

ORVANA RESOURCES US CORP



Orvana Resources
US Corp

Orvana Minerals Corp TSX- ORV

METALS

Gold

Copper

Silver



PROJECTS

EVBC Spain

DON MARIO Bolivia

COPPERWOOD
Michigan, USA

APRIL 2011
DON MARIO - UMZ
Commissioning

AUGUST 2011
EVBC
Production

2014
COPPERWOOD
Commissioning

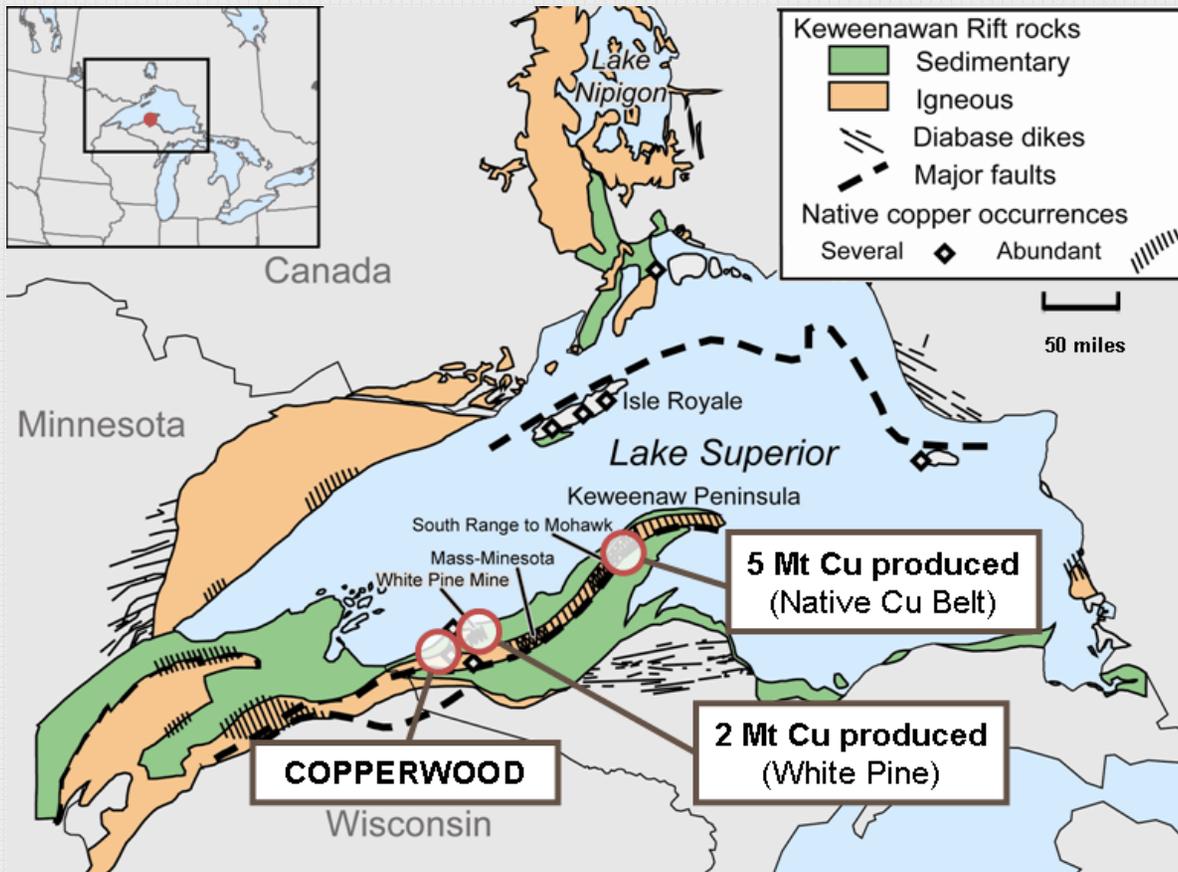
Company Snapshot

Ticker	TSX: ORV
Shares Outstanding	136.6million
Market Cap (03/13/12)	C\$117.5 million
Cash (12/31/11)	US\$13.8 million
Debt	US\$50 million (Credit Suisse)
Major Shareholder	Fabulosa Mines Ltd. (52%)
Head Office	Toronto, Ontario
Main Projects	EVBC Spain (gold-copper-silver) Don Mario UMZ, Bolivia (copper-gold-silver) Copperwood, U.S. (copper-silver)

