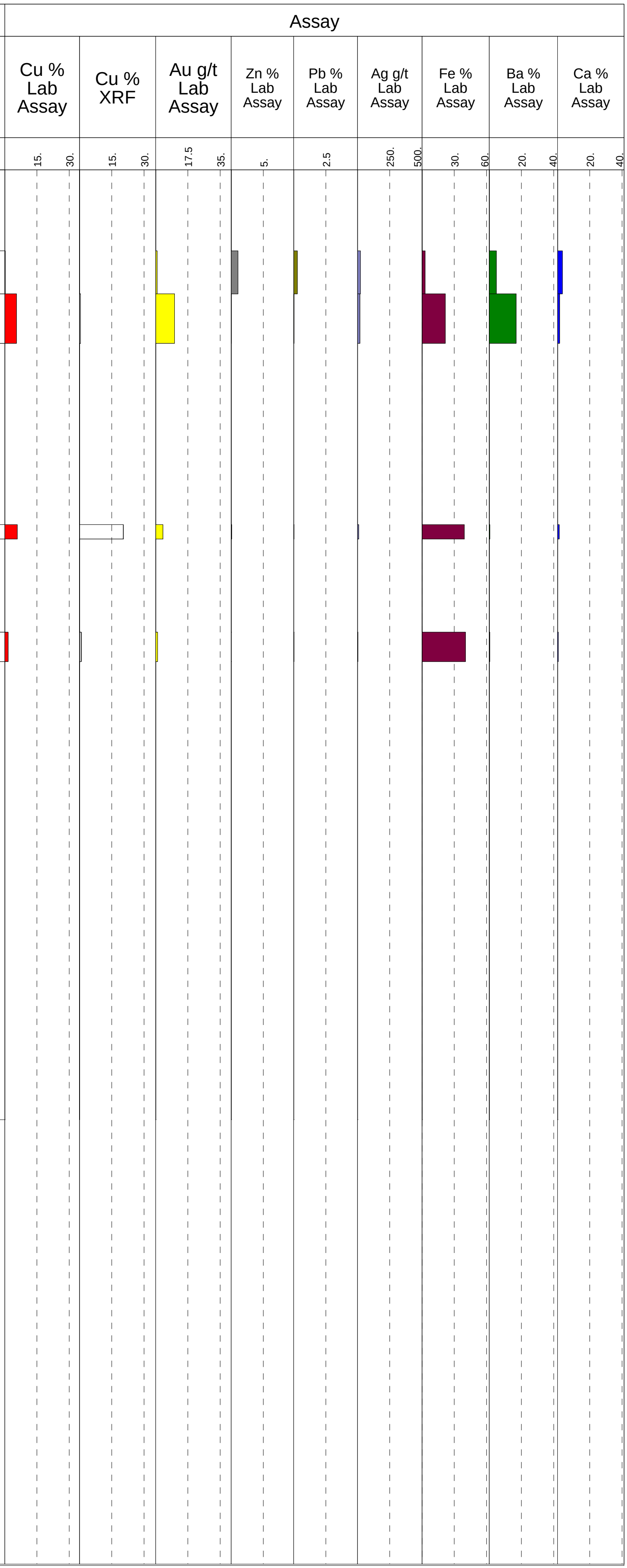
NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD051
ProjectCode: Manus
Date Drilled: 28/06/2007

East: 399137.75
North: 9580958.52
RL/Elevation: -1551.77
Depth: 13.25

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.13	**Core loss**		Uncon Sed	NS036B
1.13	1.73	**Hydrothermally altered clay-rich rock (HSI)**	0	Lithified Sed	58691
1.73	2.42	**Altered volcanic (VA)**	1	Lithified Sed	58692
2.42	4.95	**Core loss**		Lithified Sed	NS037
4.95	5.15	**Semi-massive sulfide (HSM)**	2	Sulphide	58693
5.15	6.45	**Core loss**		Basement	NS038
6.45	6.86	**Semi-massive sulfide (HSM)**	2	Basement	58694
6.86	13.25	**Core loss**		Basement	NS061



Nautilus Minerals

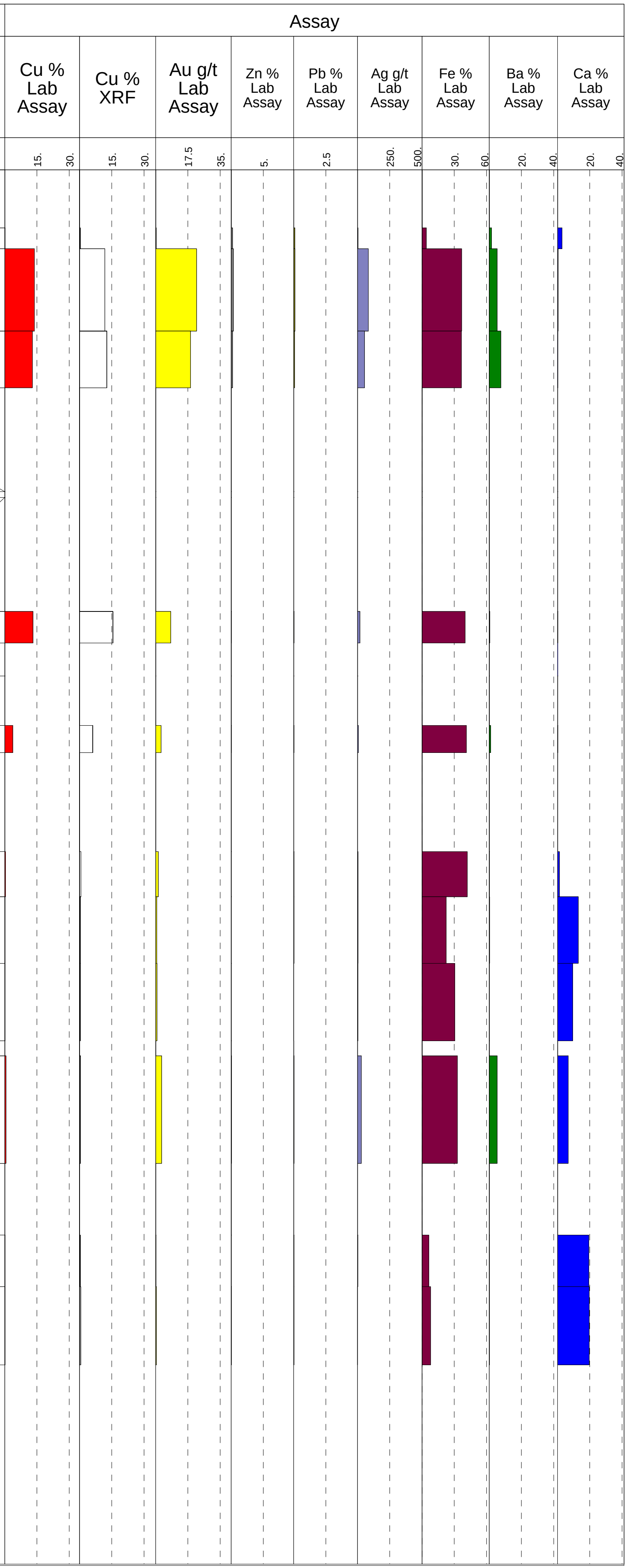
NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD052
ProjectCode: Manus
Date Drilled: 29/06/2007

East: 399291.8
North: 9581026.19
RL/Elevation: -1504.7
Depth: 16.67

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.81	Core loss		Uncon Sed	NS039
0.81	1.10	Lithified clastic sediment (SLI)	1	Sulphide	58695
1.10	2.25	Semi-massive sulfide (HSM)	1	Sulphide	58696
2.25	3.04	Semi-massive sulfide (HSM)	2	Sulphide	58697
3.04	4.49	Natural void		Sulphide	NS040
4.49	4.57	Semi-massive sulfide (HSM)		Sulphide	NS040A
4.57	6.16	Core loss		Sulphide	NS040B
6.16	6.60	Semi-massive sulfide (HSM)	2	Sulphide	58698
6.60	7.06	Core loss		Sulphide	NS040C
7.06	7.75	Semi-massive sulfide (HSM)		Sulphide	NS040D
7.75	8.13	Sulfate-Sulfide (HSS)	0	Sulphide	58699
8.13	9.51	Core loss		Sulphide	NS041A
9.51	10.14	Sulfate-Sulfide (HSS)	7	Sulphide	58700
10.14	11.07	Hydrothermally altered clay-rich rock (HSI)	7	Basement	58701
11.07	12.15	Altered volcanic (VA)	7	Basement	58702
12.15	12.36	Core loss		Basement	NS041
12.36	13.86	Anhydrite-barite rock (HAB)	0	Basement	58703
13.86	14.86	Core loss		Basement	NS042
14.86	15.58	Anhydrite-barite rock (HAB)	0	Basement	58704
15.58	16.67	Altered volcanic (VA)	0	Basement	58705



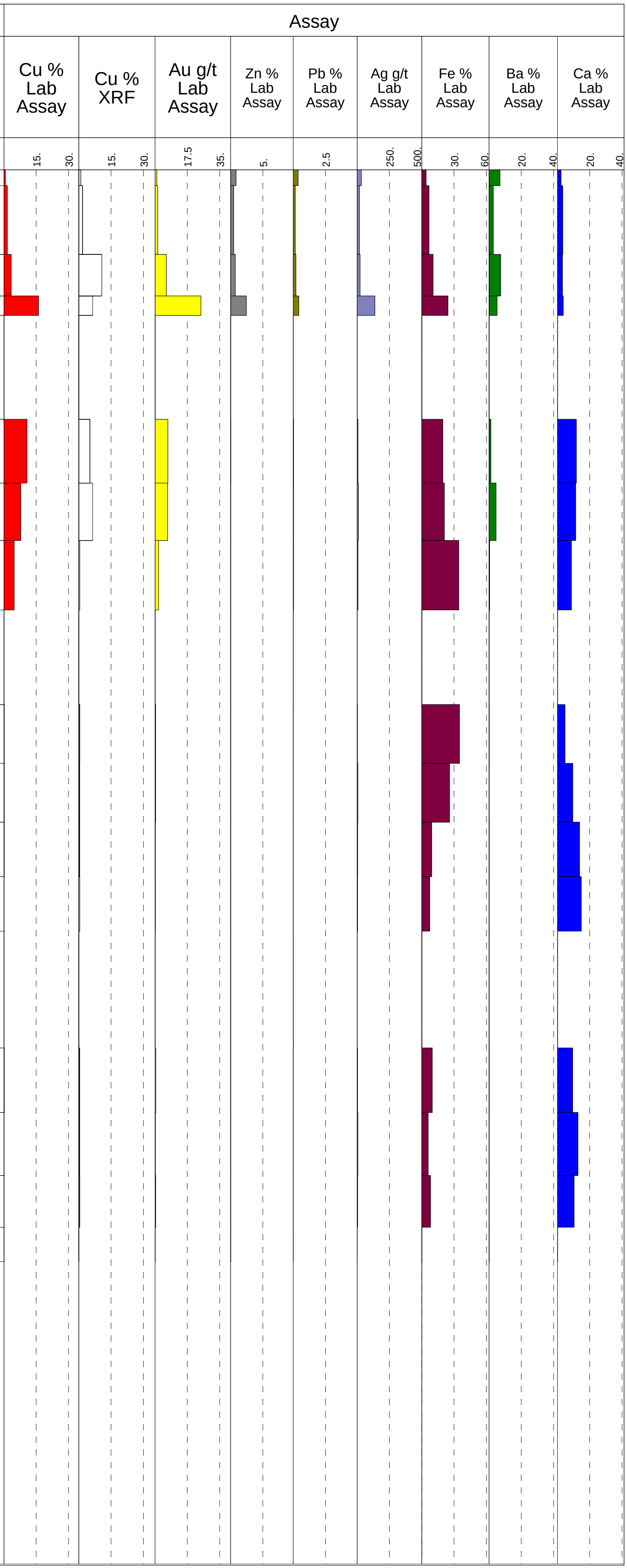
Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD053
ProjectCode: Manus
Date Drilled: 22/06/2007

East: 399352.01
North: 9581069.56
RL/Elevation: -1504.98
Depth: 15.23

From	To	Lithology	Ore Type	Domain	Sample ID
		sediment (SLI)		Lithified Sed	
0.22	1.18	Lithified clastic sediment (SLI)	0	Lithified Sed	58708
1.18	1.76	Lithified clastic sediment (SLI)	0	Sulphide	58709
1.76	2.03	Semi-massive sulfide (HSM)	1	Sulphide	58710
2.03	3.48	Core loss		Sulphide	NS043
3.48	4.37	Semi-massive sulfide (HSM)	1	Sulphide	58711
4.37	5.17	Semi-massive sulfide (HSM)	6	Sulphide	58712
5.17	6.14	Semi-massive sulfide (HSM)	6	Sulphide	58713
6.14	7.46	Core loss		Basement	NS044
7.46	8.28	Hydrothermally altered clay-rich rock (HSI)	7	Basement	58714
8.28	9.10	Hydrothermally altered clay-rich rock (HSI)	5	Basement	58715
9.10	9.86	Hydrothermally altered clay-rich rock (HSI)	5	Basement	58716
9.86	10.62	Hydrothermally altered clay-rich rock (HSI)	5	Basement	58717
10.62	12.25	Core loss		Basement	NS045
12.25	13.15	Hydrothermally altered clay-rich rock (HSI)	0	Basement	58718
13.15	14.03	Hydrothermally altered clay-rich rock (HSI)	0	Basement	58719
14.03	14.75	Hydrothermally altered clay-rich rock (HSI)	0	Basement	58720
14.75	15.23	Core loss		Basement	NS046



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

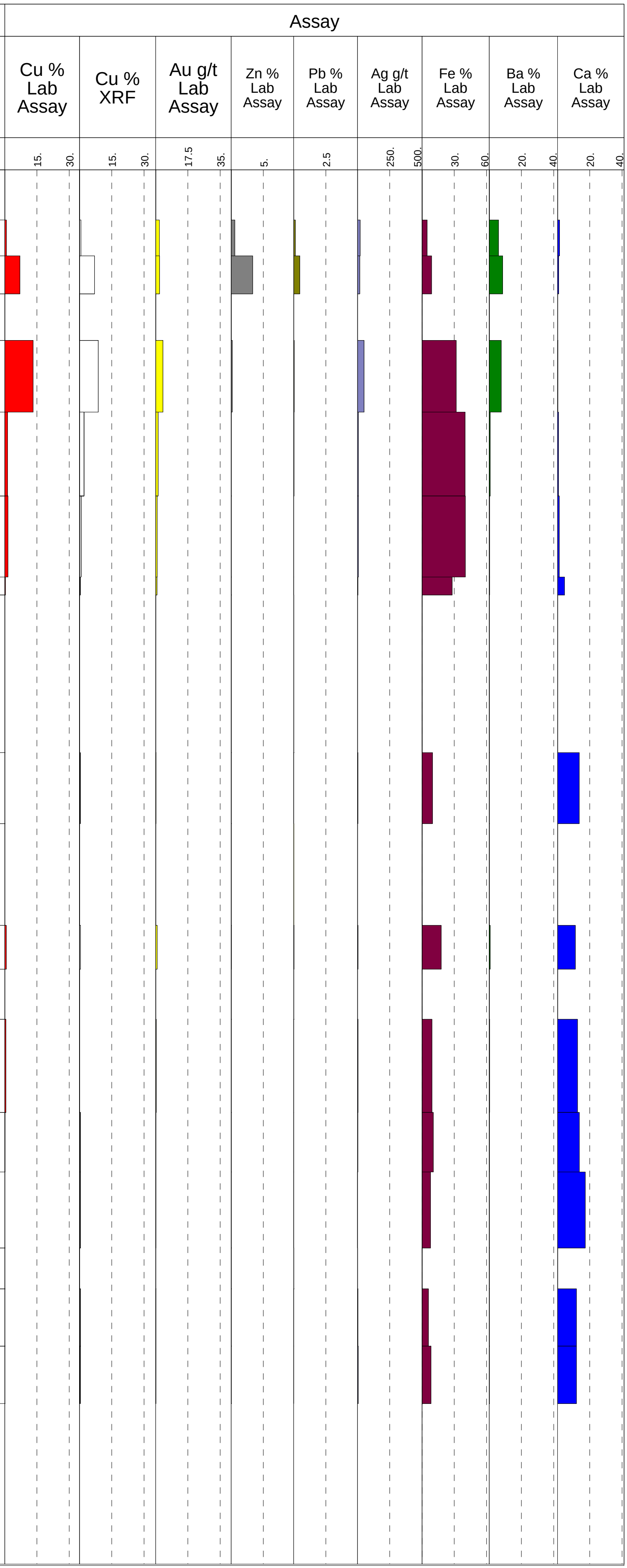
HoleID: SD054
ProjectCode: Manus
Date Drilled: 30/06/2007

East: 399341.39
North: 9581047.57
RL/Elevation: -1502.83
Depth: 17.21

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.70	Core loss		Uncon Sed	NS047
0.70	1.20	Lithified clastic sediment (SLI)	1	Lithified Sed	58721
1.20	1.73	Lithified clastic sediment (SLI)	1	Lithified Sed	58722
1.73	2.38	Core loss		Lithified Sed	NS048
2.38	3.38	Semi-massive sulfide (HSM)	3	Sulphide	58723
3.38	4.55	Massive sulfide (HMS)	3	Sulphide	58724
4.55	5.68	Massive sulfide (HMS)	4	Sulphide	58725
5.68	5.93	Hydrothermally altered clay-rich rock (HSI)	1	Sulphide	58983
5.93	8.13	Core loss		Basement	NS049
8.13	9.12	Hydrothermally altered clay-rich rock (HSI)	0	Basement	58726
9.12	10.54	Core loss		Basement	NS050
10.54	11.15	Hydrothermally altered clay-rich rock (HSI)	0	Basement	58727
11.15	11.85	Core loss		Basement	NS051
11.85	13.15	Altered volcanic (VA)	0	Basement	58728
13.15	13.98	Altered volcanic (VA)	0	Basement	58729
13.98	15.04	Altered volcanic (VA)	0	Basement	58730
15.04	15.61	Core loss		Basement	NS052
15.61	16.41	Altered volcanic (VA)	0	Basement	58731
16.41	17.21	Altered volcanic (VA)	0	Basement	58732

Assay



Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD055
ProjectCode: Manus
Date Drilled: 1/07/2007

East: 399400.78
North: 9581151.62
RL/Elevation: -1517.06
Depth: 6.78

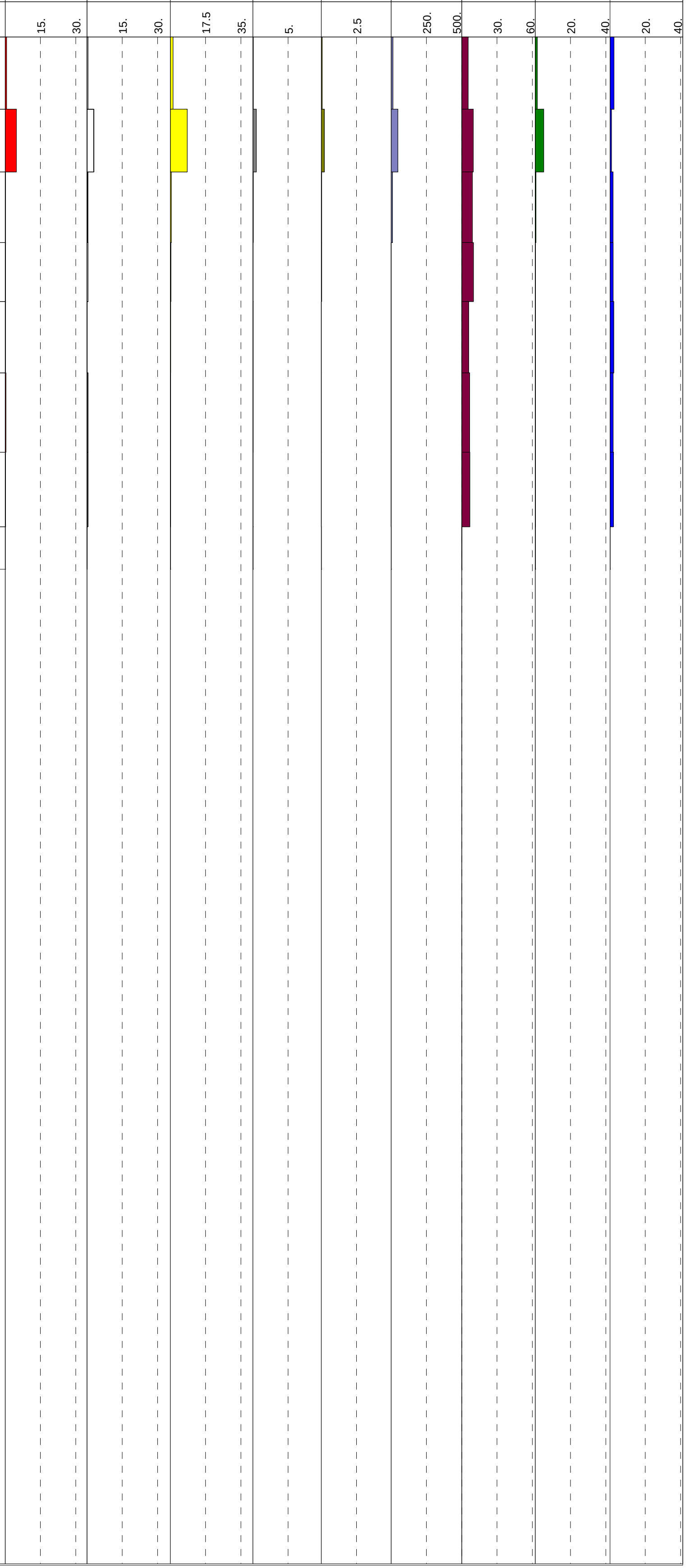
Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.92	**Volcaniclastic Sand (SVC)**	0	*Uncon Sed*	58733
0.92	1.72	**Fresh volcanic (VF)**	0	*Basement*	58734
1.72	2.62	**Fresh volcanic (VF)**	0	*Basement*	58735
2.62	3.37	**Fresh volcanic (VF)**	0	*Basement*	58736
3.37	4.28	**Fresh volcanic (VF)**	0	*Basement*	58737
4.28	5.29	**Fresh volcanic (VF)**	0	*Basement*	58738
5.29	6.24	**Fresh volcanic (VF)**	0	*Basement*	58739
6.24	6.78	**Core loss**		*Basement*	NS053

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay

Cu % Lab Assay | Cu % XRF | Au g/t Lab Assay | Zn % Lab Assay | Pb % Lab Assay | Ag g/t Lab Assay | Fe % Lab Assay | Ba % Lab Assay | Ca % Lab Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

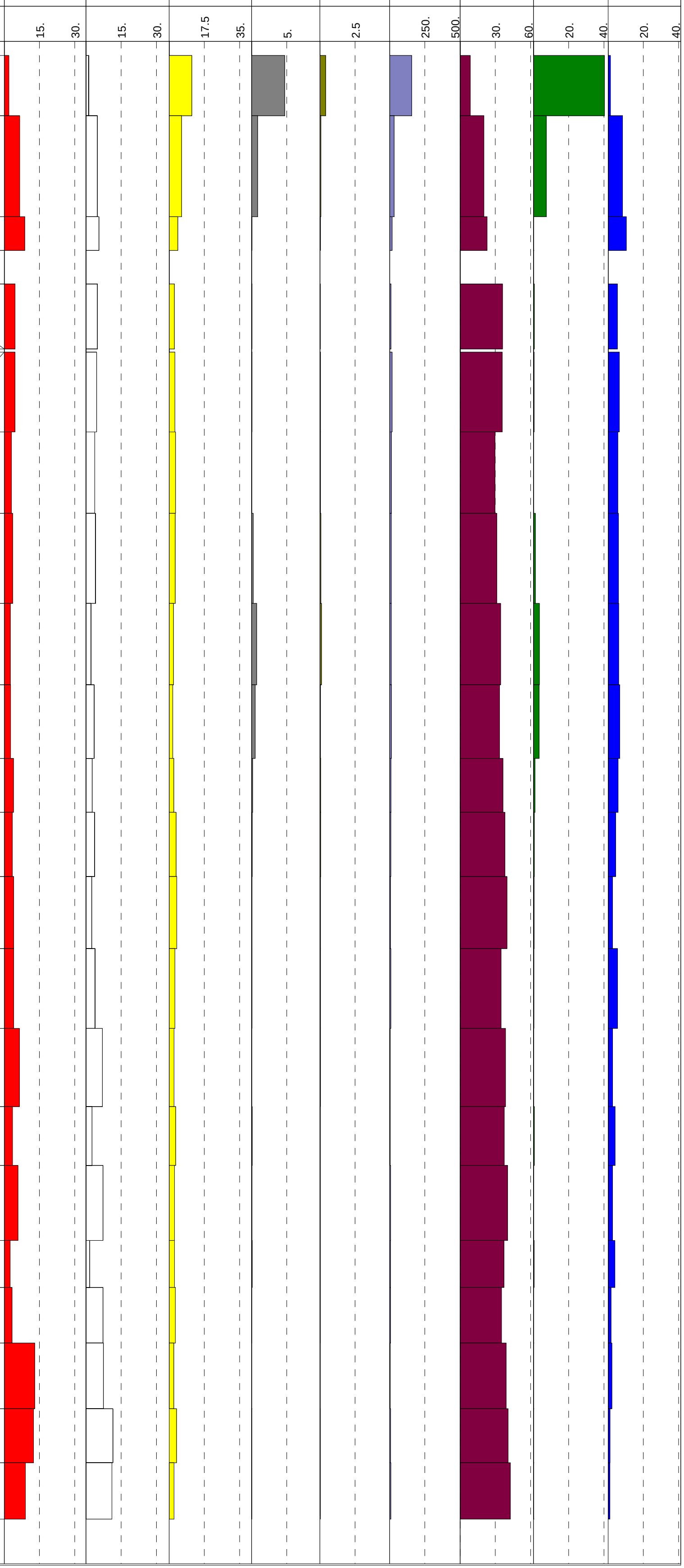
UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID:	SD056	East:	399397.3
ProjectCode:	Manus	North:	9581223.27
Date Drilled:	2/07/2007	RL/Elevation:	-1490.2
		Depth:	18.88

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
				Uncon Sed	
0.18	0.95	**Lithified clastic sediment (SLI)**	2	Uncon Sed	58740
0.95	2.24	**Semi-massive sulfide (HSM)**	4	Lithified Sed	58741
2.24	2.67	**Semi-massive sulfide (HSM)**	4	Sulphide	58742
2.67	3.10	**Core loss**		Sulphide	NS054
3.10	3.93	**Semi-massive sulfide (HSM)**	4	Sulphide	58743
3.93	3.97	**Core loss**		Sulphide	NS054A
3.97	4.99	**Semi-massive sulfide (HSM)**	4	Sulphide	58744
4.99	6.03	**Semi-massive sulfide (HSM)**	4	Sulphide	58745
6.03	7.18	**Semi-massive sulfide (HSM)**	4	Sulphide	58746
7.18	8.22	**Semi-massive sulfide (HSM)**	4	Sulphide	58747
8.22	9.16	**Semi-massive sulfide (HSM)**	4	Sulphide	58748
9.16	9.85	**Massive sulfide (HMS)**	4	Sulphide	58749
9.85	10.67	**Massive sulfide (HMS)**	4	Sulphide	58750
10.67	11.59	**Massive sulfide (HMS)**	4	Sulphide	58751
11.59	12.61	**Massive sulfide (HMS)**	4	Sulphide	58752
12.61	13.61	**Massive sulfide (HMS)**	4	Sulphide	58753
13.61	14.36	**Massive sulfide (HMS)**	4	Sulphide	58754
14.36	15.32	**Massive sulfide (HMS)**	4	Sulphide	58755
15.32	15.92	**Massive sulfide (HMS)**	4	Sulphide	58756
15.92	16.63	**Massive sulfide (HMS)**	4	Sulphide	58757
16.63	17.47	**Massive sulfide (HMS)**	4	Sulphide	58758
17.47	18.16	**Massive sulfide (HMS)**	4	Sulphide	58759
18.16	18.88	**Massive sulfide (HMS)**	4	Sulphide	58760

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD057
ProjectCode: Manus
Date Drilled: 2/07/2007

East: 399386.25
North: 9581238.97
RL/Elevation: -1483.06
Depth: 3.14

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	2.53	**Core loss**		*Uncon Sed*	NS055
2.53	3.14	**Massive sulfide (HMS)**	2	*Sulphide*	58761

Assay: Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

NAUTILUS Minerals Inc.

HoleID: SD058
ProjectCode: Manus
Date Drilled: 2/07/2007

East: 399386.26
North: 9581239.98
RL/Elevation: -1483.02
Depth: 10.63

From	To	Lithology	Ore Type	Domain	Sample ID	Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
						15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.
0.00	2.34	**Core loss**		*Unknown*	NS056									
2.34	2.56	**Massive sulfide (HMS)**	2	*Unknown*	NS056A									
2.56	6.50	**Core loss**		*Unknown*	NS057									
6.50	6.64	**Massive sulfide (HMS)**	2	*Unknown*	NS057A									
6.64	8.40	**Core loss**		*Unknown*	NS057B									
8.40	8.64	**Massive sulfide (HMS)**	2	*Unknown*	NS057C									
8.64	10.30	**Core loss**		*Unknown*	NS057D									
10.30	10.63	**Massive sulfide (HMS)**	2	*Unknown*	NS058									

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

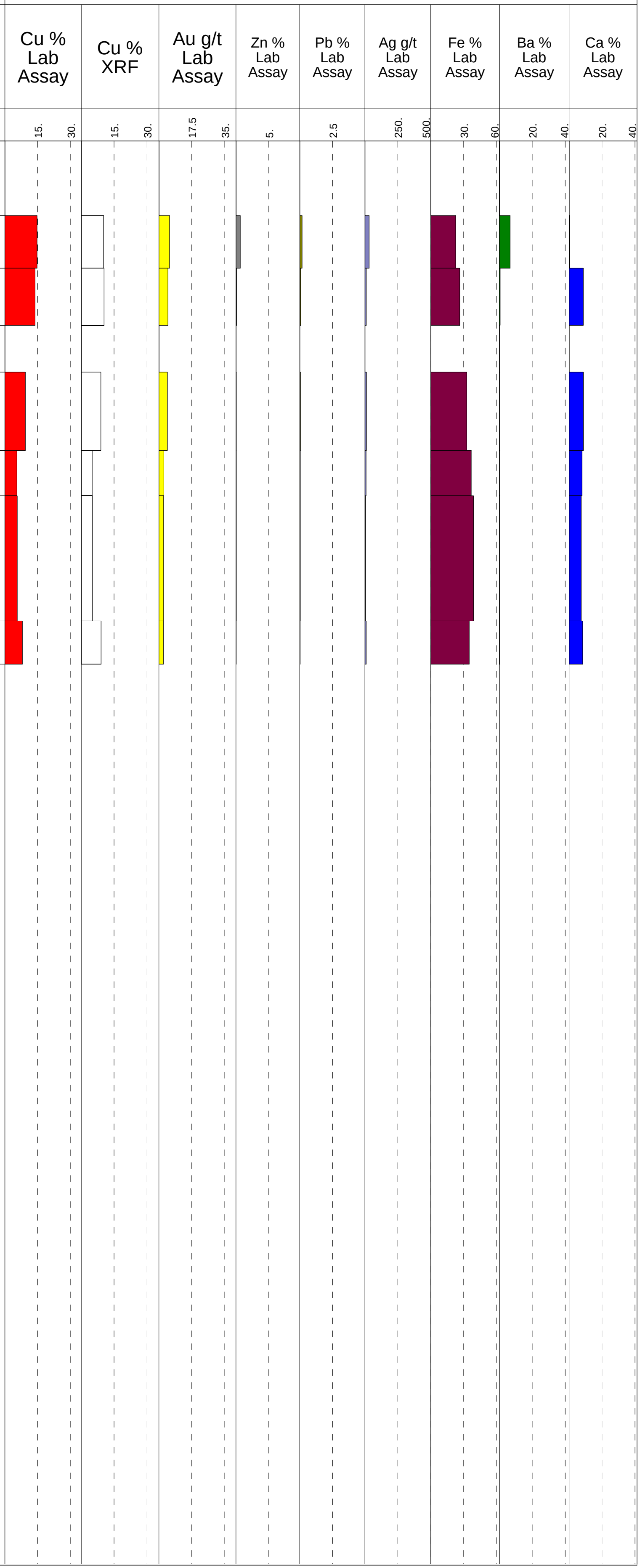
UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD059
ProjectCode: Manus
Date Drilled: 2/07/2007

East: 399403.9
North: 9581233.97
RL/Elevation: -1490.62
Depth: 7.15

Depth	From	To	Lithology		Ore Type	Domain	Sample ID
	0.00	1.02	**Core loss**			*Uncon Sed*	NS059
	1.02	1.74	**Massive sulfide (HMS)**		1	*Sulphide*	58762
2	1.74	2.52	**Massive sulfide (HMS)**		4	*Sulphide*	58763
	2.52	3.16	**Core loss**			*Sulphide*	NS060
4	3.16	4.23	**Massive sulfide (HMS)**		4	*Sulphide*	58764
	4.23	4.85	**Massive sulfide (HMS)**		4	*Sulphide*	58765
6	4.85	6.56	**Massive sulfide (HMS)**		4	*Sulphide*	58766
	6.56	7.15	**Massive sulfide (HMS)**		4	*Sulphide*	58767
8							
10							
12							
14							
16							
18							

Assay



NAUTILUS Minerals Inc.

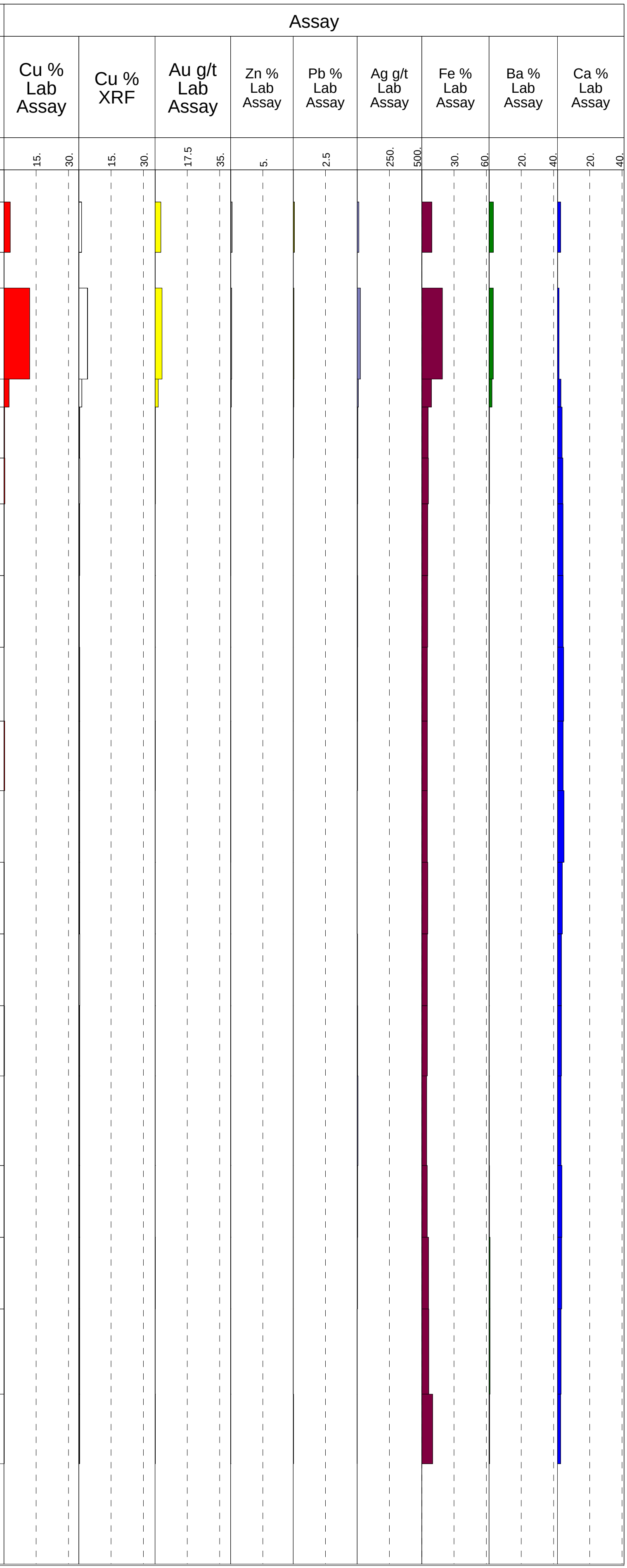
UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD060
ProjectCode: Manus
Date Drilled: 4/07/2007

East: 399343.21
North: 9581219.43
RL/Elevation: -1502.14
Depth: 18.05

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.45	**Core loss**		*Uncon Sed*	NS060A
0.45	1.15	**Volcaniclastic Sand (SVC)**	1	*Uncon Sed*	58769
1.15	1.65	**Core loss**		*Uncon Sed*	NS060B
1.65	2.92	**Volcaniclastic Sand (SVC)**	1	*Uncon Sed*	58770
2.92	3.31	**Volcaniclastic Sand (SVC)**	0	*Uncon Sed*	58771
3.31	4.02	**Altered volcanic (VA)**	0	*Basement*	58772
4.02	4.66	**Altered volcanic (VA)**	0	*Basement*	58773
4.66	5.66	**Partly-altered volcanic (VPA)**	0	*Basement*	58774
5.66	6.66	**Partly-altered volcanic (VPA)**	0	*Basement*	58775
6.66	7.69	**Partly-altered volcanic (VPA)**	0	*Basement*	58776
7.69	8.66	**Partly-altered volcanic (VPA)**	0	*Basement*	58777
8.66	9.66	**Partly-altered volcanic (VPA)**	0	*Basement*	58778
9.66	10.66	**Partly-altered volcanic (VPA)**	0	*Basement*	58779
10.66	11.66	**Partly-altered volcanic (VPA)**	0	*Basement*	58780
11.66	12.64	**Partly-altered volcanic (VPA)**	0	*Basement*	58781
12.64	13.89	**Partly-altered volcanic (VPA)**	0	*Basement*	58782
13.89	14.89	**Partly-altered volcanic (VPA)**	0	*Basement*	58783
14.89	15.89	**Partly-altered volcanic (VPA)**	0	*Basement*	58784
15.89	17.08	**Partly-altered volcanic (VPA)**	0	*Basement*	58785
17.08	18.05	**Partly-altered volcanic (VPA)**	0	*Basement*	58786



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD061
ProjectCode: Manus
Date Drilled: 5/07/2007

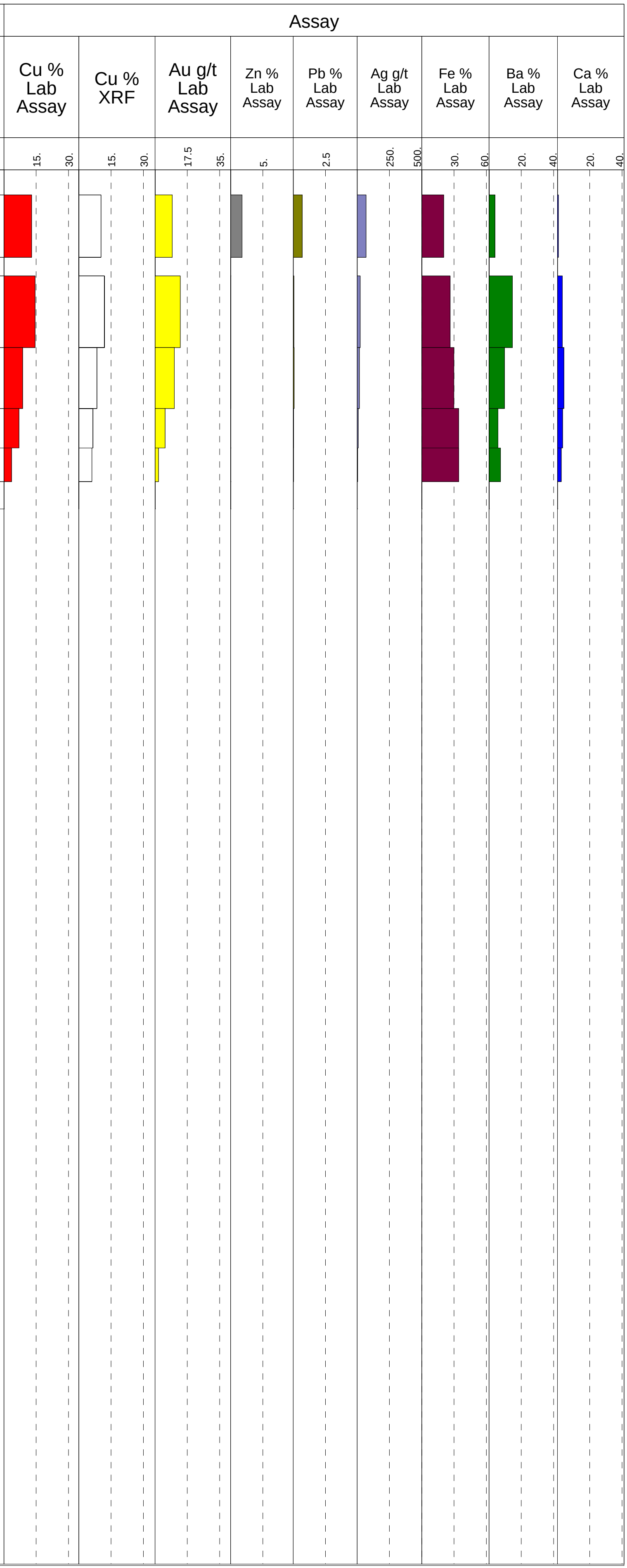
East: 399444.3
North: 9581179.96
RL/Elevation: -1499.66
Depth: 4.73

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.35	**Core loss**		Uncon Sed	NS062
0.35	1.22	**Semi-massive sulfide (HSM)**	3	Sulphide	58787
1.22	1.48	**Core loss**		Sulphide	NS063
1.48	2.48	**Massive sulfide (HMS)**	3	Sulphide	58788
2.48	3.33	**Massive sulfide (HMS)**	3	Sulphide	58789
3.33	3.88	**Massive sulfide (HMS)**	4	Sulphide	58790
3.88	4.35	**Semi-massive sulfide (HSM)**	4	Sulphide	58791
4.35	4.73	**Core loss**		Unknown	NS064

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

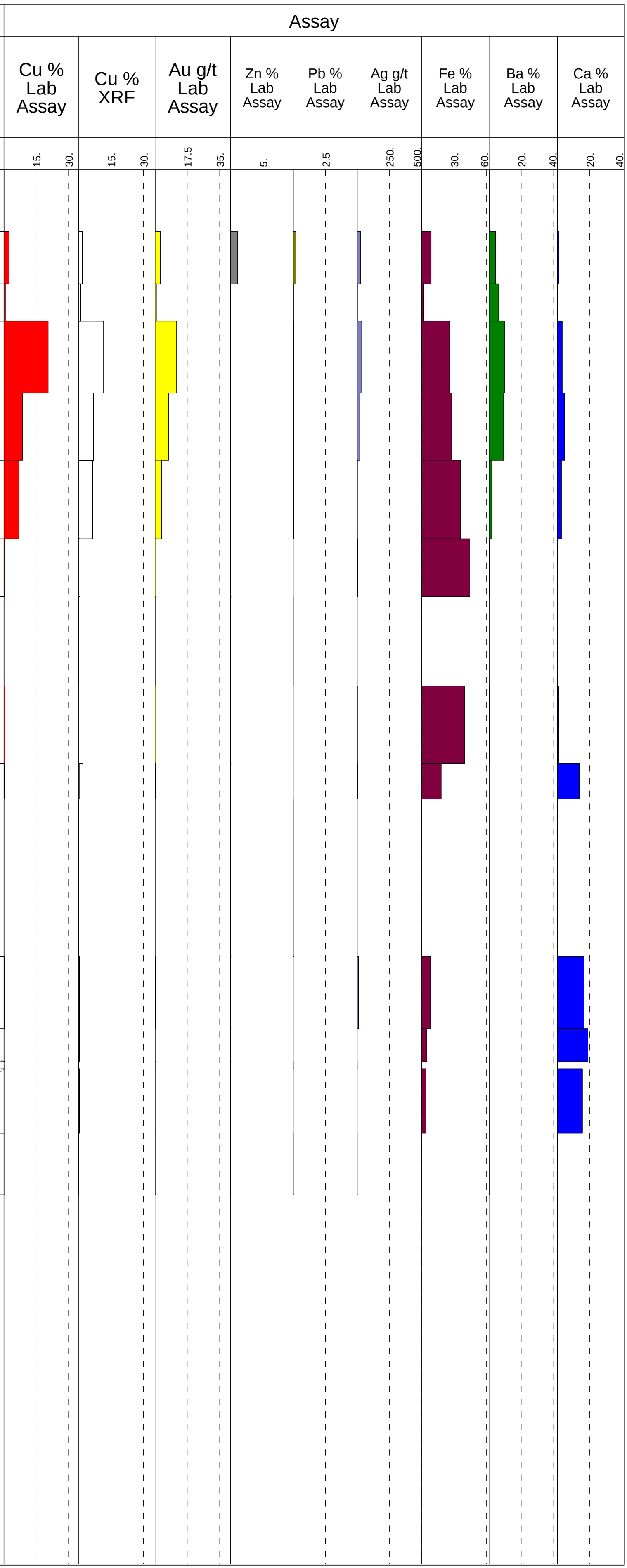
HoleID: SD062
ProjectCode: Manus
Date Drilled: 5/07/2007

