March 17 2014

HIGHLAND COPPER COMPANY INC.

NI 43-101 Technical Report on the Copperwood Project, Michigan, USA

Technical Report prepared in accordance with NI 43-101 and Form 43-101F1

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Effective Date of Technical Report: March 17, 2014

Submitted: June 12, 2014

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Report Number: 1401359

REPORT

Golder Associates

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TABLES

FIGURES

GLOSSARY

Abbreviation	Description
%	Percent
°	Degrees (Azimuth or Dip)
°C	Degrees Celsius
3D	Three Dimensional
Ag	Silver
amsl	Above Mean Sea Level
AX	AX Size Core; Core Diameter 3.01 cm
APEGA	Association of Professional Engineers and Geoscientists of Alberta
APEGBC	Association of Professional Engineers and Geoscientists of British Columbia
APGO	Association of Professional Geoscientists of Ontario
BCM	Bear Creek Mining
BX	BX Size Core; Core Diameter 4.20 cm
CBS	Copper Bearing Sequence
cm	Centimetre
CIM	Canadian Institute of Mining Metallurgy and Petroleum
CPG	Certified Professional Geologist
CRM	Control Reference Material
Cu	Copper
E	East
EIA	Environmental Impact Assessment
Fe-O	Iron Oxide
g/t	Grams per Tonne
GEOID03	National Geodetic Survey Geoid 03
ha	Hectares
HQ	HQ Size Core; Core Diameter 6.35 cm
ICP OES	Inductively Coupled Plasma Optical Emission Spectrometry
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
KLA	Keweenaw Land Association, Ltd.
km	kilometre
km^2	Square Kilometre
LiDAR	Light Detection and Ranging
LCBS	Lower Copper Bearing Sequence
LLC	Limited Liability Company
MDEQ	Michigan Department of Environmental Quality
m	Metre
mm	Millimetre
Mt	Million Tonnes
N	North
NAD83	North American Datum 1983
NAVD88	North American Vertical Datum 1988

NI 43-101	National Instrument 43-101
NI 43-101CP	National Instrument 43-101 Companion Policy
NI 43-101F1	National Instrument 43-101 Form 1 - Technical Report
NQ	NQ Size Core; Core Diameter 4.80 cm
NREPA	Natural Resources and Environment Protection Act
P. Geo.	Professional Geologist
QA/QC	Quality Assurance/Quality Control
QP	Qualified Person
S	South
Sage	Sage Minerals, Inc.
t	Tonnes
TSX	Toronto Stock Exchange
US$	United States Dollars
USA	United States of America
USMR	United States Metals Refining Company
UTM	Universal Transverse Mercator
W	West
wt.%	Weight Percent

ITEM 1 SUMMARY

1.1 Introduction

Golder Associates Ltd. (Golder) was commissioned by Highland Copper Company Inc. (Highland) to provide an independent Qualified Person's (QP) review and technical report for the Orvana Minerals Corp. (Orvana) Copperwood Project located in the Upper Peninsula, Michigan, United States of America (USA). Highland and Orvana have entered into a definitive agreement whereby Highland will acquire all rights, title and interest in the Copperwood Project from Orvana through the acquisition of all of the outstanding shares of Orvana Resources US Corp.

Highland's acquisition of the Copperwood Project is subject to the review and approval of the TSX Venture Exchange. The filing of a technical report disclosing historical resources for the Copperwood Project, prepared by an independent QP and in accordance with the guidelines and standards presented in National Instrument (NI) 43-101 and supporting documentation, is in partial fulfilment of the requirements set forth by the TSX Venture Exchange for the acquisition by Highland of the Copperwood Project.

The Golder QP has not completed the work necessary to classify the historical estimate for the Copperwood Project as current Mineral Resources. Golder and Highland are not treating the historical estimate as current NI 43-101 compliant Mineral Resources, therefore the historical resources should not be relied upon.

1.2 Project Description and Location

The Copperwood Project is situated in northwest Michigan, USA, in Ironwood and Wakefield townships, Gogebic County. A general property location map is shown in Figure 1.1, Location Map. The project layout is shown in Figure 1.2, Project Location with Lease Information. The coordinate central to the project area is approximately 270,000 meters (m) East, 5,173,500 m North (UTM Zone 16, NAD83 datum).

The Copperwood Main and Section 6 properties consist of three metallic mineral leases totaling 941 hectares (ha). The Copperwood Main lease property is approximately 712 ha, whereas the Section 6 property consists of 229 ha.

The Golder QP is not aware of any known legal, political or environmental liabilities that exist on the property.

1.3 Ownership History

On February 11, 2014, Highland and Orvana announced they had entered into a definitive agreement whereby Highland will acquire all rights, title and interest in the Copperwood project from Orvana through the acquisition of all of the outstanding shares of Orvana Resources US Corp., a wholly owned subsidiary of Orvana. Closing of the Copperwood acquisition is conditional upon the completion of financing to fund the acquisition and receipt of all required regulatory approvals including the approval of the TSX Venture Exchange by May 31, 2014.

Orvana has been conducting exploration activities on the Copperwood Project property since 2008. Orvana currently holds two individual 20 year lease agreements for combined mineral rights on approximately 712 ha for the Copperwood Main area and a 30 year lease for mineral rights over a 229 ha area known as Section 6. Annual rent payments are due over the term of the leases. These lease payments may be applied as a credit against royalty payments. In addition, Orvana has options to convert an additional 1,559 ha into mineral leases on three mineralized zones adjacent to the Copperwood Project mineral leases (the "Satellite Deposits"). Orvana has acquired approximately 700 ha of land that provides full access rights to the Copperwood property and provide space for surface infrastructure for the potential future mine site.

Prior to Orvana involvement the Copperwood Project was held by AMAX from 1956 to 1983, when the lease was discontinued. From 1956 to 1959, the lease was held by United States Metals Refining Company (USMR), under control of AMAX. USMR was integrated into AMAX in 1959.

1.4 Geological Setting

The Copperwood Project is situated on the flank of the 2,200 kilometre (km) long Mesoproterozoic midcontinent rift system of North America and is hosted in the Nonesuch Formation, a package of lacustrine and fluvial sediments, which forms part of the Oronto Group post-rifting basin fill. Mineralisation is hosted within three conformable units collectively termed the Copper Bearing Sequence (CBS), within the Parting Shale at the base of the Nonesuch Formation. The CBS is composed of the Domino, Red Massive and the Gray Laminated siltstone units. The Domino sub-unit is the principal copper host at Copperwood and is characterised by black shale with a mean thickness of 1.6 meters (m). The Red Massive sub-unit comprises siltstone to sandstone and has a mean thickness of 0.3 m. The Gray Laminated sub-unit is a gray laminated siltstone and has a mean thickness of 1.0 m. The CBS at Copperwood has been delineated by drilling over an area of approximately 3,049 m east-west and 1,130 m north-south. The Regional Geology of the Western Upper Peninsula and Local Geology Maps and Generalised Stratigraphic Column are shown on Figures 7.1, Figure 7.2 and Figure 7.3, respectively.

The Copperwood deposit is hosted within the western limb of the broad, gently north-plunging Western Syncline. The CBS dips gently to the north and subcrops beneath 20 to 35 m of unconsolidated glacial sediments along the southern edge of the Project area.

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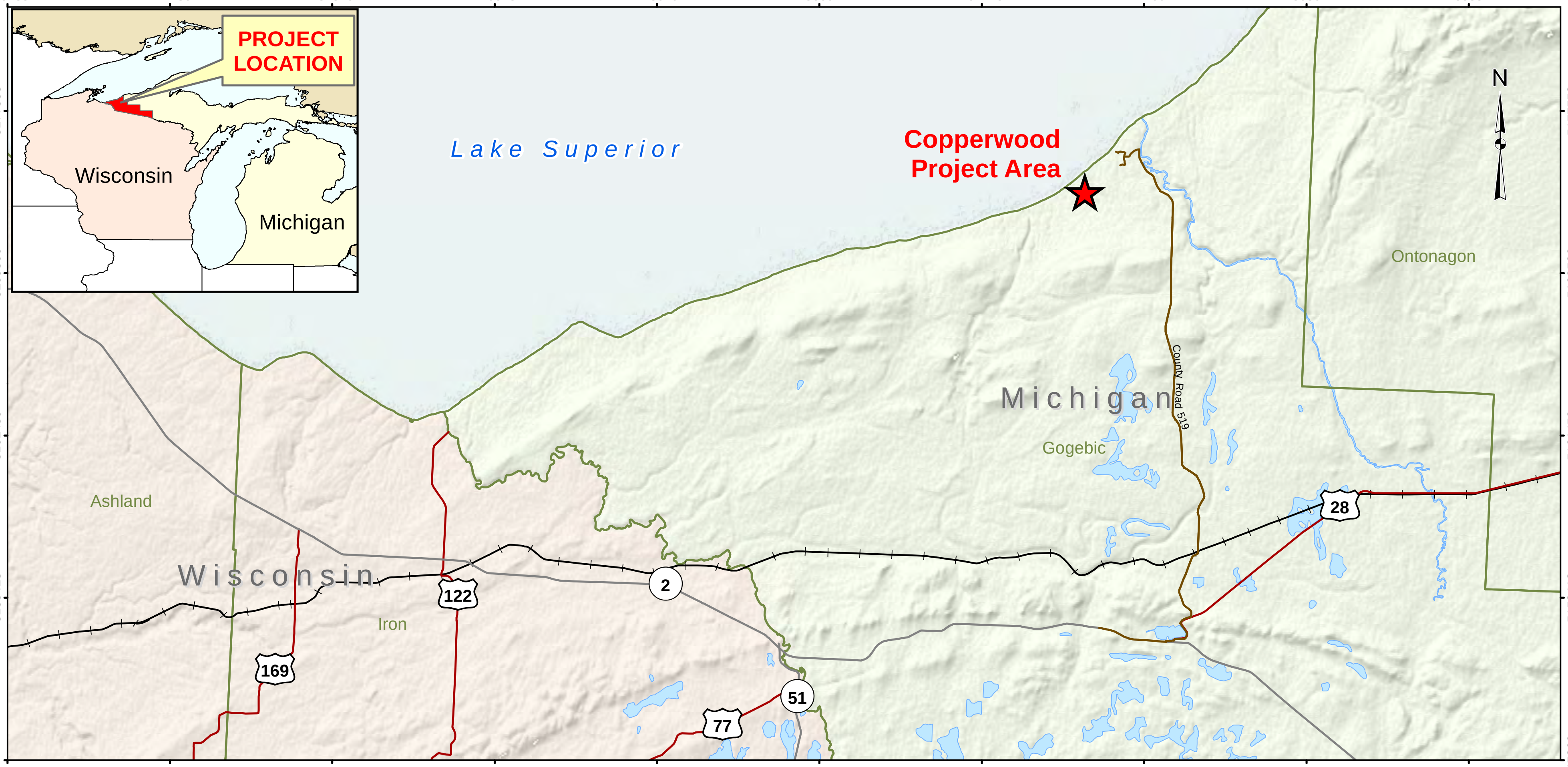


LEGEND

Copperwood Project	Michigan	Town
	Wisconsin	County Road
	US County	US Hwy
		US State Hwy
		US Rail
		Lake
		River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

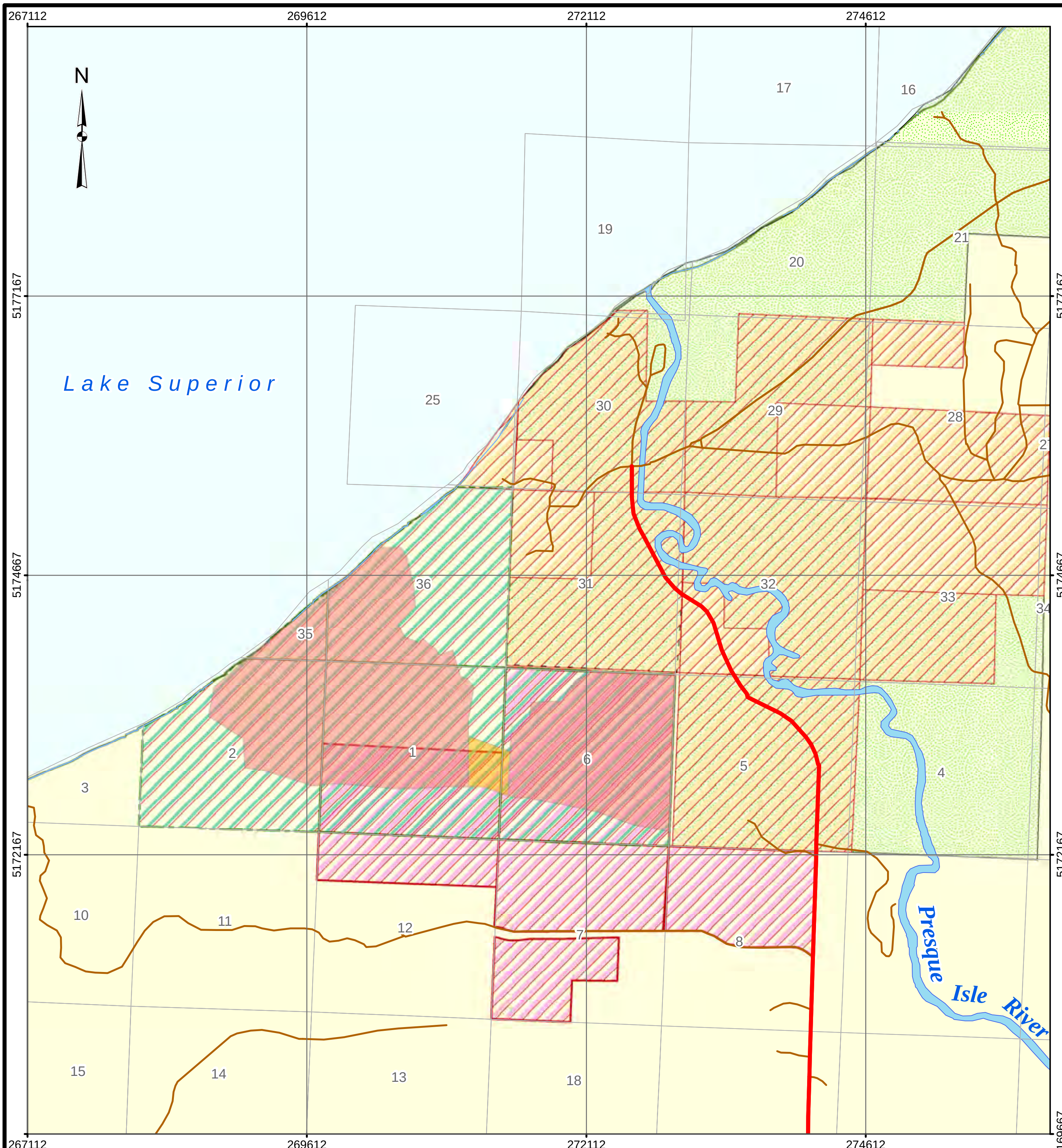
PROJECT
COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE
LOCATION MAP

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

FIGURE: 1.1



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LEGEND

- Orvana Mineral Lease
- Orvana Surface Rights
- Orvana Mineral Rights "Option to Lease"
- Resource Boundary
- Bridge
- *Porcupine Mountains Wilderness State Park*
- County Road 519
- Road
- Michigan Sections
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units. All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

PROJECT LOCATION
WITH LEASE INFORMATION

Golder Associates

PROJECT		1401359	FILE No.
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN REV. 0
GIS	JNS	14 Mar. 2014	
CHECK	JdW	01 Apr. 2014	**FIGURE: 1.2**
REVIEW	JdW	01 Apr. 2014	

1.5 Mineralization

The mineralization at Copperwood has been interpreted as a sediment-hosted stratiform copper deposit of the reduced facies class. Well known reduced-facies sediment-hosted stratiform copper deposits include most of the deposits within the Central African Copperbelt and the Kupferschiefer (Poland), Redstone (Canada) and nearby White Pine (USA).

Sediment-hosted stratiform copper deposits consist of copper and copper-iron sulphide minerals hosted by siliciclastic or dolomitic rocks in which a relatively thin copper-bearing zone is mostly conformable with stratification of the host sedimentary rocks. Copper in chalcocite occurs as disseminations and seams along bedding planes. Chalcocite is the only observed copper-sulphide bearing mineral present at Copperwood.

1.6 Historical Exploration Work

Historical exploration at Copperwood has been completed through surface drilling programs conducted in 1956, 1957, 1959, 2008, 2009, 2010 and 2011. In 1958 AMAX sunk an exploration shaft and collected underground channel samples from a 620 metre (m) exploration drift.

To date there have been no surface geochemical exploration programs nor have there been any surface or airborne geophysical exploration programs conducted on the Copperwood Project.

A summary of the historic exploration activity on the Copperwood project is presented in Table 1.1, Summary of Copperwood Exploration and Reporting Activity.

1.7 Historical Drilling

Historical exploration drilling on the Copperwood Project property and surrounding leases was completed during two separate phases of activity; the first phase by USMR and Bear Creek Mining (BCM) was performed from 1956 to 1959 while the second phase was performed by Orvana starting in 2008 and continuing to the present day.

Between 1956 and 1959 USMR and BCM drilled 184 core holes in the Western Syncline area. Forty-two of these drill holes were drilled in the Copperwood Main area, 23 in Section 6 by USMR in 1956 and 1958. BCM drilling 119 drill holes in the Satellite properties in 1959. The core diameter for these holes was between 3.01 cm (AX size core) and 4.20 cm (BX size core).

The second phase of drilling at Copperwood commenced in 2008, with Orvana drilling 5 core holes for environmental purposes. These drill holes intersected significant copper mineralisation. Orvana subsequently completed 82 drill holes in 2009. Orvana drilled 24 additional core holes during 2010 to firm up the resource, to collect metallurgical and geotechnical data and to investigate a suspected fault. Another 15 core holes were drilled during 2010 to verify copper mineralisation in the Section 6 area. In 2013 Orvana drilled 21 core holes to collect additional metallurgical and geotechnical data. The core diameter for the Orvana drill holes was 4.80 cm (NQ size core) for the 2008 to 2010 drilling and 6.35 cm (HQ size core) for the 2013 drilling program.

Table 1.2, Drilling Statistics by Company and Exploration Campaign, summarises the historic drilling activity completed on the Copperwood Project.

Table 1.1: Summary of Copperwood Exploration and Reporting Activity

Company	Activity	Year
U.S. Geological Survey	Economic geology publication demonstrates potential of Western Syncline.	1954
USMR	Leased 1,552 ha in Western Syncline area (Cox, 2003).	1956
USMR	Drilled 26 holes focused on margin of Western Syncline and discovered Copperwood.	1956
USMR	Drilled 135 holes throughout the Western Syncline.	1958
AMAX	Sank 71 m vertical exploration shaft and advanced 635 m of exploration drifts, including three small stopes.	1957-1958
BCR	Drilled 23 holes in the Satellite properties. BCR terminated leases in the early 1960's.	1959
AMAX	Internal engineering and economic study that ended activities by USMR.	1959
AMAX	Engineering and economic review concluded deposit was mineable.	1974
AMAX	Terminated Western Syncline leases.	1983
Orvana	Leased 712 ha at Copperwood and options 1,559 ha in Western Syncline.	2008
Orvana	Began environmental studies with 5 drill holes intersecting copper mineralization.	2008
Orvana	Drilled 82 holes.	2009
Orvana	Leased 229 ha covering Section 6	2010
Orvana	Drilled 38 holes. Completed NI 43-101 compliant Mineral Resource estimate.	2010
Orvana	NI 43-101 compliant Mineral Resource estimate completed.	2011
Orvana	Completed NI 43-101 compliant Prefeasibility Study.	2011
Orvana	Completed NI 43-101 compliant Feasibility Study.	2012
Orvana	Mining Permit Approved by Michigan Department of Environmental Quality.	2012
Orvana	Drilled 21 holes for metallurgical and geotechnical studies.	2013

Table 1.2: Drilling Statistics by Company and Exploration Campaign

Operator	Period	Core Size	Drill Hole Count	Length (m)	% of Total Drilling
USMR	1956 to 1958	BX & AX	161	20,875	46%
BMC	1959	BX & AX	23	3,998	9%
Orvana	2008	NQ	6	744	2%
Orvana	2009	NQ	82	12,685	28%
Orvana	2010	NQ	23	2,801	6%
Orvana[I]	2010	NQ	15	1,250	3%
Orvana[II]	2013	HQ	21	2,781	6%
All Programs	1956 to 2013	BX, AX,NQ & HQ	331	45,134	100%

[I] Section 6 only.

[II] Metallurgical and geotechnical drilling only; not currently included in model or estimates.

1.8 Historical Sampling and Analysis

Sampling at Copperwood comprised half and quarter split core samples collected from surface diamond-drill programs and channel samples collected from an underground exploration drift. Sample intervals were variable and honoured logged lithologic intervals. Extensive specific gravity measurements and core recovery observations and measurements were collected.

Activation Laboratories Ltd, (Actlab) in Ancaster, Ontario, Canada was used as the primary laboratory for the final preparation of samples and assays for the Orvana re-assay program. Actlab is accredited by the Standards Council of Canada and conforms to requirements of CAN- P-1579 (ISO/IEC 17025:2005). Accreditation includes the analytical procedures used for the Copperwood Main, Section 6 and Satellite samples.

Legacy data were verified by Orvana either though resampling and/or through comparison with twin holes completed in 2008, 2009 and 2010. Legacy drilling data were the subject of a major study by Orvana in 2010 through re-sampling existing core and sample pulps and rejects from the 1950s drilling. The samples were resubmitted with standards and blanks and other appropriate Quality Assurance/Quality Control (QA/QC) measures. An NI 43-101 technical report completed by AMEC in January 2011 concluded that the information was appropriate for resource estimation. This technical report covered surrounding lands for which Orvana controlled the mineral rights through lease options. These properties are referred to as the Satellite properties. Section 6, which was under mineral lease, was within the Satellite properties for the AMEC report but later became part of the adjacent Copperwood main area.

1.9 Historical Security of Samples

Drill core from the 1950s drilling campaigns has been stored in cardboard boxes in archives at the White Pine Mine and in a state core storage facility. Details of core and sample security measures implemented during the 1950s drilling campaigns were not available for review by the Golder QP; however, the careful archiving of core from the 1950s allowed the resampling and evaluation process that was completed by Orvana.

Core from the 2008 through 2013 Orvana drilling programs has been stored inside a locked facility in Ironwood, Michigan.

Based on Golder's review of the previous technical reports it is Golder's opinion that sample preparation, security and analytical procedures undertaken during the 2008, 2009, 2010 and 2011 drill programs were completed following industry best practices.

1.10 Historical Resource Estimates

Based on a review of the previous technical reports Golder considers the 2011 NI 43-101 technical report, prepared by Marston and Marston (Marston) on behalf of Orvana, to be the most relevant and up to date (effective date of January 25, 2011) source for the purpose of stating an historical Mineral Resource estimate for the Copperwood Project.

The 2011 Marston technical report and historical Mineral Resource estimate are discussed in detail in Item 6 of this technical report. Summaries of the other historical Mineral Resource estimates are also presented in Item 6 of this technical report.

The 2011 Marston technical report was prepared on behalf of Orvana, before Highland and Orvana entered into any agreements concerning the Copperwood Project. There are no more recent estimates or data available for the Copperwood Project.

It is the opinion of the Golder QP that the 2011 Marston technical report is relevant and reliable for disclosure as historical Mineral Resources for the Copperwood Project. The 2011 Marston technical report was prepared in accordance with NI 43-101, NI 43-101CP and NI-43-101F1 documents using all material data available at the time of preparation. The technical report was prepared by a Marston geologist that met the NI 43-101 QP requirements as outlined in the instrument. The categories and definitions for Mineral Resources used in the 2011 Marston technical report were those identified in the NI 43-101 document at the time of preparation and are consistent with the categories and definitions identified in Section 1.2 and Section 1.3 of the current NI 43-101 document.

It must be noted that the Golder QP has not completed the work necessary to classify the historical estimate for the Copperwood Project as current Mineral Resources. Golder and Highland are not treating the historical estimate as current NI 43-101 compliant Mineral Resources, therefore the historical resources should not be relied upon.

A detailed review of the base data, geological model and resource estimates is required before a QP would be in a position to consider classification of the historical resource estimate as current Mineral Resources for the Copperwood Project. Additional work, including the completion of a preliminary feasibility study, is required before a QP would be in a position to evaluate the potential for estimation of ore reserves for the Copperwood Project.

The 2011 Marston estimate involved base data evaluation and 3D geological modelling conducted under the supervision of the Marston QP. Drill sample information was available from 149 drill holes for the Copperwood Main area and 156 drill holes (142 legacy plus 14 in 2010) for the Section 6 area and nearby satellites. Drill holes from sections adjacent to Section 6 were used to enhance the model on boundary areas. A total of 2,411 samples from 197 drill holes were used in 2011 Marston model and resource estimation.

Marston modelled and estimated copper (wt. %) and silver (g/t). The historical Mineral Resource estimate used a minimum combined thickness of the Domino and the Upper Layer of 1.5 m and a minimum copper grade cut-off of 0.8 wt.%.

The Marston 2011 classification of the historical Mineral Resource was based on the following drill hole spacing parameters:

- Measured Mineral Resources - drill hole spacing of 185 m.
- Indicated Mineral Resources - drill hole spacing of 365 m.
- Inferred Mineral Resources - drill hole spacing of 914 m.

The 2011 Marston technical report cautioned that the Copperwood Project has only been assessed for reasonable prospects for economic extraction using assumptions based on analogous deposits.

Historical resources for the Copperwood Project, as presented in the 2011 Marston technical report, are summarised in Table 1.3,February 2011 Marston Copperwood Historical Resource Estimate.

Table 1.3: February 2011 Marston Copperwood Historical Resource Estimate

Copperwood Main			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt. %)**	**Silver Grade (g/t)**
Measured	17.0	1.84	5.75
Indicated	3.6	1.62	4.57
Measured and Indicated	20.7	1.80	5.54
Inferred	2.6	1.06	2.02

Bridge			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt. %)**	**Silver Grade (g/t)**
Measured	0.6	1.10	1.63
Indicated	0.2	1.10	1.84
Measured and Indicated	0.8	1.10	1.67
Inferred	0.0	-	-

Section 6			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt. %)**	**Silver Grade (g/t)**
Measured	5.6	1.38	1.96
Indicated	3.0	1.24	1.17
Measured and Indicated	8.6	1.34	1.69
Inferred	0.1	1.35	1.53

Total (Copperwood Main, Bridge and Section 6 Combined)			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt. %)**	**Silver Grade (g/t)**
Measured and Indicated	30.1	1.65	4.34
Inferred	2.7	1.07	2.01

1.11 Historical Environmental Work

Orvana commenced with collecting base line data for an Environmental Impact Assessment (EIA) in 2008. Collection of environmental data has continued throughout the subsequent years. Data collected to date includes surface and ground water monitoring sites and wells, stream and wetland mapping, terrestrial and aquatic flora and fauna identification studies and acid rock drainage and metals leaching analysis on samples of various mineralized and waste rock types present at Copperwood.

In addition to field and analytical studies, Orvana has established an air quality and meteorological station on the site that has been collecting data since December 2008.

All work undertaken on the Copperwood Project to date has been performed in compliance with Michigan State Department of Environmental Quality (MDEQ) regulations. To date Orvana has obtained the following permits from the MDEQ:

- April 30, 2012 - Part 632 Mining Permit for Copperwood Project, Upper Peninsula, Michigan, USA.
- November 13, 2012 - National Pollutant Discharge Elimination System permits for treated sanitary and process wastewaters related to the proposed Copperwood copper mine, Upper Peninsula, Michigan, USA.
- July 17, 2012 – Air Quality Division Permit to Install 180-11
- February 22, 2013 - Wetlands Part 303 and the Inlands Lakes and Streams Part 301 permits for the proposed Copperwood copper mine.
- June 24, 2013 – Part 315 Dam Safety Permit.

Depending on the results of studies to be conducted by Highland, these permits may have to be amended.

1.12 Historical Metallurgical Work

Historical independent metallurgical test work was completed in 2011 by METCON Research, located in Tucson, Arizona; in 2010 by Mountain States Research and Development Inc., located in Vail, Arizona; in 2009 by Kappes, Cassiday & Associates, located in Reno, Nevada;, and in the 1950s by AMAX. Core samples from the CBS, tested through single-stage and locked-cycle flotation tests, show the overall copper recovery from material of this type is expected to be greater than 86% with a concentrate grade of around 25 wt.% copper. The results indicate that the material can be processed by conventional flotation methods.

1.13 Historical Mining Operations

There is no current mining activity on the Copperwood Project property and there is no record or evidence of historical mining activity on the Copperwood Project property. The vertical shaft, exploration drifts and stopes developed by AMAX in 1958 were purely for exploration purposes.

1.14 Conclusions

Based on a review of the previous technical reports Golder considers the 2011 NI 43-101 technical report, prepared by Marston on behalf of Orvana, to be the most relevant and up to date (effective date of January 25, 2011) source for the purpose of stating an historical Mineral Resource estimate for the Copperwood Project.

At a 0.8 wt.% copper cut-off grade, Measured and Indicated historical Mineral Resources total 30.1 million tonnes (Mt) at 1.65% copper and 4.34 g/t silver. At a 0.8 wt.% copper cut-off grade, Inferred historical Mineral Resources total 2.7 Mt at 1.07 wt.% copper and 2.01 g/t silver.

It must be noted that the Golder QP has not completed the work necessary to classify the historical estimate for the Copperwood Project as current Mineral Resources. Golder and Highland are not treating the historical estimate as current NI 43-101 compliant Mineral Resources, therefore the historical resources should not be relied upon.

It is the Golder QP's opinion that the Orvana exploration programs, including drilling programs, analytical programs, historical data validation and resampling programs, and QA/QC programs resampling have been well done. Exploration programs completed on the Copperwood Project have met their objective of identifying copper mineralisation that has a reasonable prospect of meeting economic extractability requirements. The drill hole spacing and quality of data are felt to be reliable and proper for stating relevant historical Mineral Resources for the Copperwood Project.

The known extent of the Copperwood historical Mineral Resource area is currently 1.5 km x 2.5 km (3.75 km^2). Copperwood mineralisation is similar to that at the historically producing White Pine Mine located 30 km to the northeast.

The historical Mineral Resource at Copperwood has several positive features:

- Access to the mineralisation should not involve extensive drifting in waste since the southeastern edge of the Copperwood Project is near the surface.
- The mineralisation is relatively flat-lying providing the possibility of mechanised mining. The footwall and hanging wall rocks are reasonably competent.
- There are few faults and structural complications.
- The continuity of grade is good, which should help simplify the mine planning.
- The mineralisation is expected to be above any major aquifers, limiting the amount of water related costs for underground mining.
- Copper mineralisation is as chalcocite and should be amenable to known floatation and concentration methods.

Risks to the successful extraction of the Resource do exist:

- Dilution is a principle concern and is the factor that lead Marston to use small model block heights (0.15 m) in an effort to better estimate dilution grades.
- Dilution is expected to come from the floor and the back of the mineralisation as well internal subgrade material from the Red Massive unit especially in Section 6 where the Domino is thin.
- Grade control will need to be developed to control excess dilution from the roof and the floor.
- Dilution may increase in areas where the dip of the mineralisation is increased.

Additional work is required to allow Highland to estimate current Mineral Resources. Once current Mineral Resources have been estimated additional work, performed to the preliminary feasibility level as defined by CIM, is required to allow for consideration in converting current Mineral Resources to Mineral Reserves.

1.15 Recommendations

The Golder QP has not performed sufficient work to report historical Mineral Resources as current Mineral Resources for the Copperwood Project. Golder recommends that Highland perform a comprehensive review of the base data, modelling and estimates so as to allow for reporting current mineral Resources as per the standards and guidelines presented in NI 43-101 and supporting documentation.

Golder recommends that the base data review include:

- Review of topography base data and topography modelling from a detailed Light Detection and Ranging (LiDAR) survey
- Review of drill hole collar coordinate and elevation surveys
- Review of drill hole down hole survey and lithology data and interpretations
- Review of geostatistical analysis and interpretations, with the generation of wireframes, etc.
- Review of analytical data and QA/QC results

In addition to reviewing the historical data and interpretations used in the Marston 2011 and earlier models, Golder also recommends that the 21 drill holes completed by Orvana as part of the 2013 metallurgical and geotechnical programs be incorporated into the modelling database.

Once the modelling database is updated and reviewed in detail, Golder recommends that Highland update the Copperwood geological model.

Golder recommends that Highland then estimate current Mineral Resources according to the guidelines presented in NI 43-101 and supporting documentation and using the updated geological model.

Once Highland has established current Mineral Resources for the Copperwood Project, Golder recommends that Highland initiate a preliminary feasibility study to allow for the consideration of converting Mineral Resources to Mineral Reserves.

The estimated budget to carry out the proposed work is summarized in Table 1.4, Budget Estimate for Proposed Work to be Completed by Highland.

It is Golder's opinion that the Copperwood mineralization is well defined, and significant additional delineation drilling is not required. Golder does recommend that Highland consider drilling several confirmation holes that twin existing historical holes; with the purpose of verifying the location and thickness of the target units as well as to verifying grade data. These holes could also be used to generate material for metallurgical testing. The comprehensive, well documented and well organized core, logging, sampling, analysis, QA/QC, photographic and other related records of exploration data retained by Orvana at the Ironwood project office will allow for ease of performing future detailed base data reviews and/or resampling programs.

Table 1.4: Budget Estimate for Proposed Work to be Completed by Highland

Activity	Phase 1 (6 months; US$)	Phase 2 (6 months; US$)	Total (US$)
LiDAR Survey	$40,000		$40,000
Confirmatory/met drilling (1,700 m in 10 ddh)	$340,000		$340,000
Mineral Resource estimate	$50,000		$50,000
Metallurgical testing		$100,000	$100,000
Engineering studies		$950,000	$950,000
Technical management	$125,000	$200,000	$325,000
Totals	$555,000	$1,250,000	$1,805,000

There is potential for a mineral development in other areas of the Western Syncline on lands which Orvana hold options to outside the Project and Section 6 areas. Additionally, the historical Mineral Resource is thought to continue to the west under Lake Superior. Orvana has not evaluated the potential of mining under the lake.

ITEM 2 INTRODUCTION

2.1 Terms of Reference

Golder was retained by Highland as an independent qualified entity to review and report on historical estimates of Mineral Resources and to prepare an NI 43-101 technical report for the Copperwood Project located in northern Michigan, USA. The Copperwood Project is currently wholly owned by Orvana. Highland and Orvana have entered into a definitive agreement whereby Highland will acquire all rights, title and interest in the Copperwood Project from Orvana through the acquisition of all of the outstanding shares of Orvana Resources US Corp.

Highland's acquisition of the Copperwood Project is subject to the review and approval of the TSX Venture Exchange. The filing of an NI 43-101 technical report, prepared by an independent QP, disclosing historical resources for the Copperwood Project is in partial fulfilment of the requirements set forth by the TSX Venture Exchange.

This technical report was prepared by Golder in accordance with the following documents published by the Canadian securities regulatory authorities:

- NI 43-101 – Standards of Disclosure for Mineral Projects (effective date June 30, 2011).
- NI 43-101 Companion Policy (NI 43-101CP), Standards of Disclosure for Mineral Projects (effective date June 30, 2011) and,
- Form NI 43-101F1 – Technical Report (effective date June 30, 2011).

Additionally, Golder has also prepared this report in accordance with guidelines for scientific and technical disclosure on mineral properties published by the TSX Venture Exchange:

- Appendix 3F – Mining Standards Guidelines (effective date June 14, 2010).

This technical report discloses a historical Mineral Resource estimate for the Copperwood Project, as per the guidelines presented in Section 2.4 of NI 43-101. This report discloses historical resources only as no work has been completed to date by Highland to verify the historical resources, nor to update the resource models or estimates.

Information contained in this report was obtained from Highland; sources included the previously published NI 43-101 technical reports and references cited in those reports. The most recent technical report stating a Mineral Resource estimate for the Copperwood Project was written by Marston & Marston Inc. (Marston) in March 2011.

Marston was acquired by Golder in May 2011, and was integrated into the company. The QP responsible for the preparation of the current Golder technical report was involved as a Marston employee in the preparation of the 2011 Marston technical report in the role of internal senior technical reviewer.

2.2 Effective Date

The effective date of this technical report, titled NI 43-101 Technical Report on the Copperwood Project, Michigan, USA, is March 17, 2014.

There were no material changes to the scientific and technical information on the Copperwood Project between the effective date and the signature date of the technical report.

2.3 Qualified Person and Current Personal Inspection

The Independent QP responsible for the preparation of the report is Mr. Jerry DeWolfe, P. Geo., Senior Geological Consultant at Golder.

Mr. DeWolfe met with Orvana and Highland personnel, including Orvana's independent QP Dr. Theodore Bornhorst, at the Orvana Copperwood Project office in Ironwood Michigan, from March 11 to 14 2014, to perform a QP current personal inspection site visit as required under NI 43-101. The purpose of the visit was to familiarize the QP with the general geology of the area and detailed geology of the Copperwood Project property, to review the project exploration history, to verify drill hole locations in the field, to review available information and to discuss procedures and methods applied during the past exploration programs.

Two previous Copperwood Project site visits were conducted by Marston/Golder personnel. The first was on May 16 to 19, 2010 by Mr. Lynn Partington, P.E., Senior Consulting Engineer, and QP for Marston. The earlier site visits were performed in conjunction with the July 2010 NI 43-101 Scoping Study for which Marston was a co-author. A second site visit was performed from December 13 to 15, 2010 by Mr. Michael B. Ward, CPG, Senior Geological Consultant and QP for Marston. The second Marston site visit was arranged to discuss the status of the Copperwood Project and to review available information. The site visit included a visit to the Copperwood Project property and to the core logging and sample preparation facilities in Ironwood, Michigan.

2.4 Data Sources

Golder has sourced information from previous technical reports and appropriate reference documents as cited in the text and summarised in Item 21 of this report. Golder has relied upon other experts in the fields of mineral tenure, surface rights, permitting and environment as outlined in Item 3.

There have been three NI 43-101 Mineral Resource estimate technical reports issued regarding this Project.

AMEC produced a resource estimate as part of an NI 43-101 technical report in April 2010. The April 2010 AMEC technical report addressed the resource in the project area on lands covering portions of Sections 1 and 2 of Township 49N, R46W and Sections 35 and 36 of Township 50N Range 46W. The April 2010 AMEC technical report concluded that there was an NI 43-101 compliant resource for the Copperwood Project with both Measured Mineral Resources and Indicated Mineral Resources. The technical report had an effective date of April 30, 2010

The second NI 43-101 Mineral Resource estimate technical report was prepared in 2011 by AMEC, covering an additional 229 ha from the nearby Section 6 property and surrounding Satellite project, was issued in January 2011. The resources on the Satellite properties, including Section 6, were evaluated by AMEC in an NI 43-101 technical report published on January 27, 2011. The technical report had an effective date of January 24, 2011.