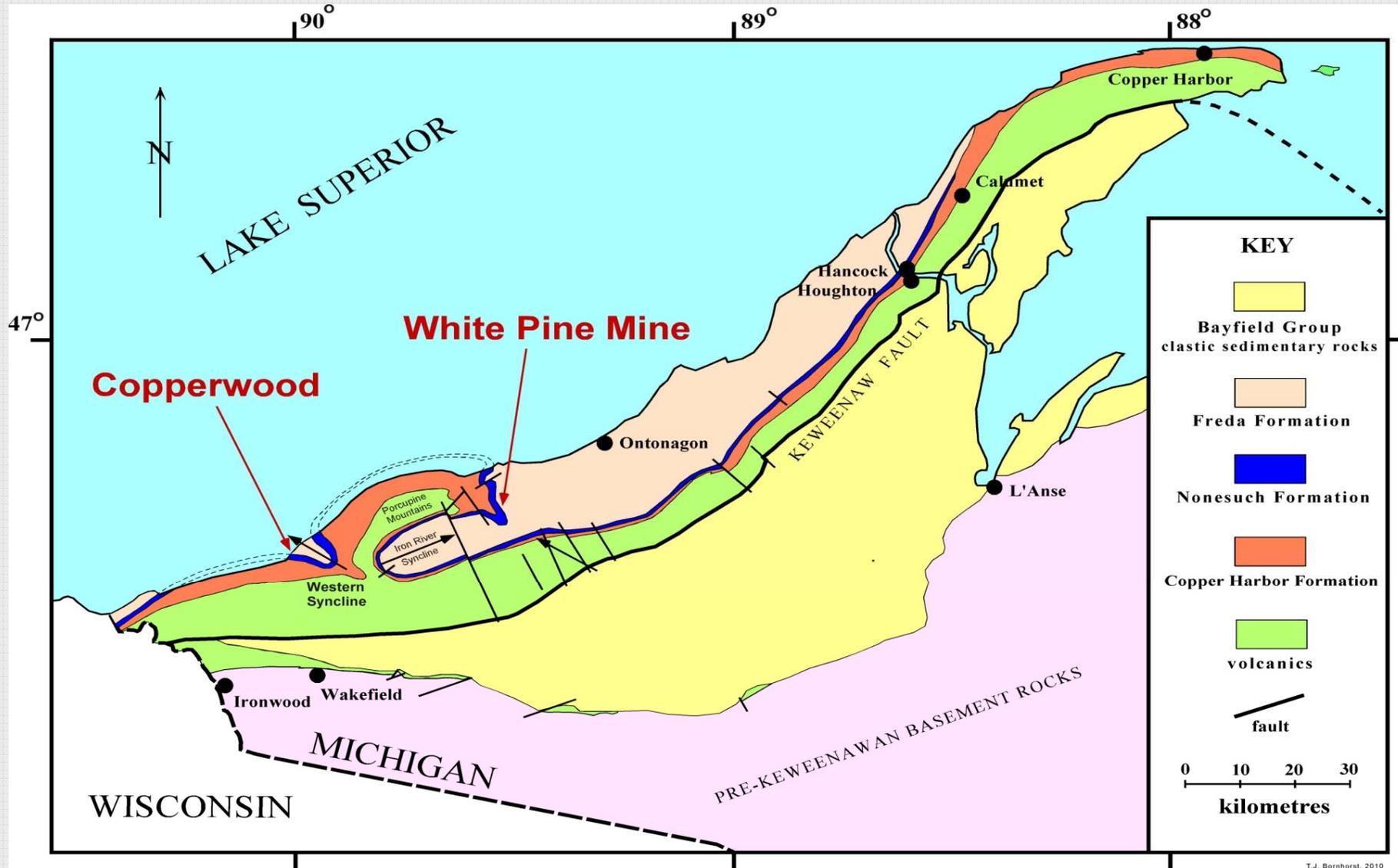
COPPERWOOD RECENT HISTORY

- Orvana signed mineral leases in Fall 2008 & Fall 2010
- Began environmental baseline studies in October, 2008
- Drilled over 40,000 feet in Summer, 2009 to delineate deposit
- Scoping Study released in September, 2010 - **Positive**
- Released Toronto Stock Exchange-compliant resource estimate
- Acquired land for access & infrastructure alternatives in August, 2010
- Additional drilling in Winter, 2010-11
- Pre-Feasibility Study submitted July 29, 2011 **Positive**
- Feasibility Study submitted on Mar 23rd 2012 **Positive**