East: 399442.87
North: 9581178.87
RL/Elevation: -1499.68
Depth: 14.3

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.86	**Core loss**		Uncon Sed	NS065
0.86	1.59	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58792
1.59	2.11	**Hydrothermal, other (H_Other)**	0	Lithified Sed	58793
2.11	3.11	**Massive sulfide (HMS)**	2	Sulphide	58794
3.11	4.05	**Massive sulfide (HMS)**	2	Sulphide	58795
4.05	5.15	**Massive sulfide (HMS)**	2	Sulphide	58796
5.15	5.95	**Massive sulfide (HMS)**	2	Sulphide	58797
5.95	7.20	**Core loss**		Sulphide	NS066
7.20	8.28	**Massive sulfide (HMS)**	2	Sulphide	58798
8.28	8.78	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58799
8.78	10.97	**Core loss**		Basement	NS067
10.97	11.98	**Anhydrite (HAN)**	7	Basement	58800
11.98	12.44	**Anhydrite (HAN)**	5	Basement	58801
12.44	12.54	**Core loss**		Basement	NS068
12.54	13.44	**Anhydrite (HAN)**	5	Basement	58802
13.44	14.30	**Core loss**		Basement	NS069

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD063
ProjectCode: Manus
Date Drilled: 6/07/2007

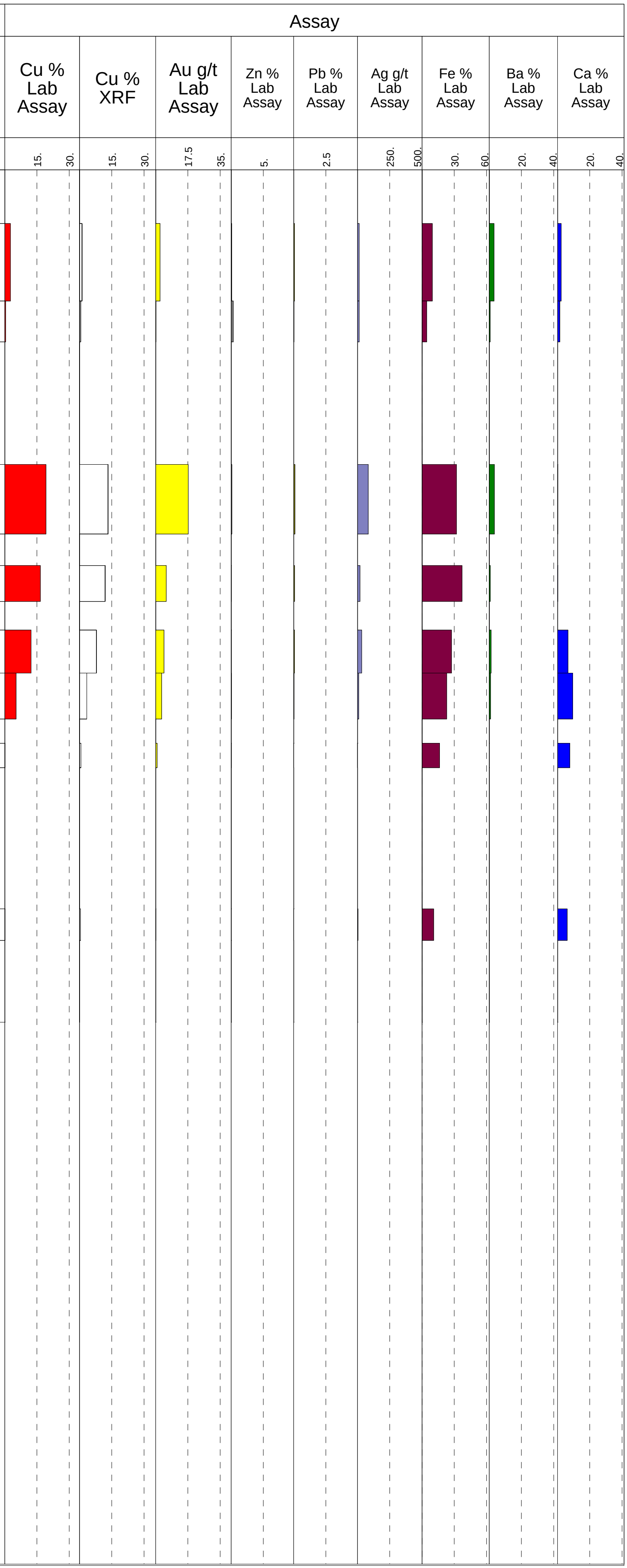
East: 399446.19
North: 9581291.14
RL/Elevation: -1517.03
Depth: 11.89

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.75	**Core loss**		*Uncon Sed*	NS070
0.75	1.83	**Volcaniclastic Sand (SVC)**	0	*Uncon Sed*	58803
1.83	2.40	**Clay (SCY)**	0	*Uncon Sed*	58804
2.40	4.11	**Core loss**		*Uncon Sed*	NS071
4.11	5.08	**Massive sulfide (HMS)**	4	*Sulphide*	58805
5.08	5.52	**Core loss**		*Sulphide*	NS072
5.52	6.02	**Massive sulfide (HMS)**	4	*Sulphide*	58806
6.02	6.42	**Core loss**		*Sulphide*	NS073
6.42	7.02	**Massive sulfide (HMS)**	4	*Sulphide*	58807
7.02	7.66	**Massive sulfide (HMS)**	4	*Sulphide*	58808
7.66	8.00	**Core loss**		*Basement*	NS074
8.00	8.34	**Altered volcanic (VA)**	7	*Basement*	58809
8.34	10.31	**Core loss**		*Basement*	NS075
10.31	10.75	**Altered volcanic (VA)**	7	*Basement*	58810
10.75	11.89	**Core loss**		*Basement*	NS076

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD064
ProjectCode: Manus
Date Drilled: 7/07/2007

East: 399485.63
North: 9581275.54
RL/Elevation: -1508.37
Depth: 19.5

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.36	**Core loss**		Uncon Sed	NS077
0.36	1.49	**Massive sulfide (HMS)**	1	Sulphide	58811
1.49	2.49	**Massive sulfide (HMS)**	1	Sulphide	58812
2.49	3.49	**Massive sulfide (HMS)**	2	Sulphide	58813
3.49	4.52	**Massive sulfide (HMS)**	2	Sulphide	58814
4.52	5.68	**Core loss**		Sulphide	NS078
5.68	6.55	**Massive sulfide (HMS)**	2	Sulphide	58815
6.55	7.45	**Massive sulfide (HMS)**	2	Sulphide	58816
7.45	7.85	**Core loss**		Sulphide	NS079
7.85	8.85	**Massive sulfide (HMS)**	2	Sulphide	58817
8.85	9.85	**Massive sulfide (HMS)**	2	Sulphide	58818
9.85	10.85	**Massive sulfide (HMS)**	2	Sulphide	58819
10.85	11.85	**Massive sulfide (HMS)**	2	Sulphide	58820
11.85	12.85	**Massive sulfide (HMS)**	2	Sulphide	58821
12.85	13.54	**Massive sulfide (HMS)**	4	Sulphide	58822
13.54	14.10	**Massive sulfide (HMS)**	4	Sulphide	58823
14.10	14.33	**Core loss**		Sulphide	NS080
14.33	14.99	**Massive sulfide (HMS)**	4	Sulphide	58824
14.99	16.17	**Core loss**		Sulphide	NS081
16.17	17.03	**Massive sulfide (HMS)**	4	Sulphide	58825
17.03	18.17	**Core loss**		Basement	NS082
18.17	18.82	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	58826
18.82	19.05	**Core loss**		Basement	NS083

Assay

Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD065
ProjectCode: Manus
Date Drilled: 8/07/2007

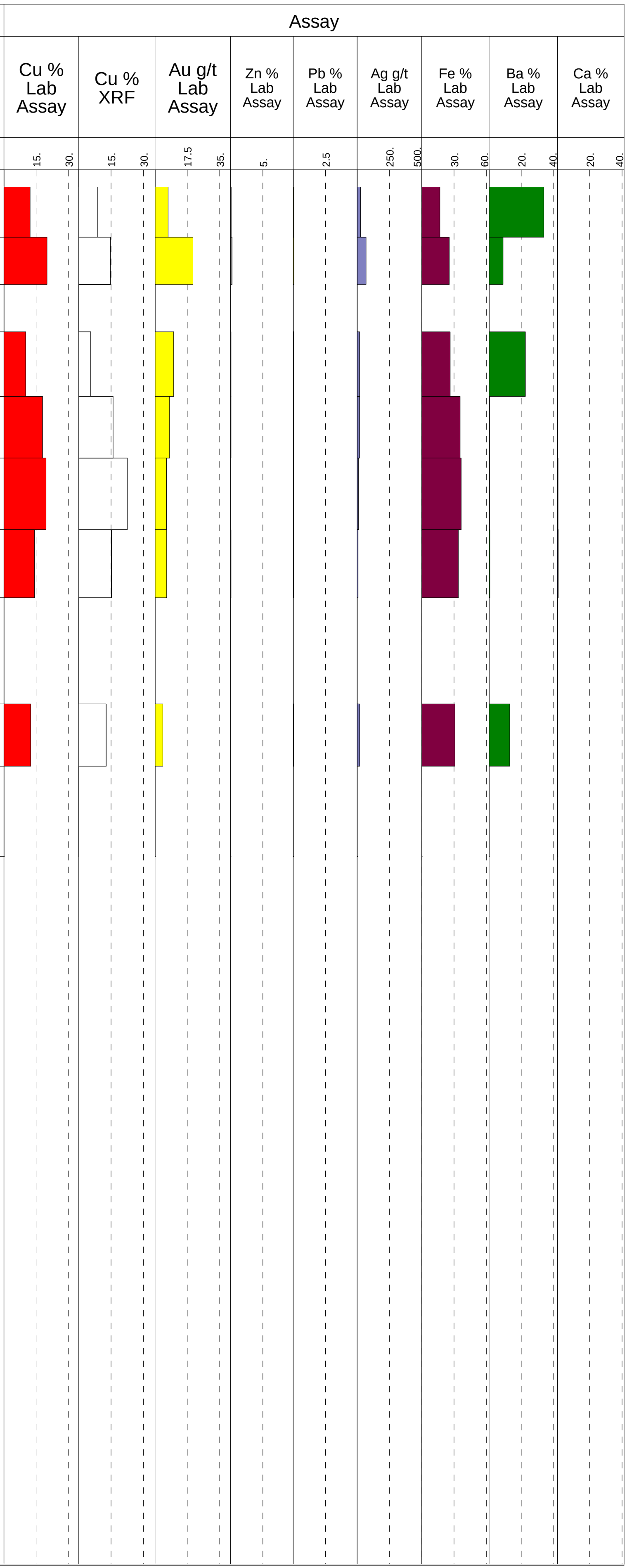
East: 399388.55
North: 9581260.67
RL/Elevation: -1492.91
Depth: 9.58

Geology Items

From	To	Lithology		Ore Type	Domain	Sample ID
0.00	0.24	Core loss			Uncon Sed	NS084
0.24	0.94	Semi-massive sulfide (HSM)		1	Sulphide	58827
0.94	1.60	Semi-massive sulfide (HSM)		1	Sulphide	58828
1.60	2.26	Core loss			Sulphide	NS085
2.26	3.16	Semi-massive sulfide (HSM)		1	Sulphide	58829
3.16	4.02	Massive sulfide (HMS)		3	Sulphide	58830
4.02	5.02	Massive sulfide (HMS)		3	Sulphide	58831
5.02	5.97	Massive sulfide (HMS)		3	Sulphide	58832
5.97	7.45	Core loss			Sulphide	NS086
7.45	8.32	Massive sulfide (HMS)		3	Sulphide	58833
8.32	9.58	Core loss			Unknown	NS087

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



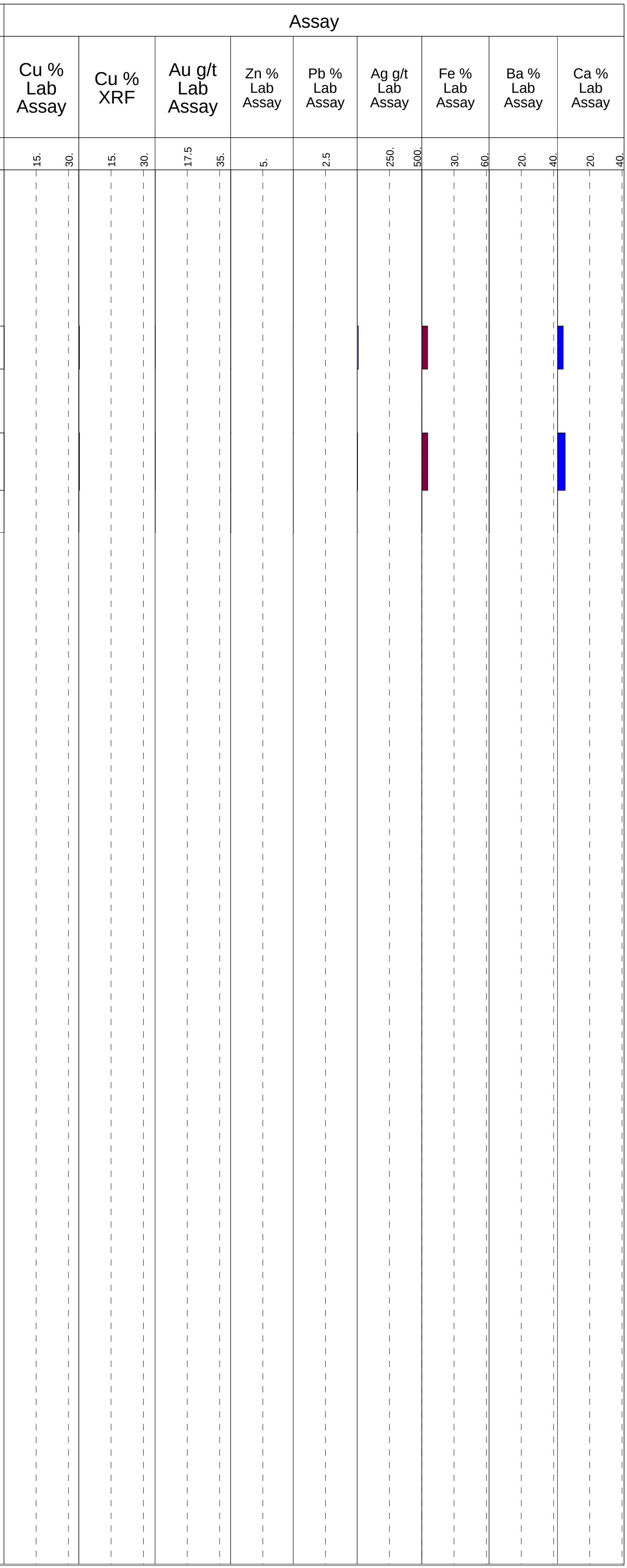
Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD066
ProjectCode: Manus
Date Drilled: 8/07/2007

East: 399387.36
North: 9581331.68
RL/Elevation: -1503.2
Depth: 5.06

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	2.18	**Core loss**		*Uncon Sed*	NS088
2.18	2.78	**Fresh volcanic (VF)**	0	*Unknown*	58834
2.78	3.67	**Core loss**		*Unknown*	NS089
3.67	4.47	**Fresh volcanic (VF)**	0	*Unknown*	58835
4.47	5.06	**Core loss**		*Unknown*	NS090



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD067
ProjectCode: Manus
Date Drilled: 9/07/2007

East: 399650.59
North: 9581098.32
RL/Elevation: -1519.76
Depth: 4.75

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.60	**Semi-massive sulfide (HSM)**	3	Sulphide	58836
0.60	1.04	**Core loss**		Basement	NS091
1.04	2.48	**Altered volcanic (VA)**	0	Basement	58837
2.48	3.04	**Altered volcanic (VA)**	0	Basement	58838
3.04	3.61	**Semi-massive sulfide (HSM)**	3	Basement	58839
3.61	4.75	**Core loss**		Basement	NS092

Assay columns (scales): Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

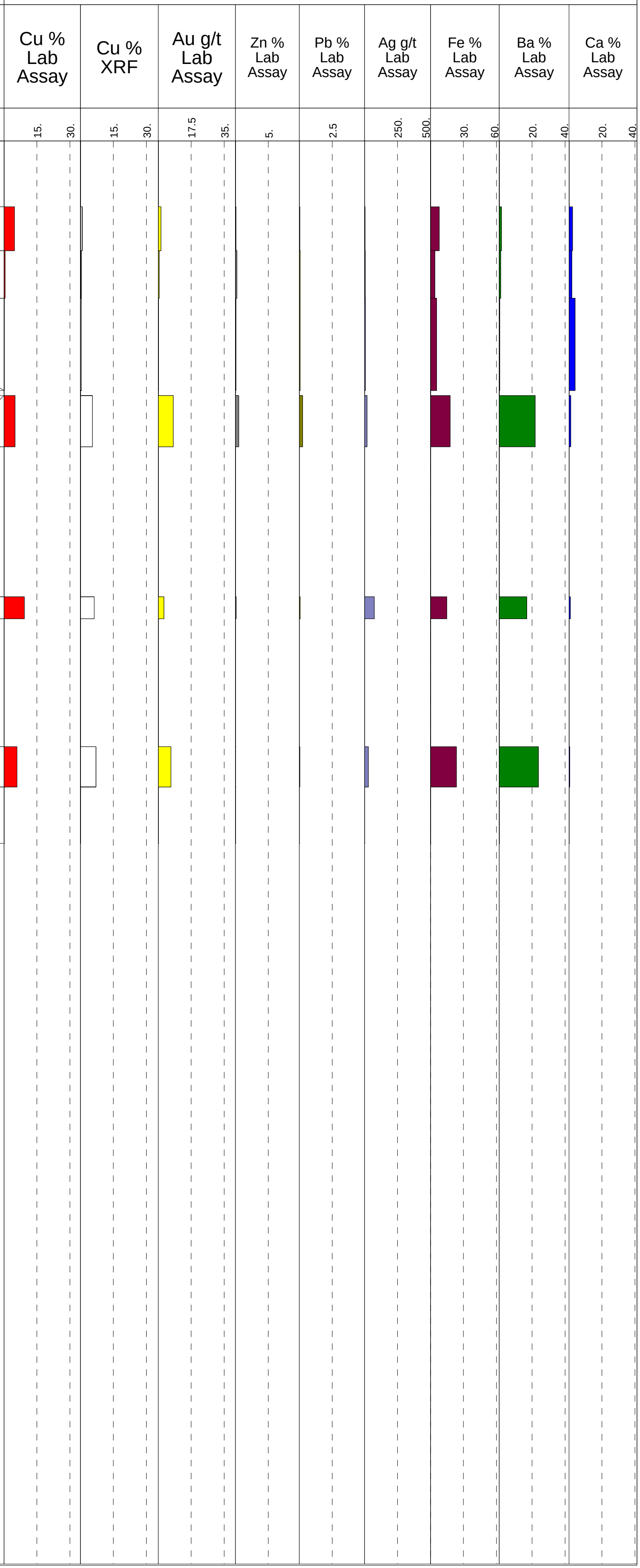
HoleID:	SD068	East:	399652.1
ProjectCode:	Manus	North:	9581101.45
Date Drilled:	9/07/2007	RL/Elevation:	-1520.12
		Depth:	9.6

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.90	**Core loss**		Uncon Sed	NS093
0.90	1.50	**Lithified clastic sediment (SLI)**	1	Lithified Sed	58840
1.50	2.15	**Clay (SCY)**	0	Lithified Sed	58841
2.15	3.41	**Fresh volcanic (VF)**	0	Lithified Sed	58842
3.41	3.48	**Core loss**		Lithified Sed	NS094
3.48	4.18	**Partly-altered volcanic (VPA)**	4	Lithified Sed	58843
4.18	6.23	**Core loss**		Lithified Sed	NS095
6.23	6.53	**Semi-massive sulfide (HSM)**	4	Sulphide	58844
6.53	8.28	**Core loss**		Sulphide	NS096
8.28	8.83	**Semi-massive sulfide (HSM)**	4	Sulphide	58845
8.83	9.60	**Core loss**		Unknown	NS097

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



Nautilus Minerals

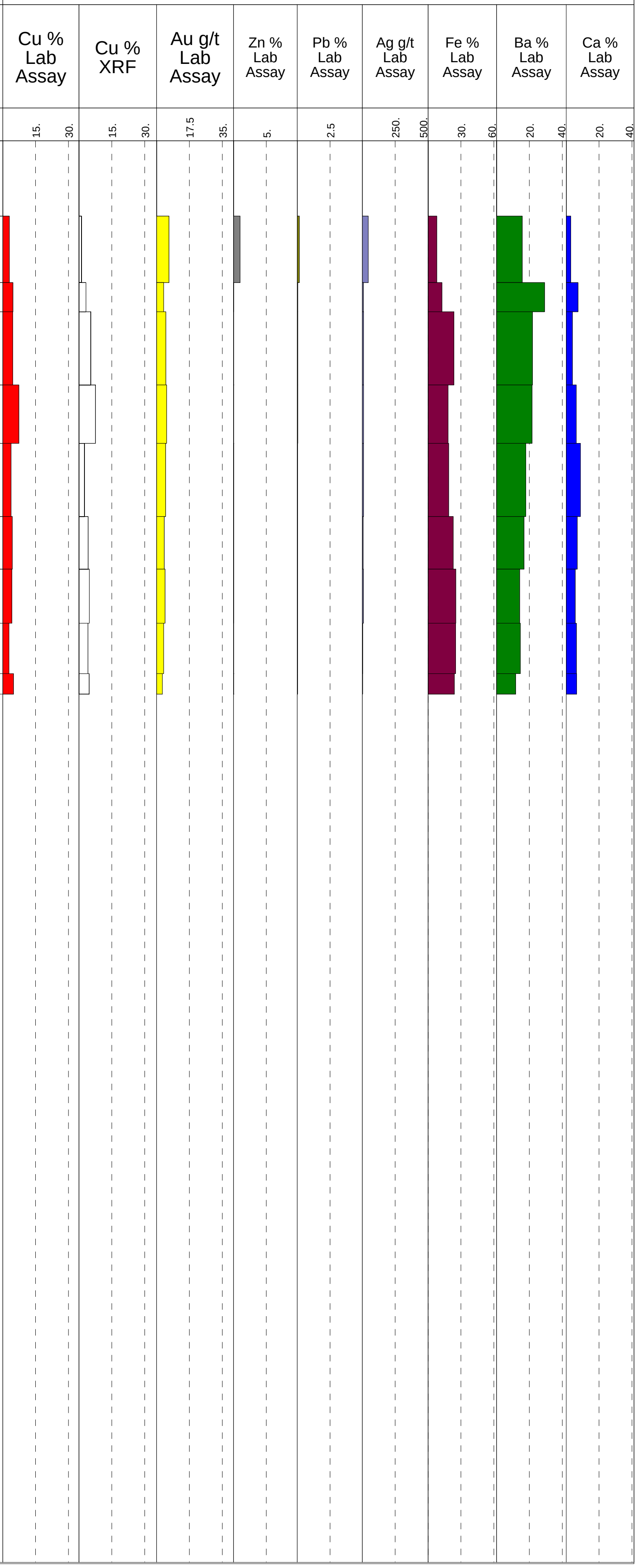
UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD069
ProjectCode: Manus
Date Drilled: 10/07/2007

East: 399641.57
North: 9581096.33
RL/Elevation: -1518.24
Depth: 7.57

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.03	**Core loss**		Uncon Sed	NS098
1.03	1.94	**Hydrothermally altered clay-rich rock (HSI)**	0	Lithified Sed	58846
1.94	2.34	**Semi-massive sulfide (HSM)**	5	Sulphide	58847
2.34	3.34	**Massive sulfide (HMS)**	2	Sulphide	58848
3.34	4.14	**Massive sulfide (HMS)**	2	Sulphide	58849
4.14	5.14	**Massive sulfide (HMS)**	4	Sulphide	58850
5.14	5.86	**Massive sulfide (HMS)**	4	Sulphide	58851
5.86	6.60	**Massive sulfide (HMS)**	4	Sulphide	58852
6.60	7.29	**Massive sulfide (HMS)**	4	Sulphide	58853
7.29	7.57	**Massive sulfide (HMS)**	4	Sulphide	58854

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID:	SD070	East:	399695.94
ProjectCode:	Manus	North:	9581057.49
Date Drilled:	10/07/2007	RL/Elevation:	-1527.11
		Depth:	0.9

Depth	Geology Items							Assay								
	From	To	Lithology		Ore Type	Domain	Sample ID	Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
								15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.
	0.00	0.70	**Core loss**			*Uncon Sed*	NS098A									
	0.70	0.90	**Semi-massive sulfide (HSM)**		2	*Sulphide*	58855									

Depth: 2 4 6 8 10 12 14 16 18

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

Nautilus Minerals

HoleID: SD071
ProjectCode: Manus
Date Drilled: 11/07/2007

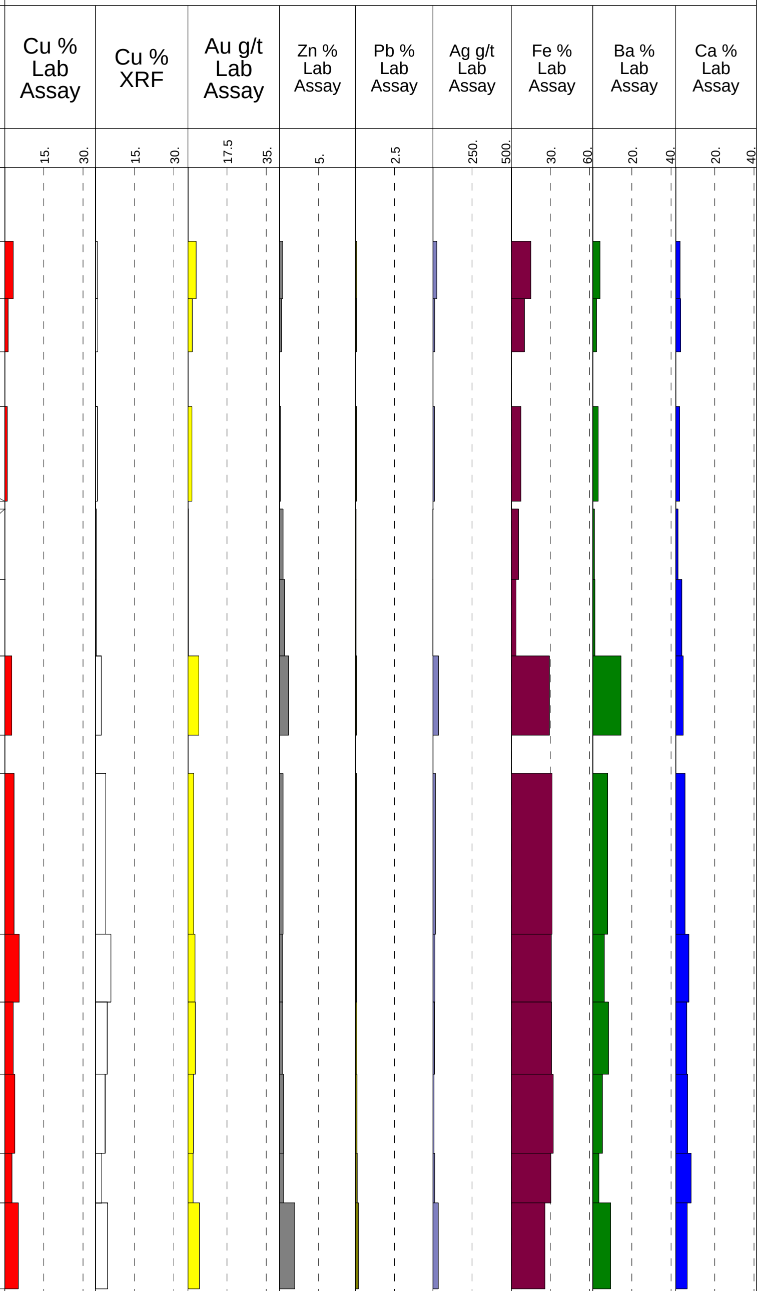
East: 399692.72
North: 9581054.47
RL/Elevation: -1526.9
Depth: 12.9

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.85	**Core loss**		Uncon Sed	NS099
0.85	1.51	**Silt (SLT)**	1	Lithified Sed	58856
1.51	2.12	**Silt (SLT)**	1	Lithified Sed	58857
2.12	2.75	**Core loss**		Lithified Sed	NS100
2.75	3.84	**Silt (SLT)**	0	Lithified Sed	58858
3.84	3.93	**Core loss**		Lithified Sed	NS101
3.93	4.74	**Silt (SLT)**	0	Lithified Sed	58859
4.74	5.62	**Silt (SLT)**	0	Lithified Sed	58860
5.62	6.53	**Semi-massive sulfide (HSM)**	2	Sulphide	58861
6.53	6.97	**Core loss**		Sulphide	NS102
6.97	8.82	**Massive sulfide (HMS)**	4	Sulphide	58862
8.82	9.60	**Massive sulfide (HMS)**	4	Sulphide	58863
9.60	10.43	**Massive sulfide (HMS)**	4	Sulphide	58864
10.43	11.34	**Massive sulfide (HMS)**	4	Sulphide	58865
11.34	11.91	**Massive sulfide (HMS)**	4	Sulphide	58866
11.91	12.90	**Massive sulfide (HMS)**	4	Sulphide	58867

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

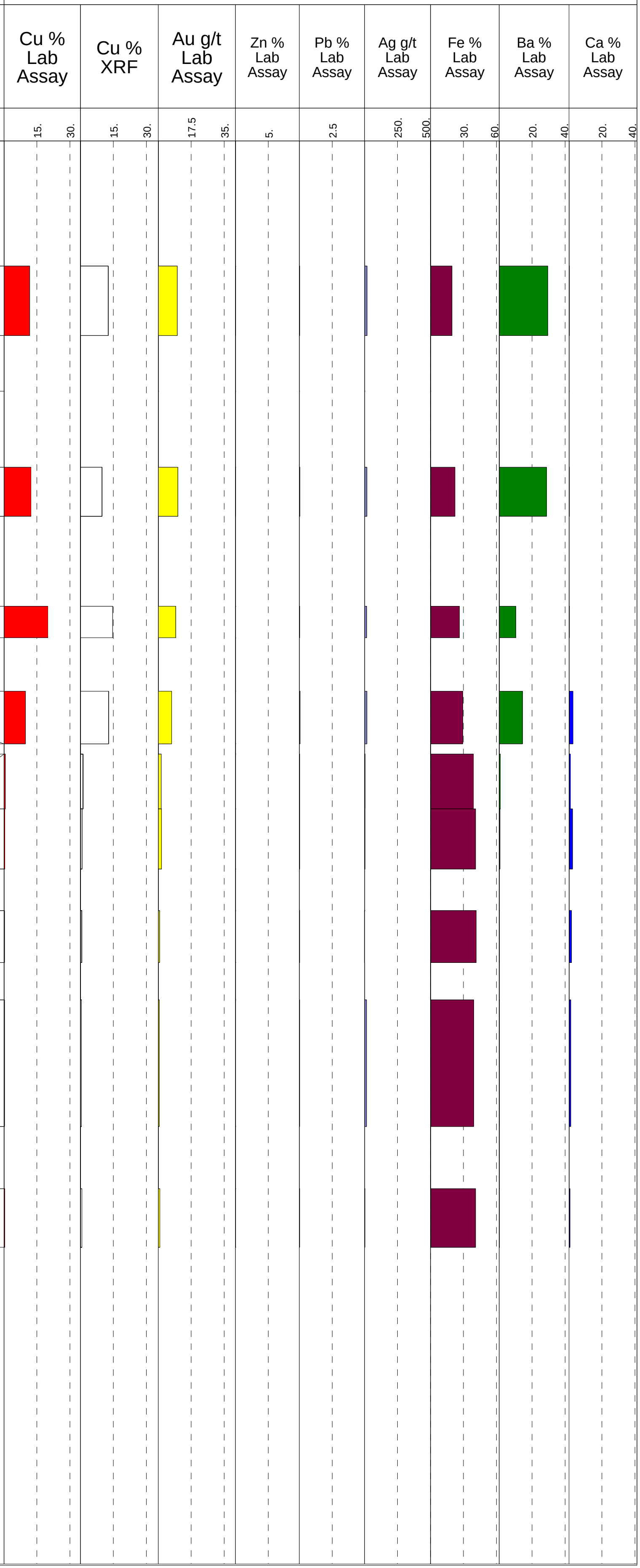
HoleID: SD072
ProjectCode: Manus
Date Drilled: 12/07/2007

East: 399696.02
North: 9581008.56
RL/Elevation: -1529.19
Depth: 15.12

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.71	**Core loss**		*Uncon Sed*	NS103
1.71	2.66	**Massive sulfide (HMS)**	1	*Sulphide*	58868
2.66	3.42	**Core loss**		*Sulphide*	NS104
3.42	4.46	**Core loss**		*Sulphide*	NS105
4.46	5.13	**Semi-massive sulfide (HSM)**	2	*Sulphide*	58869
5.13	6.36	**Core loss**		*Sulphide*	NS106
6.36	6.79	**Massive sulfide (HMS)**	3	*Sulphide*	58870
6.79	7.52	**Core loss**		*Sulphide*	NS107
7.52	8.24	**Massive sulfide (HMS)**	3	*Sulphide*	58871
8.24	8.38	**Core loss**		*Sulphide*	NS108
8.38	9.13	**Massive sulfide (HMS)**	3	*Sulphide*	58872
9.13	9.95	**Massive sulfide (HMS)**	3	*Sulphide*	58873
9.95	10.52	**Core loss**		*Sulphide*	NS109
10.52	11.23	**Massive sulfide (HMS)**	4	*Sulphide*	58874
11.23	11.74	**Core loss**		*Sulphide*	NS110
11.74	13.47	**Massive sulfide (HMS)**	4	*Sulphide*	58875
13.47	14.32	**Core loss**		*Sulphide*	NS111
14.32	15.12	**Massive sulfide (HMS)**	3	*Sulphide*	58876

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD073
ProjectCode: Manus
Date Drilled: 13/07/2007

East: 399696.04
North: 9580953.84
RL/Elevation: -1536.03
Depth: 3.56

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	2.00	**Core loss**		Uncon Sed	NS112
2.00	2.42	**Fresh volcanic (VF)**	0	Basement	58877
2.42	2.69	**Core loss**		Basement	NS113
2.69	3.56	**Fresh volcanic (VF)**	0	Basement	58878

Assay

Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD074
ProjectCode: Manus
Date Drilled: 13/07/2007

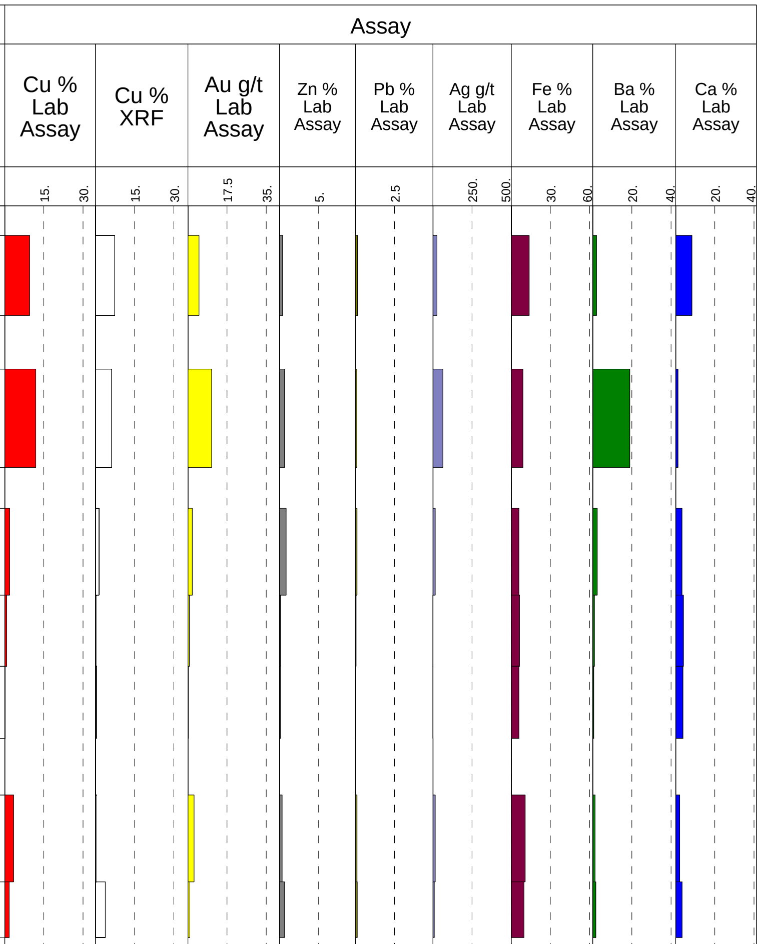
East: 399699.97
North: 9580988.13
RL/Elevation: -1531.79
Depth: 8.42

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.34	**Core loss**		*Uncon Sed*	NS114
0.34	1.26	**Lithified clastic sediment (SLI)**	1	*Uncon Sed*	58879
1.26	1.88	**Core loss**		*Uncon Sed*	NS115
1.88	3.01	**Lithified clastic sediment (SLI)**	1	*Lithified Sed*	58880
3.01	3.48	**Core loss**		*Lithified Sed*	NS116
3.48	4.48	**Altered volcanic (VA)**	0	*Lithified Sed*	58881
4.48	5.30	**Partly-altered volcanic (VPA)**	0	*Sulphide*	58882
5.30	6.13	**Partly-altered volcanic (VPA)**	0	*Sulphide*	58883
6.13	6.78	**Core loss**		*Uncon Sed*	NS117
6.78	7.78	**Altered volcanic (VA)**	0	*Basement*	58884
7.78	8.42	**Altered volcanic (VA)**	0	*Basement*	58885

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



UTM 56S
WGS 84
Date Printed: 7/12/2007

Nautilus Minerals

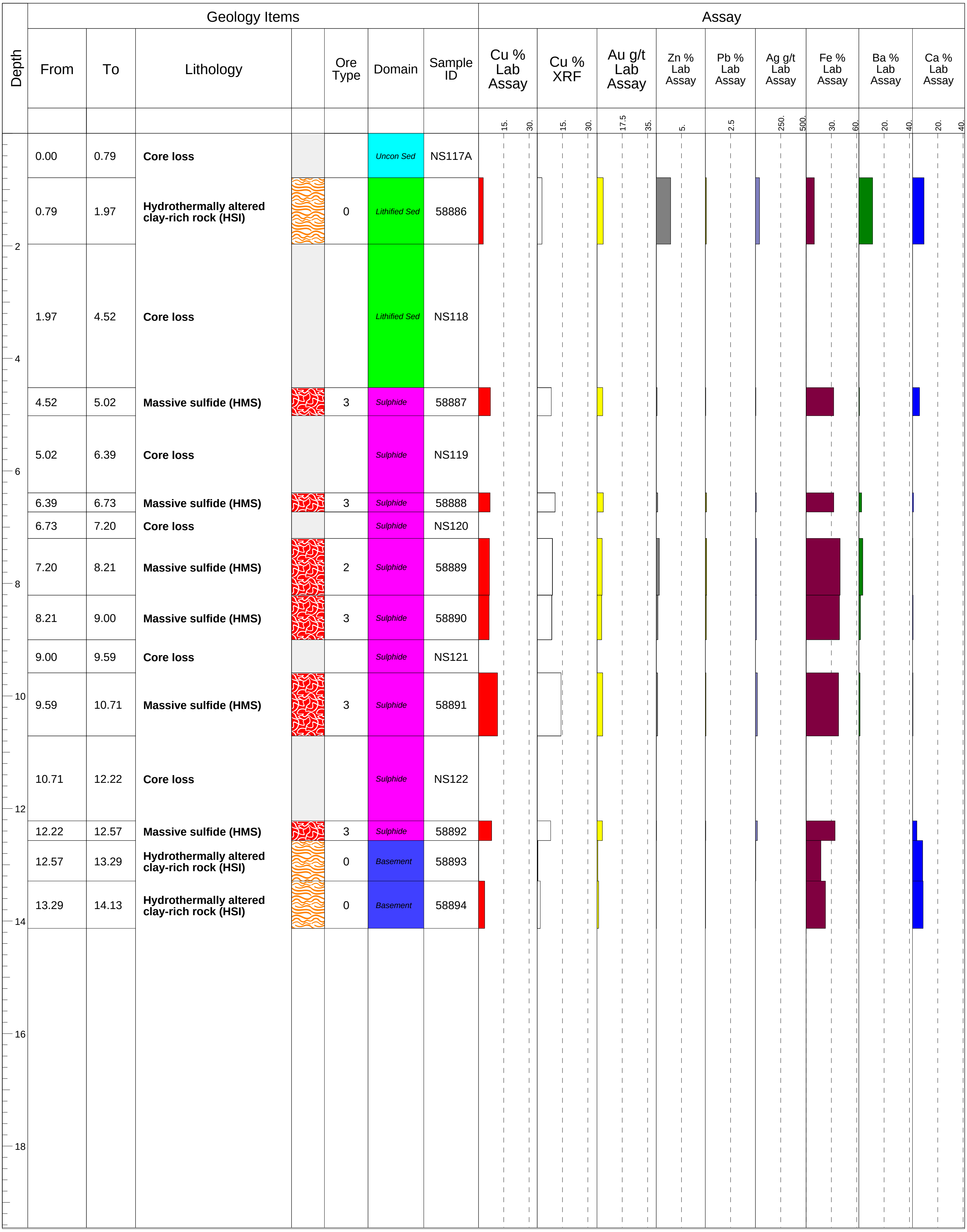
HoleID: SD075
ProjectCode: Manus
Date Drilled: 14/07/2007

East: 399730.37
North: 9580904.09
RL/Elevation: -1515.6
Depth: 14.13

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.79	Core loss		Uncon Sed	NS117A
0.79	1.97	Hydrothermally altered clay-rich rock (HSI)	0	Lithified Sed	58886
1.97	4.52	Core loss		Lithified Sed	NS118
4.52	5.02	Massive sulfide (HMS)	3	Sulphide	58887
5.02	6.39	Core loss		Sulphide	NS119
6.39	6.73	Massive sulfide (HMS)	3	Sulphide	58888
6.73	7.20	Core loss		Sulphide	NS120
7.20	8.21	Massive sulfide (HMS)	2	Sulphide	58889
8.21	9.00	Massive sulfide (HMS)	3	Sulphide	58890
9.00	9.59	Core loss		Sulphide	NS121
9.59	10.71	Massive sulfide (HMS)	3	Sulphide	58891
10.71	12.22	Core loss		Sulphide	NS122
12.22	12.57	Massive sulfide (HMS)	3	Sulphide	58892
12.57	13.29	Hydrothermally altered clay-rich rock (HSI)	0	Basement	58893
13.29	14.13	Hydrothermally altered clay-rich rock (HSI)	0	Basement	58894

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD076
ProjectCode: Manus
Date Drilled: 14/07/2007

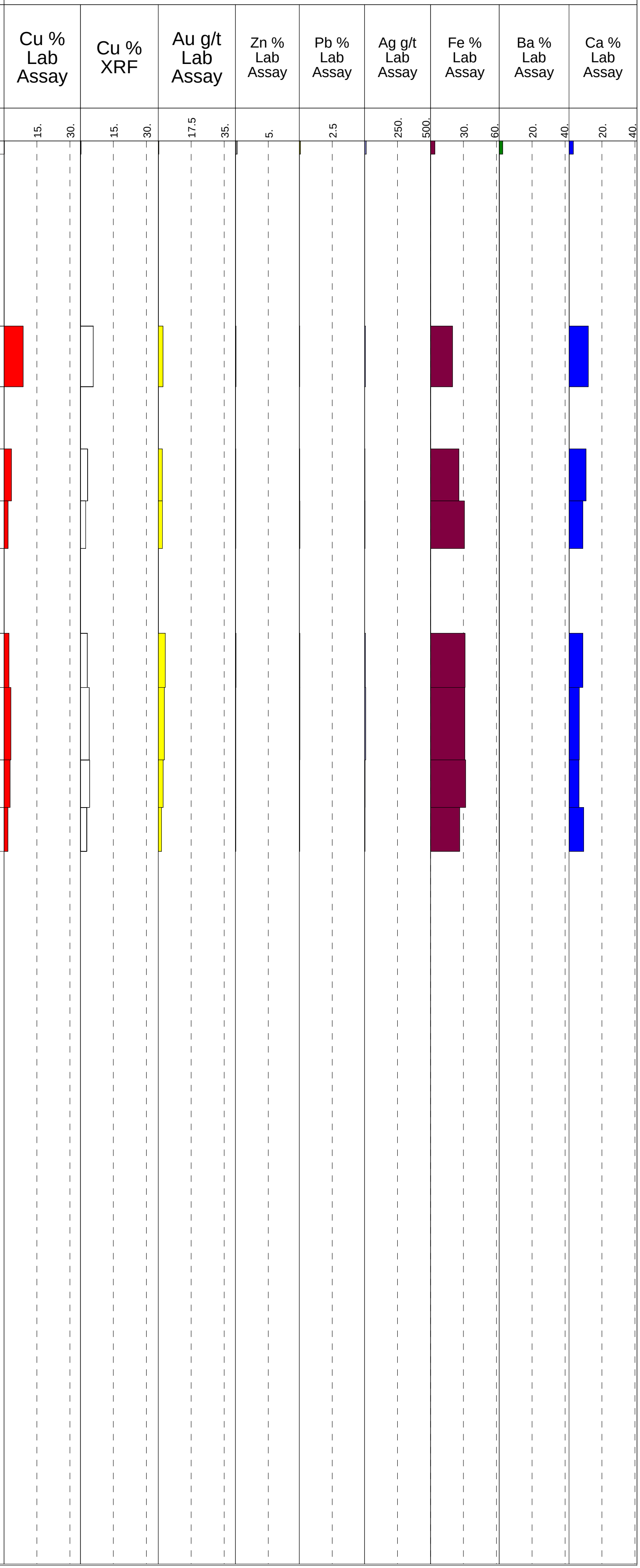
East: 399740.83
North: 9580884.22
RL/Elevation: -1522.32
Depth: 9.71

