



Manganese is Electric!



FOCUS ON ULTRA HIGH-PURITY MANGANESE PRODUCTS



**Euro
Manganese
Inc.**

**FOCUS ON GREEN AND EUROPEAN
ULTRA HIGH-PURITY MANGANESE PRODUCTS**

Edelmetallmesse München 2019

EMN Highlights



WASTE REPROCESSING NOT MINING

- EMN holds 100% of the rights to the Chvaletice Manganese Project. **98% of resource classified as Measured.**
- **Europe's largest manganese resource**, hosted in tailings/waste from 1951-1975 Communist era mining operation.
- Targeting competitive production of **environmentally-superior, ultra-high-purity manganese products**
- EMN **pilot plant** tests have confirmed ability to meet **highest customer specifications** for new-generation of EV battery production.



STRATEGIC EUROPEAN ASSET 25-YEAR LIFE

- **25-year project life targeted.**
- Low-cost extraction method anticipated, involving the **recycling of manganese-rich waste** – no hard rock mining or milling required – using innovative combination of **proven, clean and commercial technology.**
- Strategic Asset in Europe: China produces over 98% of all electrolytic manganese metal and over 90% of high-purity manganese sulfate in the world.
- High-purity manganese used principally in lithium-ion batteries. **Rapid demand growth** for in Europe.



EXCELLENT INFRASTRUCTURE TIER-ONE JURISDICTION

- Rail, highway, gas pipeline, water and power available on-site.
- Located at major node in Czech national electrical grid = competitively-priced electrical power.
- Secured industrially-zoned land for plant.
- Sophisticated, **stable and business-friendly European Union jurisdiction.**
- Potential for Czech Government and EU incentives for direct foreign investment.
- Clear legal and regulatory framework.
- 19% corporate tax rate.

Development Plan Highlights



CLEAR DEVELOPMENT PLAN

- Extensive metallurgical testing and three pilot-plant runs completed. Confirmed ability to convert Chvaltice tailings into **ultra high purity manganese products**.
- **Preliminary mining permit secured** in April 2018.
- Preliminary Economic Assessment issued in early 2019. **Robust economics**.
- **Demonstration Plant to run in 2020** to produce bulk, finished product for customer testing and qualification. Strong customer interest in securing these products. Company expects DP production to be fully committed.

STRONG MARKET OUTLOOK FOR MANGANESE PRODUCTS

- Demand for manganese products for lithium-ion battery production expected to ramp-up very significantly around the world.
- Stable, growing manganese demand in the high-performance steel and aluminum superalloy production – Mature industry with many European, North American and international consumers.
- Major investments in European electrical vehicle battery, cathode and precursor plants in close proximity to Project. NMC cathode chemistry expected to dominate in most countries, including Europe, requiring development of massive, new high-purity manganese production capacity. Industry under-investment expected to create supply deficits in near to medium term. Barriers to entry are significant.

HIGHLY-EXPERIENCED MANAGEMENT TEAM

- Solid multidisciplinary team with **proven corporate and project development track record**, as well as extensive operating track record. Rare in-house high-purity manganese production experience.
- Secured access to world-leading high-purity manganese production expertise, know-how and technology.
- Company founders have **award-winning track record of excellence in environmental and social practices**.