COPPERWOOD LOCATION

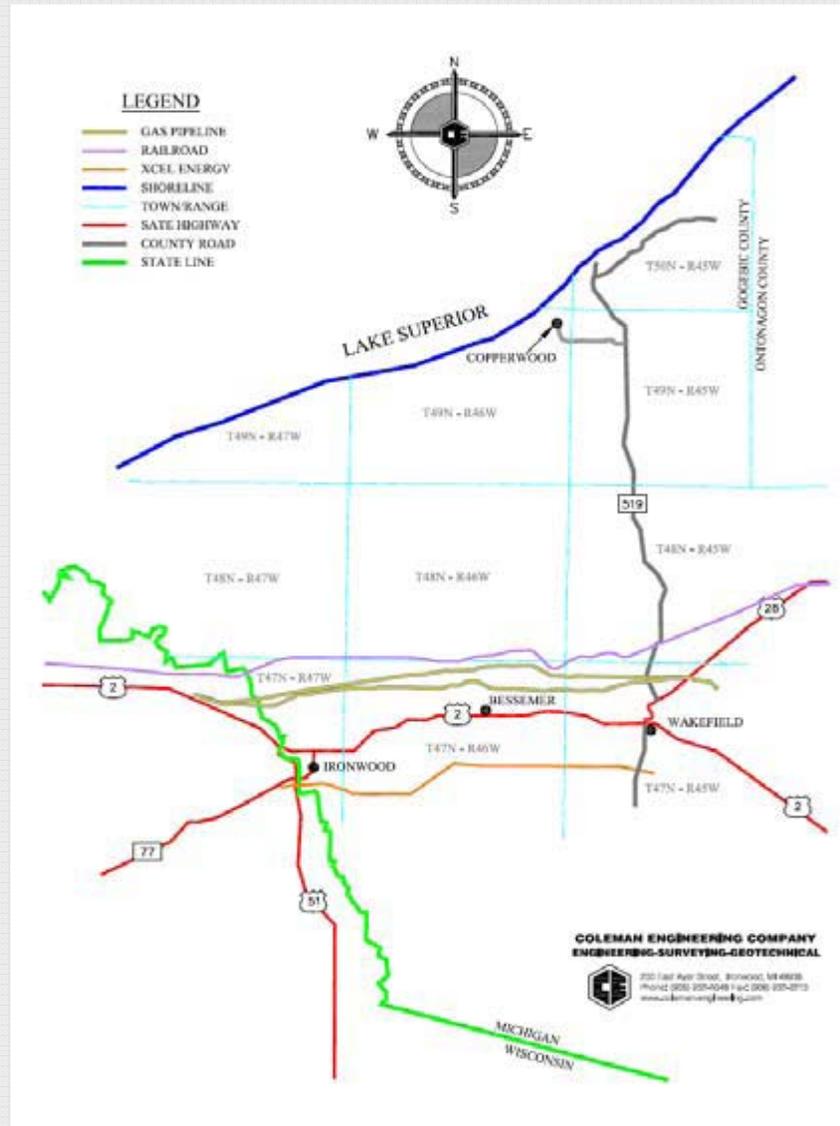


COPPERWOOD LOCATION

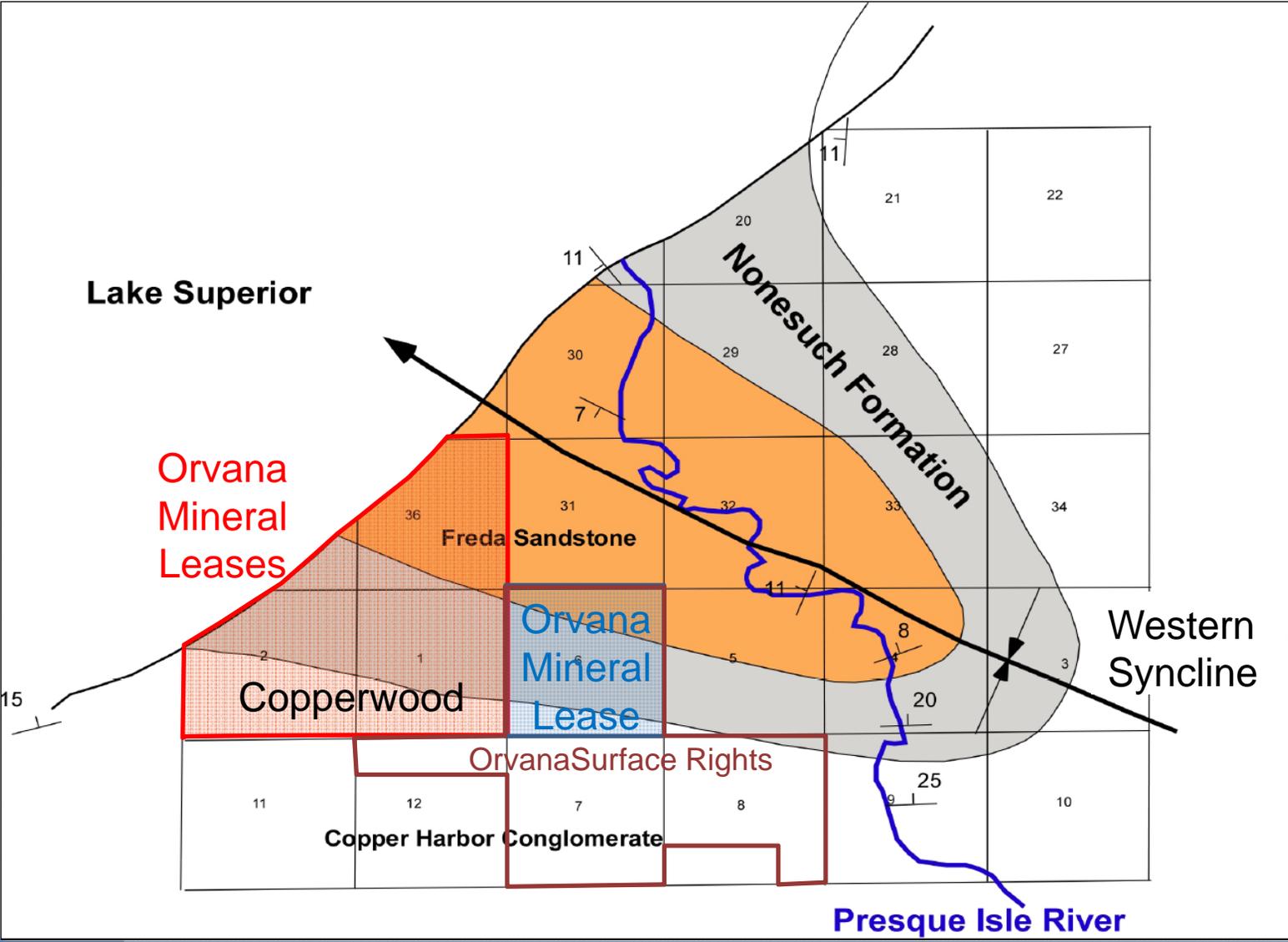


T.J. Bornhorst, 2010

COPPERWOOD LOCATION

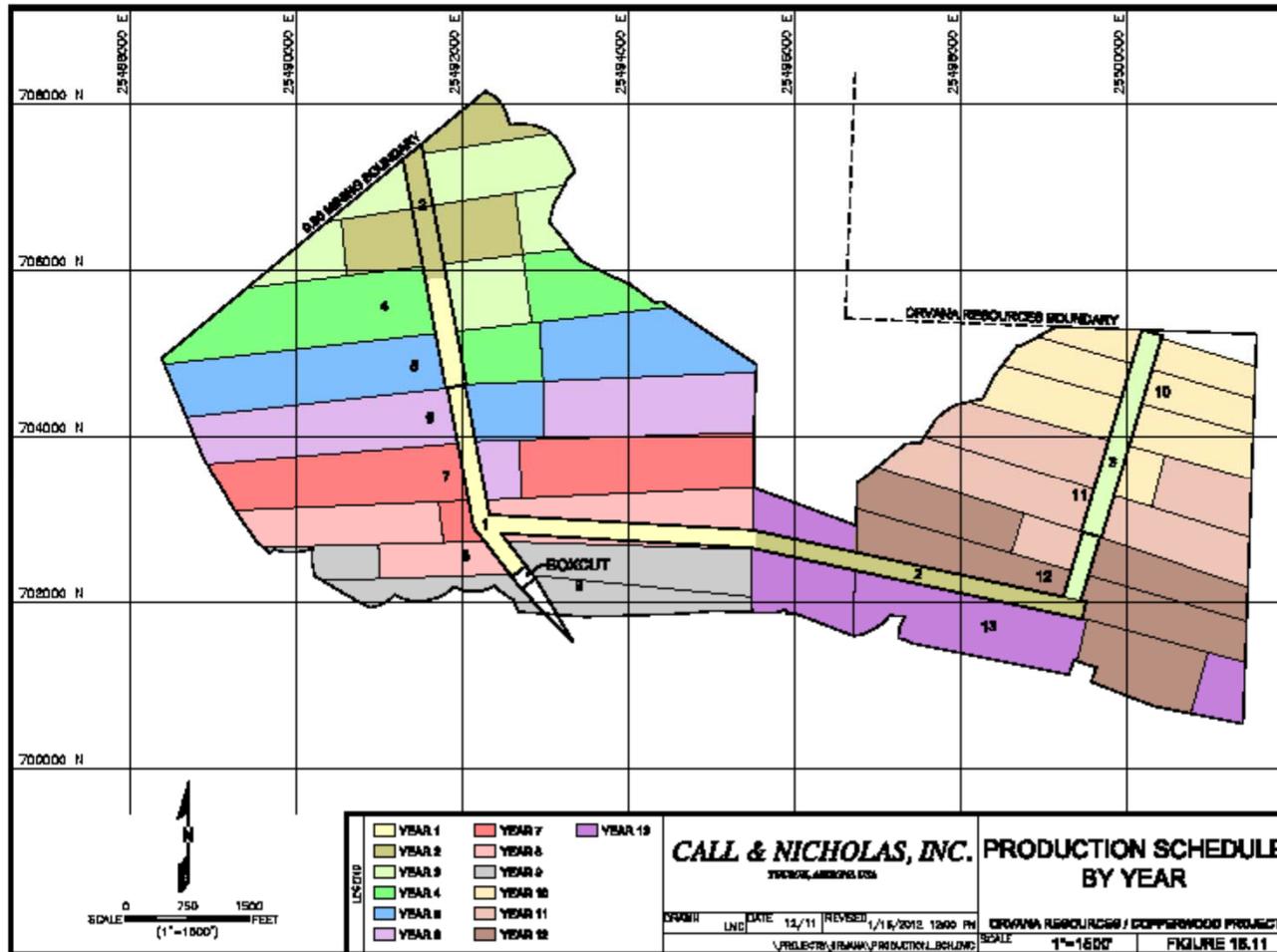


COPPERWOOD PROJECT

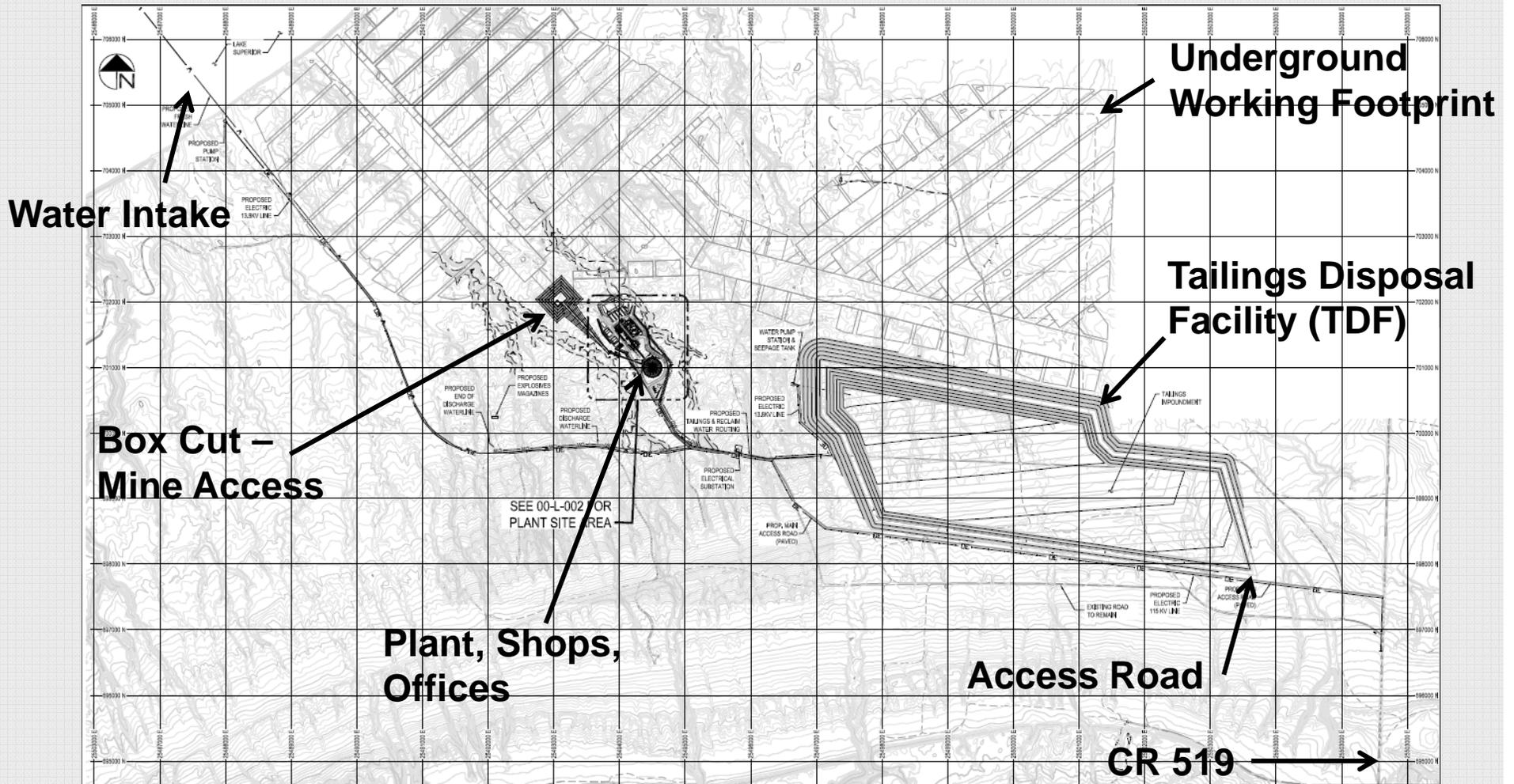


COPPERWOOD PROPOSED MINE PLAN

Capital Investment - ~\$220m pre-production, 13-year mine life, Underground room-and-pillar



SITE GENERAL ARRANGEMENT



REVISED	BY/DATE	CHK/DWG	APPD	REVISION	BY/DATE	CHK/DWG	APPD	REVISION	REV. NO.	DATE	BY/DATE	CHK/DWG	APPD	REVISION



PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN: J. ORTEGA CHECKED: [blank] JOB NO.: [blank] DWT. NO.: [blank] MGR. ENG.: J. SCHWAB PROJECT: [blank] CLIENT: [blank]	ORVANA RESOURCES US CORP. COPPERWOOD PROJECT Pre-Feasibility Study Copper, MI	DRAWING TITLE: OVERALL SITE GENERAL ARRANGEMENT PLAN	DESIGNER: K D Engineering ADDRESS: [blank] PHONE: [blank] FAX: [blank]