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
		sediment (SLI)		Lithified Sed	
0.18	2.53	Core loss		Lithified Sed	NS123
2.53	3.36	Semi-massive sulfide (HSM)	2	Sulphide	58896
3.36	4.21	Core loss		Sulphide	NS124
4.21	4.92	Massive sulfide (HMS)	4	Sulphide	58897
4.92	5.57	Massive sulfide (HMS)	4	Sulphide	58898
5.57	6.73	Core loss		Sulphide	NS125
6.73	7.47	Massive sulfide (HMS)	4	Sulphide	58899
7.47	8.46	Massive sulfide (HMS)	4	Sulphide	58900
8.46	9.11	Massive sulfide (HMS)	4	Sulphide	58901
9.11	9.71	Massive sulfide (HMS)	4	Sulphide	58902

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

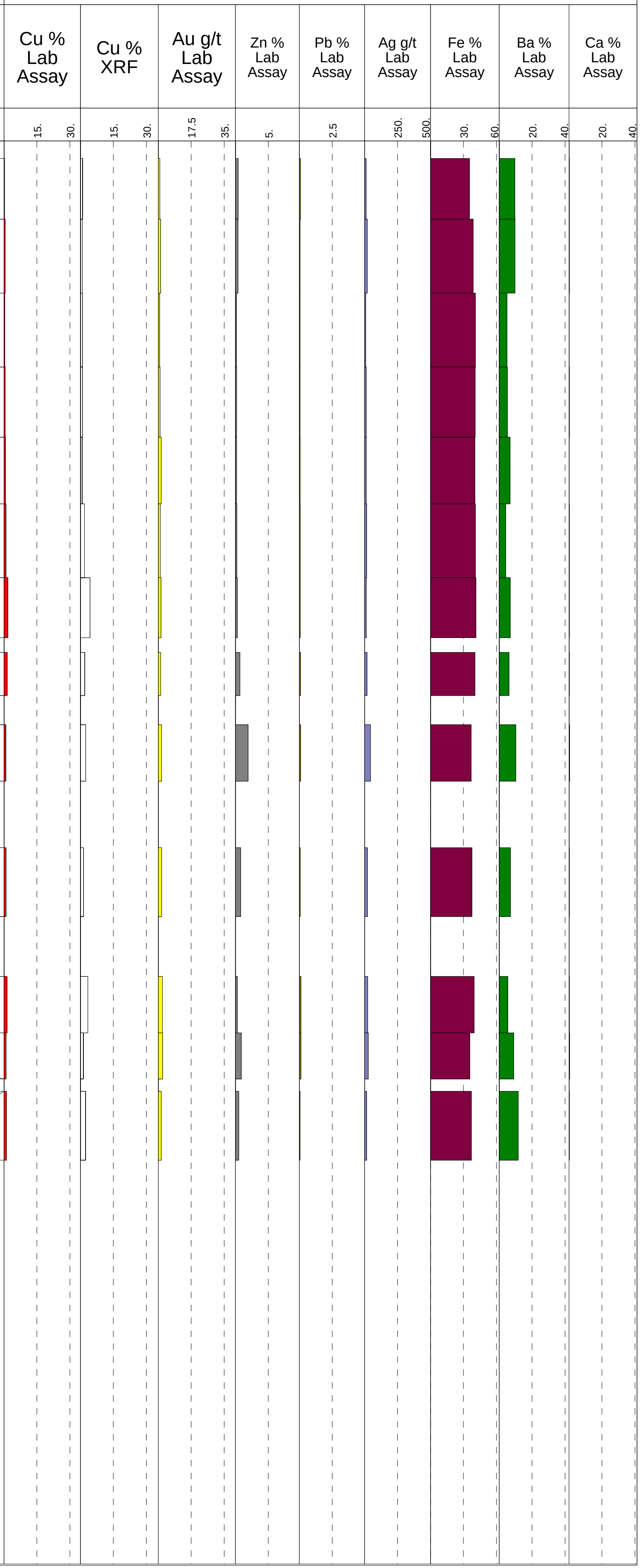
HoleID: SD077
ProjectCode: Manus
Date Drilled: 16/07/2007

East: 399774.1
North: 9580871.28
RL/Elevation: -1526.86
Depth: 13.93

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.24	Core loss		Uncon Sed	NS125A
0.24	1.07	Massive sulfide (HMS)	2	Sulphide	58933
1.07	2.08	Massive sulfide (HMS)	2	Sulphide	58904
2.08	3.09	Massive sulfide (HMS)	2	Sulphide	58905
3.09	4.05	Massive sulfide (HMS)	2	Sulphide	58906
4.05	4.96	Massive sulfide (HMS)	2	Sulphide	58907
4.96	5.97	Massive sulfide (HMS)	2	Sulphide	58908
5.97	6.79	Massive sulfide (HMS)	2	Sulphide	58909
6.79	6.99	Core loss		Sulphide	NS125B
6.99	7.58	Massive sulfide (HMS)	2	Sulphide	58910
7.58	7.98	Core loss		Sulphide	NS126
7.98	8.75	Massive sulfide (HMS)	2	Sulphide	58911
8.75	9.66	Core loss		Sulphide	NS127
9.66	10.60	Massive sulfide (HMS)	2	Sulphide	58912
10.60	11.42	Core loss		Sulphide	NS128
11.42	12.19	Massive sulfide (HMS)	2	Sulphide	58913
12.19	12.82	Massive sulfide (HMS)	2	Sulphide	58914
12.82	12.99	Core loss		Sulphide	NS128A
12.99	13.93	Massive sulfide (HMS)	2	Sulphide	58915

Assay



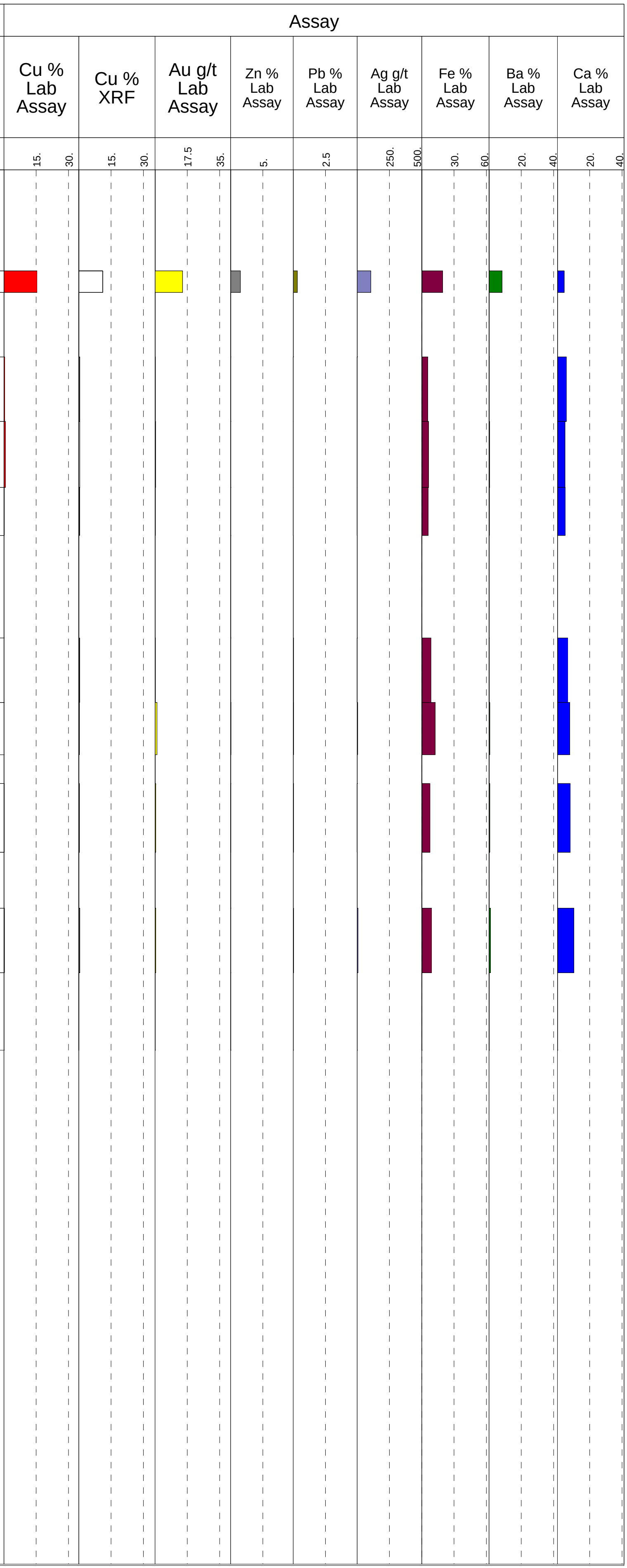
Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD078
ProjectCode: Manus
Date Drilled: 17/07/2007

East: 399630.44
North: 9581043.37
RL/Elevation: -1508.72
Depth: 12.28

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.41	**Core loss**		Uncon Sed	NS129
1.41	1.71	**Semi-massive sulfide (HSM)**	1	Sulphide	58917
1.71	2.61	**Core loss**		Basement	NS130
2.61	3.51	**Altered volcanic (VA)**	0	Basement	58918
3.51	4.43	**Altered volcanic (VA)**	0	Basement	58919
4.43	5.10	**Altered volcanic (VA)**	0	Basement	58920
5.10	6.53	**Core loss**		Basement	NS131
6.53	7.43	**Altered volcanic (VA)**	0	Basement	58921
7.43	8.16	**Altered volcanic (VA)**	0	Basement	58922
8.16	8.56	**Core loss**		Basement	NS132
8.56	9.52	**Altered volcanic (VA)**	0	Basement	58923
9.52	10.30	**Core loss**		Basement	NS133
10.30	11.20	**Altered volcanic (VA)**	0	Basement	58924
11.20	12.28	**Core loss**		Basement	NS134



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

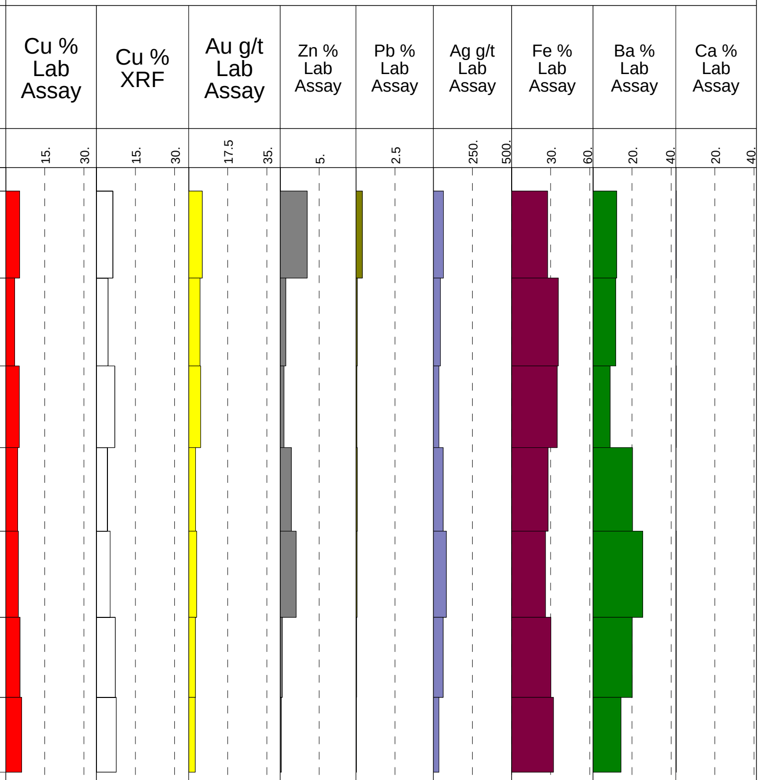
HoleID:	SD079	East:	399370.92
ProjectCode:	Manus	North:	9581034.74
Date Drilled:	18/07/2007	RL/Elevation:	-1512.1
		Depth:	6.95

Geology Items

From	To	Lithology		Ore Type	Domain	Sample ID
0.00	0.27	**Core loss**			Uncon Sed	NS135
0.27	1.27	**Massive sulfide (HMS)**		1	Sulphide	58934
1.27	2.28	**Massive sulfide (HMS)**		1	Sulphide	58935
2.28	3.22	**Massive sulfide (HMS)**		2	Sulphide	58936
3.22	4.18	**Massive sulfide (HMS)**		2	Sulphide	58937
4.18	5.17	**Massive sulfide (HMS)**		3	Sulphide	58938
5.17	6.09	**Massive sulfide (HMS)**		3	Sulphide	58939
6.09	6.95	**Massive sulfide (HMS)**		3	Sulphide	58940

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD080
ProjectCode: Manus
Date Drilled: 19/07/2007

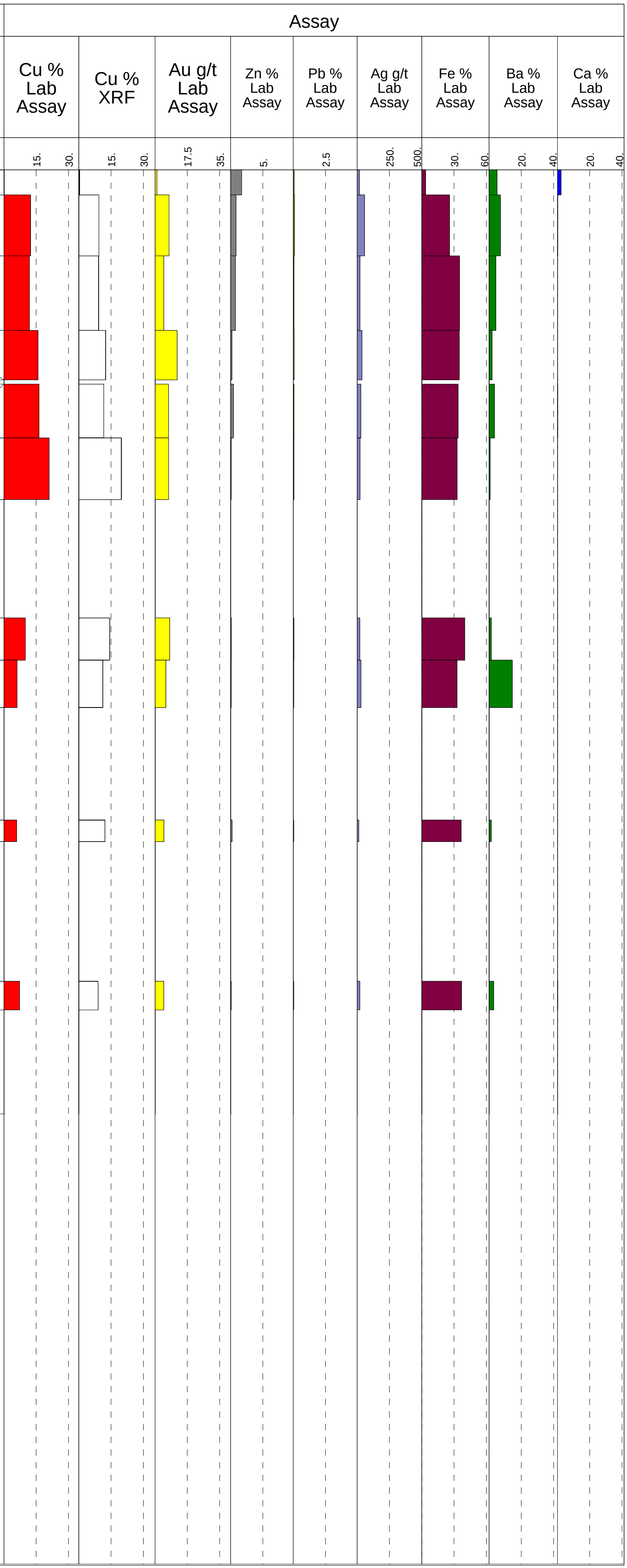
East: 399378.52
North: 9581086.72
RL/Elevation: -1495.5
Depth: 13.17

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.35	**Lithified clastic sediment (SLI)**	0	Sulphide	58941
0.35	1.20	**Semi-massive sulfide (HSM)**	2	Sulphide	58942
1.20	2.24	**Massive sulfide (HMS)**	2	Sulphide	58943
2.24	2.93	**Massive sulfide (HMS)**	2	Sulphide	58944
2.93	2.99	**Core loss**		Sulphide	NS135A
2.99	3.74	**Massive sulfide (HMS)**	2	Sulphide	58945
3.74	4.60	**Massive sulfide (HMS)**	2	Sulphide	58946
4.60	6.25	**Core loss**		Sulphide	NS136
6.25	6.84	**Massive sulfide (HMS)**	2	Sulphide	58947
6.84	7.50	**Massive sulfide (HMS)**	2	Sulphide	58948
7.50	9.07	**Core loss**		Sulphide	NS137
9.07	9.37	**Massive sulfide (HMS)**	2	Sulphide	58949
9.37	11.32	**Core loss**		Sulphide	NS138
11.32	11.72	**Massive sulfide (HMS)**	2	Sulphide	58950
11.72	13.17	**Core loss**		Unknown	NS139

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD081
ProjectCode: Manus
Date Drilled: 19/07/2007

East: 399314.04
North: 9580988.45
RL/Elevation: -1509.65
Depth: 4.56

Depth	From	To	Lithology		Ore Type	Domain	Sample ID	Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
								15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.
	0.00	0.76	**Core loss**			*Uncon Sed*	NS151									
	0.76	1.32	**Fresh volcanic (VF)**		0	*Basement*	58964									
	1.32	1.91	**Fresh volcanic (VF)**		0	*Basement*	58965									
	1.91	4.56	**Core loss**			*Basement*	NS152									

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD082
ProjectCode: Manus
Date Drilled: 19/07/2007

East: 399297.96
North: 9580972.22
RL/Elevation: -1509.52
Depth: 3.59

Depth	Geology Items							Assay								
	From	To	Lithology		Ore Type	Domain	Sample ID	Cu % Lab Assay (15. 30.)	Cu % XRF (15. 30.)	Au g/t Lab Assay (17.5 35.)	Zn % Lab Assay (5.)	Pb % Lab Assay (2.5)	Ag g/t Lab Assay (250. 500.)	Fe % Lab Assay (30. 60.)	Ba % Lab Assay (20. 40.)	Ca % Lab Assay (20. 40.)
	0.00	1.57	**Core loss**			*Uncon Sed*	NS153									
	1.57	1.92	**Fresh volcanic (VF)**		0	*Uncon Sed*	58966									
2	1.92	2.57	**Fresh volcanic (VF)**		0	*Basement*	58967									
	2.57	3.12	**Fresh volcanic (VF)**		0	*Basement*	58968									
	3.12	3.59	**Core loss**			*Lithified Sed*	NS154									
4																
6																
8																
10																
12																
14																
16																
18																

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

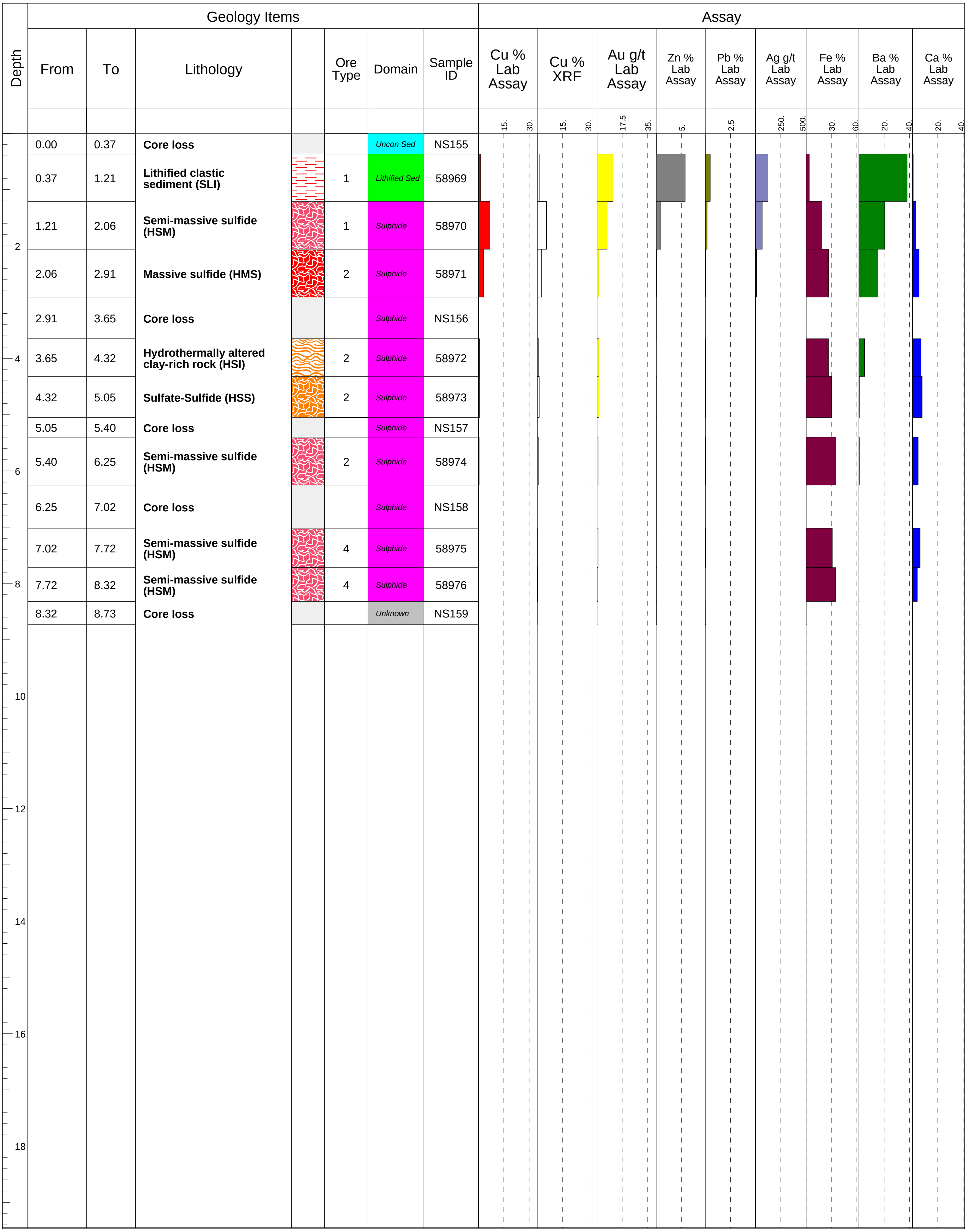
HoleID: SD083
ProjectCode: Manus
Date Drilled: 20/07/2007

East: 399311.15
North: 9581032.88
RL/Elevation: -1504.72
Depth: 8.73

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.37	Core loss		Uncon Sed	NS155
0.37	1.21	Lithified clastic sediment (SLI)	1	Lithified Sed	58969
1.21	2.06	Semi-massive sulfide (HSM)	1	Sulphide	58970
2.06	2.91	Massive sulfide (HMS)	2	Sulphide	58971
2.91	3.65	Core loss		Sulphide	NS156
3.65	4.32	Hydrothermally altered clay-rich rock (HSI)	2	Sulphide	58972
4.32	5.05	Sulfate-Sulfide (HSS)	2	Sulphide	58973
5.05	5.40	Core loss		Sulphide	NS157
5.40	6.25	Semi-massive sulfide (HSM)	2	Sulphide	58974
6.25	7.02	Core loss		Sulphide	NS158
7.02	7.72	Semi-massive sulfide (HSM)	4	Sulphide	58975
7.72	8.32	Semi-massive sulfide (HSM)	4	Sulphide	58976
8.32	8.73	Core loss		Unknown	NS159

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID:	SD084	East:	399297.59
ProjectCode:	Manus	North:	9581068.05
Date Drilled:	20/07/2007	RL/Elevation:	-1514.8
		Depth:	4.43

From	To	Lithology		Ore Type	Domain	Sample ID
0.00	1.77	**Core loss**			*Uncon Sed*	NS160
1.77	2.07	**Fresh volcanic (VF)**		0	*Basement*	58977
2.07	3.93	**Core loss**			*Basement*	NS161
3.93	4.43	**Fresh volcanic (VF)**		0	*Basement*	58978

Assay

Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

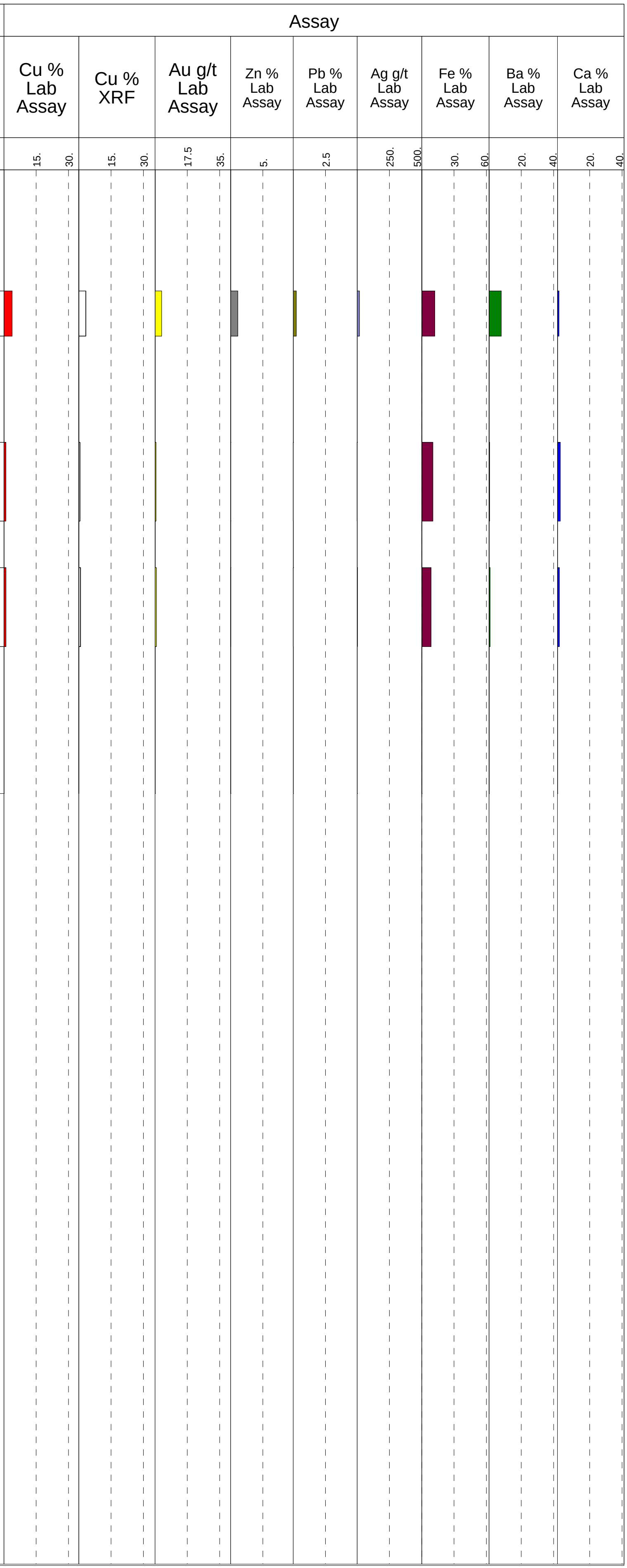
NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID:	SD085	East:	399317.95
ProjectCode:	Manus	North:	9581096.19
Date Drilled:	20/07/2007	RL/Elevation:	-1508.07
		Depth:	8.7

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.69	**Core loss**		Uncon Sed	NS162
1.69	2.32	**Altered volcanic (VA)**	1	Uncon Sed	58979
2.32	3.80	**Core loss**		Uncon Sed	NS163
3.80	4.90	**Altered volcanic (VA)**	1	Uncon Sed	58980
4.90	5.55	**Core loss**		Uncon Sed	NS164
5.55	6.65	**Altered volcanic (VA)**	2	Basement	58981
6.65	8.70	**Core loss**		Basement	NS165



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

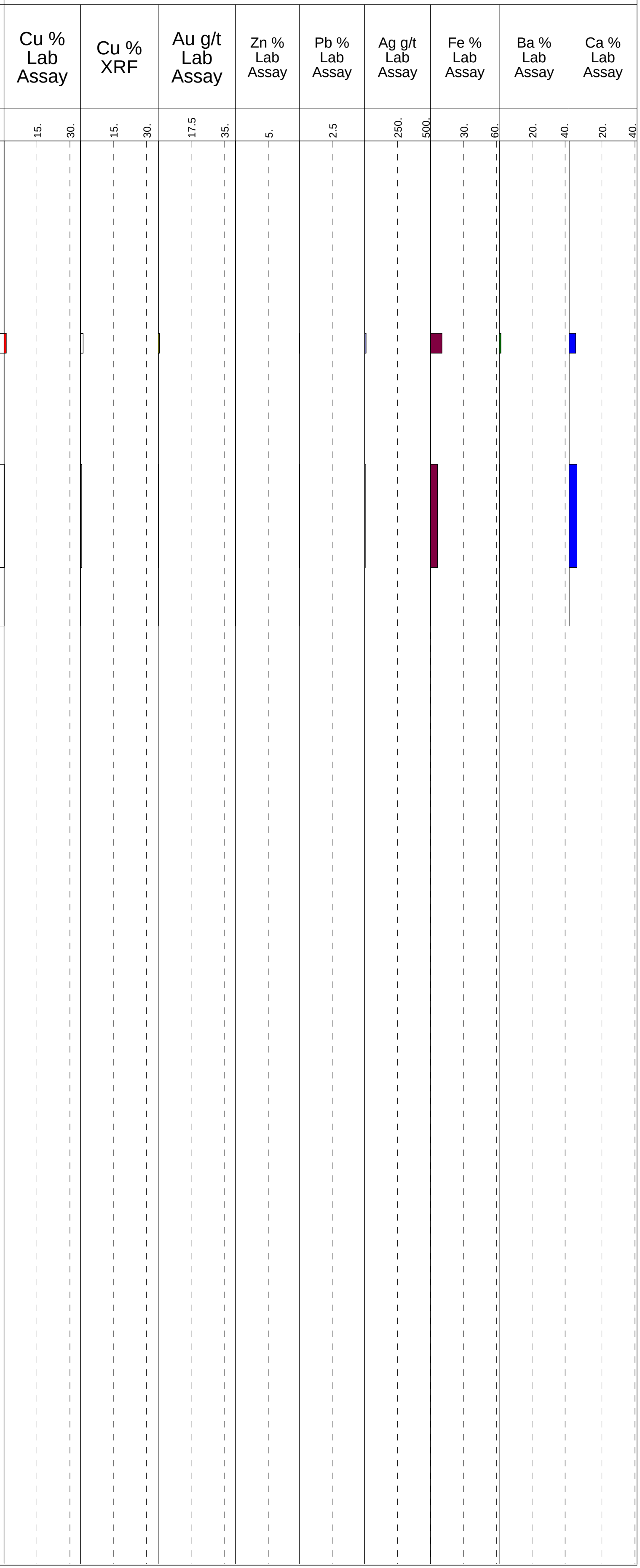
HoleID: SD086
ProjectCode: Manus
Date Drilled: 21/07/2007

East: 399312.22
North: 9581144.7
RL/Elevation: -1503.73
Depth: 6.63

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	2.63	**Core loss**		*Uncon Sed*	NS166
2.63	2.90	**Semi-massive sulfide (HSM)**	1	*Sulphide*	58982
2.90	4.42	**Core loss**		*Basement*	NS167
4.42	5.83	**Fresh volcanic (VF)**	0	*Basement*	58984
5.83	6.63	**Core loss**		*Basement*	NS168

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID:	SD087
ProjectCode:	Manus
Date Drilled:	21/07/2007
East:	399449.04
North:	9581123.6
RL/Elevation:	-1508.04
Depth:	8.52

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
				Uncon Sed	
0.19	1.00	**Sulfate-Sulfide (HSS)**	1	Sulphide	58985
1.00	1.71	**Sulfate-Sulfide (HSS)**	2	Sulphide	58986
1.71	2.73	**Core loss**		Sulphide	NS169
2.73	3.48	**Semi-massive sulfide (HSM)**	1	Sulphide	58987
3.48	5.14	**Core loss**		Basement	NS170
5.14	5.94	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58988
5.94	6.57	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	58989
6.57	7.37	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	58990
7.37	7.87	**Core loss**		Basement	NS171
7.87	8.52	**Altered volcanic (VA)**	7	Basement	58991

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay

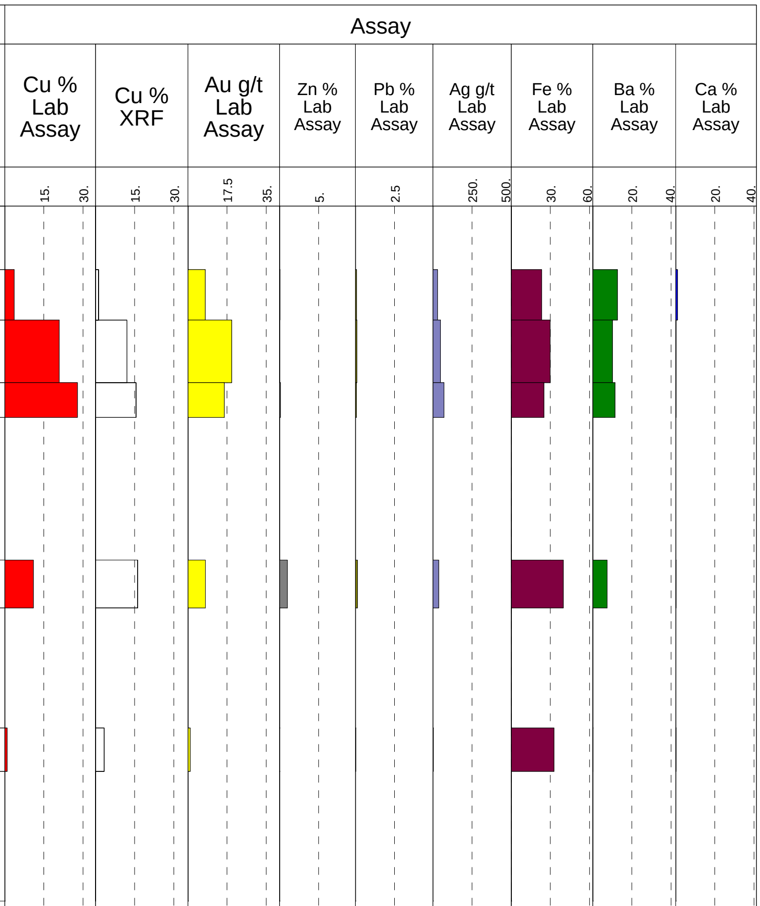
UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD088
ProjectCode: Manus
Date Drilled: 21/07/2007

East: 399447.96
North: 9581155.85
RL/Elevation: -1507.63
Depth: 7.99

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.73	**Core loss**		*Uncon Sed*	NS172
0.73	1.31	**Silt (SLT)**	0	*Sulphide*	58992
1.31	2.03	**Semi-massive sulfide (HSM)**	2	*Sulphide*	58993
2.03	2.43	**Massive sulfide (HMS)**	2	*Sulphide*	58994
2.43	4.07	**Core loss**		*Sulphide*	NS173
4.07	4.62	**Massive sulfide (HMS)**	2	*Sulphide*	58995
4.62	6.00	**Core loss**		*Sulphide*	NS174
6.00	6.50	**Massive sulfide (HMS)**	2	*Sulphide*	58996
6.50	7.99	**Core loss**		*Unknown*	NS175



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

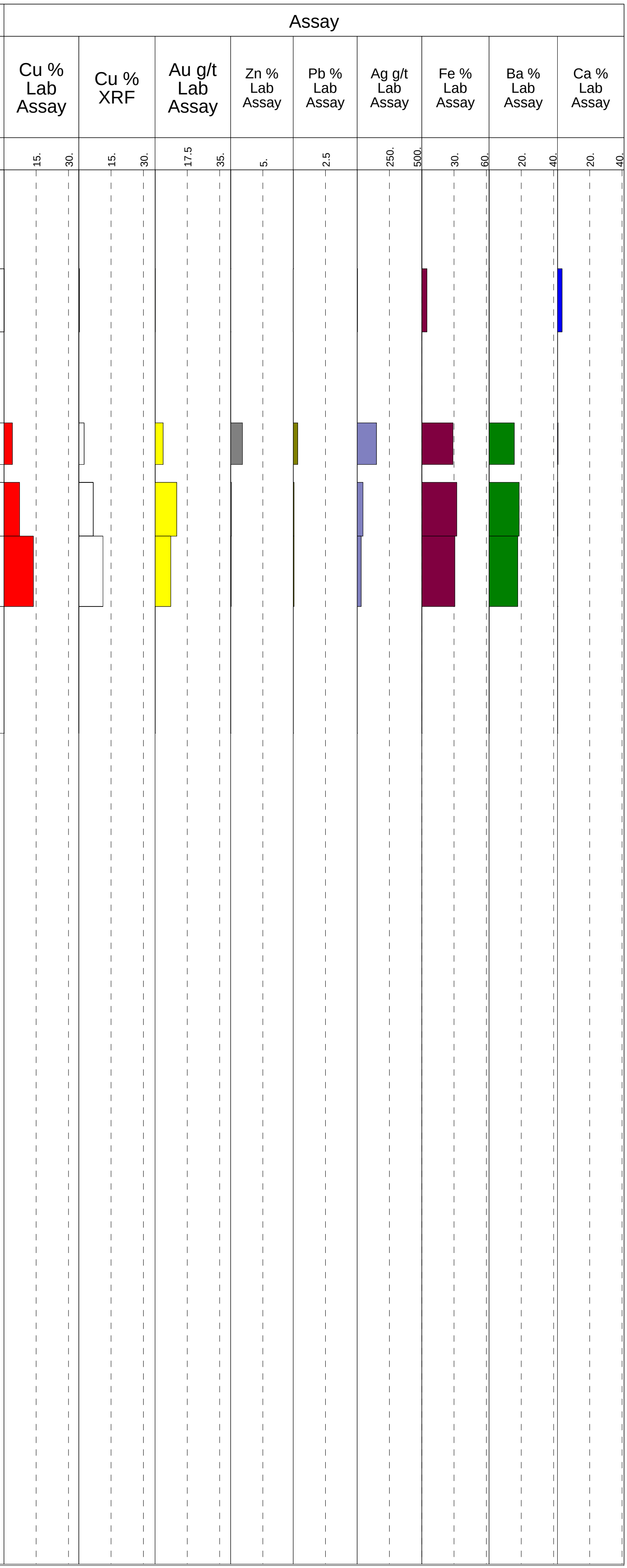
HoleID: SD089
ProjectCode: Manus
Date Drilled: 21/07/2007

East: 399443.81
North: 9581139.85
RL/Elevation: -1511.61
Depth: 7.86

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.38	**Core loss**		Uncon Sed	NS176
1.38	2.26	**Silt (SLT)**	0	Lithified Sed	58997
2.26	3.53	**Core loss**		Lithified Sed	NS177
3.53	4.11	**Semi-massive sulfide (HSM)**	2	Sulphide	58998
4.11	4.36	**Core loss**		Sulphide	NS177A
4.36	5.11	**Massive sulfide (HMS)**	2	Sulphide	58999
5.11	6.09	**Massive sulfide (HMS)**	2	Sulphide	59000
6.09	7.86	**Core loss**		Unknown	NS178

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

NAUTILUS Minerals Inc.	UTM 56S WGS 84 Date Printed: 7/12/2007	

Nautilus Minerals

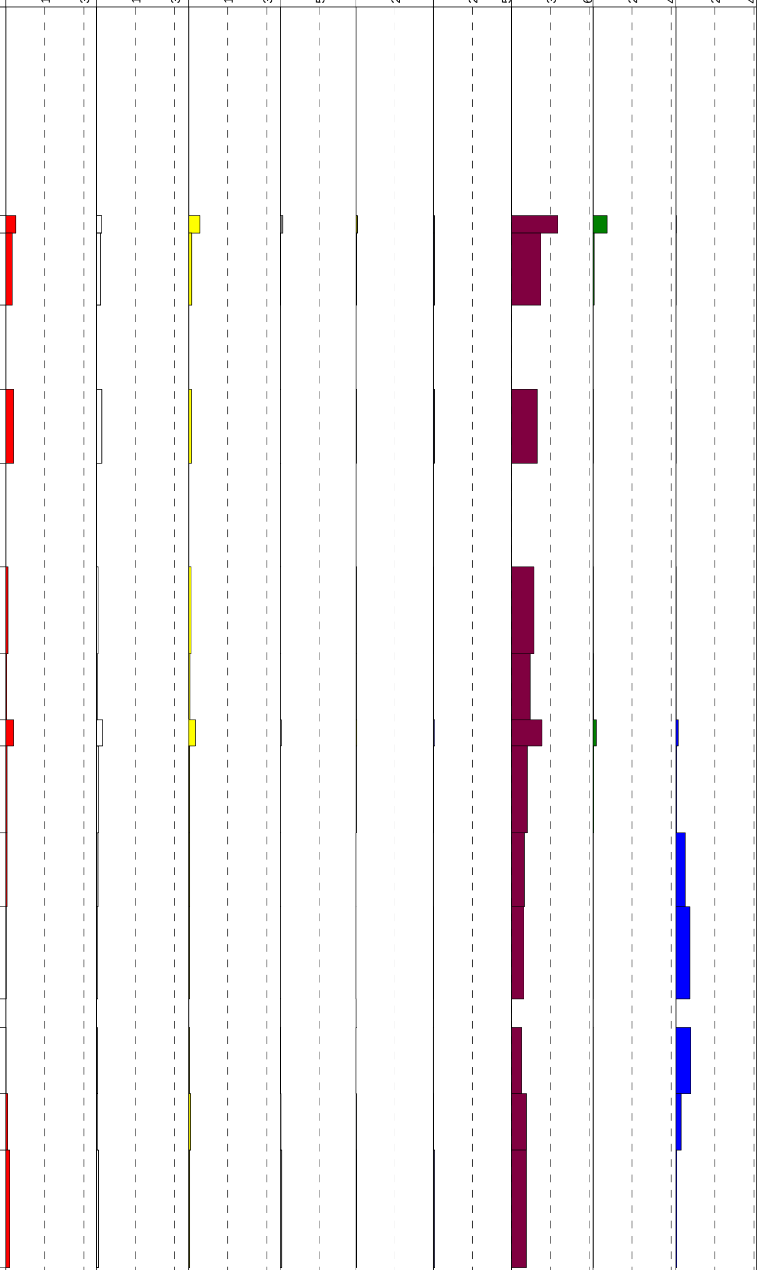
HoleID:	SD090	East:	399386.32
ProjectCode:	Manus	North:	9581054.62
Date Drilled:	22/07/2007	RL/Elevation:	-1512.38
		Depth:	14.5

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	2.40	**Core loss**		*Uncon Sed*	NS179
2.40	2.60	**Sulfate-Sulfide (HSS)**	1	*Sulphide*	59001
2.60	3.43	**Hydrothermally altered clay-rich rock (HSI)**	7	*Basement*	59002
3.43	4.40	**Core loss**		*Basement*	NS180
4.40	5.25	**Altered volcanic (VA)**	7	*Basement*	59003
5.25	6.44	**Core loss**		*Basement*	NS181
6.44	7.44	**Altered volcanic (VA)**	7	*Basement*	59004
7.44	8.20	**Altered volcanic (VA)**	7	*Basement*	59005
8.20	8.50	**Volcaniclastic Sand (SVC)**	0	*Basement*	59006
8.50	9.50	**Altered volcanic (VA)**	7	*Basement*	59007
9.50	10.35	**Altered volcanic (VA)**	7	*Basement*	59008
10.35	11.41	**Altered volcanic (VA)**	7	*Basement*	59009
11.41	11.74	**Core loss**		*Basement*	NS182
11.74	12.50	**Altered volcanic (VA)**	7	*Basement*	59010
12.50	13.15	**Altered volcanic (VA)**	7	*Basement*	59011
13.15	14.50	**Altered volcanic (VA)**	7	*Basement*	59012