The third NI 43-101 Mineral Resource estimate technical report was prepared in March 2011 by Marston and covered the Copperwood Main, Bridge and Section 6 areas. The technical report had an effective date of January 25, 2011.

In addition to the three NI 43-101 Mineral Resource estimate technical reports issued, Orvana has also issued NI 43-101 compliant Scoping (effective date of September 24, 2010; authored by AMEC), Prefeasibility (effective date of July 29, 2011; authored by KD Engineering, Marston and Knight Piesold) and Feasibility (effective date of March 21, 2012; authored by KD Engineering, Golder and Milne and Associates Inc.) reports for the Copperwood Project.

2.5 Language, Currency and Measurement Unit Standards

Unless otherwise indicated this technical report uses Canadian English spelling, USA dollar currency and System International (metric) units. Coordinates in this technical report are presented in metric units metres (m) or kilometres (km) using the Universal Transverse Mercator (UTM) projection (UTM Zone 16, NAD83 datum). Elevations are reported as metres above mean sea level (m amsl).

The previous Copperwood Project technical reports used a combination of metric and imperial units; however, to reduce confusion and avoid the use of mixed measurement units Golder has converted imperial units from these reports to metric wherever possible.

The previous Copperwood Project technical reports presented coordinates using State Plane coordinates (Michigan North Zone, NAD83) in international feet, and elevations were derived using GEOID03 and NAVD88; however, Golder has converted these coordinates to metric units and the UTM projection (UTM Zone 16, NAD83 datum) to be consistent with the use of metric units throughout this technical report.

ITEM 3 RELIANCE ON OTHER EXPERTS

This report was prepared by Jerry DeWolfe, P. Geo., an independent QP under the guidelines and definitions presented in NI 43-101 and supporting documents NI 43-101CP and Form 43-101F1. In preparing this report, the Golder QP has relied on assistance and information from various parties and sources. Sources of information are acknowledged throughout the report, where the information is relied upon.

The Golder QP for this technical report has relied upon information provided by experts as allowed by Item 5 of Form 43-101F1. In particular, this report contains information relating to mineral titles, legal agreements as well as permitting and regulatory matters in the State of Michigan. The Golder QP is not qualified to verify these matters and has relied upon information provided by Highland and Orvana including lease agreements and legal opinions concerning Orvana's mineral and surface rights prepared by Kendricks, Bordeau, Adamini, Greenlee & Keefe, P.C., a Michigan law firm, for the benefit of Orvana.

ITEM 4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The two properties considered in this technical report are the Copperwood Main property and Copperwood Section 6 property. The Copperwood Main property is situated within northwestern Michigan, USA, Gogebic County, Ironwood and Wakefield townships at approximately 270,000 m east, 5,173,500 m north. The Section 6 property within the Wakefield Township is located at approximately 272,200 m east, 5,173,100 m north as shown in Figure 4.1, Location Map.

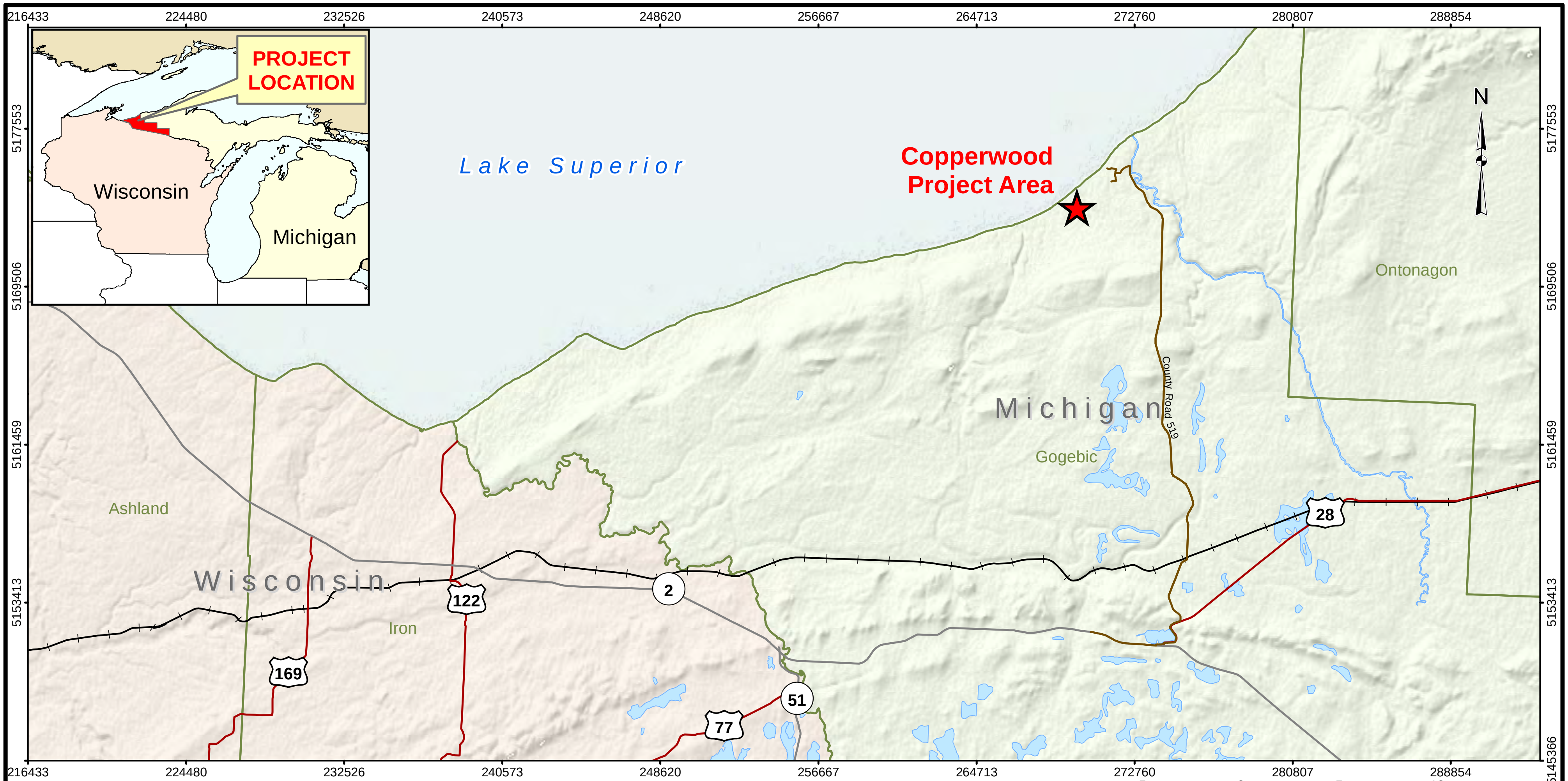
Surface and mineral rights in Michigan are located and described with reference to a grid established by the federal government as part of the Public Lands Survey System. Townships are squares of 36 square miles (93 km^2) comprising 6 x 6 arrays of 36 sections, named according to distance and direction from a principal meridian and baseline. Sections are one-mile square (2.6 km^2), and can be divided into quarters, labeled NE, NW, SE, and SW. Each quarter can also be split into halves or quarters, which are labeled according to the side or corner of the quarter section they encompass (e.g., NE 1/4 of the NW 1/4).

4.2 Mineral Tenure

The Copperwood Main and Section 6 properties consist of three metallic and non-metallic mineral leases totaling contiguous 941 contiguous hectares. In Michigan, as with many other states, mineral rights are distinct from surface rights. Mineral rights may be sold or retained separately from the surface rights, in which case, the mineral rights are said to be severed. The Copperwood Main and Section 6 properties' mineral rights are severed.

The Copperwood Main lease property comprises two distinct 20-year lease agreements with Sage Minerals Inc. (Sage) and Keweenaw Land Association, Limited (KLA). In September 2010 Orvana signed a 30 year mineral-lease agreement with A. M. Chesbrough LLC (Chesbrough) for the Section 6 lease property. The Copperwood Main lease property is approximately 712 ha, whereas the Section 6 lease property consists of approximately 229 ha as shown in Figure 4.2. The mineral rights boundaries and lease details are summarised in Table 4.1, below. The sections, surveyed as part of the Public Lands Survey System, are identified at corners with federal monuments.

E:\CopperWood\GIS\MapFiles\Fig1.1_4.1_Highland_ANSI_A_8_5x11_BaseMap_Landscape.mxd



LEGEND

- Copperwood Project
- Michigan
- Wisconsin
- US County
- Town
- County Road
- US Hwy
- US State Hwy
- US Rail
- Lake
- River

5 0 5 10

SCALE 1:300,000 Kilometers METERS

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

LOCATION MAP

Golder Associates

PROJECT		1401359	FILE No.
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN REV. 0
GIS	JNS	14 Mar. 2014	
CHECK	JdW	01 Apr. 2014	FIGURE: 4.1
REVIEW	JdW	01 Apr. 2014	

Table 4.1: Copperwood Main and Section 6 Mineral Tenure

Property	Township & Range	Section	Area (ha)	Status
Main	50N 46W	36	214.5	20-Year Lease ending in 2028
	49N 46W	2	221.8	
Main	50N 46W	35	28.3	20-Year Lease ending in 2028
	49N 46W	1	247.3	
Section 6	49N 45W	6	229.0	30-Year Lease ending in 2036

In addition, Orvana has options to convert an additional 1,559 ha into mineral leases on three mineralized zones adjacent to the Copperwood Project mineral leases (the "Satellite Deposits").

4.3 Surface Rights

Orvana has acquired approximately 700 ha of land that provides full access rights to the Copperwood property and provide space for surface infrastructure for the potential future mine site, The area acquired are described below and depicted in Figure 4.2, Project Location Map:

- The entire Section 6, Township 49 North, Range 45 West, Wakefield Township;
- The North Half, the Southwest Quarter, and the Northeast Quarter of the Southeast Quarter, Section 7, Township 49 North, Range 45 West, Wakefield Township;
- The North Half of Section 8, Township 49 North, Range 45 West, Wakefield Township, except the portion lying East of the County Road 519 right of way;
- The North Half of the North Half, Section 12, Township 49 North, Range 46 West, Ironwood Township;
- The South Half of Section 1, Township 49 North, Range 46 West, Ironwood Township, Gogebic County, Michigan;
- A 200.00 by 300.00 foot (61 by 91 m) parcel in Government Lot 2, Section 2, Township 49 North, Range 46 West, Ironwood Township, Gogebic County, Michigan;
- An easement for ingress, egress, utilities and underwater pipe installation over Government Lot 2, Section 2, Township 49 North, Range 46 West, Ironwood Township, Gogebic County, Michigan.

4.4 Agreements, Royalties and Encumbrances

The Copperwood Main and Section 6 properties consist of three metallic mineral leases totaling 941 ha.

- Mining Lease between Orvana and Keweenaw Land Association, Limited ("KLA") dated September 10, 2008, concerning:
  - Section 1, Township 49 North, Range 46 West, Ontonagon Township, Gogebic County; and
  - Section 35, Township 50 North, Range 46 West, Ontonagon Township, Gogebic County;
- Mining Lease between Orvana and Sage Minerals Inc., Limited ("Sage") dated October 16, 2008, concerning:
  - Section 2, Township 49 North, Range 46 West, Ontonagon Township, Gogebic County; and
  - Section 36, Township 50 North, Range 46 West, Ontonagon Township, Gogebic County;
- Mining Lease between Orvana and A.M. Chesbrough, LLC dated September 30, 2010, concerning:
  - Section 6, Township 49 North, Range 45 West, Wakefield Township, Gogebic County.

To maintain its rights under the leases, Orvana must pay an annual rent as shown in Table 4.2, KLA and Sage Lease Payment Schedules for Copperwood Project and Table 4.3, Chesbrough Lease Payment Schedule.

In addition to the lease payments, Orvana must pay to the mineral right owners (Sage, KLA and Chesbrough) a sliding scale Net Smelter Return (NSR) royalty on production from its leases. The royalty rate ranges from 2% to 4% on a sliding scale based on adjusted copper prices. Initially the royalty will be:

- 2% NSR for an invoiced copper price below a lower bench mark price; and,
- 4% NSR for an invoiced copper price above an upper bench mark price.

Table 4.2: KLA and Sage Lease Payment Schedules for Copperwood Project

Date	Amount
Commencement Date	$10,000
1st Anniversary of Commencement Date	$15,000
2nd Anniversary of Commencement Date	$20,000
3rd Anniversary of Commencement Date	$25,000
4th Anniversary of Commencement Date	$30,000
5th through 10th Anniversary of Commencement Date	$40,000
11th through 15th Anniversary of Commencement Date	$50,000
16th through 20th Anniversary of Commencement Date	$90,000

Table 4.3: Chesbrough Lease Payment Schedule

Date	Amount
Commencement Date	$12,500
1st through 4th Anniversary of Commencement Date	$9,000
5th through 10th Anniversary of Commencement Date	$11,250
11th through 15th Anniversary of Commencement Date	$15,000
16th through 20th Anniversary of Commencement Date	$18,750
21st through 25th Anniversary of Commencement Date	$22,500
26th through 30th Anniversary of Commencement Date	$26,250

For an invoiced copper price greater than the lower benchmark price and less than the upper benchmark price, the following equation is used:

$$\frac{2\% \ * \ \text{invoiced copper price}}{\text{lower benchmark copper price}}$$

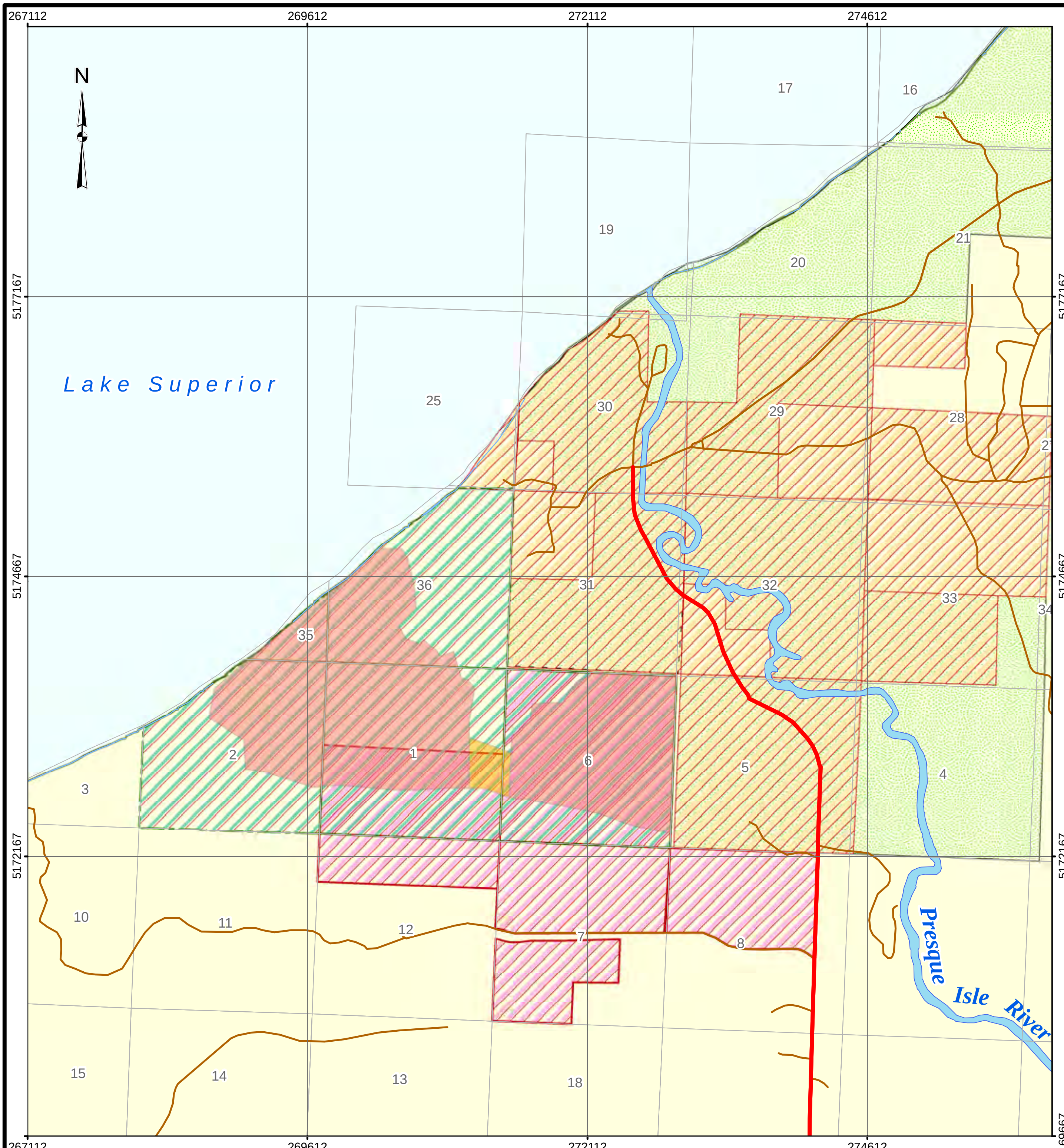
Invoiced copper is the price per pound of copper shown on a concentrate invoice. The lower and upper benchmark prices are subject to adjustment for inflation on a quarterly basis based on the Producer Price Index – Finished Goods, prepared by the USA Department of Labour. Benchmark prices are initially set at $2/lb copper and $4/lb copper, respectively.

All lease payments may be applied as a credit against the royalties during production.

There are no other known encumbrances on the mineral rights for the Copperwood Main and Section 6 properties as shown in Figure 4.2, Project Location Map.

4.5 Environmental Liabilities

Environmental work performed by Orvana identified potential localized surface water impacts resulting from the surface rock piles from the 1950's exploration shaft excavation; some of this excavated material was also used in historic road and culvert construction on the property. As part of the permitting process Orvana proposed mitigation in the form of removing this material from the rock pile site, roads and culverts and storing it in the planned Copperwood Tailings Disposal Facility. No other known environmental liabilities exist on the Copperwood Project property.



1,000 0 1,000 2,000

Meters

SCALE 1:50,030 METERS

LEGEND

- Orvana Mineral Lease
- Orvana Surface Rights
- Orvana Mineral Rights "Option to Lease"
- Resource Boundary
- Bridge
- *Porcupine Mountains Wilderness State Park*
- County Road 519
- Road
- Michigan Sections
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units. All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

E:\CopperWood\GIS\MapFiles\Fig1.2_4.2Highland_ANSI_A_8_5x11_ProjLoc_Lease_Portrait.mxd

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

PROJECT LOCATION WITH LEASE INFORMATION

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014	**FIGURE: 4.2**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

4.6 Permitting

The MDEQ is responsible for enforcing state laws for protecting natural resources. Michigan's environmental regulations are compiled under the Natural Resources and Environmental Protection Act (NREPA), Act 451 of the Public Acts 1994, as amended. Mining of nonferrous metals is regulated under Part 632, Nonferrous Metallic Mining and Reclamation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 632 was enacted in December, 2004.

4.6.1 Exploration

The drilling, operating, plugging, and site restoration of test wells (drill holes) are regulated under Part 625, Mineral Wells, of the Natural Resources and Environment Protection Act, 1994 PA 451, as amended (NREPA). In addition, test wells must meet the requirements of other Parts of the NREPA to prevent damage to water, air, soil, wetlands, and other environmental values. In most areas of the state, Part 625 requires a permit for a test well that penetrates 50 feet (15 m) or more into bedrock or below the deepest fresh water aquifer. However, a permit is not required for test wells where the bedrock is Precambrian in age, although these wells must meet all other requirements of Part 625. A test well must be plugged promptly after abandonment, following procedures specified by the MDEQ. A well is considered abandoned if it is inactive for one year, unless an extension is granted by the MDEQ based on the owner showing a good reason to keep the well open. Wells must be plugged in a manner that seals off and confines any fluids in the formations penetrated by the well, and prevents any surface water or other materials from entering the well. Removal of overburden and extraction of limited amounts of materials for the purpose of exploration to the extent necessary to determine the location, quantity, or quality of a mineral deposit on land that does not become a part of a mining operation within 2 years must be graded and revegetated.

All drilling at Copperwood is in Precambrian bedrock and therefore no permits for drilling are required.

4.6.2 Development

Mining of nonferrous metals is regulated under Part 632, Nonferrous Metallic Mining and Reclamation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

Part 632 covers all aspects of nonferrous metal mining including transportation, storage, treatment, and disposal of ore, waste rock, and other materials. A permit application under Part 632 must include an environmental impact assessment that describes baseline conditions, expected impacts to the mined area and surrounding affected areas, and alternatives. An application must also include a detailed plan for mining and reclamation that would minimize impacts of the proposed operation, and a contingency plan for dealing with any accidents or failures.

Part 632 provides extensive opportunities for public input, including a public meeting on an application and a public hearing on a proposed permit decision. A permit can be granted only if the applicant demonstrates that the mining operation will not pollute, impair, or destroy the air, water, or other natural resources or the public trust in those resources in accordance with the Michigan Environmental Protection Act. Upon completion of mining, the mine site and associated lands must be reclaimed to achieve a self-sustaining ecosystem that does not require perpetual care. Post-closure monitoring of water quality must be continued for at least 20 years, subject to modification after public review. Part 632 requires a mining company to maintain financial assurance throughout the mining operation and the post-closure monitoring period. The financial assurance must cover the cost for the MDEQ to conduct any necessary reclamation and remediation measures and must be updated at least every three years. Funding to cover the costs for the MDEQ to administer the law comes from permit fees and from annual operating fees based on tons of material mined.

Orvana has obtained the following permits from the MDEQ:

- April 30, 2012 - Part 632 Mining Permit for Copperwood Project, Upper Peninsula, Michigan, USA.
- November 13, 2012 - National Pollutant Discharge Elimination System permits for treated sanitary and process wastewaters related to the proposed Copperwood copper mine, Upper Peninsula, Michigan, USA.
- July 17, 2012 – Air Quality Division Permit to Install 180-11
- February 22, 2013 - Wetlands Part 303 and the Inlands Lakes and Streams Part 301 permits for the proposed Copperwood copper mine.
- June 24, 2013 – Part 315 Dam Safety Permit.

Depending on the results of studies to be conducted by Highland, these permits may have to be amended.

4.7 Socio-Economics

The State of Michigan, and in particular the Upper Peninsula, has a long mining history, primarily for copper and iron. The large-scale underground White Pine copper mine in Ontonagon County began operation in 1953 and ended in 1996. Exploration programs and mining operations in Michigan are governed by modern mining and environmental laws. The workforce of the western Upper Peninsula of Michigan is currently experiencing high unemployment levels. Many experienced miners and locally-owned firms also exist in the region with necessary mining support capabilities. The Copperwood project has received local and Michigan State bi-partisan support.

ITEM 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The Copperwood Project property is located approximately 22.5 km by road to the town of Wakefield in Gogebic County, Michigan, and also is located approximately 40 km by road from the town of Ironwood, also in Gogebic County. Wakefield and Ironwood have populations of 2,300 and 6,800, respectively.

The main access to the Copperwood Project property is by way of the paved north-south County Road 519, which branches off State Highway M-28 just east of Wakefield, Michigan. The project property is transected by a series of dirt roads and drill trails allowing access for exploration activities.

During inclement weather, four-wheel drive vehicles are required for accessing the project property. Future mining activities at the Copperwood property may require an upgrade of the paved County Road 519 to an all-season level and an upgrade of the dirt road from County Road 519 to the Copperwood site. Site access is shown in Figure 5.1, Project Location Infrastructure Map, and Figure 5.2, Project Exploration Lease Map.

5.2 Local Resources and Infrastructure

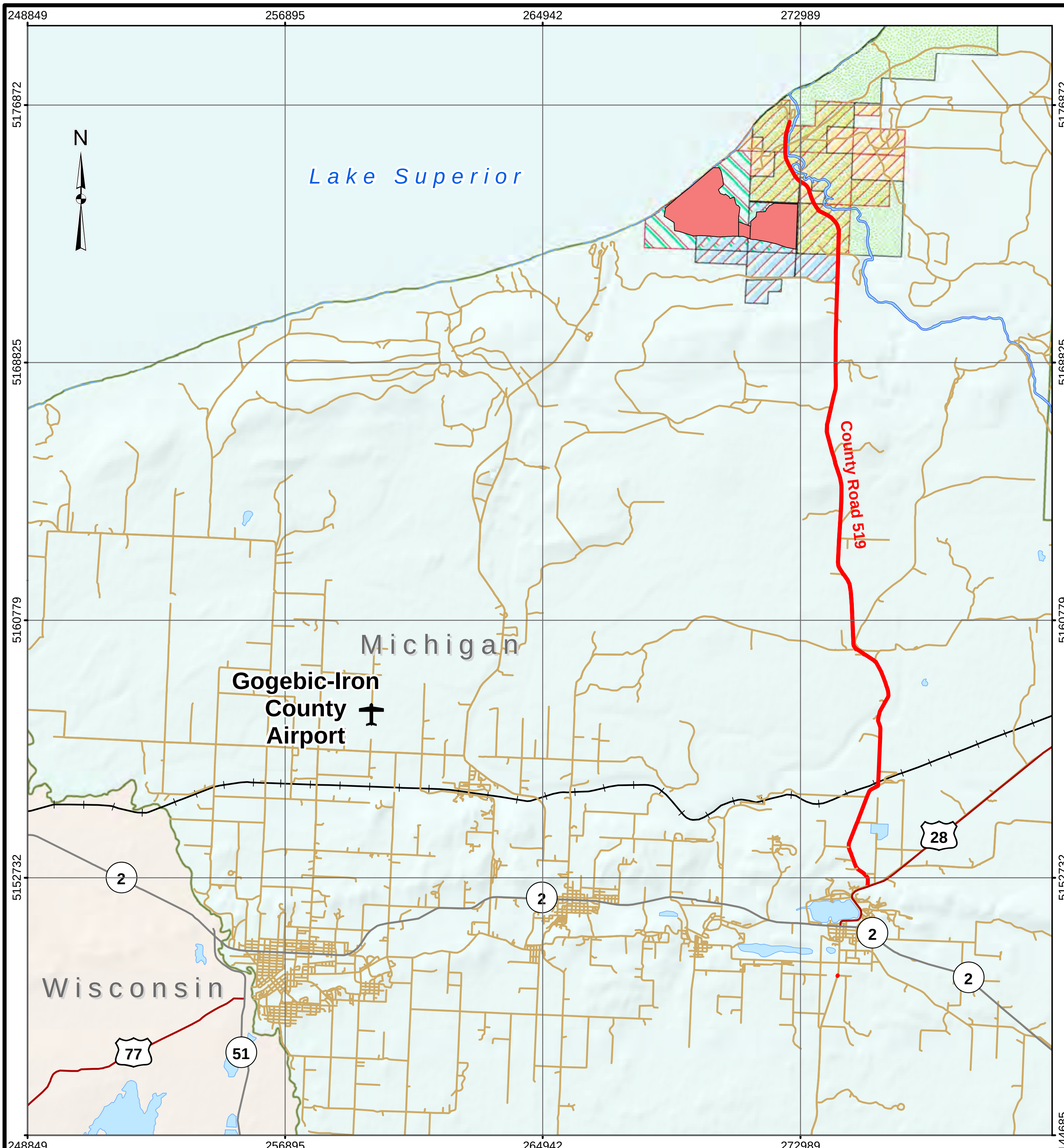
A Canadian National Railway Company rail line is located at Thomaston about 18 km from the Copperwood site via County Road 519. There is an existing loading station at Thomaston, which is used for timber. Additionally, an old railway spur bed that passes immediately adjacent to the property; laying tracks along this bed would provide rail access right to the Copperwood Project site. Access by way of air travel is accomplished through the Gogebic-Iron County Airport located 6 km north of Ironwood.

The workforce for any current and future mining activity could be sourced from a combination of the local area after training as appropriate or from external areas. Unemployment is high in Gogebic County; both skilled and unskilled labours are available for work.

Operation can be conducted year-round and will not be affected by the climate. Infrastructure including access, power and water is sufficient to support the Highland operation.

There is a 88KV power line located 18 km from the Copperwood property; however, this is a unique voltage that may be obsolete before long. Xcel Energy owns the nearest transmission lines, which are located approximately 32 km south of the property.

White Pine Electric Power is a potential alternative; it is a small independent power producer located approximately 32 km east of the property. Onsite power generation is also an option. A major natural gas pipeline is approximately 16 km south of the property.



LEGEND

- Orvana Mineral Lease
- Orvana Surface Rights
- Orvana Mineral Rights "Option to Lease"
- Resource Boundary
- *Porcupine Mountains Wilderness State Park*
- Lake
- River
- Town
- Gogebic Iron County
- US Hwy
- US State Hwy
- Road
- County Road 519
- US Rail

2.5 0 2.5 5

Kilometers

SCALE 1:175,000

METERS

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units. All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

PROJECT LOCATION
INFRASTRUCTURE MAP

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	17 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	17 Mar. 2014		
CHECK	JdW	01 Apr. 2014	**FIGURE: 5.1**	
REVIEW	JdW	01 Apr. 2014		

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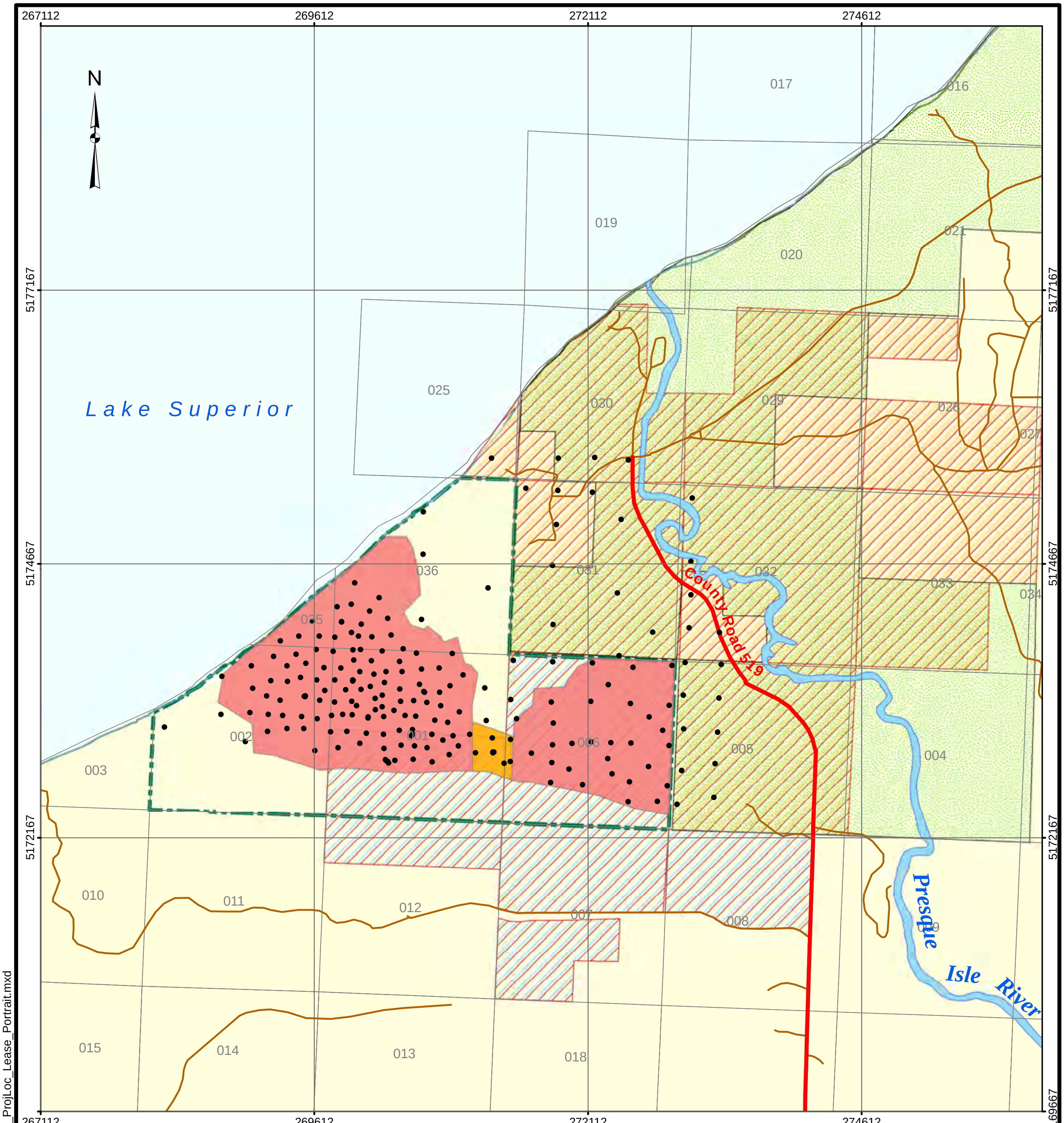

LEGEND

- Orvana Mineral Lease
- Orvana Surface Rights
- Orvana Mineral Rights "Option to Lease"
- Existing Drill Hole
- Resource Boundary
- Bridge
- *Porcupine Mountains Wilderness State Park*
- Michigan Sections
- County Road 519
- Road
- Lake
- River

1,000 0 1,000 2,000
Meters
SCALE 1:50,030
METERS

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units. All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

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PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

PROJECT EXPLORATION LEASE MAP

Golder Associates

PROJECT		1401359	FILE No.
DESIGN	JNS	20 Mar. 2014	SCALE AS SHOWN — REV. 0
GIS	JNS	20 Mar. 2014	
CHECK	JdW	01 Apr. 2014	**FIGURE: 5.2**
REVIEW	JdW	01 Apr. 2014	

There are no aquifers beneath the surface of the property. Potable and process water for any planned mining operation could be obtained from Wakefield through the Gogebic Range Water Authority. Discussions between Orvana and the Gogebic Range Water Authority had begun but are currently suspended. The well field south of the mine site may also be viable. Current site communications comprise cell phone service available via a repeater tower at Indianhead ski area.

The only infrastructure on the Copperwood Project property is a network of dirt roads, logging roads and drill trails. The main dirt roads are in good condition.

The Copperwood Project property is of sufficient extent for all needed surface infrastructure including a processing facility; maintenance; surface equipment storage; fuel storage; explosives storage; administrative offices; water treatment plant; and, storage for waste rock, top soil and snow.

5.3 Physiography

The land surface at the Copperwood Project property slopes northwest toward the Lake Superior shoreline. The ground surface elevation along the southern edge of the site is approximately 288 m amsl as compared to the approximate elevation of 198 m amsl at the top of the bluff along the Lake Superior shoreline. Mean elevation of the Lake Superior shoreline is approximately 184 m amsl. The topographic contours across the area are generally parallel to the Lake Superior shoreline with the ground surface sloping at a rate of approximately 19 m per km to the northwest. The gently undulating planar surface is transected by small intermittent streams that flow northwest towards Lake Superior. The larger of these streams form steep-walled valleys in glacial deposits that are 3 to 5 m deep in the upper reaches and as much as 12 m deep nearing Lake Superior.

Vegetation at Copperwood is characterised by immature mixed deciduous forest. Wetlands occur onsite in the base of drainage channels and stream corridors that direct surface runoff. Wetlands are also established in depressions or small isolated basins on gently sloping plateaus between the drainage channels and stream corridors. Commercial logging and hunting cabins are the current land uses within, and in direct vicinity of, Copperwood.

5.4 Climate

The Copperwood Project property is situated immediately south of the Lake Superior shoreline where the local climate consists of four seasons typical of mid-latitude temperate climates. The maximum mean monthly temperature in the summer months is approximately 18°C and in the winter months is about -12°C. The annual precipitation is approximately 890 millimetres (mm) of rain equivalent (rain and snow) with the greatest monthly precipitation of about 100 mm and least monthly precipitation of about 30 mm of rain equivalent. Mean annual total snowfall is approximately 4.5 m with the maximum monthly mean snow depth of about 0.6 m. Wind at the Copperwood site is predominantly from the east-southeast and west-northwest directions with peak gusts of about 60 kilometres per hour. Weather measurements are from a local meteorological station operating at the Copperwood Project property and from the Ironwood, Michigan meteorological station.

ITEM 6 HISTORY

6.1 Exploration History

Exploration history is well documented by AMEC in the April 2010 NI 43-101 technical report; it is repeated here as referenced. Updates are included by Golder where applicable. The history of exploration completed in the Copperwood area is summarised in Table 6.1, Summary of Copperwood Exploration Activity.

Table 6.1: Summary of Copperwood Exploration Activity

Company	Activity	Year
U.S. Geological Survey	Economic geology publication demonstrates potential of Western Syncline.	1954
USMR	Leased 1,552 ha in Western Syncline area (Cox, 2003).	1956
USMR	Drilled 26 holes focused on margin of Western Syncline and discovered Copperwood.	1956
USMR	Drilled 135 holes throughout the Western Syncline.	1958
AMAX	Sank 71 m vertical exploration shaft and advanced 635 m of exploration drifts, including three small stopes.	1957-1958
BCR	Drilled 23 holes in the Satellite properties. BCR terminated leases in the early 1960's.	1959
AMAX	Internal engineering and economic study that ended activities by USMR.	1959
AMAX	Engineering and economic review concluded deposit was mineable.	1974
AMAX	Terminated Western Syncline leases.	1983
Orvana	Leased 712 ha at Copperwood and options 1,559 ha in Western Syncline.	2008
Orvana	Began environmental studies with 5 drill holes intersecting copper mineralization.	2008
Orvana	Drilled 82 holes.	2009
Orvana	Leased 229 ha covering Section 6.	2010
Orvana	Drilled 38 holes. Completed NI 43-101 compliant Mineral Resource estimate.	2010
Orvana	NI 43-101 compliant Mineral Resource estimate completed.	2011
Orvana	Completed NI 43-101 compliant Prefeasibility Study.	2011
Orvana	Completed NI 43-101 compliant Feasibility Study.	2012
Orvana	Mining Permit Approved by Michigan Department of Environmental Quality.	2012
Orvana	Drilled 21 holes for metallurgical and geotechnical studies.	2013

Archaeological evidence suggests that native copper was first extracted by locals on the Keweenaw Peninsula about 7,000 years ago. From 1610 to 1845 the presence of Lake Superior copper attracted early European and American interest. From 1845 to 1968 the mines of the Keweenaw Peninsula produced approximately 5 Mt of refined copper from 380 Mt of ore hosted by tops of sub-aerial lava flows, interflow clastic sedimentary beds and cross vein systems. Native copper represented over 99% of the metallic minerals in the mined ore bodies of the Keweenaw Peninsula. Copper mineralisation in the base of the Nonesuch Formation was first recognised in the 1850s in the White Pine area about 30 km northeast of Copperwood (Ensign et al., 1968). From 1915 to 1921 native copper was economically extracted from the base of the Nonesuch Formation.