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THE BENEFITS

SUMMARY: ORVANA COPPERWOOD PROJECT, CONSTRUCTION AND OPERATIONS IMPACTS ON GOGEBIC, HOUGHTON AND ONTONAGON COUNTIES IN MICHIGAN, AND IRON AND ASHLAND COUNTIES IN WISCONSIN

Years	Value Added Totals	Output Totals	Employment Totals
Construction			
2012	\$69,861,238	\$138,257,381	491
2013	\$71,238,122	\$140,982,267	491
Ongoing	\$7,699,681	\$15,237,887	14
Operations			
Peak Year*	\$150,881,517	\$222,136,829	443
Typical Year	\$111,095,603	\$163,672,700	456
Grand Total**	\$1,423,269,696	\$2,096,803,711	NA

- Value Added** - A measure of the impacting industry's contribution to the local community; it includes wages, rents, interest, and profits.
- Output** - Represents the value of local production required to sustain activities
- Employment** - Estimates are in terms of jobs, not in terms of full-time equivalent employees. Hence, these may be temporary, part-time or short-term jobs.

Economic Impact of Orvana's
Copperwood Project
Upper Peninsula, Michigan



Labovitz School
OF BUSINESS AND ECONOMICS
Bureau of Business and
Economic Research

MICHIGAN PERMITS

- PART 632 MINING PERMIT (EIA)
 - Submitted 9/23/11
 - Deemed Administratively Complete 10/6/11
 - Draft Permit Approved on 2/15/12
 - Final Decision by 4/15/12
- WETLANDS PERMIT
 - Submitted Fall of 2011 – Pending Federal Review
- DISCHARGE PERMIT - NPDES
 - Submitted 11/15/11
 - Expecting Issuance in Spring of 2012
- AIR QUALITY PERMIT
 - Submitted 11/30/11
 - Expecting Issuance in Spring of 2012

