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For Immediate Release

Euro Manganese Announces PEA Results for Chvaletice Manganese Project with an after-tax Net Present Value of US$593 Million

Vancouver, Canada (January 30, 2019) – Euro Manganese Inc. (TSX-V/ASX: EMN) (the "**Company**" or "**EMN**"), today announced the results of the Preliminary Economic Assessment ("**PEA**") for the development of Western Europe's largest manganese deposit owned by Mangan Chvaletice s.r.o. ("**Mangan**"), a 100% owned subsidiary of EMN in the Czech Republic, the Chvaletice Manganese Project ("**Chvaletice Manganese Project**", **"CMP",** or "**Project**"), and provided further information for the Company's development plans for 2019. All economic values are in US dollars unless indicated otherwise.

HIGHLIGHTS:

- ***PEA based on the recycling of a 27 million tonnes Measured and Indicated tailings resource (98.3% Measured) with a combined grade averaging 7.33% Mn, without the requirement of any hard rock mining, crushing or milling.***
- ***25-year project operating life producing 1.19 million tonnes of high-purity electrolytic manganese metal ("HPEMM"), two-thirds of which is expected to be converted into high-purity manganese sulphate monohydrate powder ("HPMSM").***
- ***Saleable product includes 404,100 tonnes of HPEMM and 2.35 million tonnes of HPMSM, focusing principally on Europe's rapidly emerging electric vehicle battery industry.***
- ***Flexibility to supply either HPEMM or HPMSM, to suit customer preference.***
- ***Pre-tax NPV of $782 million and after tax NPV of $593 million, using a 10% real discount rate.***
- ***$404 million in pre-production capital, $24.8 million in sustaining capital, and $31 million in working capital, with an ungeared, pre-tax 25.2% IRR with a 4.5-year payback, and a post-tax 22.6% IRR with a 4.9-year payback.***
- ***Project economics are based on projected average HPEMM (containing 99.9% Mn) price of $4,617/tonne and HPMSM (containing 32% Mn) price of $2,666/tonne over the project life.***
- ***Targeting production of ultra-high-purity electrolytic manganese metal with specifications exceeding 99.9% Mn and ultra-high-purity manganese sulphate monohydrate with a minimum manganese content of 32.34%, which exceed typical industry standards.***
- ***Exceptionally green project credentials. Project designed to meet or exceed all Czech and European safety, health and environmental standards, to remediate the Chvaletice tailings and arrest ongoing pollution related to unlined historical tailings piles.***
- ***Access to excellent transportation, energy and community infrastructure.***
- ***Proposed process plant site to be located in an industrially-zoned brownfields site, where a historical process plant generated the Chvaletice tailings.***

- ***Sophisticated, stable and business-friendly European Union jurisdiction that is highly supportive of new and, especially, green investments.***
- ***Robust project economic potential and rapidly growing market demand for high-purity manganese products support a wide range of potential financing alternatives.***
- ***Opportunities exist to enhance returns through process optimization initiatives and various investment incentives that may be available through the Czech Republic and European Union.***
- ***Next steps: Build and commission a Demonstration Plant in 2019 to produce multi-tonne, High-Purity Manganese product samples for customer testing and qualification, in conjunction with ongoing studies leading to completion of a feasibility study and submission of permit applications that will require further environmental investigations.***

Marco Romero, President and CEO of EMN, commented:

"The PEA demonstrates the compelling potential of the Chvaletice Manganese Project. Euro Manganese is in a unique position in the battery industry, with its 100% holding of Western Europe's most significant and strategically-located manganese deposit. What makes this project even more significant for an automotive industry focused on making our world greener, and for other consumers striving to secure sustainably produced raw materials, is that these products would be produced by recycling waste."

Dr. Roman Shklanka, Chairman of EMN, added:

"The advent of electric vehicle manufacturing is transforming the entire global automobile industry. Revolutionary changes are taking place before our eyes and these have created unprecedented opportunities for an entirely new battery raw materials supply chain. Manganese is emerging as a key component in the dominant formulations of lithium-ion batteries, which are expected to drive strong demand for highly-refined manganese products well into the coming decades. A great deal of high-purity manganese materials production capacity needs to be brought on stream to meet the requirements of electric vehicle battery makers alone. Our plan is to be there for them, as a reliable supplier of environmentally-superior, high-purity manganese products. Our strategic location in the Czech Republic, central to a major emerging cluster of electric vehicle plants and a related ecosystem of chemical, cell and battery producers, our 25-year Project operating life, and our focus on the green production of high-purity manganese products made from the remediation of an old environmentally-impacted site, has attracted the attention of lithium-ion battery, battery precursor and cathode makers around the world."

Mr. Romero continued, "*Our Project team is now focused on further defining and refining our plans to advance the Project through front-end engineering and optimization work, and on the efficient progression of Project permitting. Planning, process engineering design and metallurgical test work are ongoing, ahead of the upcoming feasibility study, which we target completing by late 2019. Our plan for this year includes building and operating a demonstration plant capable of producing multi-tonne, high-purity manganese product samples for customer testing and qualification. Our 2019 plans also include intensifying community, stakeholder and regulatory consultation, and the filing of Project Permit Application."*

The PEA is based on a Measured and Indicated Mineral Resource Estimate, as detailed in the NI 43-101 and Technical Report prepared by Tetra Tech on January 28, 2019, a copy of which is filed on SEDAR and can be found on the Company's website. The JORC Technical Report is expected to be lodged with the Australian Securities Exchange ("ASX") within the next week. None of these Mineral Resources have been converted to Mineral Reserves. The PEA is considered preliminary in nature and includes estimated costs that are subject to an approximate margin of error of plus or minus 35%. Accordingly, there is no certainty that the PEA will be realized. Mineral Resources that are not Mineral Reserves do not by definition have demonstrated economic viability.

This PEA was compiled and project-managed by Tetra Tech Canada Inc. ("**Tetra Tech**"), Vancouver, with major input from CINF Engineering Ltd ("**CINF**") (comprehensive process design, plant engineering, equipment selection and testing), Changsha Research Institute for Mining and Metallurgy ("**CRIMM**") (metallurgical testwork, process design, product development and pilot plant testing), Bilfinger Tebodin Czech Republic ("**Tebodin**") (Czech and European cost estimation, localization and environmental services), GET s.r.o. ("**GET**") (geology and sampling, environmental and tailings extraction planning) and Sudop Ltd (railway infrastructure design study). An updated NI 43-101 Technical Report on the Chvaletice Manganese Project including results of the PEA will be filed within 45 days on SEDAR and made available on the Company's website.

Project Design Approach and Benefits to Local Residents

- The CMP process plant is being designed to reliably and cost-effectively produce HPEMM and HPMSM products that meet or exceed all known customer specifications, including those for low-cobalt NMC cathode formulations, while complying with the stringent Czech Republic and European Union health, safety and environmental standards. In setting the life of the Project at 25 years with stable production levels, the goals of providing a long-term stable product supply for our customers, market stability and economic benefits for local communities and the citizens of the Czech Republic, were balanced against the generation of acceptable rates of return for the long-term investment that are required by EMN to develop the Project.
- The Project is designed to produce high-purity manganese products, anticipating customer specifications for the emerging specifications for low-nickel battery formulations, produced with the cleanest technology available, assuring customers product quality, verifiable provenance and n small environmental footprint.
- The Project would result in the environmental remediation of a polluted site, where metals and other compounds currently leach into the groundwater. As extraction, reprocessing and proper disposal of the Chvaletice tailings is carried out, the site will be progressively rehabilitated to be in compliance with Czech and European environmental requirements.
- Modern, conventional and commercially-proven technologies that are employed in a variety of industries were incorporated in the various components of the CMP process flowsheet.
- The Company has extensively engaged and plans to continue meaningful consultation with local residents, communities, organizations and regulatory agencies, soliciting active local participation and input in the Project's evaluation and planning process.
- Since the inception of the CMP, the Company has sought-out, trained and helped to develop numerous talented Czech professionals. EMN expects that the project would employ Czech residents during construction and operations. The Project would be expected to employ approximately 400 people during operations.
- During its construction period and its 25-year life, total expenditures within the Czech Republic are estimated at $2.70 billion (CZK 62.0 billion), which would include corporate and payroll taxes and royalties payable within the Czech Republic of approximately $1.07 billion (CZK 23.8 billion).