Assay

Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

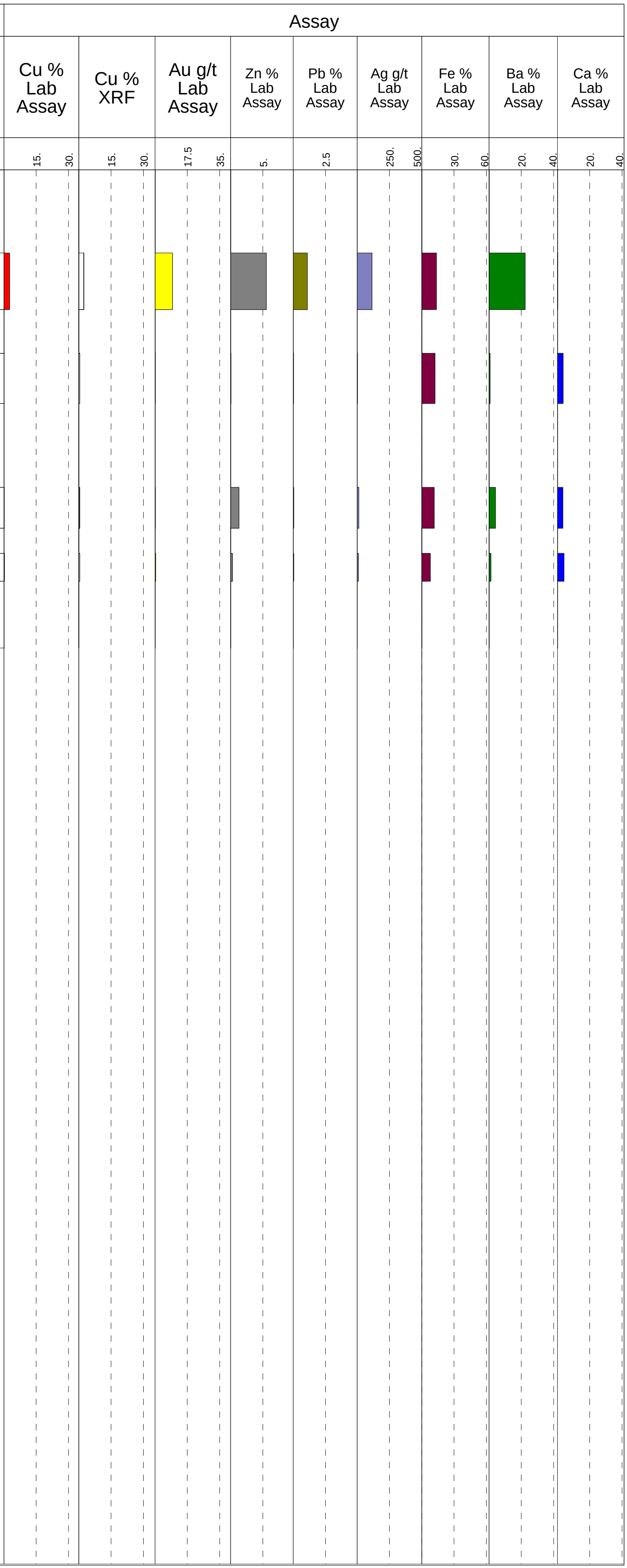
HoleID: SD091
ProjectCode: Manus
Date Drilled: 22/07/2007

East: 399413.05
North: 9581098.89
RL/Elevation: -1511.26
Depth: 6.67

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.16	**Core loss**		*Uncon Sed*	NS183
1.16	1.95	**Volcanic breccia with sulphide matrix**	1	*Sulphide*	59013
1.95	2.56	**Core loss**		*Sulphide*	NS184
2.56	3.26	**Volcanic breccia with sulphide matrix**	8	*Sulphide*	59014
3.26	4.43	**Core loss**		*Sulphide*	NS185
4.43	5.00	**Volcanic breccia with sulphide matrix**	8	*Sulphide*	59015
5.00	5.35	**Core loss**		*Basement*	NS186
5.35	5.74	**Partly-altered volcanic (VPA)**	8	*Basement*	59016
5.74	6.67	**Core loss**		*Basement*	NS187

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD092
ProjectCode: Manus
Date Drilled: 23/07/2007

East: 399412.67
North: 9581077.05
RL/Elevation: -1510.83
Depth: 5.37

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.63	**Core loss**		Uncon Sed	NS188
0.63	1.69	**Silt (SLT)**	0	Uncon Sed	59017
1.69	2.17	**Fresh volcanic (VF)**	0	Basement	59018
2.17	3.58	**Core loss**		Basement	NS189
3.58	4.28	**Fresh volcanic (VF)**	0	Basement	59019
4.28	5.37	**Core loss**		Basement	NS190

Assay: Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

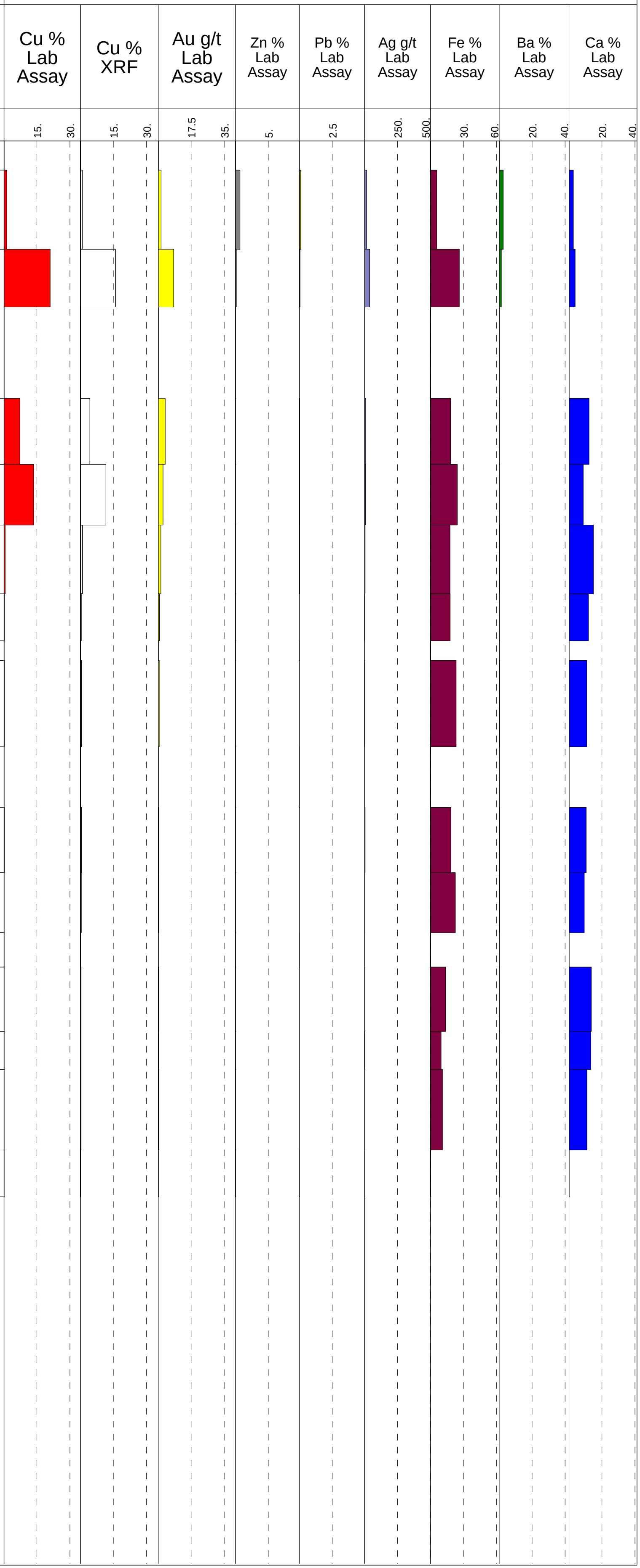
HoleID: SD093
ProjectCode: Manus
Date Drilled: 23/07/2007

East: 399350.24
North: 9581071.59
RL/Elevation: -1505.34
Depth: 14.43

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.40	**Core loss**		Uncon Sed	NS191
0.40	1.48	**Lithified clastic sediment (SLI)**	1	Lithified Sed	59023
1.48	2.27	**Massive sulfide (HMS)**	1	Sulphide	59024
2.27	3.52	**Core loss**		Sulphide	NS192
3.52	4.42	**Semi-massive sulfide (HSM)**	3	Sulphide	59025
4.42	5.25	**Massive sulfide (HMS)**	3	Sulphide	59026
5.25	6.19	**Sulfate-Sulfide (HSS)**	4	Sulphide	59027
6.19	6.83	**Sulfate-Sulfide (HSS)**	0	Sulphide	59028
6.83	7.10	**Core loss**		Sulphide	NS193
7.10	8.28	**Sulfate-Sulfide (HSS)**	0	Sulphide	59029
8.28	9.11	**Core loss**		Basement	NS194
9.11	10.00	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59030
10.00	10.82	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59031
10.82	11.29	**Core loss**		Basement	NS195
11.29	12.17	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59032
12.17	12.69	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59033
12.69	13.79	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59034
13.79	14.43	**Core loss**		Basement	NS196

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD094
ProjectCode: Manus
Date Drilled: 24/07/2007

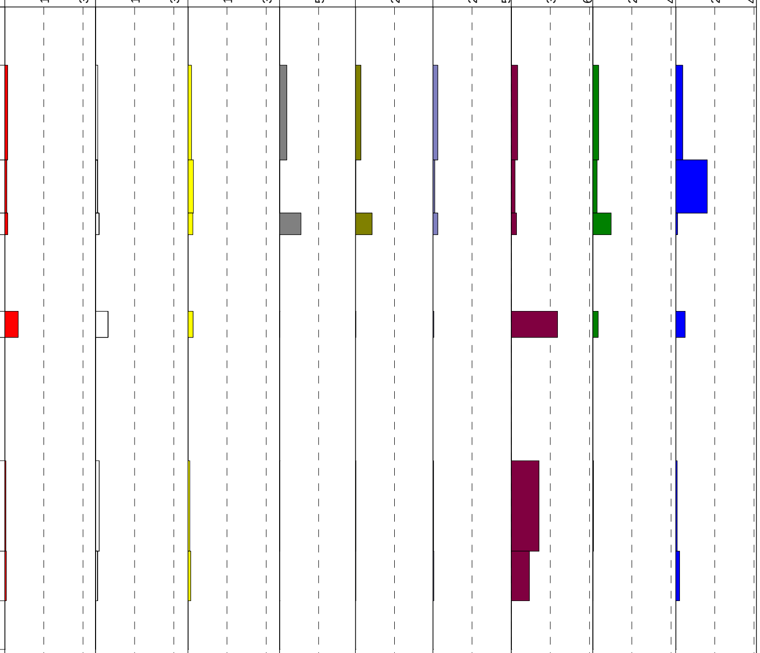
East: 399401.24
North: 9581163.67
RL/Elevation: -1515.84
Depth: 7.39

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.67	**Core loss**		Uncon Sed	NS197
0.67	1.76	**Lithified clastic sediment (SLI)**	0	Uncon Sed	59035
1.76	2.37	**Silt (SLT)**	0	Uncon Sed	59036
2.37	2.62	**Silt (SLT)**	0	Uncon Sed	59037
2.62	3.50	**Core loss**		Lithified Sed	NS198
3.50	3.80	**Silt (SLT)**	6	Sulphide	59038
3.80	5.22	**Core loss**		Basement	NS199
5.22	6.26	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	59039
6.26	6.83	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	59040
6.83	7.39	**Core loss**		Basement	NS200

Assay

Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD095
ProjectCode: Manus
Date Drilled: 25/07/2007

East: 399378
North: 9581288.82
RL/Elevation: -1500.27
Depth: 4.79

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.78	**Core loss**		Uncon Sed	NS201
0.78	1.18	**Fresh volcanic (VF)**	0	Basement	59041
1.18	2.03	**Fresh volcanic (VF)**	0	Basement	59042
2.03	2.96	**Core loss**		Basement	NS202
2.96	3.16	**Fresh volcanic (VF)**	0	Basement	59043
3.16	3.88	**Core loss**		Basement	NS203
3.88	4.28	**Fresh volcanic (VF)**	0	Basement	59044
4.28	4.79	**Core loss**		Basement	NS204

Assay columns: Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

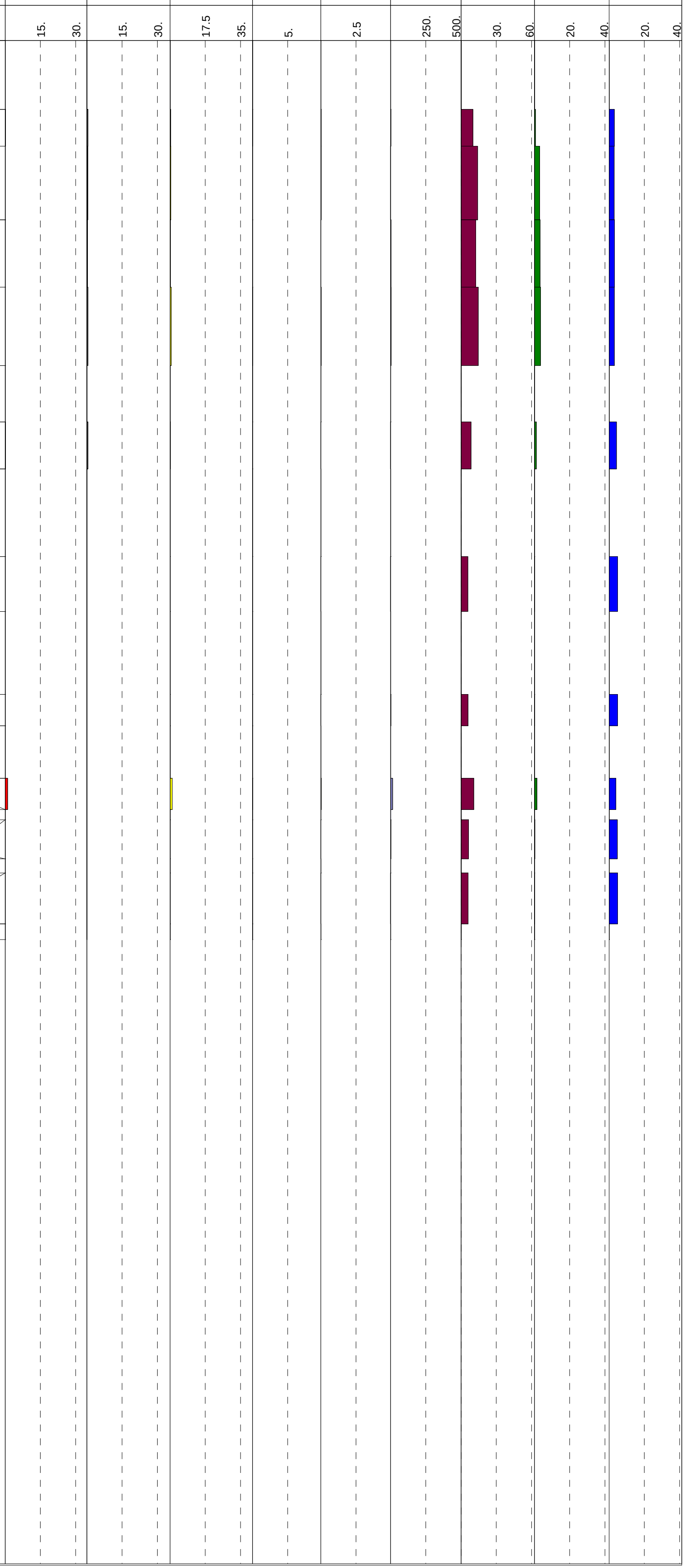
NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD096
ProjectCode: Manus
Date Drilled: 25/07/2007

East: 399366.51
North: 9581254.73
RL/Elevation: -1498.37
Depth: 11.48

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.88	**Core loss**		*Uncon Sed*	NS205
0.88	1.35	**Volcanic breccia with sulphide matrix**	8	*Basement*	59045
1.35	2.29	**Volcanic breccia with sulphide matrix**	8	*Basement*	59046
2.29	3.15	**Volcanic breccia with sulphide matrix**	8	*Basement*	59047
3.15	4.15	**Volcanic breccia with sulphide matrix**	8	*Basement*	59048
4.15	4.87	**Core loss**		*Basement*	NS206
4.87	5.47	**Fresh volcanic (VF)**	0	*Basement*	59049
5.47	6.59	**Core loss**		*Basement*	NS207
6.59	7.29	**Fresh volcanic (VF)**	0	*Basement*	59050
7.29	8.35	**Core loss**		*Basement*	NS208
8.35	8.75	**Fresh volcanic (VF)**	0	*Basement*	59051
8.75	9.42	**Core loss**		*Basement*	NS209
9.42	9.82	**Fresh volcanic (VF)**	0	*Basement*	59052
9.82	9.95	**Core loss**		*Basement*	NS210
9.95	10.45	**Fresh volcanic (VF)**	0	*Basement*	59053
10.45	10.63	**Core loss**		*Basement*	NS211
10.63	11.28	**Fresh volcanic (VF)**	0	*Basement*	59054
11.28	11.48	**Core loss**		*Basement*	NS212



Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD097
ProjectCode: Manus
Date Drilled: 26/07/2007

East: 399456.85
North: 9581226.91
RL/Elevation: -1520.29
Depth: 3.95

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.96	**Core loss**		*Uncon Sed*	NS213
0.96	1.30	**Silt (SLT)**	0	*Uncon Sed*	59055
1.30	1.54	**Core loss**		*Uncon Sed*	NS214
1.54	2.28	**Silt (SLT)**	0	*Uncon Sed*	59056
2.28	2.77	**Silt (SLT)**	0	*Uncon Sed*	59057
2.77	3.95	**Core loss**		*Unknown*	NS215

Assay: Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

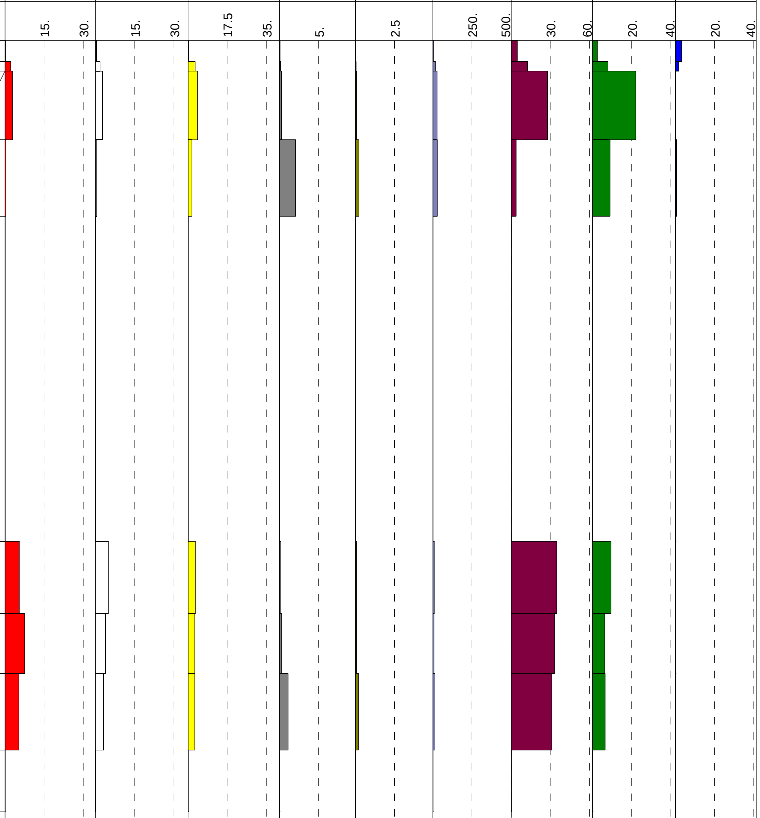
HoleID: SD098
ProjectCode: Manus
Date Drilled: 27/07/2007

East: 399481.5
North: 9581256.74
RL/Elevation: -1512.02
Depth: 8.87

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.24	**Silt (SLT)**	0	Uncon Sed	59058
0.24	0.35	**Lithified clastic sediment (SLI)**	1	Uncon Sed	59059
0.35	1.14	**Semi-massive sulfide (HSM)**	4	Uncon Sed	59060
1.14	2.02	**Lithified clastic sediment (SLI)**	0	Uncon Sed	59061
2.02	5.76	**Core loss**		Unknown	NS216
5.76	6.59	**Massive sulfide (HMS)**	4	Sulphide	59062
6.59	7.28	**Massive sulfide (HMS)**	4	Sulphide	59098
7.28	8.16	**Massive sulfide (HMS)**	4	Sulphide	59063
8.16	8.87	**Core loss**		Unknown	NS217

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

NAUTILUS Minerals Inc.

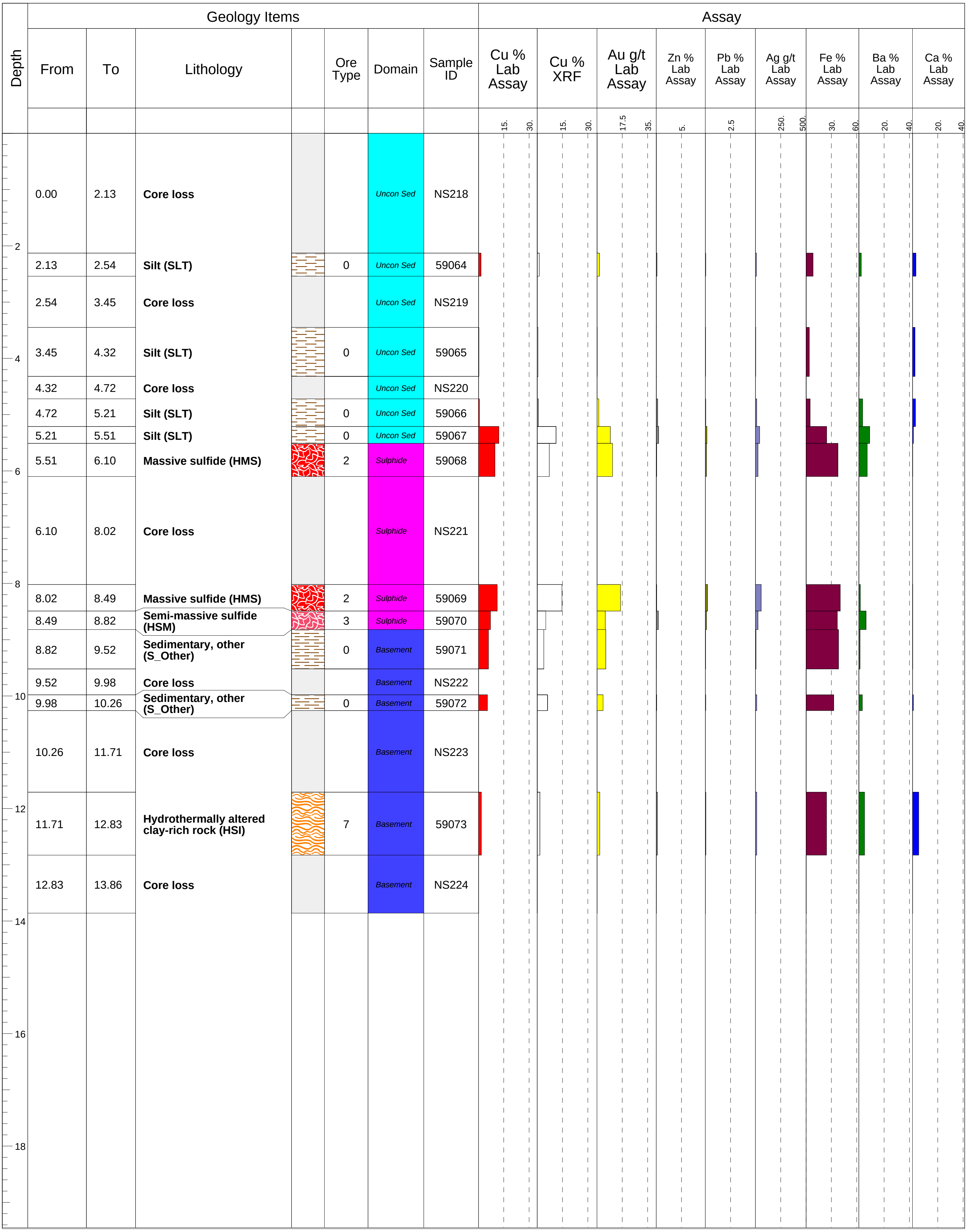
UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD099
ProjectCode: Manus
Date Drilled: 27/07/2007

East: 399447.61
North: 9581237.14
RL/Elevation: -1520.13
Depth: 13.86

Depth	From	To	Lithology	Ore Type	Domain	Sample ID
	0.00	2.13	**Core loss**		Uncon Sed	NS218
	2.13	2.54	**Silt (SLT)**	0	Uncon Sed	59064
	2.54	3.45	**Core loss**		Uncon Sed	NS219
	3.45	4.32	**Silt (SLT)**	0	Uncon Sed	59065
	4.32	4.72	**Core loss**		Uncon Sed	NS220
	4.72	5.21	**Silt (SLT)**	0	Uncon Sed	59066
	5.21	5.51	**Silt (SLT)**	0	Uncon Sed	59067
	5.51	6.10	**Massive sulfide (HMS)**	2	Sulphide	59068
	6.10	8.02	**Core loss**		Sulphide	NS221
	8.02	8.49	**Massive sulfide (HMS)**	2	Sulphide	59069
	8.49	8.82	**Semi-massive sulfide (HSM)**	3	Sulphide	59070
	8.82	9.52	**Sedimentary, other (S_Other)**	0	Basement	59071
	9.52	9.98	**Core loss**		Basement	NS222
	9.98	10.26	**Sedimentary, other (S_Other)**	0	Basement	59072
	10.26	11.71	**Core loss**		Basement	NS223
	11.71	12.83	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	59073
	12.83	13.86	**Core loss**		Basement	NS224



Nautilus Minerals

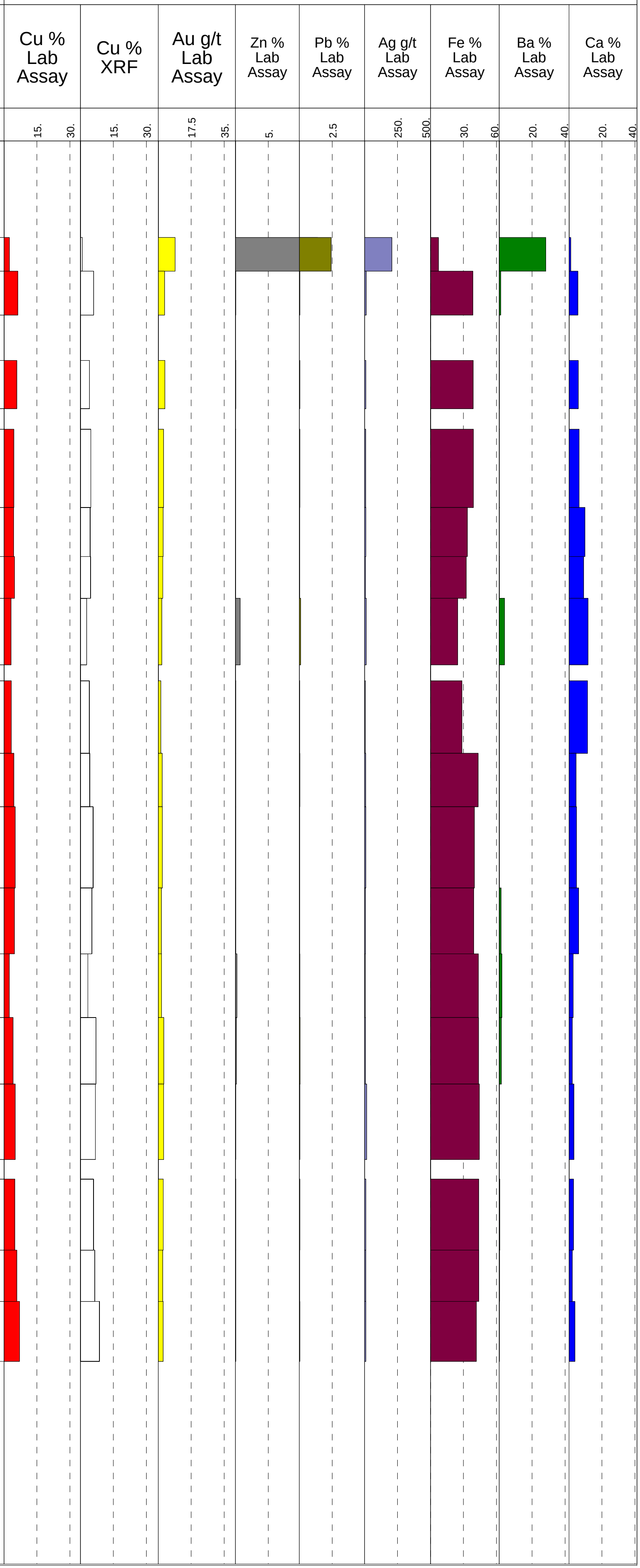
UTM 56S	
WGS 84	
Date Printed:	7/12/2007

HoleID:	SD100	East:	399397.82
ProjectCode:	Manus	North:	9581222.4
Date Drilled:	28/07/2007	RL/Elevation:	-1490.3
		Depth:	16.68

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.32	Core loss		Uncon Sed	NS225
1.32	1.78	Sedimentary, other (S_Other)	0	Lithified Sed	59074
1.78	2.38	Semi-massive sulfide (HSM)	2	Sulphide	59075
2.38	3.00	Core loss		Sulphide	NS226
3.00	3.66	Semi-massive sulfide (HSM)	2	Sulphide	59076
3.66	3.94	Core loss		Sulphide	NS227
3.94	5.01	Semi-massive sulfide (HSM)	2	Sulphide	59077
5.01	5.68	Semi-massive sulfide (HSM)	4	Sulphide	59078
5.68	6.25	Sulfate-Sulfide (HSS)	4	Sulphide	59079
6.25	7.16	Sulfate-Sulfide (HSS)	4	Sulphide	59080
7.16	7.38	Core loss		Sulphide	NS229
7.38	8.37	Sulfate-Sulfide (HSS)	4	Sulphide	59081
8.37	9.10	Massive sulfide (HMS)	4	Sulphide	59082
9.10	10.21	Massive sulfide (HMS)	4	Sulphide	59083
10.21	11.11	Massive sulfide (HMS)	4	Sulphide	59084
11.11	11.98	Massive sulfide (HMS)	7	Sulphide	59085
11.98	12.89	Massive sulfide (HMS)	7	Sulphide	59086
12.89	13.92	Massive sulfide (HMS)	7	Sulphide	59087
13.92	14.19	Core loss		Sulphide	NS230
14.19	15.16	Massive sulfide (HMS)	7	Sulphide	59088
15.16	15.86	Massive sulfide (HMS)	7	Sulphide	59089
15.86	16.68	Massive sulfide (HMS)	7	Sulphide	59090

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

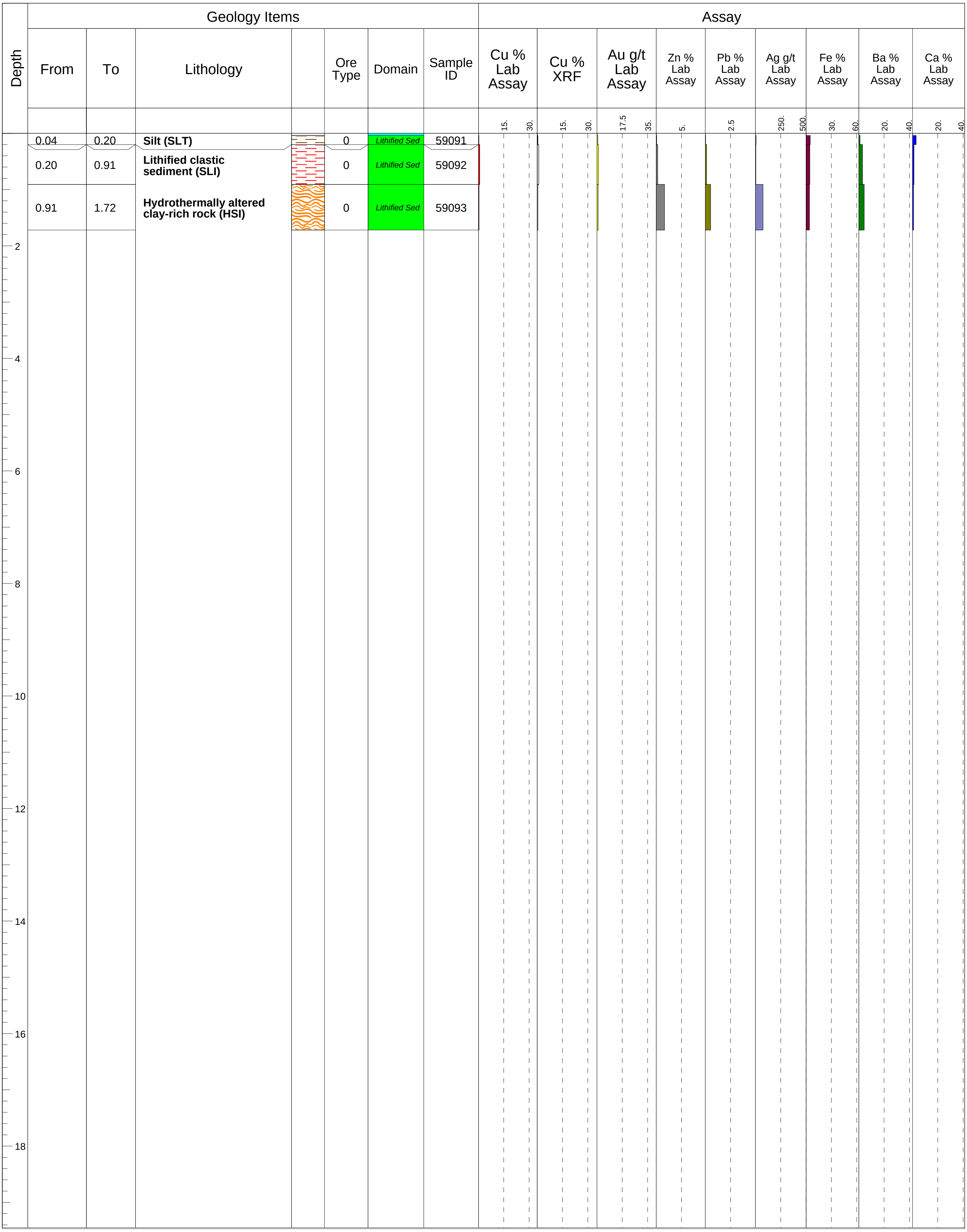
HoleID: SD101
ProjectCode: Manus
Date Drilled: 27/07/2007

East: 399484.59
North: 9581263.86
RL/Elevation: -1512.86
Depth: 1.72

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.04	0.20	**Silt (SLT)**	0	Lithified Sed	59091
0.20	0.91	**Lithified clastic sediment (SLI)**	0	Lithified Sed	59092
0.91	1.72	**Hydrothermally altered clay-rich rock (HSI)**	0	Lithified Sed	59093

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD102
ProjectCode: Manus
Date Drilled: 27/07/2007

East: 399406.67
North: 9581290.18
RL/Elevation: -1500.87
Depth: 1.91

Depth	From	To	Lithology		Ore Type	Domain	Sample ID	Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
								15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.
	0.00	0.81	**Core loss**			Uncon Sed	NS232									
	0.81	1.21	**Fresh volcanic (VF)**		0	Basement	59094									
	1.21	1.91	**Core loss**			Basement	NS233									

Depth: 2 4 6 8 10 12 14 16 18

Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

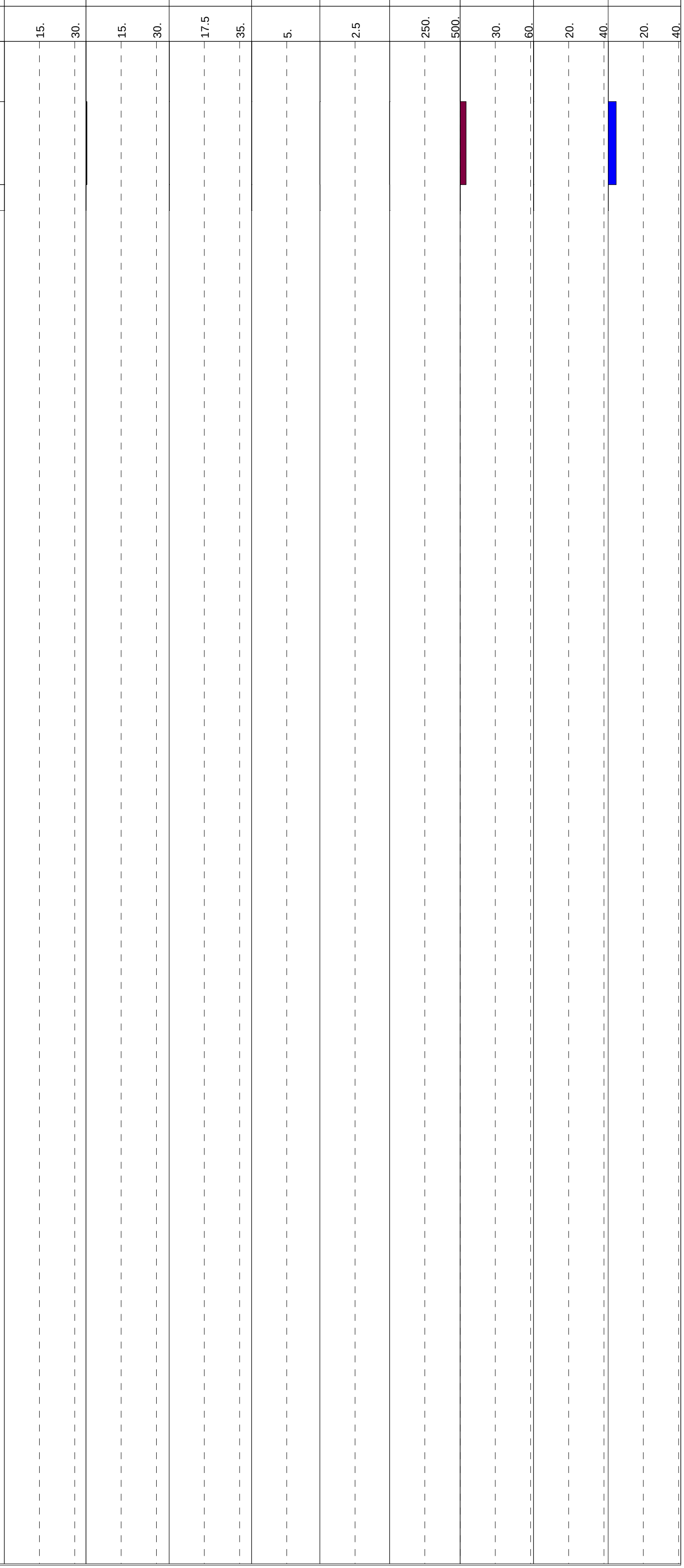
HoleID: SD103
ProjectCode: Manus
Date Drilled: 27/07/2007

East: 399406.15
North: 9581289.3
RL/Elevation: -1500.96
Depth: 2.16

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.77	**Core loss**		Uncon Sed	NS234
0.77	1.83	**Fresh volcanic (VF)**	0	Basement	59095
1.83	2.16	**Core loss**		Basement	NS235

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

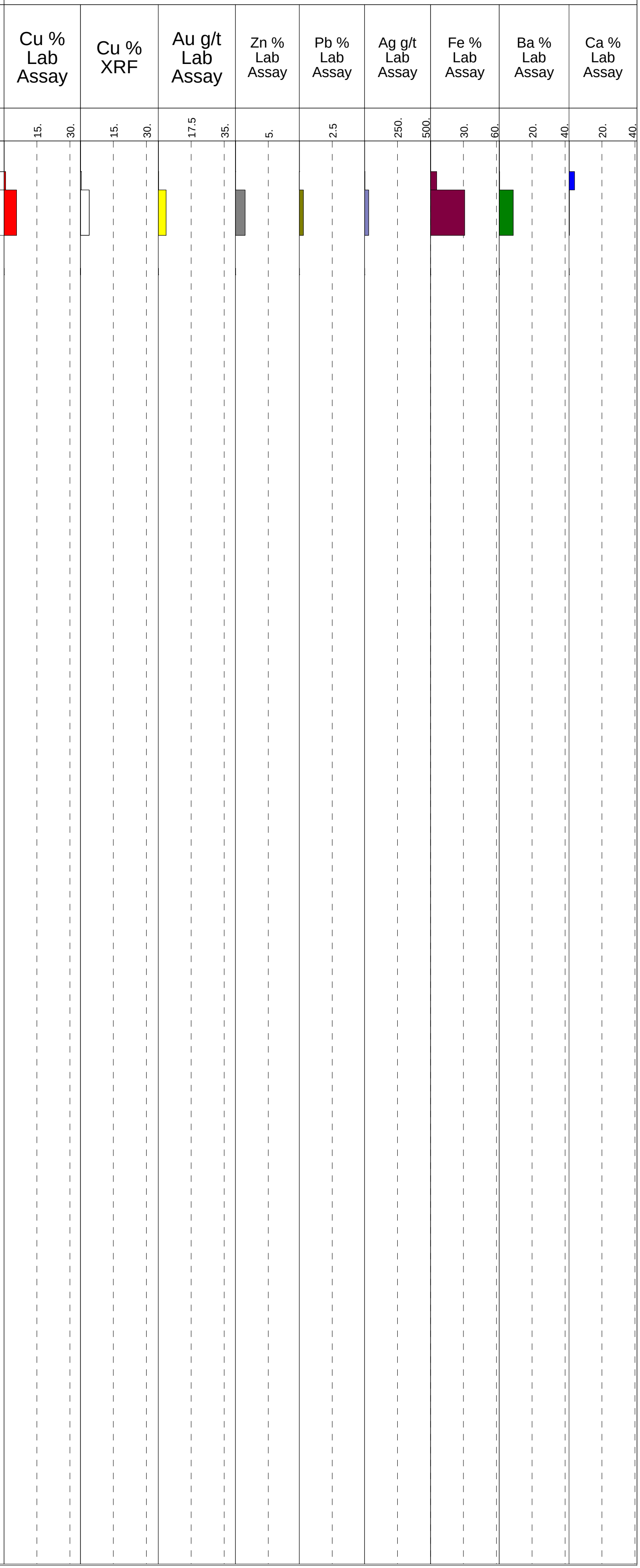
HoleID: SD104
ProjectCode: Manus
Date Drilled: 28/07/2007

East: 399359.43
North: 9581037.49
RL/Elevation: -1510.51
Depth: 1.83

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.42	**Core loss**		Uncon Sed	NS236
0.42	0.67	**Reworked Sand (SND)**	0	Sulphide	59096
0.67	1.29	**Massive sulfide (HMS)**	2	Sulphide	59097

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

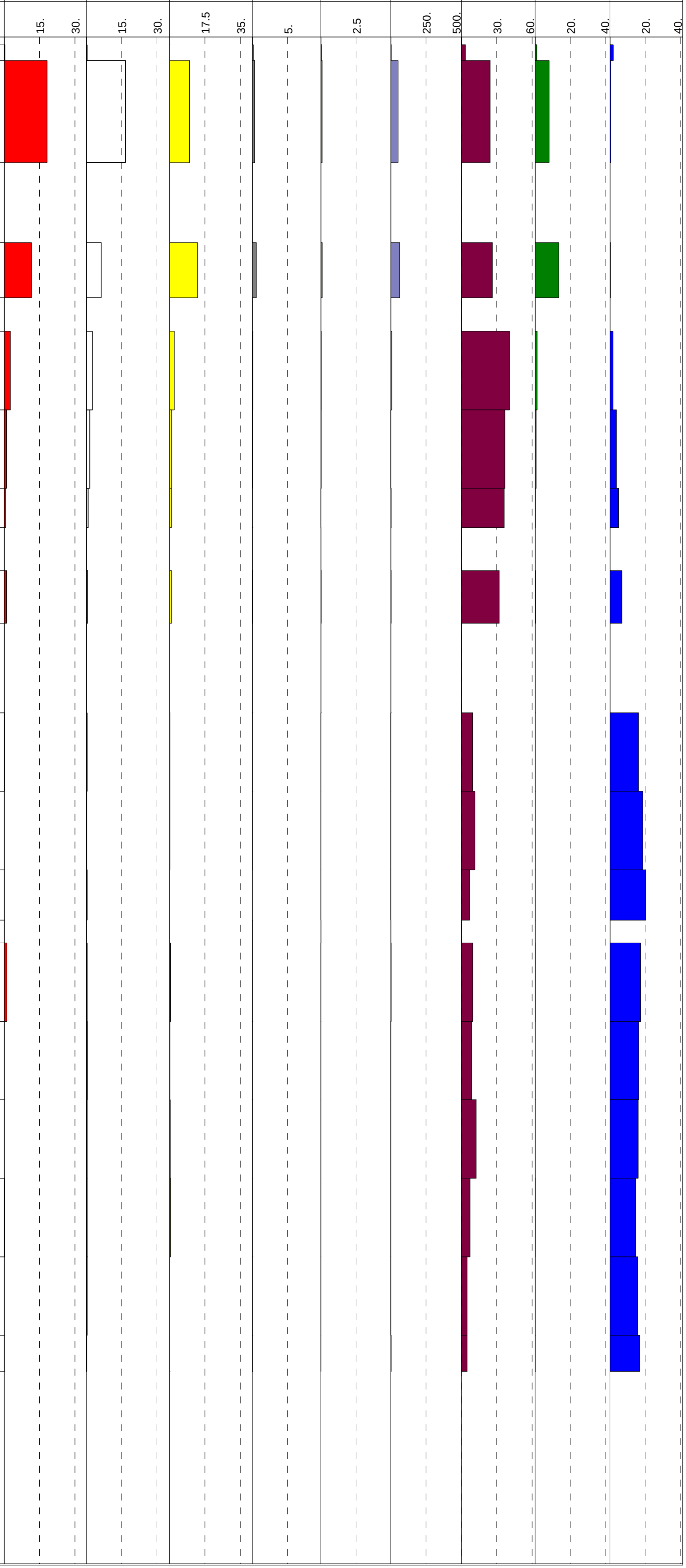
HoleID: SD105
ProjectCode: Manus
Date Drilled: 29/07/2007