Project Location and Infrastructure

**Strategically located
90km east of Prague,
in the heart of Europe.**

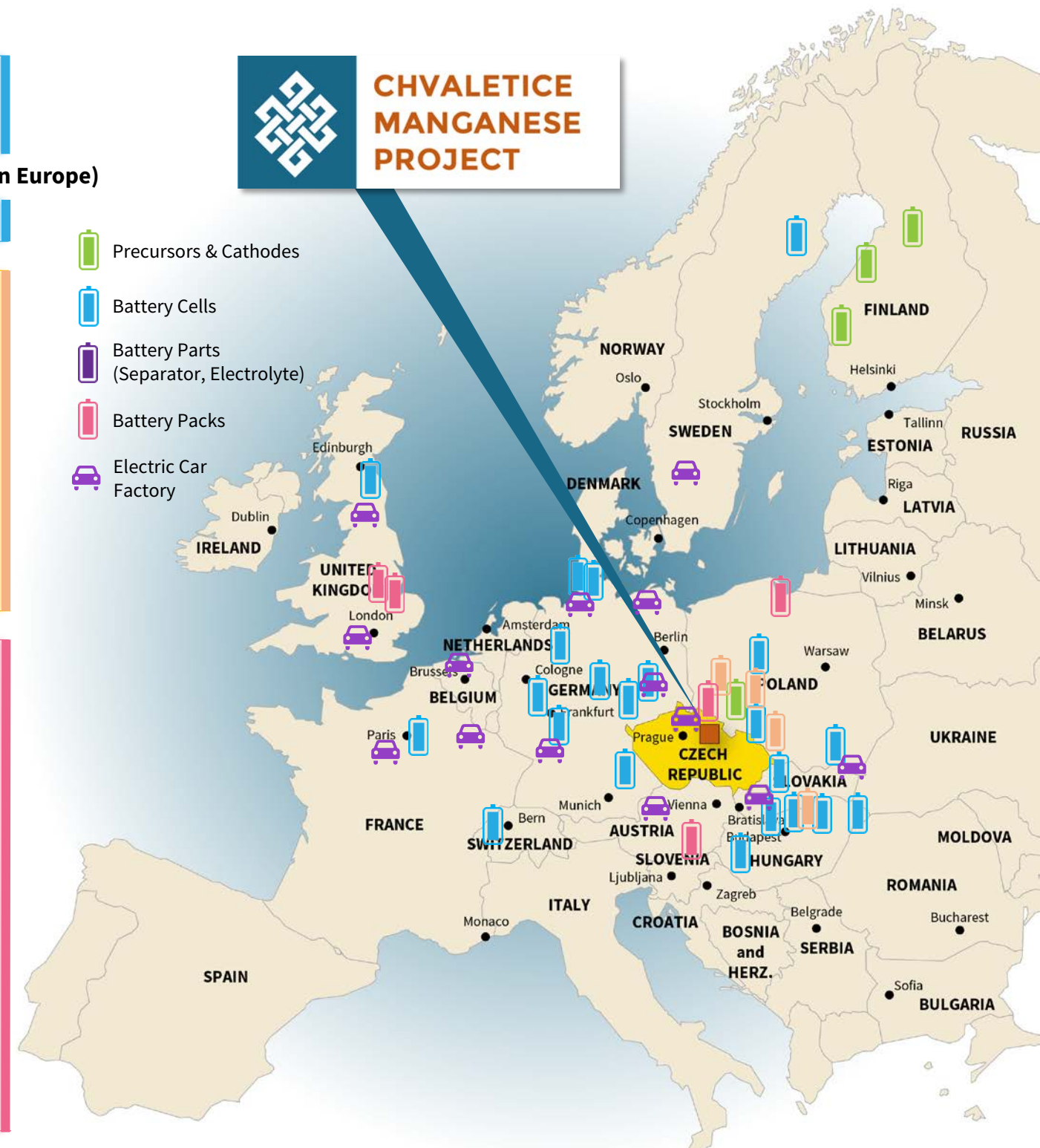
- ➔ Set in an industrialized valley with gentle topography, served by excellent infrastructure. **Rail, gas, water and power are all available on the Project site.**
- ➔ Adjacent to 820 MW power station at a major node in the Czech Republic's modern electrical distribution grid.
- ➔ Easy rail and road access to the ports of Hamburg, Gdansk and Rotterdam.



Growing Lithium Battery Cluster in Europe

Europe is becoming a global hub for EV and battery production

BASF	FINLAND ~15 GWh	inoBat	SLOVAKIA 10 GWh	BYD	TBD ~15 GWh
TerraFame	FINLAND	Leclanché	SWITZERLAND 1 GWh	SVOLT 蜂巢能源	TBD (Eastern Europe) 20 GWh?
umicore	FINLAND	saft	FRANCE 2 GWh	SK innovation	POLAND
umicore	POLAND ~30 GWh	CATL	GERMANY 60 GWh	HUA RONG	POLAND
northvolt	SWEDEN 32 GWh	northvolt	GERMANY 30 GWh	FOOSUNG	POLAND
Envision AESC	UNITED KINGDOM 8 GWh	FARASIS	GERMANY 10 GWh	'TORAY'	HUNGARY
LG 화학	POLAND 17 GWh	Blackstone Resources	GERMANY	northvolt	POLAND
Johnson Matthey	POLAND ~30 GWh	Customcells	GERMANY 1 GWh	Daimler	POLAND
SK innovation	HUNGARY 7.5 GWh	LIACON	GERMANY 1 GWh	SAMSUNG SAMSUNG SDI	AUSTRIA
SK innovation	HUNGARY 7.5 GWh	VARTA	GERMANY 1 GWh	Jaguar	UNITED KINGDOM
SAMSUNG SAMSUNG SDI	HUNGARY 3 GWh	TERRAE	GERMANY 34 GWh	LAND-ROVER	UNITED KINGDOM
GSYUASA	HUNGARY	TESLA	TBD ~20-40 GWh	Hyperbat	UNITED KINGDOM