PEA Summary and Economic Analysis

The following summarizes the material assumptions used in, and the results of, the PEA, assuming a targeted start of production in the second half of 2022:

Table 1: Economic and Operations Summary (M = Millions, K = Thousands)

Product Price Assumptions	**Life of Project/Average**
High-purity electrolytic manganese metal ("HPEMM") [(1)]	$4,617 per tonne
High purity manganese sulphate monohydrate ("HPMSM") [(1)]	$2,666 per tonne
Capital Requirements	
Initial Capital requirements	$403.9 M
Life of Project Sustaining Capital (excludes $255 M in maintenance costs which are included in operating costs)	$24.8 M
Working Capital	$30.5 M
Operating Costs (per tonne plant feed)	
Tailings extraction	$2.02/t
Magnetic separation, HPEMM & HPMSM processing	$90.21/t
Tailings stacking/storage, site services, and water treatment	$5.76/t
General and administrative	$5.04/t
Contingency on operating costs	$8.24/t
Total Site Costs	$111.28/t
Freight and Insurance, Selling costs and Royalties (per t plant feed)	
Freight and insurance, and selling costs	$14.94/t
Czech Government royalty [(2)]	$4.53/t
Net smelter returns ("NSR") royalty, on sales less allowable costs [(3)]	$3.40/t
Total cost per tonne plant feed	$134.14/t
Production Summary	
Life of project operations	25 years
Chvaletice tailings extracted & processed	26,828 K tonnes
Total manganese grade	7.33%
Contained Manganese (Mn)	1,967 K tonnes
HPEMM produced	1,186.4 K tonnes
HPEMM further processed into HPMSM	782.3 tonnes
HPEMM sold	404.1 k tonnes
HPMSM produced/sold	2,345.0 K tonnes
Total Mn contained in HPEMM & HPMSM	1,165 K tonnes
Overall Mn recovery	59.2%

Project Economics	**Before-Tax**	**After-Tax**
Net Present value, (10% real discount rate)	$781.6 M	$593.2 M
Internal Rate of Return	25.2%	22.6%
Payback (from start of processing)	4.5 Years	4.9 Years
Cumulative Cash Flow, undiscounted	$4,088.8 M	$3,291.8 M

Notes:

1. Average real selling prices per tonne of HPEMM (99.9% Mn content) and HPMSM (32% Mn content) for the period as projected in a market study prepared for the Company by CPM Group LLC, entitled "Market Outlook for High-purity Electrolytic Manganese Metal and High-purity Manganese sulphate monohydrate," dated January 21, 2019.
2. Czech government royalty is 2,308 Czech Koruna (CZK) per tonne of Mn produced, translated to USD at a projected CZK to USD exchange rate of 22.14.
3. A 1.2% NSR royalty is payable to the founding shareholders of Mangan.

Table 2: Total Life of Project Revenue, Costs and Cash Flows

Projected Cash Flows	**Life of Project (M)**
Total HPEMM Revenue	$1,865.7
Total HPMSM Revenue	$6,251.3
Freight, Insurance and Selling costs	$400.8
Czech Government Royalties	$121.4
Revenues, net of above costs	**$7,594.8**
NSR Royalty	$91.1
Site Operating Costs	$2,985.3
Capital Costs (initial, sustaining and demolition less salvage value)	$429.6
Project Cash Flow (pre-tax)	**$4,088.8**
Taxes	$797.0
Life of Project Undiscounted Cash Flows	**$3,291.8**

The Czech corporate income tax rate is 19%. In addition to the royalty of CZK 2,308 per tonne of unit Mn produced, the Czech Republic has various payroll and other taxes to generate revenue. The Company has chosen to model the economics of this project conservatively from a tax perspective, with a full tax burden, based on Czech legislated tax rates. Investment incentives exist in the Czech Republic and the European Union for certain, qualified investments, including investment tax credits, grants, and accelerated depreciation. The Company will take advantage of these opportunities as it advances the Project through the feasibility study stage.

Sensitivity Analysis

A sensitivity analysis for the Chvaletice Manganese Project was carried out to determine the effects of key variables in relation to the post-tax NPV of $593 million at a real discount rate of 10%. The results of the sensitivity analysis are presented in Table 3 below.

Table 3: Project Sensitivity Analysis

Sensitivity	**Change from Base Case (M)**	**After-tax NPV (M)**
Base NPV		$593
Discount rate, 12%	$(175)	$418
Discount rate, 8%	$238	$831
HPEMM/HPMSM average prices +10%	$176	$769
HPEMM/HPMSM average prices -10%	$(175)	$418
Total capital +10%	$(35)	$558

Sensitivity	Change from Base Case (M)	After-tax NPV (M)
Total capital -10%	$36	$629
Total operating costs +10%	$(74)	$519
Total operating costs -10%	$74	$667
Recoveries +10%	$57	$650
Recoveries -10%	$(58)	$535

Initial and Sustaining Capital Estimates

Capital expenditure estimates have been prepared for both initial and sustaining capital. A projected summary timeline of scheduled capital costs is shown in Table 4.

Table 4: Initial Capital and Sustaining Capital Schedule

Year	Initial Capital (M)	Sustaining Capital (M)
Pre-operations, year 2	$161.5	
Pre-operations, year 1	$242.4	-
1	-	$0.7
2	-	$0.2
3	-	$0.2
4	-	$0.2
5	-	$5.0
6	-	-
7	-	-
8 - 25	-	$18.5
Total	**$403.9**	**$24.8**

The expected initial capital expenditures (Table 5) for the Project, inclusive of capitalized operating start-up costs, as estimated by Tetra Tech, as of January 1, 2019, are $403.9 million, including all development-related costs that will be incurred prior to the envisaged commencement of commercial operations. Capital costs incurred after start-up are assigned to sustaining capital and are projected to be paid out of operating cash-flows (also see Table 5). Contingencies on initial capital expenditures have been added at appropriate percentages to each component of the Project, excluding capitalized operating costs, resulting in an overall contingency of $44.2 million or 17% of direct costs. Life of project maintenance costs are estimated to be $255 million, or average $10.2 million per annum.

Table 5: Initial and Sustaining Cost Estimates

Item	Pre-Production Initial Capital (M)	Sustaining Capital (M)
Overall site costs	$35.1	-
Tailings extraction	$2.2	$4.8
Process	$166.8	$12.0
HPMSM process, from 99.9% HPEMM	$25.4	$8.0

Item	Pre-Production Initial Capital (M)	Sustaining Capital (M)
Tailings, residues management	$4.4	-
On-site Infrastructure	$21.1	-
Subtotal, direct costs	**$255.0**	**$24.8**
Project Indirect costs	$72.7	-
Owner's costs	$32.0	-
Contingency	$44.2	-
Total	**$403.9**	**$24.8**

Note: Totals may not add exactly due to rounding.

The Project site is served by excellent existing infrastructure, including rail, highway, a gas pipeline, water and is adjacent to an operating power plant. The proposed plant site is zoned for industrial use and is the site of the former process plant that produced the Chvaletice tailings. New and refurbished infrastructure that will be built to service the Project include a tailings excavation and handling facility: a south and north site connection bridge for transporting tailings slurry, return water pipes and the tube conveyor that returns a mixture of non-magnetic tailings and washed leach residue to the residue dry stacking area; a magnetic separation beneficiation plant; enclosed and winterized process plant buildings and various reagent storage facilities and product warehouse; an upgraded rail spur system with related loading/unloading facilities; an internal road network; an electrical supply system, including two 110 kV step-down substations, four 380 V/36 kA rectifier transformers and local step-down transformers; a process equipment maintenance workshop; a mobile fleet maintenance workshop; spare part and maintenance supply warehouses; a comprehensive water management system laboratories; and general administrative offices.

Operating Cost Estimate

Onsite operating costs are expected to average $111.28 per tonne plant feed ($2.57 per kg Mn equivalent) with offsite operating costs estimated to average $22.87 per tonne plant feed ($0.52 per kg Mn equivalent), as shown in Table 6.

Table 6: Life of Project Operating Costs

Operating Costs ("Opex")	Total (M)	$ per tonne Plant Feed	$ per kg Mn Equivalent
Extraction costs	$54.2	$2.02	$0.05
Magnetic Separation and processing to HPEMM	$2,019.0	$75.26	$1.74
Processing of HPEMM to HPMSM	$401.1	$14.95	$0.34
Tailings stacking/storage, site services and water treatment	$154.5	$5.76	$0.13
General and administrative	$135.3	$5.04	$0.12
Contingency on operating costs	$221.2	$8.24	$0.19
Subtotal, Onsite Opex	**$2,985.3**	**$111.28**	**$2.57**
Freight and insurance, and selling costs	$400.8	$14.94	$0.34
Czech Government royalty [(1)]	$121.4	$4.53	$0.10
NSR royalty, on sales less allowable costs [(2)]	$91.2	$3.40	$0.08
Subtotal, Offsite Opex	**$613.4**	**$22.87**	**$0.52**
All-in Opex	**$3,598.7**	**$134.14**	**$3.09**

Notes:

1. Czech government royalty is 2,308 Czech Koruna (CZK) per tonne of Mn extracted, translated to USD at a projected CZK to USD exchange rate of 22.14.
2. A 1.2% NSR royalty is payable to the founding shareholders of Mangan.

Resource Estimate

Tetra Tech was engaged to oversee the planning and execution of sampling and assaying, to prepare the updated Resource Estimate for EMN's Chvaletice Manganese Project, to prepare the Technical Report in accordance with National Instrument 43-101 - *Standards and Disclosures for Mineral Projects*, and to prepare the independent JORC Code technical report in accordance with the Joint Ore Reserves Committee Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 Edition ("**JORC Code**"). The 43-101 Technical Report, entitled "Technical Report and Mineral Resource Estimate for the Chvaletice Manganese Project, Chvaletice, Czech Republic", with an effective date of December 8, 2018, was filed on SEDAR on January 28, 2019. The JORC Code Technical Report is expected to be lodged with the ASX within the next week.