Subsequent exploration led to the discovery and the 1953 opening by Copper Range Company of the White Pine Mine. The construction of the White Pine Mine, mill, smelter, refinery and power plant was financed by the U.S. Government. Approximately 2 Mt of copper and 128 million grams of silver, with a mean grade of 1.14 wt.% copper and 7 g/t silver, were produced from 1954 until its closure in 1996. Chalcocite accounted for 85% to 90% of the copper with the remainder as native copper.

From about 1948 to 1954 geologists Walter White and James Wright of the U.S. Geological Survey conducted a major study of the Nonesuch Formation at the White Pine Mine and surrounding area. In a paper summarising their work (White and Wright, 1954), the Western Syncline is clearly shown. Although there is no comment on copper mineralisation in the Western Syncline, they concluded, “The environment favourable for deposition of sediments similar to those at White Pine therefore existed over an area many times larger than that of the White Pine copper deposit itself.” This publication led to the leasing of the Western Syncline area by the USMR.

In 1956 USMR secured an option from KLA and Sage (timber companies who had retained the mineral rights after selling the surface rights) to lease mineral rights over and proximal to the Western Syncline. USMR drilled a total of 161 vertical holes between August 1956 and November 1958. The first 26 holes were drilled to define the margin of the syncline and to sample the base of the Nonesuch Formation. One hundred thirty-five holes were then completed at 660 or 330 m spacing. Forty-two of these holes, the deepest of which reached 337 m, were drilled within the area of the Copperwood leased mineral rights. This drilling led to the discovery of the Copperwood deposit.

An underground exploration program was initiated by AMAX in July 1958. A vertical exploration shaft was sunk 71 m through 28 m of glacial overburden, 39 m of the Nonesuch Formation and 4 m of the Copper Harbour Formation sandstones. Exploration drifts were driven along strike 373 m to the east and 262 m to the west, and three small stopes were driven up-dip to assess rock mechanic characteristics and the nature of the mineralised zone. The exploration shaft was refilled from the surface upon completion.

During a proposed merger of the Copper Range Company, the operator of the White Pine Mine and AMAX in 1974, an independent consultant completed an engineering and review of existing data. An independent historical, non-compliant Mineral Resource estimate for the Western Syncline Deposit was completed in 1974. The U.S. Government disallowed the proposed merger and in 1983, due to corporate financial issues, AMAX terminated the Western Syncline mineral lease agreements.

No further work was conducted on the Copperwood property between 1983 and 2008.

Beginning in 2008 Orvana implemented a series of exploration drilling programs at Copperwood (2008, 2009, 2010 and 2011) culminating in 126 drill holes (17,480 total metres of drilling). Additionally, Orvana commissioned several independent technical reports for the Copperwood Main, Section 6 and Satellite areas in 2010 and 2011.

In 2013 Orvana drilled 21 drill holes for collecting metallurgical and geotechnical studies; 11 holes were drilled (2,781 total metres of drilling) primarily for metallurgical purposes and 7 holes were drilled primarily for geotechnical purposes with 1 hole drilled for both metallurgical and geotechnical purposes. As of the effective date of this technical report these 21 drill holes have not been added to the geological model for Copperwood nor have they been used for any Mineral Resource evaluations.

Details of the Orvana exploration, drilling, sampling and analytical programs are expanded upon in Item 9, Item 10 and Item 11 of this technical report.

Highland has not conducted any exploration work on the Copperwood Project property as of the effective date of this technical report.

6.2 Production History

The Copperwood Project property has not had any historical or current production. The vertical shaft, exploration drifts and stopes developed by AMAX in 1958 were purely for exploration purposes.

6.3 Environmental History

In September 2008, Orvana contracted STS to conduct the base line studies for an EIA covering the Copperwood Project area. STS was subsequently purchased by AECOM and the environmental studies were continued with AECOM.

In January 2009, the EIA's initial phase of surface and subsurface water sampling was completed. This is the first step in the two-year long process of developing a seasonal and long-term characterization of the site. In completing this phase of the assessment, 20 holes (totalling 1,239 m) were drilled, packer-tested, and completed as groundwater monitoring wells. These drill holes encountered between 21 to 33 m of fine-grained, unconsolidated glacial sediments overlying the bedrock. Fourteen drill holes were completed in bedrock above the copper-bearing interval and six holes intersected the copper-bearing interval. Also, 14 shallow water monitoring wells were completed.

A meteorological and air-quality monitoring station was installed on the Copperwood Project site and data collection commenced on December 18, 2008.

Other studies required as part of the EIA, including studies of the site's ecosystem, habitat features and terrestrial and aquatic flora and fauna, have also commenced.

An environmental geochemical examination was completed on eight reject samples of mineralization, hanging wall, and footwall rocks from three historic drill holes. Interpretation of the geochemical test results by Geochimica, Inc. indicates that Copperwood rocks are unlikely to be acid generating and, consequently, may be characterized as non-reactive under Michigan mining laws. In addition, the rock pile created by the extraction of copper-bearing rock from the underground exploration activity in the 1950s was recently trenched and sampled. This rock pile has been subjected to approximately 50 years of wet, oxidizing conditions. Based on visual observations, the rocks appear to be non-reactive.

The EIA studies are essentially complete as of the date of this technical report; however ongoing monitoring will continue on the project as required.

6.4 Historical Resources

6.4.1 Background Regarding Historical Resource Estimates for the Copperwood Project

As discussed previously, a number of historical resource estimates for the Copperwood Project have been issued by previous owners:

- USMR – Covering larger area that included the Copperwood Project area, prepared in 1959.
- AMAX – Covering larger area that included the Copperwood Project area, prepared in 1974.
- Orvana (AMEC) – Copperwood Main area, published April 2010, effective date of April 30, 2010.
- Orvana (AMEC) –Satellite Properties, published January 2011, effective date of January 24, 2011.
- Orvana (Marston) –Copperwood Main, Bridge and Section 6 areas, published March 2011, effective date of January 25, 2011.

All previous estimates were issued before Highland and Orvana entered into any agreement concerning the Copperwood Project. The USMR and AMAX estimates predated the introduction of NI 43-101 (2001) guidelines, while the 2010 and 2011 Orvana estimates were prepared by AMEC and Marston in accordance with NI 43-101 guidelines in place at the time of preparation.

Based on a review of the historic Mineral Resource estimate technical reports Golder considers the March 2011 NI 43-101 technical report, prepared by Marston and Marston (Marston) on behalf of Orvana, to be the most relevant and up to date (effective date of January 25, 2011) source for the purpose of stating an historical resource estimate for the Copperwood Project. The other historical resource estimates are summarized below, followed by a more in depth review of the 2011 Marston historical estimate. The other historical resource estimates are provided for comparison with the 2011 Marston historical Mineral Resource estimate. The Historical Mineral Resource Statement provided by Golder in this technical report uses the 2011 Marston estimate as its basis.

It must be noted that the Golder QP has not completed the work necessary to classify the historical estimate for the Copperwood Project as current Mineral Resources. Golder and Highland are not treating any of the historical Mineral Resource estimates discussed in this section as current NI 43-101 compliant Mineral Resources, therefore the historical resources should not be relied upon.

6.4.2 USMR and AMAX Historical Resource Estimates

An internal engineering and economic study of the entire Western Syncline was completed in 1959 by USMR. The study reported an estimated Mineral Resource of 136.9 Mt at 1.07 wt.% copper at a 1 wt.% copper cut-off in some areas and a copper cut-off of 0.8 wt.% in others. The USMR Mineral Resource estimate also included mineralisation in the upper shale unit, or Upper Copper Bearing Sequence (UCBS). This mineralisation has not been included in any of the later historical resource estimates. The Copperwood portion of this historic resource estimate was 23.8 Mt at 1.46 wt.% copper. USMR planned to mine the deposit by applying a room-and-pillar mining method. The USMR study concluded it would be necessary to extract barren siltstone hanging wall to reach a stable back. This resulted in excessive dilution and unfavourable economics.

During a proposed merger of the Copper Range Company, the operator of the White Pine Mine and AMAX in 1974, an independent consultant completed an engineering study and review of existing data and concluded that the back could be controlled by using resin bolts, which had been recently employed at the White Pine Mine. By controlling the back, the problem of excessive dilution was eliminated, and the economics of mining the Western Syncline Deposit were deemed favourable. An independent historical, non-compliant Mineral Resource estimate for the Western Syncline Deposit was completed in 1974 that included Mineral Resources of 92.3 Mt at 1.27 wt.% copper at a 0.9 wt.% cut-off and a minimum mining height of 1.83 m using the same raw data as used by USMR. The Copperwood portion of this historic resource estimate was 21.9 Mt at 1.68 wt.% copper.

USMR and AMAX historical Mineral Resource estimates for the Copperwood portion of the Western Syncline are summarised in Table 6.2, USMR & AMAX Historical Resource Estimates for Copperwood.

Table 6.2: USMR & AMAX Historical Resource Estimates for Copperwood

Historical Resource	Tonnage (million tonnes)	Grade Copper wt.%	Cutoff Copper wt.%	Minimum Thickness (m)
1959 USMR Engineering and Economic Study	23.8	1.46	1	2.6
1974 Independent Consultant Engineering and Economic Review	21.9	1.68	1	2.0

6.4.3 Orvana – AMEC Historical Resource Estimates

In 2008 Orvana leased the Copperwood Project area from KLA and Sage and initiated an Environmental Impact Assessment as required by Michigan's Nonferrous Metallic Mining Regulations. In the fall of 2008 groundwater monitoring wells were completed. Five of these water monitoring holes intersected the mineralised zone of the

Copperwood deposit. In 2009 Orvana completed 82 exploration drill holes. On 22 March 2010 Orvana announced an NI 43-101 compliant resource estimate for the Copperwood deposit. This was followed by an NI 43-101 compliant resource estimate for the Section 6 and Satellite Properties in January 2011. Both of these were completed by AMEC. The AMEC historical resource estimates are summarized in Table 6.3.

Table 6.3: AMEC Historical Resource Estimates for Copperwood

Historical Resource	Tonnage (million tonnes)	Grade Copper (wt.%)	Cutoff Copper (wt.%)	Minimum Thickness (m)
2010 AMEC Copperwood Main Domino				
Measured	7.79	2.56	1	1.66
Indicated	2.48	2.39	1	1.22
Measured and Indicated	10.27	2.52	1	1.53
Inferred	1.3	2.29	1	0.95
2010 AMEC Copperwood Main Upper Layer				
Measured	6.35	1.15	1	1.35
Indicated	2.85	1.07	1	1.39
Measured and Indicated	9.2	1.13	1	1.36
Inferred	1.97	0.96	1	1.43
2010 AMEC Copperwood Main Combined Domino and Upper				
Measured	14.15	1.93	1	3.01
Indicated	5.33	1.69	1	2.6
Measured and Indicated	19.47	1.86	1	2.89
Inferred	3.27	1.49	1	2.38
2011 AMEC Section 6				
Indicated	8.41	1.42	1	1.89
Inferred	0.46	1.29	1	1.54

6.4.4 Orvana – Marston Historical Resource Estimate

In March 2011 Marston completed an update to the Copperwood Main and Section 6 resource estimates. The model used in the resource estimate update was built by Peter DuBois, PE, in Marston's St. Louis office under the supervision of Michael B. Ward, CPG, Senior Geological Consultant, for Marston. The Mineral Resource estimates were completed using Ventyx (formerly Mincom) Stratmodel and Block Model software.

Marston adhered to the Canadian Institute of Mining Metallurgy and Petroleum (CIM) definitions of resources and reserves as referenced in NI 43-101. Mineral Resources were confined by the software to the appropriate stratigraphic units. Mineral Reserves were not estimated as part of the 2011 Marston technical report as a preliminary feasibility study had not been completed. The Marston 2011 historical Mineral Resource estimates are summarized in Table 6.4.

Table 6.4: Marston 2011 Historical Mineral Resource Estimate

Copperwood Main			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured	17.0	1.84	5.75
Indicated	3.6	1.62	4.57
Measured and Indicated	20.7	1.80	5.54
Inferred	2.6	1.06	2.02

Bridge			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured	0.6	1.10	1.63
Indicated	0.2	1.10	1.84
Measured and Indicated	0.8	1.10	1.67
Inferred	0.0	-	-

Section 6			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured	5.6	1.38	1.96
Indicated	3.0	1.24	1.17
Measured and Indicated	8.6	1.34	1.69
Inferred	0.1	1.35	1.53

Total (Copperwood Main, Bridge and Section 6 Combined)			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured and Indicated	30.1	1.65	4.34
Inferred	2.9	1.07	2.01

6.4.5 Methodology Used in Marston 2011 Historical Resource Estimate

The following sections are a summary of the work undertaken by Marston to prepare the 2011 Mineral Resource estimate and technical report.

6.4.5.1 Database

Orvana provided Marston with drill data information in the form of Microsoft Excel spreadsheets for the Copperwood Project and Section 6. The assay information, down-hole surveys, and collar information was imported to a Microsoft Access database. Data checking routines were employed to check for duplicate assay information, collar locations that contained missing lithology, assay and down hole surveys, lithology containing missing intervals, and errant values. Typographical, transposition or other potential data entry errors were corrected where encountered.

Drill sample information was available from 149 drill holes for the Copperwood Project and 156 drill holes (142 legacy plus 14 in 2010) for the Section 6 resource estimate and nearby satellites. Drill holes from adjacent sections to Section 6 were used to enhance this model on boundary areas. A total of 2,411 samples from 197 drill holes were used in the Marston model.

The four twinned holes excluded from the database by AMEC (April 2010) were also excluded from the Marston modelling data set and were replaced by the more recently drilled holes. Holes PC 13 and PC 15 in Section 6 were also excluded from the data and replaced with twin holes CW-10-133 and CW-10-136 respectively.

Holes that contained repeated instances of the Domino, namely drill hole CW-09-82, were not used in the modelling process. Drill holes that fell outside of the model extents and any additional legacy holes that were twinned were not used. Drill holes completed in the 2010 drilling program that were not used for modelling include all holes where the copper-bearing sequence was not differentiated. These holes also do not have assay values. Thus, their exclusion from the model was reflected in the stratigraphic model only. Assay values would not have been impacted by their inclusion. Table 6.5, Drill Holes Not Used, shows a list of holes not used in the Marston model and the reason for their exclusion is given. Table 6.6, Drill Holes Used in Model, shows a summary list of drill holes received and used in the Marston model.

Drill data from 85 legacy drill holes drilled between 1957 and 1959 was used in the Marston model. The legacy drill holes were included in the model because of Orvana's resampling program of these holes in 2009 and 2010. An appropriate QA/QC protocol was applied to the sampling, and part of AMEC's resource estimate for the Satellite Properties (AMEC 2011) concluded that the information from this program was appropriate for resource estimation.

Underground channel sample information was not used in this Marston model or resultant Mineral Resource estimates.

Table 6.5: Drill holes Not Used

Drill Hole ID	Comments	Drill Hole ID	Comments	Drill Hole ID	Comments
CW-10-103	CBS not differentiated	M56-W8	Outside of model area - no topography	M57-W153	Outside of Model Area
CW-10-104	CBS not differentiated	M57-W158	Outside of model area - no topography	M57-W102	Outside of Model Area
CW-10-106	CBS not differentiated	M56-W5	Outside of model area - no topography	M57-W155	Outside of Model Area
CW-10-107	CBS not differentiated	M57-W152	Outside of model area - no topography	M57-W92	Outside of Model Area
CW-10-108	CBS not differentiated	M57-W124	Outside of model area - no topography	M57-W138	Outside of Model Area
CW-10-109	CBS not differentiated	M57-W139	Outside of model area - no topography	M57-W144	Outside of Model Area
CW-10-115	CBS not differentiated	M57-W157	Outside of model area - no topography	M57-W145	Outside of Model Area
CW-09-82	Multiple Zones of Domino - Faulted?	M57-W127	Outside of model area - no topography	M57-W125	Outside of Model Area
M56-W19	CBS not differentiated	M57-W118	Outside of model area - no topography	M57-W81	Outside of Model Area
M56-W28	Twinned Hole in AMEC report	M57-W44	Outside of model area - no topography	M57-W133	Outside of Model Area
M57-W62	Twinned Hole in AMEC report	M57-W67	Outside of model area - no topography	M57-W79	Outside of Model Area
M57-W69	Twinned Hole in AMEC report	M57-W134	Outside of model area - no topography	M57-W123	Outside of Model Area
M57-W72	Twinned Hole in AMEC report	M57-W50	Outside of model area - no topography	M57-W128	Outside of Model Area

Drill Hole ID	Comments	Drill Hole ID	Comments	Drill Hole ID	Comments
M56-W12	Incomplete Lith Records-possibly redrilled?	M56-W14		M57-W151	Outside of Model Area
PC-15	Twinned Hole with CW-10-131	M57-W131		M57-W99	Outside of Model Area
PC-13	Twinned Hole with CW-10-137	PC-16	No confidence in hole location - collar matches but Domino appears abnormally high in elevation	M57-W154	Outside of Model Area
M56-W15	No lith or survey data	M56-W2	Outside of Model Area	M57-W93	Outside of Model Area
M57-W122	No lith or survey data	M56-W2A	Outside of Model Area	M57-W146	Outside of Model Area
M57-W129	No lith or survey data	M57-W84	Outside of Model Area	M57-W90	Outside of Model Area
M57-W100	Outside of model area - no topography	M57-W88	Outside of Model Area	M57-W142	Outside of Model Area
M57-W41	Outside of model area - no topography	M57-W68	Outside of Model Area	M57-W140	Outside of Model Area
M57-W56	Outside of model area - no topography	M57-W78	Outside of Model Area	M57-W156	Outside of Model Area
M57-W106	Outside of model area - no topography	M56-W1	Outside of Model Area	M57-W91	Outside of Model Area
M57-W43	Outside of model area - no topography	M57-W71	Outside of Model Area	M57-W86	Outside of Model Area
M57-W74	Outside of model area - no topography	M57-W107	Outside of Model Area	M57-W135	Outside of Model Area
M57-W42	Outside of model area - no topography	M57-W34	Outside of Model Area	M57-W141	Outside of Model Area
M57-W120	Outside of model area - no topography	M57-W87	Outside of Model Area	M57-W143	Outside of Model Area

Drill Hole ID	Comments	Drill Hole ID	Comments	Drill Hole ID	Comments
M56-W20	Outside of model area - no topography	M57-W30	Outside of Model Area	M57-W132	Outside of Model Area
M56-W17	Outside of model area - no topography	M57-W105	Outside of Model Area	M57-W137	Outside of Model Area
M57-W121	Outside of model area - no topography	M57-W111	Outside of Model Area	M57-W136	Outside of Model Area
M56-W16	Outside of model area - no topography	M57-W94	Outside of Model Area	M57-W85	Outside of Model Area

Table 6.6: Drill holes Used in the Model

Drill Holes Used In Model						
BC-10-113	CW-09-38	CW-09-68	CW-09-98	M56-W09	M57-W35	M57-W77
BC-10-117	CW-09-39	CW-09-69	CW-09-99	M56-W11	M57-W36	M57-W80
BC-10-118	CW-09-41	CW-09-70	CW-10-105	M56-W12A	M57-W37	M57-W82
CW-08-09	CW-09-42	CW-09-71	CW-10-110	M56-W13	M57-W38	M57-W83
CW-08-11	CW-09-43	CW-09-72	CW-10-111	M56-W18	M57-W39	M57-W89
CW-08-13	CW-09-44	CW-09-73	CW-10-112	M56-W21	M57-W40	M57-W95
CW-08-16	CW-09-45	CW-09-74	CW-10-114	M56-W22	M57-W45	M57-W98
CW-08-17	CW-09-46	CW-09-75	CW-10-116	M56-W23	M57-W46	PC-1
CW-08-20	CW-09-47	CW-09-76	CW-10-119	M56-W24	M57-W47	PC-10
CW-09-100	CW-09-48	CW-09-77	CW-10-121	M56-W25	M57-W48	PC-11
CW-09-101	CW-09-49	CW-09-78	CW-10-122	M56-W26	M57-W49	PC-12
CW-09-102	CW-09-50	CW-09-79	CW-10-123	M56-W3	M57-W51	PC-14
CW-09-21	CW-09-51	CW-09-80	CW-10-125	M56-W4A	M57-W52	PC-17
CW-09-22	CW-09-52	CW-09-81	CW-10-126	M57-W101	M57-W53	PC-18
CW-09-23	CW-09-53	CW-09-83	CW-10-127	M57-W103	M57-W54	PC-19
CW-09-24	CW-09-54	CW-09-84	CW-10-128	M57-W108	M57-W55	PC-2
CW-09-25	CW-09-55	CW-09-85	CW-10-129	M57-W109	M57-W57	PC-20
CW-09-26	CW-09-56	CW-09-86	CW-10-130	M57-W110	M57-W58	PC-21
CW-09-27	CW-09-57	CW-09-87	CW-10-131	M57-W114	M57-W59	PC-22
CW-09-28	CW-09-58	CW-09-88	CW-10-132	M57-W116	M57-W60	PC-23
CW-09-29	CW-09-59	CW-09-89	CW-10-133	M57-W117	M57-W61	PC-3
CW-09-30	CW-09-60	CW-09-90	CW-10-136	M57-W126	M57-W63	PC-4
CW-09-31	CW-09-61	CW-09-91	CW-10-137	M57-W148	M57-W64	PC-5
CW-09-32	CW-09-62	CW-09-92	CW-10-138	M57-W159	M57-W65	PC-6
CW-09-33	CW-09-63	CW-09-93	CW-10-139	M57-W27	M57-W66	PC-7
CW-09-34	CW-09-64	CW-09-94	CW-11-140	M57-W29	M57-W70	PC-8
CW-09-35A	CW-09-65	CW-09-95	CW-11-141	M57-W31	M57-W73	PC-9
CW-09-36	CW-09-66	CW-09-96	CW-11-142	M57-W32	M57-W75	
CW-09-37	CW-09-67	CW-09-97	CW-11-143	M57-W33	M57-W76	

6.4.5.2 Deposit Modelling

Marston developed a stratigraphic model using Ventyx MineScape software. This produced a 3-D model of the gently dipping strata in the Lower Copper Bearing Sequence (LCBS; Domino, Red Massive and Gray Laminated). The contacts within the LCBS rock units were modelled as surfaces within confining strata. The stratigraphic model used a planar interpolator for the trend and thickness for the units, while a finite element method interpolator was used for the surfaces. During gridding of the stratigraphy, thicknesses were smoothed with Ventyx's Stratmodel thickness smoothing routine. The surfaces did not require smoothing because the finite element method interpolator contains a smoothing routine in the software

While information was available for the Gray Siltstone, Red Laminated and Copper Harbour sandstone, the dataset for each of these units was incomplete. Lithologic entries did not exist for all of the units in each drill hole. In some holes, the lithology was entered as undifferentiated Gray Laminated; this would result in a potentially false zero thickness for a unit, and would prevent using a stratigraphic model across all of the LCBS units within the stratigraphic model. This issue was resolved by using an external thickness grid method and adding or subtracting the thickness from the modelled unit floor and roof elevations.

Thus the thicknesses, where reported, of the Gray Siltstone, Red Laminated, and Copper Harbour Sandstone were interpolated using a finite element method interpolator. These thicknesses were added or subtracted from the Gray Laminated roof or Domino / Copper Harbour Siltstone floor. Using this method, Marston was able to create a contiguous and continuous surface for each of the units from the Gray Siltstone through the Copper Harbour Sandstone. Figure 6.1, Typical Stratigraphic Model Cross Section S-N, and Figure 6.2, Typical Stratigraphic Model Cross Section W-E, show a typical stratigraphic cross section of the modelled units along a generally north-south and east–west direction, respectively.

While the Red Laminated would add some tonnage to the resource estimate, the ultimate goal of this exercise was to eventually interpolate grade across all units that may be intercepted within the extraction of the Copperwood Resource. This will aid in future mine design and provide a better estimation of potential dilution.

The primary Copper hosts in the LCBS are the Domino, the Red Massive sandstone and the Gray Laminated while the overlying Red Laminated siltstone and underlying Copper Harbour formation which consists of the Copper Harbour sandstone and conglomerate and Copper Harbour Siltstone may contain ore grade mineralisation.

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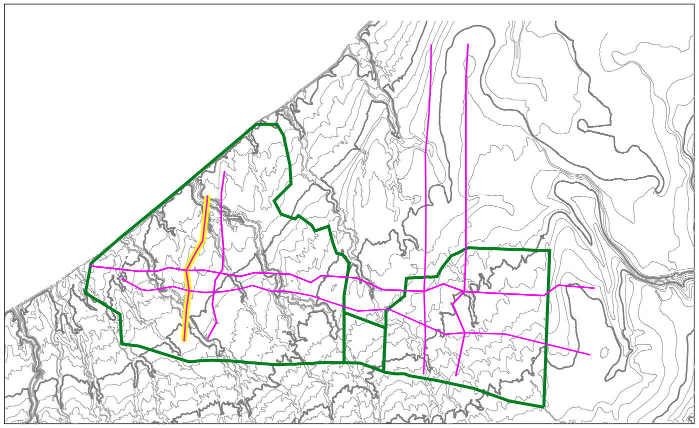
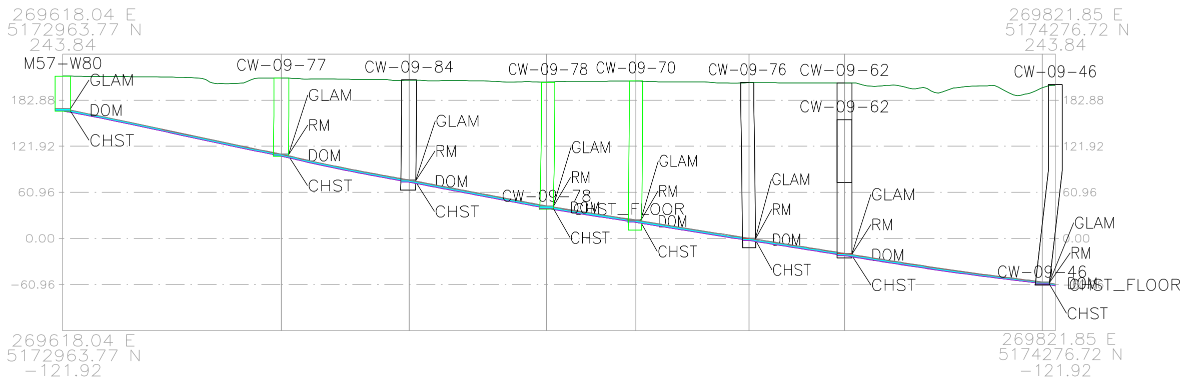
KEY MAP





100 50 0 100 Metres 200 300 400

SCALE 1:10,000

LEGEND

- Model Limit
- Cross-Section
- Active Cross-Section
- Topography
- Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

TYPICAL STRATIGRAPHIC MODEL
CROSS-SECTION S-N
SECTION 06

PROJECT No. 1401359

Rev. 01

FIGURE 6.1

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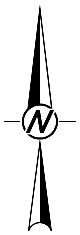
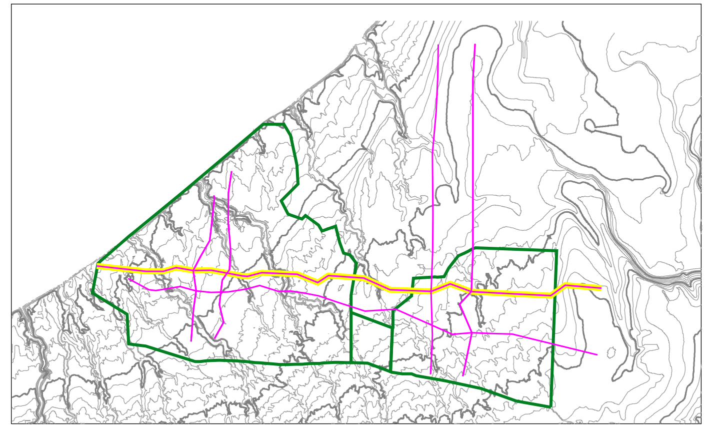
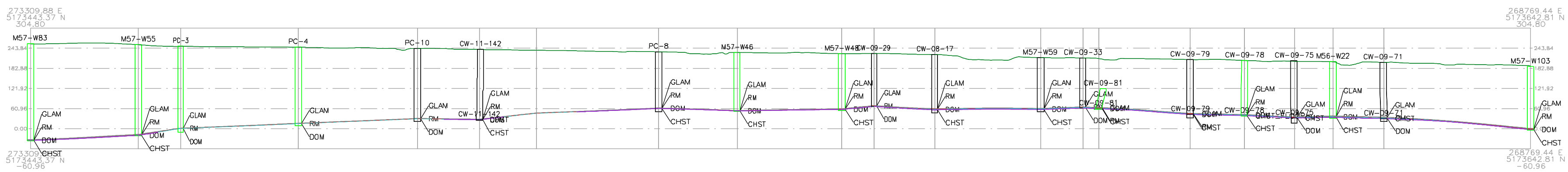


KEY MAP





250 125 0 250 Metres 500 750 1000

SCALE 1:20,000

LEGEND

Model Limit

Cross-Section

Active Cross-Section

Topography

Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

TYPICAL STRATIGRAPHIC MODEL
CROSS-SECTION W-E
SECTION 26

PROJECT No. 1401359

Rev. 01

FIGURE 6.2

1 in
0

6.4.5.3 Deposit Data Analysis

Descriptive Statistics

The assay statistics shown in Table 6.7, Descriptive Statistics for Drill Hole Composites, display the relatively consistent nature of the mineralisation. The mineralised stratigraphy in the Copperwood Project area continues into Section 6 but the primary copper host, the Domino, thins from over 1.5 m in the Copperwood project area to about 0.6 m in Section 6. In addition, the poorly mineralised Red Massive sandstone becomes somewhat thicker in Section 6. Despite this, the grade continuity of the combined composite (Domino, Red Massive and Gray Laminated) is very strong. Mining in Section 6 will need to extract all of the LCBS that meets the cut-off criteria to make a mineable thickness. The differences in the grade and thickness of the LCBS between the Copperwood Project and Section 6 are apparent in Table 6.7. Also apparent are the very low standard deviation and the coefficient of variation (standard deviation / mean) measures of dispersion for Section 6 and the Copperwood Project.

Table 6.7: Descriptive Statistics for Drill hole Composite

Copperwood Project	Copper wt.%	LCBS	Copper X
		Thickness (m)	Thickness (>1.5m)
Mean	1.74	2.69	4.79
Standard Deviation	0.45	0.80	1.98
Minimum	0.83	0.52	0.68
Maximum	3.13	4.82	8.31
Count	151	151	151
Coefficient of Variation	0.26	0.30	0.41

Section 6	Copper wt.%	LCBS	Copper X
		Thickness (m)	Thickness (>1.5m)
Mean	1.35	1.98	2.69
Standard Deviation	0.18	0.25	0.53
Minimum	1.04	1.52	1.68
Maximum	1.79	2.44	3.91
Count	33	33	33
Coefficient of Variation	0.13	0.13	0.20

The descriptive statistics from stratigraphic model are shown in Table 6.8. In addition, Table 6.9, below, shows the descriptive statistics for the stratigraphic model regarding drill hole spacing. Figure 6.3, Histogram of Copper (wt.%) Assay, shows a histogram of the copper values. Figure 6.4, Histogram of Silver (g/t), shows the distribution of silver assay data.

Table 6.8: Descriptive Statistics from Stratigraphic Model

Unit	Thickness (m)					
	Average	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis
Gray Laminated	1.10	4.00	0.49	0.47	2.77	10.87
Red Massive	0.34	1.21	0.01	0.18	1.31	3.38
Domino	1.18	2.29	0.06	0.65	-0.08	-1.46
Copper Harbor Siltstone	0.22	0.94	0.02	0.94	1.44	2.04

Table 6.9: Descriptive Statistics for Drill Hole Distances

Description	Number	Units
Number of Distances	199	holes
Minimum Distance	45	m
Maximum Distance	603	m
Mean Distance	168	m
Standard Deviation	96	m

Figure 6.5, Validation of Domino Structure, shows a graph of the validation of the Domino floor from the model and in the drill holes while Figure 6.6, Validation of Domino Thickness, shows the variance between the drill hole data and the Marston model. Figure 6.7, Validations of Red Massive Thickness, shows the validations conducted on the Red Massive Thickness, and Figure 6.8, Validation of Gray Laminated Thickness, shows the validations conducted on Gray Laminated Thickness. Validations were not necessary for the structure of each unit because all units from the stratigraphic model were modelled as contiguous; thus, each floor is adjacent to the lower neighbouring unit's roof.

A suite of maps showing the structure of each seam is shown in the figures below:

- Figure 6.9, Structure and Thickness of Gray Siltstone
- Figure 6.10, Structure and Thickness of Red Laminated
- Figure 6.11, Structure and Thickness of Gray Laminated
- Figure 6.12, Structure and Thickness of Red Massive
- Figure 6.13, Structure and Thickness of Domino
- Figure 6.14, Structure and Thickness of Copper Harbor Siltstone

The slope of the Domino floor is shown in, Figure 6.15, Slope of Domino Structure.

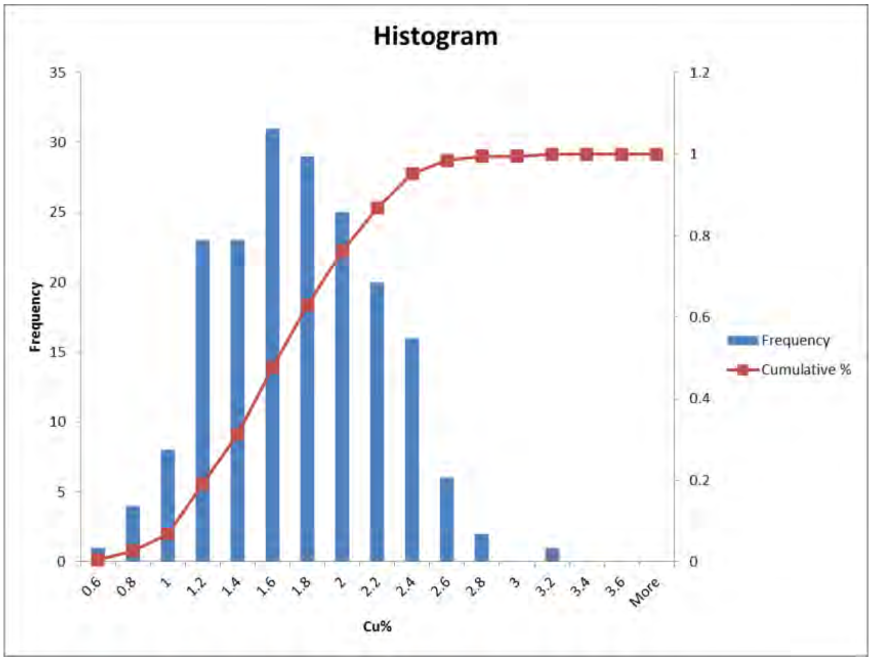


Figure 6.3: Histogram of Copper (Copper wt.%) Assay

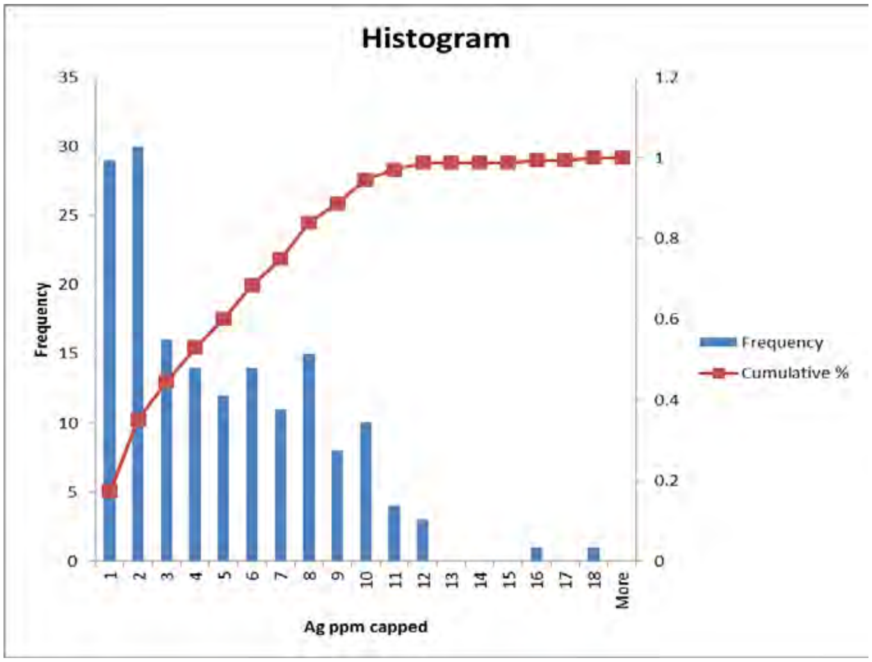


Figure 6.4: Histogram of Silver (g/t)