Source: Cairn Energy Research Advisors ©2019

Lithium Ion Battery Market Mn Demand

Manganese use in NMC and LNMO cathode formulations

➔ **NMC has several major formulations, each expressed as a ratio of Nickel to Manganese to Cobalt:**

➔ **NMC 1-1-1**

Most NMC today is the 1-1-1 formulation, which is the most stable and long-lasting.

➔ **NMC 5-3-2 and 6-2-2**

Going forward, 5-3-2 and 6-2-2 will emerge in 2020 and 8-1-1 in 2023. By 2026 the majority will be 5-3-2.

➔ **NMC 8-1-1**

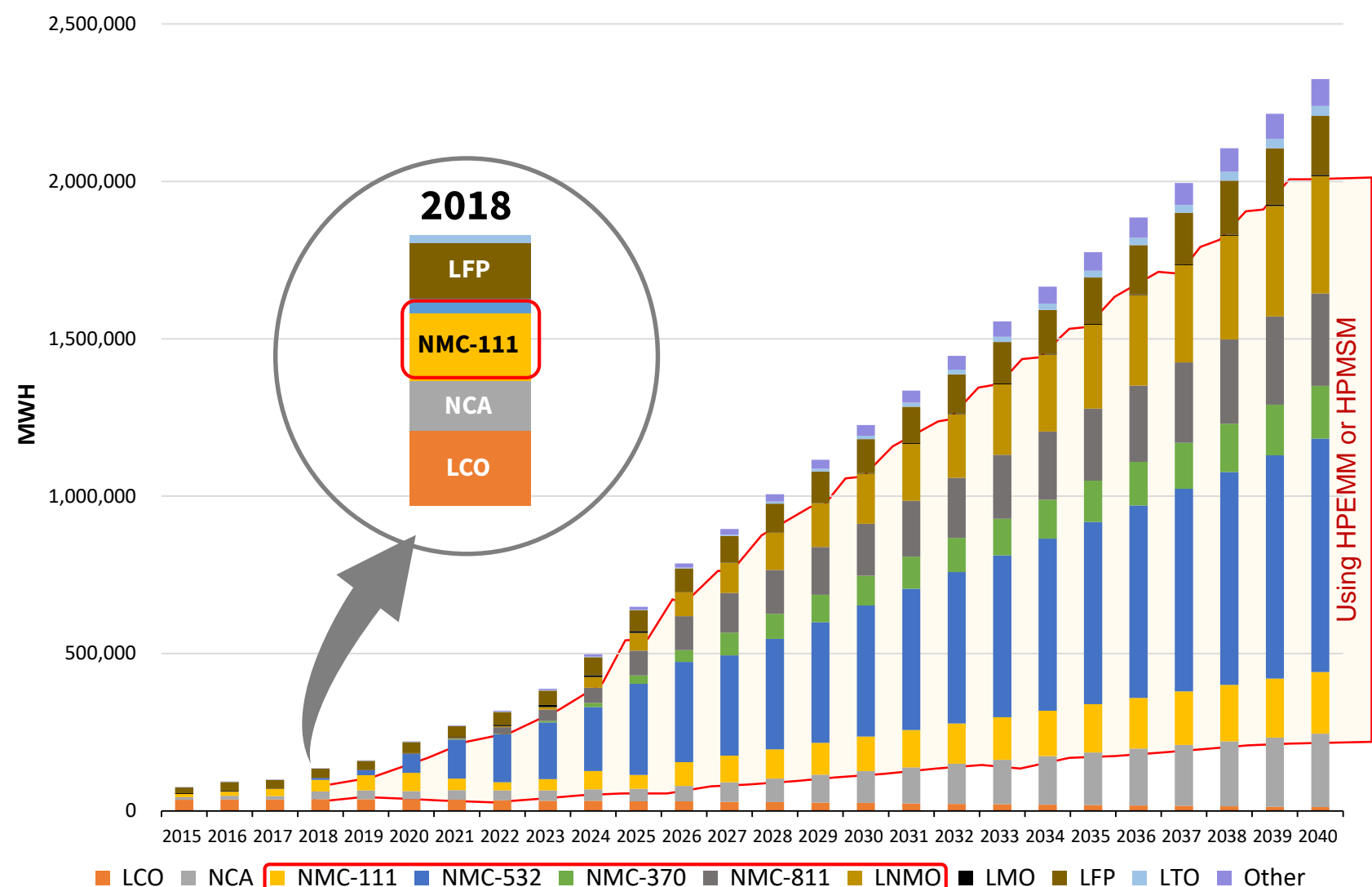
Higher Ni-content is preferable to buyers due to the lower proportion of Co, making it cheaper. Additionally, 8-1-1 has a higher energy density. If durability & stability issues can be solved, it will become the cathode chemistry of choice for carmakers.