The updated Mineral Resource Estimate resulted in a reclassification and upgrade of the tailings contained in the three Chvaletice tailings cells to Measured and Indicated categories, from Indicated and Inferred. The Project's combined Measured and Indicated Resources now amount to 26,960,000 tonnes, grading 7.33% total manganese and 5.86% soluble manganese, as detailed in Table 7 below:

Table 7 - Chvaletice Mineral Resource Statement, Effective December 8, 2018

Tailings Cell #	Classification	Dry In - situ Bulk Density (t/m³)	Volume (m³)	Tonnage (metric tonnes)	Total Mn (%)	Soluble Mn (%)
#1	MEASURED	1.52	6,577,000	10,029,000	7.95	6.49
	INDICATED	1.47	160,000	236,000	8.35	6.67
#2	MEASURED	1.53	7,990,000	12,201,000	6.79	5.42
	INDICATED	1.55	123,000	189,000	7.22	5.30
#3	MEASURED	1.45	2,942,000	4,265,000	7.35	5.63
	INDICATED	1.45	27,000	39,000	7.90	5.89
TOTAL	**MEASURED**	**1.51**	**17,509,000**	**26,496,000**	**7.32**	**5.86**
	INDICATED	**1.50**	**309,000**	**464,000**	**7.85**	**6.05**
COMBINED	**M&I**	**1.51**	**17,818,000**	**26,960,000**	**7.33**	**5.86**

Notes:

1. Estimated in accordance with the Canadian Institution of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves adopted by CIM Council, as amended, which are materially identical to JORC Code.
2. The Chvaletice Mineral Resource has a reasonable prospect for eventual economic extraction. Mineral Resources do not have demonstrated economic viability, and no Mineral Reserves have been defined for the Project.
3. Indicated Resources have lower confidence that Measured Resources. A break-even grade of 3.20% total Mn has been estimated for the Chvaletice deposit based on preliminary pre-concentration operating costs of US$5.22/t feed, leaching and refining operating cost estimates of US$173/t concentrate, 63% recovery for magnetic separation derived from the average total Mn recovery of 87.7% on the average head grade, 71% recovery for leaching and refining, and a metal price of US$2.00/kg for 99.7% EMM (Shanghai Metals Market, Dec 2018). The price for high purity 99.9% EMM is expected to be higher.
4. A cut-off grade has not been applied to the block model. The estimated break-even cut-off grade falls below the grade of most of the blocks (excluding 10,000 tonnes which have grades less than 3.20% total Mn). It is assumed that material segregation will not be possible during extraction due to inherent difficulty of grade control and selective mining for this deposit type.
5. Grade capping has not been applied.
6. Numbers may not add exactly due to rounding.

PROCESSING FACILITIES DESCRIPTION:

Tailings Extraction, Residue Storage Facility and Reclamation

In the tailings extraction plan, the three tailings cells would be excavated in a counter-clockwise sequence, starting with Cell #3, followed by Cells #1 and #2. Tailings would be extracted using shovel excavators and hauled by truck to an intermediate re-pulping and a covered surge pile/storage station located between Cells #2 and #3. The storage station would create a 7-day material stockpile, whereby excavation and process waste dry stacking operations are limited to day time on weekdays only. Re-pulped tailings will be fed to the magnetic separation plant via a slurry pipeline on a continuous basis.

A blend of non-magnetic tailings (NMT), washed leach residue (LR) and gypsum materials from the process plant would be conveyed using a tube conveyor to the storage station and placed and compacted in the lined Residue Storage Facility ("RSF"). The excavated area exposed after extraction of the existing tailings would be lined with a geomembrane liner. The facility will be constructed in stages to suit residue storage requirements and to minimize the footprint of tailings and process residues exposed to the air at any given time. An initial starter cell would be constructed immediately adjacent to north of the existing Cell #2. Subsequent cells would be constructed within the extracted-out footprint of the tailings piles. Design features of the filtered residue storage facility include a geomembrane lined bottom, perimeter surface water diversion and a contact water collection system that is integrated with the overall site water management system. Dust management would include the implementation of modern dust suppression methods on open faces, interim stack surfaces and haul roads, as required. Progressive cover placement/reclamation would be undertaken as an integrated part of the residue stacking procedure. The residue stack cover would consist of a low permeability soil and/or geomembrane cover to inhibit erosion and infiltration, and a growth media layer to support vegetation growth. The cover would be placed progressively when residue crest and perimeter stack slopes meet design grades. The site would be expected to be fully reclaimed and brought back into productive community use that would be established in consultation with local residents, regulators and national government agencies. The RSF would be monitored during the post-closure period for geotechnical and environmental performance.

Table 8: PEA Tailings Extraction, Processing and Production Plan by Year

Year	Tailings Milled (kt) [1]	Mn Grade (%) [1]	Contained Mn (kt)	HPEMM produced (kt) [2]	HPEMM Converted to HPMSM (kt) [2]	HPMSM produced (kt)	Total Mn production (kt)	Overall Recovery (%) [3]
1	713	7.91	56.4	31.5	6.7	20.0	31.3	55.5
2	1,146	7.25	83.1	50.0	16.6	50.0	49.5	59.6
3	1,141	7.27	83.0	50.0	25.0	75.0	49.3	59.4
4 - 25 Average	1,083	7.37	79.3	47.9	33.4	100.0	47.0	59.3
Total	**26,828**	**7.33**	**1,966.9**	**1,186.4**	**782.3**	**2,345.0**	**1,164.8**	**59.2**

Notes:

1. Tonnage and grade in Table 8 were calculated by GET and includes an overall 0.5% manganese loss factor and no dilution.
2. Approximately two-thirds of the annual HPEMM production is converted to HPMSM on the site, with the balance being sold as HPEMM.
3. The combined overall recovery of manganese from tailings to high purity manganese products is estimated to be 59.2% over the life of the Project, excluding the extraction manganese loss factor of 0.5%. Manganese recoveries in the production of HPEMM and HPMSM are expected to average 60.3% and 58.7%, respectively.

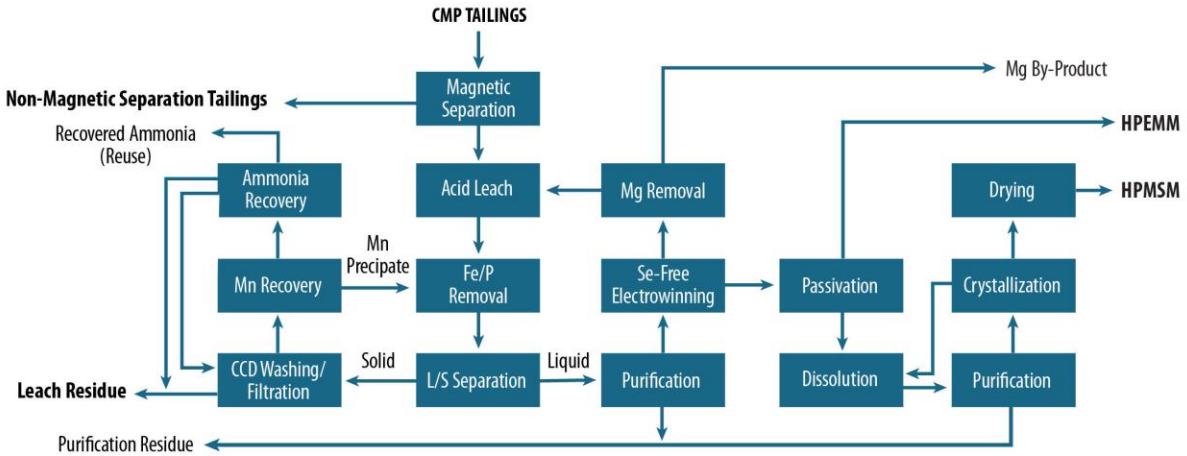
High Purity Manganese Products Production Facility

The processing facilities, including ancillary facilities, and process flowsheet for HPEMM and HPMSM production from the CMP tailings were designed by CINF together with EMN and Tetra Tech, based on the comprehensive metallurgical test results provided mainly by CRIMM. Tebodin provided engineering services to define local regulatory design requirements and review the design compliance.

The design work included preliminary process circuit and process equipment optimization. Mass, energy and water balances were simulated and estimated by a combination of METSIM modelling, calculations using results from the metallurgical test work program and CINF's experience in designing EMM and MSM process plants. Key equipment items were sized and selected by the design team incorporating inputs from potential Chinese equipment vendors.