East: 399336.07
North: 9581043.04
RL/Elevation: -1503.76
Depth: 17

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.10	0.30	Lithified clastic sediment (SLI)	0	Uncon Sed	59099
0.30	1.60	Massive sulfide (HMS)	1	Sulphide	59100
1.60	2.62	Core loss		Sulphide	NS238
2.62	3.32	Semi-massive sulfide (HSM)	1	Sulphide	59101
3.32	3.75	Core loss		Sulphide	NS239
3.75	4.75	Massive sulfide (HMS)	2	Sulphide	59102
4.75	5.75	Semi-massive sulfide (HSM)	3	Sulphide	59103
5.75	6.25	Sulfate-Sulfide (HSS)	5	Sulphide	59104
6.25	6.80	Core loss		Sulphide	NS240
6.80	7.47	Sulfate-Sulfide (HSS)	0	Sulphide	59105
7.47	8.61	Core loss		Sulphide	NS241
8.61	9.61	Anhydrite (HAN)	0	Sulphide	59106
9.61	10.61	Anhydrite (HAN)	0	Sulphide	59107
10.61	11.25	Anhydrite (HAN)	0	Sulphide	59108
11.25	11.54	Core loss		Sulphide	NS242
11.54	12.54	Anhydrite (HAN)	0	Sulphide	59109
12.54	13.54	Anhydrite (HAN)	0	Basement	59110
13.54	14.54	Anhydrite (HAN)	0	Basement	59111
14.54	15.54	Altered volcanic (VA)	7	Basement	59112
15.54	16.54	Altered volcanic (VA)	7	Basement	59113
16.54	17.00	Altered volcanic (VA)	7	Basement	59114

Assay



Nautilus Minerals

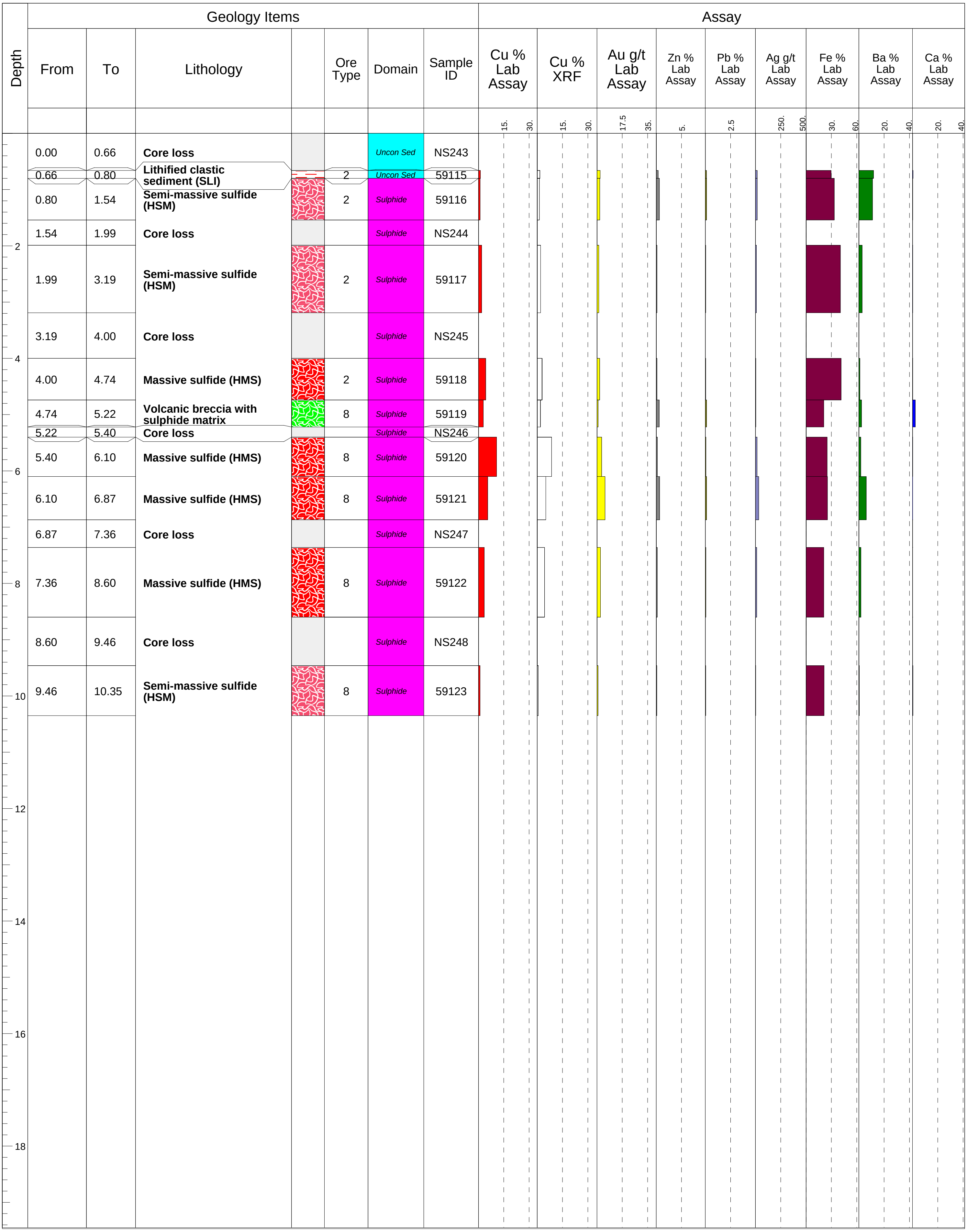
NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD106
ProjectCode: Manus
Date Drilled: 30/07/2007

East: 399362.08
North: 9581044.62
RL/Elevation: -1509.02
Depth: 10.35

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.66	Core loss		Uncon Sed	NS243
0.66	0.80	Lithified clastic sediment (SLI)	2	Uncon Sed	59115
0.80	1.54	Semi-massive sulfide (HSM)	2	Sulphide	59116
1.54	1.99	Core loss		Sulphide	NS244
1.99	3.19	Semi-massive sulfide (HSM)	2	Sulphide	59117
3.19	4.00	Core loss		Sulphide	NS245
4.00	4.74	Massive sulfide (HMS)	2	Sulphide	59118
4.74	5.22	Volcanic breccia with sulphide matrix	8	Sulphide	59119
5.22	5.40	Core loss		Sulphide	NS246
5.40	6.10	Massive sulfide (HMS)	8	Sulphide	59120
6.10	6.87	Massive sulfide (HMS)	8	Sulphide	59121
6.87	7.36	Core loss		Sulphide	NS247
7.36	8.60	Massive sulfide (HMS)	8	Sulphide	59122
8.60	9.46	Core loss		Sulphide	NS248
9.46	10.35	Semi-massive sulfide (HSM)	8	Sulphide	59123



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

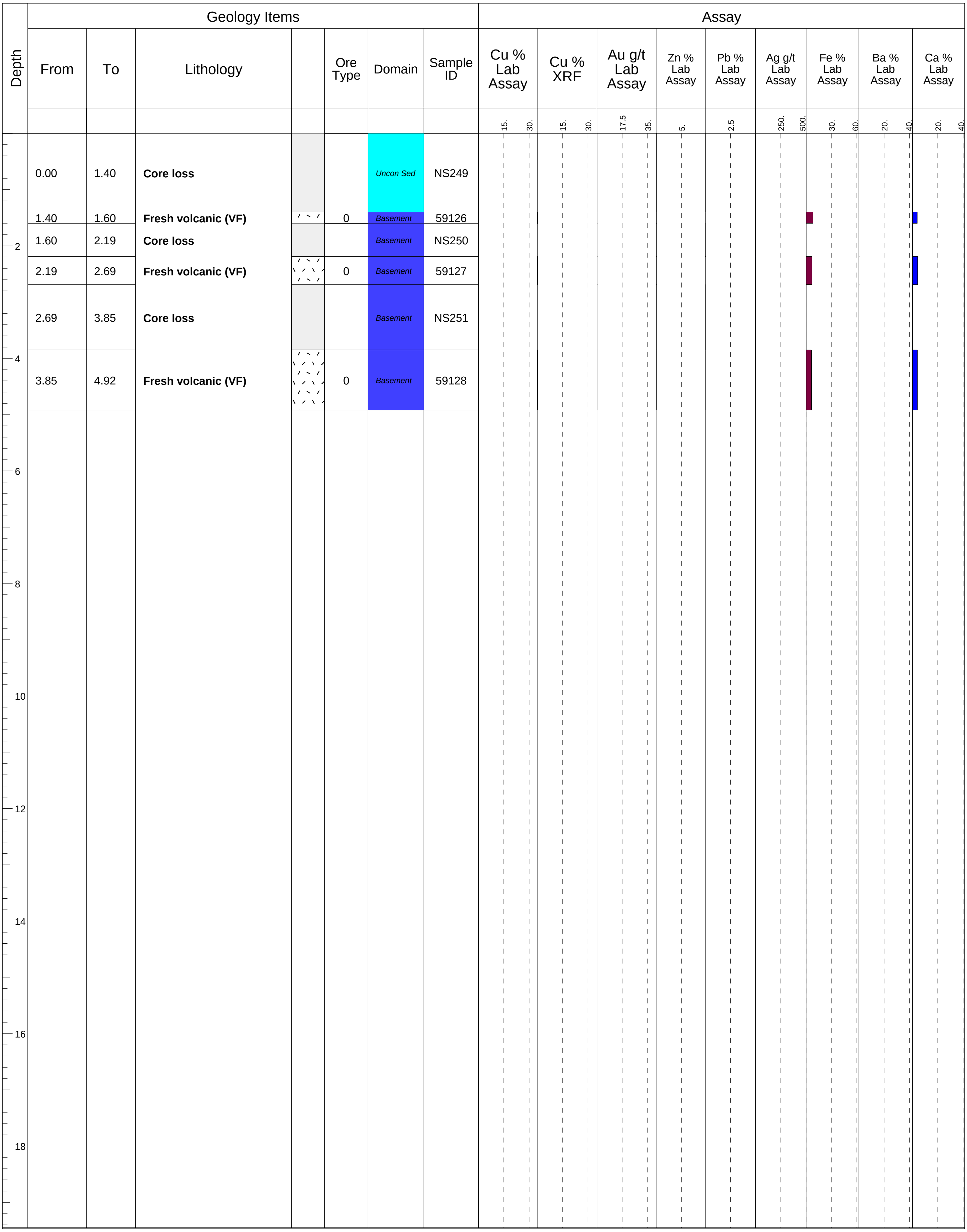
Nautilus Minerals

HoleID: SD107
ProjectCode: Manus
Date Drilled: 30/07/2007

East: 399555.45
North: 9581255.9
RL/Elevation: -1514.81
Depth: 4.92

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.40	**Core loss**		*Uncon Sed*	NS249
1.40	1.60	**Fresh volcanic (VF)**	0	*Basement*	59126
1.60	2.19	**Core loss**		*Basement*	NS250
2.19	2.69	**Fresh volcanic (VF)**	0	*Basement*	59127
2.69	3.85	**Core loss**		*Basement*	NS251
3.85	4.92	**Fresh volcanic (VF)**	0	*Basement*	59128

Assay columns: Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD108
ProjectCode: Manus
Date Drilled: 31/07/2007

East: 399495.52
North: 9581216.06
RL/Elevation: -1516.97
Depth: 2.26

From	To	Lithology		Ore Type	Domain	Sample ID
0.00	1.67	**Core loss**			*Uncon Sed*	NS252
1.67	2.26	**Silt (SLT)**		0	*Uncon Sed*	59129

Assay: Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD109
ProjectCode: Manus
Date Drilled: 31/07/2007

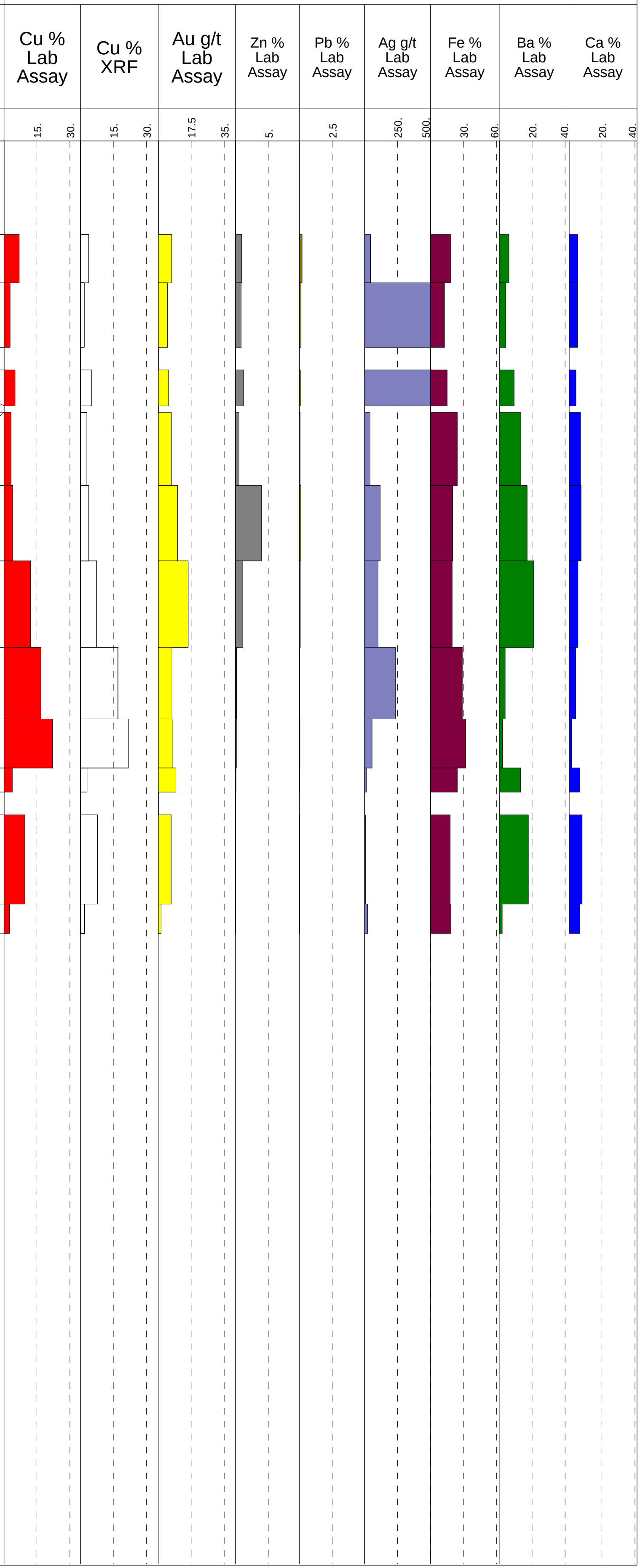
East: 399696.58
North: 9581082.35
RL/Elevation: -1520.35
Depth: 10.83

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.28	Core loss		Uncon Sed	NS253
1.28	1.94	Silt (SLT)	1	Uncon Sed	59130
1.94	2.82	Silt (SLT)	1	Uncon Sed	59131
2.82	3.13	Core loss		Uncon Sed	NS254
3.13	3.62	Hydrothermally altered clay-rich rock (HSI)	1	Lithified Sed	59132
3.62	3.71	Core loss		Lithified Sed	NS255
3.71	4.71	Semi-massive sulfide (HSM)	4	Sulphide	59133
4.71	5.74	Sulfate-Sulfide (HSS)	4	Sulphide	59134
5.74	6.92	Semi-massive sulfide (HSM)	4	Sulphide	59135
6.92	7.90	Massive sulfide (HMS)	4	Sulphide	59136
7.90	8.57	Massive sulfide (HMS)	4	Sulphide	59137
8.57	8.90	Semi-massive sulfide (HSM)	5	Sulphide	59138
8.90	9.21	Core loss		Sulphide	NS256
9.21	10.43	Massive sulfide (HMS)	5	Sulphide	59139
10.43	10.83	Hydrothermally altered clay-rich rock (HSI)	5	Sulphide	59140

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



UTM 56S	
WGS 84	
Date Printed:	7/12/2007

Nautilus Minerals

HoleID: SD110

ProjectCode: Manus

Date Drilled: 1/08/2007

East: 399696.7

North: 9581101.95

RL/Elevation: -1525.28

Depth: 4.87

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.32	**Core loss**		*Uncon Sed*	NS257
1.32	1.76	**Silt (SLT)**	0	*Uncon Sed*	59141
1.76	2.71	**Core loss**		*Uncon Sed*	NS258
2.71	3.25	**Silt (SLT)**	0	*Uncon Sed*	59142
3.25	4.05	**Fresh volcanic (VF)**	0	*Basement*	59143
4.05	4.87	**Fresh volcanic (VF)**	0	*Basement*	59144

Assay

Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
15. 30.	15. 30.	17.5 35.	5.	2.5	250. 500.	30. 60.	20. 40.	20. 40.

Depth: 2 4 6 8 10 12 14 16 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD111
ProjectCode: Manus
Date Drilled: 31/07/2007

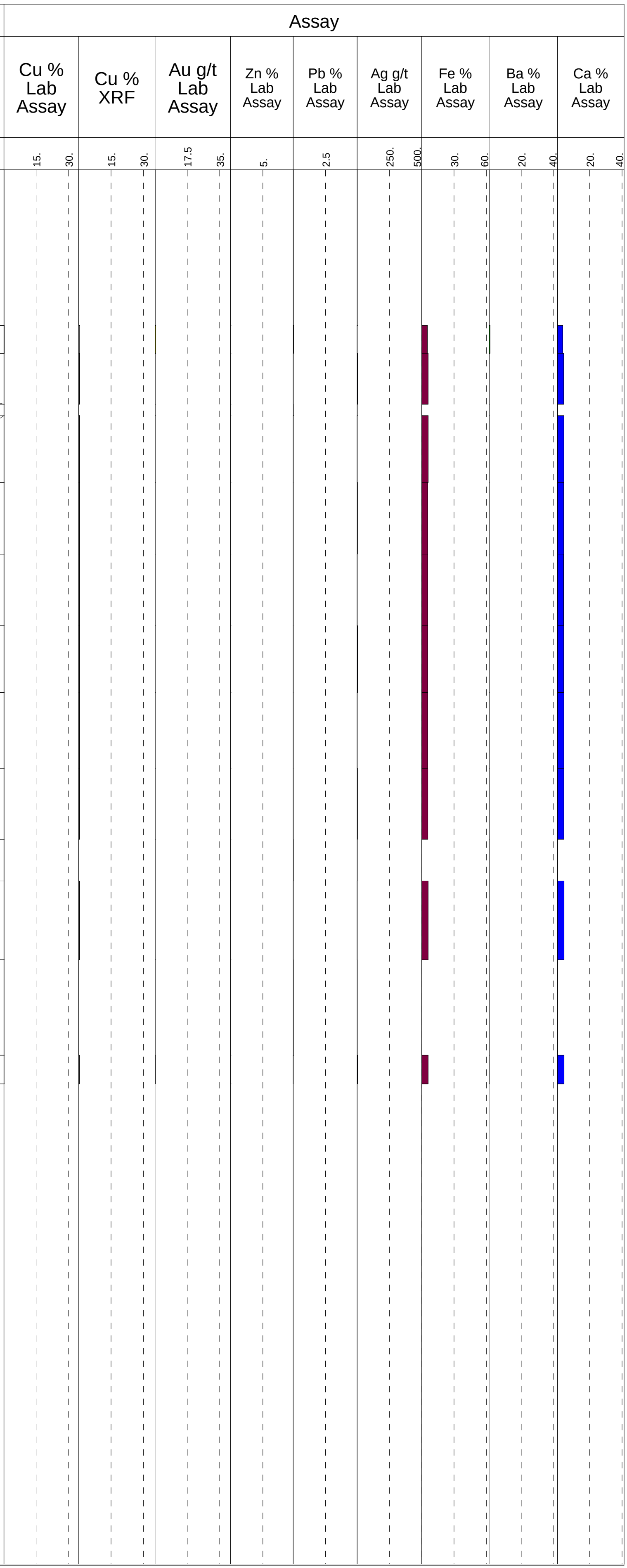
East: 399754.72
North: 9581046.82
RL/Elevation: -1545.82
Depth: 12.75

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	2.17	**Core loss**		*Uncon Sed*	NS259
2.17	2.56	**Sedimentary, other (S_Other)**	0	*Basement*	59145
2.56	3.27	**Fresh volcanic (VF)**	0	*Basement*	59146
3.27	3.43	**Core loss**		*Basement*	NS260
3.43	4.36	**Fresh volcanic (VF)**	0	*Basement*	59147
4.36	5.36	**Fresh volcanic (VF)**	0	*Basement*	59148
5.36	6.36	**Fresh volcanic (VF)**	0	*Basement*	59149
6.36	7.29	**Fresh volcanic (VF)**	0	*Basement*	59150
7.29	8.35	**Fresh volcanic (VF)**	0	*Basement*	59151
8.35	9.34	**Fresh volcanic (VF)**	0	*Basement*	59152
9.34	9.92	**Core loss**		*Basement*	NS261
9.92	11.02	**Fresh volcanic (VF)**	0	*Basement*	59153
11.02	12.35	**Core loss**		*Basement*	NS262
12.35	12.75	**Fresh volcanic (VF)**	0	*Basement*	59154

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

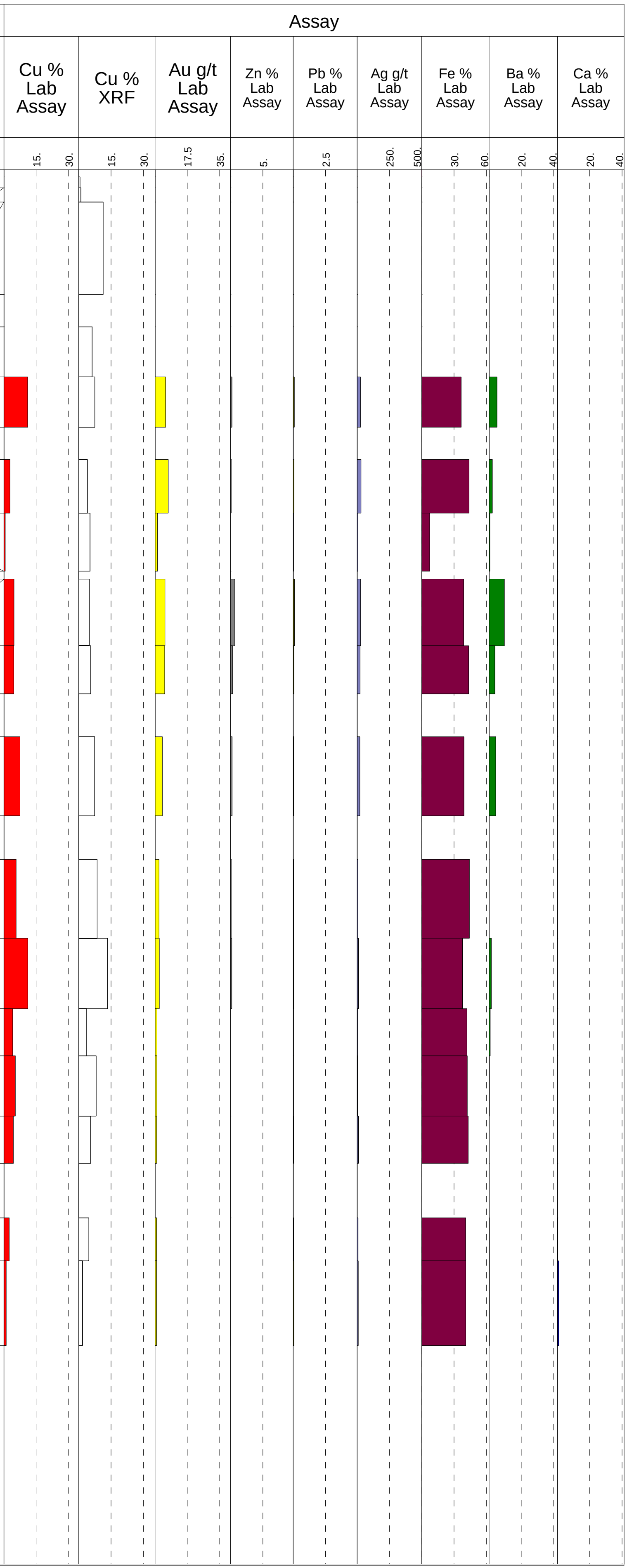
HoleID: SD112
ProjectCode: Manus
Date Drilled: 3/08/2007

East: 399485.87
North: 9581274.42
RL/Elevation: -1508.32
Depth: 16.4

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.10	0.25	Sedimentary, other (S_Other)	1	Uncon Sed	59175
0.25	0.45	Lithified clastic sediment (SLI)	1	Lithified Sed	59176
0.45	1.74	Semi-massive sulfide (HSM)	1	Sulphide	59177
1.74	2.19	Core loss		Sulphide	NS279
2.19	2.89	Semi-massive sulfide (HSM)	1	Sulphide	59178
2.89	3.59	Massive sulfide (HMS)	2	Sulphide	59179
3.59	4.04	Core loss		Sulphide	NS280
4.04	4.79	Massive sulfide (HMS)	2	Sulphide	59180
4.79	5.60	Massive sulfide (HMS)	2	Sulphide	59181
5.60	5.71	Core loss		Sulphide	NS281
5.71	6.64	Massive sulfide (HMS)	2	Sulphide	59182
6.64	7.31	Massive sulfide (HMS)	2	Sulphide	59183
7.31	7.91	Core loss		Sulphide	NS282
7.91	9.01	Massive sulfide (HMS)	2	Sulphide	59184
9.01	9.62	Core loss		Sulphide	NS283
9.62	10.72	Massive sulfide (HMS)	3	Sulphide	59185
10.72	11.70	Massive sulfide (HMS)	3	Sulphide	59186
11.70	12.36	Massive sulfide (HMS)	3	Sulphide	59187
12.36	13.20	Massive sulfide (HMS)	3	Sulphide	59188
13.20	13.86	Massive sulfide (HMS)	2	Sulphide	59189
13.86	14.62	Core loss		Sulphide	NS284
14.62	15.22	Semi-massive sulfide (HSM)	3	Sulphide	59190
15.22	16.40	Massive sulfide (HMS)	3	Sulphide	59191

Assay



Nautilus Minerals

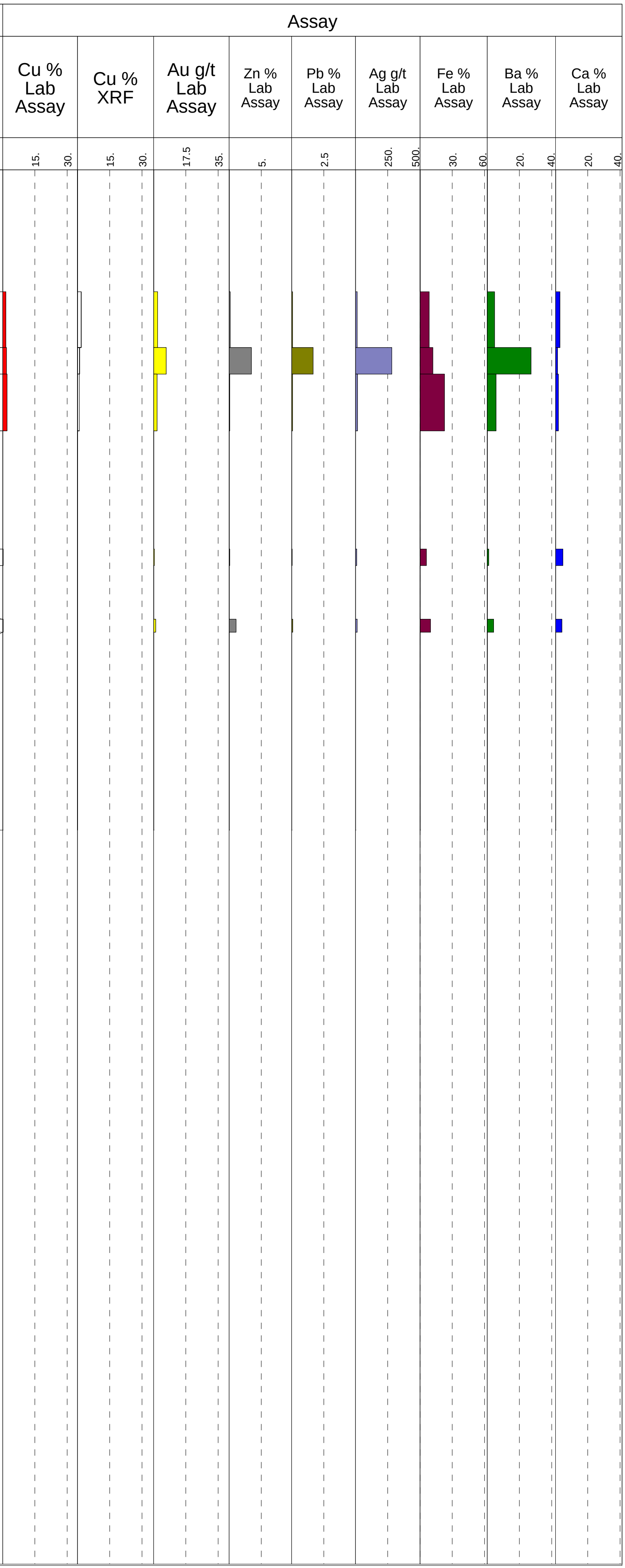
NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD113
ProjectCode: Manus
Date Drilled: 1/08/2007

East: 399353.55
North: 9581147.22
RL/Elevation: -1509.89
Depth: 9.21

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.70	**Core loss**		Uncon Sed	NS263
1.70	2.48	**Silt (SLT)**	0	Uncon Sed	59155
2.48	2.85	**Lithified clastic sediment (SLI)**	0	Sulphide	59156
2.85	3.64	**Semi-massive sulfide (HSM)**	4	Sulphide	59157
3.64	5.29	**Core loss**		Basement	NS264
5.29	5.52	**Fresh volcanic (VF)**	0	Basement	59158
5.52	6.27	**Core loss**		Basement	NS265
6.27	6.45	**Fresh volcanic (VF)**	0	Basement	59159
6.45	9.21	**Core loss**		Basement	NS266



NAUTILUS Minerals Inc.

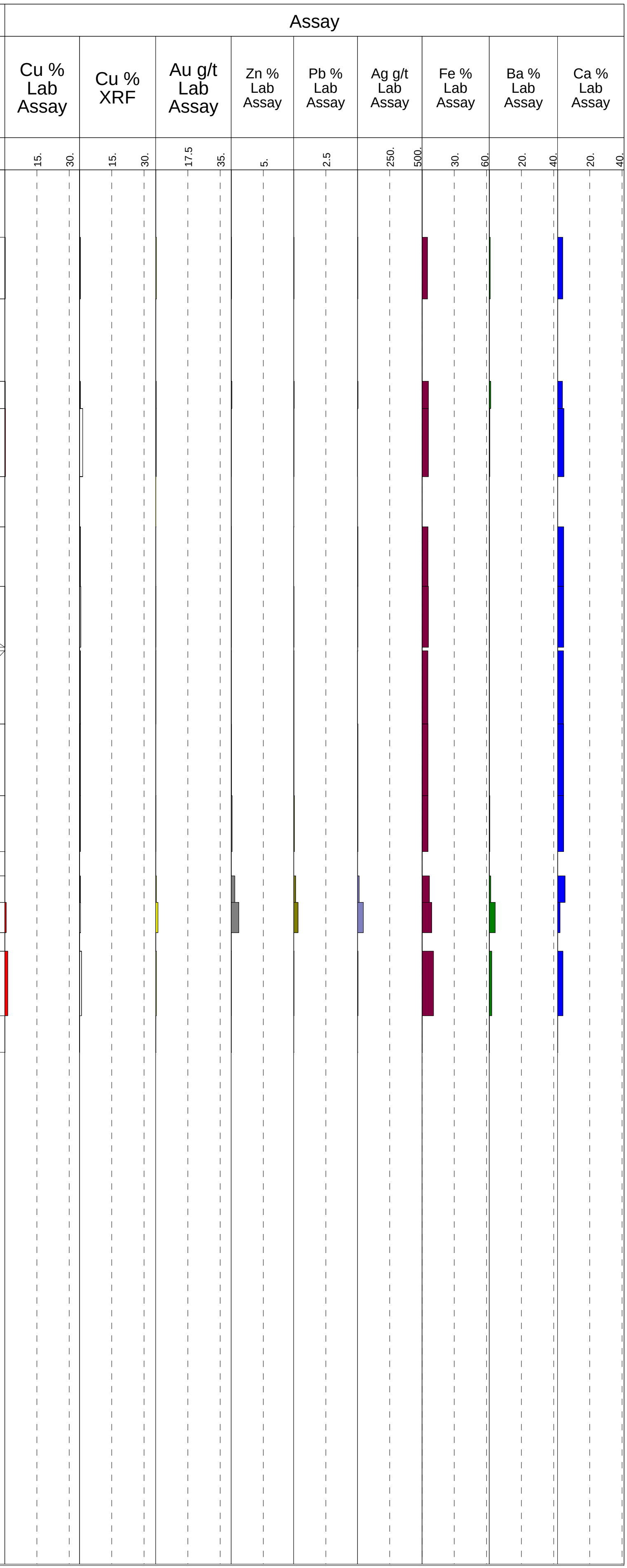
UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD114
ProjectCode: Manus
Date Drilled: 2/08/2007

East: 399675.13
North: 9581029.74
RL/Elevation: -1519.22
Depth: 12.31

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.94	Core loss		Uncon Sed	NS268
0.94	1.80	Silt (SLT)	0	Uncon Sed	59160
1.80	2.95	Core loss		Uncon Sed	NS269
2.95	3.33	Silt (SLT)	0	Uncon Sed	59161
3.33	4.28	Fresh volcanic (VF)	0	Basement	59162
4.28	4.98	Core loss		Basement	NS270
4.98	5.81	Fresh volcanic (VF)	0	Basement	59163
5.81	6.66	Fresh volcanic (VF)	0	Basement	59164
6.66	6.71	Core loss		Basement	NS271
6.71	7.73	Fresh volcanic (VF)	0	Basement	59165
7.73	8.73	Fresh volcanic (VF)	0	Basement	59166
8.73	9.51	Fresh volcanic (VF)	0	Basement	59167
9.51	9.85	Core loss		Basement	NS272
9.85	10.22	Fresh volcanic (VF)	0	Basement	59168
10.22	10.64	Hydrothermally altered clay-rich rock (HSI)	0	Basement	59169
10.64	10.90	Core loss		Basement	NS273
10.90	11.80	Hydrothermally altered clay-rich rock (HSI)	0	Basement	59170
11.80	12.31	Core loss		Basement	NS274



Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD115
ProjectCode: Manus
Date Drilled: 3/08/2007

East: 399351.51
North: 9581236.98
RL/Elevation: -1502.54
Depth: 4.75

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.39	**Core loss**		Uncon Sed	NS275
1.39	1.79	**Partly-altered volcanic (VPA)**	0	Basement	59171
1.79	1.90	**Core loss**		Basement	NS276
1.90	2.70	**Partly-altered volcanic (VPA)**	0	Basement	59172
2.70	3.50	**Partly-altered volcanic (VPA)**	0	Basement	59173
3.50	4.35	**Core loss**		Basement	NS277
4.35	4.75	**Fresh volcanic (VF)**	0	Basement	59174

Assay: Cu % Lab Assay (15., 30.) | Cu % XRF (15., 30.) | Au g/t Lab Assay (17.5, 35.) | Zn % Lab Assay (5.) | Pb % Lab Assay (2.5) | Ag g/t Lab Assay (250., 500.) | Fe % Lab Assay (30., 60.) | Ba % Lab Assay (20., 40.) | Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

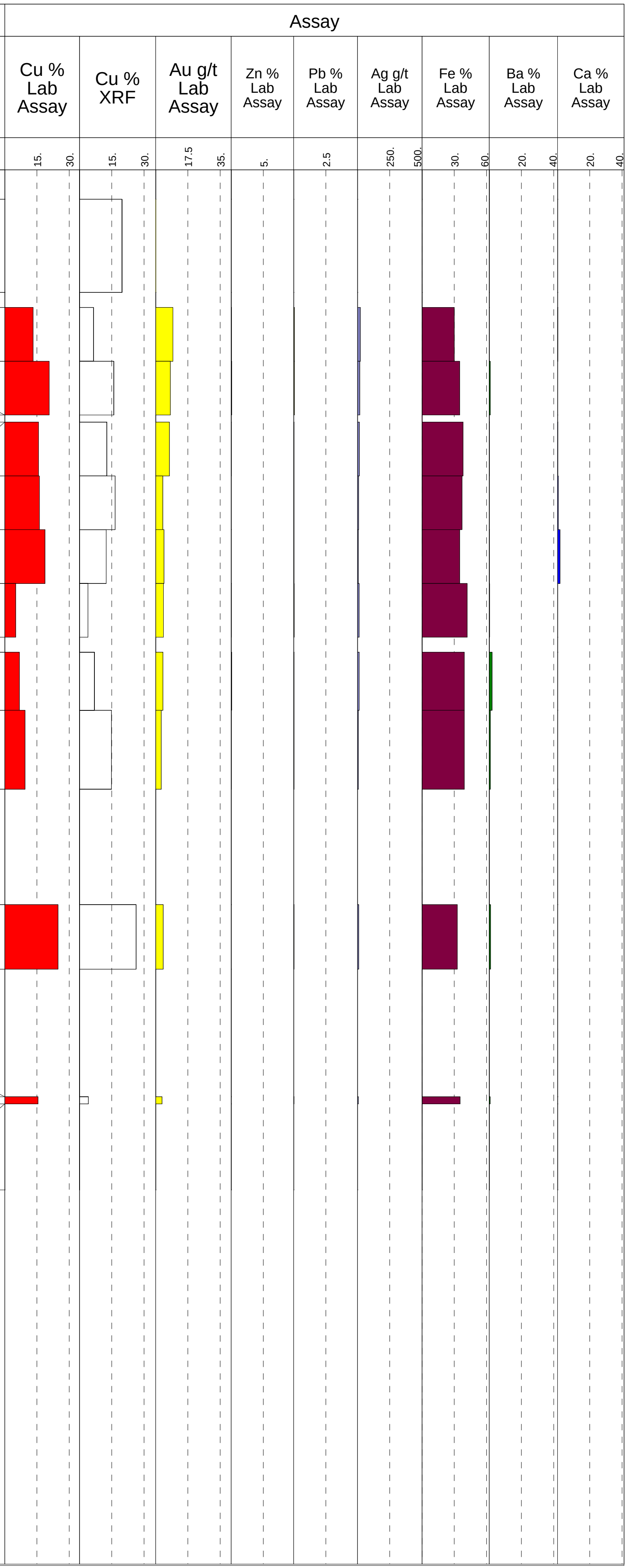
HoleID: SD116
ProjectCode: Manus
Date Drilled: 5/08/2007

East: 399387.95
North: 9581258.83
RL/Elevation: -1494.87
Depth: 14.23

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.41	Core loss		Uncon Sed	NS285
0.41	1.71	Massive sulfide (HMS)	1	Sulphide	59192
1.71	1.92	Core loss		Sulphide	NS286
1.92	2.67	Massive sulfide (HMS)	2	Sulphide	59193
2.67	3.42	Massive sulfide (HMS)	2	Sulphide	59194
3.42	3.52	Core loss		Sulphide	NS287
3.52	4.27	Massive sulfide (HMS)	3	Sulphide	59195
4.27	5.02	Massive sulfide (HMS)	3	Sulphide	59196
5.02	5.77	Massive sulfide (HMS)	3	Sulphide	59197
5.77	6.52	Semi-massive sulfide (HSM)	2	Sulphide	59198
6.52	6.73	Core loss		Sulphide	NS289
6.73	7.54	Semi-massive sulfide (HSM)	2	Sulphide	59199
7.54	8.64	Massive sulfide (HMS)	3	Sulphide	59200
8.64	10.25	Core loss		Basement	NS290
10.25	11.15	Massive sulfide (HMS)	2	Basement	59201
11.15	12.93	Core loss		Basement	NS291
12.93	13.03	Sulfate-Sulfide (HSS)	2	Basement	59202
13.03	14.23	Core loss		Basement	NS292

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD117
ProjectCode: Manus
Date Drilled: 6/08/2007

East: 399404.4
North: 9581232.97
RL/Elevation: -1491.31
Depth: 4.15

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.49	**Core loss**		Uncon Sed	NS293
1.49	2.67	**Semi-massive sulfide (HSM)**	5	Sulphide	59203
2.67	3.48	**Core loss**		Sulphide	NS294
3.48	3.99	**Semi-massive sulfide (HSM)**	5	Sulphide	59204
3.99	4.15	**Core loss**		Unknown	NS295

Assay

Cu % Lab Assay	Cu % XRF	Au g/t Lab Assay	Zn % Lab Assay	Pb % Lab Assay	Ag g/t Lab Assay	Fe % Lab Assay	Ba % Lab Assay	Ca % Lab Assay
15. / 30.	15. / 30.	17.5 / 35.	5.	2.5	250. / 500.	30. / 60.	20. / 40.	20. / 40.