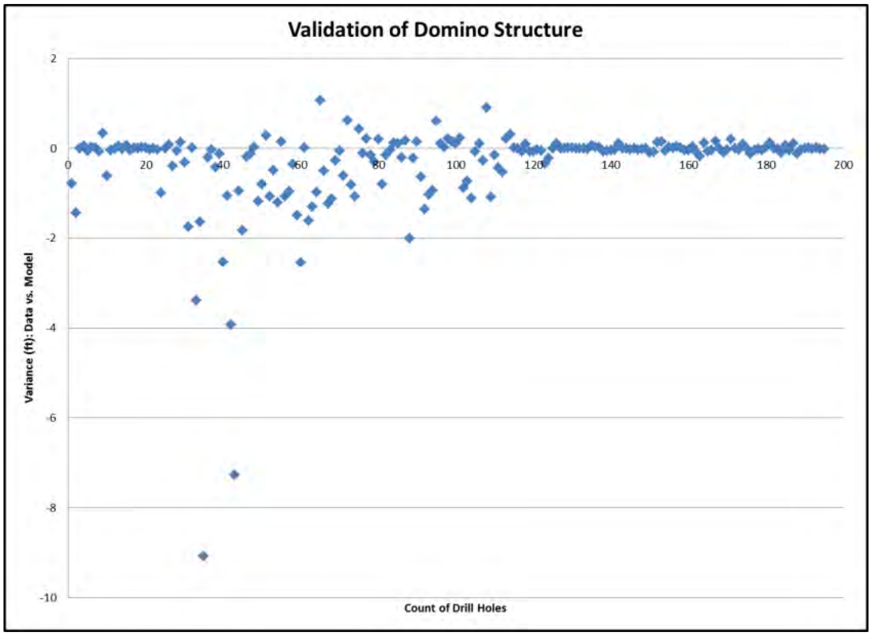


Figure 6.5: Validation of Domino Structure

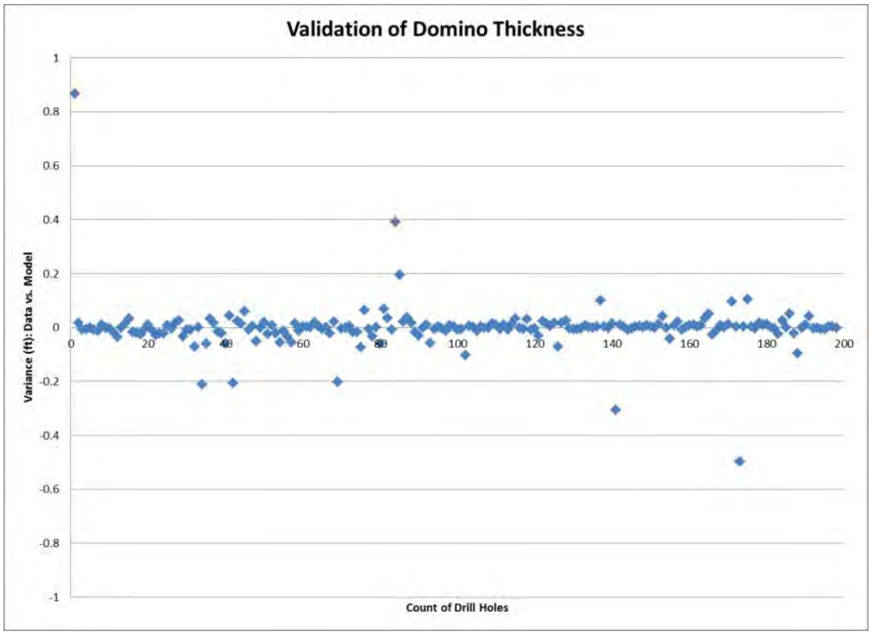


Figure 6.6: Validation of Domino Thickness

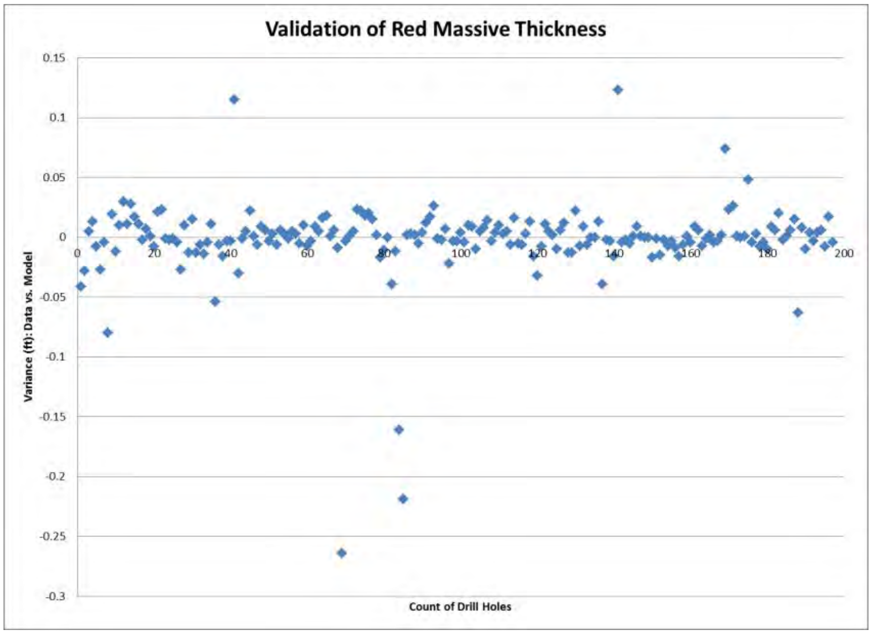


Figure 6.7: Validation of Red Massive Thickness

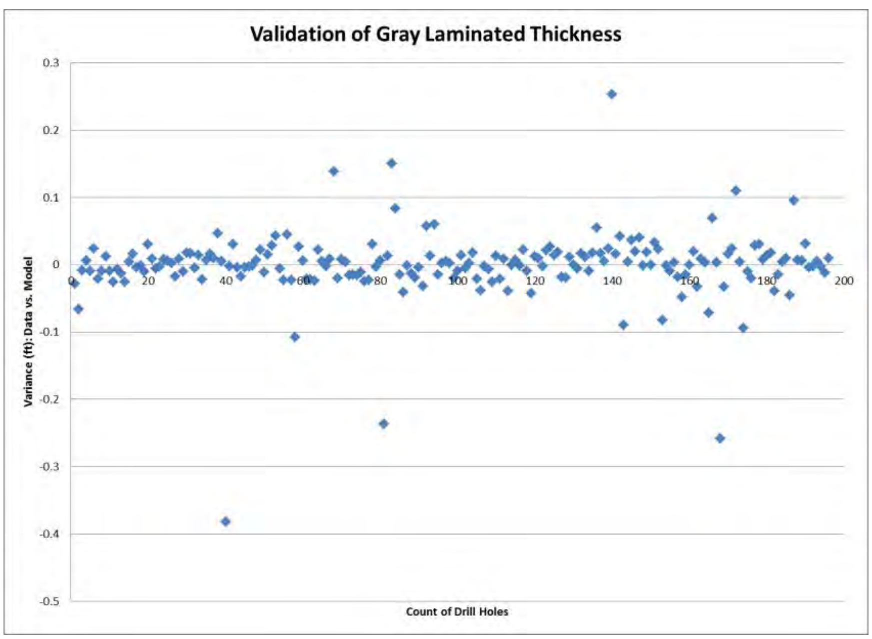


Figure 6.8: Validation of Gray Laminated Thickness

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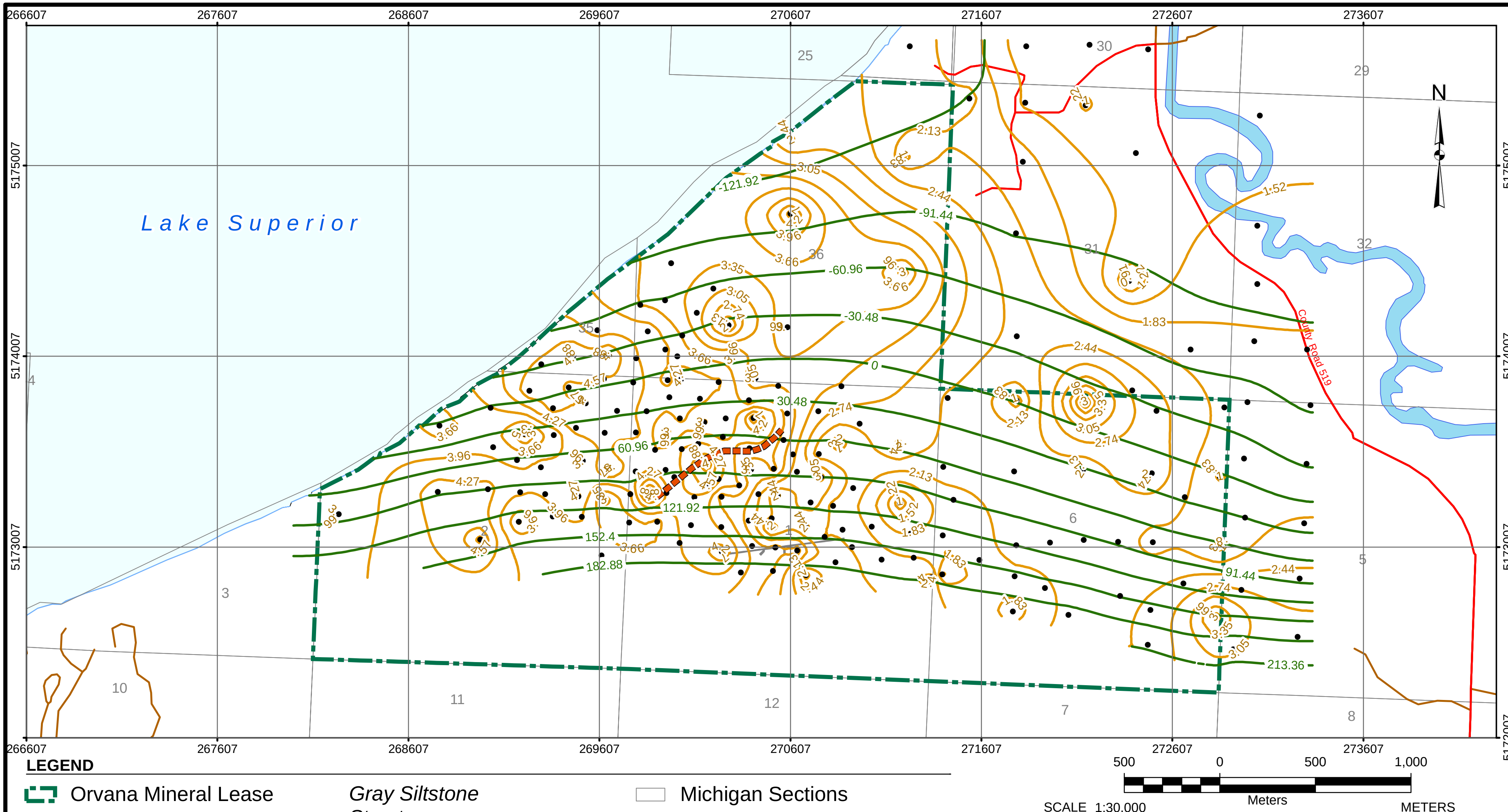


LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out
- *Gray Siltstone Structure Contour Interval = 30.48 m*
- *Gray Siltstone Thickness Contour Interval = 0.3048 m*
- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

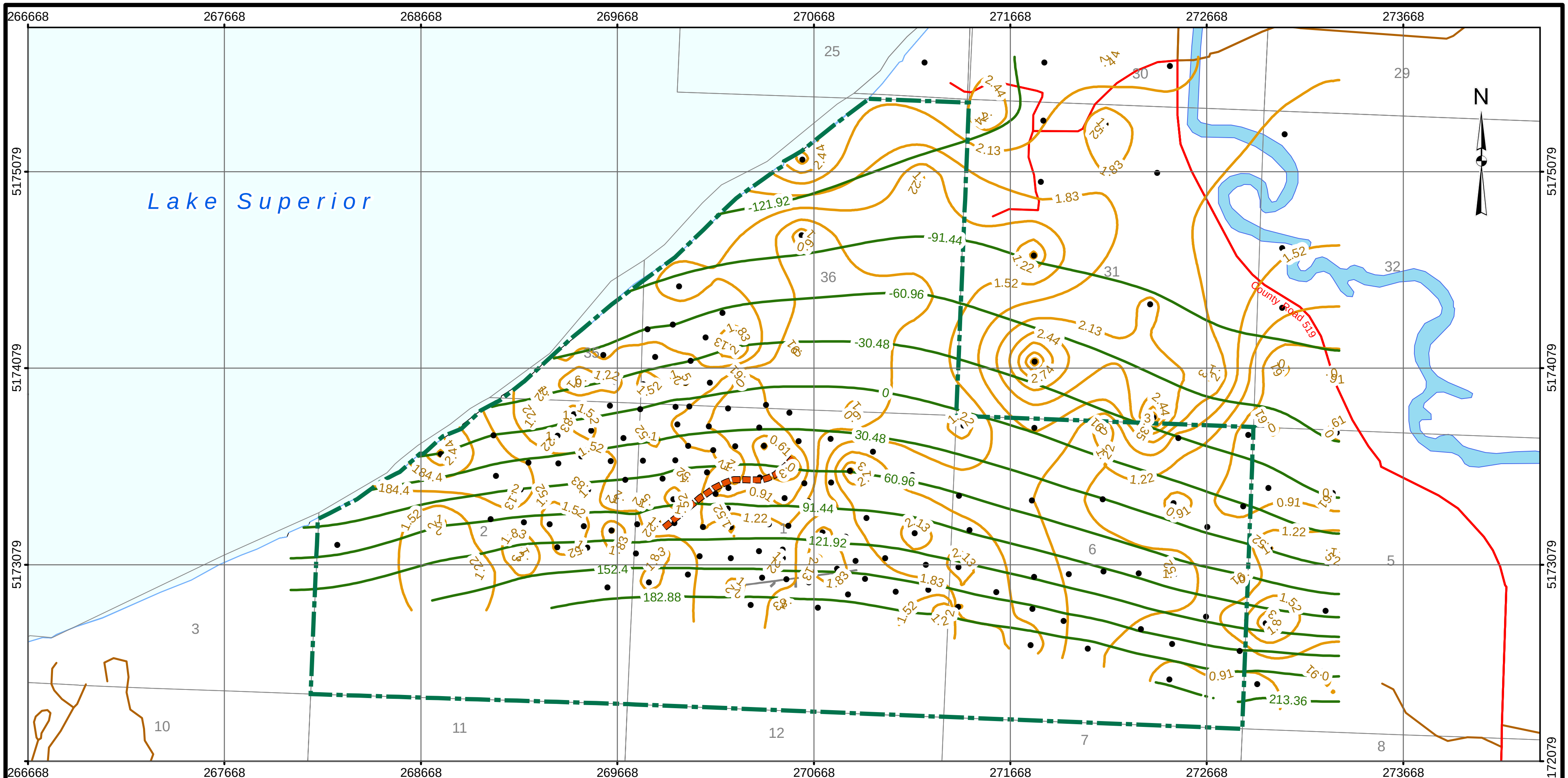
STRUCTURE AND THICKNESS
GRAY SILSTONE

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

FIGURE: 6.9

E:\CopperWood\GIS\MapFiles\Fig6.10_Highland_ANSI_A_8_5x11_RedLam_Landscape.mxd



LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out
- *Red Laminated Structure Contour Interval = 30.48 m*
- *Red Laminated Thickness Contour Interval = 0.3048 m*
- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

STRUCTURE AND THICKNESS RED LAMINATED

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014	**FIGURE: 6.10**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

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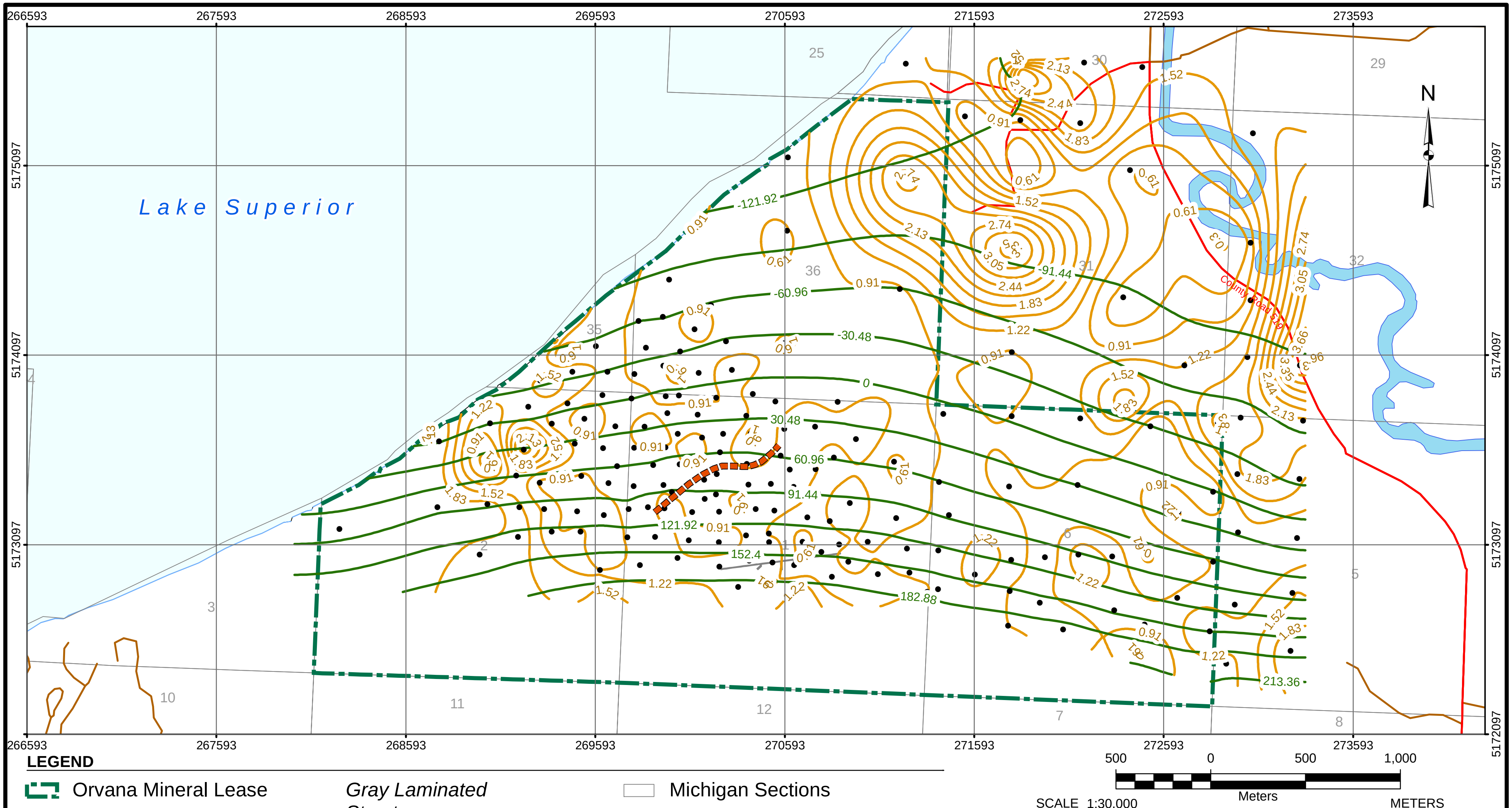

LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out
- *Gray Laminated Structure Contour Interval = 30.48 m*
- *Gray Laminated Thickness Contour Interval = 0.3048 m*
- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

STRUCTURE AND THICKNESS
GRAY LAMINATED

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014	**FIGURE: 6.11**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

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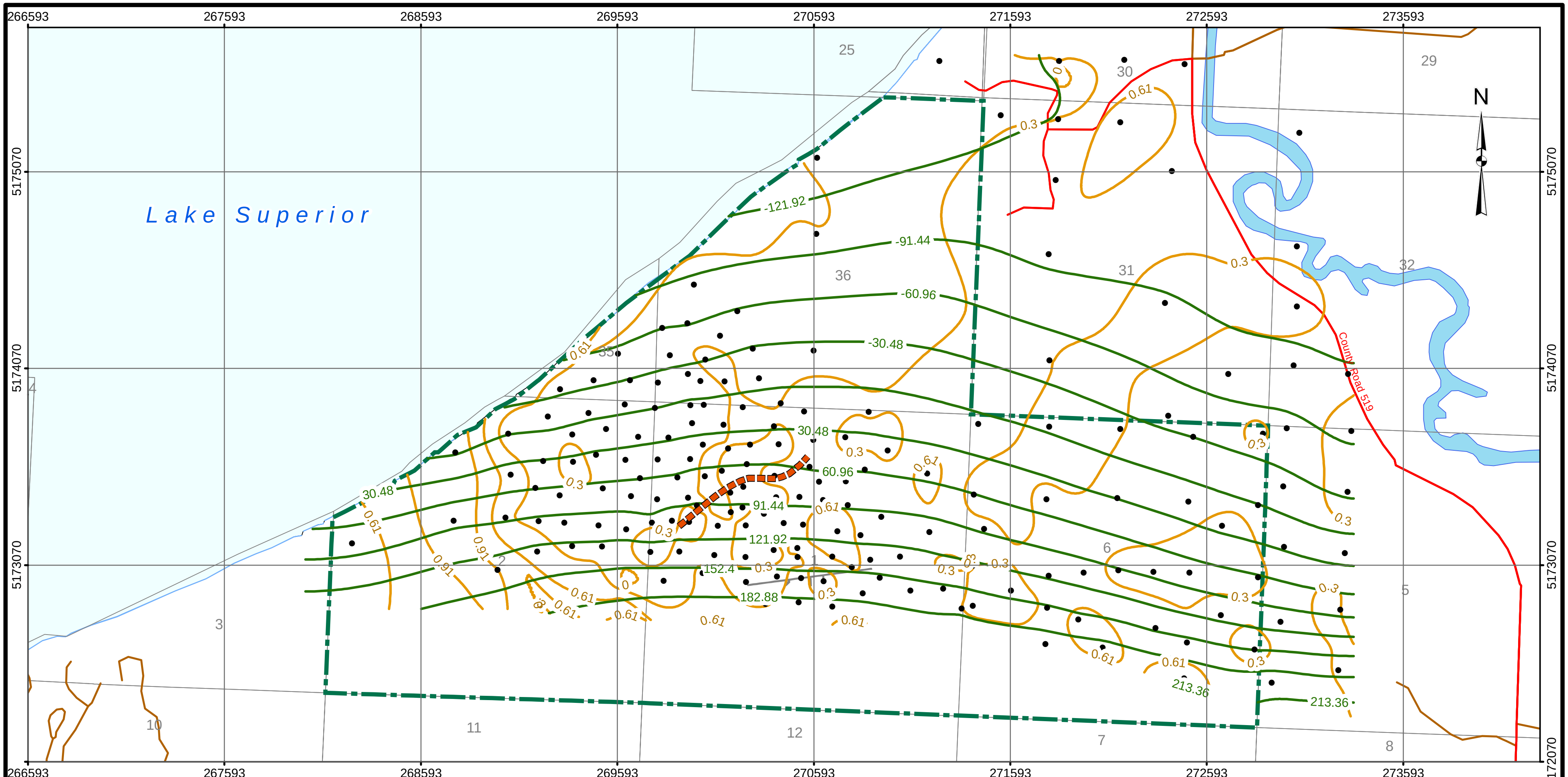

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SCALE 1:30,000 Meters METERS

LEGEND

Orvana Mineral Lease	*Red Massive Structure Contour Interval = 30.48 m*
Existing Drill Hole	*Red Massive Thickness Contour Interval = 0.3048 m*
Fault	Michigan Sections
Mined Out	County Road 519
	Road
	Lake
	River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

STRUCTURE AND THICKNESS
RED MASSIVE

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014	**FIGURE: 6.12**	
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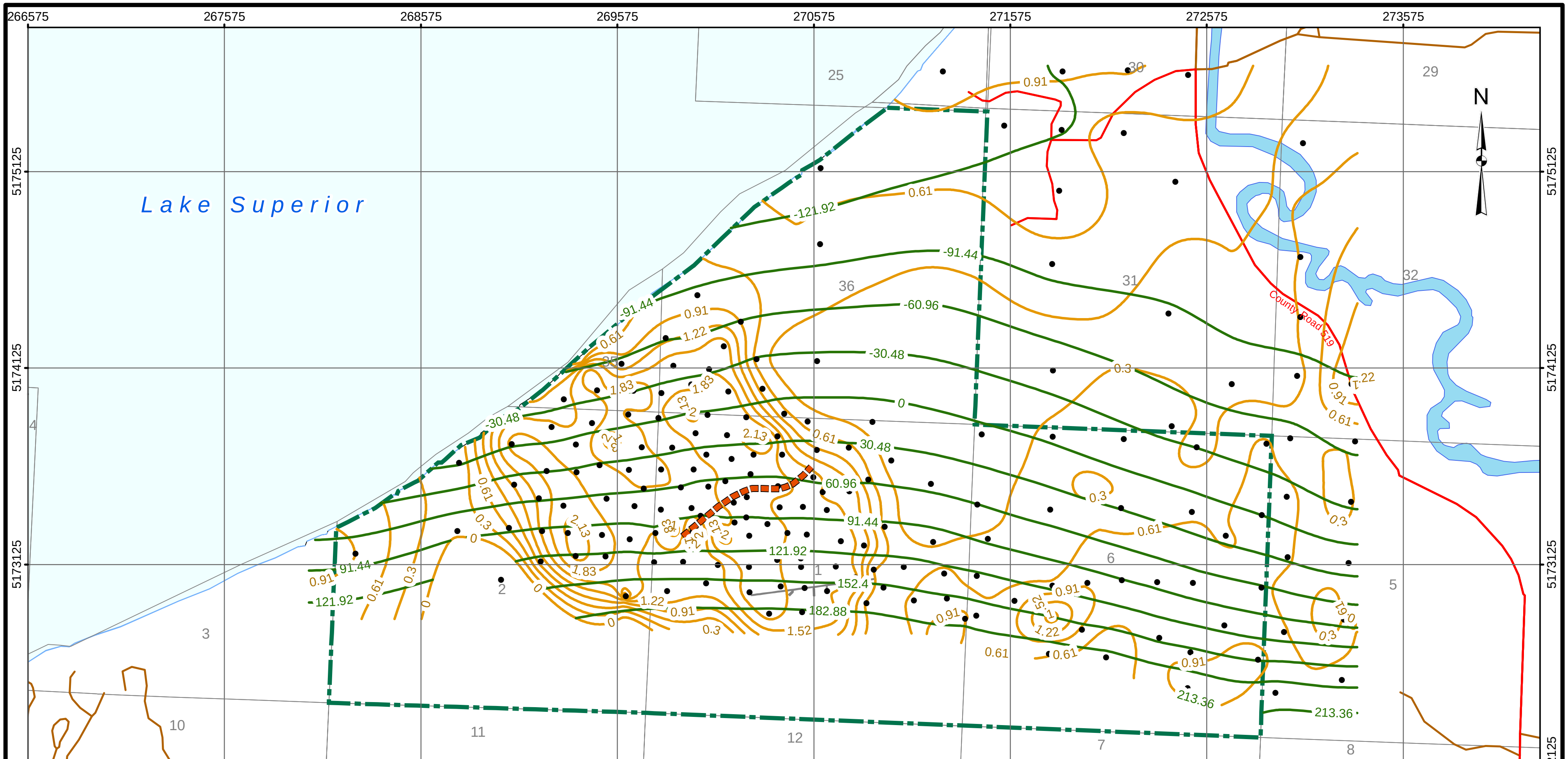

LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out
- *Domino Structure Contour Interval = 30.48 m*
- *Domino Thickness Contour Interval = 0.3048 m*
- Michigan Sections
- County Road 519
- Road
- Lake
- River

500 0 500 1,000

Meters

SCALE 1:30,000 METERS

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

STRUCTURE AND THICKNESS DOMINO

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014	**FIGURE: 6.13**	
REVIEW	JdW	01 Apr. 2014		

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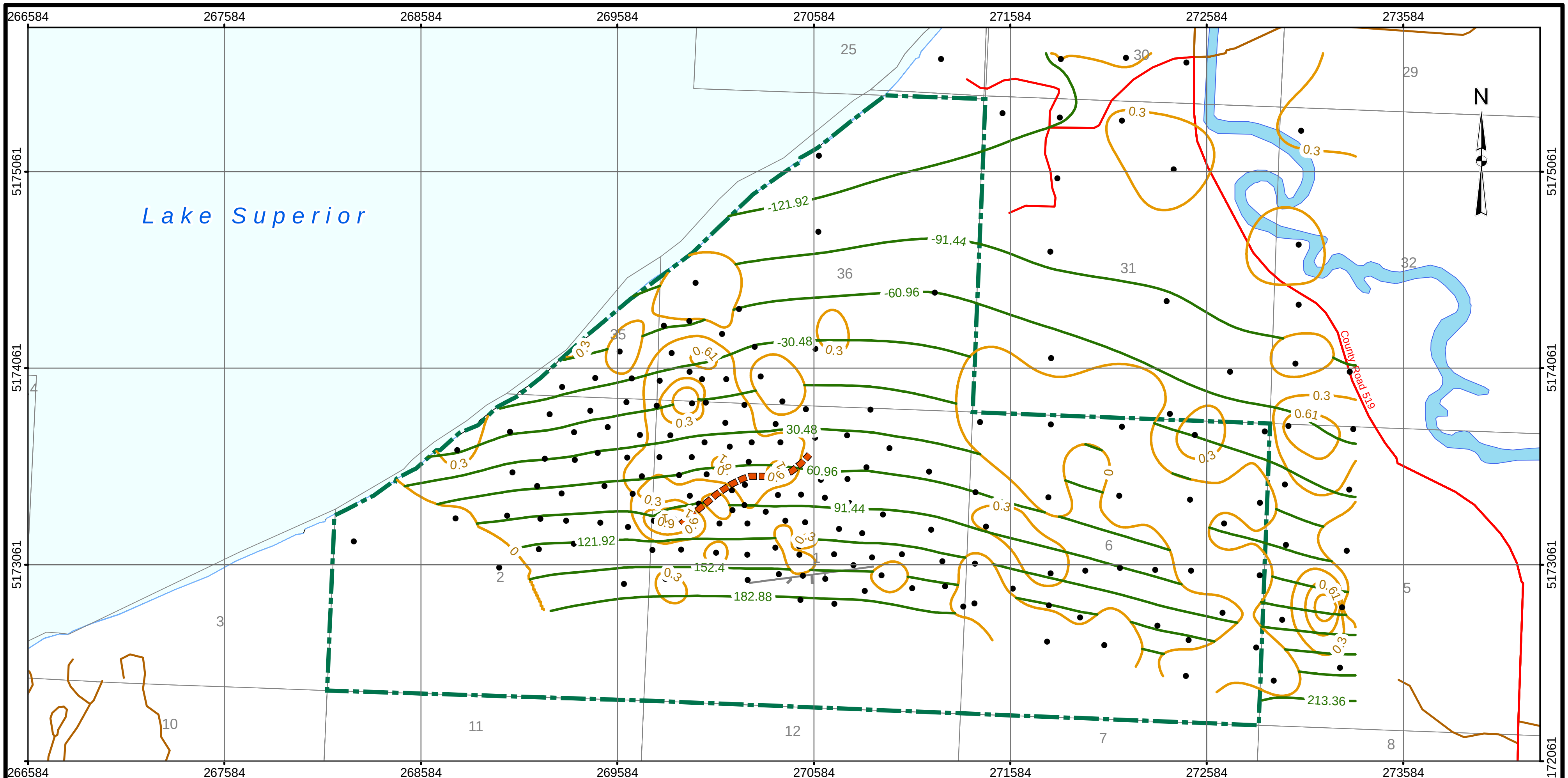

LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out
- *Copper Harbor Siltstone Structure Contour Interval = 3.048 m*
- *Copper Harbor Siltstone Thickness Contour Interval = 0.3048 m*
- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

STRUCTURE AND THICKNESS
COPPER HARBOR SILTSTONE

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014	**FIGURE: 6.14**	
REVIEW	JdW	01 Apr. 2014		

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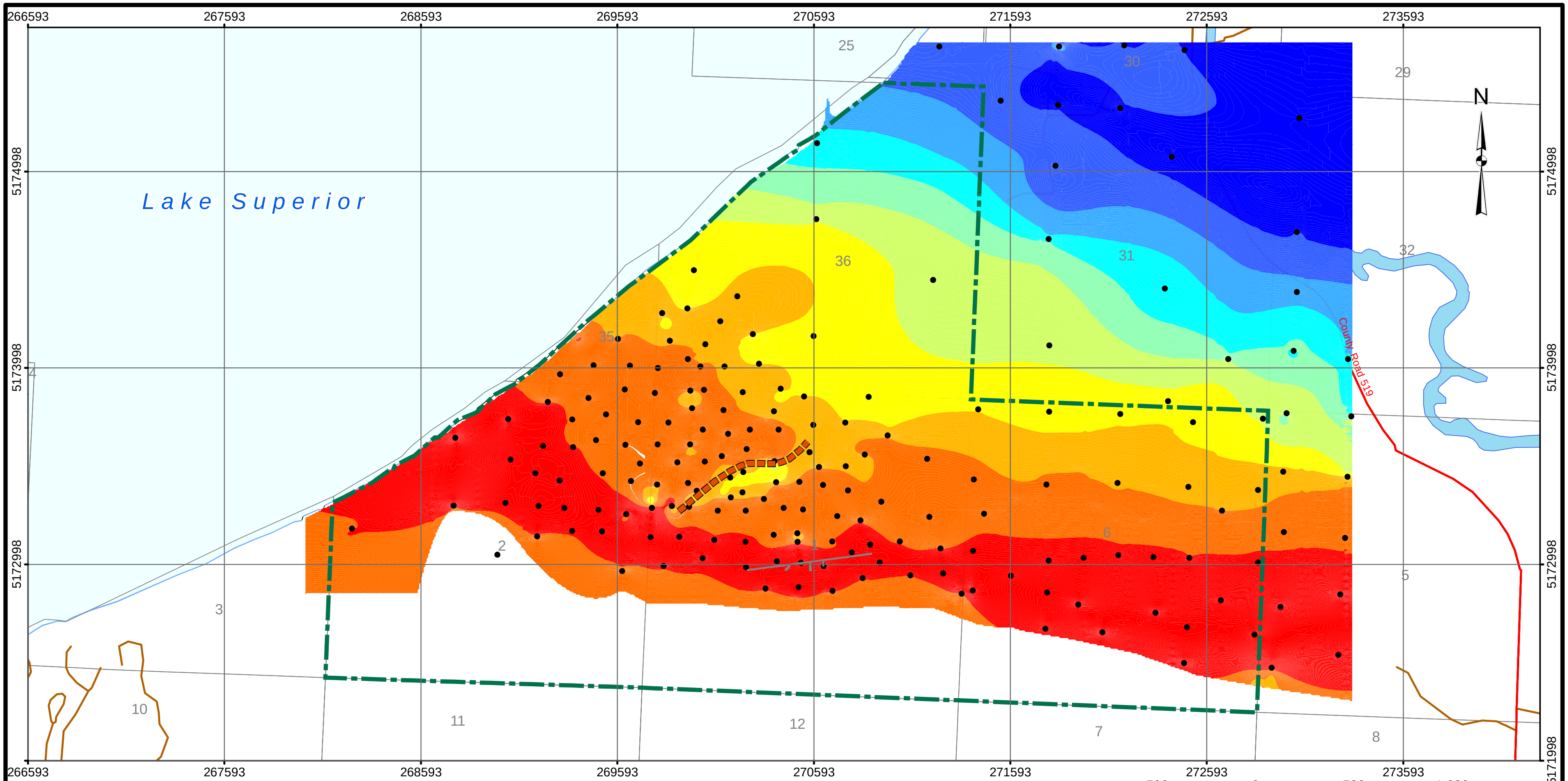


LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out

Slope (%)

- < 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- 10 - 12
- 12 - 14
- 14 - 16
- 16 - 20
- > 20

- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

SLOPE OF DOMINO STRUCTURE (%)

Golder Associates

PROJECT		1401359	FILE No.
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN REV. 0
GIS	JNS	14 Mar. 2014	**FIGURE: 6.15**
CHECK	JdW	01 Apr. 2014	
REVIEW	JdW	01 Apr. 2014	

Extreme Values

Marston's inspection of the copper values in the 2011 technical report agreed with the conclusions of AMEC in 2010 and 2011 technical report filings for the Copperwood Project and for Section 6; that is, the composite data did not show high outliers that would justify the use of a cap grade applied to copper composites. The coefficient of variation for the population was low. Grade capping was not applied to copper values.

Silver values did exhibit some extreme values that needed evaluation. Seven sample assays exist in the data base above three standard deviations over the mean, with a high value of 108 g/t. If not capped, these samples would have a disproportionate impact on the composite values. These samples represented less than 0.3% of the data but produced blocks during an early evaluation that comprise about 1% of the model at grades above the mean plus three standard deviations. A simplified approach to capping was taken; outlier values were reduced to the mean plus three standard deviations. A cap grade for silver of 25 g/t was used in this resource estimate.

Table 6.10, below, shows the block model statistics regarding interpolated assay data within the model before and after the capping of the silver grade.

Table 6.10: Block Model Statistics

Model Type	Inverse Distance		Nearest Neighbor	
Attribute	Copper (wt.%)	Silver (g/t)	Copper (wt.%)	Silver (g/t)
Mean	1.67	3.42	1.71	3.47
Minimum	0.80	0.00	0.00	0.00
Maximum	6.51	25.00	8.72	25.00
Standard Deviation	0.70	3.79	0.88	4.86
Count	116,156	116,033	116,156	116,033
Coefficient of Variation	0.42	1.11	0.52	1.40

6.4.5.4 Composting

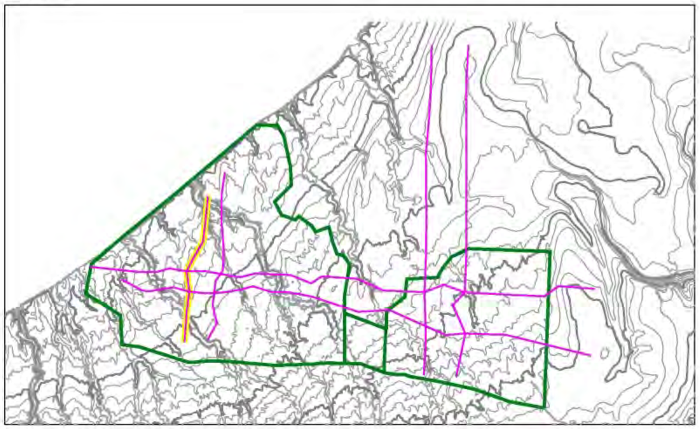
Marston defined potentially economic mineralisation as instances where the copper grade in a block was above 0.8 wt.% copper. Each block was determined individually. To determine whether the full height of blocks in a 30 by 30 m area met grade and thickness criteria, the copper grade between the roof and floor of the zones of the mineralisation was composited. These composites were then gridded and contoured and used to assist in delineating the boundary of potential extraction. While the floor of the mineralisation tended to be along the contact between the Domino and Copper Harbour Siltstone, there were exceptions where the grade of the Domino, in close proximity to the floor, was not above cut-off, and the block grade was below 0.8 wt.% copper. In this case, the floor of the mineralisation was placed within the Domino unit rather than at the contact.

Figure 6.16 shows typical cross sections of the block model along the dip of the main Copperwood resource, while Figure 6.17, Typical Block Model Cross Section S-N, shows the grade along the dip of the Section 6 portion of the resource. Figure 6.18, Typical Block Model Cross Section W-E, shows the cross sect on along the strike of both the main Copperwood Project and Section 6 blocks. The cross sections display the block grades interpolated by the block model.

For the roof, the typical extent of the economic mineralised zone was the contact between the Red Laminated and Gray Laminated siltstones. Similar to the determination of the mineralised zone floor, exceptions existed for the roof as well. Some parts of the Red Laminated contained sufficient copper grade to make cut-off while in other areas, portions of the Gray Laminated did not meet the 0.8 wt.% copper cut-off grade. In these locations, the roof of the mineralised zone occurs within the Gray Laminated unit. Figure 6.19, Potential Economic Mineralized Zone Thickness, shows a plan view of the block model thickness where copper assay is above the assigned cut-off grade of 0.8 wt.% copper. The composite copper assays are shown in Figure 6.20, Composite Copper (wt.%).

Silver did not influence the determination of the mineralised zone. Composite silver assay contours are shown in Figure 6.21, Composite Silver (g/t).