The CMP process plant has been designed to have a 25-year project life at a nominal production rate of 48,000 tonnes per annum of HPEMM by extracting approximately 1.1 million tonnes of tailings per year. Two-thirds of the annual HPEMM flake production would be expected to be converted to approximately 100,000 tonnes per annum of HPMSM. A progressive ramp up of HPEMM sales has been assumed to limit potential market supply imbalances in the first four years of production. This product mix is expected to best meet the high purity manganese market demand expected in current and future low-cobalt lithium-ion battery formulations. The HPEMM product containing >99.9% manganese is expected to be sold as flakes and powders and would be produced without the use of selenium and chromium. The CMP HPMSM product is designed to contain no less than 99.9% manganese sulfate monohydrate (MSM) and a minimum of 32.34% manganese and will be sold in powder form, produced without the use of fluorine. The proposed process flow sheet is illustrated in Figure 1:

Figure 1. PEA Simplified Process Flowsheet



The major unit operations in the CMP flow sheet are:

- Excavated tailings would be re-pulped and pumped via a pipeline carried by an overhead bridge that would cross Highway #322 and the railway line and related spurs that adjoin the proposed process plant site located immediately south of the tailings piles.
- The tailings slurry would be beneficiated in a wet, high-intensity magnetic separation circuit that upgrades the manganese grade of the leach feed to approximately 15% total manganese and rejects an average 57.7% of the feed to non-magnetic tailings, with an expected 86% manganese recovery. The magnetic concentrate and non-magnetic tailings produced would be dewatered using thickeners and filters. The concentrate would be fed to the downstream leach process and the dewatered tailings, together with the washed leach residue would be dry stacked at the RSF.
- The magnetic concentrate cake would be re-pulped using anolyte solution from the electrowinning tank house and leached using dilute sulfuric acid at 90°C for approximately 6 hours. Neutralization of the slurry would be achieved using hydrated lime. Air sparging of the neutralized slurry would be used to cost-effectively coprecipitate the substantial quantities of impurities that leach with the manganese. The leach pulp would be filtered in automatic pressure filters to separate pregnant leach solution from the leach residue.

- The leach residue would then be washed with process water in a multi-stage counter current decantation circuit and dewatered using pressure filtration prior to co-disposal with the non-magnetic separation tailings in a lined dry stack tailings storage facility that is progressively constructed in excavated areas of the CMP tailings cells.
- The wash water from the leach residue washing circuit would be treated for manganese and ammonia recovery to minimize manganese and ammonia losses. The wash water recovery system recovers manganese units to the leaching circuit in the form of manganese carbonate. The spent wash water solution would be treated to recover ammonia using a conventional lime boil process and would produce a gypsum by-product, the value of which is not included in the Project's economics. The recovered ammonia would be reused in the HPEMM production circuits. The inclusion of the leach residue washing circuit with its associated wash water recovery circuit is expected to be a world-leading industry practice for the hydrometallurgical processing of manganese ores. Returning clean washed tailings to the carefully prepared containment cells in the excavated areas of the tailings progressively remediates the environmental impact risks of legacy mining operations.
- The pregnant solution from the leaching circuit would be purified to remove heavy metals and other impurities and stabilized to prevent uncontrolled crystallization of salts to produce the solution for the downstream electrowinning process.
- Electrowinning would be conducted in electrowinning cells following addition of sulphur dioxide to the tank house feed solution. The tank house would have the capacity to produce 50,000 t/a HPEMM using an energy efficient and selenium free process. The proposed electrowinning circuit is designed to have a plating cycle of 24 hours at a cell voltage of 4.2 to 4.4 V and an average cathode-current density of 320 to 370 A/m^2. Cathodes would be harvested using automatic harvesting machines, washed, passivated without the use of chromium and stripped of electrodeposited manganese metal using industry-standard automatic cathode plate stripping machines. The safety and health standards that have been used in the design of the CMP tank house include comprehensive mist emission control and mechanical handling systems that eliminate manual handling of cathodes and other processes. Tank house system design features include the recovery of anode slimes to minimize manganese losses, as well as diaphragm cleaning and ongoing cell maintenance operations. Approximately two thirds of the HPEMM flakes would then be used as feed for HPMSM production. The remaining HPEMM flakes would be packed and directly shipped to customers. Future opportunities include the sale of powders in addition to flakes.
- A magnesium removal process has been incorporated into the process plant design to ensure efficient electrowinning operations and high-quality product. The magnesium removal process would maintain the magnesium concentration in the electrowinning solutions at a level that prevents uncontrolled precipitation of salts and scaling. The process would use low cost reagents without incurring significant losses of manganese and reagent units.
- The base case PEA production plan proposes to dissolve approximately two-thirds of the HPEMM flakes using sulfuric acid to produce 100,000 t/a of HPMSM powder in a dust-free chemical processing facility. The dissolved HPMSM solution would be further purified to remove trace impurities carried by the HPEMM flakes. This plant design assumes the feed solution will be concentrated using an energy efficient, low temperature mechanical vapor recompression (MVR) crystallization process to generate a single specification of manganese sulfate monohydrate crystals. The HPMSM crystals would be separated from the saturated MVR crystal slurry using centrifuges. The dewatered crystals would be dried using disc dryers to produce the final HPMSM powder, while the spent feed solution would return to the HPEMM dissolution circuit. The dried HPMSM powder product would be packed prior to being shipped in trucks or containers to customers worldwide.

Environmental Impacts, Permitting and Community Engagement

The vicinity of the Chvaletice tailings has been significantly impacted by past mining and related heavy industrial activities. Mining activity at Chvaletice ended in 1975. Czech law exempts land owners and developers from impacts prior to 1989, when communism ended in then Czechoslovakia.

Environmental baseline studies and other environmental studies have been in progress since the summer of 2016. These studies include collection of flora, fauna, hydrological, hydrogeological, climatic, air quality, land-use and socio-economic data, as well as airshed and emissions modelling.

Since 2017, GET, a Czech mining, geological and environmental services firm, has produced several studies for the Project, including environmental baseline studies. These included ecosystem mapping, documentation of the physical and environmental characteristics of the CMP site and an assessment of land use plans of the adjoining municipalities. Significant local features were recorded, including sensitive and protected areas, vegetation, landscape elements, and areas or sites of historical, cultural, archaeological or geological importance. Climate, air, water, soil, natural resources, fauna, flora and ecosystems, landscape and population of the area were inventoried. The baseline studies provide an overall assessment of the environment conditions that prevail in the Project area of interest.

Tebodin, the Czech division of a major European industrial and chemical engineering firm, has provided localization services for EMN that identified local requirements and permits required for the CMP. Tebodin also conducted wide-ranging process plant site selection studies, prior to Mangan securing the currently proposed plant site. They also provided local operating and construction costs estimates, such as reagent and logistic costs, operation consumables, duties and taxes, bulk construction material rates, labour surveys, engineering and construction services and energy supply and costs. Other work by Tebodin, included a review of local regulatory requirements for the permitting process and a review of Czech environmental regulations, standards and environmental practices, including waste water, waste and tailings storage, air, noise and other regulations. A time schedule for the process of an environmental impact assessment, environmental permits and building permits were provided, which suggested that permitting could take approximately 16 months from the time the permitting process is initiated.

EMN has initiated pro-active and regular consultation with community stakeholders, which are expected to intensify as the CMP evaluation and planning advances. In November 2017, the Company's subsidiary, Mangan, inaugurated a Project Information Center in the Town of Chvaletice's Municipal Culture House, to provide residents with opportunities to learn about the CMP, help them to develop relationships with the Company and its team, and to provide feedback and suggestions during the Project evaluation and planning stage. In November of 2018, Mangan relocated its registered office to Chvaletice. This move is intended as a first step towards ultimately basing its head office in this municipality, close to its operations.

Due to the location of the CMP on the shore of the Labe River and overlying a shallow aquifer in the Labe Valley, there are environmental sensitivities related to ongoing tailings runoff and impacts to local groundwater. Currently, EMN has knowledge of impacted groundwater caused by the historical mining and processing activity in the area, particularly the ongoing leaching of metals and other pollutants from the tailings. The Company continues to regularly monitor these impacts in groundwater wells. The Company expects that its proposed reprocessing of the Chvaletice tailings will result in a significant reduction or elimination of ongoing groundwater pollution caused by the existing unlined tailings facility.

Planning and preparation of the Project's permit application has been initiated, with the objective of filing a Project Description/Notification early in 2019 with the Czech Ministry of the Environment. The Project Description/Notification will include a description of:

- Manganese production process and resulting environmental footprint;
- Results of baseline and other studies conducted to date;
- Health, safety and environmental management plans;
- Impact assessment, impact mitigation and avoidance plans/measures;
- Socio-economic impacts on local communities; and
- Reclamation plans/objectives.

The Project Description will be available to local communities, residents, organizations and regulators, during a public comment and consultation period. The Project Description and the input and comments received, as well as any requirements for changes or additional studies, will serve as the basis of further environmental studies that will support the approval of permits.

Planning is underway to design, build and commission a demonstration plant in the Czech Republic that will provide bulk, multi-tonne finished product samples for customer evaluation. This will provide confirmation to the customers of the ability of EMN to meet high product specifications. The demonstration plant will enable process optimization and testing for the product development. In addition, it is expected to serve as a testing and training facility for future operators.