➔ **NMC 3-7-0**

New chemistry revealed by BASF in 2018. May use up to 70% Mn in its cathode.

➔ **LNMO** (Lithium-Nickel-Manganese Oxide)

The highest consumer of Mn per 1 kWh of capacity (1+ kg) will mature commercially after 2025, principally in electronics and in certain formulations of EV batteries.



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CHVALETICE MANGANESE PROJECT OVERVIEW

Drilling & Bulk Sampling



↑ Sonic drill – modern, effective sampling tool



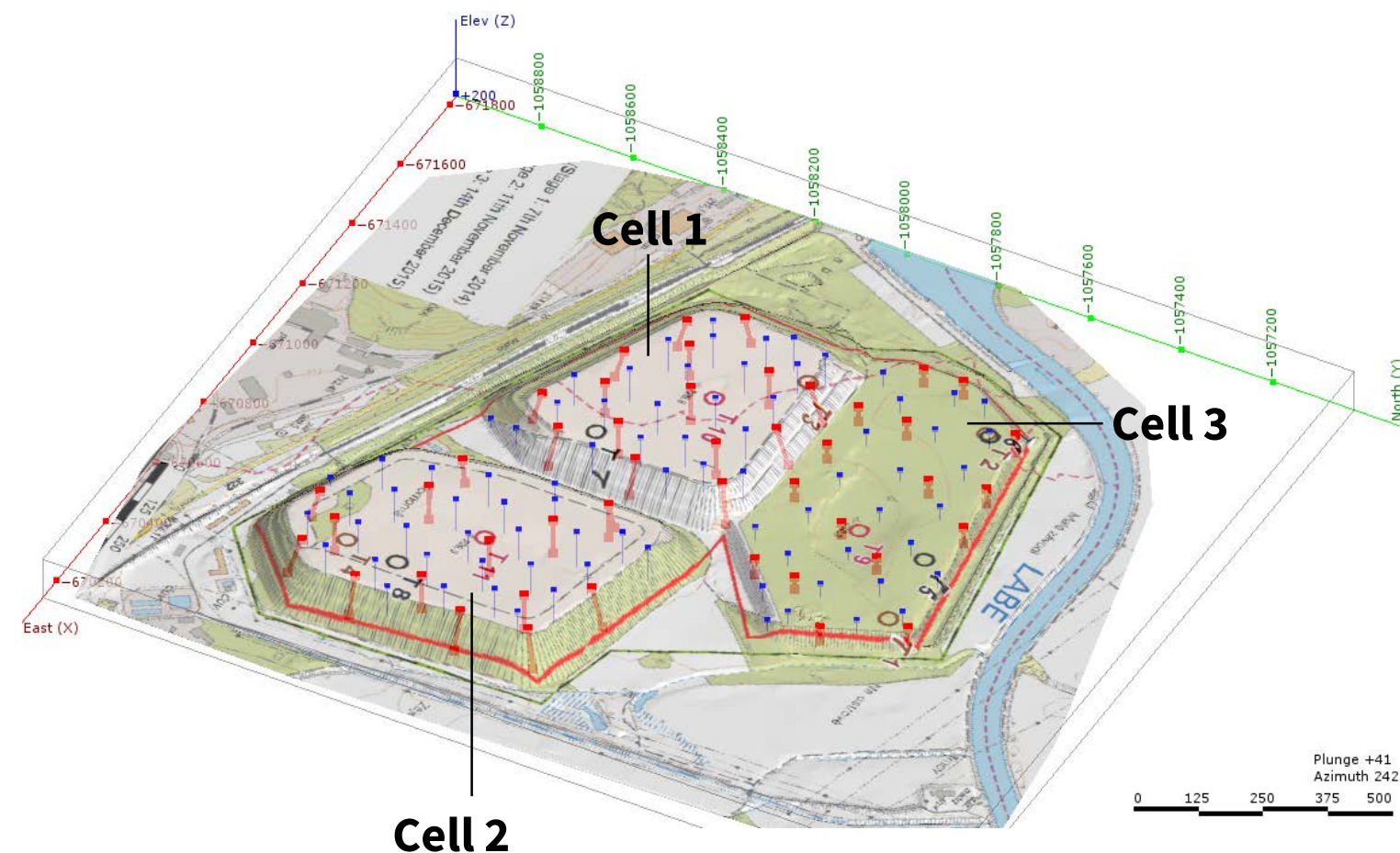
↑ Sonic drill “core” of soft, sandy tailings material