Path: G:\1401359 Highland\Deliverables\Draft_Report\Figures



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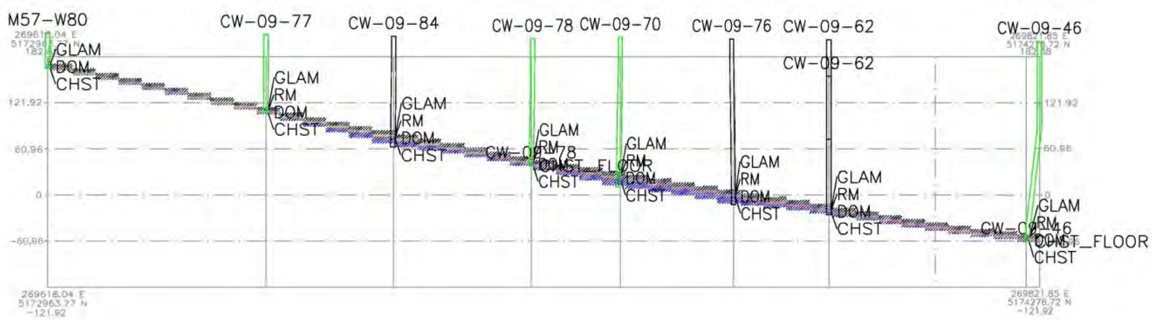


100 50 0 100 Metres 200 300 400

SCALE 1:10,000

LEGEND

- Model Limit
- Cross-Section
- Active Cross-Section
- Topography
- Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

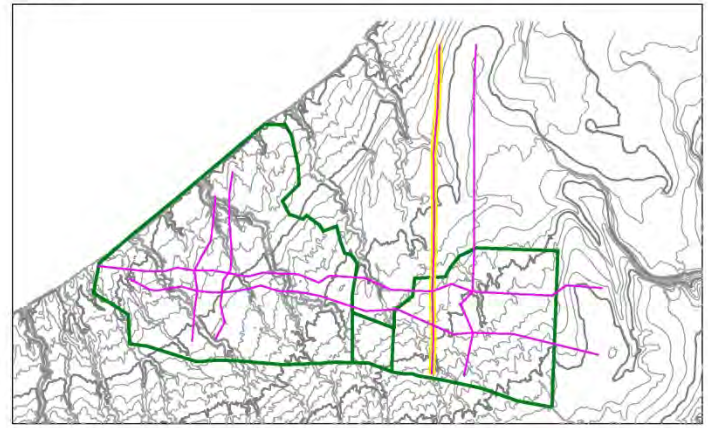
TYPICAL BLOCK MODEL CROSS-SECTION S-N SECTION 06

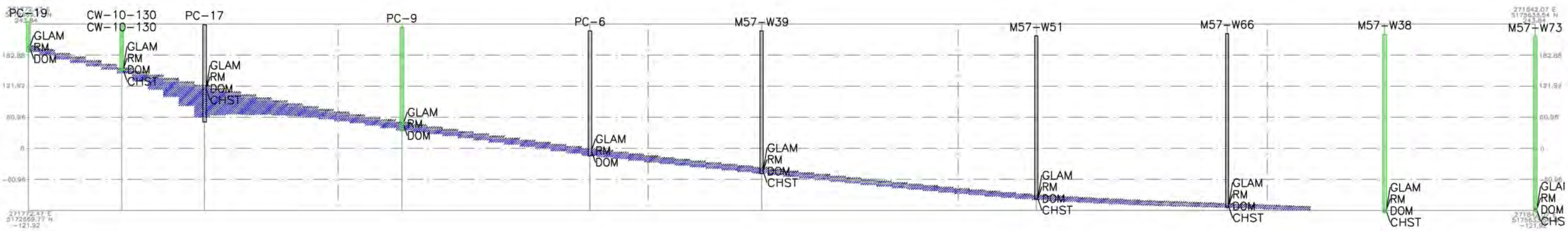
PROJECT No. 1401359

Rev. 01

FIGURE 6.16

Path: G:\1401359 Highland\Deliverables\Draft_Report\Figures





200 100 0 200 Metres 400 600 800

SCALE 1:12,000

LEGEND

- Model Limit
- Cross-Section
- Active Cross-Section
- Topography
- Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

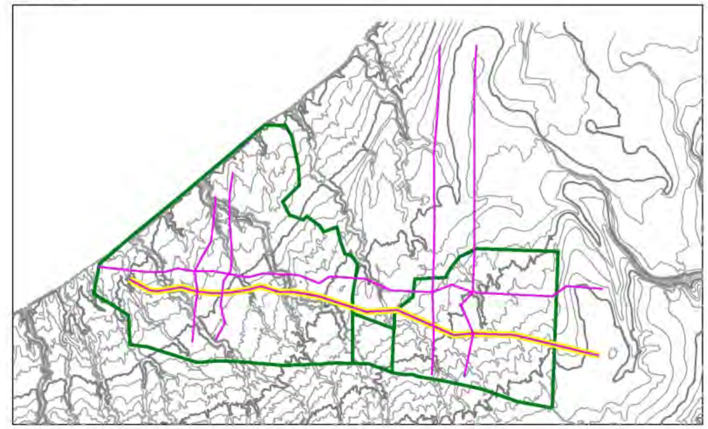
TYPICAL BLOCK MODEL CROSS-SECTION S-N SECTION 19

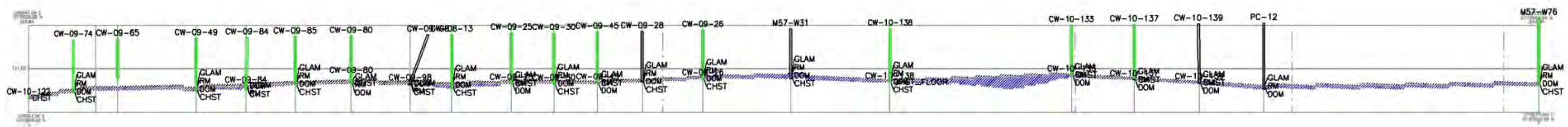
PROJECT No. 1401359

Rev. 01

FIGURE 6.17

Path: G:\1401359 Highland\Deliverables\Draft_Report\Figures





250 125 0 250 Metres 500 750 1000

SCALE 1:20,000

LEGEND

- Model Limit
- Cross-Section
- Active Cross-Section
- Topography
- Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

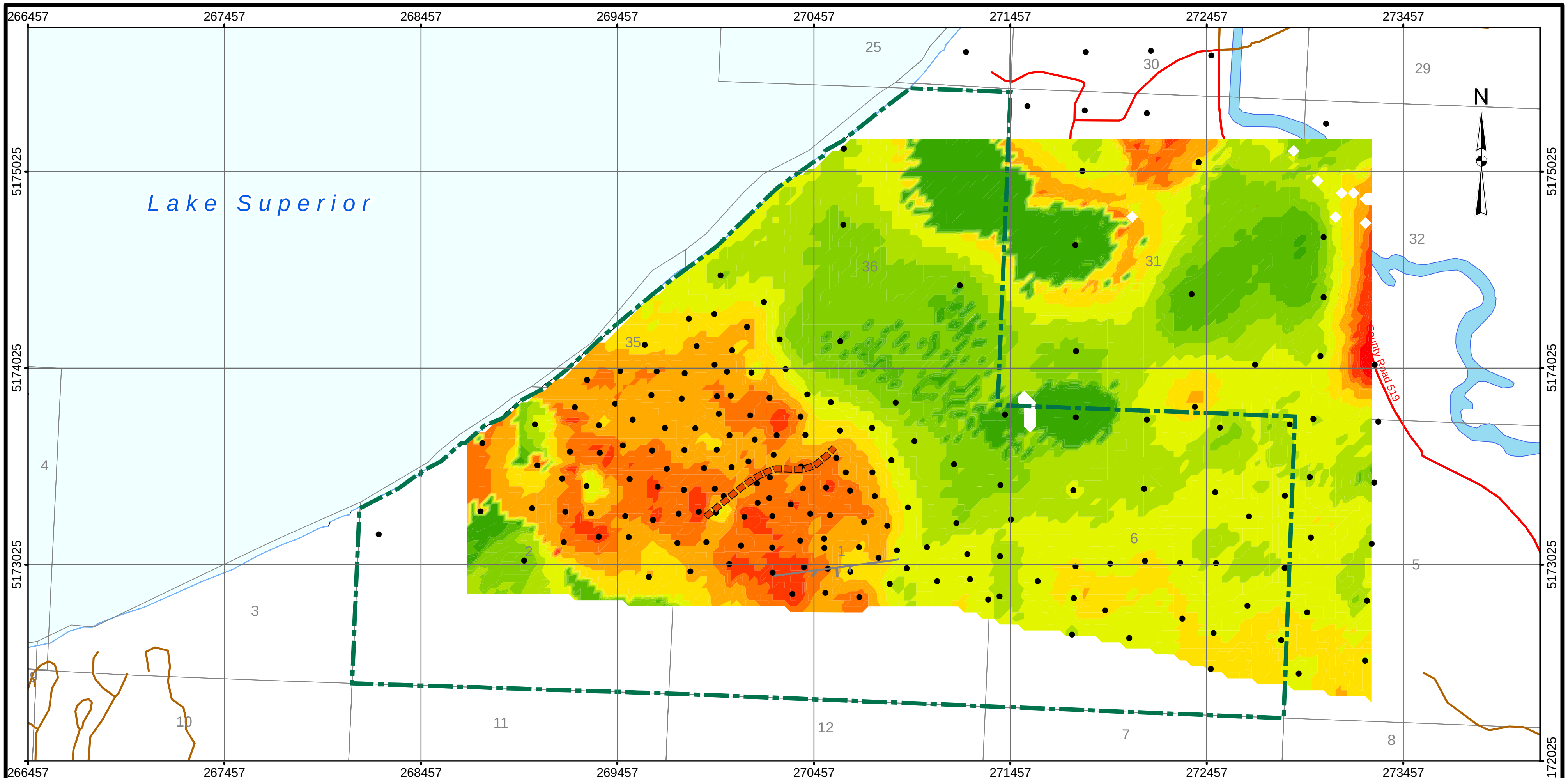
TYPICAL BLOCK MODEL
CROSS-SECTION W-E
SECTION 25

PROJECT No. 1401359

Rev. 01

FIGURE 6.18

E:\CopperWood\GIS\MapFiles\Fig6.19_Highland_ANSI_A_8_5x11_EconMinZone_Landscape.mxd



500 0 500 1,000

Meters

SCALE 1:30,000 METERS

LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out

Mineralized Zone (m)

- < 0 .91
- 1.22
- 1.52
- 1.83
- 2.29
- 2.74
- 3.2
- 3.51
- 4.11
- > 4.88

- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

POTENTIAL ECONOMIC MINERALIZED ZONE THICKNESS (m)

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	17 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	17 Mar. 2014	**FIGURE: 6.19**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

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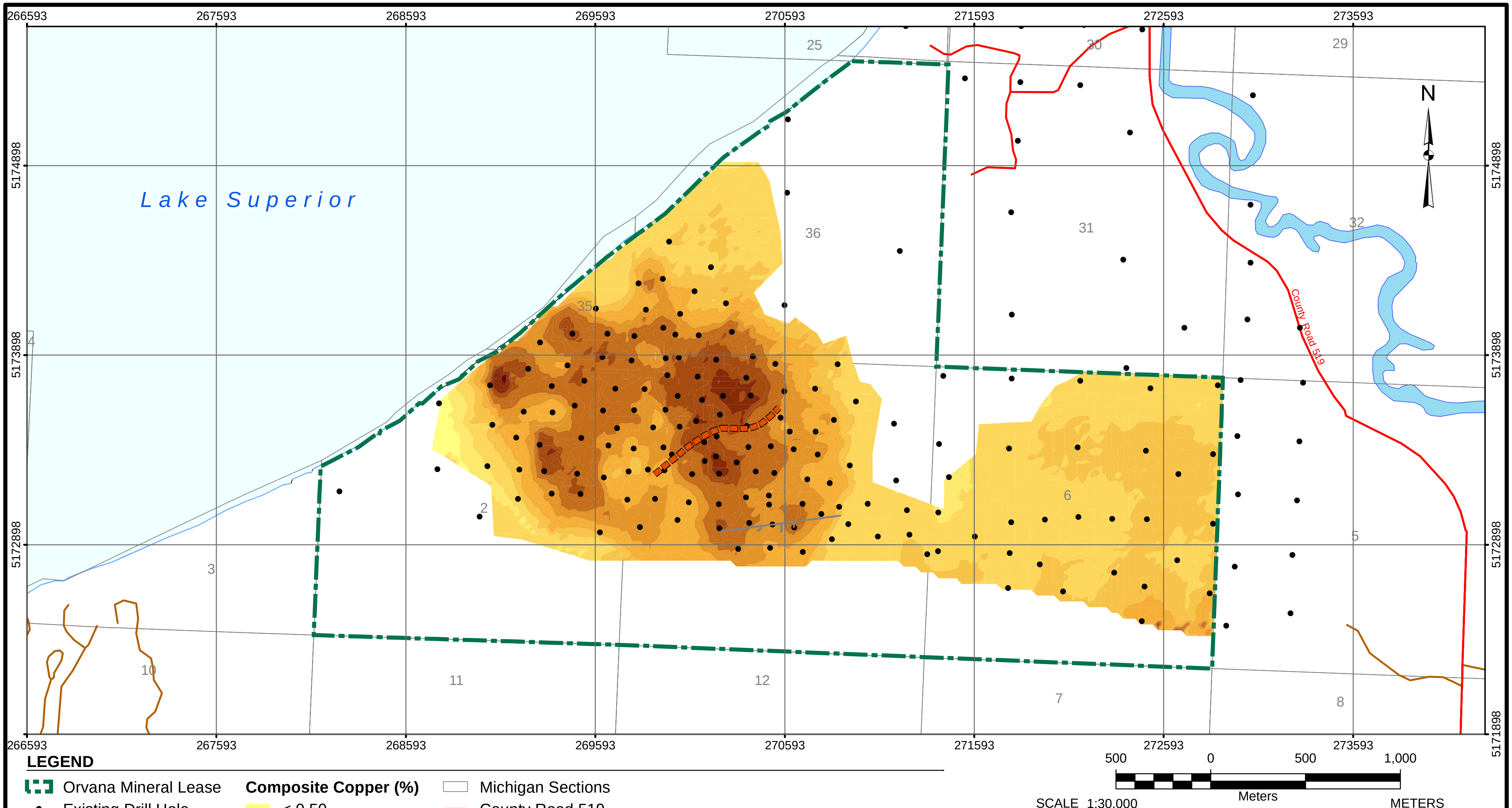

LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out

Composite Copper (%)

- < 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- 1.25 - 1.50
- 1.50 - 1.75
- 1.75 - 2.00
- 2.00 - 2.25
- 2.25 - 2.50
- > 2.50

- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

COMPOSITE COPPER ASSAY
(% Cu)

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014	**FIGURE: 6.20**	
REVIEW	JdW	01 Apr. 2014		

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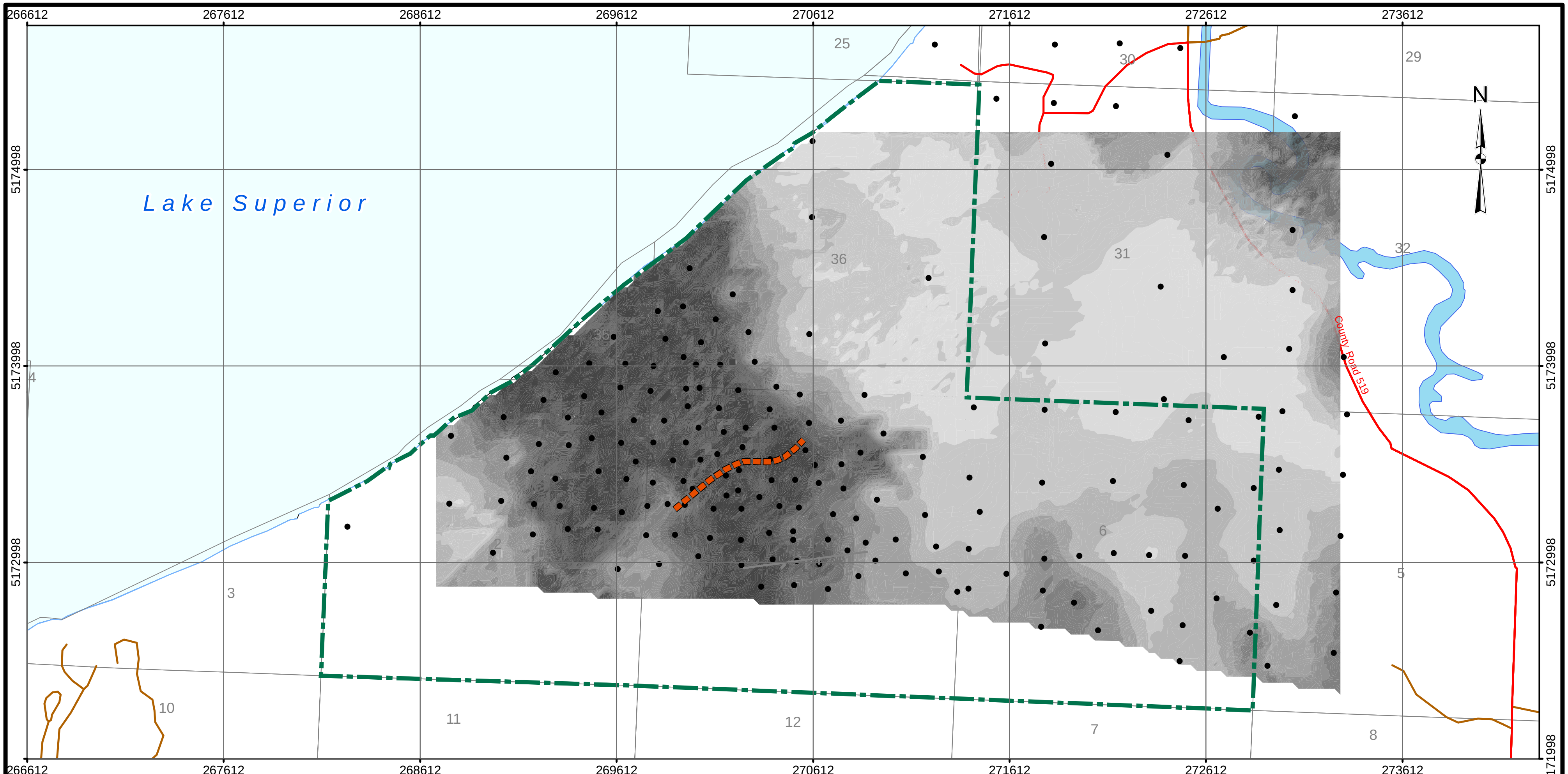


500 0 500 1,000

Meters

SCALE 1:30,000 METERS

LEGEND

- Orvana Mineral Lease
- Existing Drill Hole
- Fault
- Mined Out

Composite Silver (g/t)

- < 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.00 - 3.00
- 3.00 - 3.50
- 3.50 - 4.00
- 4.00 - 4.50
- > 4.50

- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

COMPOSITE SILVER ASSAY
(g/t Ag)

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014	**FIGURE: 6.21**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

6.4.5.5 Variogram Analysis

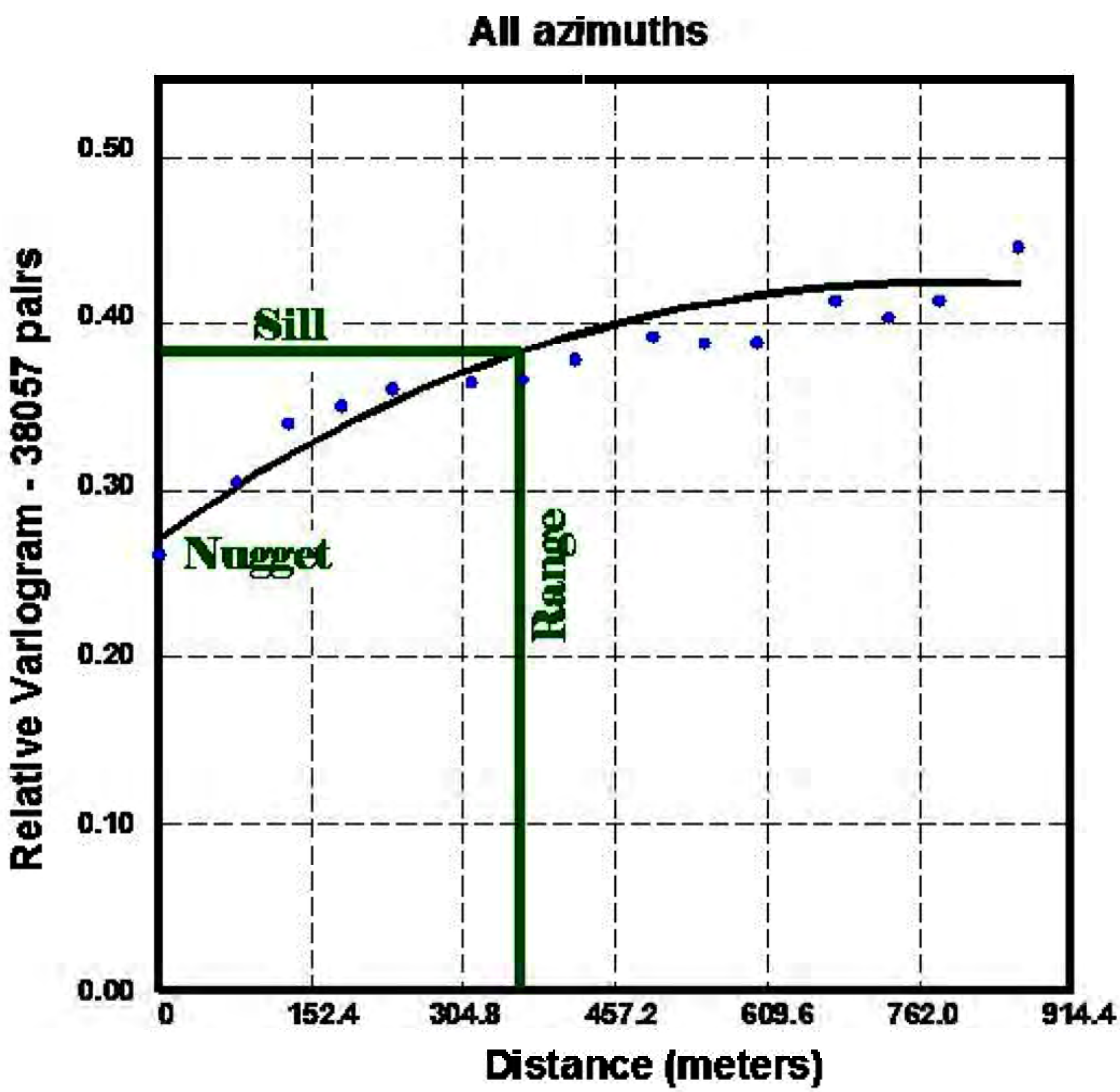
In order to determine reasonable ranges for grade interpolation and to determine Indicated and Measured categories for resources, Marston used variography. An example of the variogram for copper grade is shown in Figure 6.22, Typical Variogram of Copper Grade X Thickness. Variograms were created for copper and silver grades with omnidirectional and aligned azimuths. Typical range for each of the variograms was approximately 365 m.

To evaluate potential anisotropy in the distribution of mineralisation, an azimuth of 315° was used to test for preferred direction of mineralisation. This azimuth would parallel the proposed mains and would be perpendicular to the panels in the main Copperwood Resource area. No significant difference was observed in the variograms' ranges or quality. The lack of apparent anisotropy and structural complications indicated that an inverse distance model should adequately model the resource at the Copperwood Project and Section 6.

6.4.5.6 Block Model and Grade Estimation Procedures

In order to estimate the grade across rock type, Marston created a block model. Blocks within the block model consisted of non-subcelled, orthogonal 30 m by 30 m by 0.15 m (x, y, z) size blocks. These blocks were generated from the existing stratigraphic model. The sparse model does not contain blocks that were outside of the stratigraphic model (Gray Siltstone – Copper Harbour Sandstone). The drill hole grades were interpolated between data points using an inverse distance squared method. To allow better control of the horizontal (within-seam) distribution of the mineralisation within the LCBS block model, the anisotropy of the x and y axes was 1,000 times that of the z axis.

To interpolate grades across the block model, tiered search radii of 245 m, 366 m and 915 m were used. Octant searches were used with a minimum three octants, minimum of three samples per cell, one minimum sample per octant, and three maximum samples per octant. No data transformations were used in the interpolation of the assay data.



LEGEND

Resource Category

Drill Hole Distances (Radius)
- Measured - 182.8 m
- Indicated - 365.8 m
- Inferred - 914.4 m

REFERENCE

PROJECT
COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE
TYPICAL VARIOGRAM OF COPPER GRADE (% Cu) x THICKNESS (m)

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	17 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	17 Mar. 2014	**FIGURE: 6.22**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

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6.4.5.7 Specific Gravity

Orvana collected 172 specific gravity measurements from within the Domino, Red Massive, Gray Laminated and Red Laminated units of the LCBS for the Copperwood Project area. The results were very consistent with a low coefficient of variation. Thirty-seven additional specific gravity measurements were collected within the Section 6 area in 2010 with similar results. Specific gravities were consistently between 2.70 and 2.72.

The block model was updated to set the specific gravity of all blocks in the Red Laminated and Gray Laminated to 2.72 with all other blocks set to 2.70.

6.4.5.8 Model Validation

Nearest Neighbour Model Comparison

In order to validate the block model created with an inverse-distance squared interpolator, Marston created a second block model using a nearest neighbour interpolation method. The block datasets were exported from Mincom. The datasets were reduced to the blocks where the inverse method grade was greater than 0.8 wt.% copper. Statistical results of the mean, maximum and minimum grades in addition to the number of blocks meeting the selection criteria are shown in Table 6.10 (under statistics).

Resources were also checked between the nearest neighbour and inverse distance methods. Due to differing interpolation methods, it was anticipated that the nearest neighbour method would yield a higher grade and lower tonnage. This is exhibited in Table 6.10. Thus it is reasonable to assume that the inverse model can provide an accurate representation of the Copperwood and Section 6 resource.

Visual Validation

Marston inspected the blocks using cross sections of the block model. From these cross sections Marston concluded that the block model adequately interpolates the grade between data points. Figure 6.16 and Figure 6.18, show examples of the block grades and drill hole locations and grades. Marston reviewed cross sections through, or within close proximity to, nearly all of the holes within the resource area. Modelled block grades appeared to reasonably reflect the neighbouring drill hole composites.

6.4.5.9 Historical Resources Classification

The model blocks were categorised based on the distance from the block to the nearest data point (drill hole composite). One half of the range, 183 m based on variography, was used for blocks to be classified as Measured. Blocks were considered Indicated if they were within a distance of 366 m, a distance equivalent to the variographic range. Inferred resources were allowed to extend approximately 914 m from the nearest data point. The search ranges were reduced to half the accepted distance on the edges of the model where either no further data were available for interpolation or, the geology was unfavourable. The model was manually adjusted in peripheral areas.

For the purpose of the Marston Mineral Resource estimates, all Measured and Indicated resources were required to meet the composite grade cut-off of 0.8 wt.% copper and 1.5 m thickness. Inferred resources were not required to meet both of these values, provided the composite thickness multiplied by composite grade was greater than 1.2 m- percent (1.5 m with a mean grade of 0.8 wt.% copper). This case would occur where a thin band of high grade material can maintain a mean grade above cut-off when mining a mineable thickness of 1.5 m.

Boundaries for the Marston Measured and Indicated used dipping polygons of influence. Some smoothing of these ellipsoids was performed by hand to create more realistic blocks for mine planning purposes. Mineral Resource classification boundary polygons for the Copperwood Project are presented in Figure 6.23

6.4.5.10 Silver Values

The silver grades for 2011 Marston Mineral Resource estimate have been estimated using similar estimation parameters as used for the copper grades but were considered by Marston as a by-product and deemed insufficient to pay for extraction alone; further, Marston concluded that extracting the copper mineralisation without the silver is not believed possible. Details regarding the silver metallurgy and mineralogy are not yet fully evaluated.

Marston states that silver would likely be mined along with the copper mineralisation and would bear no additional mining or transportation costs; however, it would be processed with the copper and the concentrate shipped to a smelting facility where it may have to carry a penalty charge. Nevertheless Marston believed that there was a reasonable expectation of the silver being mined and making a profit; thus, it has been included in their resource statement.

Further study of the silver recoveries and smelter charges will need to be completed in the pre-feasibility process before the expected benefits can be used in a cost model, but it is likely that recovered silver will add monetary value to the property.

6.4.5.11 Assessment of Prospects for Economic Development

Marston was requested to examine the use of a 0.8 wt.% copper grade cut-off with a minimum thickness of 1.5 m. Although these resources are believed to have a reasonable expectation of being extracted economically, they are not reserves. A preliminary feasibility assessment for this property has not yet been completed.

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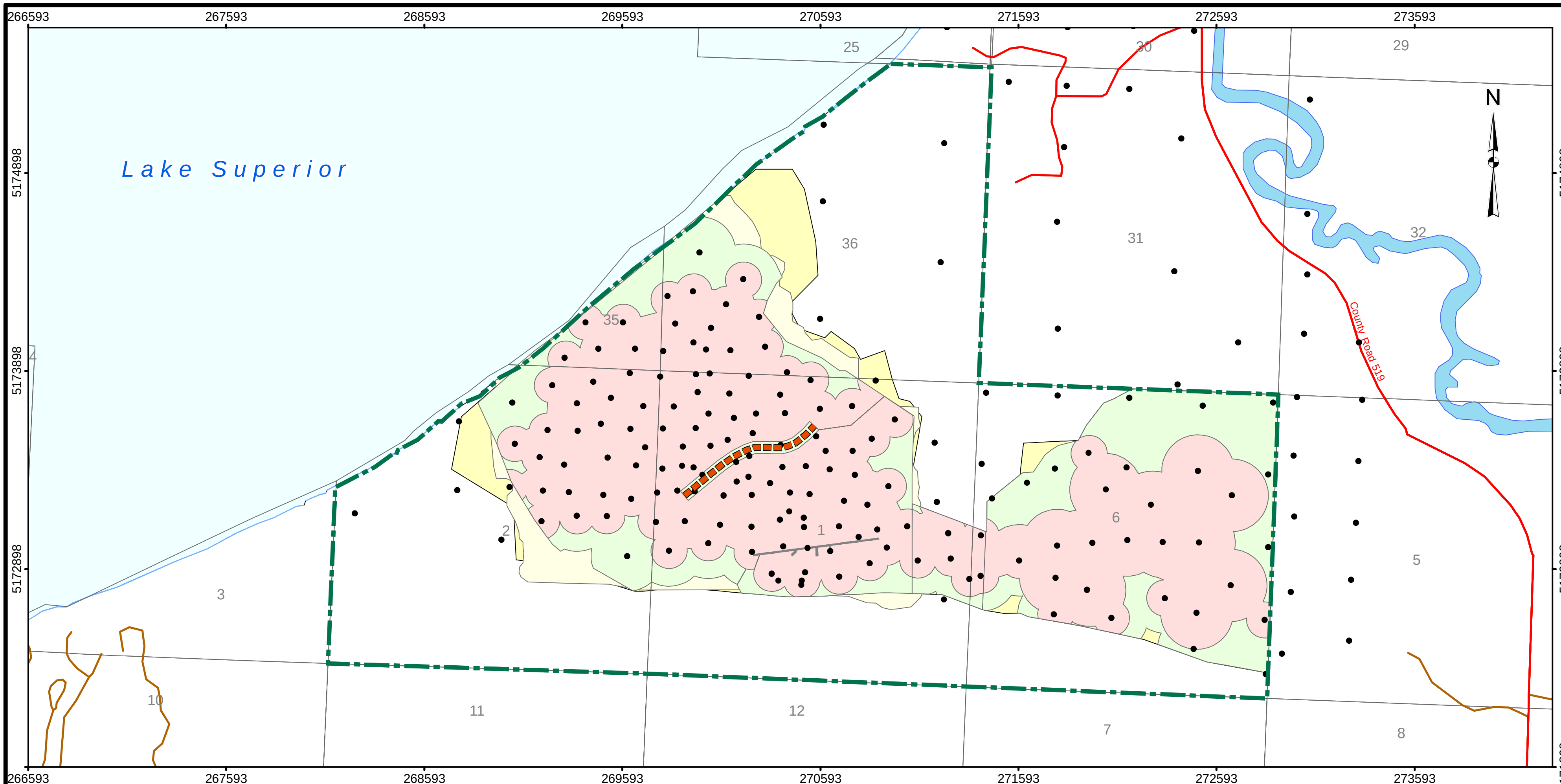

500 0 500 1,000

SCALE 1:30,000 Meters METERS

LEGEND

- Orvana Mineral Lease
- Model Limit
- Existing Drill Hole
- Fault
- Mined Out
- Measured Resources
- Indicated Resources
- Inferred Resources
- Michigan Sections
- County Road 519
- Road
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

RESOURCE CLASSIFICATION BOUNDARIES

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014	**FIGURE: 6.23**	
REVIEW	JdW	01 Apr. 2014		

6.5 Statement of Historical Mineral Resources for the Copperwood Project

The 2011 Marston technical report was prepared on behalf of Orvana, before Highland and Orvana entered into any agreements concerning the Copperwood Project.

The 2011 Marston technical report was issued on March 7, 2011 and has an effective date of January 25, 2011. There are no more recent historical Mineral Resource estimate technical reports available for the purpose of reporting historical resources for the Copperwood Project.

It is the opinion of the Golder QP that the 2011 Marston technical report is relevant and reliable for disclosure as historical Mineral Resources for the Copperwood Project. The 2011 Marston technical report was prepared in accordance with NI 43-101, NI 43-101CP and NI-43-101F1 documents using all material data available at the effective date of the technical report. The technical report was prepared by a Marston geologist that met the NI 43-101 QP requirements as outlined in the instrument.

The categories, classification and definitions for Mineral Resources used in the 2011 Marston technical report were the CIM definitions identified in the NI 43-101 document in effect at the effective date of the technical report and are consistent with CIM definitions identified in Section 1.2 and Section 1.3 of the current NI 43-101 document.

It must be noted that the Golder QP has not completed the work necessary to classify the historical Mineral Resource estimate for the Copperwood Project as current Mineral Resources. Golder and Highland are not treating the historical Mineral Resource estimate as current NI 43-101 compliant Mineral Resources, therefore the historical Mineral Resources should not be relied upon.

Historical Mineral Resources for the Copperwood Project, as originally stated by Marston (effective date of January 25, 2011) are presented in Table 6.11, Historical Mineral Resources for the Copperwood Project.

Table 6.11: Historical Mineral Resources for the Copperwood Project

Copperwood Main			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured	17.0	1.84	5.75
Indicated	3.6	1.62	4.57
Measured and Indicated	20.7	1.80	5.54
Inferred	2.6	1.06	2.02

Bridge			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured	0.6	1.10	1.63
Indicated	0.2	1.10	1.84
Measured and Indicated	0.8	1.10	1.67
Inferred	0.0	-	-

Section 6			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured	5.6	1.38	1.96
Indicated	3.0	1.24	1.17
Measured and Indicated	8.6	1.34	1.69
Inferred	0.1	1.35	1.53

Total (Copperwood Main, Bridge and Section 6 Combined)			
Historical Resource Category	**Tonnes (millions)**	**Copper Grade (wt.%)**	**Silver Grade (g/t)**
Measured and Indicated	30.1	1.65	4.34
Inferred	2.7	1.07	2.01

ITEM 7 GEOLOGICAL SETTING AND MINERALIZATION

Geological descriptions for the Copperwood Project area are based on several authors including Cannon et al., 1989; Elmore, 1984; Elmore et al., 1989; Hieshima and Pratt, 1991; Davis and Paces, 1990; Bornhorst et al., 1988; Cannon, 1992; Bornhorst, 1997; Cannon, 1994; Swenson et al., 2004; White, 1968; Stoiber and Davidson, 1959; Bornhorst and Robinson, 2004; Catacosinos, 2001; Bornhorst and Lankton, 2009; and, Bornhorst and Williams, 2013. Much of this section is taken directly from the AMEC, April 2010 NI 43-101 technical report.

7.1 Regional Geology

The Copperwood Project area is situated along the flank of the 2,200 km long Mesoproterozoic Midcontinent rift system of North America. The Midcontinent rift system is filled by up to 30 km thick package of Keweenawan Supergroup volcanic and clastic sedimentary rocks. These rocks are exposed in the Lake Superior region and are notable for hosting economic deposits of copper. Regional geology is shown in Figure 7.1, General Geology of the Western Upper Peninsula.

Tholeiitic flood basalts with minor interbedded red conglomerate and sandstone are deposited within a 150 km wide rift. These strata make up the Keweenawan Supergroup rift phase rocks. Keweenawan Supergroup post-rift phase rocks consist of basin-sag fluvial and lacustrine clastic rocks of the Oronto and Bayfield groups.

The Oronto Group, subdivided into three formations (the Copper Harbour Formation, the Nonesuch Formation and the Freda Formation), are described below from depth as shown in Figure 7.2, General Stratigraphic Column.

The Copper Harbour Formation is composed of red-brown conglomerates and sandstones with lesser siltstone and is upward and basinward fining. The Copper Harbour Formation sedimentary rocks were fluvial deposits in coalescing alluvial fans.

The Nonesuch Formation interfingers with and conformably overlies the Copper Harbour Formation. The formation consists of an up to a 300 m thick package of lacustrine and fluvial black-to-gray-to-green-red siltstone, shale, carbonate laminate and minor sandstone. Black to dark gray shale deposited in anoxic lacustrine conditions favourable for the preservation of organic carbon and pyrite are common in the lower 30 m of the formation. The Nonesuch Formation is thought to have been deposited in a marine environment.

The Freda Formation is gradational with and conformably overlies the Nonesuch Formation. The Freda Formation consists of red-brown fine to very-fine sandstone, siltstone and mudstone. The formation was deposited by shallow meandering rivers resulting in fining-upward sequences on a metres scale.

The last developmental phase of the Midcontinent rift system, from 1,070 to 1,050 million years ago, was characterised by a partial inversion of original graben bounding normal faults into major reverse faults accompanied by the deposition of mature clastic sedimentary rocks of the Bayfield Group. The present-day dip of Keweenawan Supergroup strata is a result of syn-depositional sagging and tilting related to faults and folds associated with the compression event.