Value Enhancing Opportunities

The Company expects to continue evaluating potential value-enhancing opportunities for the Project as it moves through the feasibility stage. These include the potential for on-site production of sulphuric acid, optimizing building sizing and layout, equipment selection, solid-liquid separation methods, alternative magnesium removal methods, manganese sulphate crystallization technologies, leaching methods, waste generation minimization, as well as minimizing energy and water consumption. EMN also plans to evaluate the possibility of selling by-product magnesium sulfate for agricultural use. These opportunities and others will be evaluated within the scope of work of design studies of the CMP feasibility study program.

Competent and Qualified Person Statement

All production targets for the Chvaletice Manganese Project referred to in this news release are underpinned by estimated Measured and Indicated Mineral Resources prepared by competent persons and qualified persons in accordance with the requirements of the JORC Code and NI 43-101, respectively. Additionally, the scientific and technical information included in this news release, is based upon information prepared and approved by Mr. James Barr, P. Geo, Senior Geologist, Mr. Jianhui (John) Huang, Ph.D., P. Eng., Senior Metallurgical Engineer, Mr. Hassan Ghaffari, P.Eng, M.A.Sc., Senior Process Engineer and Mr. Mark Horan, P.Eng, MSc., Senior Mining Engineer, all with Tetra Tech. Messrs. Barr, Horan, Ghaffari and Huang are consultants to, and independent of, EMN within the meaning of NI 43-101, and have sufficient experience in the field of activity being reported to qualify as Competent Persons as defined in the JORC Code, and are qualified persons, as defined in NI 43-101. Mr. Barr is responsible for the mineral resource estimate, Mr. Huang is responsible for the metallurgical test work results, process engineering, operating cost and capital cost estimates, Mr. Ghaffari is responsible for infrastructure, and Mr. Horan is responsible for mining and financial analysis. Mr. Barr visited the property during the 2017 drilling program and again during the 2018 drilling campaign, on July 30-31st, 2018, during which time he observed the drilling, sample collection and preparation, sample logging and sample storage facilities. Mr. Huang visited the Project on February 5, 2018 and visited the CRIMM laboratory and pilot plant facility five times between January 20, 2017 and September 20, 2018 to witness sample preparation and test/assay facilities and to discuss the test program and results with CRIMM's technical team. Mr. Huang also visited the SGS Minerals Services (SGS) laboratory on June 29, 2017. Messrs. Barr, Huang, Ghaffari and Horan have no economic or financial interest in the Company and consent to the inclusion in this news release of the matters based on their information in the form and context in which it appears.

In addition, technical information concerning the Chvaletice Manganese Project is reviewed by Mr. Gary Nordin, a consultant to EMN and its Chief Geologist, and a Qualified Person under NI 43-101. Mr. Nordin has reviewed and approved the information in this news release for which he is responsible and has consented to the inclusion of the matters in this news release based on the information in the form and context in which it appears.

Technical Report

Further information about the PEA, including key assumptions, parameters, risks and other factors, will be provided in the NI 43-101 Technical Report on the Chvaletice Manganese Project that will be filed on SEDAR under the Company's SEDAR profile at www.sedar.com within 45 days of this news release.

The Company has also filed an independent NI 43-101 Technical Report for the Chvaletice Manganese Project titled "Technical Report and Mineral Resource Estimate for the Chvaletice Manganese Project, Chvaletice, Czech Republic", with an effective date of December 8, 2018 and which was filed on SEDAR on January 28, 2019. That Technical Report includes relevant information regarding the effective dates and the assumptions, parameters and methods of the 2018 Mineral Resource estimates cited in this news release, as well as information regarding data verification, exploration procedures, sample preparation, analysis and security. The JORC Technical Report is expected to be lodged with the ASX within the next week.

Cautionary Statement

The projected extraction method, potential production profile and project plan are conceptual in nature and additional technical studies will need to be completed in order to fully assess their viability. There is no certainty that a potential tailings recycling operation will be realized or that a production decision will be made. A production decision that is made without a feasibility study will carry additional potential risks. Project design and extraction schedules, metallurgical flow sheets and process plant designs may require additional detailed work and economic analysis and internal studies to ensure satisfactory operational conditions and decisions regarding future targeted production.

The PEA is also based on the material assumptions outlined in this news release. These include assumptions about the availability of funding. While EMN considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the PEA can be achieved.

To achieve the range of outcomes indicated in the PEA, excluding working capital, funding in the order of US$430 million -US$440 million is assumed to be required. Investors should note that there is no certainty that EMN will be able to raise that amount of funding when needed. It is also likely that such funding may only be available on terms that may be dilutive to or otherwise affect the fundamental value of EMN's existing shares. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the PEA.

Forward-Looking Statements

Certain statements in this news release constitute "forward-looking statements" or "forward-looking information" within the meaning of applicable securities laws. Such statements and information involve known and unknown risks, uncertainties and other factors that may cause the actual results, performance or achievements of the Company, its projects, or industry results, to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements or information. Such statements can be identified by the use of words such as "may", "would", "could", "will", "intend", "expect", "believe", "plan", "anticipate", "estimate", "scheduled", "forecast", "predict" and other similar terminology, or state that certain actions, events or results "may", "could", "would", "might" or "will" be taken, occur or be achieved.

All of the results of the PEA constitute forward-looking information or statements, including estimates of internal rates of return (including any pre-tax and after-tax internal rates of return, payback periods, net present values, future production, estimates of cash cost, assumed long term prices for HPEMM and HPMSM, proposed extraction plans and methods, operating life estimates, cash flow forecasts, metal recoveries and estimates of capital and operating costs (including US$404 million in pre-production capital). Furthermore, with respect to this specific forward-looking information concerning the development of the Project, the Company has based its assumptions and analysis on certain factors that are inherently uncertain. Uncertainties include among others: (i) the adequacy of infrastructure; (ii) the ability to develop adequate processing capacity; (iii) the price of HPEMM and HPMSM; (iv) the availability

of equipment and facilities necessary to complete development; (v) the size of future processing plants and future tailings extraction rates; (vi) the cost of consumables and extraction and processing equipment; (vii) unforeseen technological and engineering problems; (viii) currency fluctuations; (ix) changes in laws or regulations; (x) the availability and productivity of skilled labour; and (xi) the regulation of the mining industry by various governmental agencies.

Such forward-looking information or statements also include, without limitation, statements regarding the Company's intentions regarding the Project in the Czech Republic, including without limitation, the continued evaluation and development of the Project, the initiating of a feasibility study, the building of the demonstration plant in the Czech Republic, the filing of a environmental impact assessment, related permit applications and a formal project description with the Czech regulatory agencies and local communities, the growth and development of the high purity manganese products market and any other matters relating to the exploration and development of the Project. The Company also cautions readers that the PEA on the Project that supports the technical feasibility or economic viability of the Project, including the marketability of the high-purity manganese products, extraction method, costs, processing, metal recoveries and any other technical aspects related to the Project, is preliminary in nature and there is no certainty that the PEA will be realized.

Readers are cautioned not to place undue reliance on forward-looking information or statements. Forward-looking statements and information involve significant risks and uncertainties, should not be read as guarantees of future performance or results and will not necessarily be accurate indicators of whether or not such results will be achieved. A number of factors could cause actual results to differ materially from the results discussed in the forward-looking statements or information, including, but not limited to, the factors discussed under "Risks Notice" and elsewhere in the Company's MD&A, as well as the inability to obtain regulatory approvals in a timely manner; the potential for unknown or unexpected events to cause contractual conditions to not be satisfied; unexpected changes in laws, rules or regulations, or their enforcement by applicable authorities; the failure of parties to contracts with the company to perform as agreed; social or labour unrest; changes in commodity prices; and the failure of exploration programs or studies to deliver anticipated results or results that would justify and support continued exploration, studies, development or operations.

This news release also contains references to estimates of Mineral Resources. The estimation of Mineral Resources is inherently uncertain and involves subjective judgments about many relevant factors. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The accuracy of any such estimates is a function of the quantity and quality of available data, and of the assumptions made and judgments used in engineering and geological interpretation, which may prove to be unreliable and depend, to a certain extent, upon the analysis of drilling results and statistical inferences that may ultimately prove to be inaccurate. Mineral Resource estimates may have to be re-estimated based on, among other things: (i) fluctuations in manganese or other mineral prices; (ii) results of drilling; (iii) results of metallurgical testing and other studies; (iv) changes to proposed extraction operations, including recoveries and dilution; (v) the evaluation of extraction and operating plans subsequent to the date of any estimates; and (vi) the possible failure to receive required permits, approvals and licences.

Although the forward-looking statements contained in this news release are based upon what management of the Company believes are reasonable assumptions, the Company cannot assure investors that actual results will be consistent with these forward-looking statements. These forward-looking statements are made as of the date of this news release and are expressly qualified in their entirety by this cautionary statement. Subject to applicable securities laws, the Company does not assume any obligation to update or revise the forward-looking statements contained herein to reflect events or circumstances occurring after the date of this news release.