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD118
ProjectCode: Manus
Date Drilled: 6/08/2007

East: 399150
North: 9580933.04
RL/Elevation: -1543.78
Depth: 12.72

From	To	Lithology	Ore Type	Domain	Sample ID	Cu % Lab Assay (15. – 30.)	Cu % XRF (15. – 30.)	Au g/t Lab Assay (17.5 – 35.)	Zn % Lab Assay (5.)	Pb % Lab Assay (2.5)	Ag g/t Lab Assay (250. – 500.)	Fe % Lab Assay (30. – 60.)	Ba % Lab Assay (20. – 40.)	Ca % Lab Assay (20. – 40.)
0.00	1.21	Core loss		Uncon Sed	NS296									
1.21	1.71	Lithified clastic sediment (SLI)	1	Lithified Sed	59205									
1.71	3.01	Core loss		Lithified Sed	NS297									
3.01	3.42	Lithified clastic sediment (SLI)	1	Lithified Sed	59206									
3.42	4.93	Core loss		Lithified Sed	NS298									
4.93	5.13	Sedimentary, other (S_Other)	1	Lithified Sed	59207									
5.13	6.64	Core loss		Lithified Sed	NS299									
6.64	6.84	Hydrothermally altered clay-rich rock (HSI)	8	Sulphide	59208									
6.84	7.98	Core loss		Sulphide	NS300									
7.98	8.63	Hydrothermally altered clay-rich rock (HSI)	8	Sulphide	59209									
8.63	9.26	Core loss		Sulphide	NS301									
9.26	10.46	Hydrothermally altered clay-rich rock (HSI)	0	Sulphide	59210									
10.46	12.48	Core loss		Sulphide	NS302									
12.48	12.72	Hydrothermally altered clay-rich rock (HSI)	0	Sulphide	59211									

Depth: 2 4 6 8 10 12 14 16 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

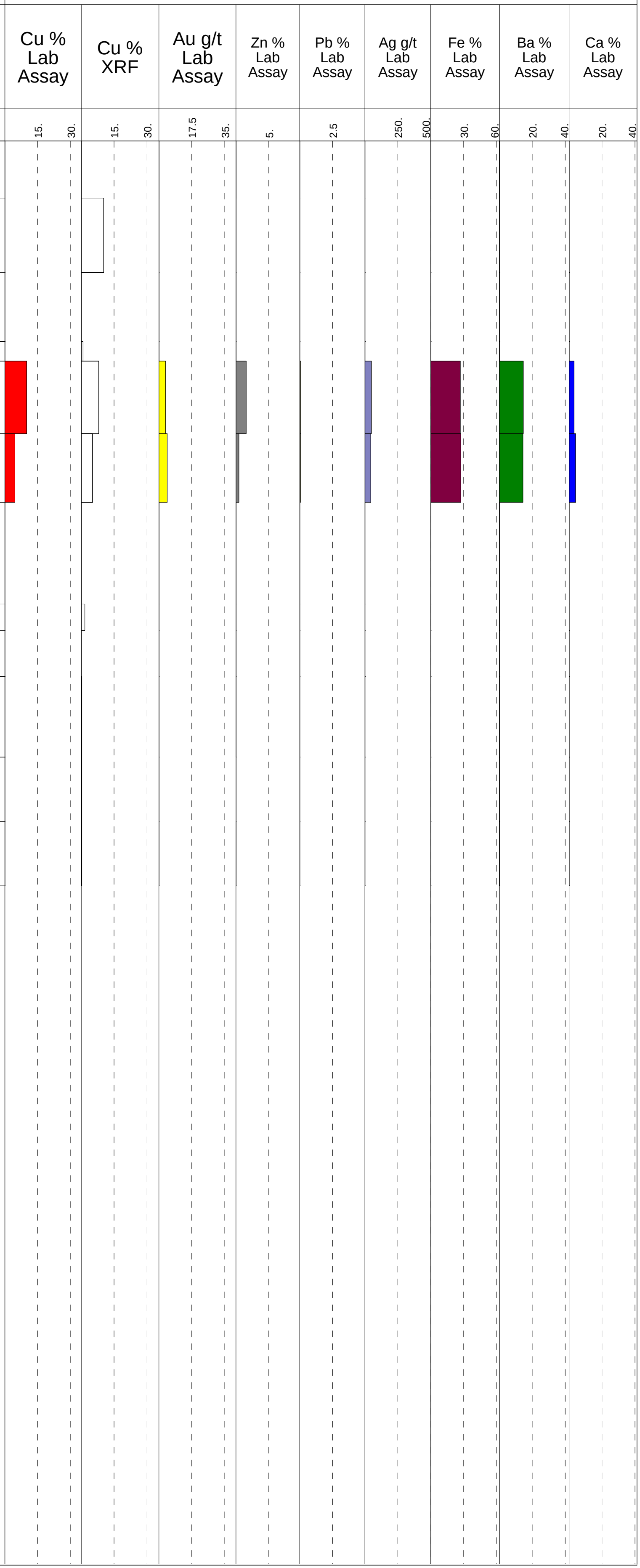
HoleID: SD119
ProjectCode: Manus
Date Drilled: 6/08/2007

East: 399106.28
North: 9580924.9
RL/Elevation: -1551.25
Depth: 10.18

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.78	**Core loss**		Uncon Sed	NS303
0.78	1.80	**Massive sulfide (HMS)**	1	Sulphide	59212
1.80	2.74	**Core loss**		Sulphide	NS304
2.74	3.01	**Clay (SCY)**	1	Sulphide	59213
3.01	4.00	**Semi-massive sulfide (HSM)**	2	Sulphide	59214
4.00	4.94	**Sulfate-Sulfide (HSS)**	2	Sulphide	59215
4.94	6.33	**Core loss**		Sulphide	NS305
6.33	6.69	**Semi-massive sulfide (HSM)**	5	Sulphide	59216
6.69	7.32	**Core loss**		Basement	NS306
7.32	8.42	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59217
8.42	9.30	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59218
9.30	10.18	**Hydrothermally altered clay-rich rock (HSI)**	0	Basement	59219

Assay



Nautilus Minerals

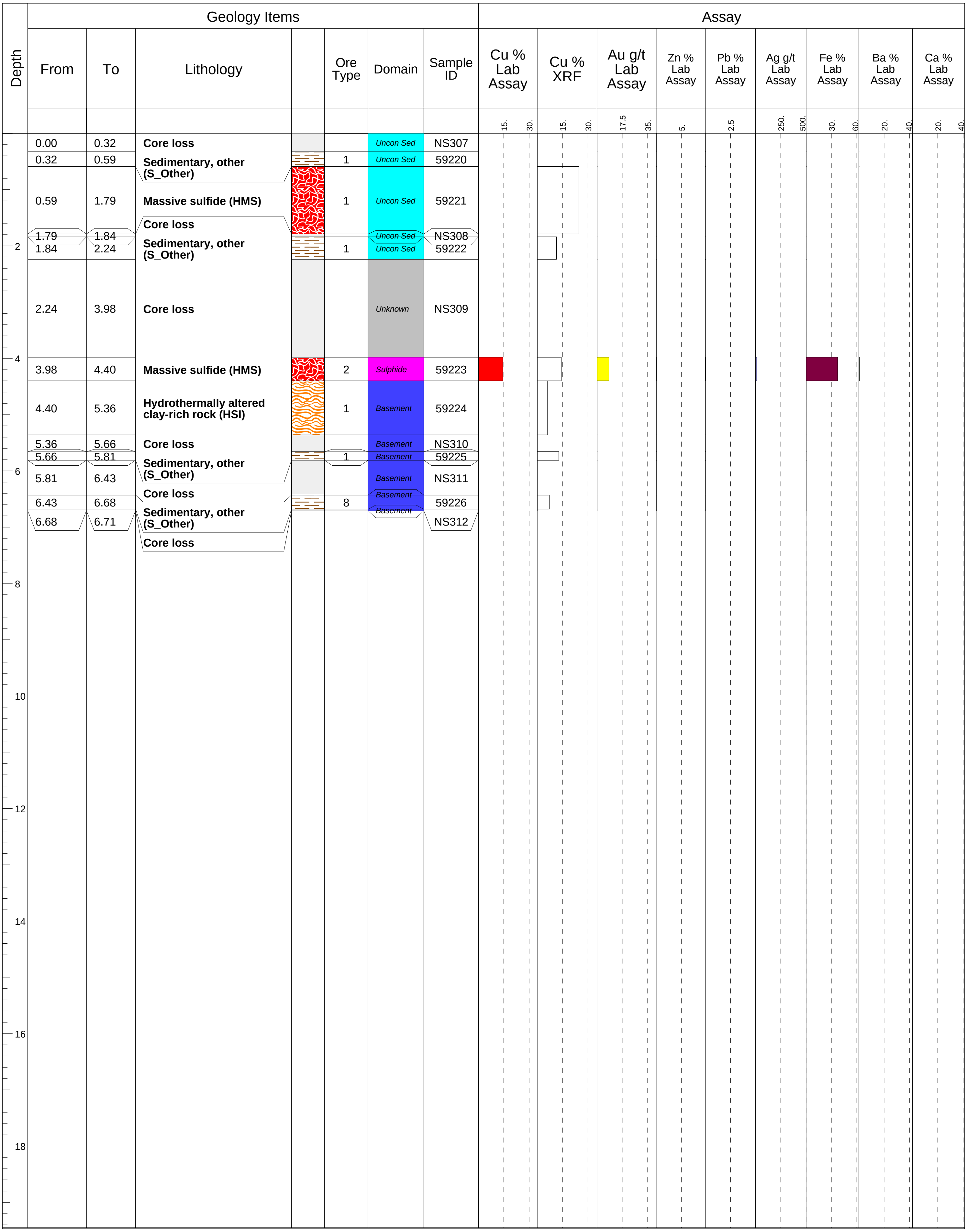
NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD120
ProjectCode: Manus
Date Drilled: 7/08/2007

East: 399134.91
North: 9580953.21
RL/Elevation: -1550.06
Depth: 6.71

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.32	**Core loss**		Uncon Sed	NS307
0.32	0.59	**Sedimentary, other (S_Other)**	1	Uncon Sed	59220
0.59	1.79	**Massive sulfide (HMS)**	1	Uncon Sed	59221
1.79	1.84	**Core loss**		Uncon Sed	NS308
1.84	2.24	**Sedimentary, other (S_Other)**	1	Uncon Sed	59222
2.24	3.98	**Core loss**		Unknown	NS309
3.98	4.40	**Massive sulfide (HMS)**	2	Sulphide	59223
4.40	5.36	**Hydrothermally altered clay-rich rock (HSI)**	1	Basement	59224
5.36	5.66	**Core loss**		Basement	NS310
5.66	5.81	**Sedimentary, other (S_Other)**	1	Basement	59225
5.81	6.43	**Core loss**		Basement	NS311
6.43	6.68	**Sedimentary, other (S_Other)**	8	Basement	59226
6.68	6.71	**Core loss**		Basement	NS312



Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

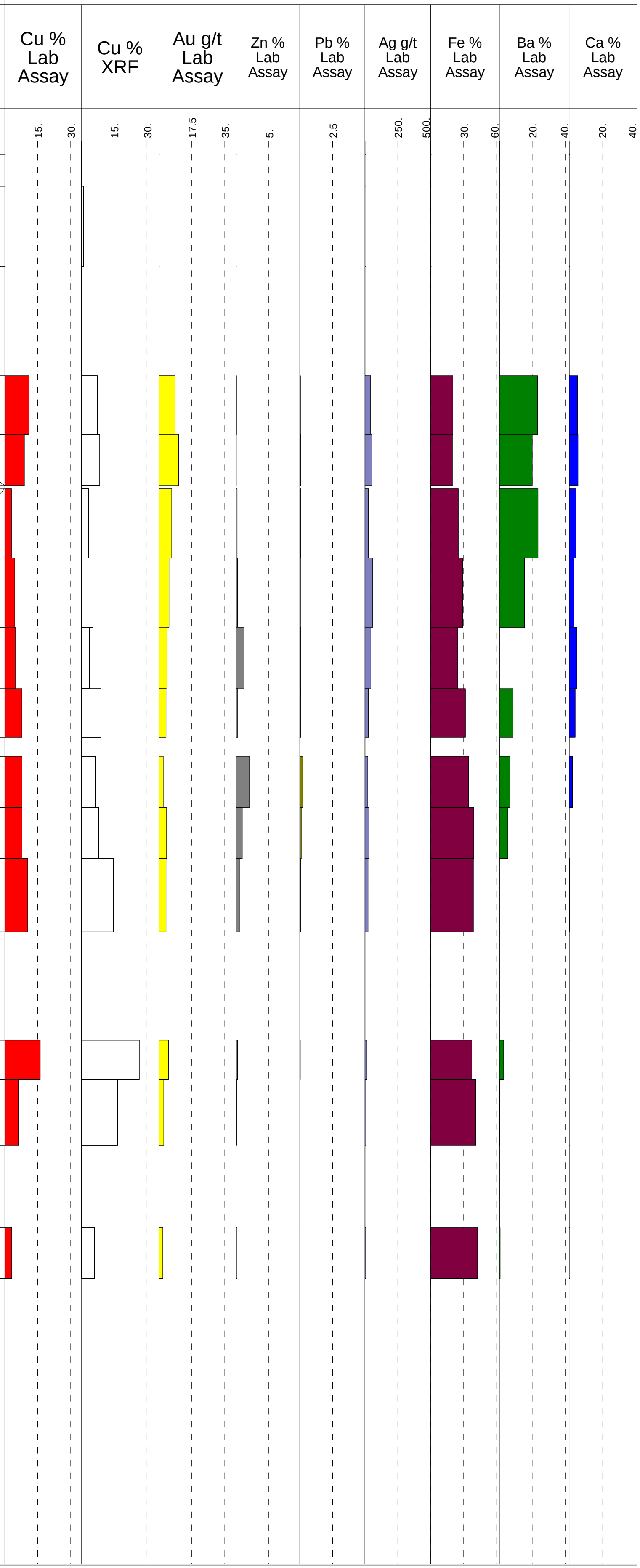
HoleID: SD121
ProjectCode: Manus
Date Drilled: 8/08/2007

East: 399080.35
North: 9580956.2
RL/Elevation: -1557.68
Depth: 15.55

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
				Uncon Sed	
0.19	0.62	**Lithified clastic sediment (SLI)**	1	Uncon Sed	59227
0.62	1.72	**Sedimentary, other (S_Other)**	1	Uncon Sed	59228
1.72	3.21	**Core loss**		Unknown	NS314
3.21	4.01	**Massive sulfide (HMS)**	1	Sulphide	59229
4.01	4.71	**Massive sulfide (HMS)**	2	Sulphide	59230
4.71	4.75	**Core loss**		Sulphide	NS315
4.75	5.70	**Massive sulfide (HMS)**	2	Sulphide	59231
5.70	6.65	**Massive sulfide (HMS)**	2	Sulphide	59232
6.65	7.49	**Semi-massive sulfide (HSM)**	2	Sulphide	59233
7.49	8.15	**Massive sulfide (HMS)**	2	Sulphide	59234
8.15	8.41	**Core loss**		Sulphide	NS316
8.41	9.11	**Massive sulfide (HMS)**	2	Sulphide	59235
9.11	9.81	**Massive sulfide (HMS)**	2	Sulphide	59236
9.81	10.81	**Massive sulfide (HMS)**	2	Sulphide	59237
10.81	12.29	**Core loss**		Sulphide	NS317
12.29	12.83	**Massive sulfide (HMS)**	2	Sulphide	59238
12.83	13.73	**Massive sulfide (HMS)**	4	Sulphide	59239
13.73	14.85	**Core loss**		Sulphide	NS318
14.85	15.55	**Massive sulfide (HMS)**	4	Sulphide	59240

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

Nautilus Minerals

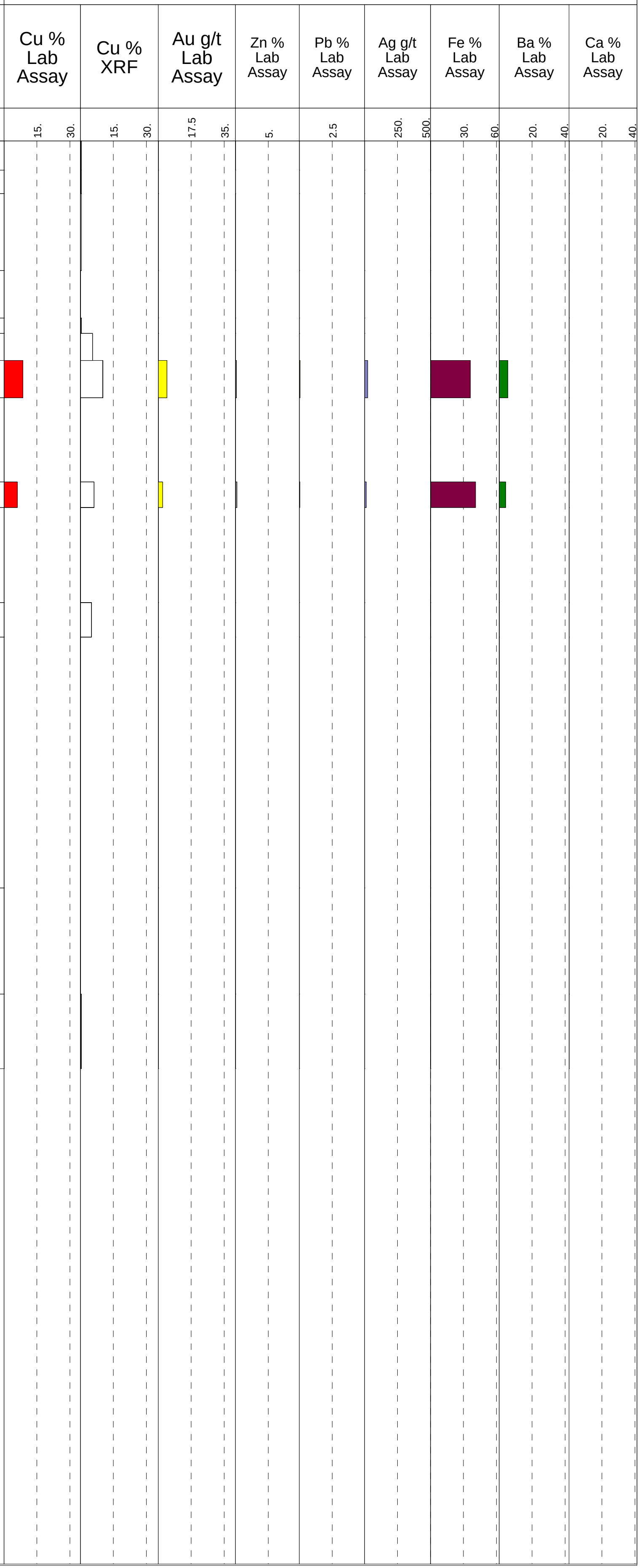
HoleID: SD122
ProjectCode: Manus
Date Drilled: 8/08/2007

East: 399074.04
North: 9580930.47
RL/Elevation: -1562.72
Depth: 12.68

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.40	Lithified clastic sediment (SLI)	1	Uncon Sed	59241
0.40	0.72	Sedimentary, other (S_Other)	1	Uncon Sed	59242
0.72	1.77	Sedimentary, other (S_Other)	1	Uncon Sed	59249
1.77	2.42	Core loss		Uncon Sed	NS319
2.42	2.63	Sedimentary, other (S_Other)	1	Sulphide	59243
2.63	3.00	Lithified clastic sediment (SLI)	1	Sulphide	59244
3.00	3.51	Massive sulfide (HMS)	2	Sulphide	59245
3.51	4.66	Core loss		Sulphide	NS320
4.66	5.01	Massive sulfide (HMS)	2	Sulphide	59246
5.01	6.31	Natural void		Unknown	NS321
6.31	6.78	Hydrothermally altered clay-rich rock (HSI)	7	Basement	59247
6.78	10.21	Core loss		Basement	NS322
10.21	11.66	Core loss		Basement	NS323
11.66	12.68	Hydrothermally altered clay-rich rock (HSI)	8	Basement	59248

Assay



UTM 56S	
WGS 84	
Date Printed:	7/12/2007

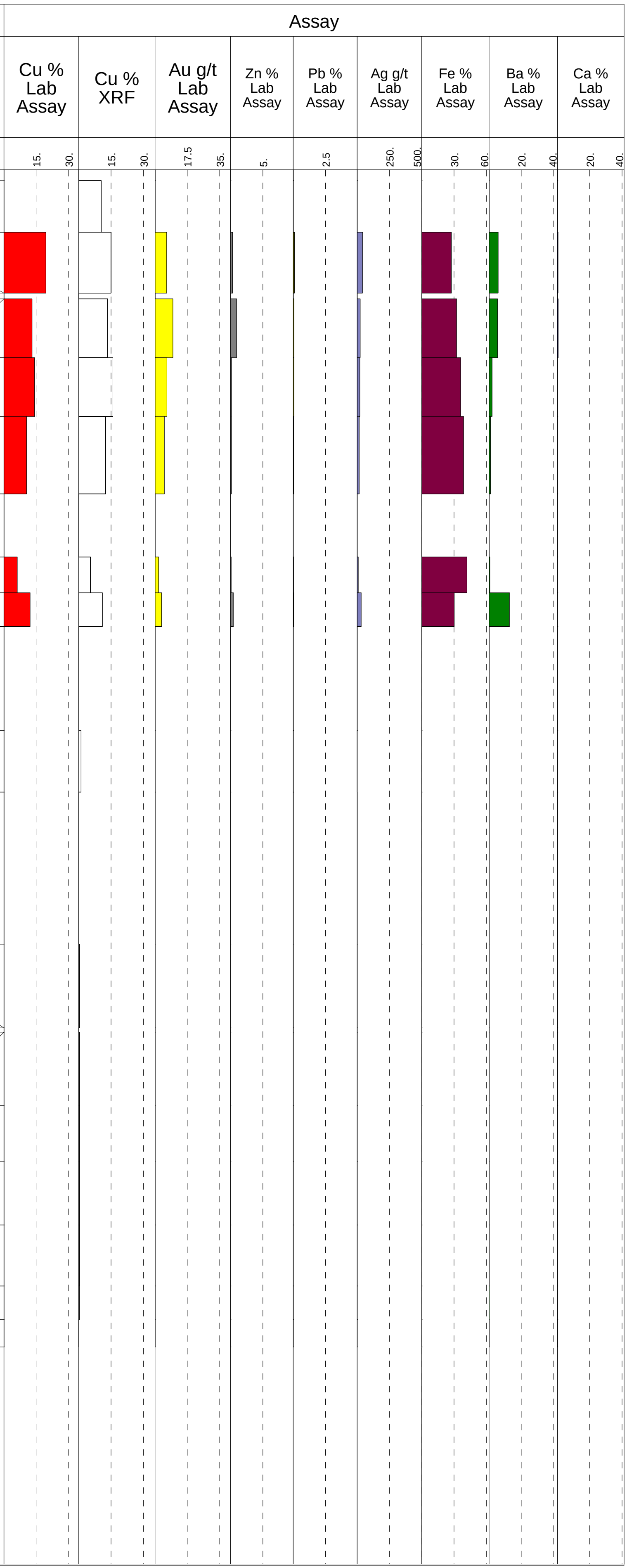
Nautilus Minerals

HoleID:	SD123	East:	399290.84
ProjectCode:	Manus	North:	9581030.46
Date Drilled:	10/08/2007	RL/Elevation:	-1505.69
		Depth:	16.42

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.15	0.87	Massive sulfide (HMS)	1	Sulphide	59517
0.87	1.72	Massive sulfide (HMS)	3	Sulphide	59518
1.72	1.80	Core loss		Sulphide	NS334
1.80	2.62	Massive sulfide (HMS)	2	Sulphide	59519
2.62	3.44	Massive sulfide (HMS)	3	Sulphide	59520
3.44	4.52	Massive sulfide (HMS)	2	Sulphide	59521
4.52	5.40	Core loss		Basement	NS335
5.40	5.90	Massive sulfide (HMS)	3	Basement	59522
5.90	6.37	Massive sulfide (HMS)	2	Basement	59523
6.37	7.82	Core loss		Basement	NS336
7.82	8.68	Semi-massive sulfide (HSM)	5	Basement	59524
8.68	10.80	Core loss		Basement	NS337
10.80	11.97	Anhydrite (HAN)	5	Basement	59525
11.97	12.03	Core loss		Basement	NS338
12.03	13.05	Hydrothermally altered clay-rich rock (HSI)	5	Basement	59526
13.05	13.83	Hydrothermally altered clay-rich rock (HSI)	5	Basement	59527
13.83	14.72	Anhydrite (HAN)	5	Basement	59528
14.72	15.57	Altered volcanic (VA)	5	Basement	59529
15.57	16.04	Altered volcanic (VA)		Basement	59530
16.04	16.42	Core loss		Basement	NS339

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

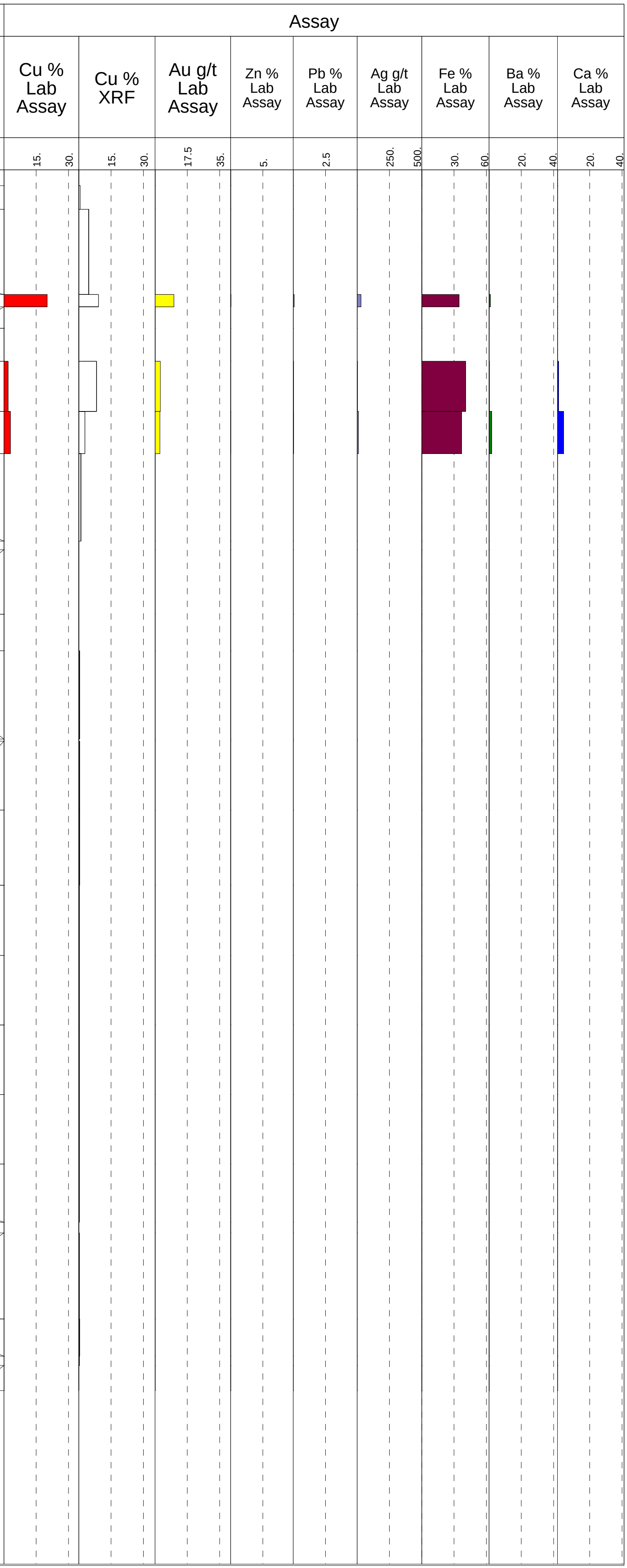
Nautilus Minerals

HoleID: SD124
ProjectCode: Manus
Date Drilled: 9/08/2007

East: 399338.03
North: 9581044.2
RL/Elevation: -1503.46
Depth: 17.03

From	To	Lithology	Ore Type	Domain	Sample ID
				Uncon Sed	
0.22	0.55	Lithified clastic sediment (SLI)	1	Lithified Sed	59250
0.55	1.74	Lithified clastic sediment (SLI)	1	Lithified Sed	59501
1.74	1.91	Massive sulfide (HMS)	3	Sulphide	59502
1.91	2.21	Natural void		Sulphide	NS325
2.21	2.67	Core loss		Sulphide	NS326
2.67	3.37	Massive sulfide (HMS)	3	Sulphide	59503
3.37	3.96	Massive sulfide (HMS)	2	Sulphide	59504
3.96	5.18	Semi-massive sulfide (HSM)	5	Sulphide	59505
5.18	5.30	Core loss		Sulphide	NS327
5.30	6.20	Natural void		Sulphide	NS328
6.20	6.71	Core loss		Sulphide	NS329
6.71	7.94	Hydrothermally altered clay-rich rock (HSI)	7	Sulphide	59506
7.94	7.97	Core loss		Basement	NS330
7.97	8.93	Altered volcanic (VA)	7	Basement	59507
8.93	9.98	Altered volcanic (VA)	7	Basement	59508
9.98	10.96	Altered volcanic (VA)	7	Basement	59509
10.96	11.93	Altered volcanic (VA)	7	Basement	59510
11.93	12.90	Altered volcanic (VA)	7	Basement	59511
12.90	13.87	Altered volcanic (VA)	7	Basement	59512
13.87	14.68	Altered volcanic (VA)	7	Basement	59513
14.68	14.83	Core loss		Basement	NS331
14.83	16.03	Altered volcanic (VA)	7	Basement	59514
16.03	16.55	Anhydrite (HAN)	5	Basement	59515
16.55	16.68	Altered volcanic (VA)	7	Basement	59516
16.68	17.03	Core loss		Basement	NS332

Assay



UTM 56S
WGS 84
Date Printed: 7/12/2007

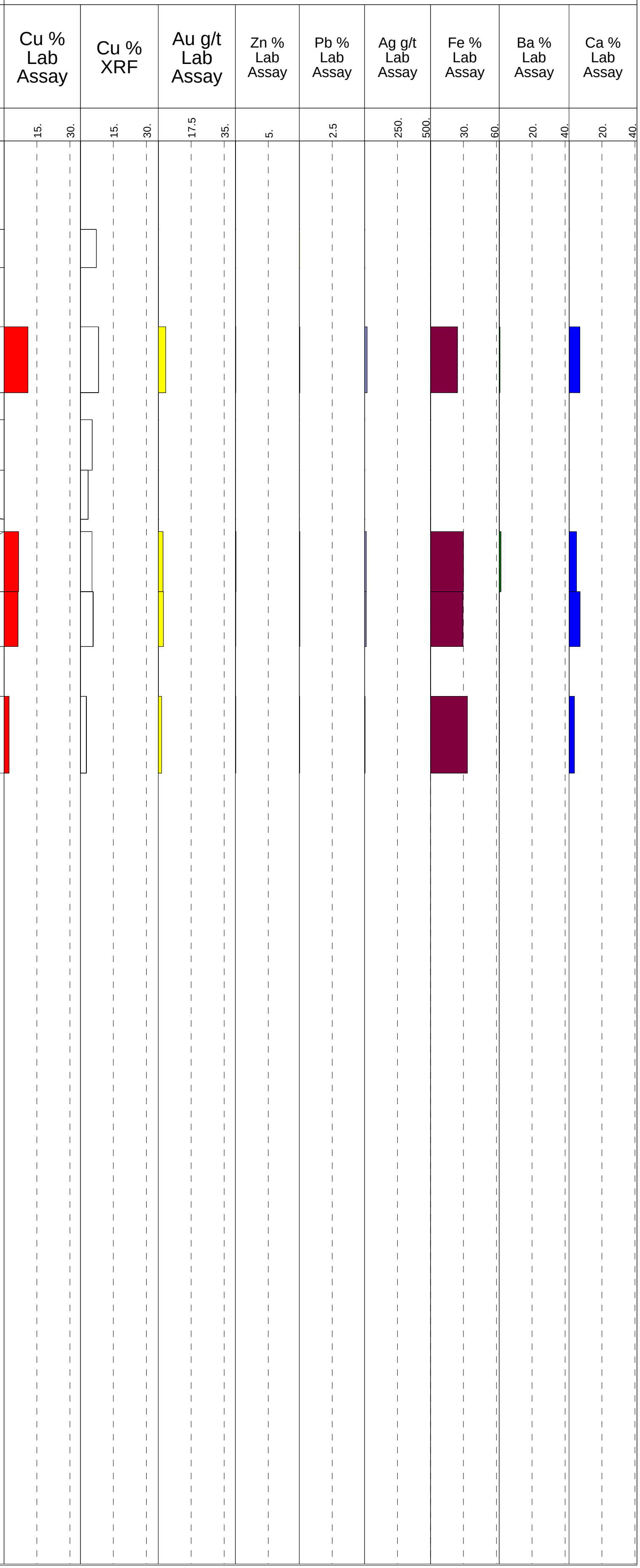
Nautilus Minerals

HoleID:	SD125
ProjectCode:	Manus
Date Drilled:	10/08/2007
East:	399395.84
North:	9581225.39
RL/Elevation:	-1490.02
Depth:	8.64

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.21	**Core loss**		Uncon Sed	NS340
1.21	1.73	**Lithified clastic sediment (SLI)**	1	Uncon Sed	59531
1.73	2.54	**Core loss**		Unknown	NS341
2.54	3.44	**Massive sulfide (HMS)**	4	Uncon Sed	59532
3.44	3.81	**Core loss**		Unknown	NS342
3.81	4.50	**Semi-massive sulfide (HSM)**	5	Uncon Sed	59533
4.50	5.17	**Semi-massive sulfide (HSM)**	5	Uncon Sed	59534
5.17	5.34	**Core loss**		Unknown	NS343
5.34	6.16	**Massive sulfide (HMS)**	4	Uncon Sed	59535
6.16	6.91	**Massive sulfide (HMS)**	4	Uncon Sed	59536
6.91	7.59	**Core loss**		Unknown	NS344
7.59	8.64	**Massive sulfide (HMS)**	4	Sulphide	59537

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD126
ProjectCode: Manus
Date Drilled: 11/08/2007

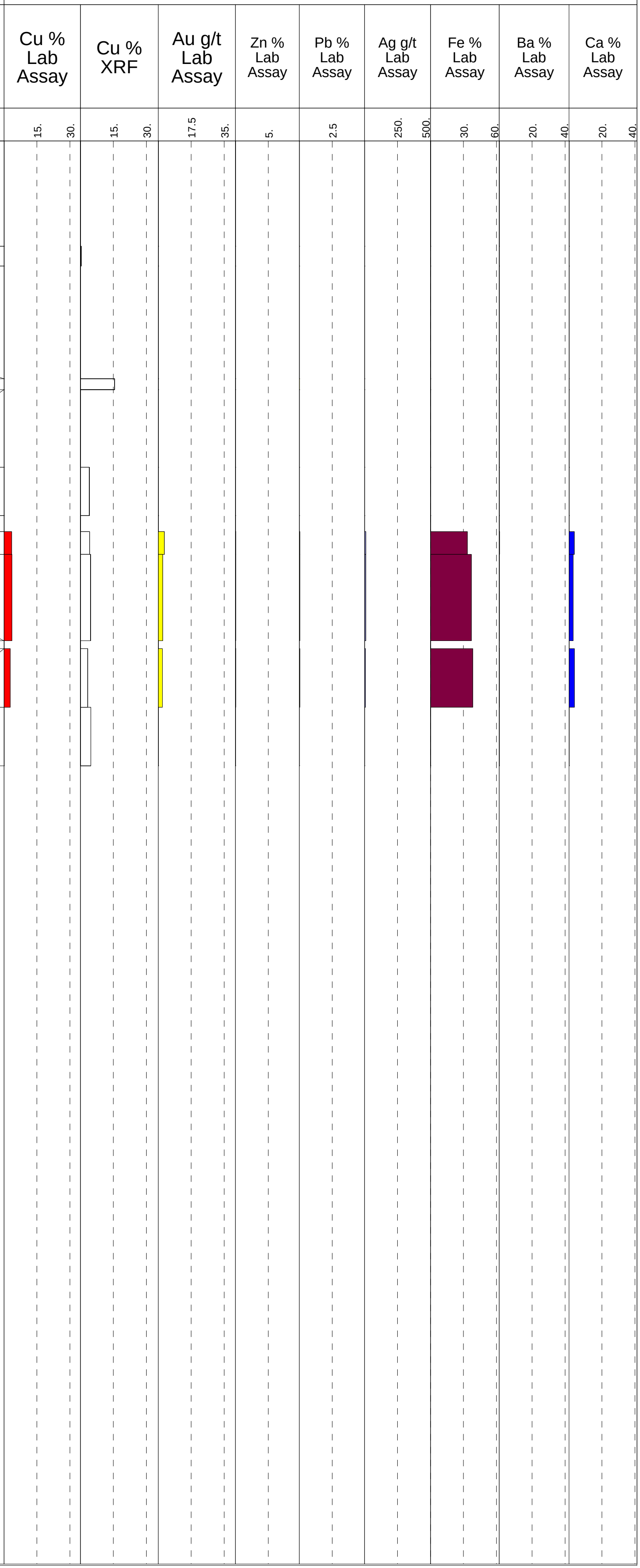
East: 399398.33
North: 9581215.38
RL/Elevation: -1492.67
Depth: 8.54

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.44	**Core loss**		Uncon Sed	NS345
1.44	1.71	**Lithified clastic sediment (SLI)**	1	Lithified Sed	59538
1.71	3.25	**Core loss**		Lithified Sed	NS346
3.25	3.40	**Massive sulfide (HMS)**	1	Sulphide	59539
3.40	4.46	**Core loss**		Sulphide	NS347
4.46	5.12	**Semi-massive sulfide (HSM)**	5	Sulphide	59540
5.12	5.34	**Core loss**		Sulphide	NS348
5.34	5.65	**Semi-massive sulfide (HSM)**	4	Sulphide	59541
5.65	6.83	**Massive sulfide (HMS)**	4	Sulphide	59542
6.83	6.94	**Core loss**		Sulphide	NS349
6.94	7.74	**Massive sulfide (HMS)**	4	Sulphide	59543
7.74	8.54	**Massive sulfide (HMS)**	5	Sulphide	59544

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

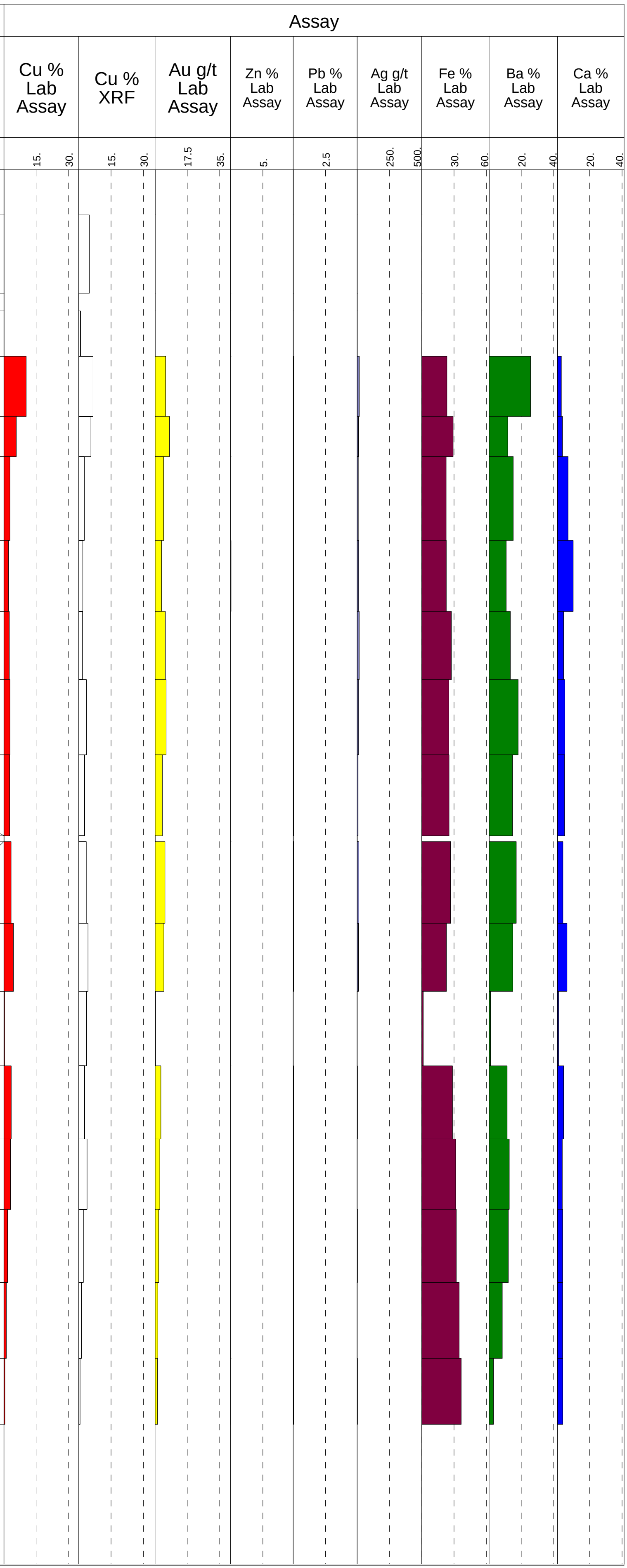
HoleID: SD127
ProjectCode: Manus
Date Drilled: 12/08/2007

East: 399642.07
North: 9581093.65
RL/Elevation: -1519.15
Depth: 17.5

Geology Items

Depth	From	To	Lithology	Ore Type	Domain	Sample ID
	0.00	0.63	Core loss		Uncon Sed	NS350
	0.63	1.72	Lithified clastic sediment (SLI)	1	Lithified Sed	59545
2	1.72	1.97	Core loss		Lithified Sed	NS351
	1.97	2.60	Lithified clastic sediment (SLI)	1	Lithified Sed	59546
	2.60	3.44	Massive sulfide (HMS)	2	Sulphide	59547
	3.44	4.00	Massive sulfide (HMS)	3	Sulphide	59548
4	4.00	5.17	Massive sulfide (HMS)	4	Sulphide	59549
6	5.17	6.16	Semi-massive sulfide (HSM)	4	Sulphide	59550
	6.16	7.11	Massive sulfide (HMS)	4	Sulphide	59551
8	7.11	8.16	Massive sulfide (HMS)	4	Sulphide	59552
	8.16	9.29	Semi-massive sulfide (HSM)	4	Sulphide	59553
	9.29	9.37	Core loss		Sulphide	NS352
10	9.37	10.51	Semi-massive sulfide (HSM)	4	Sulphide	59554
	10.51	11.46	Semi-massive sulfide (HSM)	4	Sulphide	59555
12	11.46	12.50	Massive sulfide (HMS)	4	Sulphide	59556
	12.50	13.52	Semi-massive sulfide (HSM)	4	Basement	59557
14	13.52	14.50	Massive sulfide (HMS)	4	Basement	59558
	14.50	15.52	Massive sulfide (HMS)	4	Basement	59559
16	15.52	16.58	Semi-massive sulfide (HSM)	4	Basement	59560
	16.58	17.50	Massive sulfide (HMS)	4	Basement	59561
18						

Assay



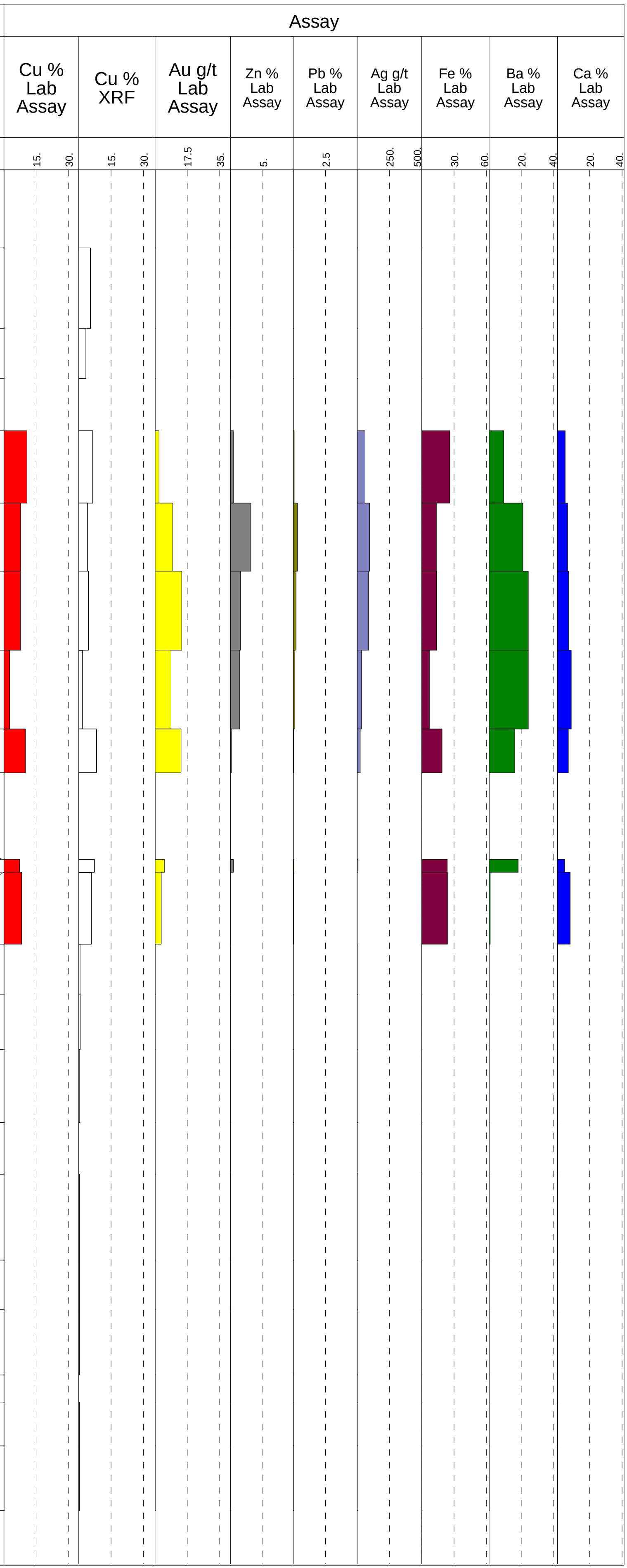
Nautilus Minerals

UTM 56S	
WGS 84	
Date Printed:	7/12/2007
HoleID:	SD128
ProjectCode:	Manus
Date Drilled:	13/08/2007
East:	399696.86
North:	9581085.09
RL/Elevation:	-1520.49
Depth:	18.7

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.09	Core loss		Uncon Sed	NS353
1.09	2.21	Lithified clastic sediment (SLI)	1	Lithified Sed	59562
2.21	2.91	Lithified clastic sediment (SLI)	1	Lithified Sed	59563
2.91	3.64	Core loss		Lithified Sed	NS354
3.64	4.65	Massive sulfide (HMS)	2	Sulphide	59564
4.65	5.60	Massive sulfide (HMS)	2	Sulphide	59565
5.60	6.70	Massive sulfide (HMS)	2	Sulphide	59566
6.70	7.80	Semi-massive sulfide (HSM)	2	Sulphide	59567
7.80	8.41	Massive sulfide (HMS)	3	Sulphide	59568
8.41	9.62	Core loss		Sulphide	NS355
9.62	9.80	Massive sulfide (HMS)	3	Sulphide	59569
9.80	10.80	Massive sulfide (HMS)	4	Sulphide	59570
10.80	11.50	Altered volcanic (VA)	6	Sulphide	59571
11.50	12.27	Semi-massive sulfide (HSM)	6	Sulphide	59572
12.27	13.29	Semi-massive sulfide (HSM)	6	Sulphide	59573
13.29	14.01	Core loss		Basement	NS356
14.01	15.21	Hydrothermally altered clay-rich rock (HSI)	8	Basement	59574
15.21	15.90	Hydrothermally altered clay-rich rock (HSI)	1	Basement	59575
15.90	16.81	Altered volcanic (VA)	0	Basement	59576
16.81	17.19	Core loss		Basement	NS357
17.19	17.80	Altered volcanic (VA)	0	Basement	59577
17.80	18.70	Altered volcanic (VA)	0	Basement	59578