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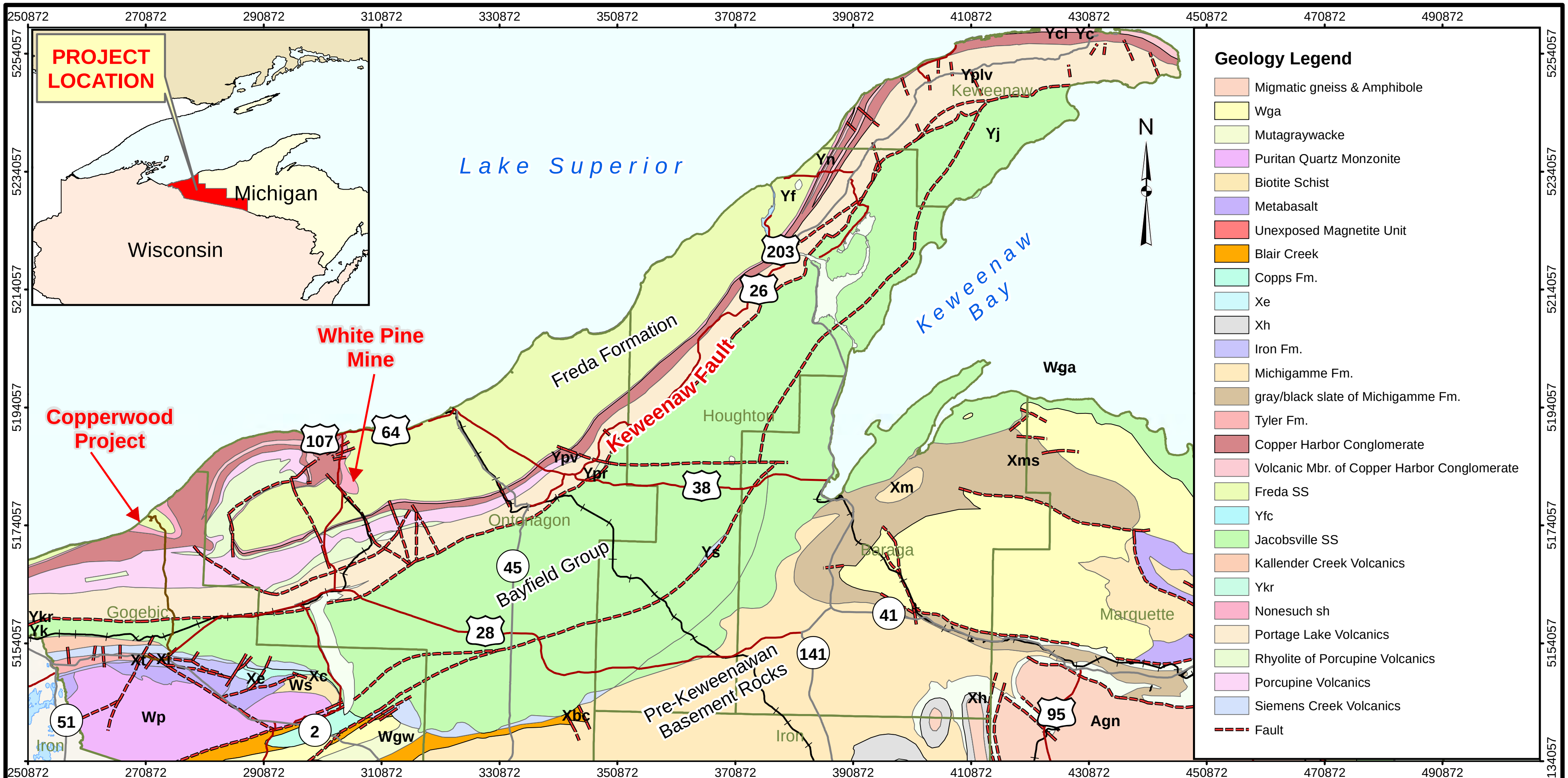


10 0 10 20 30

Kilometers

SCALE 1:1,000,000

METERS

LEGEND

- Town/City
- County Road
- US Hwy
- US State Hwy
- US Rail
- US County
- Lake
- River

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

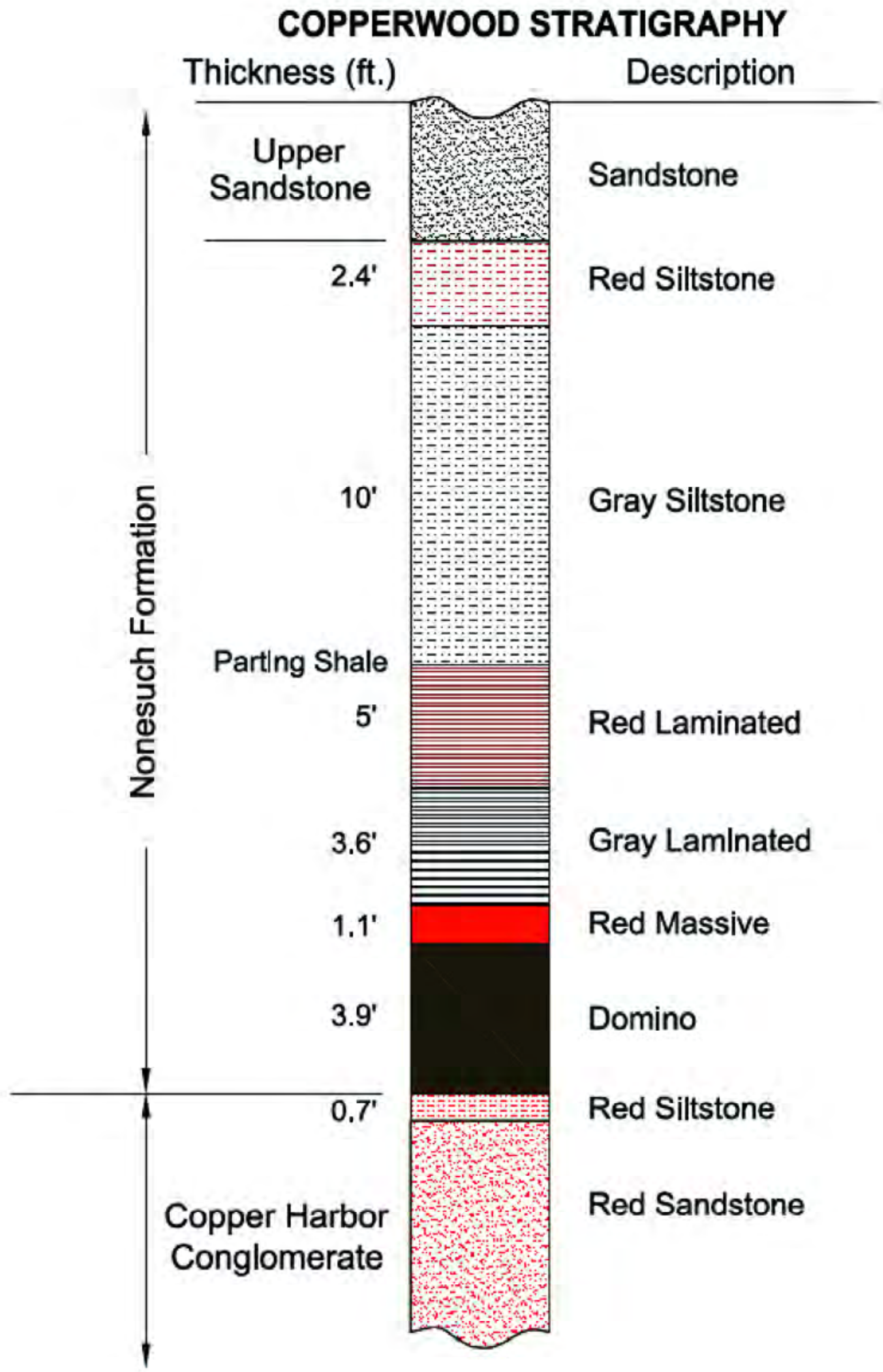
COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

GENERAL GEOLOGY OF THE WESTERN UPPER PENINSULA

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	17 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	17 Mar. 2014		
CHECK	JdW	01 Apr. 2014	FIGURE: 7.1	
REVIEW	JdW	01 Apr. 2014		



LEGEND

REFERENCE

PROJECT COPPERWOOD PROJECT GOGEBIC COUNTY, MICHIGAN					
TITLE **GENERAL STRATIGRAPHIC COLUMN**					
Golder Associates	PROJECT		1401359	FILE No.	
	DESIGN	JNS	17 Mar. 2014	SCALE AS SHOWN	REV. 0
	GIS	JNS	17 Mar. 2014	**FIGURE: 7.2**	
	CHECK	JdW	01 Apr. 2014		
	REVIEW	JdW	01 Apr. 2014		

Evidence of pervasive alteration by metamorphic fluid is shown in the rift-phase volcanic rocks. These metamorphic fluids moved through a network of faults and fractures developed during late rift compression and are likely responsible for deposition of native copper in the volcanic dominated strata of the Keweenaw Peninsula rocks and sulphide copper in the base of the Nonesuch shale.

The area, subjected to erosion during which multiple kilometres of bedrock, was eroded following the late rift compression event. As a result, the copper deposits were exposed. These Precambrian copper deposits were likely subjected to a long period of downward percolating ground waters followed by marine submergence during the Phanerozoic. The rift rocks were subsequently buried by Phanerozoic sedimentary rocks beginning in the late Cambrian and ending in the middle Jurassic. Deposition of the Phanerozoic rocks was followed by another period of erosion and non-deposition from the middle Jurassic to the Pleistocene. The Phanerozoic rocks were removed by erosion from Precambrian rocks of the western Upper Peninsula by Pleistocene continental glaciers beginning about 2 million years ago.

The last retreating glaciers left behind unconsolidated gravels, sands and muds deposited in glacial, glaciofluvial and glacial lacustrine conditions about 10,000 years ago.

7.2 Property Geology

Mineralization at the Copperwood Project property is hosted at the base of the Nonesuch shale on the southwest limb of the northwest plunging Western Syncline as shown in Figure 7.3, Geology of the Project Area. The Oronto Group sedimentary rock in this area thins dramatically eastward toward the Porcupine Mountains volcanic structure, indicating an ancestral topographic high during deposition. Only the upper part of the Copper Harbour Formation occurs at Copperwood. A complete stratigraphic section up to about 220 m thick of the Nonesuch Formation occurs in the northern part of the Copperwood mineral lease area. In all of the other parts, the upper contact is missing due to erosion.

The Nonesuch Formation marks a dramatic change from the oxidised red coloured Copper Harbour Formation to a gray to black coloured clastic sedimentary section. The lowermost part of the Nonesuch Formation is termed the Parting Shale.

Drilling at Copperwood by Orvana has delineated the stratigraphy of the uppermost Copper Harbour Formation and Parting Shale member of the Nonesuch Formation as shown in the generalised stratigraphic column in Figure 7.2. This figure reflects modelled thicknesses for the Red Siltstone within the Copper Harbour Formation, Domino, Red Massive and the Gray Laminated. Thicknesses of other illustrated un-modelled intervals reflect generalised values.

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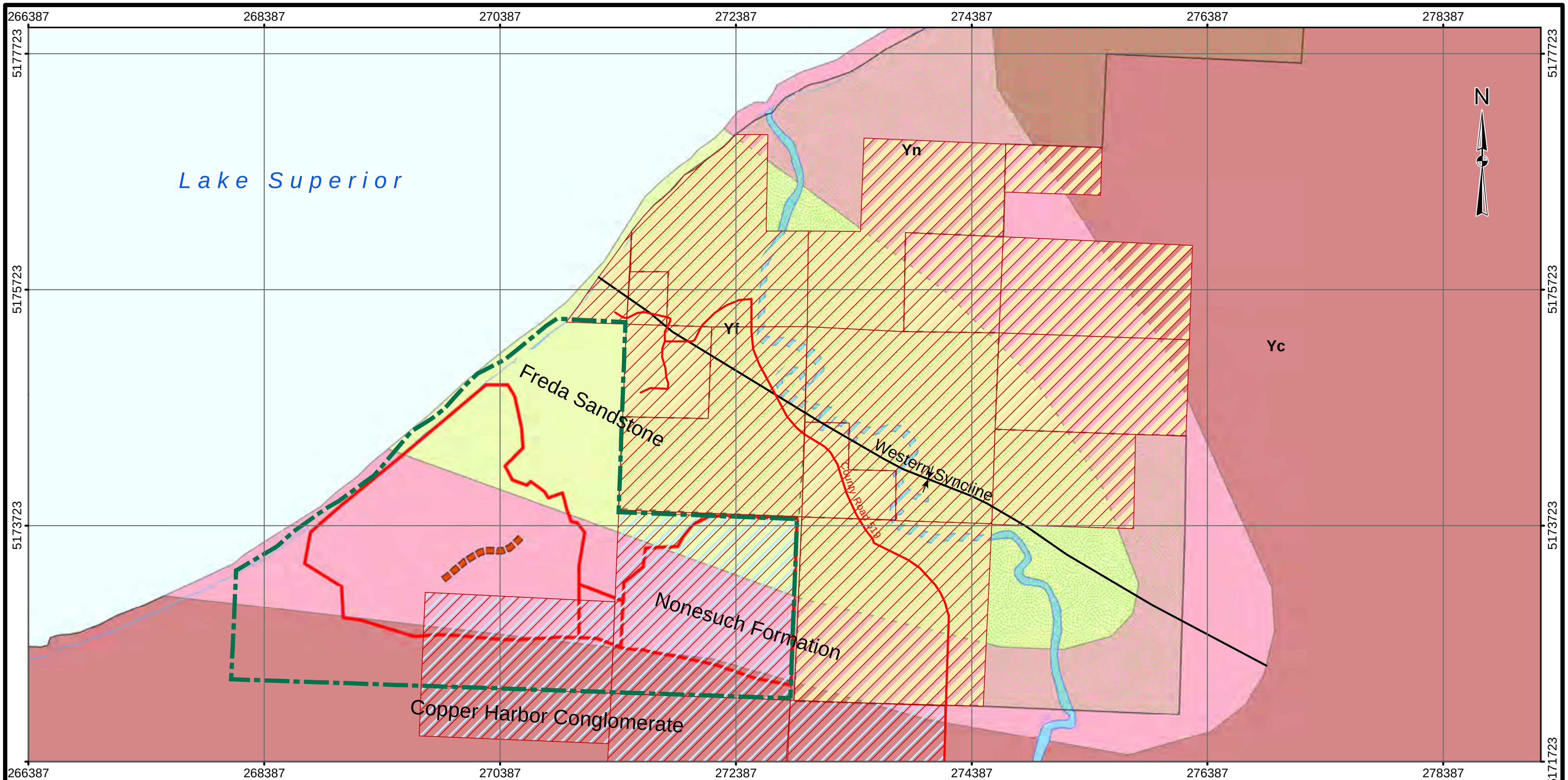


1,000 0 1,000 2,000

SCALE 1:50,000 Meters METERS

LEGEND

- Orvana Mineral Lease
- Orvana Surface Rights
- Orvana Mineral Rights "Option to Lease"
- Resource Boundary
- Revised Fault
- *Porcupine Mountains Wilderness State Park*
- County Road 519
- Lake
- River

Geology

- Copper Harbor Conglomerate
- Freda Sandstone
- Nonesuch Fm
- Western Syncline

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

GEOLOGY OF THE PROJECT AREA

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014	**FIGURE: 7.3**	
REVIEW	JdW	01 Apr. 2014		

Parting Shale

The Parting Shale at the base of the Nonesuch Formation is subdivided into (from the bottom upwards) the Domino, Red Massive, Gray Laminated, Red Laminated, Gray Siltstone and Red Siltstone sub- units.

The Domino sub-unit, the principal copper host at Copperwood, lies immediately above the Copper Harbour Formation and is characterised by laminated dark gray to black shale and siltstone. Red-brown layers are present throughout in varying frequency. There are occasionally very fine-grained gray sandstone beds with thickness of a few centimetres within the upper half of Domino. A thin, typically less than 0.1 m thick zone of brecciated shale/siltstone is often, but not always, present at or near the base. The Domino ranges in thickness from 0.0 to 2.3 m and has a mean thickness of 1.6 m.

The Red Massive sub-unit consists of massive dark red-brown siltstone with beds of fine-grained sandstone. Towards the top of the Red Massive, the colour changes from red-brown to reddish- gray, and the upper contact is placed where the colour changes from reddish gray to gray. This upward colour change occurs over a thickness of a few centimetres. The contact with the Domino is sharp and easily recognised in drill core as an abrupt change from dark gray or black of Domino to red-brown of Red Massive. The Red Massive has a mean thickness of 0.3 m and ranges from 0.0 to 1.2 m thick.

The Gray Laminated sub-unit contact with the Red Massive is transitional. This unit consists of light-to-medium, gray-to-reddish gray laminated and locally massive siltstone. Brownish layers are occasionally present in parts of the Gray Laminated interval. A 0.01 to 0.05 m thick zone of calcareous nodules in gray siltstone occurs in all holes near the base of Gray Laminated. The upper contact is placed where the colour change from dominantly gray to mixed maroon and gray. The transition zone is roughly on the order of 0.1 m thick. The Gray Laminated has a mean thickness of 1.0 m and ranges from 0.0 to 2.6 m thick.

The Red Laminated sub-unit contact with the underlying Gray Laminated is transitional. This unit is characterised by laminated siltstone with bimodal colour distribution of maroon to red-brown and gray. Typical Red Laminated has mottled or wavy maroon intervals interspersed with medium-gray to reddish-gray siltstone. Copper-rich mineralisation is typically restricted to the lower 0.3 m of the Red Laminated unit. The Red Laminated sub-unit has a mean thickness of 1.4 m and ranges from 0.0 to 3.1 m thick.

Gray Siltstone and Red Siltstone overlie the Red Laminated and mark the top of the Parting Shale. An informally named Upper Sandstone sub-unit of the Nonesuch Formation overlies the Parting Shale

Copper-Bearing Sequence

The CBS is comprised of the Domino, Red Massive and Gray Laminated. For resource calculations, the Domino has been delineated as a separate layer, and the Red Massive and Gray Laminated are combined and collectively termed the Upper Layer. In a few areas, the upper part of the Gray Laminated is copper poor and is excluded from the Upper Layer. Similarly, some areas of the Red Laminated have sufficiently high grade to be included into the Upper Layer for resource estimation.

Structure

All the units at Copperwood dip gently to the north and vary from 12° in the south near the interface with overburden to 8° in the north near the synclinal axis. The lower contact of the Nonesuch Formation subcrops beneath 20 to 35 m of unconsolidated glacial sediments and is approximately 275 m beneath the bedrock surface about 1.3 km to the north.

During AMEC's review of the property as part of the April 2010 technical report, an apparent change in the dip of the strata was noted and felt to reflect the presence of a northward-dipping shallow reverse fault with minor displacement of 3 to 7 m. Fault intersections were logged in three holes drilled in the vicinity of the flexure (AMEC 2010). Concerns over how this may affect mining and the projected length of this structure motivated Orvana to target drilling in the area of the fault during the 2010 drilling campaign. Based on observations from this drilling, the strike length of the fault has been reduced. The extent is shown in Figure 6.9.

Figure 7.4 through Figure 7.6 present three cross sections within the project area. The cross sections show the constant gentle dip of the CBS across an east-west distance of 1,220 m.

Alteration

Most minerals in the siltstone-dominated lithologies of the Parting Shale are too fine-grained to be identified in drill core using only the aid of a hand lens. An exception is calcite, which fills thin single millimetre scale healed fractures that cut across bedding typically at high angles. At least a few calcite healed fractures are found in the CBS of every hole.

Results from an X-ray diffraction, microscopic and Scanning Electron Microscope mineralogy study on rejects of CBS rocks from legacy holes are consistent with the quantitative X-ray diffraction results presented above. The studied samples contained the non-sulphide minerals: quartz, albite, chlorite with minor titaniferous iron oxide (hematite or magnetite) and patchy domains of iron oxide minerals remaining after chalcocite replaced pyrite.

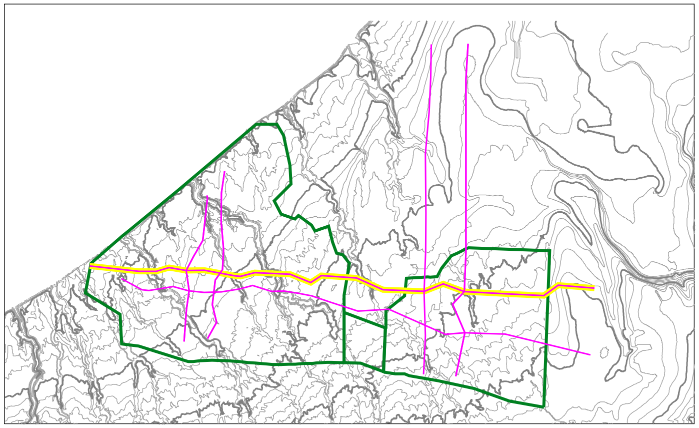
The non-sulphide mineralogy of the CBS is consistent with low-temperature and low-pressure metamorphism.

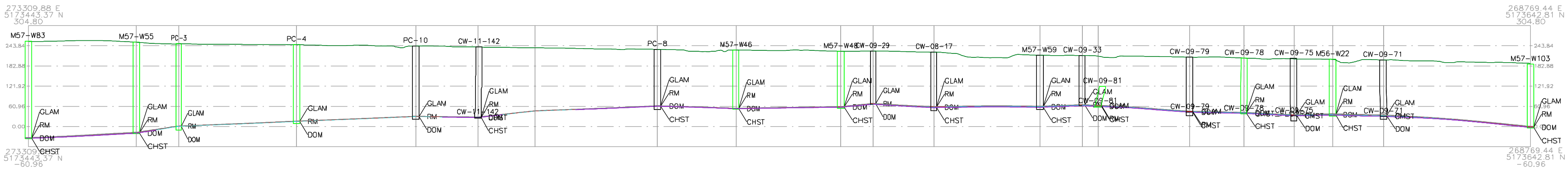
7.3 Comparison to White Pine Mine

The White Pine Mine is located about 30 km northeast of the Copperwood Project. The White Pine and Copperwood sites are both considered stratiform copper deposits hosted by shale and siltstone. Geologically, the sites encompass the same overall stratigraphic position: the base of the Nonesuch Formation. The similarities and differences between White Pine and Copperwood are described below. A comparison of the stratigraphy of the base of the Nonesuch Formation at the Copperwood Project and the White Pine areas is depicted in Figure 7.7, Comparison of the Stratigraphy of White Pine.

Path: G:\1401359 Highland\Deliverables\Draft_Report\Figures

KEY MAP





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LEGEND

- Model Limit
- Cross-Section
- Active Cross-Section
- Topography
- Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

TYPICAL STRATIGRAPHIC MODEL
CROSS-SECTION W-E
SECTION 26

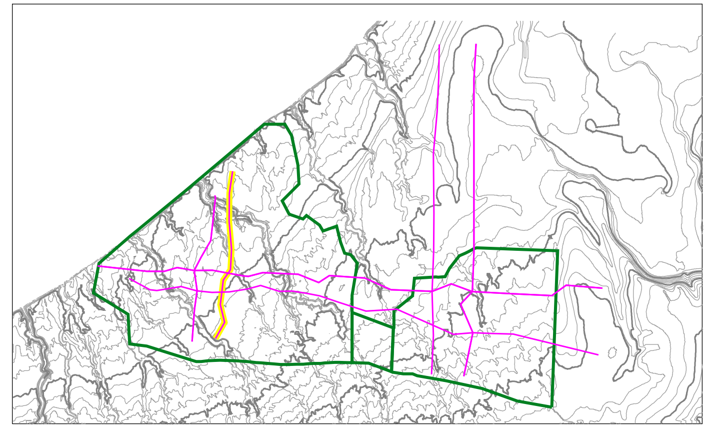
PROJECT No. 1401359

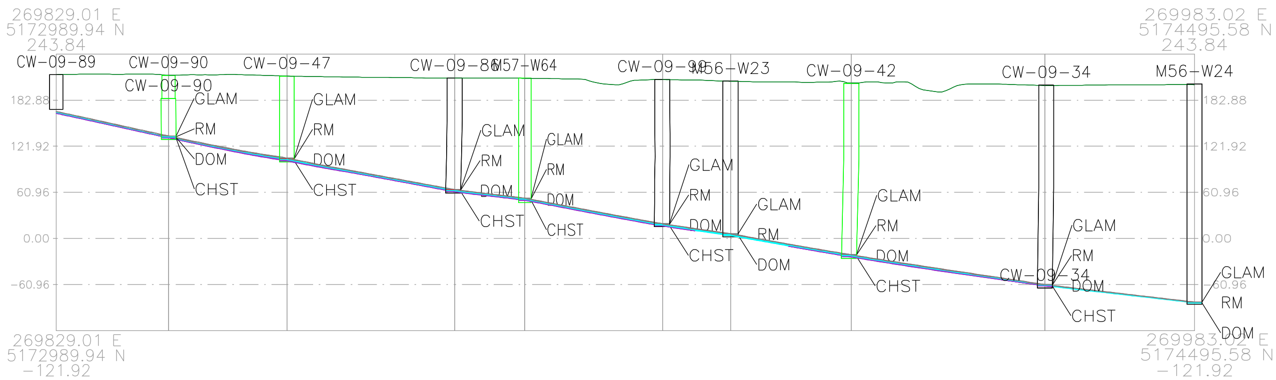
Rev. 01

FIGURE 7.4

Path: G:\1401359 Highland\Deliverables\Draft_Report\Figures

KEY MAP





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LEGEND

- Model Limit
- Cross-Section
- Active Cross-Section
- Topography
- Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

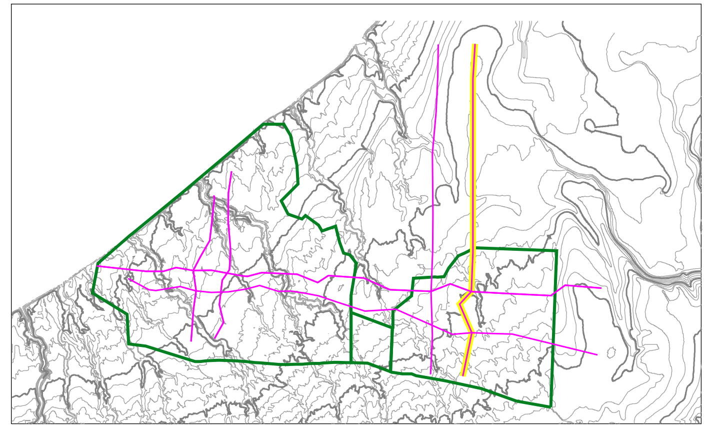
TITLE

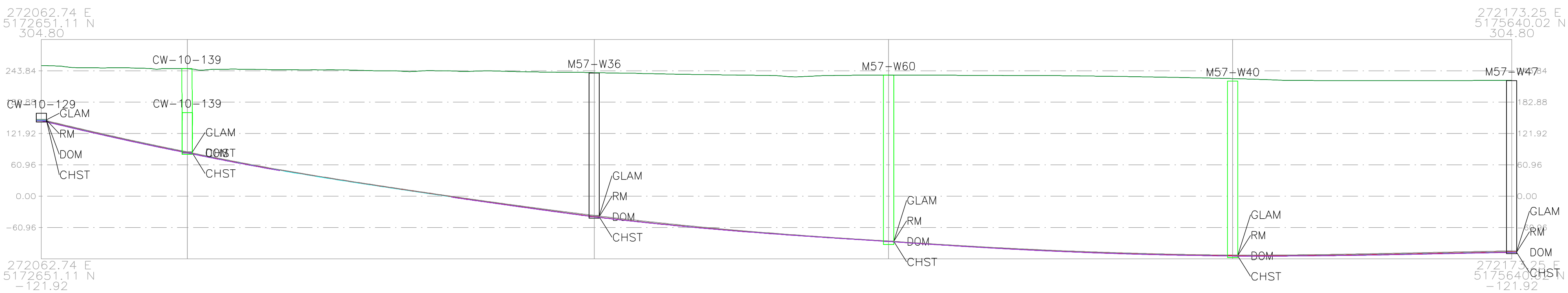
TYPICAL STRATIGRAPHIC MODEL
CROSS-SECTION S-N
SECTION 08

PROJECT No.	Rev.	FIGURE
1401359	01	7.5

Path: G:\1401359 Highland\Deliverables\Draft_Report\Figures

KEY MAP





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LEGEND

- Model Limit
- Cross-Section
- Active Cross-Section
- Topography
- Mineralised Zone

CLIENT

CONSULTANT

Golder Associates

YYYY-MM-DD	2014-04-14
PREPARED	JNS
DESIGN	JNS
REVIEW	JdW
APPROVED	JdW

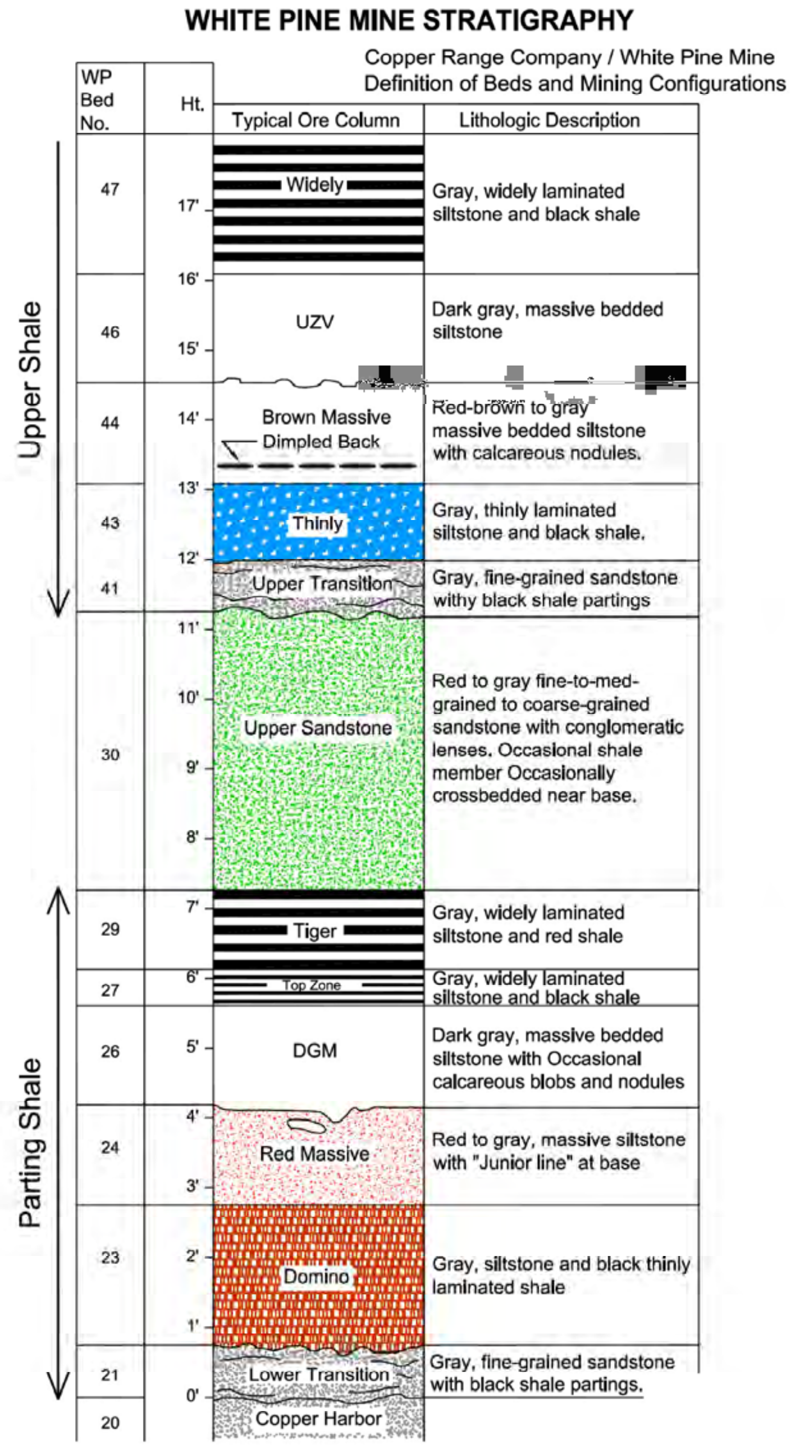
PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

TYPICAL STRATIGRAPHIC MODEL
CROSS-SECTION S-N
SECTION 21

PROJECT No. 1401359 Rev. 01 FIGURE 7.6



LEGEND

REFERENCE

Source: Orvana Minerals Corp. "Comparison of the lithostratigraphy of the base of the Nonesuch Formation at Copperwood and the White Pine Mine"

NOT TO SCALE

PROJECT
COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE
COMPARISON OF THE STRATIGRAPHY OF WHITE PINE

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	17 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	17 Mar. 2014	**FIGURE: 7.7**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

E:\CopperWood\GIS\MapFiles\Fig7.7_Highland_ANSI_A_8_5x11_WhitePineStrat_Portrait.mxd

Lithologically the lowermost three subunits of the Parting Shale between the two mine sites are similar but their thicknesses are not. At Copperwood, the thickness of the Parting Shale and Domino is typically 2.5 times than the thickness found at White Pine. The Domino at Copperwood is significantly thicker, averaging 1.6 m, compared to 0.6 m at White Pine.

Full column bulk mining at White Pine included all of the Parting Shale, the weakly mineralised Upper Sandstone and the Upper Shale. The Parting Shale at White Pine is similar to Copperwood except at White Pine, the roof was Upper Sandstone while the proposed roof for Copperwood is Red Laminated siltstone.

Structurally, there are significant differences between Copperwood and White Pine. The White Pine deposit straddles an anticline and a right-lateral strike-slip fault. Both the southwest and northwest domains of the White Pine deposit contain strike-slip and thrust faults. These faults are interpreted as being generated during the regional late rift compressional event. In contrast, the Copperwood site, structurally located on a simple dipping plane, contains only one identified fault.

The higher stratigraphic units at Copperwood do not correlate with White Pine. The copper bearing mineral at Copperwood is exclusively fine-grained chalcocite. In contrast, the White Pine Mine has two distinct types of mineralisation; about 85% to 90% of the copper occurs as chalcocite and the rest as native copper.

The copper grades are very consistent within individual units averaging 2.58 wt.%, 0.39 wt.% and 1.32 wt.% for the Domino, Red Massive, and Gray Laminated, respectively, in the main Project area. A similar pattern of relatively consistent grades occurs at White Pine with the stratigraphically equivalent Domino, Red Massive and Dark Gray Massive subunits.

At White Pine, the second-stage copper mineralisation is characterised by native copper occurring as sheets along faults and adjacent beds. Thus, second-stage mineralising fluids were likely of the same origin as those related to native copper in the Keweenaw Peninsula. There is no evidence to demonstrate a similar second stage of copper mineralisation at Copperwood.

7.4 Mineralisation

Much of this discussion is taken from AMEC's April 2010 NI 43-101 technical report as cited therein. Mineralisation at White Pine Mine has been described by Mauk, 1992; Brown, 2009; Hitzman, 2005; Swenson et al., 2004; Johnson et al., 1995; and, White, 1971. The following discussion is derived from these authors.

The Copperwood deposit is situated on the western limb of the Western Syncline within the Nonesuch Formation. The Nonesuch Formation contains a mineralised zone located at the base, which is stratigraphically equivalent to the mineralised zone at the White Pine Mine. In comparison to the White Pine Mine, where the bulk of mining was in the full column of Parting Shale to Upper Shale, mineralisation at Copperwood is in two separated sequences referred to by AMEC as the Upper Copper Bearing Sequence (UCBS) and the Lower Copper Bearing Sequence (LCBS). These sequences are separated by poorly mineralised sediments from 1.5 to 5.0 m thick. As currently understood, the UCBS in the south limb of the Western Syncline is too thin for economic extraction. The LCBS comprised of the Domino, Red Massive and Gray Laminated units of the Parting Shale comprise the potential mineable portion of the CBS being evaluated at Copperwood.

The Domino at the Main Project area is significantly thicker, averaging 1.6 m, compared to 0.6 m at White Pine but thins to about 0.6 m in Section 6. Similar to White Pine, the copper assays at Copperwood are remarkably consistent within individual units with mean copper grades of 2.58 wt.%, 0.39 wt.%, and 1.32 wt.% for the Domino, Red Massive and Gray Laminated, respectively. The Red Laminated demonstrates a localized 1% increase in copper grades occurring at the base of the unit adjacent to the Gray Laminated. Silver is also present at Copperwood, with mean grades of 5.5 g/t.

The CBS has been delineated over an area of approximately 3,049 m east-west and 1,130 m north-south.

Chalcocite is the only observed copper sulphide-bearing mineral at Copperwood. Chalcocite principally occurs as disseminations within shale and siltstone. Individual disseminated grains of chalcocite are most commonly very fine grained, approximately 5 to 50 microns (μ) in diameter. Chalcocite occurs as free grains and as complex grains where chalcocite appears to have replaced pyrite grains as evidenced by remnant patchy domains of an iron oxide mineral (probably goethite). In the highest grade samples, located in the top 0.3 m of Domino, chalcocite occurs as layers that are parallel to laminations in the rock with the layers usually less than 2 mm thick. Occasionally ovoids of chalcocite occur that are up to 3 mm in their long axis.

There is an overall correlation with the degree of redness of the host rock within the CBS and the abundance of chalcocite within the CBS. The dark-gray to gray coloured Domino has the highest copper grades; the medium to light gray coloured Gray Laminated has medium copper grades; and, the red-brown coloured Red Massive has distinctly the lowest copper grades.

Grade profiles for each of the CBS units show that there is a natural break in the grade profile, at approximately 1 wt.% copper. The 1 wt.% copper grade is a natural cut-off and is extensively used in Zambian and other African sediment-hosted copper deposits where most intercepts grade a few tenths of a percent copper above or below the mineralised interval and well over 1 wt.% copper inside the mineralised interval.

The chalcocite mineralisation of the Western Syncline, including Copperwood, is interpreted to have the same origin as White Pine, and the two deposits mirror each other on either side of the Porcupine Mountains volcanic structure.

The silver mineralogy at Copperwood has not been studied. Mean silver grade is 5.5 g/t in the Copperwood Main resource area and less than 2 g/t in Section 6.

ITEM 8 DEPOSIT TYPES

The following description of sediment-hosted copper deposits has been excerpted from the Copperwood Project 2010 NI 43-101 technical report prepared by AMEC for Orvana Minerals Corporation. The description is derived from several authors including Gustafson and Williams, 1981; Kirkham, 1989; Lindsey et al., 1995; Cox et al., 2003; and, Hitzman et al., 2005.

Copperwood is a sediment-hosted stratiform copper deposit. Sediment-hosted stratiform copper deposits consist of copper and copper-iron sulphide minerals hosted by silciclastic or dolomitic rocks in which a relatively thin (typically less than 3 m thick) copper-bearing zone is mostly conformable with stratification of the host sedimentary rocks. Copper occurs as disseminations and veins.

These deposits have been grouped on the basis of the reductant into three subtypes: reduced facies, Red-bed Copper and Revett Copper. They can also be classified based on basinal setting into two subtypes: Kupferschiefer and Red-bed. The reduced facies and Kupferschiefer subtypes are similar. Examples of the reduced facies or Kupferschiefer subtypes include most of the deposits within the Central African Copperbelt (such as Nkana, Nchanga, Mufulira, Tenke–Fungurume and Kolwezi), the Kupferschiefer (Poland), Redstone (Canada) and White Pine (USA).

The following are common features of the reduced facies or Kupferschiefer subtype sediment hosted copper deposits as summarised by Cox et al., 2003 and Hitzman et al., 2005.