The Company's actual results could differ materially from those anticipated in these forward-looking statements as a result of the factors set forth in the "Risks Notice" section and elsewhere in the Company's MD&A for the year ended September 30, 2018 and its Annual Information Form.

About Euro Manganese Inc.

Euro Manganese Inc. is a Canadian mineral resource company, whose principal focus is advancing the evaluation and development of the Chvaletice Manganese Project, in which it holds a 100% interest. The proposed Project entails re-processing a significant manganese deposit hosted in historic mine tailings, strategically located in the Czech Republic. EMN's goal is to become a leading, competitive and environmentally superior supplier of Ultra-High-Purity Manganese Products, serving both the lithium-ion battery industry, as well as producers of specialty steel and aluminum alloys.

Neither TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in the policies of the TSX Venture Exchange), or the ASX accepts responsibility for the adequacy or accuracy of this release.

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APPENDIX 1
JORC CODE 2012 Edition – TABLE 1

SECTION 1. Sampling Techniques and Data

Criteria	Explanation
Sampling Techniques	▪ The 2018 sampling program is summarized as: ▪ Sonic rig advanced at 2 m intervals using 100mm core tube, approx. 14 kg wet weight per sample ▪ 730 core samples (2 m) of tailings material were recovered for analysis ▪ Samples extracted from core tube at 1 m subsamples (approx. 7 kg wet weight) for logging and physical measurements ▪ A quarter split (approx. 3.5 kg wet weight) was extracted from the 1 m subsamples, recombined with the corresponding 1 m quarter split subsample, bagged and shipped to SGS for particle size analysis, lithogeochemistry, metals analysis and bulk density testing (approx. 7 kg for 2 m representative sample ▪ Remaining ¾ sample was split for additional test work in Czech Republic, and for metallurgical test work in China. ▪ All samples were clearly labelled and stored in vacuum-packed and sealed plastic bags to preserve original moisture content and prevent sample deterioration. Geochemical samples were contained in plastic buckets, inventoried and stored in a locked facility in Prelouc, Czech Republic, prior to being shipped to SGS Bor.
Drilling Techniques	▪ The 2018 program completed drilling of 1,509.5 metres in 80 holes, ▪ The program included completion of 35 vertical and 19 inclined 100 mm diameter Sonic holes, totaling 1,409.5 m, and an additional 26 mobile percussion drill holes, totaling 100 m, were completed around the perimeter embankments of the tailings piles in areas which were not previously accessed for sampling ▪ Sonic holes were placed as infill holes with approximately 75 metre spacing between 2017 holes and as inclined directed underneath the outer perimeter embankment, using 100 mm diameter size rods and sonic core barrel advance provided by Eijkelkamp SonicSampDrill B.V. and crews from Giesbeek, the Netherlands
Drill Sample Recovery	▪ Recoveries estimated by field crew and recorded on geological logs ▪ No casing was installed and drill rods were pulled for each core run
Logging	▪ Logging was conducted in the field at drill side by GET sro, on hard copy paper and transcribed into digital drillhole database ▪ Records include lithological description, wet mass, estimated recovery, and volume.
Subsampling Techniques and Sample Preparation	▪ Sampling excludes overlying topsoil, and underlying native soil substrate ▪ Assay samples received at SGS Bor were weighed (wet) and homogenized by hand using the “Japanese slab cake method” of kneading and rolling the sample ▪ A 500 g subsample sent to laser diffraction particle size analysis ▪ The remaining sample was dried (105 degrees C) and homogenized ▪ 1 kg was extracted for pulverization to 95% passing 75µm mesh ▪ First stage of analysis was conducted SGS in Bor, Serbia, which included partial digestion using aqua regia with ICP/MS or AAS, and near total digestion using four acids (nitric, perchloric, hydrofluoric and hydrochloric) with ICP/MS or AAS from 0.5g aliquots ▪ The second stage of analysis was conducted at SGS in Lakefield, Ontario, Canada, which included using lithium borate fusion and x-ray fluorescence (XRF) for major concentration of major cation oxide, concentration of in organic sulphur and carbon using LECO furnace, measurement of specific gravity by pycnometer, and for particle size analysis by LD-PSA. ▪ Total of 888 samples were analyzed at SGS laboratories.
Quality of Assay Data and Laboratory Tests	▪ Quality control (QC) protocol included insertion of field duplicates (5%), blank (4%) and certified reference samples (5%) in all drill holes, collection of sample preparation duplicate (5%) and pulp duplicates (2%). ▪ Three holes were drilled in 2018 to twin holes completed in 2017 ▪ A database was compiled, and various checks and measures were performed by Tetra Tech. No significant quality assurance (QA) concerns were identified by the Competent Person.
Verification of Sampling and Assaying	▪ Independent analyses were conducted by an external umpire laboratory; Activation Laboratories, located in Ancaster, Ontario, Canada. The lab received 96 representative samples (approximately 1 in 10) ▪ Independent CP sampling was conducted
Location of Data Points	▪ Property topography was provided by GET sro in Czech projection S-JTSK using the Bpv datum

SECTION 1. Sampling Techniques and Data

Criteria	Explanation
	▪ Surveying of drill hole collars was completed on-site by GET using a Trimble model R4 GNSS global positioning system (GPS) receiver equipment
Data Spacing and Distribution	▪ Infill Sonic holes (35) were spaced at approximately 100 m, giving approximately 75m overall average spacing including the 2017 drill holes ▪ Perimeter Sonic holes (19) were inclined at 45 degrees and spaced at two holes per side of the tailings cells ▪ Perimeter percussion holes (26) were drilled vertically and spaced at approximately two to three holes per side of the tailings cells ▪ Downhole sampling continuous at 2 m intervals
Orientation of Data in Relation to Geological Structure	▪ Drillholes were drilled both vertically and inclined through heterogeneous tailings mass
Sample Security	▪ Samples stored at a field warehouse managed by Geomin in Jihlava prior to shipping to laboratory for analyses
Audits or Reviews	▪ Independent site visit, sampling and data review completed by Tetra Tech Competent Person, James Barr, P.Geo., during the delineation drilling campaign on July 30-31st, 2018

SECTION 2. Reporting of Exploration Results

Criteria	Explanation
Mineral Tenement and Land Tenure Status	▪ Mangan is a private company established in the Czech Republic in 1997, is 100% owned by Euro Manganese Inc., and holds 100% ownership of exploration licence number 631/550/14-Hd (which was valid until September 30, 2019, but on December 4, 2018 was renewed and extended to May 31, 2023) and exploration licence number MZP/2018/550/386-Hd (valid until May 31, 2023), ▪ Exploration licence number 631/550/14-Hd is registered to include mineral rights on a total area of 0.98 km² (98 ha) which cover the Chvaletice Manganese Project deposits, of which 0.82 km² is located within the Municipality of Trnavka, and 0.16 km² is located within the Municipality of Chvaletice ▪ Exploration licence MZP/2018/550/386-Hd allows the company to drill on the perimeter of the tailings piles ▪ On April 28, 2018, Mangan was issued a Preliminary Mining Permit by the Ministry of Environment, Licence No. MZP/2018/550/387-HD which covers the areas included in the Exploration Licences and secures Mangan's rights for the entire deposit area and is a prerequisite for the application for the establishment of the Mining Lease District. ▪ At present, Mangan does not hold surface rights to the Chvaletice Manganese Project area, which are considered as those lands of original ground elevation surrounding and immediately underlying the protected area that contains tailings Cells 1, 2, and 3. The area of interest for the Chvaletice Manganese Project overlies and adjoins 18 privately owned land parcels.
Exploration Done by Other Parties	▪ Hand auger sampling in 2014, four holes ranging from 2 to 2.5 m depth ▪ Testpit sampling in 2015, seven testpits ranging between 1.8 to 3.8 m depth
Geology	▪ The mineralization found in tailings at the Chvaletice Manganese Project deposited by manmade processes following grinding and flotation processes of black pyritic shale and is therefore not characteristic of a traditional bedrock hosted manganese deposit ▪ The material can be physically characterized as a compacted soil, with varying degrees of particle sizes from clay to coarse sand. ▪ Mineralogy has been quantified by limited x-ray diffraction (XRD) analyses, with resulting manganese bearing mineral phases as rhodochrosite (and other Mn-bearing carbonates), spessartine (and other Mn-silicates); quartz was the main gangue mineral, and pyrite was the main sulphide mineral.
Drill Hole Information	▪ Drillholes were collared on the surface of the tailings deposits and drilled vertically downwards to completion in the underlying native soil substrate, approximate average depth in Cell 1 = 26 metres, Cell 2 = 27 metres and Cell 3 = 11 metres
Data Aggregation Methods	▪ Raw drillhole samples were composited to 2 metre intervals for use in mineral resource estimation

SECTION 2. Reporting of Exploration Results

Criteria	Explanation
Relationship Between Mineralization Widths and Intercept Points	▪ Downhole width is equivalent to true width
Diagrams	▪ Diagrams, maps and cross-sections are included in the press release for reference
Balanced Reporting	▪ All of the tailing material which has been assayed has reported elevated concentration of manganese ▪ 2018 Sample assay grades range from 0.19% to 11.69% total Manganese (by XRF analysis), with mean value of 7.29%
Other Substantive Exploration Data	▪ A total of 6.6 km lines of high-resolution electric resistivity tomography (ERT) and seismic refraction was conducted by Glmpuls Praha spol. s.r.o., on behalf of Mangan Chvaletice, in 2017
Further Work	▪ No further exploration work is recommended or planned.