PERMITS – PATH FORWARD

Orvana Resources US Corp Copperwood Project

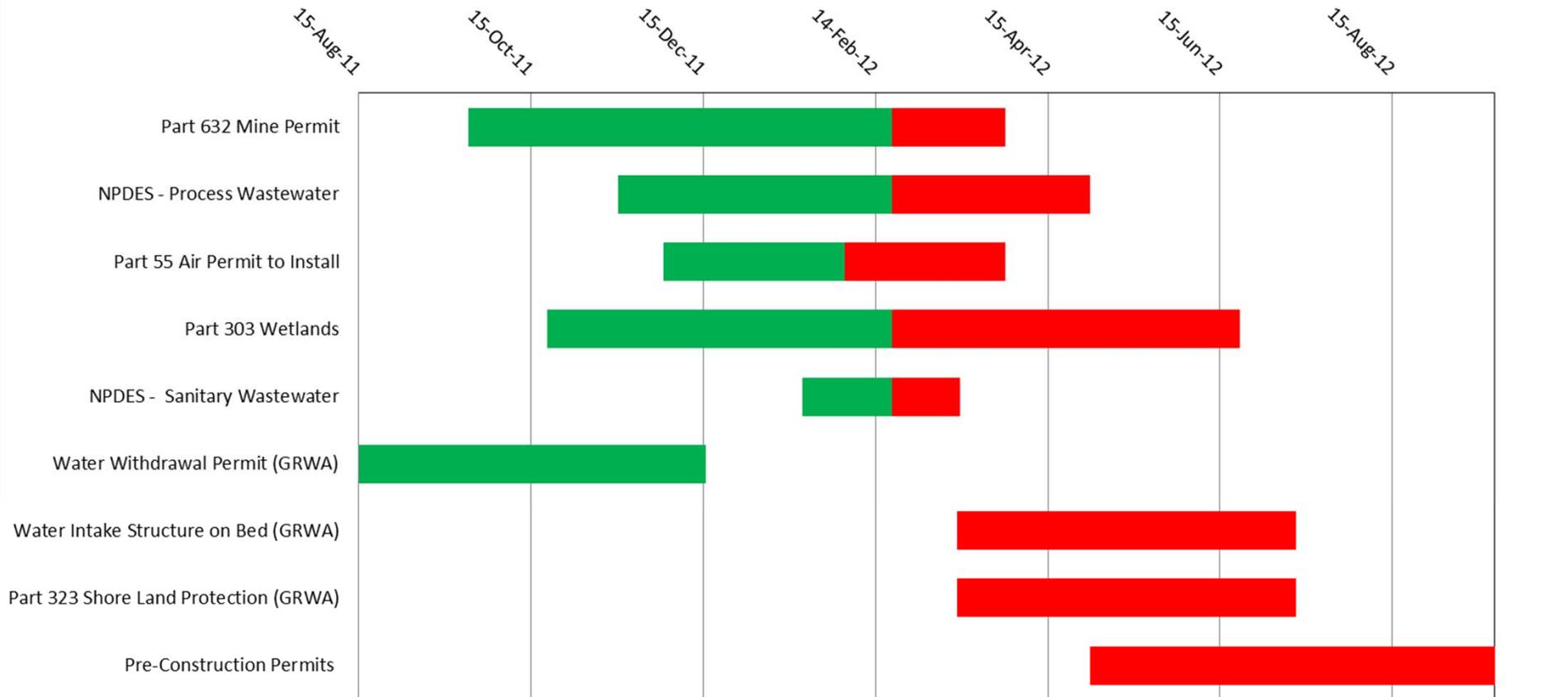
Permit Matrix 2/20/2012

Agency	Type of Approval	SUBMITTAL	Contractor	COMMENTS
MDEQ	Part 632, Non-ferrous Metallic Mineral Mining	Sept. 23, 2011	ORUSC	Draft approved Feb 15th
MDEQ	Part 31 NPDES for WWTP	Nov. 16, 2011	GOLDER	PENDING REVIEW
MDEQ	Part 31 NPDES for Construction (2)		OPEN	PRE - CONSTRUCTION
MDEQ	Part 31 NPDES for Industrial Stormwater	Not Required	TO TDF	NOT REQUIRED
MDEQ	Part 31 NPDES for Sanitary Wastewater	Jan. 12, 2012	COLEMAN	PENDING REVIEW
MDEQ	Part 301, Inland Lakes and Streams		COLEMAN	PRE - CONSTRUCTION
MDEQ	Part 303 Wetlands	21-Oct-11	AECOM	PENDING REVIEW
MDEQ	Act 207 AGST		ORUSC	PRE - CONSTRUCTION
MDEQ	Part 55 Air Permit to Install	Nov. 20, 2011	AECOM	PENDING REVIEW
MDEQ	Part 55 Air Renewable Operating Permit	Nov. 20, 2011	AECOM	PENDING REVIEW
MDEQ	Part 315, Dam Safety (3)		GOLDER	PRE - CONSTRUCTION
MDEQ/ACOE	Structure on Bed	Mar, 2012	GRWA	IN DEVELOPMENT
MDEQ	Withdrawal Permit	Aug. 2011	GRWA	APPROVED
MDEQ	Part 323, Shore Land Protection	Feb. 2012	GRWA	IN DEVELOPMENT
MDEQ	Part 365, Threatened and Endangered Species (relocate Showy Orchids)		AECOM	PRE - CONSTRUCTION
Gogebic County Health Department	Potable Water Supply		ORUSC	PRE - CONSTRUCTION

(1) All statutory references to Public Act 451 of 1994, as amended, unless otherwise indicated.

PERMITS – PATH FORWARD

Copperwood Project Permit Timeline
 (From application submittal to estimated final approval)



Note: Pre-Construction Permits pending design work and include Part 301 Inland Lakes & Streams (Access Road), Part 315 Dam Safety, Part 35 Threatened/Endangered Species Relocation, Act 207 Storage Tanks, SESC & Construction Stormwater, Western UP Health Dept (Potable Water Supply)

■ Completed ■ Remaining

BANKABLE FEASIBILITY STUDY

- Cash Flow model completed Jan 31
- Press Release on BFS published Feb 7th
- BFS to be complete by Mar 23th
- Contributors
 - KD ENGINEERING – lead engineering firm
 - Metallurgical Testing (Metcon) completed
 - Process Plant Design in progress
 - Steve Milne - Drill & Blast Model Review
 - GOLDER – TDF & WASTE-WATER TREATMENT
 - EXCEL – POWER
 - Proposed routing alternative complete with Permit to be submitted
 - GRWA – WATER INTAKE
 - Agreement developed & reviewed by legal counsel, waiting on GRWA for approval to start working on Permit to construct intake