- *Geological setting:* Intracratonic rift with coarse-grained sub-aerial sediments overlain by fine-grained sediments or restricted marine setting/basin margin followed by widespread euxinic marine deposits; near paleo-equator; partly evaporitic on the flanks of basement highs; footwall sediments highly permeable; and, host ranging in age from Early Proterozoic to late Tertiary, but predominate in late Mesoproterozoic to late Neoproterozoic.
- *Host Rocks:* Marine or lacustrine; thin-bedded to finely-laminated green, black or gray shale, thinly laminated tidal/sabkha facies or reefoid carbonate rocks, and dolomitic shales; common organic carbon and finely disseminated pyrite; tend to have large lateral extent; and, during transgression over oxidised sequences of hematite-bearing sandstones siltstones, and conglomerates (red-beds).
- *Mineralisation:* Chalcocite and other Cu_2S-CuS minerals + bornite are diagnostic; typical minerals hematite–chalcocite–bornite–chalcopyrite–pyrite; may be zoned with chalcocite-bornite central, chalcopyrite-pyrite medial, galena-sphalerite peripheral; finely disseminated; copper sulphides replace framboidal or colloform pyrite; and, carbon-rich materials in favourable host rocks but usually consumed by redox reactions during copper mineralization processes.
- *Alteration:* Diagenetic alteration minerals in host rocks and underlying red-beds (albite, potassic feldspar, chlorite, quartz, carbonate minerals, dolomitisation, etc.); and, bleaching of red sediments to greenish gray or light gray where in contact with reducing fluids.

- *Timing of mineralisation:* Textures and fabrics indicate that all were precipitated after host-rock deposition; exact timing variable; and, may take place early to very late in the diagenetic history or in the post-diagenetic history.
- *Mineralisation controls:* Basin-scale fluid flow system in highly permeable footwall red-bed sediments; giant deposits form from multiple stages or long-term progressive fluid flow; copper is mobilised from footwall red-beds by oxidising low-temperature brines and metal carried as chloride complexes; mineralising fluid focusing by marginal basin faults, stratigraphic pinch-outs or anticlinal traps; copper mineralisation in lowermost reduced beds overlying red-beds; and, pyritic black shale/siltstone and algal mats, perhaps hydrocarbon fluids, provide source of biogenic sulphur and reducing environment for precipitation of copper.
- *Global-scale Grade-Tonnage Model:* Median reduced facies deposit has 33 Mt and 2.33 wt.% copper.

Copperwood is an example of a reduced-facies sediment-hosted copper deposit similar to White Pine. In the White Pine model, a classic sediment-hosted stratiform copper deposit formed during early diagenesis. Syn-sedimentary faults may have provided important conduits for cupriferous brines flowing from underlying red beds of the Copper Harbour Conglomerate into the reduced silt and shale of the Nonesuch Formation, where main-stage copper sulphides and native copper were precipitated.

ITEM 9 EXPLORATION

9.1 Exploration History

All exploration activities undertaken on the Copperwood project were performed by previous owners, namely Orvana, AMAX and USMR. Highland had not conducted any exploration activities relating to the Copperwood Project at the time this report was prepared.

A summary of historical exploration activities conducted on the Copperwood Project is presented in Item 6 of this technical report. The following sections focus primarily on the exploration programs implemented by Orvana between 2008 to present.

9.2 Orvana Exploration Programs

Beginning in 2008 Orvana implemented a series of exploration drilling programs at Copperwood (2008, 2009, 2010 and 2011) culminating in 126 drill holes (17,480 total metres of drilling). Additionally, Orvana commissioned several independent technical reports for the Copperwood Main, Section 6 and Satellite areas in 2010 and 2011.

Orvana completed a major resampling and surveying program for Section 6 and the Satellite properties. During late 2010 Orvana drilled an additional 23 diamond drill holes in the Project area and 15 new holes in Section 6.

The resampling program involved the collection of archived core, rejects and pulps from 87 historic drill holes, which included all but one of the legacy drill holes in Section 6 (drill hole PC-13). This drill hole was twinned as part of the drilling program at the request of Marston.

Orvana contracted Coleman Engineering Co. of Ironwood, Michigan to survey historic drill collars in the Satellite project areas. They were able to locate and survey 111 drill hole collars, and coordinates were estimated for an additional 56 drill holes based on the presence of sumps or other evidence was observed, but no monuments were found.

In 2013 Orvana drilled 21 drill holes for collecting metallurgical and geotechnical studies; 13 holes were drilled (2,781 total metres of drilling) primarily for metallurgical purposes and 7 holes were drilled primarily for geotechnical purposes with 1 hole drilled for both metallurgical and geotechnical purposes. As of the effective date of this technical report these 21 drill holes have not been added to the geological model for Copperwood nor have they been used for any Mineral Resource evaluations.

9.3 Airborne Geophysical Studies

There are no known surface geophysical exploration programs for the Copperwood Project. Delineation of mineralisation has primarily been completed through drilling from surface and limited underground channel sampling.

9.4 Geochemical Surveys

There are no known surface geochemical exploration programs for the Copperwood Project. Delineation of mineralisation primarily has been completed through drilling from surface and limited underground channel sampling.

ITEM 10 DRILLING

10.1 Drilling History

All drilling activities undertaken on the Copperwood project were performed by previous owners, namely Orvana, AMAX and USMR. Highland had not conducted any drilling activities relating to the Copperwood Project at the time this report was prepared.

A summary of historical drilling activities conducted on the Copperwood Project is presented in Item 6 of this technical report. The following sections focus primarily on the drilling programs implemented by Orvana between 2008 to present.

10.2 Summary and Interpretation

Drilling on the Copperwood Project property and surrounding leases was completed in two different areas. USMR and BCM drilled 184 core holes in the Western Syncline area. USMR drilled 42 drill holes in the Copperwood Main area in 1956 and 1958. BCM drilled 23 holes drilled in Section 6 in 1959. USMR drilled an additional 119 drill holes in the Satellite properties between 1956 and 1958. The core diameter for these holes was between 3.01 cm (AX size core) and 4.2 cm (BX size core). The deepest hole reached a depth of 354 m. This drilling was completed during the 1950s. Figure 10.2, Drill Hole Location Map, shows all drilling.

The second phase of drilling at Copperwood commenced in 2008, with Orvana drilling five holes for environmental purposes. These drill holes intersected significant copper mineralisation. Orvana subsequently completed 82 drill holes in 2009. Orvana commissioned an NI 43-101 compliant resource estimate from AMEC for the main Copperwood area and followed up on this during 2010 with 24 additional core holes for 2,801 m in order to firm up the resource, to collect metallurgical and geotechnical data and to investigate a suspected fault. Another 15 holes, totalling 1,250 m, were cored in Section 6 during 2010 to verify copper mineralisation in the Section 6 area. Table 10.1, Drilling Statistics by Company and Exploration Campaign, summarises the completed drill holes.

Table 10.1: Drilling Statistics by Company and Exploration Campaign

Operator	Period	Core Size	Drill Hole Count	Length (m)	% of Total Drilling
USMR	1956 to 1958	BX & AX	161	20,875	46%
BMC	1959	BX & AX	23	3,998	9%
Orvana	2008	NQ	6	744	2%
Orvana	2009	NQ	82	12,685	28%
Orvana	2010	NQ	23	2,801	6%
Orvana[I]	2010	NQ	15	1,250	3%
Orvana[II]	2013	HQ	21	2,781	6%
All Programs	1956 to 2013	BX, AX NQ & HQ	331	45,134	100%

The Copperwood and Section 6 mineralisation is on the southwestern limb of the Western Syncline. In this area, the CBS dips to the north at 10º to 15º to the north. Almost all of the drilling has been vertical; therefore, intercepts are slightly greater than true widths.

Drilling contractors and equipment type for the legacy drilling in the 1950s are unknown.

In 2008 Orvana contracted Boart Longyear of Salt Lake City, Utah, which used a truck mounted core drill. In 2009 Orvana used Layne Christensen Co. (Layne) of Arizona. Layne initially used a truck mounted reverse circulation drill to pre-collar drill holes and a track mounted core drill to complete the work, however after a few holes, began coring from surface once casing was set. During 2010 Orvana contracted Idea Drilling of Virginia, Minnesota. Idea Drilling used a modified Hagby Onram 1000 drill rig and another larger Hagby drill rig. Figure 10.1 is a photograph of winter drilling at the Section 6 project.

Figure 10.1: Winter drilling at the Section 6 project

During the Marston site visit in December 2010, Idea Drilling had two core drills running. The visited drill sites appeared well kept and orderly, and procedures being followed were in line with industry standards.

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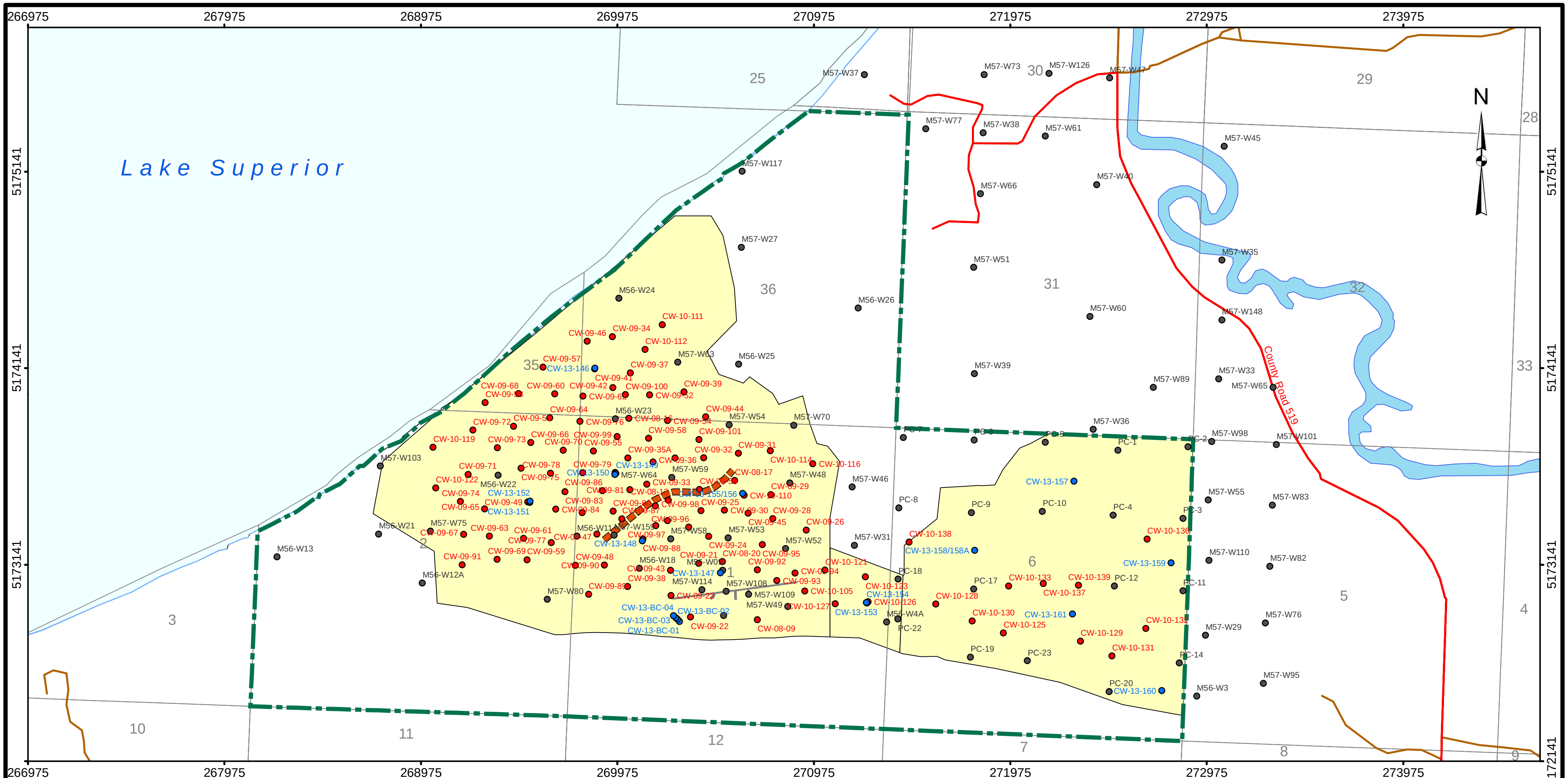


LEGEND

- Orvana Mineral Lease
- Model Limit
- Fault
- Mined Out
- Pre-Orvana Drilling
- Orvana 2008-2012 Drilling
- Orvana 2013 Drilling
- Michigan Sections
- County Road 519
- Road
- Lake
- River

500 0 500 1,000

SCALE 1:30,000 Meters METERS

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

DRILL HOLE LOCATION MAP

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014		
CHECK	JdW	01 Apr. 2014	FIGURE: 10.2	
REVIEW	JdW	01 Apr. 2014		

10.3 Drilling Procedures

10.3.1 Collar Surveys

Orvana hired Coleman Engineering Co. from nearby Ironwood, Michigan to resurvey drill collars form previous drilling. Fifteen of the 21 BCM legacy drill hole collars were located in the Section 6 area during 2010. USMR did not leave behind drill hole collars and/or monuments. Based on information provided by a former USMR project geologist, the sumps were determined to be within a few meters of the drill hole. The 28 USMR original drill sites located in the Copperwood Main area in 2009 were resurveyed based on known holes and expected relative position to drill sumps.

Coleman Engineering Co. surveyed all of Orvana's drill collars for the 2008 through 2010 drilling programs. The collars were surveyed using a differential GPS instrument. Collar coordinates were measured using State Plane coordinates in Michigan North Zone, NAD83 in international feet, and elevations were derived using GEOID03 and NAVD88.

10.3.2 Down-hole Surveys

No down-hole survey information is available for the legacy (pre-2009) drill holes; however, all of these holes were drilled vertically. All but five of the holes drilled by Orvana were vertical drill holes. The five angled holes drilled in 2009 were at 70°. This was determined at the collar with a driller's level and compass.

The majority of the 2009 drill holes had two or more down-hole measurements with measurements at about every 45 m. Twelve drill holes had measurements at the bottom of the hole only while five drill holes had no surveys. Survey information was taken with a Reflex EZ shot down-hole survey tool. Very little deviation from vertical was observed.

Down-hole surveys were recorded for all but one drill hole in the 2010 drilling program. Measurements were collected using a Flexit tool at 6 m intervals. None of the drill holes deviated more than 2° from vertical, and most holes had deviations of less than 1° from vertical. Inclinations from the Flexit surveys when checked against the driller's single shot measurement (at the bottom of the hole) were within 0.5° of dip.

10.3.3 Core Logging

Orvana concentrated on logging the mineralised sequences CBS, although the company's geologist commonly noted marker horizons above the LCBS beginning with the Galaxy or Stripey lithology when available. A geologist typically marked the core for manual breaks and significant features on the drill site. The core was then re-examined in the core processing facility by the independent QP, Dr. Bornhorst, who checked and adjusted significant lithological picks based on the driller's total depth (TD) measurement. Logging is completed on paper and transferred to Microsoft Excel spreadsheets.

Drill core was photographed and logged for rock quality issues, and point load tests were conducted at selected intervals. Orvana has also collected over 200 samples for density measurements.

During the most recent Orvana drilling program, only the expected mineralization, footwall and hanging wall are logged in detail.

10.3.4 Core Storage

The legacy drill core from previous drilling campaigns has been stored in cardboard boxes in archives at the White Pine Mine and in a state core storage facility. This careful archiving of core from the 1950s allowed the resampling and evaluation process that was completed by Orvana.

Core from the Orvana drilling program is stored in covered core boxes organized on core racks inside a locked facility in Ironwood, Michigan.

10.3.5 Summary and Interpretation

The legacy core drilling appears to have been completed to industry standards at the time it was drilled, and care was taken in its preservation. Drill collars were relocated by Orvana in 2009 and 2010. The core drilling program conducted during 2010, 2011 and 2013 meets current industry standards.

Samples for analysis at Copperwood Main and Section 6 have come from ½ or ¼ core splits from diamond drilling programs conducted in the 1950s by USMR and BCM. Since 2008 Orvana collected ½ core splits for analysis. Sample intervals honour lithological contacts and are variable in length. Commonly, multiple samples have been collected within one lithological unit.

10.4 Sampling Method and Approach

10.4.1 Legacy Samples

Legacy data were verified by Orvana either though resampling and/or through comparison with twin holes completed in 2008, 2009 and 2010. Copperwood Main legacy drilling data were the subject of a major study by Orvana in 2010 through re-sampling existing core and sample pulps and rejects from the 1950s drilling. Orvana retained AMEC in 2010 to examine and determine the appropriate level of confidence that should be placed on legacy drilling in the Satellite properties to the Copperwood Main area, including historical drilling in Section 6. This was the subject of an NI-43-101 technical report prepared by AMEC (effective date of January 24, 2011). AMEC concluded with this study that the information was of sufficient quality to justify an Indicated resource category for much of the Satellite properties.

For this legacy drilling study, Orvana was able to collect core or pulp samples for 87 of the 138 holes covering the Satellite properties (AMEC, 2011). Samples were available for all but one of the drill holes in Section 6. This hole, PC-13, was twinned at Marston's request during the 2010 drilling campaign. Four hundred forty-five pulp samples, 14 coarse reject samples and 983, ¼ core samples from the legacy drilling were sampled and re-assayed by Orvana to validate the historical drilling.

Marston reviewed the results collected from the re-sampling program. No significant bias was detected between the original ½ core and new ¼ core samples for and statistical analysis returned a coefficient of determination (R^2 value) of 0.91. The wide scatter shown in Figure 10.3, Comparison of Legacy Original Copper Results with Resampled Results, is likely due to the inability to collect exactly the same sample as the original. Differences in precision between methods used in the 1950s and from 2009 to 2010 are also a likely contributor.

Marston found a comparison between pulp re-assays and the original samples to have a very strong correlation when considered at copper values above 0.10 wt.% and with the removal of five outliers or obvious errors. This can be observed in Figure 10.4, Comparison of Legacy Pulp Samples with Re-Assays.

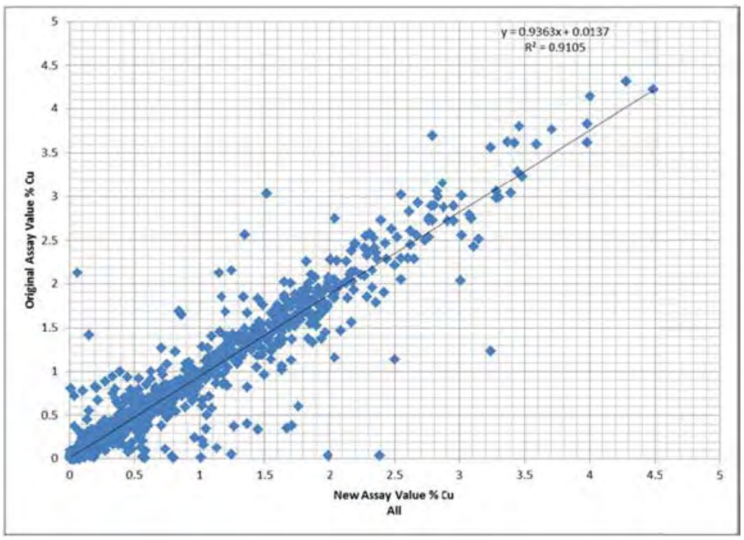


Figure 10.3: Comparison of Legacy Original Copper Results with Resampled Results

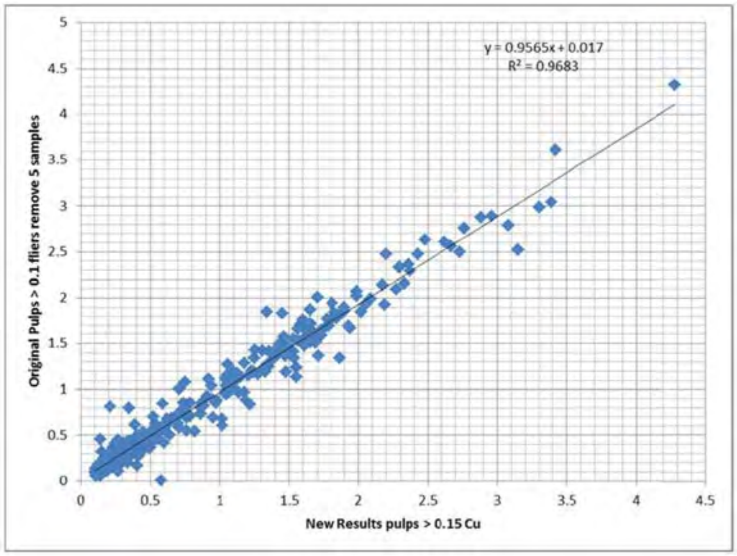


Figure 10.4: Comparison of Legacy Pulp Samples with Re-Assays

This report is primarily concerned with those legacy holes within the Copperwood Project area and in Section 6. Legacy drill holes in Section 6 have a pre-fix of PC and were drilled by BCM in 1959 (T. Bornhorst). BCM did not assay for silver.

Core for all of these drill holes within Section 6, with the exception of PC-13, was available for Orvana to sample.

Orvana submitted standards, blanks and duplicate samples with the re-sampled core and pulp samples to bring the quality of the legacy database up to currently accepted standards.

10.4.2 Core Drilling

Samples collected from drill core during the 1956, 1957 and 1959 campaigns were ½ splits from AX (30.1 mm diameter) and BX (40 mm) cores. The resampling of the archive cores were samples from sawed ¼ core from these earlier programs.

Orvana used two different methods of core sampling during their 2008 to 2011 exploration programs. Initially, Orvana collected ½ splits from NQ (47 mm diameter) size core. This core was then quartered to collect samples for metallurgical testing with the remaining ¼ kept as an archive sample. For the Marston technical report, Orvana modified its procedure, such that core was marked at the drill site by the company geologist and boxed at the drill. This boxed core was transported to the logging and processing facility in Ironwood where the core lithology contacts are re-measured by the QP from the bottom of the drill hole. A sample selection sheet was created. Samples were selected based on lithological contacts often with more than one sample per stratigraphic unit. Samples were also selected on 0.3 m intervals above and below the CBS units. Typically two, 0.3 m samples were collected above the Gray Laminated unit within the Red Laminated siltstone, and one 3 m sample was collected from the Copper Harbour Formation below the Domino layer.

After logging, core was photographed and sawed in half or quarters using a diamond saw without recirculating saw water. Periodically core halves are weighed, and the saw guide is adjusted to ensure equal halves are cut. Figure 10.5 , Figure 10.6 and Figure 10.7 show the set up for these procedures.

Drilling in 2010 added 23 additional drill holes, totalling 2,801 m, in the Copperwood Project resource area. Eleven of these drill holes were drilled specifically for metallurgical and geotechnical samples and were not sampled for normal assay purposes. An additional 72 samples were processed from the 2010 drilling.

Figure 10.5: Core saw station

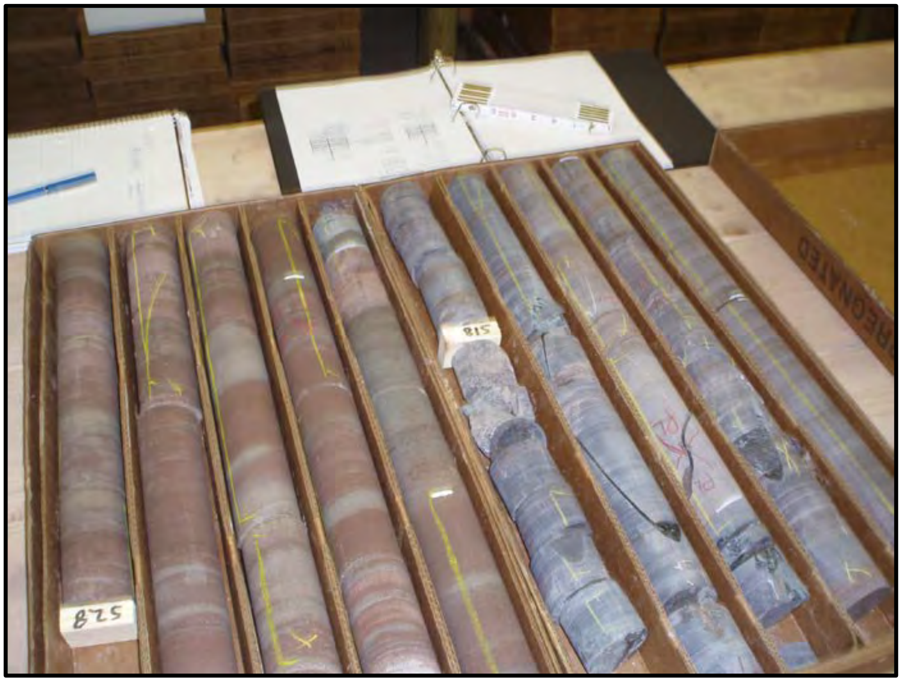


Figure 10.6: Core ready for logging

Figure 10.7: Core photography

Fifteen core holes were drilled in Section 6 in 2010 and 2011 to supplement the 23 legacy drill holes in that section. This effort added 1,250 m of drilling. From this drilling, 122 samples were collected for assay. Two of the core holes in Section 6 were designed as twin holes; these will be discussed further in Item 13 of this technical report. Section 6 covers an area of approximately 229 ha.

10.4.3 Orvana Core Re-sample Program (AMEC, 2011)

Orvana collected the following samples:

- 906, by quartering the remaining USMR and BCM ½ core;
- 447 from REI pulps; and,
- 76 additional samples by quartering existing USMR and BCM ½ core in previously un-sampled areas.

The mean sample interval length was 0.44 m for the ¼ core and 0.57 m for pulps. During sampling of core, Orvana:

- selected re-sample intervals corresponding with previous sample intervals;
- marked the core and created unique sample IDs, by adding zero (0) (or last tenth) to the end of the existing sample number;
- quartered the existing core with a core saw; and,
- weighed the ½ core prior to, and the ¼ core after cutting for control.

Where there was insufficient material, sample intervals were combined, and new intervals were created.

10.4.4 Core Recovery

Actual core recovery for the drilling programs in 1956, 1957 and 1959 was not recorded on the geological logs, but observations from archived core indicate that it should be considered as good (AMEC, 2011). Core recovery for drilling conducted from 2008 through 2010 indicates that recovery is generally good to excellent. Drillers routinely mark recovery on driller's daily logs and this is verified by the geologist on the site. For the 2010 drilling program, recoveries were 90% to 100% with few exceptions within the mineralised zone.

10.4.5 Density

As reported in AMEC's 2010 technical report, during the 2009 drilling program 172 samples were collected and specific gravities (SG) measured from each of the three stratigraphic units within the CBS using appropriate methods. The mean specific gravity for the stratigraphic units was between 2.70 and 2.72 with very low variability. See Table 10.2, below, from AMEC's April 2010 resource study.

Table 10.2: Specific Gravity Summary for Copperwood Main

	Domino	Red Massive	Grey Laminated	Red Laminated
Mean	2.70	2.70	2.72	2.72
Standard Deviation	0.04	0.02	0.02	0.02
Minimum	2.63	2.67	2.68	2.68
Maximum	2.79	2.75	2.76	2.75
Coefficient of Variation	0.014	0.006	0.007	0.007
Count	60	32	60	20

Marston requested some additional specific gravity calculations from drill holes in Section 6 to verify continuity. Mean specific gravity for all rock types combined is 2.71, with a similar statistical variability to AMEC's study, as shown in Table 10.3, Specific Gravity Summary for Section 6.

Table 10.3: Specific Gravity Summary for Section 6

	Domino	Upper CBS	Red Laminated
Mean	2.71	2.71	2.71
Standard Deviation	0.03	0.02	0.01
Minimum	2.66	2.71	2.71
Maximum	2.74	2.74	2.74
Coefficient of Variation	0.010	0.007	0.003
Count	10	20	7

10.4.6 Sample Quality

AMEC's study of Orvana's re-sampling of the legacy materials concluded that the data produced was appropriate for estimation of resources. Observed and recorded core recoveries indicate very good quality core within the mineralised sections.

ITEM 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

All sample selection, analysis and QA/QC activities undertaken on the Copperwood project were performed by previous owners, namely Orvana, AMAX and USMR. Highland had not conducted any sampling activities relating to the Copperwood Project at the time this report was prepared.

Orvana prepared core processing, quality control and security procedures manuals prior to beginning the 2009 drilling program. These procedure manuals provided guidelines for collecting, logging and sampling drill cores and security measures for drilling conducted by Orvana during 2009-2010.

The resources estimate for the Copperwood Main and for Section 6 areas have recently been evaluated (AMEC 2010; AMEC 2011; Marston 2011). These resource estimates involved the use of drilling previously evaluated by Orvana's 2010 NI 43-101 technical report completed by AMEC; historical or legacy drilling evaluated by Orvana's resampling program and reported on in an NI 43-101 completed by AMEC in January of 2011; and, additional drilling completed by Orvana in the Copperwood Main and Section 6 areas during 2010 and 2011 drilling campaigns.

The pre-2010 drilling used to evaluate the Copperwood Project is described in detail in the April 2010 NI 43-101 written by AMEC. The procedures for drilling in 2010 are based on the same procedure manuals. The Section 6 area is a product of the 2010 drilling and a subset of the historical drilling discussed in the January 2011 NI 43-101 technical report filing produced by AMEC. The methods for collection and resampling of the historical drilling and an evaluation of the 2010 drilling are discussed because they are relevant to this study.

11.1 Historical Drilling

USMR and BCM sample preparation and analytical methods are unknown. It is known that one half of the core was submitted for assay and that results for both USMR and BCM were reported as copper weight percent (wt. %). USMR assayed a portion of the drilling for silver while BCM did not evaluate silver values.

11.1.1 Orvana Re-assay Program (2010) from AMEC, 2011

Orvana applied its drill core processing, quality control and security procedures prepared for the 2009 Copperwood diamond drill program to the 2010 Copperwood satellites core sampling and re-assay program. Procedure manuals prepared by Orvana provided guidelines to collecting, logging, and sampling the drill core and security measures. All work was completed by Orvana contract personnel under the supervision of Orvana's independent QP, Dr. Bornhorst.

AMEC's review concluded that sample preparation, security and analytical procedures undertaken during the 2010 re-assay program follow industry best practices.

Orvana retrieved the archived core, re-logged it and then transported it to a facility in Houghton, Michigan where it was sawn in half or quartered. Prior to sawing, the core was photographed, and lithology and sample intervals were checked for consistency against log sheets. Half or ¼ core samples were placed in individually numbered sample bags, which were then placed in larger sacks for shipment to the laboratory. All facilities were secured by lock and key, and all stages of transport and storage were documented with chain of custody forms.

Actlab, in Ancaster, Ontario, Canada was used as the primary laboratory for the final preparation of samples and assays for the Orvana re-assay program. Actlab is accredited by the Standards Council of Canada and conforms to requirements of CAN- P-1579 (ISO/IEC 17025:2005). Accreditation includes the analytical procedures used for the Copperwood, Section 6 and Satellite samples.

Upon receipt, Actlab:

- checked the sample IDs against documentation;
- crushed and pulverised the core following Actlab's Code RX2 procedure;
- crushed the entire core sample to a nominal minus 10 mesh (1.7 mm);
- mechanically split the crushed core with a riffle splitter to obtain a representative sample;
- pulverised the crushed core split to at least 85% minus 200 mesh (75 microns);
- routinely cleaned the crusher between samples with cleaner sand;
- and, routinely checked the quality of crushing and pulverisation

11.2 Orvana 2010 and 2011 Drilling Programs

A drilling program beginning in 2010 and finishing in early 2011 added 23 core holes to the Copperwood Project area and 15 core holes to the Section 6 area to verify and further evaluate mining and copper recovery characteristics. Although 23 new holes were drilled in the Copperwood Project area, only 12 of these drill holes were assayed for copper. The remainder of the holes was used for metallurgical and geotechnical test work.

The evaluation of Section 6 is based on 23 legacy drill holes and 15 new drill holes completed in early January 2011. Marston requested that two of the planned new holes twin legacy holes in Section 6 as part of the verification process.

11.3 Sample Preparation and Reduction

11.3.1 Analysis

All primary lab samples submitted by Orvana were analysed using Actlab's 1E2 - Aqua Regia – ICP procedure. The sample is digested with aqua regia and analysed by ICP for 37 elements. Lower and upper detection limits are reported as 1 g/t and 10,000 g/t for copper and 0.2 g/t and 100 g/t for silver.

Samples returning greater than 2,000 g/t copper or greater than 25 g/t silver were routinely re-analysed using Actlab's Code 8 AR procedure. The sample is digested by aqua regia and analysed by ICP OES. Lower detection limits are 0.001 wt.% for copper and 3 g/t for silver.

11.3.2 Quality Control

Orvana implemented a comprehensive QA/QC program for its 2010 and 2011 core drilling and re-sampling of legacy samples, which is discussed well in AMEC's 2011 NI 43-101 technical report covering the satellite deposits and in the resource assessment technical report for April 2010. Marston reviewed the QA/QC program for the 2010 and 2011 drilling and for those legacy drill holes included in the study.

Table 11.1is a summary of QA/QC sample insertion rates for 2010 and 2011 drilling and legacy holes in Section 6. The table indicates the level of quality control samples used for the new drilling and for the legacy drill samples from Section 6.

Table 11.1: Control Reference Material Insertion Rates for 2010 and 2011 Drilling

QA/QC Sample Type	Pulp/Coarse	Number	Insertion Rate
Control Reference Material	Pulp Control Reference Material	65	10.1%
Blanks	Coarse	31	4.8%
	Pulps	21	3.3%
Duplicates	Coarse	11	1.5%
	Pulps	20	3.1%

11.3.3 Blanks and Assessment of Contamination

Orvana inserted coarse blanks and certified pulp blanks into the samples stream as part of the QA/QC program for re-assaying the legacy drill holes and for 2010 core drilling. Coarse blank samples go through the same process as the core samples. Coarse blanks are useful for identifying sample mix-ups and contamination in the crushing and pulverising process. For the legacy resamples and 2010 core drilling, Orvana submitted 31 blanks made from coarse glass into the sample stream. Assay values for the coarse glass blanks showed a negligible amount of contamination with most results at or below detection limit with a high of 0.007 wt.% copper. All silver values for this material were below the detection limit (0.2 g/t silver).

Orvana also inserted pulp blanks made commercially (OREAS 22B). Pulp blanks are pulverized barren material. When barren pulps are inserted into the sample stream immediately after highly mineralised material, they are designed to catch possible contamination in the assay process. Twenty blank pulps were used in the processing of these samples. Four of the 20 samples returned copper values just above detection with the highest at 30 g/t.

Silver values were at or below detection limit with one sample returning 0.3 g/t silver. These values indicate a negligible amount of contamination.

11.3.4 Duplicate Sample Performance

Orvana used two types of sample duplicates to evaluate lab precision. Coarse duplicates are sample splits collected immediately after primary crushing and splitting of the samples for assay. The second type of duplicates used was pulp sample splits which were collected after the sample was pulverised for analysis. Both types of samples are collected and resubmitted to the same laboratory as a check on relative error in the analysis process.

For the 2010 and 2011 drilling programs, 11 coarse duplicates were resubmitted to Actlabs, and 20 pulp duplicates were submitted.

Eleven splits were submitted as coarse duplicates. Two samples had a relative difference for copper of greater than 10% and one of those was greater than the 20% threshold. Thus, one sample or 9% of the samples exceeded the pre-determined threshold of 20% for coarse duplicates used by AMEC in the two previous technical reports. This relationship is shown on Figure 11.1, Coarse Duplicate Relative Error Copper vs Sample Mean.

The comparison of pulp duplicates helps to understand the precision of the analytical process. Pulps should have less variability than the coarse materials, and it is expected that the error rate should be less than for coarse duplicates. A threshold error limit of 90% of the sample pairs having a relative error of less than 10% was applied to pulps by AMEC.

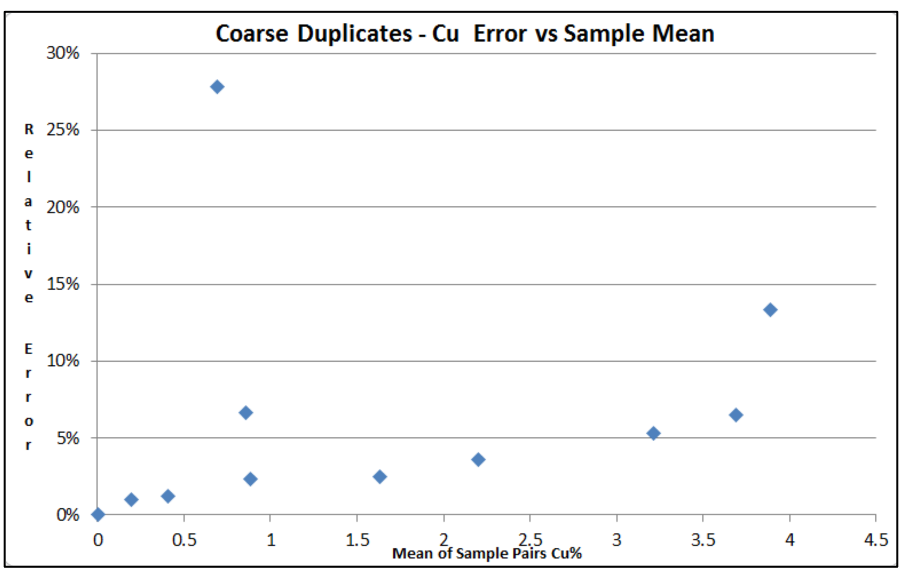


Figure 11.1: Coarse Duplicate Relative Error Copper vs Sample Mean

Relative error for pulp duplicates for copper values were evaluated. One sample at very low levels of copper reported 0.006 wt.% vs. 0.01 wt.% copper failed. Although the relative difference is 40%, the quantity of copper is negligible. Thus, the comparison of relative error to the mean of the sample pairs is important to put the level of error in perspective.

Figure 11.2, Pulp Duplicates - Silver Error vs. Sample Mean, shows two samples at low silver values to be over the accepted threshold of 10% relative error. The number of samples used for this comparison was limited to 18, and the less than 1 g/t level is not of economic significance. AMEC's January 2011 resource assessment of the legacy sample data had a much larger sample group (99), which showed lab precision for silver to be reasonable.