SECTION 3 Estimation and Reporting of Mineral Resources

Criteria	Explanation
Database Integrity	▪ Tetra Tech undertook verification of the data transfer and compilation process at SGS through visual comparison of the issued certificates of analysis with the digital assay records ▪ The drillhole database was visually inspected by Tetra Tech, and corrections made prior to further inspection using digital validation tools within Leapfrog Geo modelling software
Site Visits	▪ A site visit was conducted by Tetra Tech CP, James Barr, P.Geo., from July 1 to 3, 2017, and July 30-31, 2018, during both drilling campaigns, and a site visit was conducted by Mr. Jianhui Huang, Ph.D., P.Eng on February 5, 2018.
Geological Interpretation	▪ A mineral resource estimate has been developed for total and soluble manganese concentrations ▪ Total manganese is based on XRF analysis, and soluble manganese is based on results of aqua regia digestion and ICP-MS or AAS analysis. ▪ Additionally, average moisture and grain size distribution indicators are reported for the deposit ▪ Geological interpretation assumes that deposition of tailings materials was episodic over the life of the historical mining operations, and the material was deposited from processed materials with mixed particle sizes suspended in slurry with thin lateral continuity with a particle gradation from coarse to fine away from the point of discharge
Dimensions	▪ Total surface area is approximately 1,032,800 m^2, approximate total volume (tailings) 17,528,800 m^3, approximate total volume of topsoil is 2,060,030 m^3 ▪ The resource is reported using a sub-block model with parent blocks 50x50x4 metres and sub-blocks 12.5x12.5x2 metres
Estimation and Modelling Techniques	▪ The Mineral Resource Estimate was calculated using Aranz Leapfrog Geo ▪ Interpolation searches were 150x150x8 metres and were performed using an inverse distance (to the exponent 3) methodology. Data distribution did not conform to reliable variography assessment. ▪ The search was limited to a maximum of two samples per drill hole and required a minimum of two to a maximum of six samples in order to populate a block.
Moisture	▪ The tonnage is reported on an in situ dry material basis ▪ Moisture loss was measured during sample handling and preparation
Cut-off Parameters	▪ A break-even grade of 3.20% total Mn has been estimated for the Chvaletice deposit. A cut-off grade has not been applied to the block model. The estimated break-even cut-off grade falls below the grade of most of the blocks (excluding 10,000 tonnes which have grades less than 3.20% total Mn). It is assumed that material segregation will not be possible during mining due to inherent difficulty of grade control and selective mining for this deposit type.
Mining Factors or Assumptions	▪ The deposit sits above ground and is candidate for traditional truck and shovel mining, or other possible surface extraction techniques following dewatering of tailings ▪ It is assumed that material segregation will not be possible due to inherent difficulty of grade control and selective mining for this deposit type
Metallurgical Factors or Assumptions	▪ Preliminary assumptions include pre-concentration operating costs of US$5.22/t feed, leaching and refining operating cost estimates of US$173/t concentrate, 63% recovery for magnetic separation derived from the average total Mn recovery of 87.7% on the average head grade,

SECTION 3 Estimation and Reporting of Mineral Resources

Criteria	Explanation
	71% recovery for leaching and refining, and a metal price of US$2.00/kg for 99.7% EMM (Shanghai Metals Market, Dec 2018). The price for high purity 99.9% EMM is expected to be higher
Environmental Factors or Assumptions	▪ The area covered by the Chvaletice tailings has been significantly impacted by past mining and other heavy industrial activities ▪ Environmental baseline studies have been in progress since the summer of 2016. These include hydrological sampling and monitoring, as well fauna and flora surveys
Bulk Density	▪ In situ dry bulk density is basis for tonnage estimate and was calculated from estimated core recovery along with laboratory measurements for mass and moisture ▪ Bulk density was a variable modelled into the block model based on the calculated in situ dry bulk density for each sample ▪ Calculated in situ dry bulk density values for individual samples range between 0.35 t/m^3 and 3.15 t/m^3, with a mean value of 1.55 t/m^3
Classification	▪ Classification is based on the JORC Code, and divides the mineral resource into Measured and Indicated categories ▪ A variance analysis on the block model determined that blocks supported from five or more samples, within an average distance of 100 m and with the closest sample within 75 metres be classified as Measured Resources, and blocks with greater than three samples within average distance of 150 metres be classified as Indicated Resources. ▪ No blocks were classified as Inferred Resources.
Audits and Reviews	▪ No external audits were performed ▪ Internal peer and senior review audits were performed as part of Tetra Tech's quality management system
Discussion of Relative Accuracy/Confidence	▪ The mineral resource estimate is reported as a weighted average grade and tonnage based on the search methodology and is not reported within error or confidence limits ▪ Indicated resources are considered lower confidence with higher margin of error than Measured resources ▪ The modelling was validated using visual comparison, declustered mean comparison, and swath plots and is considered to be representative of the input data ▪ Reconciliation to the 2017 block model was completed to identify areas with significant changes may have occurred ▪ Bulk density relies on estimated recovery from the field which may introduce some error into the calculation ▪ Assumption of lateral continuity/gradation of particle size may introduce error

SECTION 4 Estimation and Reporting of Mineral Reserves

Criteria	Explanation
Mineral Resource estimate for conversion to Ore Reserves	▪ This is a Preliminary Economical Assessment Report. ▪ No ore reserves have been defined and reported in the Preliminary Economical Assessment Report.
Site visits	▪ A site visit was conducted by Tetra Tech CP, James Barr, P.Geo., from July 1 to 3, 2017, and July 30-31, 2018, during both drilling campaigns, and a site visit was conducted by Mr. Jianhui Huang, Ph.D., P.Eng on February 5, 2018. Mr. Jianhui Huang, Ph.D., P.Eng also visited the Changsha Research Institute of Mining and Metallurgy Co. Ltd. (CRIMM) laboratory and pilot plant facility five times between January 20, 2017 and September 20, 2018 to witness sample preparation and test/assay facilities and to discuss test program and results with CRIMM's technical team. Mr. Huang also visited the SGS Minerals Services (SGS) laboratory on June 29, 2017.
Studies status	▪ Preliminary Economical Assessment has been completed January 2019. ▪ No mineral resource has been converted to ore reserves ▪ Several preliminary environmental studies have been conducted, including environmental baseline studies, environmental risks assessment, preliminary estimate of impacts on air, and social environmental impact study.
Cut-off parameters	▪ No reserves have been defined in the Preliminary Economical Assessment.