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

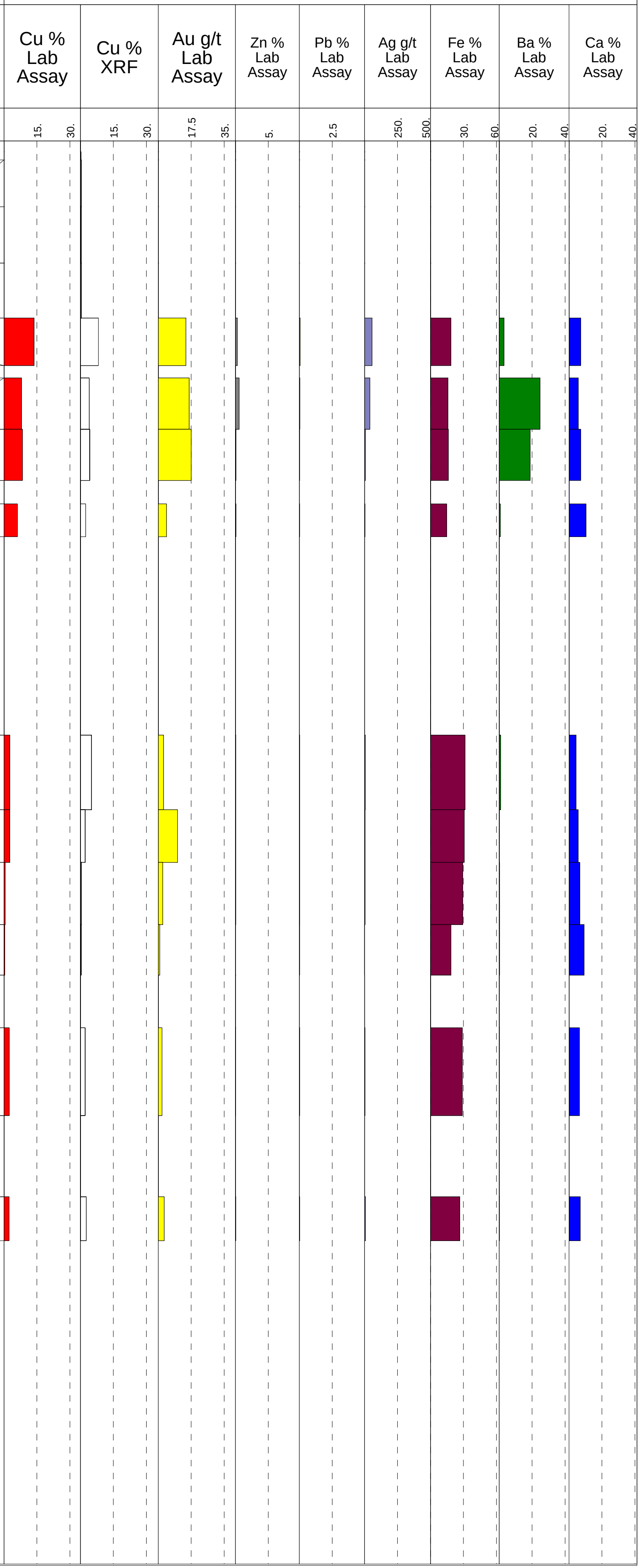
HoleID:	SD129
ProjectCode:	Manus
Date Drilled:	14/08/2007
East:	399742.1
North:	9580889.88
RL/Elevation:	-1520.68
Depth:	15.03

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.15	0.26	Lithified clastic sediment (SLI)	1	Lithified Sed	59579
0.26	0.90	Volcaniclastic Sand (SVC)	1	Lithified Sed	59580
0.90	1.67	Volcaniclastic Sand (SVC)	1	Lithified Sed	59581
1.67	2.42	Volcaniclastic Sand (SVC)	1	Lithified Sed	59582
2.42	3.07	Massive sulfide (HMS)	2	Sulphide	59583
3.07	3.24	Core loss		Sulphide	NS359
3.24	3.94	Semi-massive sulfide (HSM)	2	Sulphide	59584
3.94	4.64	Massive sulfide (HMS)	2	Sulphide	59585
4.64	4.96	Core loss		Sulphide	NS360
4.96	5.41	Semi-massive sulfide (HSM)	2	Sulphide	59586
5.41	8.12	Core loss		Sulphide	NS361
8.12	9.14	Semi-massive sulfide (HSM)	4	Sulphide	59587
9.14	9.86	Semi-massive sulfide (HSM)	4	Sulphide	59588
9.86	10.71	Massive sulfide (HMS)	4	Sulphide	59589
10.71	11.40	Hydrothermally altered clay-rich rock (HSI)	4	Sulphide	59590
11.40	12.12	Core loss		Sulphide	NS362
12.12	13.32	Massive sulfide (HMS)	4	Sulphide	59591
13.32	14.43	Core loss		Sulphide	NS363
14.43	15.03	Massive sulfide (HMS)	4	Sulphide	59592

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID:	SD130	East:	398857.88
ProjectCode:	Manus	North:	9581049.07
Date Drilled:	15/08/2007	RL/Elevation:	-1614.78
		Depth:	12.05

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.93	**Core loss**		Uncon Sed	NS364
0.93	1.20	**Lithified clastic sediment (SLI)**	1	Uncon Sed	59593
1.20	1.63	**Silt (SLT)**	1	Uncon Sed	59594
1.63	1.83	**Massive sulfide (HMS)**	2	Sulphide	59599
1.83	2.51	**Core loss**		Sulphide	NS365
2.51	3.52	**Massive sulfide (HMS)**	3	Sulphide	59595
3.52	6.47	**Core loss**		Basement	NS366
6.47	6.87	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	59596
6.87	8.37	**Core loss**		Basement	NS367
8.37	8.60	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	59597
8.60	9.82	**Core loss**		Basement	NS368
9.82	10.60	**Hydrothermally altered clay-rich rock (HSI)**	7	Basement	59598
10.60	12.05	**Core loss**		Basement	NS369

Assay

Cu % Lab Assay (15., 30.) | Cu % XRF (15., 30.) | Au g/t Lab Assay (17.5, 35.) | Zn % Lab Assay (5.) | Pb % Lab Assay (2.5) | Ag g/t Lab Assay (250., 500.) | Fe % Lab Assay (30., 60.) | Ba % Lab Assay (20., 40.) | Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD131
ProjectCode: Manus
Date Drilled: 15/08/2007

East: 399009.37
North: 9580994.86
RL/Elevation: -1571.62
Depth: 11.06

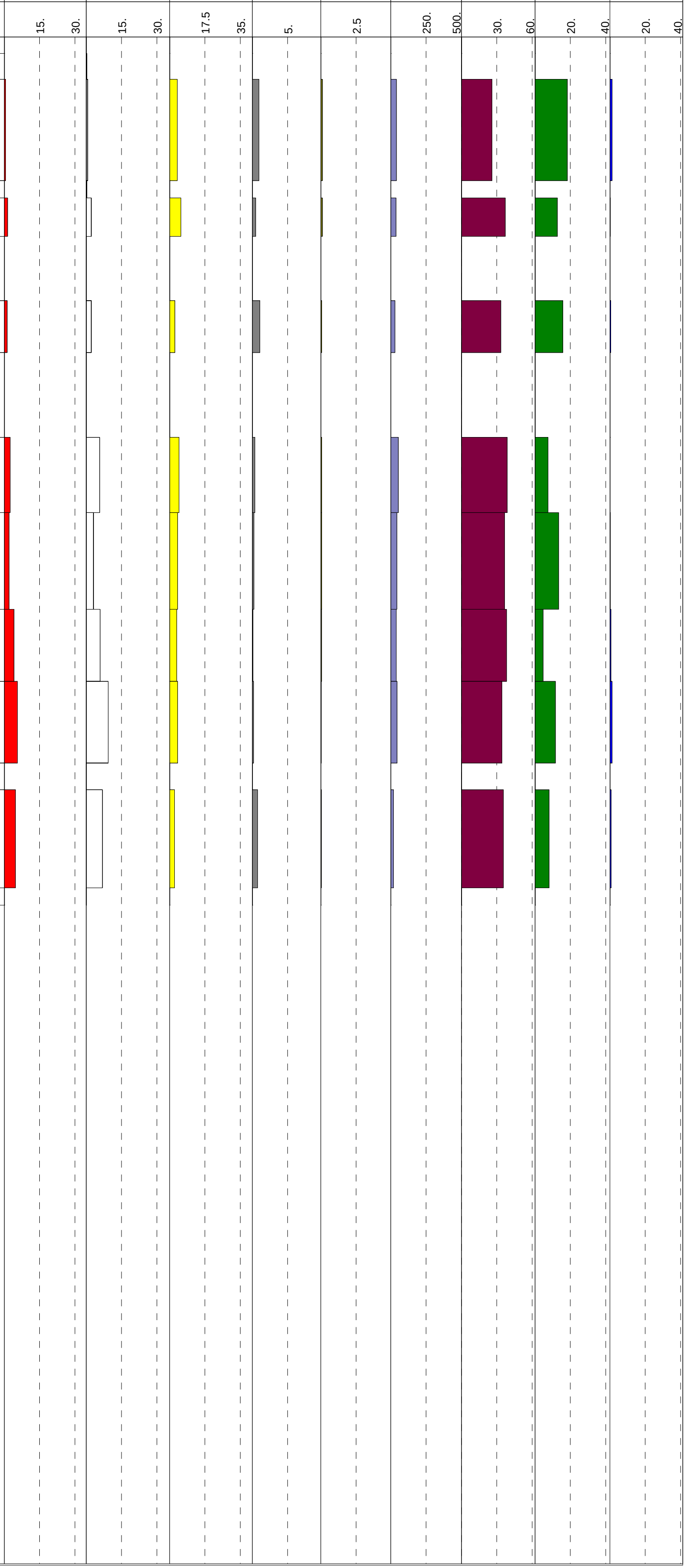
Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
				Uncon Sed	
0.21	0.54	**Lithified clastic sediment (SLI)**	1	Lithified Sed	59600
0.54	1.83	**Massive sulfide (HMS)**	2	Sulphide	59601
1.83	2.05	**Lithified clastic sediment (SLI)**	1	Sulphide	59602
2.05	2.54	**Massive sulfide (HMS)**	2	Sulphide	59603
2.54	3.36	**Core loss**		Sulphide	NS371
3.36	4.02	**Massive sulfide (HMS)**	2	Sulphide	59604
4.02	5.10	**Core loss**		Sulphide	NS372
5.10	6.06	**Massive sulfide (HMS)**	2	Sulphide	59605
6.06	7.29	**Massive sulfide (HMS)**	2	Sulphide	59606
7.29	8.21	**Massive sulfide (HMS)**	2	Sulphide	59607
8.21	9.25	**Massive sulfide (HMS)**	2	Sulphide	59608
9.25	9.59	**Core loss**		Sulphide	NS373
9.59	10.84	**Massive sulfide (HMS)**	2	Sulphide	59609
10.84	11.06	**Core loss**		Unknown	NS374

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay

Cu % Lab Assay | Cu % XRF | Au g/t Lab Assay | Zn % Lab Assay | Pb % Lab Assay | Ag g/t Lab Assay | Fe % Lab Assay | Ba % Lab Assay | Ca % Lab Assay



Nautilus Minerals

UTM 56S
WGS 84
Date Printed:
7/12/2007

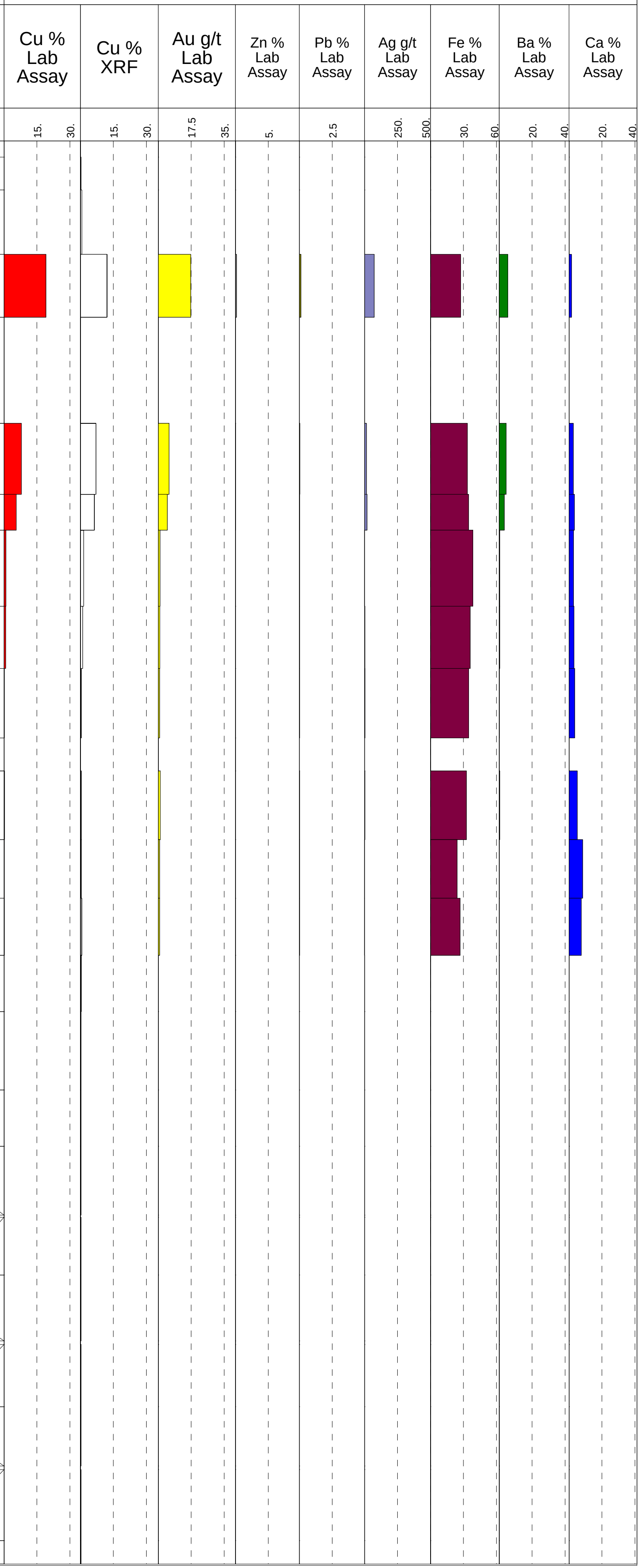
HoleID: SD132
ProjectCode: Manus
Date Drilled: 15/08/2007

East: 399336.34
North: 9581043.26
RL/Elevation: -1504.14
Depth: 19.82

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
				Uncon Sed	
0.22	0.67	Lithified clastic sediment (SLI)	1	Lithified Sed	59610
0.67	1.55	Lithified clastic sediment (SLI)	1	Lithified Sed	59611
1.55	2.41	Massive sulfide (HMS)	3	Sulphide	59612
2.41	3.86	Core loss		Sulphide	NS376
3.86	4.83	Massive sulfide (HMS)	3	Sulphide	59613
4.83	5.32	Massive sulfide (HMS)	3	Sulphide	59614
5.32	6.36	Massive sulfide (HMS)	4	Sulphide	59615
6.36	7.21	Massive sulfide (HMS)	4	Sulphide	59616
7.21	8.16	Semi-massive sulfide (HSM)	4	Sulphide	59617
8.16	8.61	Core loss		Sulphide	NS377
8.61	9.55	Semi-massive sulfide (HSM)	4	Sulphide	59618
9.55	10.35	Semi-massive sulfide (HSM)	4	Sulphide	59619
10.35	11.13	Semi-massive sulfide (HSM)	4	Sulphide	59620
11.13	11.90	Sulfate-Sulfide (HSS)	5	Basement	59621
11.90	12.97	Anhydrite (HAN)	6	Basement	59622
12.97	13.74	Anhydrite (HAN)	6	Basement	59623
13.74	14.68	Altered volcanic (VA)	7	Basement	59624
14.68	14.71	Core loss		Basement	NS378
14.71	15.50	Altered volcanic (VA)	7	Basement	59625
15.50	16.40	Altered volcanic (VA)	7	Basement	59626
16.40	16.45	Core loss		Basement	NS379
16.45	17.30	Altered volcanic (VA)	7	Basement	59627
17.30	18.11	Altered volcanic (VA)	7	Basement	59628
18.11	18.16	Core loss		Basement	NS380
18.16	19.13	Altered volcanic (VA)	7	Basement	59629
19.13	19.82	Hydrothermally altered clay-rich rock (HSI)	7	Basement	59630

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD132
ProjectCode: Manus
Date Drilled: 15/08/2007

East: 399336.34
North: 9581043.26
RL/Elevation: -1504.14
Depth: 19.82

Depth	Geology Items							Assay								
	From	To	Lithology		Ore Type	Domain	Sample ID	Cu % Lab Assay (15. 30.)	Cu % XRF (15. 30.)	Au g/t Lab Assay (17.5 35.)	Zn % Lab Assay (5.)	Pb % Lab Assay (2.5)	Ag g/t Lab Assay (250. 500.)	Fe % Lab Assay (30. 60.)	Ba % Lab Assay (20. 40.)	Ca % Lab Assay (20. 40.)
	19.13	19.82	**Hydrothermally altered clay-rich rock (HSI)**		7	*Basement*	59630									

Depth scale: 20, 22, 24, 26, 28, 30, 32, 34, 36, 38

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD133
ProjectCode: Manus
Date Drilled: 17/08/2007

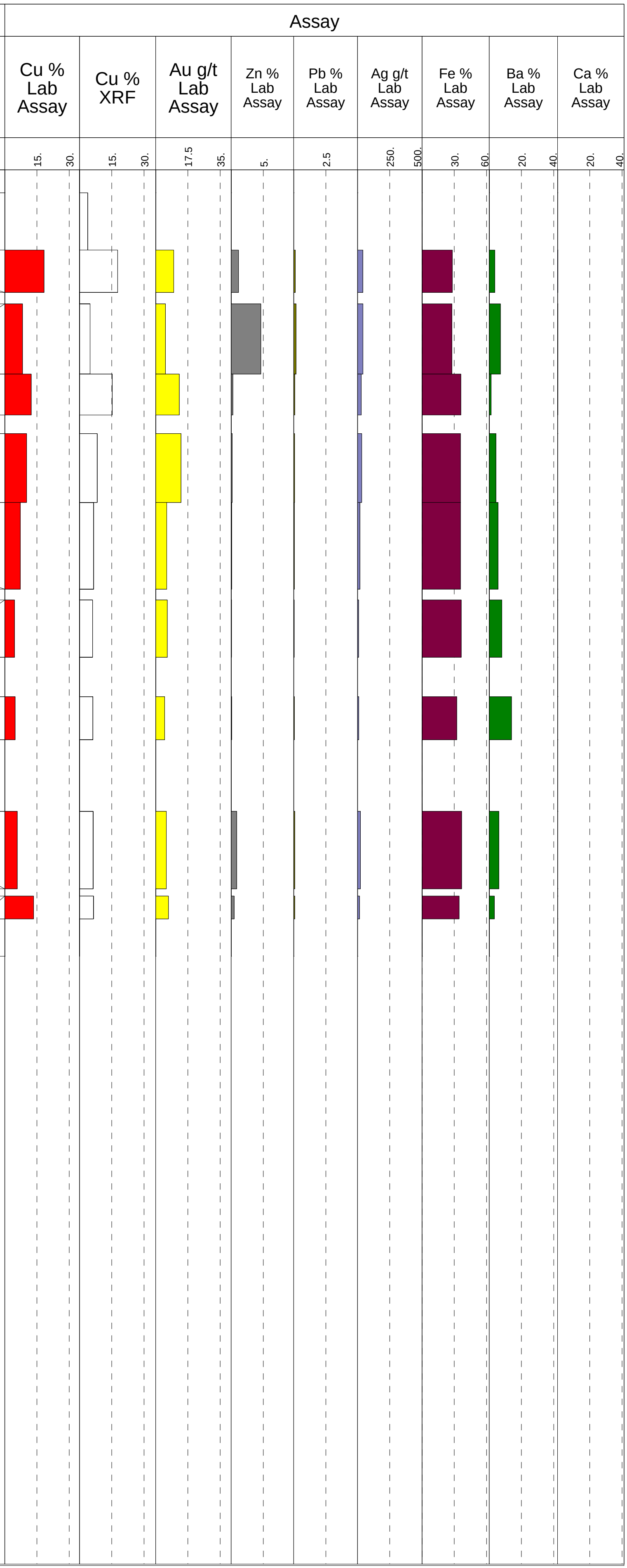
East: 399486.36
North: 9581275.71
RL/Elevation: -1508.02
Depth: 10.97

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.32	**Core loss**		Uncon Sed	NS381
0.32	1.12	**Lithified clastic sediment (SLI)**	1	Unknown	59631
1.12	1.71	**Massive sulfide (HMS)**	3	Unknown	59632
1.71	1.87	**Core loss**		Unknown	NS382
1.87	2.85	**Semi-massive sulfide (HSM)**	3	Unknown	59633
2.85	3.42	**Massive sulfide (HMS)**	3	Unknown	59634
3.42	3.68	**Core loss**		Unknown	NS383
3.68	4.64	**Massive sulfide (HMS)**	2	Unknown	59635
4.64	5.85	**Massive sulfide (HMS)**	2	Unknown	59636
5.85	6.00	**Core loss**		Unknown	NS384
6.00	6.80	**Massive sulfide (HMS)**	2	Unknown	59637
6.80	7.35	**Core loss**		Unknown	NS385
7.35	7.95	**Massive sulfide (HMS)**	2	Unknown	59638
7.95	8.95	**Core loss**		Unknown	NS386
8.95	10.03	**Massive sulfide (HMS)**	2	Unknown	59639
10.03	10.13	**Core loss**		Unknown	NS387
10.13	10.45	**Massive sulfide (HMS)**	2	Unknown	59640
10.45	10.97	**Core loss**		Unknown	NS388

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



UTM 56S
WGS 84
Date Printed:
7/12/2007

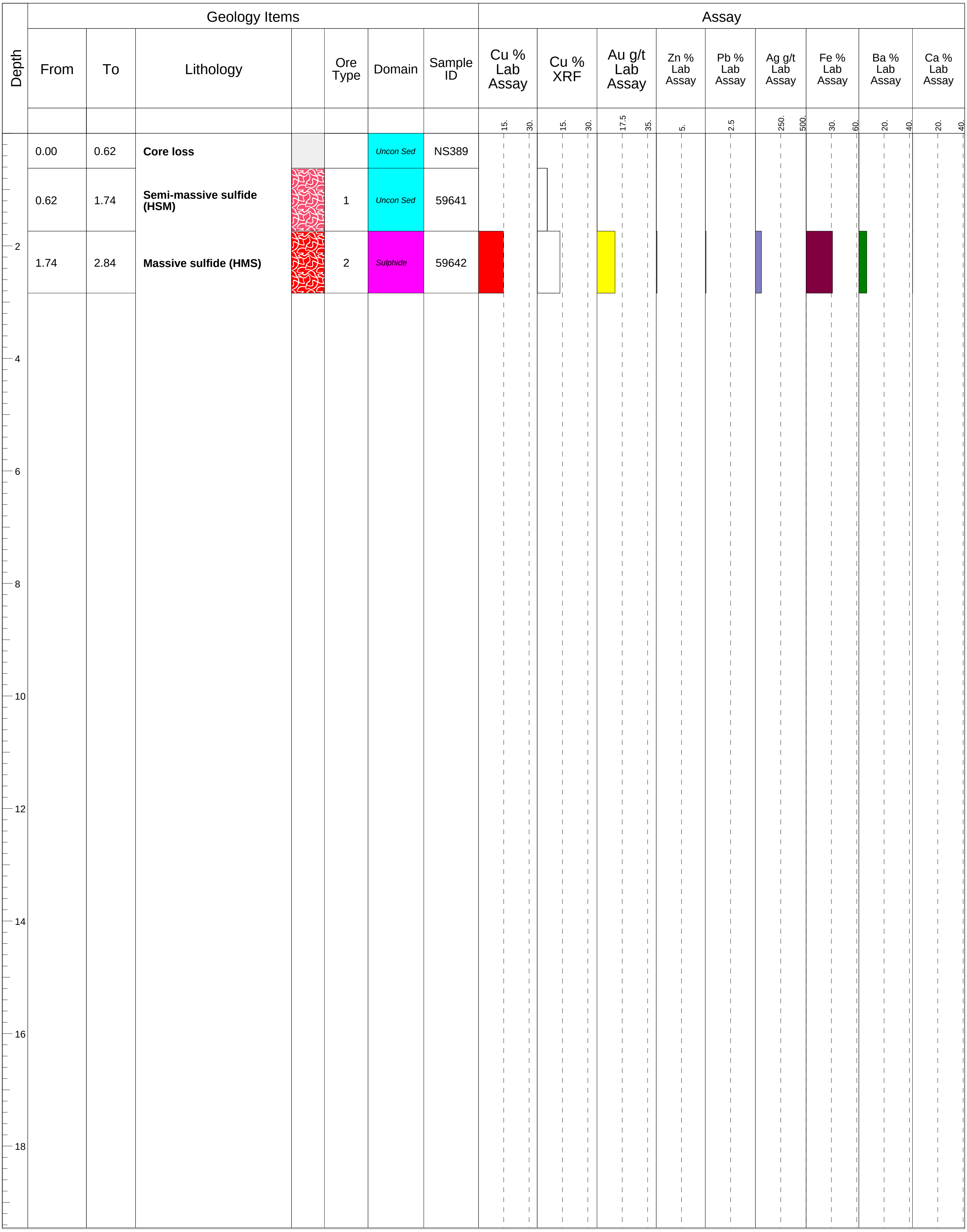
Nautilus Minerals

HoleID: SD134
ProjectCode: Manus
Date Drilled: 18/08/2007

East: 399390.36
North: 9581259.21
RL/Elevation: -1495.38
Depth: 2.84

From	To	Lithology		Ore Type	Domain	Sample ID
0.00	0.62	**Core loss**			*Uncon Sed*	NS389
0.62	1.74	**Semi-massive sulfide (HSM)**		1	*Uncon Sed*	59641
1.74	2.84	**Massive sulfide (HMS)**		2	*Sulphide*	59642

Assay



NAUTILUS Minerals Inc.

UTM 56S

WGS 84

Date Printed:

7/12/2007

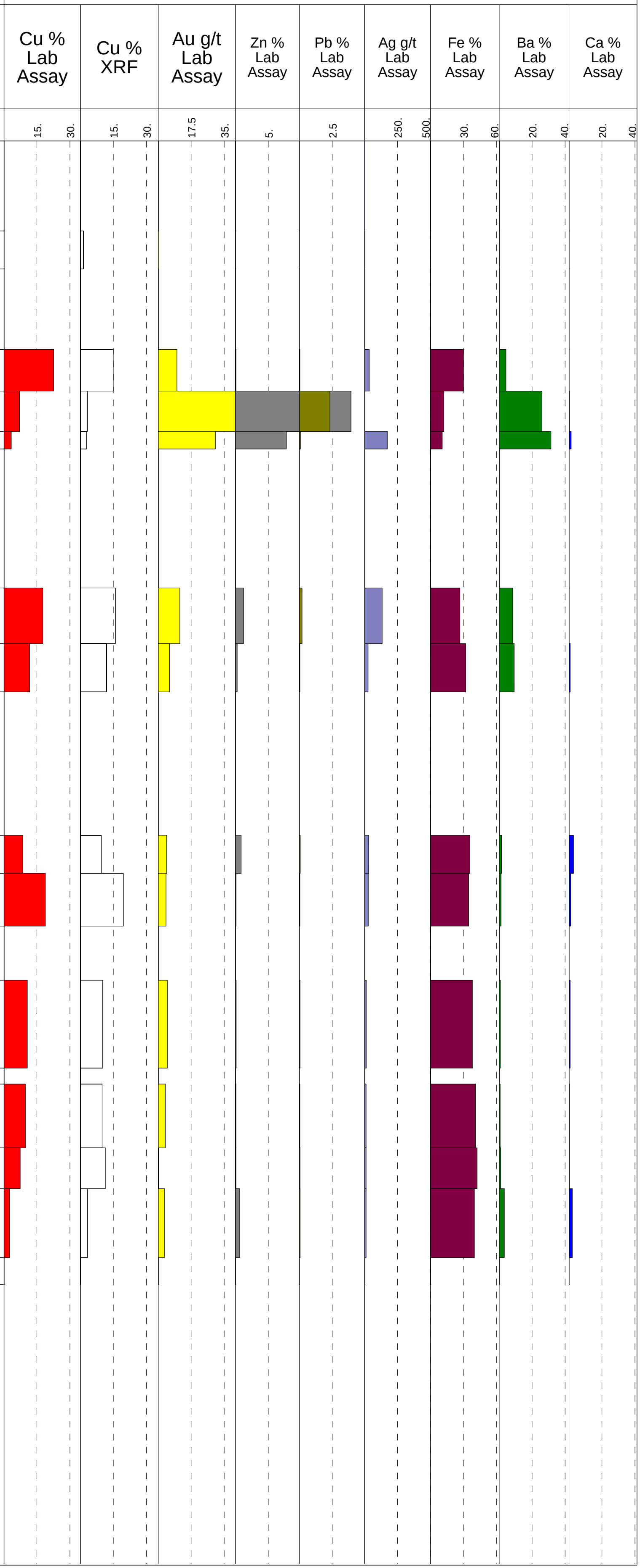
Nautilus Minerals

HoleID:	SD135	East:	399387.23
ProjectCode:	Manus	North:	9581257.23
Date Drilled:	18/08/2007	RL/Elevation:	-1493.85
		Depth:	15.63

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.23	Core loss		Uncon Sed	NS390
1.23	1.75	Lithified clastic sediment (SLI)	1	Sulphide	59643
1.75	2.85	Core loss		Sulphide	NS391
2.85	3.42	Massive sulfide (HMS)	3	Sulphide	59644
3.42	3.97	Massive sulfide (HMS)	2	Sulphide	59645
3.97	4.21	Hydrothermal, other (H_Other)	2	Sulphide	59646
4.21	6.11	Core loss		Sulphide	NS392
6.11	6.87	Massive sulfide (HMS)	2	Sulphide	59647
6.87	7.53	Massive sulfide (HMS)	2	Sulphide	59648
7.53	9.49	Core loss		Sulphide	NS393
9.49	10.01	Massive sulfide (HMS)	2	Sulphide	59649
10.01	10.73	Massive sulfide (HMS)	3	Basement	59650
10.73	11.47	Core loss		Basement	NS394
11.47	12.67	Massive sulfide (HMS)	2	Basement	59651
12.67	12.89	Core loss		Basement	NS395
12.89	13.76	Massive sulfide (HMS)	2	Basement	59652
13.76	14.32	Massive sulfide (HMS)	2	Basement	59653
14.32	15.26	Massive sulfide (HMS)	2	Basement	59654
15.26	15.63	Core loss		Basement	NS396

Assay



UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

HoleID: SD136
ProjectCode: Manus
Date Drilled: 19/08/2007

East: 399397.12
North: 9581226.21
RL/Elevation: -1489.84
Depth: 1.21

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.79	**Core loss**		*Uncon Sed*	NS397
0.79	1.21	**Semi-massive sulfide (HSM)**	2	*Uncon Sed*	59655

Assay columns: Cu % Lab Assay (15., 30.); Cu % XRF (15., 30.); Au g/t Lab Assay (17.5, 35.); Zn % Lab Assay (5.); Pb % Lab Assay (2.5); Ag g/t Lab Assay (250., 500.); Fe % Lab Assay (30., 60.); Ba % Lab Assay (20., 40.); Ca % Lab Assay (20., 40.)

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

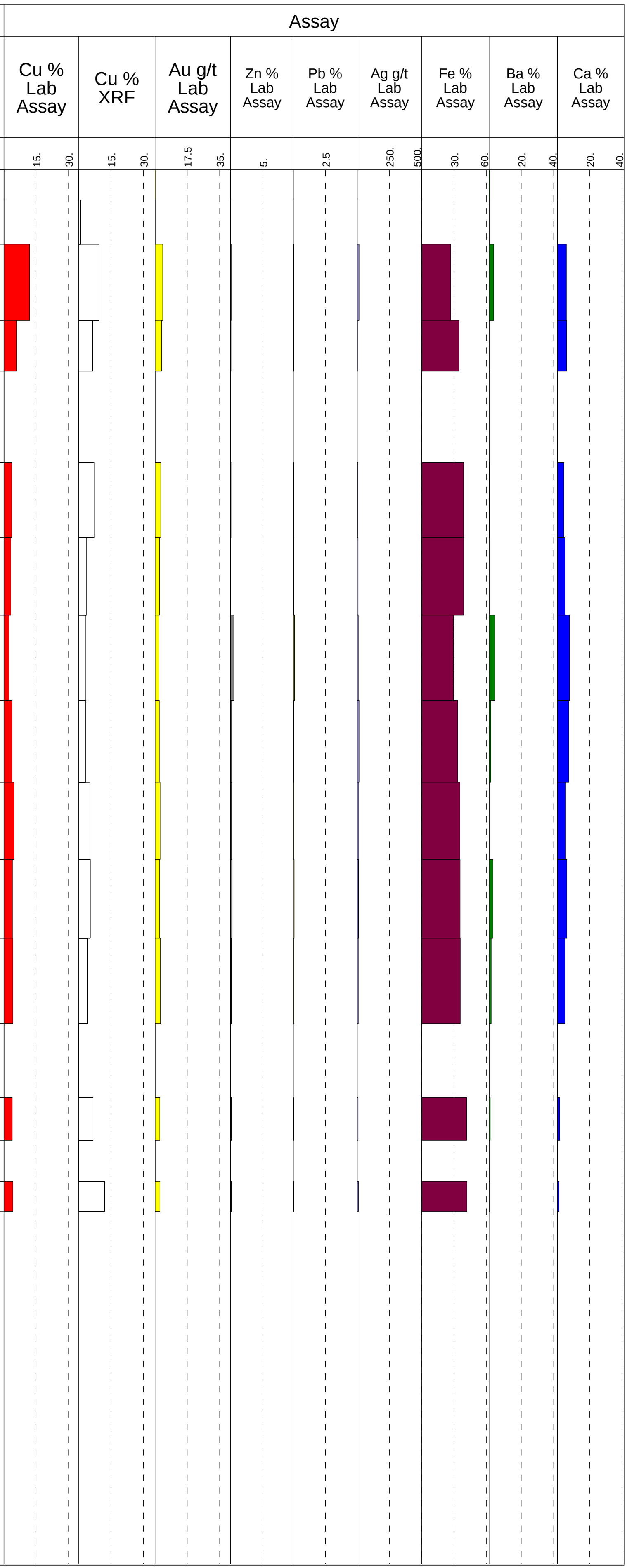
UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD137
ProjectCode: Manus
Date Drilled: 20/08/2007

East: 399395.91
North: 9581222.98
RL/Elevation: -1490.92
Depth: 14.53

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.42	Core loss		Uncon Sed	NS398
0.42	1.04	Sedimentary, other (S_Other)	1	Lithified Sed	59656
1.04	2.10	Massive sulfide (HMS)	2	Sulphide	59657
2.10	2.81	Massive sulfide (HMS)	4	Sulphide	59658
2.81	4.08	Core loss		Sulphide	NS399
4.08	5.13	Massive sulfide (HMS)	4	Sulphide	59659
5.13	6.21	Massive sulfide (HMS)	4	Sulphide	59660
6.21	7.40	Semi-massive sulfide (HSM)	4	Sulphide	59661
7.40	8.54	Massive sulfide (HMS)	4	Sulphide	59662
8.54	9.62	Massive sulfide (HMS)	4	Sulphide	59663
9.62	10.72	Massive sulfide (HMS)	4	Sulphide	59664
10.72	11.91	Massive sulfide (HMS)	4	Sulphide	59665
11.91	12.94	Core loss		Sulphide	NS400
12.94	13.54	Massive sulfide (HMS)	2	Sulphide	59666
13.54	14.11	Core loss		Sulphide	NS401
14.11	14.53	Massive sulfide (HMS)	2	Sulphide	59667

Assay



Nautilus Minerals

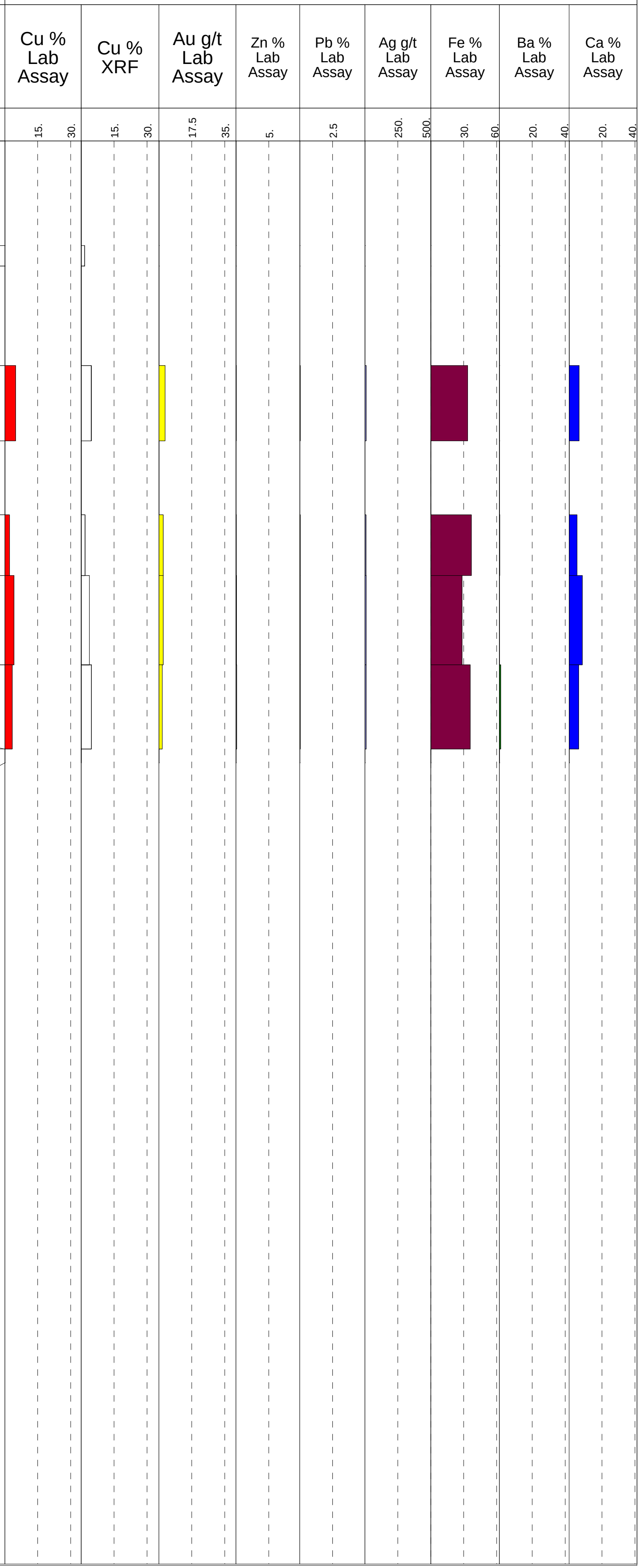
UTM 56S
WGS 84
Date Printed:
7/12/2007

HoleID: SD138
ProjectCode: Manus
Date Drilled: 21/08/2007

East: 399397.07
North: 9581221.38
RL/Elevation: -1490.98
Depth: 8.5

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.43	**Core loss**		Uncon Sed	NS402
1.43	1.71	**Lithified clastic sediment (SLI)**	1	Sulphide	59668
1.71	3.07	**Core loss**		Sulphide	NS403
3.07	4.10	**Semi-massive sulfide (HSM)**	4	Sulphide	59669
4.10	5.11	**Core loss**		Sulphide	NS404
5.11	5.94	**Massive sulfide (HMS)**	4	Sulphide	59670
5.94	7.16	**Massive sulfide (HMS)**	4	Sulphide	59671
7.16	8.31	**Massive sulfide (HMS)**	4	Sulphide	59672
8.31	8.50	**Core loss**		Unknown	NS405

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

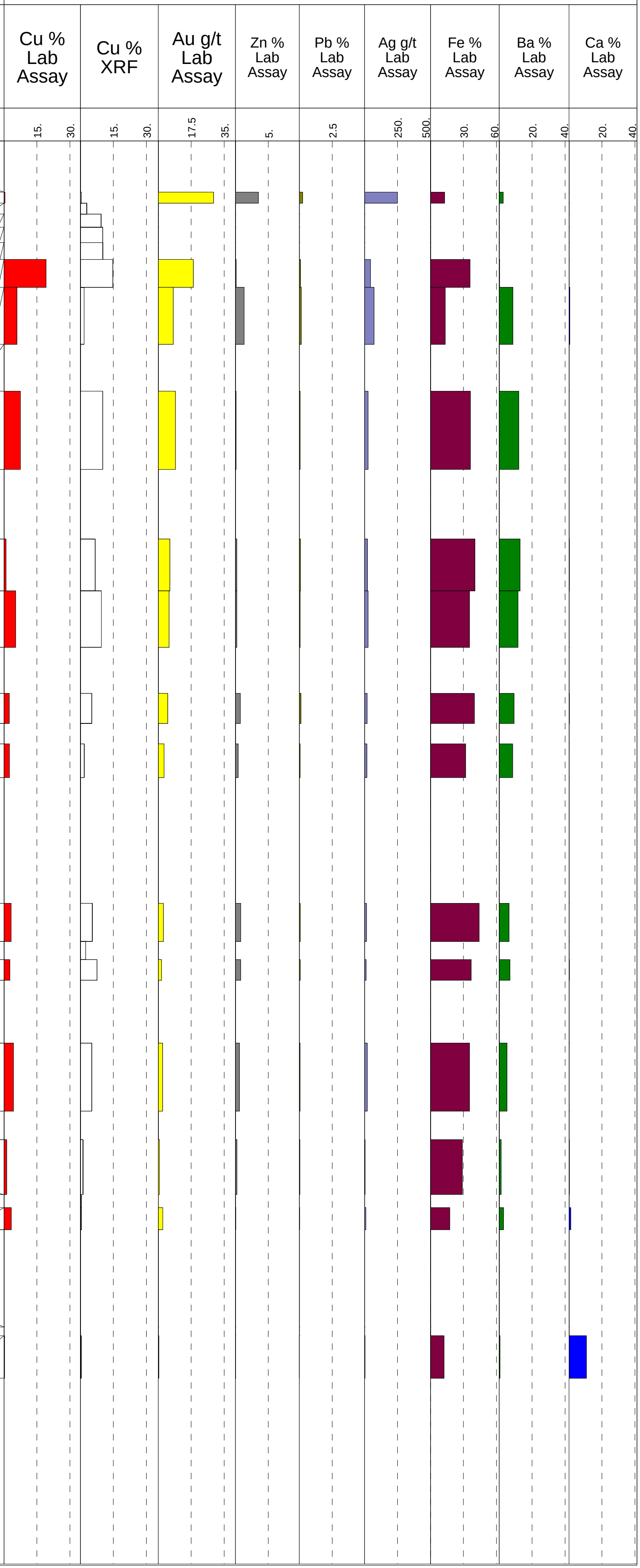
HoleID: SD139
ProjectCode: Manus
Date Drilled: 13/08/2007

East: 399519.5
North: 9581250.05
RL/Elevation: -1510.81
Depth: 16.91

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.70	Core loss		Uncon Sed	NS406
0.70	0.85	Lithified clastic sediment (SLI)	1	Sulphide	59796
0.85	1.00	Lithified clastic sediment (SLI)	1	Sulphide	62463
1.00	1.18	Massive sulfide (HMS)	3	Sulphide	62464
1.18	1.39	Massive sulfide (HMS)	3	Sulphide	62465
1.39	1.62	Massive sulfide (HMS)	3	Sulphide	62466
1.62	2.00	Massive sulfide (HMS)	3	Sulphide	59797
2.00	2.78	Clay (SCY)	0	Sulphide	59798
2.78	3.42	Core loss		Sulphide	NS407
3.42	4.49	Massive sulfide (HMS)	2	Sulphide	59799
4.49	5.44	Core loss		Sulphide	NS408
5.44	6.15	Massive sulfide (HMS)	2	Sulphide	59800
6.15	6.92	Massive sulfide (HMS)	2	Sulphide	59809
6.92	7.55	Core loss		Basement	NS409
7.55	7.96	Massive sulfide (HMS)	2	Basement	59801
7.96	8.24	Core loss		Basement	NS410
8.24	8.70	Massive sulfide (HMS)	2	Basement	59802
8.70	10.42	Core loss		Basement	NS411
10.42	10.94	Massive sulfide (HMS)	2	Basement	59803
10.94	11.19	Massive sulfide (HMS)	2	Basement	62467
11.19	11.47	Massive sulfide (HMS)	2	Basement	59804
11.47	12.33	Core loss		Basement	NS412
12.33	13.26	Semi-massive sulfide (HSM)	5	Basement	59805
13.26	13.65	Core loss		Basement	NS413
13.65	14.40	Semi-massive sulfide (HSM)	2	Basement	59806
14.40	14.58	Semi-massive sulfide (HSM)	2	Basement	62468
14.58	14.88	Hydrothermally altered clay-rich rock (HSI)	0	Basement	59807
14.88	16.21	Core loss		Basement	NS414
16.21	16.33	Core loss		Basement	NS415
16.33	16.91	Hydrothermally altered clay-rich rock (HSI)	0	Basement	59808