BANKABLE FEASIBILITY STUDY

- BFS summary

Summary of Key Financial Parameters (Drill-and-Blast Case)					
	Copper Price (US\$)/Silver Price (US\$)				
	2.50 / 17.50	2.75 / 20.00	3.00 / 22.50	3.25 / 25.00	3.50 / 27.50
NPV(8), (000's)	30,780	104,369	177,591	246,093	312,119
IRR (After Tax)	10.9%	17.1%	22.6%	27.5%	32.1%
Payback, yrs	6.2	5.2	4.6	4.2	3.8

Minalable Reserve: 30,228,000 short tons
 Copper grade: 1.41%
 Silver grade: 3.63 ppm
 Throughput: 2,625,000 short tons/year
 (reached after 3years)

Avg. Annual Production (LOM): 28,000 short tons per year Cu
 150,000 ounces per year Ag

Copper recovery: 86%
 Copper concentrate grade: 24%
 Silver grade in concentrate: 40.4 ppm (average)

Key financial input parameters are (all values in US dollars):

Pre-production capital (including contingencies): \$221,942,000
 Working & sustaining capital (LOM): \$158,682,000
 Mine operating cost (LOM) \$14.91 per short ton ore
 Processing cost (at 7,500 short tons per day): \$13.27 per short ton ore
 G&A: \$ 1.25 per short ton ore

COPPERWOOD PROPOSED MINE PLAN

- Capital Investment - ~\$200m pre-production
- 14-year mine life
- Underground room-and-pillar



ENVIRONMENTAL PROTECTION

- Protect Lake Superior
 - Locate facilities at least 1 mile away
- Protect Water Quality
 - Build a state of the art treatment plant
 - All stormwater at facility to be collected, re-used and treated
- Minimize Facility Footprint and Impact
 - Placement of facilities – compact and avoiding wetlands, streams and high quality forested areas
 - Restore site after mining to self sustaining upland forest
- Maximize Conservation Principles:
 - Focus on reducing water use – maximize water recycling
 - Permanently protect watersheds and wetlands on and around site
 - Avoid sensitive areas and key species habitats – improve habitat for fish and other aquatic species

632 Permit Structure

Part 632 Permit Application OGS Guidelines

Copperwood Mine Permit Application

Rule	Title
425.202	Environmental Impact Assessment
425.203	Mining Plan and Environmental Protection Plan
425.204	Reclamation Plan
425.205	Contingency Plan
425.301	Financial Assurance Requirements
425.302	Assurance Instruments
425.307	Statement of Financial Responsibility

Section	Title	PAGE
202	PART 202 ENVIRONMENTAL IMPACT ASSESSMENT (RULE 202)	5
203	MINING PLAN	219
204	RULE 204 RECLAMATION PLAN	307
205	CONTINGENCY PLAN	316
301	FINANCIAL ASSURANCE	336
302	RELEASE OF FINANCIAL ASSURANCE	339
Appendix's	13 Binders of supporting information	
		Total page count +6000

PREPERMITTING ACTIVITIES

- Michigan Copper Mine Regulations (Part 632)
 - **Before the application**
 - 3 years of surface and groundwater water quality monitoring
 - Wildlife, vegetation and meteorological monitoring
 - Geology, hydrogeology, topography, air quality, precipitation, historical and archeological studies
 - **The application MUST contain:**
 - An Environmental Impact Analysis
 - A Mining and Reclamation Plan
 - An Environmental Protection Plan
 - A Contingency Plan
 - Financial Assurance to Cover Future Reclamation and Restoration
 - Identification of Additional Permits and Licenses

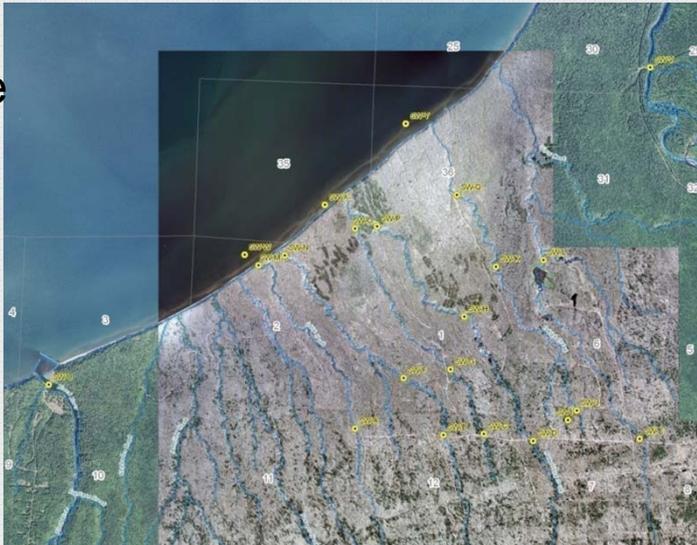
INFRASTRUCTURE AND ENVIRONMENT

- **Infrastructure**
 - Xcel Energy:
 - Utilize existing roadways and historic easements
 - Avoid infrastructure on or near Porcupine State Park
 - County Road 519 Upgrade:
 - Improve road for year round use without changing scenic qualities
 - Improve stream flow and water quality with culvert and bridge enhancements
 - Grant Funding was approved Sept 2011, \$2.6M total
 - Water Intake – Regional Water System
 - Assist GRWA in Phase I development of regional system
 - Improve water quality for residential and commercial users
 - Reduce impacts on limited aquifers and spring fed watersheds
 - Water Intake Permit Approved Dec