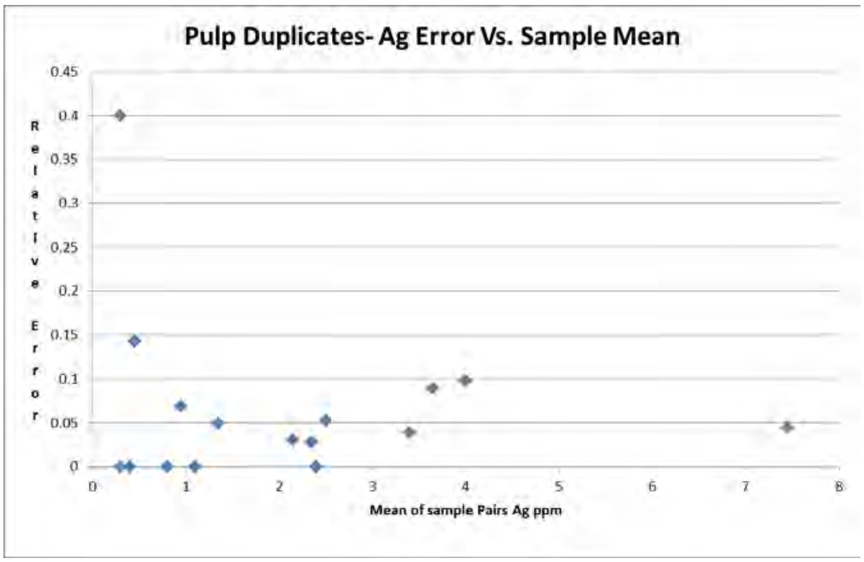


Figure 11.2: Pulp Duplicates - Silver Error vs. Sample Mean

Performance of Standards

Throughout the re-analysis and the 2010 and 2011 drilling programs, control reference materials were used at a rate of about 10%. Orvana included five different standards along with the "legacy" resampled material from Section 6 and new drilling completed in 2010 and 2011. The control reference materials covered a range of values from a low grade of 0.576 wt.% copper to a high of 6.28 wt.% copper.

The control reference materials used by Orvana were from Ore Research and Exploration Pty Ltd., an independent provider of commercial analytical standards. Ore Research and Exploration Pty Ltd. standards OREAS 93, OREAS 94, OREAS 95, OREAS 96 AND OREA S97 were used to evaluate laboratory accuracy. Very few of the control reference materials returned from Actlabs were greater than two standard deviations from the certified mean for copper. None of the control reference material statistics indicate a bias greater than 5%.

Results are represented on Figure 11.3 , Figure 11.4, Figure 11.5, Figure 11.6, Figure 11.7, and Figure 11.8.

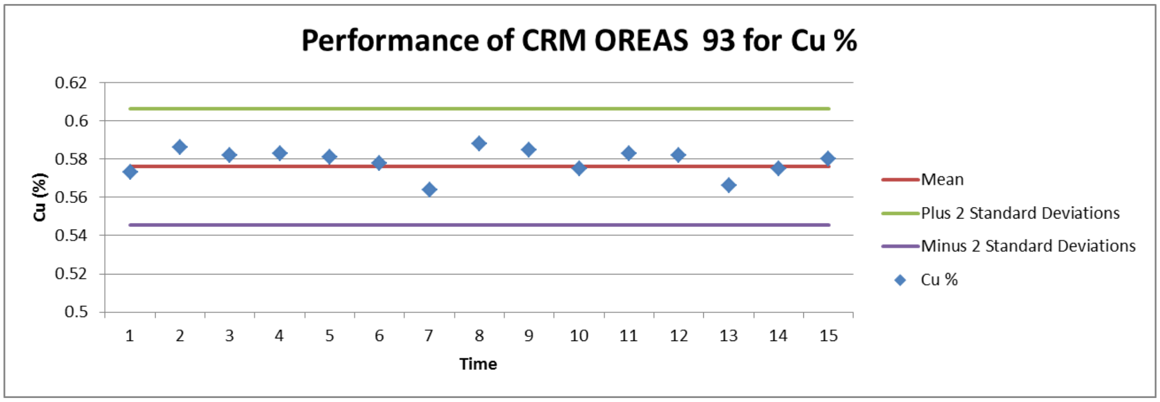


Figure 11.3 : Performance of Control Reference Material OREAS 93 for Copper wt.%

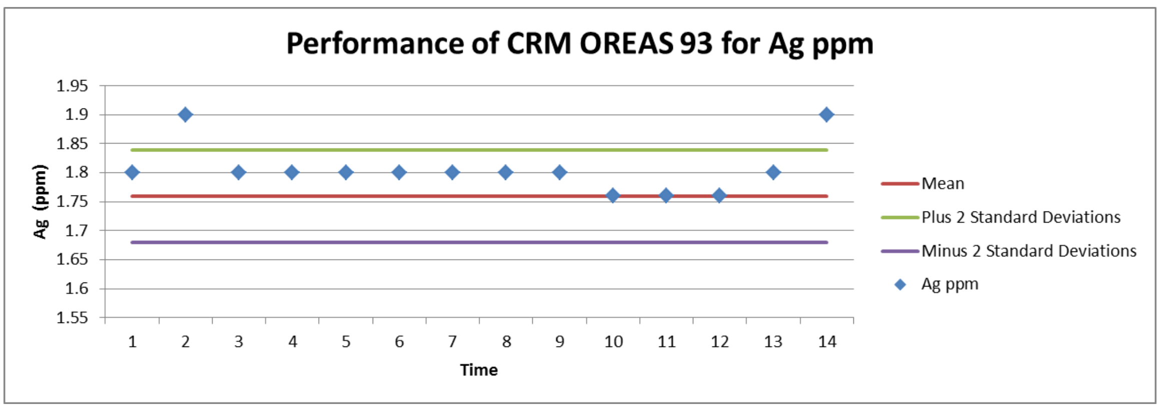


Figure 11.4: Performance of Control Reference Material OREAS 93 for Silver g/t

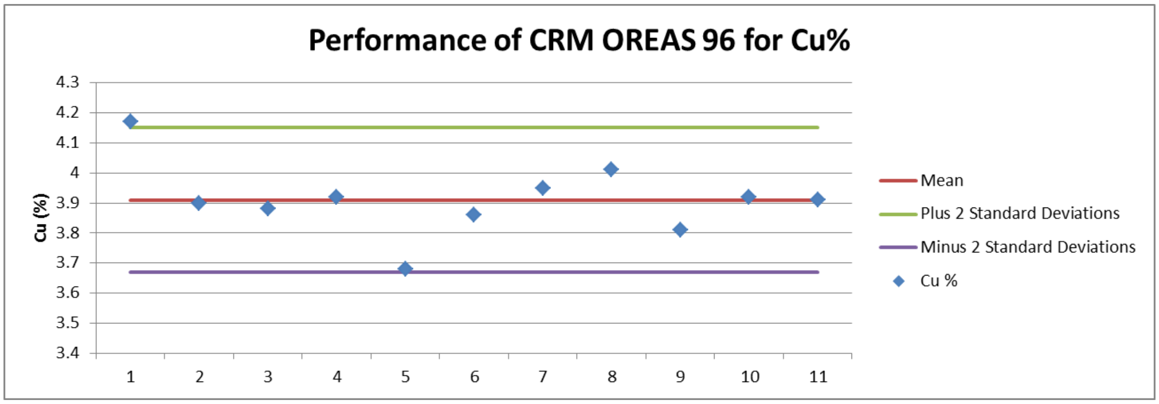


Figure 11.5: Performance of Control Reference Material OREAS 96 for Copper wt.%

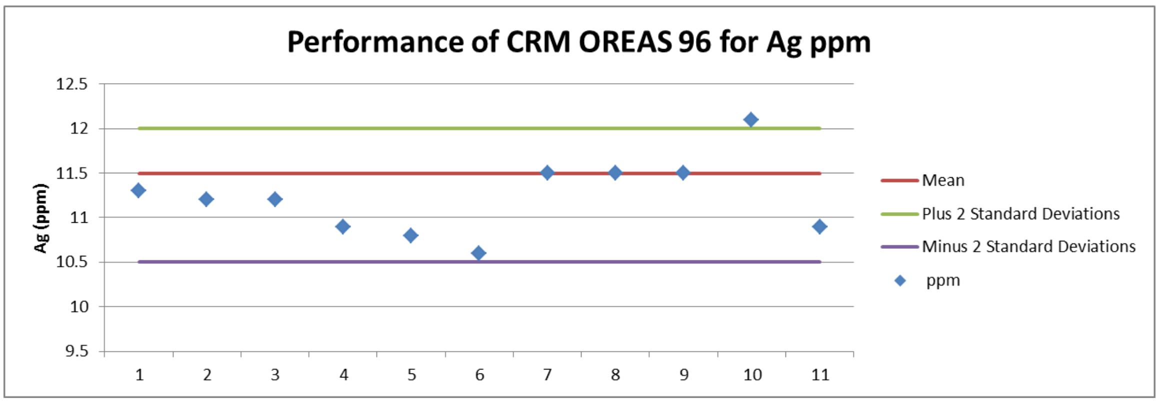


Figure 11.6: Performance of Control Reference Material OREAS 96 for Silver (g/t)

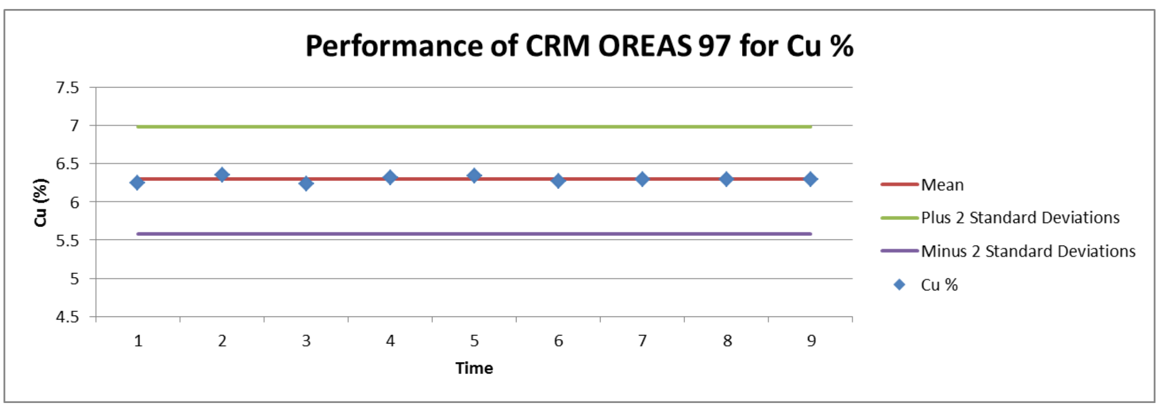


Figure 11.7: Performance of Control Reference Material OREAS 97 for Copper wt.%

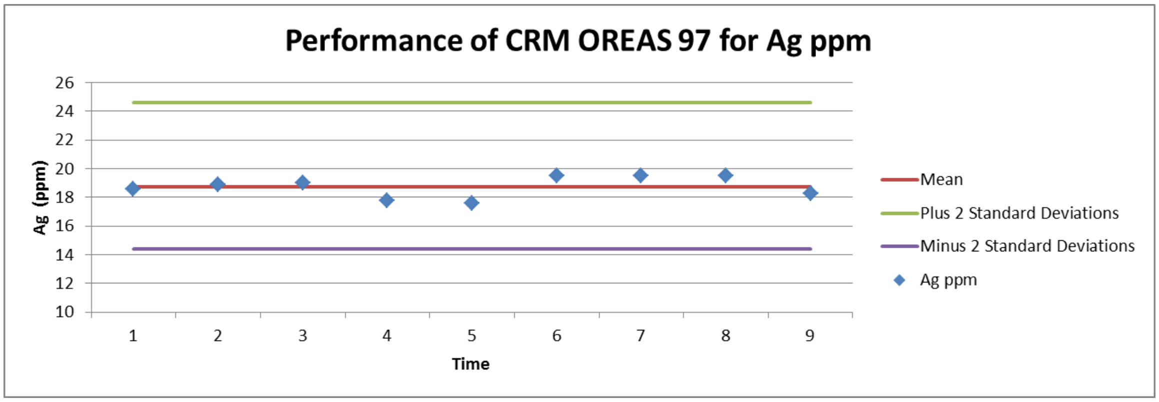


Figure 11.8: Performance of Control Reference Material OREAS 97 for Silver (g/t)

11.4 Security

Orvana established security measures to insure the integrity and validity of the samples obtained from the 2009 Copperwood drilling program and later programs. The security program was outlined in a procedures manual, which has been summarised from AMEC, April 2010.

Drill core was collected from the drill rig by a trusted person directly contracted by Orvana. The Orvana person was under supervision of the Orvana QP.

Chain of custody forms were completed for each hole and remained with those boxes of mineralized and proximal core until the assay and density results were finalised.

Each individual box of mineralised and proximal core was "sealed" with shrink wrap in the short direction (not completely encased in shrink wrap). A permanent sticker label with signature completes the seal. Figure 11.9 shows secured core boxes.

The core was transported to the core logging/storage facility (Figure 11.10, Secured storage area) in Ironwood by an Orvana contracted person using a truck or SUV. At the storage facility, the core was placed inside a secure and locked cage if not sealed with signature sealed shrink wrap.

Only Orvana's QP broke the seal on the core and notes this on the chain of custody form. Prior to breaking the seal, the existing seal was inspected and verified as intact. The core boxes do not need to remain sealed if behind locked access.

The sealed core boxes are transported for core processing by an Orvana contracted person using a truck or SUV. Prior to core processing, the seals were inspected by Orvana's QP (chain of custody notes breakage); the core is inspected by Orvana's QP for tampering. During the time the core is in control of Orvana's QP for core processing, the chain of custody form will not be updated.

Figure 11.9: Secured core boxes

Figure 11.10: Secured storage area

During core processing, the sealed boxes with mineralised and proximal core were stored in a secure area to restrict access. During each step of core processing, the core was inspected to insure integrity. After core processing was completed, the core box was resealed.

11.5 Conclusions

The quality control and quality assurance procedures meet or exceed industry standards. The performance of inserted blanks and standards indicate that the sample preparation and the lab accuracy have been of good quality. Sample duplicate results were reasonable for copper values indicating a reasonable level of precision from the contracted lab. Silver values from duplicates exceed the expected levels for relative errors between duplicates especially at low levels (1 g/t). Marston concluded that the number of samples involved in this analysis was not enough to arrive at a meaningful conclusion and the relative differences for silver values were economically inconsequential. AMEC's recent review of the same laboratory as part of a much larger study indicated that pulp duplicate precision for silver was reasonable.

Marston concluded that the QA/QC and security protocols established by Orvana and the quality of the results support resource and future reserve estimation.

The QP agrees with AMEC's assessment of the re-assay of the legacy samples showing no significant bias and that the quality of Actlabs analysis is reliable enough for the calculation of resources.

ITEM 12 DATA VERIFICATION

The Golder QP has not completed the work necessary to classify the historical estimate for the Copperwood Project as current Mineral Resources. Golder and Highland are not treating the historical estimate as current NI 43-101 compliant Mineral Resources, therefore the historical resources should not be relied upon.

A detailed review of the base data, geological model and resource estimates is required before a QP would be in a position to consider classification of the historical resource estimate as current Mineral Resources for the Copperwood Project.

Golder's data verification process included a review of the existing technical reports for the Copperwood Project, review of sections and plan maps from the 2011 Marston geological model, and discussions of drilling, logging, sampling, analytical and QA/QC methodology and practices with Orvana personnel involved in the 2008 to 2013 exploration programs.

Golder has not performed a detailed review of the geological database nor has Golder conducted any geological modelling or performed any mineral resource estimates for the Copperwood Project. Additionally, Golder has not performed any independent sampling or analysis for verification of grade data.

The Golder QP current personal inspection site visit included a visit to the Copperwood Project property (March 11 to 14, 2014) for the purpose of verifying drill hole locations and viewing the general project area layout. Deep snow at the project site limited verification to seven drill holes.

Table 12.1, Drill Hole Comparison - Site Visit Coordinates vs Original Surveyed Coordinates, shows the comparison between the original surveyed locations, and the handheld GPS survey conducted during the site visit. Several of the holes exhibited coordinate differences in excess of 20 m but given poor satellite coverage and conversion of the coordinates from another system the Golder QP is comfortable that drill hole locations for the Copperwood Project have been reasonably verified. Figure 12.1, March 2014 Site Visit, highlights the locations visited during the site visit. Figure 12.2, shows two examples of the physical drill hole collar locations visited.

During the site visit the QP also spent time with the Orvana and Highland personnel at the core logging and sample preparation facilities in Ironwood, Michigan. Orvana personnel included Dr. Theodore Bornhorst, an independent QP and professor at Michigan Tech in Houghton, Michigan. Dr. Bornhorst conducted all of the geological logging and controlled the sample security and protocol for the Orvana projects. Dr. Bornhorst also oversaw the insertion and quality control efforts reviewed in the previous Marston technical report.

Table 12.1: Drill Hole Comparison - Site Visit Coordinates vs Original Surveyed Coordinates

Site Visit Locations[I]				Original Surveyed Locations				Compare			
Drill Hole ID	Easting	Northing	Elevation (m)	Drill Hole ID	Easting	Northing	Elevation (m)	Drill Hole ID	Easting	Northing	Elevation (m)
CW-09-102	270464.60	5173190.53	243.84	CW-09-102	270436.37	5173188.99	224.20	CW-09-102	-28.23	-1.54	-19.64
CW-10-106	269860.74	5173423.15	226.47	CW-10-106	269895.43	5173419.53	213.33	CW-10-106	34.68	-3.62	-13.13
CW-10-113	270374.84	5172845.29	242.01	BC-10-113	270382.24	5172840.00	225.59	BC-10-113	7.40	-5.29	-16.42
CW-11-145	270316.86	5173333.40	231.95	CW-09-96	270339.32	5173331.11	220.71	CW-09-96	22.46	-2.29	-11.24
CW-13-147	270461.35	5173105.34	245.97	CW-13-147	270500.25	5173099.07	226.28	CW-13-147	38.90	-6.27	-19.70
CW-13-150	269944.09	5173599.86	186.84	CW-13-150	269962.42	5173599.02	211.96	CW-13-150	18.33	-0.84	25.12
M57-W108	270534.38	5173011.68	237.44	M57-W108	270529.37	5173004.12	225.68	M57-W108	-5.01	-7.56	-11.76

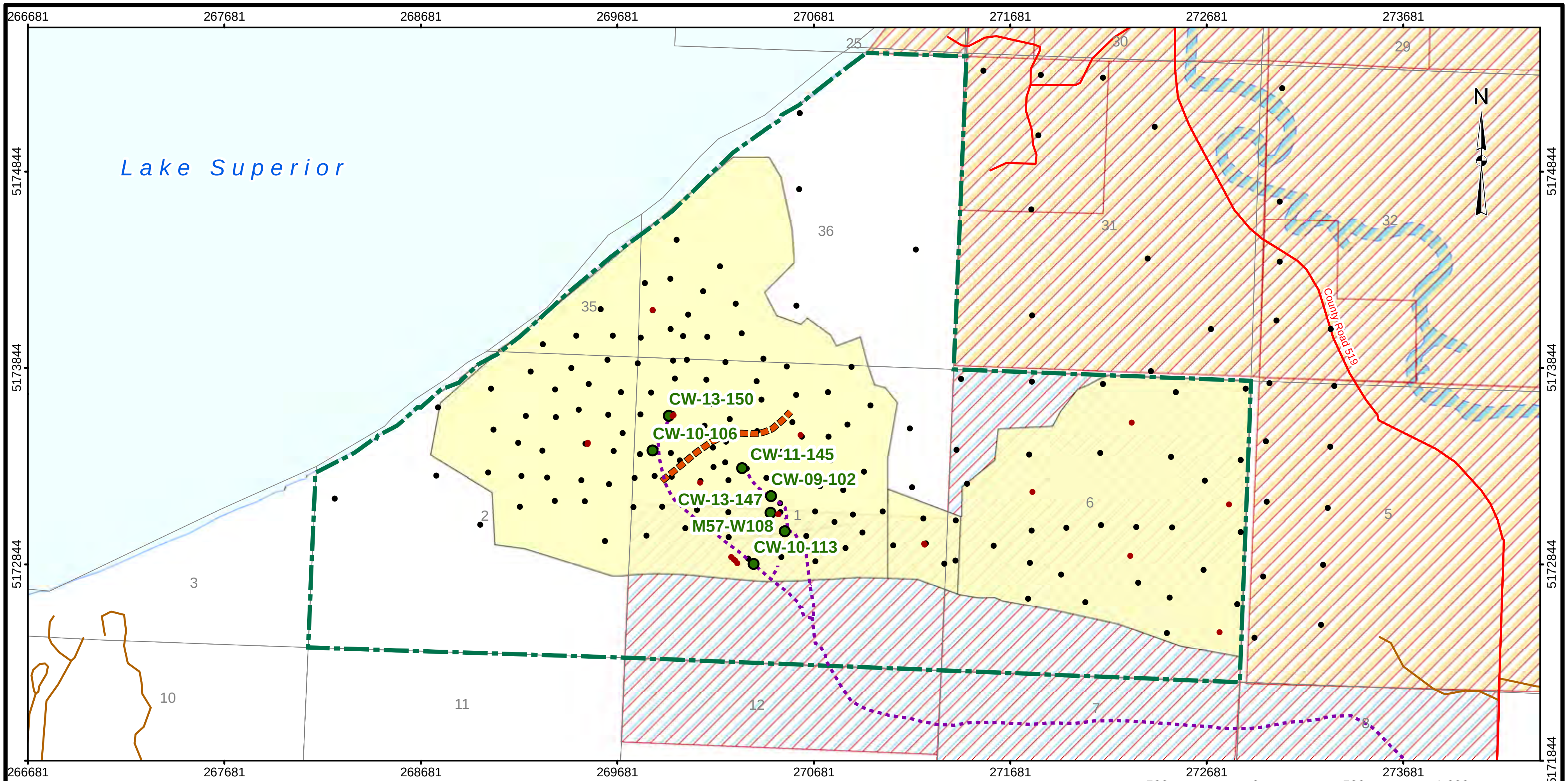
[I] All coordinates are in NAD 1983 UTM Zone 16

During the site visit the Golder QP viewed archived drill core, core logging and analysis records. The QP also reviewed the core logging, sampling, analytical, core and sample security and QA/QC procedures with the senior geologist that was responsible for all Orvana exploration programs on the Copperwood Project. Figure 12.3, Figure 12.4 and Figure 12.5 show examples of the core storage, physical core and logging and analysis records.

The Golder QP was very impressed with the comprehensive, well documented and well organized core, logging, sampling, analysis, QA/QC, photographic and other related records of exploration data retained by Orvana at the Ironwood project office. The data available will allow for ease of performing future detailed base data reviews and/or resampling programs.

Overall, the Golder QP is comfortable that the data, analyses, models and Mineral Resource estimation work collected and presented in the previous historical reports was performed in a professional manner using industry best practices and is deemed relevant and reliable for use in the statement of historical Mineral Resources presented in this technical report.

E:\CopperWood\GIS\MapFiles\Fig12.1_Highland_ANSI_A_8_5x11_SiteVist_Landscape.mxd



LEGEND

- Orvana Mineral Lease
- Orvana Mineral Rights "Option to Lease"
- Orvana Surface Rights
- Model Limit
- Existing Drill Hole
- 2013 Orvana Drilling
- Fault
- Mined Out

March 2014 Site Visit

- Surveyed Drill Hole / Monitoring Hole
- Survey Trail

- Michigan Sections
- County Road 519
- Road
- Lake
- River

500 0 500 1,000

SCALE 1:30,000 Meters METERS

REFERENCE

Note: Original coordinate system was NAD 1983 State Plane Michigan North (Feet) in imperial units.
All maps were converted to UTM and metric units for this Technical Report

DATUM: NAD 1983 UTM Zone 16 N

PROJECT

COPPERWOOD PROJECT
GOGEBIC COUNTY, MICHIGAN

TITLE

MARCH 2014 SITE VISIT

Golder Associates

PROJECT		1401359	FILE No.	
DESIGN	JNS	14 Mar. 2014	SCALE AS SHOWN	REV. 0
GIS	JNS	14 Mar. 2014	**FIGURE: 12.1**	
CHECK	JdW	01 Apr. 2014		
REVIEW	JdW	01 Apr. 2014		

Figure 12.2: Drill hole collars

Figure 12.3: Core storage

Figure 12.4: Core photo record book and an example of physical core

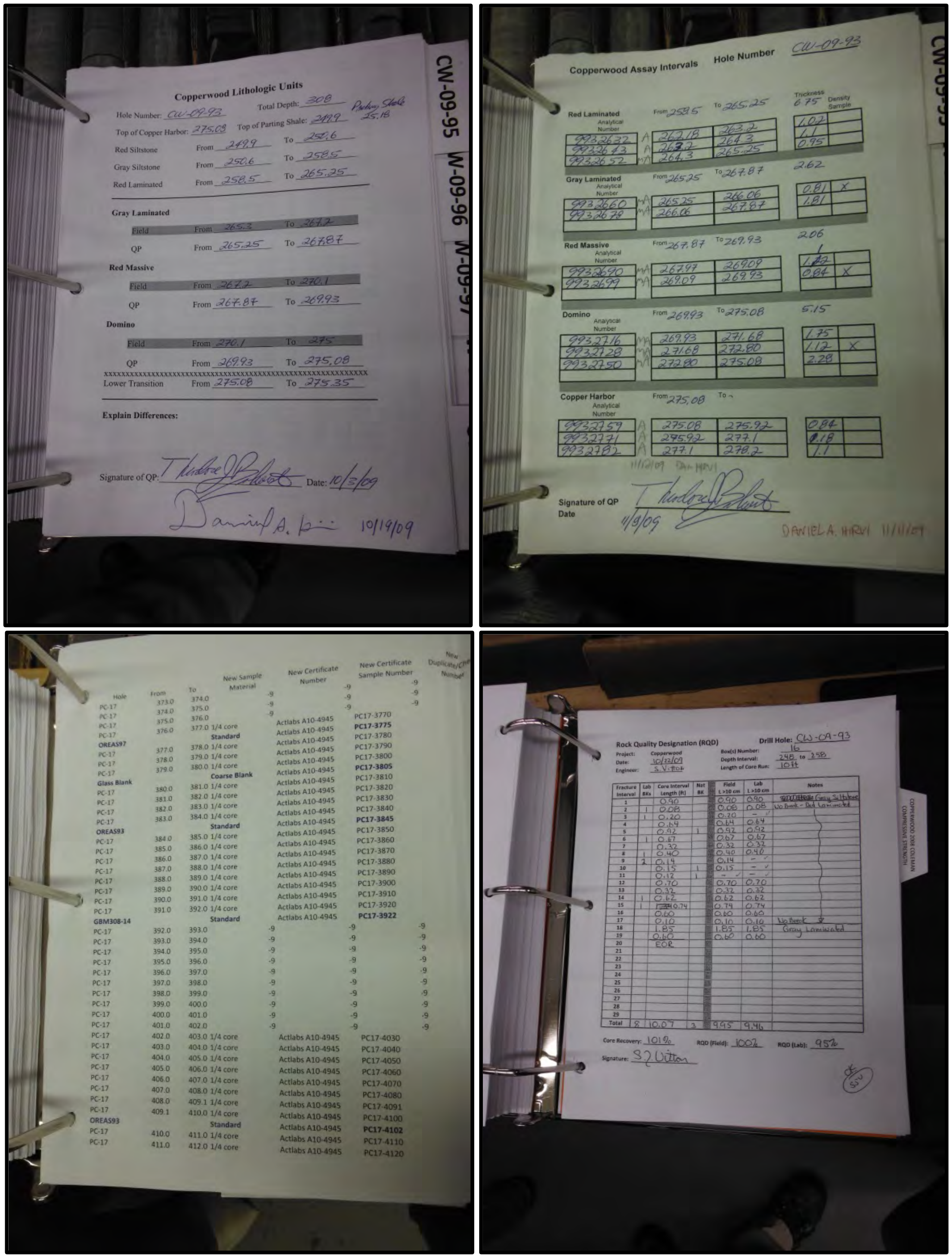


Figure 12.5: Drill hole core logging and analysis records, showing geological intervals, assay intervals, RQD intervals and legacy core re-assay database

ITEM 13 MINERAL PROCESSING AND METALLURGICAL TESTING

Not applicable to this technical report.

ITEM 14 MINERAL RESOURCE ESTIMATES

There are no current Mineral Resources for the Copperwood Project reported in this technical report. Please refer to ITEM 6, for a statement of historic resources for the Copperwood Project.

ITEM 15 MINERAL RESERVE ESTIMATES

There are no current ore reserves for the Copperwood Project reported in this technical report.

ITEM 16 MINING METHODS

Not applicable to this technical report.

ITEM 17 RECOVERY METHODS

Not applicable to this technical report.

ITEM 18 PROJECT INFRASTRUCTURE

Not applicable to this technical report.

ITEM 19 MARKET STUDIES AND CONTRACTS

Not applicable to this technical report.

ITEM 20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

Not applicable to this technical report. Please refer to ITEM 4, for details on historic studies and permitting status.

ITEM 21 CAPITAL AND OPERATING COSTS

Not applicable to this technical report.

ITEM 22 ECONOMIC ANALYSIS

Not applicable to this technical report.

ITEM 23 ADJACENT PROPERTIES

There are no other mineral exploration or development projects in the Copperwood Project area. The Satellite areas, consisting of approximately 1,516 ha outside of the Copperwood Main and Section 6 areas, are held as lease options by Orvana. The Satellite areas are the subject of an NI 43-101 compliant technical report by AMEC in January 2011.

ITEM 24 OTHER RELEVANT DATA AND INFORMATION

There is no other information relevant to this technical report.

ITEM 25 INTERPRETATION AND CONCLUSIONS

Based on a review of the previous technical reports Golder considers the 2011 NI 43-101 technical report, prepared by Marston and Marston (Marston) on behalf of Orvana, to be the most relevant and up to date (effective date of January 25, 2011) source for the purpose of stating an historical Mineral Resource estimate for the Copperwood Project.

At a 0.8% copper cut-off grade, Measured and Indicated historical Mineral Resources total 30.1 Mt at 1.65% copper and 4.34 g/t silver. At a 0.8 wt.% copper cut-off grade, Inferred historical Mineral Resources total 2.7 Mt at 1.07 wt.% copper and 2.01 g/t silver.

It must be noted that the Golder QP has not completed the work necessary to classify the historical estimate for the Copperwood Project as current Mineral Resources. Golder and Highland are not treating the historical estimate as current NI 43-101 compliant Mineral Resources, therefore the historical resources should not be relied upon.

It is the Golder QP's opinion that the Orvana exploration programs, including drilling programs, analytical programs, historical data validation and resampling programs, and QAQC programs resampling have been well done. Exploration programs completed on the Copperwood Project have met their objective of identifying copper mineralisation that has a reasonable prospect of meeting economic extractability requirements. The drill hole spacing and quality of data are felt to be reliable and proper for stating relevant historical Mineral Resources for the Copperwood Project.

The known extent of the Copperwood historical Mineral Resource area is currently 1.5 km x 2.5 km (3.75 km^2). Copperwood mineralisation is similar to that at the historically producing White Pine Mine located 30 km to the northeast.

The historical Mineral Resource at Copperwood has several positive features:

- Access to the mineralisation should not involve extensive drifting in waste since the southeastern edge of the Copperwood Project is near the surface.
- The mineralisation is relatively flat-lying providing the possibility of mechanised mining. The footwall and hanging wall rocks are reasonably competent.
- There are few faults and structural complications.
- The continuity of grade is good, which should help simplify the mine planning.
- The mineralisation is expected to be above any major aquifers, limiting the amount of water related costs for underground mining.
- Copper mineralisation is as chalcocite and should be amenable to known floatation and concentration methods.

Risks to the successful extraction of the Resource do exist:

- Dilution is a principle concern and is the factor that lead Marston to use small model block heights (0.15 m) in an effort to better estimate dilution grades.
- Dilution is expected to come from the floor and the back of the mineralisation as well internal subgrade material from the Red Massive unit especially in Section 6 where the Domino is thin.
- Grade control will need to be developed to control excess dilution from the roof and the floor.
- Dilution may increase in areas where the dip of the mineralisation is increased.

Additional work is required to allow Highland to estimate current Mineral Resources. Once current Mineral Resources have been estimated additional work, performed to the preliminary feasibility level as defined by CIM, is required to allow for consideration in converting current Mineral Resources to Mineral Reserves.

ITEM 26 RECOMMENDATIONS

The Golder QP has not performed sufficient work to report historical Mineral Resources as current Mineral Resources for the Copperwood Project. Golder recommends that Highland perform a comprehensive review of the base data, modelling and estimates so as to allow for reporting current mineral Resources as per the standards and guidelines presented in NI 43-101 and supporting documentation.

Golder recommends that the base data review include:

- Review of topography base data and topography modelling from a detailed Light Detection and Ranging (LiDAR) survey
- Review of drill hole collar coordinate and elevation surveys
- Review of drill hole down hole survey and lithology data and interpretations
- Review of geostatistical analysis and interpretations, with the generation of wireframes, etc.
- Review of analytical data and QA/QC results

In addition to reviewing the historical data and interpretations used in the Marston 2011 and earlier models, Golder also recommends that the 21 drill holes completed by Orvana as part of the 2013 metallurgical and geotechnical programs be incorporated into the modelling database.

Once the modelling database is updated and reviewed in detail, Golder recommends that Highland update the Copperwood geological model.

Golder recommends that Highland then estimate current Mineral Resources according to the guidelines presented in NI 43-101 and supporting documentation and using the updated geological model.

Once Highland has established current Mineral Resources for the Copperwood Project, Golder recommends that Highland initiate a preliminary feasibility study to allow for the consideration of converting Mineral Resources to Mineral Reserves.

The estimated budget to carry out the proposed work is summarized in Table 26.1, Budget Estimate for Proposed Work to be Completed by Highland.

It is Golder's opinion that the Copperwood mineralization is well defined, and significant additional delineation drilling is not required. Golder does recommend that Highland consider drilling several confirmation holes that twin existing historical holes; with the purpose of verifying the location and thickness of the target units as well as to verifying grade data. These holes could also be used to generate material for metallurgical testing. The comprehensive, well documented and well organized core, logging, sampling, analysis, QA/QC, photographic and other related records of exploration data retained by Orvana at the Ironwood project office will allow for ease of performing future detailed base data reviews and/or resampling programs.

Table 26.1: Budget Estimate for Proposed Work to be Completed by Highland

Activity	Phase 1 (6 months; US$)	Phase 2 (6 months; US$)	Total (US$)
LiDAR Survey	$40,000		$40,000
Confirmatory/met drilling (1,700 m in 10 ddh)	$340,000		$340,000
Mineral Resource estimate	$50,000		$50,000
Metallurgical testing		$100,000	$100,000
Engineering studies		$950,000	$950,000
Technical management	$125,000	$200,000	$325,000
Totals	$555,000	$1,250,000	$1,805,000

There is potential for a mineral development in other areas of the Western Syncline on lands which Orvana hold options to outside the Project and Section 6 areas. Additionally, the historical Mineral Resource is thought to continue to the west under Lake Superior. Orvana has not evaluated the potential of mining under the lake.

ITEM 27 REFERENCES

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DATE AND SIGNATURE PAGE

This technical report is titled **NI 43-101 Technical Report on the Copperwood Project, Michigan, USA.**

The effective date of this report is **March 17, 2014**.

The report was submitted on **June 12, 2014**.

Golder Associates Ltd. is the Author of this technical report.

The technical report is addressed to the issuer, Highland Copper Company Inc.

Mr. Jerry DeWolfe, P. Geo., is the Qualified Person for the entire technical report.

Dated at Calgary this June 12, 2014.

Jerry DeWolfe (signed)

Signature of Qualified Person

PROFESSIONAL GEOLOGIST JERRY C. DEWOLFE ALBERTA

Jerry DeWolfe, P. Geo.

Print name of Qualified Person

CERTIFICATE OF QUALIFIED PERSON

As the qualified person responsible for preparing the technical report entitled **NI 43-101 Technical Report on the Copperwood Project, Michigan, USA**, dated June 12, 2014, with an **effective date of March 17, 2014** and prepared for Highland Copper Company Inc., I, **Jerry DeWolfe**, do hereby certify that:

a) I am a Geologic Consultant at:

Golder Associates Ltd.

102, 2535 3rd Avenue S.E., Calgary, Alberta, Canada T2A 7W5

b) I am a member in good standing of the following professional associations:

- Association of Professional Engineers and Geoscientists of Alberta (APEGA)
- Association of Professional Engineers and Geoscientists of British Columbia (APEGBC)
- Association of Professional Geoscientists of Ontario (APGO).

c) I graduated with a Bachelor of Science with Honours in Geology, from Saint Mary's University, Halifax, Nova Scotia, Canada, in 2000. I graduated with a Masters of Science in Geology, from Laurentian University, Sudbury, Ontario, Canada, in 2006.

I have worked as a geologist for 14 years. My experience has focused on exploration, mine geology and resource estimation of stratigraphically controlled deposits, base metals deposits and precious metals deposits.

As a result of my education, professional qualifications, and experience, I am a Qualified Person as defined in National Instrument 43-101.

d) I completed a personal inspection of the Copperwood Property that is the subject of the technical report on March 11 to 14, 2014.

e) I am responsible for preparation of all items included in this technical report with the exception of the land, tenure and permitting as described in Item 3 of the technical report.

f) I am independent of the issuer, Highland Copper Company Inc. in accordance with the guidelines and requirements presented in Section 1.5 of National Instrument 43-101.

g) I served as the Marston internal reviewer for the Marston 2011 technical report for the Copperwood project; I have had no other prior involvement with the project.

h) I have read National Instrument 43-101, Form 43-101F1 and the Companion Policy 43-101CP, and this technical report has been prepared in compliance with the guidelines presented in NI43-101, Form 43-101F1 and 43-101CP.

i) As of the date of this Certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated at Calgary this June 12, 2014.

Jerry DeWolfe (signed)

Signature of Qualified Person

PROFESSIONAL GEOLOGIST
JERRY C. DEWOLFE
ALBERTA

Jerry DeWolfe, P. Geo.

Print name of Qualified Person

CONSENT OF QUALIFIED PERSON

Pursuant to Section 8.3 of National Instrument 43-101

Standards of Disclosure for Mineral Projects

("NI 43-101")

Jerry DeWolfe, P. Geo.

Geological Consultant

Golder Associates Ltd.

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To: British Columbia Securities Commission

Alberta Securities Commission

TSX Venture Exchange

I, Jerry DeWolfe, P.Geo., do hereby consent to the public filing of the technical report entitled *NI 43-101 Technical Report on the Copperwood Project, Michigan, USA*, prepared for Highland Copper Company Inc. (the "Issuer") and dated effective March 17, 2014 (the "Technical Report"), with the TSX Venture Exchange under its applicable policies and forms in connection with the acquisition by the Issuer of the Copperwood Project from Orvana Minerals Corp. as announced by the Issuer on February 11, 2014 and I acknowledge that the Technical Report will be filed on the System for Electronic Document Analysis and Retrieval (SEDAR) and become part of the Issuer's public record.

Signed on June 12, 2014.

PROFESSIONAL GEOLOGIST ALBERTA
JERRY C. DEWOLFE

Jerry DeWolfe (signed)

Jerry DeWolfe, P.Geo.

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