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

Nautilus Minerals

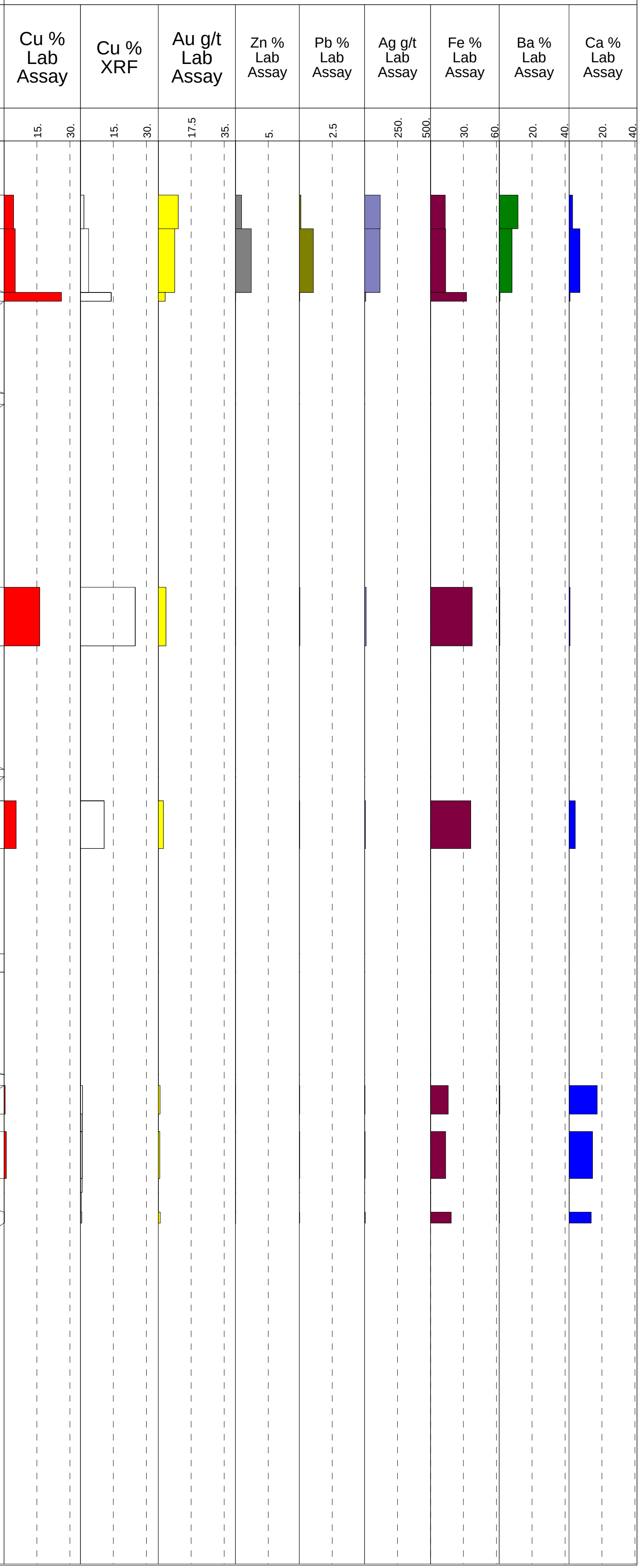
HoleID: SD140
ProjectCode: Manus
Date Drilled: 14/08/2007

East: 399360.83
North: 9581190.17
RL/Elevation: -1505.37
Depth: 14.79

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.74	Core loss		Uncon Sed	NS416
0.74	1.20	Sedimentary, other (S_Other)	0	Sulphide	59810
1.20	2.07	Sedimentary, other (S_Other)	1	Sulphide	59811
2.07	2.19	Massive sulfide (HMS)	3	Sulphide	59823
2.19	3.45	Core loss		Sulphide	NS417
3.45	3.60	Core loss		Sulphide	NS418
3.60	6.10	Core loss		Sulphide	NS419
6.10	6.90	Massive sulfide (HMS)	4	Sulphide	59812
6.90	8.59	Core loss		Basement	NS420
8.59	8.69	Core loss		Basement	NS421
8.69	9.02	Core loss		Basement	NS422
9.02	9.67	Semi-massive sulfide (HSM)	4	Basement	59813
9.67	11.11	Core loss		Basement	NS423
11.11	11.36	Core loss		Basement	NS424
11.36	12.76	Core loss		Basement	NS425
12.76	12.91	Core loss		Basement	NS426
12.91	13.30	Anhydrite (HAN)	0	Basement	59814
13.54	14.18	Sulfate-Sulfide (HSS)	5	Basement	59815
14.64	14.79	Sulfate-Sulfide (HSS)	5	Basement	59816

Assay



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

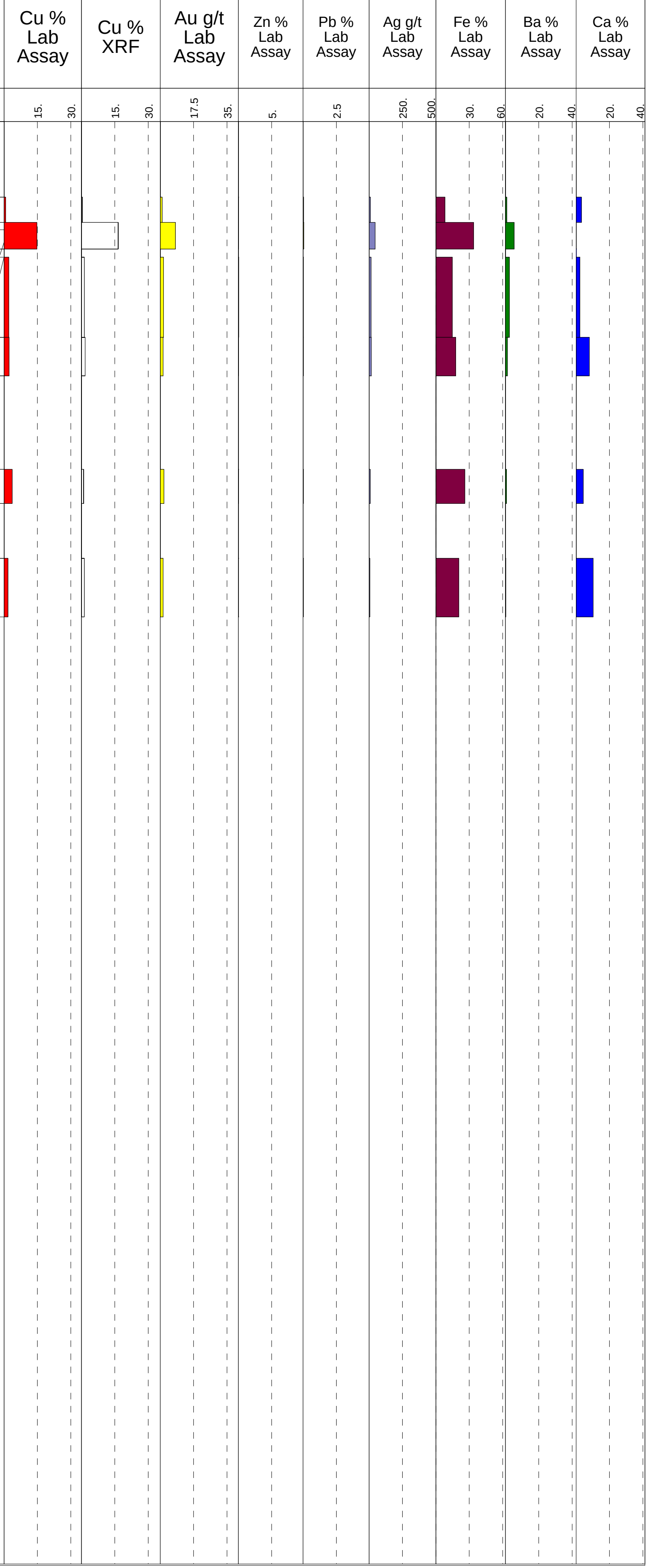
HoleID: SD141
ProjectCode: Manus
Date Drilled: 14/08/2007

East: 399010.29
North: 9580946.82
RL/Elevation: -1574.95
Depth: 6.68

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.02	Core loss		Uncon Sed	NS427
1.02	1.36	Sedimentary, other (S_Other)	0	Sulphide	59817
1.36	1.72	Massive sulfide (HMS)	2	Sulphide	59818
1.46	1.63	Massive sulfide (HMS)	4	Sulphide	62477
1.72	1.83	Core loss		Sulphide	NS428
1.83	2.91	Sedimentary, other (S_Other)	0	Sulphide	59819
2.91	3.43	Sedimentary, other (S_Other)	0	Sulphide	59820
3.43	4.69	Core loss		Sulphide	NS429
4.69	5.15	Hydrothermally altered clay-rich rock (HSI)	0	Sulphide	59821
5.15	5.89	Core loss		Sulphide	NS430
5.89	6.68	Hydrothermally altered clay-rich rock (HSI)	0	Sulphide	59822

Assay



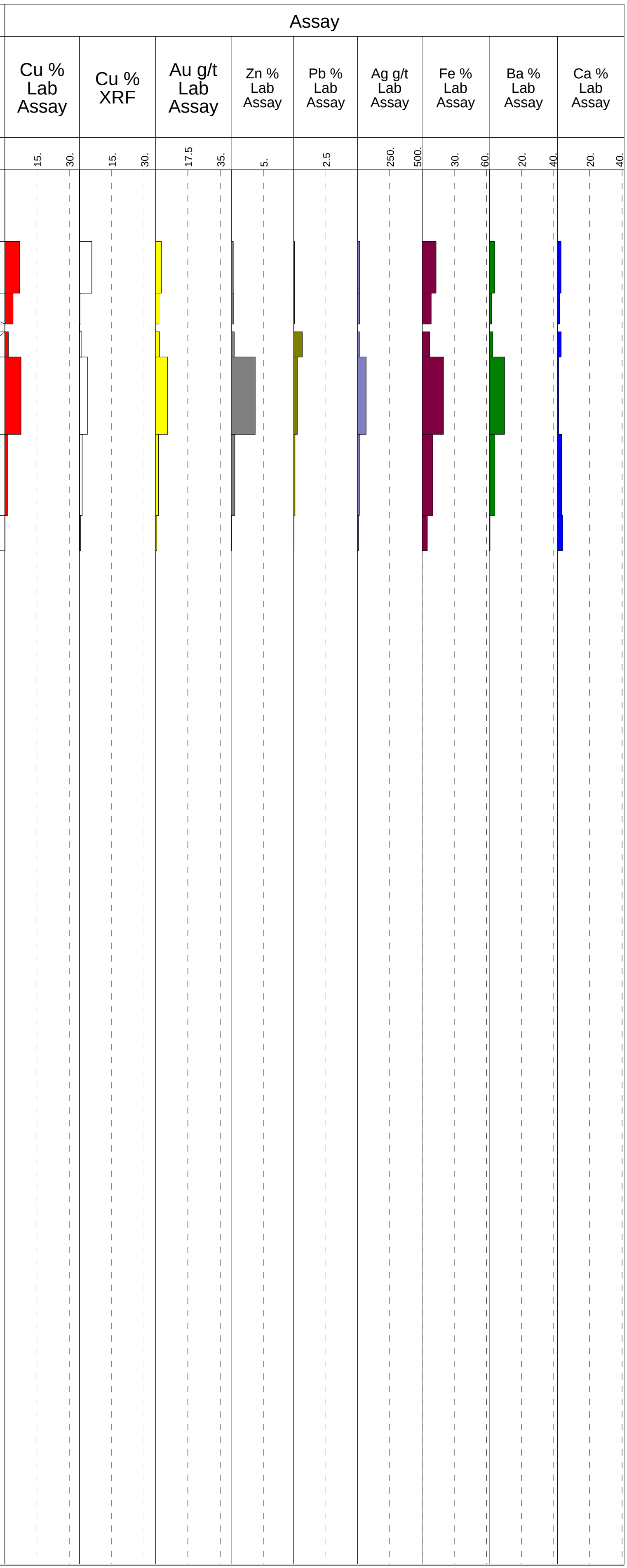
Nautilus Minerals

UTM 56S
WGS 84
Date Printed: 7/12/2007

HoleID: SD142
ProjectCode: Manus
Date Drilled: 16/08/2007

East: 399445.24
North: 9581259.77
RL/Elevation: -1519.51
Depth: 5.31

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.00	**Core loss**		Uncon Sed	NS431
1.00	1.72	**Sedimentary, other (S_Other)**	0	Sulphide	59824
1.72	2.15	**Sedimentary, other (S_Other)**	0	Sulphide	59825
2.15	2.26	**Core loss**		Sulphide	NS432
2.26	2.61	**Sedimentary, other (S_Other)**	0	Sulphide	59826
2.61	3.69	**Sedimentary, other (S_Other)**	0	Sulphide	59827
3.69	4.82	**Clay (SCY)**	0	Sulphide	59828
4.82	5.31	**Altered volcanic (VA)**	0	Sulphide	59829



Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed: 7/12/2007

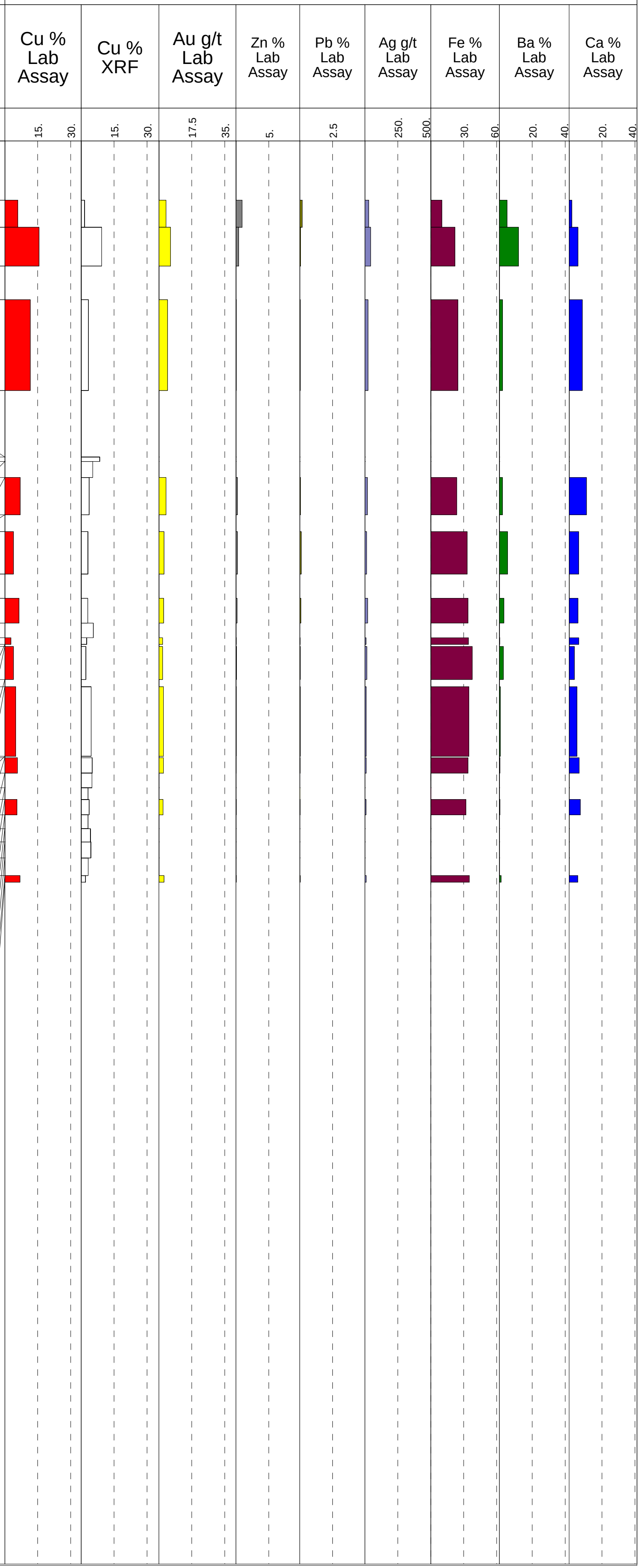
HoleID: SD143
ProjectCode: Manus
Date Drilled: 16/08/2007

East: 399648.7
North: 9581126.24
RL/Elevation: -1521.11
Depth: 10.13

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.81	**Core loss**		Uncon Sed	NS433
0.81	1.18	**Lithified clastic sediment (SLI)**	1	Uncon Sed	59830
1.18	1.71	**Massive sulfide (HMS)**	4	Uncon Sed	59831
1.71	2.17	**Core loss**		Sulphide	NS434
2.17	3.41	**Massive sulfide (HMS)**	4	Uncon Sed	59832
3.41	4.32	**Core loss**		Sulphide	NS435
4.32	4.38	**Massive sulfide (HMS)**	4	Uncon Sed	59833
4.38	4.60	**Massive sulfide (HMS)**	4	Sulphide	62478
4.60	5.11	**Massive sulfide (HMS)**	4	Sulphide	59834
5.11	5.34	**Core loss**		Sulphide	NS436
5.34	5.92	**Massive sulfide (HMS)**	4	Sulphide	59835
5.92	6.25	**Core loss**		Sulphide	NS437
6.25	6.59	**Massive sulfide (HMS)**	4	Sulphide	59836
6.59	6.79	**Massive sulfide (HMS)**	4	Sulphide	62479
6.79	6.88	**Massive sulfide (HMS)**	4	Sulphide	59837
6.88	6.91	**Core loss**		Sulphide	NS438
6.91	7.36	**Massive sulfide (HMS)**	4	Sulphide	59838
7.36	7.46	**Core loss**		Sulphide	NS439
7.46	8.41	**Massive sulfide (HMS)**	4	Sulphide	59839
8.41	8.43	**Core loss**		Sulphide	NS440
8.43	8.64	**Massive sulfide (HMS)**	4	Sulphide	59840
8.64	8.84	**Massive sulfide (HMS)**	4	Sulphide	62480
8.84	9.00	**Massive sulfide (HMS)**	4	Sulphide	62481
9.00	9.21	**Massive sulfide (HMS)**	4	Sulphide	59841
9.21	9.40	**Massive sulfide (HMS)**	4		62482
9.40	9.58	**Massive sulfide (HMS)**	4		62483
9.58	9.80	**Massive sulfide (HMS)**	4		62484
9.80	10.04	**Massive sulfide (HMS)**	4		62485
10.04	10.13	**Massive sulfide (HMS)**	4		59842

Assay



NAUTILUS
Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

Nautilus Minerals

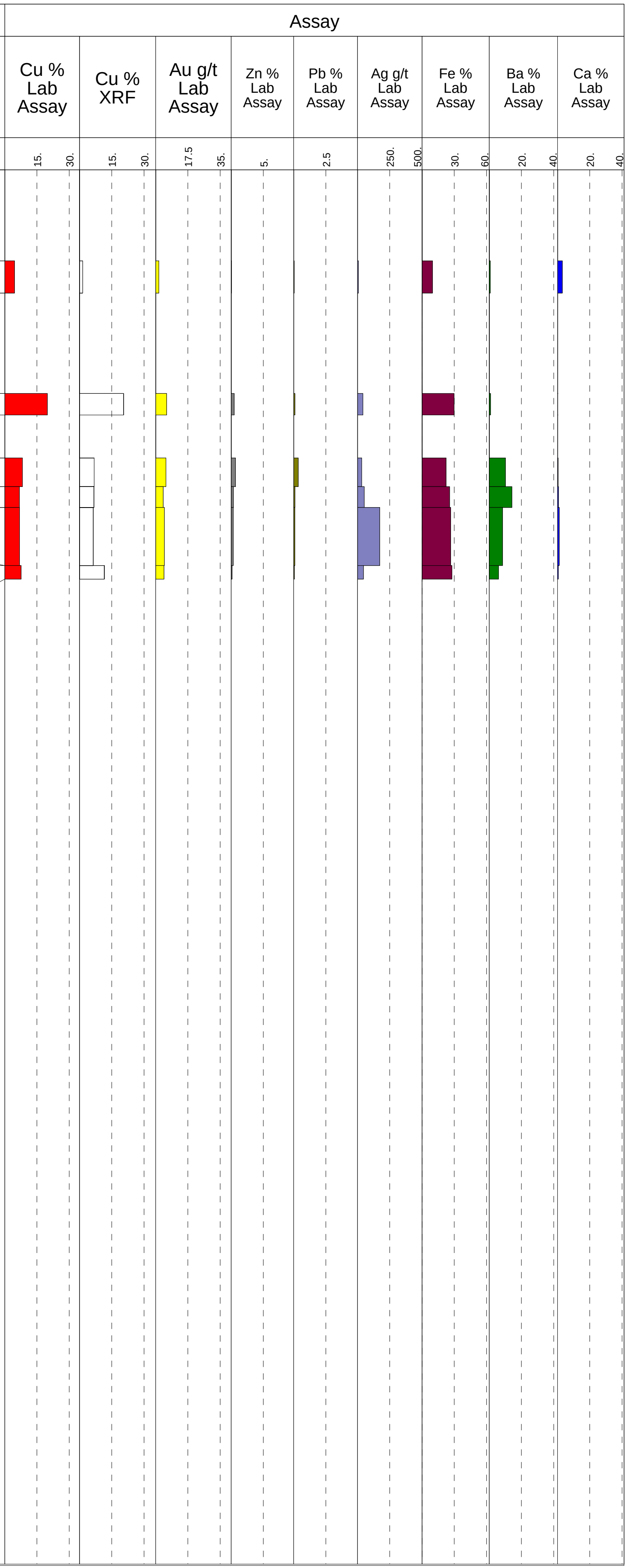
HoleID:	SD144	East:	399376.94
ProjectCode:	Manus	North:	9581126.22
Date Drilled:	18/08/2007	RL/Elevation:	-1519.52
		Depth:	5.71

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	1.27	**Core loss**		Uncon Sed	NS441
1.27	1.72	**Reworked Sand (SND)**	1	Uncon Sed	59843
1.72	3.12	**Core loss**		Basement	NS442
3.12	3.42	**Massive sulfide (HMS)**	1	Basement	59844
3.42	4.02	**Core loss**		Basement	NS443
4.02	4.42	**Semi-massive sulfide (HSM)**	1	Basement	59845
4.42	4.71	**Massive sulfide (HMS)**	1	Basement	59846
4.71	5.52	**Reworked Sand (SND)**	1	Basement	59847
5.52	5.71	**Reworked Sand (SND)**	1	Basement	59848

Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Assay



NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

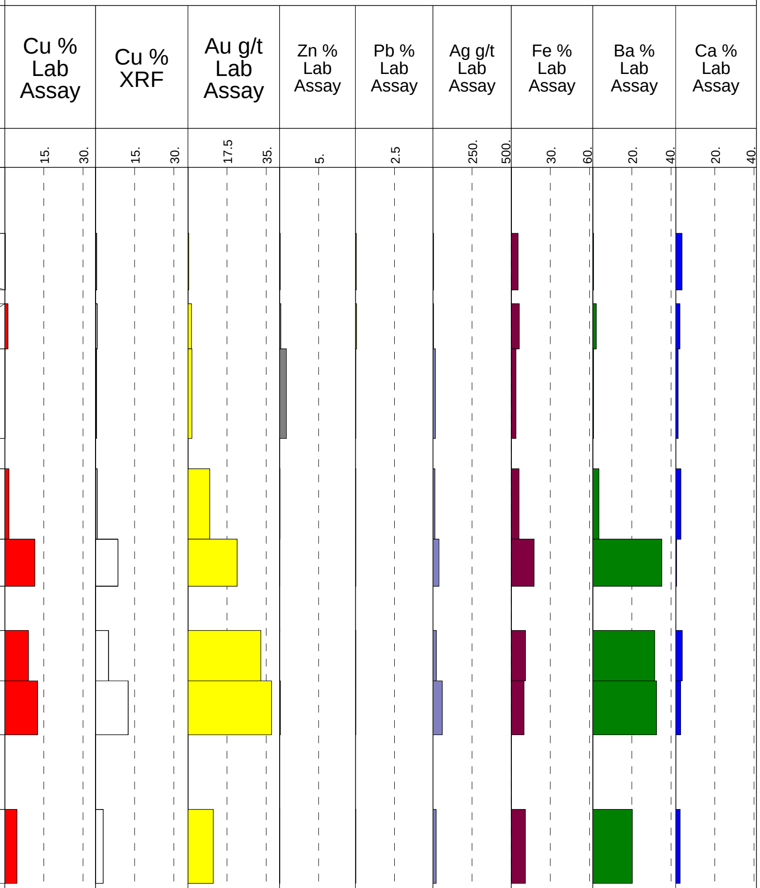
Nautilus Minerals

HoleID:	SD145	East:	399648.58
ProjectCode:	Manus	North:	9581126.85
Date Drilled:	19/08/2007	RL/Elevation:	-1521.1
		Depth:	8.24

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.76	**Core loss**		Uncon Sed	NS444
0.76	1.41	**Reworked Sand (SND)**	1	Uncon Sed	59849
1.41	1.57	**Core loss**		Sulphide	NS445
1.57	2.09	**Volcaniclastic Sand (SVC)**	0	Sulphide	59850
2.09	3.12	**Hydrothermally altered clay-rich rock (HSI)**	0	Sulphide	59851
3.12	3.47	**Core loss**		Sulphide	NS446
3.47	4.28	**Hydrothermally altered clay-rich rock (HSI)**	0	Sulphide	59852
4.28	4.82	**Semi-massive sulfide (HSM)**	1	Sulphide	59853
4.82	5.33	**Core loss**		Sulphide	NS447
5.33	5.91	**Semi-massive sulfide (HSM)**	1	Sulphide	59854
5.91	6.53	**Semi-massive sulfide (HSM)**	1	Sulphide	59855
6.53	7.39	**Core loss**		Sulphide	NS448
7.39	8.24	**Semi-massive sulfide (HSM)**	1	Sulphide	59856

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

Nautilus Minerals

NAUTILUS Minerals Inc.

UTM 56S
WGS 84
Date Printed:
7/12/2007

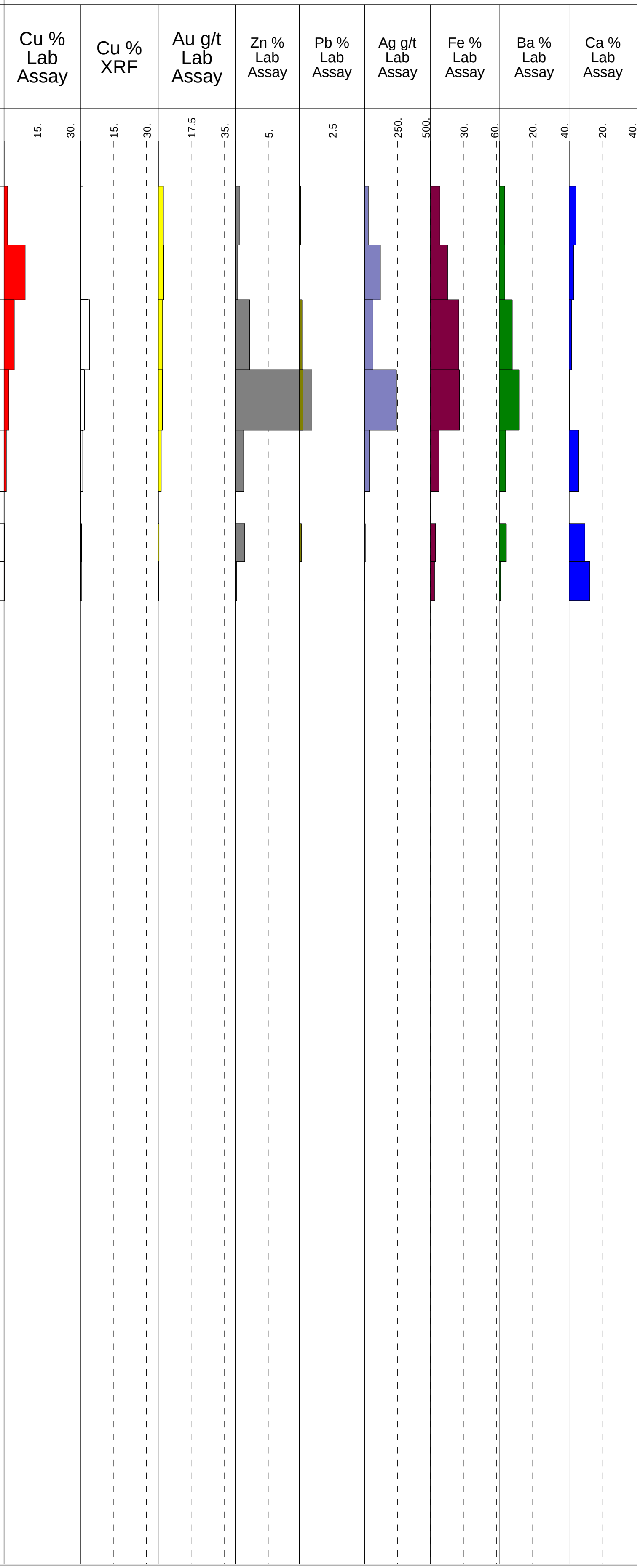
HoleID: SD146
ProjectCode: Manus
Date Drilled: 19/08/2007

East: 399676.04
North: 9581061.55
RL/Elevation: -1520.62
Depth: 6.28

Geology Items

From	To	Lithology	Ore Type	Domain	Sample ID
0.00	0.62	**Core loss**		Uncon Sed	NS449
0.62	1.42	**Reworked Sand (SND)**	1	Uncon Sed	59857
1.42	2.17	**Sulfate-Sulfide (HSS)**	1	Sulphide	59858
2.17	3.13	**Semi-massive sulfide (HSM)**	1	Sulphide	59859
3.13	3.95	**Massive sulfide (HMS)**	1	Sulphide	59860
3.95	4.79	**Altered volcanic (VA)**	5	Sulphide	59861
4.79	5.23	**Core loss**		Sulphide	NS450
5.23	5.75	**Altered volcanic (VA)**	5	Sulphide	59862
5.75	6.28	**Partly-altered volcanic (VPA)**	0	Sulphide	59863

Assay



Depth: 2, 4, 6, 8, 10, 12, 14, 16, 18

SAMPLEID	SiteNo	UTM_56S_ DGPS_X	UTM_56S_ DGPS_Y	Z	AG	AU	CU	ZN
PNGSW2011	SUZ_Surf_014	398830.0	9580973.0	-1623.0	382	5.80	0.84	11.70
59764	SOL1_07_CH_077	398842.5	9581099.0	-1657.9	14	3.29	0.66	0.21
PNGSW2056	SUZ_Surf_023	398851.0	9581005.0	-1613.0	264	3.70	0.20	26.70
58571	SOL1_07_CH_035	398859.3	9581020.3	-1610.6	320	29.90	18.35	11.40
58572	SOL1_07_CH_036	398947.7	9581003.6	-1593.4	145	0.24	0.73	12.75
PNGSW2009	SUZ_Surf_013	398987.0	9580975.0	-1581.0	216	15.75	7.58	3.14
59758	SOL1_07_CH_075	398993.4	9581013.4	-1600.0	179	27.70	19.55	1.00
58570	SOL1_07_CH_034	399000.9	9580959.0	-1577.4	327	1.79	0.30	16.65
59754	SOL1_07_CH_073	399004.2	9580964.6	-1596.7	250	56.30	16.75	2.50
59760	SOL1_07_CH_076a	399017.5	9581028.7	-1603.2	261	0.06	0.25	23.80
59762	SOL1_07_CH_076b	399017.5	9581028.7	-1603.2	173	8.69	0.28	32.40
59752	SOL1_07_CH_072	399017.7	9580977.2	-1597.5	671	1.21	1.22	22.80
59750	SOL1_07_CH_071	399026.0	9580942.7	-1595.5	331	50.70	12.75	1.53
59756	SOL1_07_CH_074	399028.8	9581012.2	-1577.0	71	16.55	0.04	5.49
59744	SOL1_07_CH_069	399049.5	9580999.0	-1582.0	34	3.13	1.48	0.15
PNGSW2065	SUZ_Surf_036	399050.0	9580968.0	-1561.0	140	0.14	0.11	15.00
59746	SOL1_07_CH_070a	399052.2	9580933.3	-1588.2	136	4.78	0.87	5.13
59748	SOL1_07_CH_070b	399052.6	9580946.7	-1586.9	142	19.25	1.77	0.11
PNGSW2006	SUZ_Surf_010	399054.0	9580979.0	-1500.0	221	20.90	0.23	4.44
58505	SSU_07_CH_006	399059.0	9580990.0	-1567.0	98	31.00	24.30	0.10
PNGSW2068	SUZ_Surf_037	399073.0	9580969.0	-1558.9	202	22.40	8.93	5.28
PNGSW2072	SUZ_Surf_039	399074.0	9580966.0	-1560.1	13	0.37	0.16	0.77
PNGSW2069	SUZ_Surf_038	399075.0	9580971.0	-1558.2	91	9.20	19.95	2.46
PNGSW2007	SUZ_Surf_011	399078.0	9580947.0	-1500.0	282	28.40	0.10	10.75
59742	SOL1_07_CH_068	399078.4	9580995.6	-1581.4	69	0.21	0.17	25.00
58508	SSU_07_CH_008	399083.0	9580966.0	-1548.0	191	23.30	21.10	3.76
58550	SOL1_07_CH_010	399092.0	9580981.0	-1500.0	187	20.10	19.55	4.74
58551	SOL1_07_CH_011	399092.0	9580981.5	-1500.0	260	22.40	16.50	6.44
58553	SOL1_07_CH_013	399092.5	9580981.0	-1500.0	60	8.81	15.25	1.83
58554	SOL1_07_CH_014	399092.5	9580981.5	-1500.0	279	24.60	12.30	7.38
PNGSW2008	SUZ_Surf_012	399099.0	9580964.0	-1562.0	66	7.20	26.50	0.87
58569	SOL1_07_CH_033	399106.1	9580935.0	-1553.1	134	9.92	1.24	3.75
59736	SOL1_07_CH_065	399138.6	9580946.9	-1563.5	116	29.60	25.00	0.27
59738	SOL1_07_CH_066	399164.4	9580947.9	-1578.3	651	1.58	3.37	22.10
58568	SOL1_07_CH_032	399203.2	9580947.2	-1533.5	721	0.01	0.37	33.50
59734	SOL1_07_CH_064	399203.8	9580954.2	-1557.1	234	0.07	0.10	35.30
59732	SOL1_07_CH_063	399222.8	9580966.3	-1550.9	117	36.70	21.30	0.16
58567	SOL1_07_CH_031	399258.0	9580979.5	-1515.1	203	20.00	17.85	3.04
59730	SOL1_07_CH_062	399261.7	9580984.4	-1546.3	147	17.25	22.70	1.96
58566	SOL1_07_CH_030	399295.8	9581027.5	-1509.1	194	34.40	15.80	2.62
59728	SOL1_07_CH_061	399313.4	9581033.4	-1527.8	129	22.70	17.25	3.43
59720	SOL1_07_CH_057	399330.6	9581150.8	-1528.6	251	29.00	9.01	5.05
59726	SOL1_07_CH_060	399337.3	9581040.8	-1506.5	132	24.40	23.20	1.73
PNGSW2014	SUZ_Surf_019	399349.0	9581178.0	-1504.0	39	4.46	27.50	0.34
58565	SOL1_07_CH_029	399350.7	9581062.9	-1506.3	150	15.30	22.10	2.57
59718	SOL1_07_CH_056	399359.4	9581158.9	-1532.8	714	7.56	0.59	33.80
PNGSW2081	SUZ_Surf_043	399364.0	9581072.0	-1511.0	102	23.40	20.80	0.48
PNGSW2004	SUZ_Surf_007	399366.0	9581169.0	-1512.5	317	11.25	15.20	0.75
59710	SOL1_07_CH_052	399370.9	9581199.2	-1523.6	179	22.40	13.25	4.21
58564	SOL1_07_CH_028	399371.8	9581085.6	-1499.6	188	34.80	8.42	2.68
58562	SOL1_07_CH_025	399374.9	9581195.4	-1503.9	136	33.50	27.70	0.32
59724	SOL1_07_CH_059	399374.9	9581037.3	-1535.2	103	7.48	2.68	2.41
PNGSW2005	SUZ_Surf_009	399377.0	9581082.0	-1503.0	46	0.58	0.15	27.70
PNGSW2079	SUZ_Surf_042	399380.0	9581071.0	-1513.0	33	4.64	18.80	0.39
59706	SOL1_07_CH_050	399382.3	9581235.5	-1510.6	230	19.65	14.55	6.36
PNGSW2003	SUZ_Surf_005	399386.0	9581181.0	-1511.0	92	32.70	23.90	0.20
59722	SOL1_07_CH_058	399399.6	9581095.5	-1446.4	136	27.40	20.60	1.17
59708	SOL1_07_CH_051	399402.6	9581199.1	-1519.0	163	26.50	20.10	3.28
59704	SOL1_07_CH_049	399408.8	9581240.9	-1514.3	154	15.90	14.50	2.53
59716	SOL1_07_CH_055	399411.3	9581161.8	-1539.0	30	5.41	21.00	0.19
58548	SOL1_07_CH_008	399412.0	9581288.0	-1500.0	109	15.95	13.90	1.74
PNGSW2051	SUZ_Surf_006	399414.2	9581201.0	-1505.7	209	21.40	16.35	4.51
PNGSW2061	SUZ_Surf_035	399424.0	9581204.0	-1500.0	184	13.00	3.71	5.40
PNGSW2059	SUZ_Surf_034	399429.0	9581193.0	-1502.0	206	19.40	10.90	9.89
PNGSW2074	SUZ_Surf_040	399430.0	9581253.0	-1522.6	10	3.23	7.26	0.09
58563	SOL1_07_CH_027	399435.0	9581143.4	-1509.7	128	24.10	30.40	0.05

58573	SOL1_07_CH_023	399439.4	9581216.5	-1512.5	177	27.80	19.10	1.68
59674	SOL1_07_CH_037	399443.8	9581305.5	-1593.5	128	22.90	24.00	1.22
59702	SOL1_07_CH_048	399443.9	9581281.2	-1539.0	128	35.90	18.00	1.81
59714	SOL1_07_CH_054	399445.3	9581177.9	-1520.1	1130	2.67	3.24	34.10
PNGSW2052	SUZ_Surf_015	399452.0	9581292.0	-1523.0	178	38.30	18.70	1.62
59712	SOL1_07_CH_053	399455.1	9581171.1	-1527.6	796	15.10	31.30	0.57
59684	SOL1_07_CH_040	399456.9	9581319.9	-1550.5	308	16.10	3.69	14.10
59682	SOL1_07_CH_039c	399458.9	9581338.6	-1553.3	108	9.69	8.89	1.93
59678	SOL1_07_CH_039a	399459.0	9581332.4	-1549.4	203	37.60	10.60	3.06
59680	SOL1_07_CH_039b	399459.0	9581332.4	-1549.4	372	44.60	8.82	5.96
59698	SOL1_07_CH_046	399463.5	9581262.6	-1542.3	989	12.80	8.76	14.95
59676	SOL1_07_CH_038	399466.6	9581304.4	-1548.2	475	18.95	1.73	5.34
58547	SOL1_07_CH_007	399468.0	9581283.0	-1500.0	238	15.95	12.20	6.62
58543	SOL1_07_CH_003	399470.0	9581284.0	-1500.0	186	12.10	18.05	8.68
58545	SOL1_07_CH_005	399470.0	9581290.0	-1500.0	98	22.40	0.51	0.58
58546	SOL1_07_CH_006	399474.0	9581289.0	-1500.0	198	19.70	15.85	4.75
59700	SOL1_07_CH_047	399474.8	9581239.2	-1542.9	884	1.88	6.93	19.35
59692	SOL1_07_CH_044a	399493.0	9581239.1	-1535.9	74	15.90	23.00	0.58
59686	SOL1_07_CH_041	399495.1	9581301.3	-1544.2	80	17.55	1.40	1.20
59688	SOL1_07_CH_042	399500.8	9581278.8	-1519.0	136	17.95	18.70	5.70
59694	SOL1_07_CH_044b	399502.6	9581247.0	-1529.3	219	24.50	14.25	8.67
59696	SOL1_07_CH_045	399522.7	9581248.2	-1528.0	223	39.90	11.15	0.56
59690	SOL1_07_CH_043	399523.6	9581264.1	-1526.8	99	15.80	14.05	2.37
PNGSW2077	SUZ_Surf_041	399531.0	9581238.0	-1524.8	172	24.70	18.60	0.47
58561	SOL1_07_CH_022	399546.6	9581260.4	-1512.1	156	15.85	15.65	1.14
59794	SOL1_07_CH_090	399597.3	9581053.3	-1530.9	106	10.20	0.24	0.59
PNGSW2016	SUZ_Surf_018	399605.0	9581054.0	-1500.0	137	22.60	12.40	3.17
59768	SOL1_07_CH_079	399605.8	9581111.1	-1529.5	97	13.40	10.35	0.75
58506	SOL1_07_CH_001	399607.0	9581033.0	-1503.0	261	28.60	1.64	8.23
58560	SOL1_07_CH_021	399622.0	9581157.7	-1510.8	144	21.80	6.68	1.53
59766	SOL1_07_CH_078	399624.7	9581125.0	-1533.7	148	33.20	21.50	1.44
PNGSW2022	SUZ_Surf_027	399629.0	9581140.0	-1516.0	16	17.05	2.49	0.28
59774	SOL1_07_CH_081	399630.9	9581074.5	-1532.7	149	35.20	10.75	2.02
PNGSW2027	SUZ_Surf_030	399632.0	9581141.0	-1521.0	67	16.15	12.75	1.60
PNGSW2019	SUZ_Surf_025	399633.0	9581142.0	-1521.0	116	19.15	21.50	0.79
PNGSW2057	SUZ_Surf_024	399633.0	9581146.0	-1520.0	38	8.10	0.04	4.76
58559	SOL1_07_CH_020	399638.2	9581114.9	-1517.4	176	51.80	7.55	0.87
59792	SOL1_07_CH_089	399639.6	9581014.9	-1527.2	691	16.15	0.24	15.95
59788	SOL1_07_CH_087	399649.1	9581027.8	-1535.0	87	16.45	22.50	0.98
59776	SOL1_07_CH_082a	399650.1	9581066.4	-1533.7	68	8.10	15.35	0.31
PNGSW2021	SUZ_Surf_028	399660.0	9581085.0	-1520.0	114	20.50	8.25	0.18
PNGSW2058	SUZ_Surf_029	399660.0	9581085.0	-1520.0	94	21.50	19.65	0.55
PNGSW2028	SUZ_Surf_031	399662.0	9581040.0	-1501.0	151	40.80	9.12	0.69
59770	SOL1_07_CH_080a	399662.6	9581115.9	-1540.7	605	15.90	3.21	5.31
PNGSW2029	SUZ_Surf_032	399664.0	9581040.0	-1505.0	226	3.01	0.57	35.00
59790	SOL1_07_CH_088	399669.8	9581014.8	-1545.9	1230	0.06	0.18	24.70
PNGSW2031	SUZ_Surf_033	399670.0	9581043.0	-1508.0	235	14.05	3.82	5.61
59778	SOL1_07_CH_082b	399670.7	9581072.4	-1538.3	625	10.90	0.54	29.20
58558	SOL1_07_CH_019	399678.6	9581048.5	-1519.4	69	0.02	0.18	27.10
59772	SOL1_07_CH_080b	399681.8	9581124.5	-1547.4	188	19.10	14.85	7.11
58556	SOL1_07_CH_017	399696.0	9580978.4	-1533.3	225	26.20	16.70	1.86
58549	SOL1_07_CH_009	399700.0	9581086.0	-1500.0	250	27.60	11.50	10.50
58544	SOL1_07_CH_004	399700.5	9581086.0	-1500.0	198	23.10	15.10	8.47
59786	SOL1_07_CH_086	399701.6	9581037.8	-1547.2	70	12.00	15.80	3.14
58557	SOL1_07_CH_018	399706.0	9581009.7	-1529.9	301	35.80	9.39	10.05
58542	SOL1_07_CH_002	399706.0	9581088.0	-1500.0	74	9.96	17.10	1.38
PNGSW2025	SUZ_Surf_020	399707.0	9581090.0	-1526.0	120	15.65	17.80	4.48
PNGSW2054	SUZ_Surf_020	399707.0	9581090.0	-1526.0	142	18.40	15.55	5.45
PNGSW2053	SUZ_Surf_017	399719.0	9581089.0	-1533.0	172	36.10	18.20	6.30
59780	SOL1_07_CH_083	399723.5	9581087.4	-1544.4	105	13.70	17.95	3.59
PNGSW2001	SUZ_Surf_002	399725.4	9580906.0	-1522.8	146	7.08	0.18	5.36
PNGSW2002	SUZ_Surf_003	399726.8	9580909.0	-1519.7	190	17.60	12.50	6.31
59784	SOL1_07_CH_085	399730.9	9581044.5	-1544.7	146	19.25	13.45	6.79
PNGSW2018	SUZ_Surf_026	399735.0	9580920.0	-1516.0	105	6.65	1.35	3.31
59782	SOL1_07_CH_084	399735.3	9581070.9	-1550.1	159	21.70	13.90	5.91
PNGSW2017	SUZ_Surf_021	399769.0	9580824.0	-1535.0	87	27.00	6.83	1.38
PNGSW2023	SUZ_Surf_022	399802.0	9580855.0	-1550.0	15	3.33	3.82	0.08