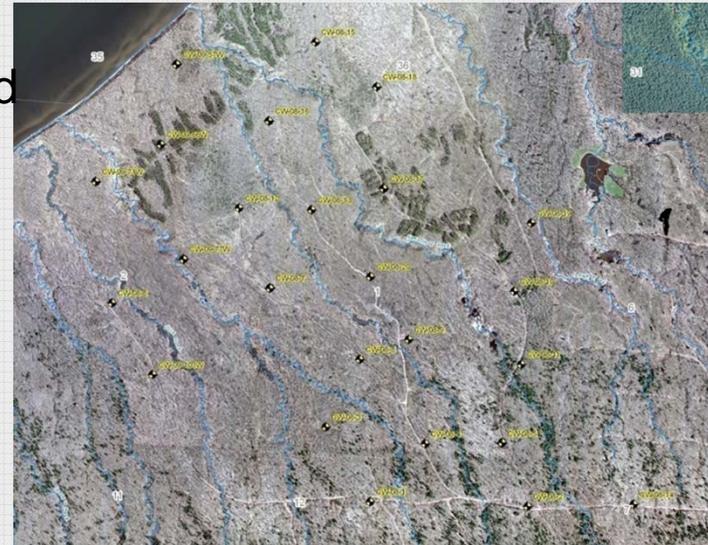
ENVIRONMENTAL STUDIES

- Surface Water Monitoring – 22 Locations
- Ground Water Monitoring – 29 Locations
- Stream and Wetland Mapping for over 1500 acres
- Air and Meteorological Monitoring Station
- Flora and Fauna
 - Amphibians and Reptiles – 12 Species
 - Mammals – 30 Species
 - Birds – 82 Species
 - Plants – 271 Species

Surface



Ground
Water



ENVIRONMENTAL STUDIES

- **HYDROGEOLOGY**

- No usable aquifer or wells in study area
- Groundwater Modeling shows poor water quality and slow movement
- Mine inflow expected to be low

- **SURFACE WATER**

- Streams are low-flow and low-quality systems
- Brook trout are not present in project area streams
- All wetlands have been mapped - plan to avoid and minimize

- **WILDLIFE**

- Common species found in the Northern Hardwoods Ecosystem
- Only one federally listed endangered species – wolf
- Area forest is primarily young aspen – heavily logged in past; fire

ENVIRONMENTAL STUDIES

- **GEOLOGY**

- Full analysis of rock chemistry and strength
- Groundwater Modeling Completed
- Non-Reactive Rock – No acid rock drainage (past and current)

- **RESTORATION**

- All drill sites restored with native vegetation and wetlands
- All drill holes completely sealed – 100% Compliance

- **NATURAL RESOURCE AGENCIES**

- Meetings with local conservation groups - positive
- Meetings with Ottawa National Forest - cooperation
- Meetings with Porcupine Mtns State Park – future partnerships
- Meetings with MDNRE – Positive feedback and suggestions

Drill site reclamation



RULE 204 RECLAMATION PLAN

Section 204.2

Contains an identification and description of final land contours.

Section 204.3

Contains a discussion of the final land use and relationship to surrounding land and land use.

Section 204.4

Contains a discussion of ponds, streams, wetlands, roads, dikes, drainage ditches, and soil erosion and sedimentation control structures that will remain after completion of reclamation.

Section 204.5

Contains a discussion and plans for stabilizing waste rock piles, settling ponds, tailings disposal facilities, overburden banks, open pit banks and walls, roads, and the plant site.

Section 204.6

Contains a plan for the final disposition of toxic and hazardous wastes, refuse, tailings and other solid waste.

Section 204.7

Contains a plan for closure of shafts, portals, and other openings.

Section 204.8

Contains a discussion for the revegetation of disturbed areas, and reclamation to achieve a self sustaining ecosystem

Section 204.9

Contains a plan for monitoring of ground and surface water quality during the post closure monitoring period.

Section 204.10

Contains the names and qualifications of professional personnel involved in the preparation of the reclamation plan

RULE 205 CONTINGENCY PLAN

Section 205.1

Assessment of the Risks and Response Measures to be followed.

Section 205.2

Notification Procedures

Section 205.3

Emergency Telephone Numbers

Section 205.4

A Plan for Testing the Contingency Plan

A copy of the contingency plan has been provided to the Gogebic County Emergency Response Coordinator, Wakefield Fire Department, and Ironwood Fire Department

RULE 301 & 302 FINANCIAL ASSURANCE

Section 301.1

Financial Assurance Mechanism

Section 301.2

Reclamation and Post Closure Estimated Costs

Section 301.3

Financial Assurance Instrument

Section 302

Final Release of Financial Assurance

COPPERWOOD - PUBLIC RELATIONS

- **Strong Community and Public Relations Program**
 - Community support includes:
 - Contribution to area wireless internet service (JV – Wakefield Twp.)
 - Scholarships to all schools in Gogebic County (\$ 24,000 to date)
 - Contributions to area fire departments for safety equipment
 - Contributions to area conservation organizations
 - Contribution to Ottawa National Forest –
County Remonumentation Project
 - GRWA Joint Venture for future industrial & residential water
 - SISU Ski Fest-2 year sponsor
 - North Country Trail – Sponsored the Fall Colors Hike
 - Gogebic County – Local Match for Road Reconstruction
- **Future Partnership Possibilities**
 - Porcupine State Park – Infrastructure
 - Ottawa National Forest – Future Recreational & Timber Access

COPPERWOOD

Historic Mine Shaft at
Copperwood – Pre-1960's