↑ 14.8-tonne bulk sample collected using Sonic drill for metallurgical and pilot plant testing

Drilling & Bulk Sampling Program

2017-2018 DRILL PROGRAM



- ➔ 160-Hole 2017-2018 Sonic and auger drill program upgraded the resource estimate to a Measured and Indicated Status (**98.3% of resource classified as Measured**)
- ➔ Resulting resource model is expected to form a reliable basis for tailings extraction plan and project economics
- ➔ Representative bulk samples were collected with drill rig to support extensive 2018/2019 metallurgical optimization testwork and process design program.
- ➔ Test mining program planned for 2020.

2018 NI 43-101/JORC Resource Estimate:



➔ NI43:101/JORC-Compliant Resource Estimate *

Updated Resource Estimate issued on December 12, 2018 by Tetra Tech Canada Inc.

Chvaletice Mineral Resource Statement, Effective Date December 8, 2018

Tailings Cell #	Classification	Volume (m ³)	Tonnage (MT)	Dry In-situ Bulk Density (t/m ³)	Total Mn (%)	Soluble Mn (%)
#1	MEASURED	6,577,000	10,029,000	1.52	7.95	6.49
	INDICATED	160,000	236,000	1.47	8.35	6.67
#2	MEASURED	7,990,000	12,201,000	1.53	6.79	5.42
	INDICATED	123,000	189,000	1.55	7.22	5.30
#3	MEASURED	2,942,000	4,265,000	1.45	7.35	5.63
	INDICATED	27,000	39,000	1.45	7.90	5.89
TOTAL	MEASURED	17,509,000	26,496,000	1.51	7.32	5.86
	INDICATED	309,000	464,000	1.50	7.85	6.05
COMBINED	M&I	17,818,000	26,960,000	1.51	7.33	5.86

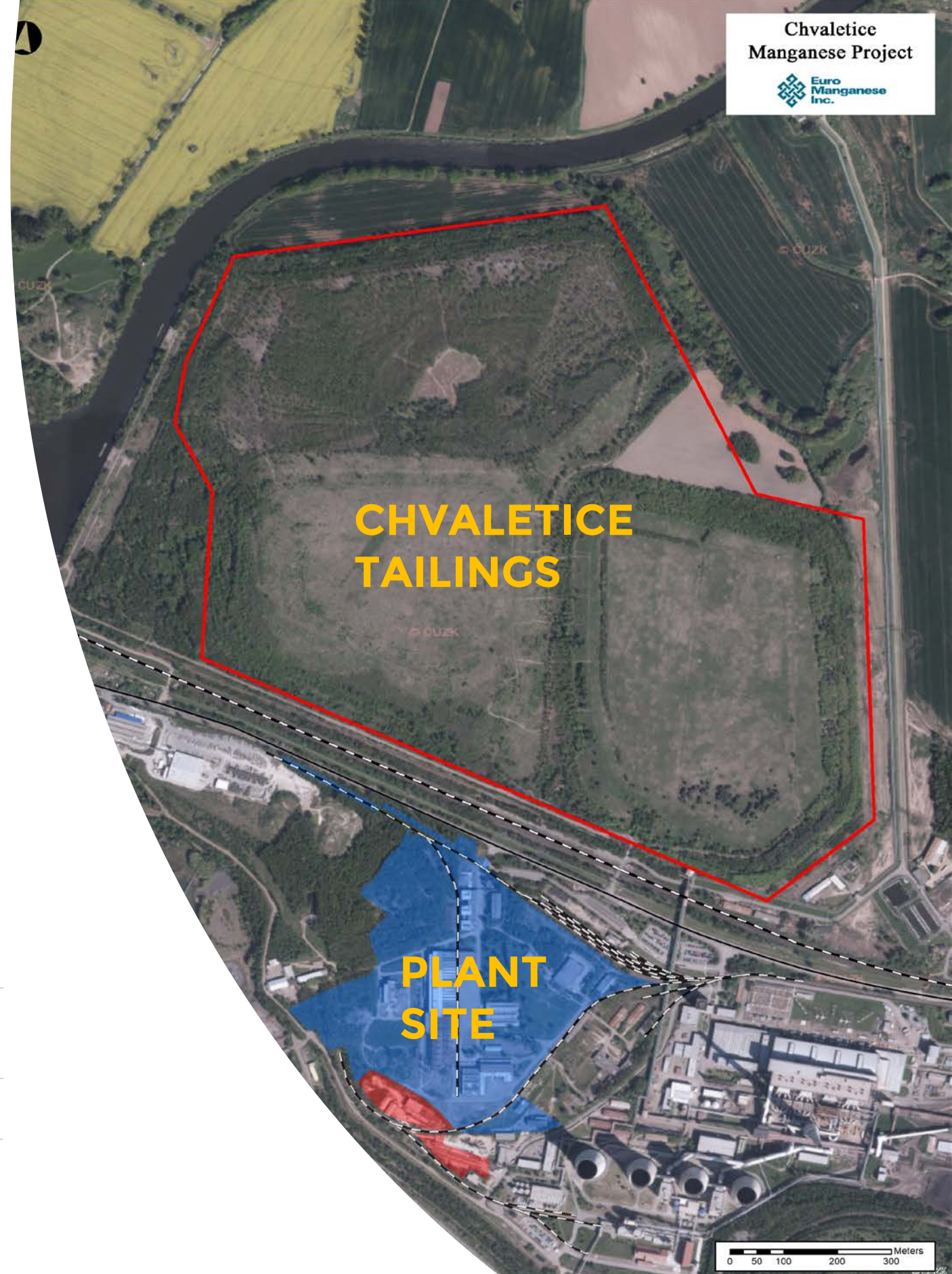
* Resources are not to be considered reserves and their economic viability has not been proven or confirmed.

➔ 2017 – 2018: 160-hole drilling program findings

- Manganese is for the most part evenly distributed through the entire tailings deposit.
- Finely milled, unconsolidated tailings placed above ground expected to result in very low mining and virtually zero ore dressing costs.
- ~80% of **manganese is contained in easily leachable manganese carbonate minerals** that require no calcination or chemical reduction prior to leaching, unlike manganese oxide ore.
- Extraordinary 98.3% of Chvaletice resource is now classified in Measured category.

Permitting Momentum and Plant Site Land

- 1 Baseline environmental studies completed. EIA preparation initiated. Early 2020 Project Notification submission targeted.
- 2 Rezoning process initiated. **Both adjoining municipalities voted unanimously to proceed with land-use plan change.**
- 3 Intensive community consultation ongoing.
Overwhelmingly positive feedback and reaction to project.
- 4 Closed option in 2018 to acquire 100% of Czech company that owns 19.94 hectares of strategically-located land (Shaded blue on map), with payments spread over up to 5-years, and tied to permitting progress milestones. Additional parcels of land secured in 2018 and 2019, including one from the adjoining village of Trnavka.
 - Plant site land already zoned for industrial use.
 - Onsite infrastructure: Two rail spurs and sidings, highway access, gas, water and electrical energy.
 - Located less than 200 metres from Chvaletice tailings.
 - Adjacent to 820 MW power plant, as well as ready-mix concrete and pre-cast concrete plants.



Progressive Reclamation and Site Remediation: Meeting Europe's Circular Economy Goals by Recycling Waste

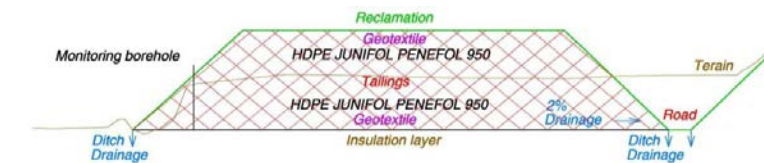


Staged Tailings Extraction

- Tailings extracted in phases, cell-by-cell, placed back on same site in full compliance with Czech and EU standards, and in-keeping with modern industry best practices.
No significant new waste generated.
- Small footprint of tailings exposed at any given time

Progressive Site Reclamation

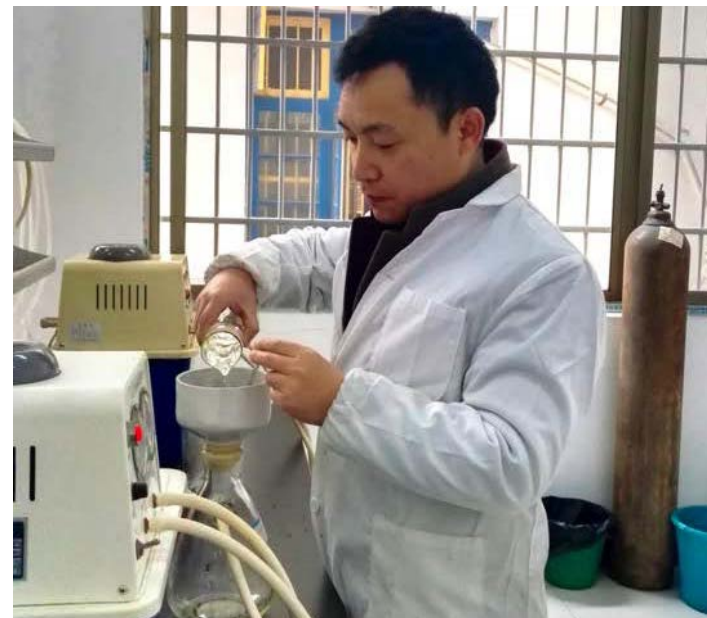
- After Mn extraction, tailings to be washed and neutralized, placed on impermeable membrane, then capped with geomembrane, before site revegetation for long-term, safe and productive use. Reclamation plan is being designed with community input.
- Site restoration and long-term usage plan expected to be designed in collaboration with local communities and regulator.
- **Minimizing environmental footprint and leaving site in better condition than it is today.**



Chvaletice Manganese Project Highlights



- **Western Europe's largest manganese deposit – expected to become Europe's only primary producer of HPEMM and HPMSM. Demonstration Plant to operate in 2020.**
- EMN focus on production of **ultra-high-purity manganese products** to serve most demanding customers.
- EMN **strategically located** in the heart of Europe, amidst a major emerging cluster of EV, cathode and battery plants.
- **EV and battery industry growing very rapidly in Europe** – Investment and plant development wave has been shifting from Asia to Europe. Billions of € being currently deployed.
- Chvaletice tailings deposit is well-suited for production of HPEMM and HPMSM, using a combination of **clean, modern and commercially-proven technology**.
- EMN has secured rights to strategic, **industrially-zoned land** for plant site adjacent to Chvaletice tailings deposit.
- **Valuable, strategic, European alternative** and complement to existing and planned HPEMM and HPMSM production.
- **Green production:** No hard rock mining. No new waste generation, only recycling of old mine waste. Process residues to be washed. Self-funding remediation of Communist era environmentally-damaged site. 48% of Czech electrical power is made from non-carbon energy sources.
Environmentally-superior Mn products.
- Proactive, respectful and intensive community engagement.
Solid permitting momentum.
- Solid EMN management team. **God is in the details.**



Euro Manganese Inc. - Capitalization

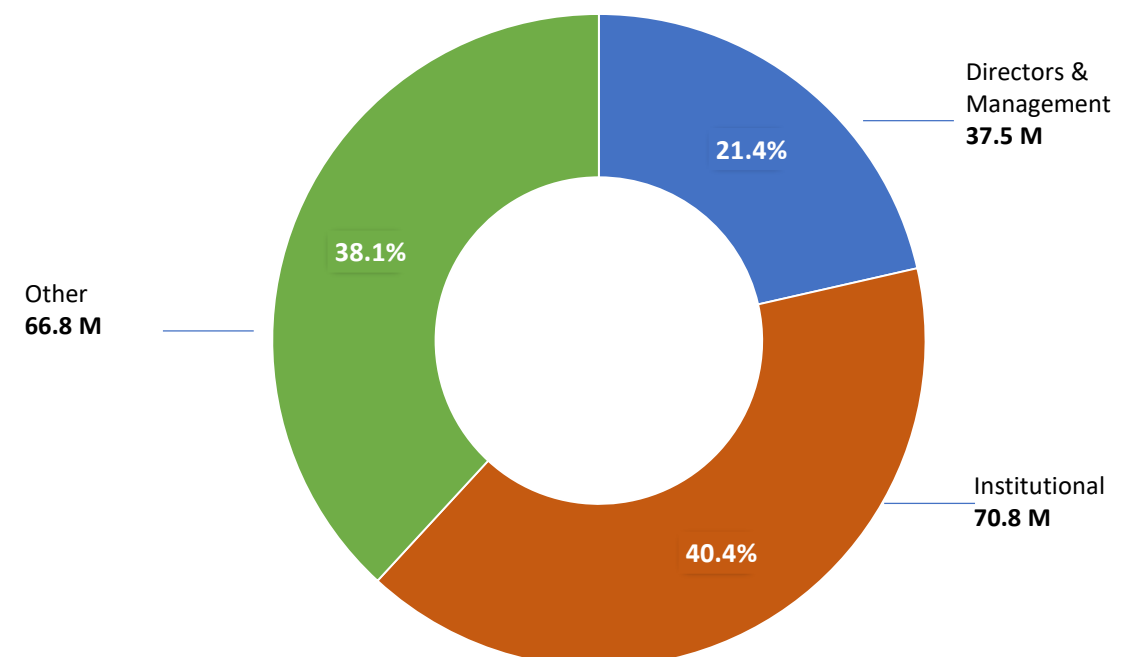


- ➔ **Dual IPOs completed on ASX and TSX Venture Exchange** (October 2nd, 2018).
- ➔ **35M Shares at C\$0.25, raised C\$8.6M**
- ➔ ASX & TSXV Symbol: **“EMN”**
- ➔ Cash position as of 6/30/2019 **~C\$5.5M.**
- ➔ Current Market Cap. **~C\$30M based on C\$0.17**

Capitalization as of September 11, 2019

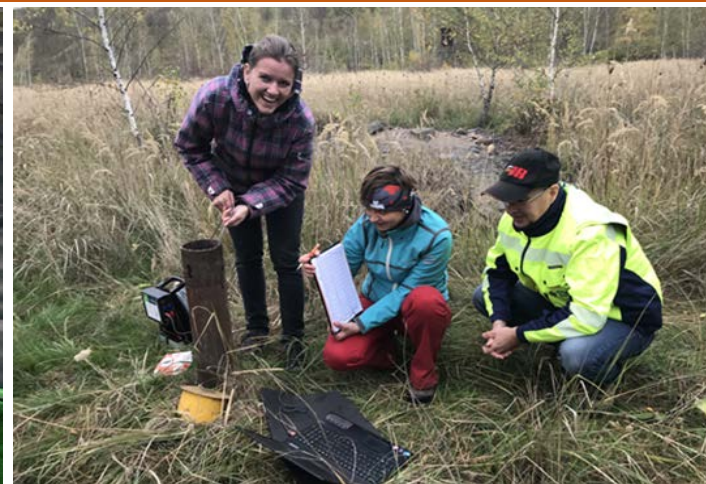
Shares (including 77.5M CDIs)	175,065,435
Options	15,500,000
Warrants	5,756,750
Fully Diluted	196,322,185

Ownership Structure at September 11, 2019 Total 175.1M





Thank You!



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