SECTION 4 Estimation and Reporting of Mineral Reserves

Criteria	Explanation
	▪ A break-even grade of 3.20% total Mn has been estimated for resource estimate of the Chvaletice deposit. A cut-off grade has not been applied to the block model. The estimated break-even cut-off grade falls below the grade of most of the blocks (excluding 10,000 tonnes which have grades less than 3.20% total Mn). It is assumed that material segregation will not be possible during mining due to inherent difficulty of grade control and selective mining for this deposit type.
Mining factors or assumptions	▪ The current level of study for the Chvaletice Manganese Project is limited to Preliminary Economic Assessment or Scoping study. As such the criteria for conversion of resources to reserves have not yet been established. ▪ A preliminary study has included the evaluation of various mining methods for on the extraction of the tailings resources. ▪ This mine plan includes assumptions on geotechnical parameters, excavation slopes, mining layout, moisture content, equipment and infrastructure requirements.
Metallurgical factors or assumptions	▪ Several metallurgical test programs have been completed, including three semi-continuous pilot plant runs and large scale batch testing based on preliminary optimized process/test conditions. ▪ A total of 25 composite samples were constructed from the drill core interval samples representing different variation characters, including spatial location, grade variation and particle size variations, and tested. ▪ Purification technologies were tested. ▪ Se-free electrowinning processed has been developed and confirmed for the mineral material. ▪ Cr-free passivation treatment for the cathode plates has been tested and developed. ▪ The metallurgical recoveries were estimated mainly from pilot plant test results that were used to calibrate a mass balance model of the process circuitst. The estimated total manganese recoveries for process circuits are shown below: - Magnetic separation: 82.1 to 90.1% tMn, averaging 86.1% tMn; - Leaching recovery: 75% tMn - Purification & Electrowinning: 93.6% tMn - HPEMM to HPMSM: 97.4% tMn. ▪ The sample products produced from the semi-continuous pilot plant tests and large scale batch tests show that high purity electrolytic manganese metal (HPEMM) and high purity manganese sulfate monohydrate (HPMSM) can be produced from the tailings material that exceed typical industry standards.
Environmental	▪ Several environmental studies have been conducted, including environmental baseline studies which include ecosystem mapping, documentation of the physical and environmental characteristics of the Chvaletice Manganese Project site and an assessment of land use plans of the adjoining municipalities. Significant local features were recorded, including sensitive and protected areas, vegetation, landscape elements, and areas or sites of historical, cultural, archaeological or geological importance. Climate, air, water, soil, natural resources, fauna, flora and ecosystems, landscape and population of the area were preliminarily inventoried. The baseline studies provide an overall assessment of the environment conditions that prevail in the Project area of interest.
Infrastructure	▪ The existing infrastructure immediately adjacent to the proposed project site includes an 800 MW coal-fired power station operated by Severní Energetická a.s. and a pre-cast concrete plant operated by Eurobeton. ▪ The Property is located along paved Highway #322 which connects to Prague, approximately 89 km by road, via Kolin and Highway #12. The proposed process plant and management office are located immediately south of the highway. A rail line is located between the highway and the Chvaletice Manganese Project tailings facility, immediately to the south of the Chvaletice tailings property, which acts as main transportation line from Prague to communities of Eastern Czech Republic. Spur lines at the south of the highway are used to transport and unload coal to the 800 MW power station, and to service an adjacent industrial park which is the site of the former processing facilities that produced the Chvaletice tailings. ▪ New and refurbished infrastructures that will be built to service the Project include one non-magnetic tailings (NMT) and washed leach residue (LR) storage facility, one extracted existing tailings pulping, one slurry pipeline and NMT/LR transport overhead bridge, various process facilities at the south site, maintenance workshop and spare part storage facilities, railway spurs and loading/unloading facilities, reagent storage facilities, laboratories, general office complex, one change room and dining room, power supply, water supply, steam supply and air supply.
Costs	▪ Capital costs were estimated based on the PEA level engineering designs completed by CINF, Tetra Tech and GET, including direct costs (equipment, buildings, equipment installation, access

Criteria	Explanation
	and inner roads, railway spur upgrading and others). Indirect costs (shipping, construction indirect, EPCM, spare parts and initial fills), owner costs and contingency (approximately 18% of direct costs). The total initial capital cost was estimated to be US$403.9 million. ▪ Major equipment prices were based on quotations. ▪ Capital costs related to process facilities and other facilities were estimated based on preliminary workshop and building layouts prepared according to engineering design. ▪ Equipment transport costs for capital cost estimates were based on percentage of equipment costs, including land and ocean transport costs, port handling costs and custom fees if applicable. ▪ Operating costs were estimated based on operation functions, including tailings extraction, process, lined NMT/LR dry stacking storage, G&A and site services. The categories included in the operation cost estimates include manpower requirement, various consumables (reagents and other consumables), electricity power consumption, steam consumption, maintenance spare parts, office and general management related costs, including safety and training costs. The average life of project operating cost was estimated to be US$112.47/t mill feed. ▪ Operating consumable costs and related shipping costs were mainly based on the marketing study prepared by Tebodin Czech Republic, s.r.o. ▪ All the costs were estimated based on Q3/Q4 costs of 2018. ▪ The foreign exchange rates used in cost estimates and economic model were based on average exchange rates of the second half year of 2018. ▪ A market study for high purity electrolytic manganese metals and high purity manganese sulfate monohydrate was conducted by CPM Group. The high purity manganese product prices were projected by the marketing study. ▪ Government royalty was based on 2,308 Czech Koruna (CZK) per tonne of Mn produced. A 1.2% NSR royalty is payable to the founding shareholders of Mangan Chvaletice s.r.o., the Company's Czech subsidiary, which owns the 100% interest in the Project.
Revenue factors	▪ A market study for high purity electrolytic manganese metals and high purity manganese sulfate monohydrate was conducted by CPM Group LLC. The high purity manganese product prices were projected by the marketing study prepared by CPM Group LLC. ▪ The products are assumed to be distributed worldwide. Preliminary transport costs for the products were estimated based on potential consumer locations and tonnages. The consumable costs and related shipping costs were mainly based on the marketing study prepared by Tebodin Czech Republic, s.r.o. ▪ Plant feed grades were based on year-by-year mine plan which was developed from mineral resource estimate. ▪ The foreign exchange rates used in costs estimates and economic model were based on average exchange rates of the second half year of 2018. ▪ The sale and distribution costs were included in the economic analysis.
Market assessment	▪ A market study for high purity electrolytic manganese metals and high purity manganese sulfate monohydrate was conducted by CPM Group LLC. ▪ The study includes the market demand and supply for high purity manganese products. High purity electrolytic manganese metal (HPEMM) and high purity manganese sulfate monohydrate (HPMSM) products are mostly used in the manufacture of lithium-ion batteries for electric vehicles (EVs) and electric storage systems (ESS) – the market is expected to experience significant growth over the next two decades. HPEMM is also used in a variety of steel, aluminum and other super alloys. ▪ The report analyzes consumption trends and potential factors that may affect their supply and demand in the next two decades. The report also analyzes supply market, indicating potential competitors appear to mainly be from China and South Africa. The main demand will be rapidly growing battery industry for electric vehicles and electric storage systems. ▪ The study shows that the prices of the HPMSM are likely to rise more steeply initially due to massive increase in demand from the battery industry. The price of conventional EMM will continue to be driven by the aluminum and steel alloy industry and the level of economic activity in these sectors, but the battery industry will have growing influence on the general price levels of electrolytic manganese metal and the high-purity premiums are likely to raise in the next decade. ▪ The preliminary test results show that the products produced from the semi-continuous pilot plant and large-scale batch testing would meet the specifications required by potential customers.

SECTION 4 Estimation and Reporting of Mineral Reserves

Criteria	Explanation
Economic	▪ All the capital costs, operating costs, product packing, shipping, sales as well as revenue streams were included in the financial model. ▪ The base NPV calculations were based on a discount rate of 10%. The post-tax NPV at a discount rate of 10% was US$593 M with a 22.6% IRR and 4.9 years payback. ▪ Project sensitivity was analyzed to compare the key variables of discount rate, product price, capital cost, operating cost and metal recovery on pre-tax and post-tax NPV. The project is relatively less sensitive to capital costs compared to operating cost and product price.
Social	▪ EMN has initiated the social impact studies, including collection of land-use and socio-economic data, ▪ EMN has initiated pro-active and regular consultation with community stakeholders, which are expected to intensify as the Chvaletice Manganese Project evaluation and planning advances. In November 2017, The Company's subsidiary, Mangan Chvaletice s.r.o. ("Mangan"), inaugurated a Project Information Center in the Town of Chvaletice's Municipal Culture House, to provide residents with opportunities to learn about the Project, help them to develop relationships with the Company and its team, and to provide feedback and suggestions during the Project evaluation and planning stage. In November of 2018, Mangan relocated its registered office to Chvaletice. This move is intended as a first step towards ultimately basing its head office in this municipality, in close proximity to its operations.
Other	▪ A number of value-enhancing opportunities are planned for the Project have been identified that will be evaluated further. ▪ Planning is underway to design, build and commission a demonstration plant in the Czech Republic that will provide bulk, multi-tonne finished product samples for customer evaluation. The demonstration plant will also provide process optimization and testing for the project development. In addition, it is also expected to serve as a testing and training facility for future operations.
Classification	▪ This is a preliminary economical assessment; no ore reserves have been defined and reported in the Report.
Audits or reviews	▪ No ore reserves have been defined and reported in the Report. ▪ The process engineering design and cost estimates by CINF were overseen and reviewed by Tetra Tech, EMN's technical team and Tebodin. ▪ The comprehensive metallurgical test work conducted by CRIMM in 2017 and 2018 was overseen and reviewed by EMN's technical team and Tetra Tech. Randomly selected samples were assayed by independent assay laboratories. Some of the verification tests are on going.
Discussion of relative accuracy/confidence	▪ No ore reserves have been defined and reported in the Preliminary Economical Assessment Report. ▪ The 2017-2018 metallurgical test program by CRIMM has widely assessed the effect of the various plant mill feed samples, including a total of 25 composite samples representing different variation characters, covering spatial location, grade variation and particle size variations. Further tests to optimize equipment sizing and type, operating conditions and impurity removal and control are recommended. ▪ The capital cost estimates were estimated according to circuit design and preliminary layout. The main equipment costs are from quotations from potential suppliers. ▪ Operating costs were estimated by various categories and on circuit and area basis. Most of consumable prices were based on a supply marketing study conducted by Tebodin Czech Republic, s.r.o. ▪ Both operating cost and capital costs are expected in line with Class 5 or better, compared to PEA level cost estimates. ▪ Some of the potential product and process technology risks are associated with the Project are: - Market changes in high-purity manganese products and their acceptance by customers - Some metallurgical responses and product assays should be confirmed. More metallurgical test work is required to verify key operating conditions, especially impurity controls. - Scale up and control of crystallization and purification processes. - Rheology of mined and processed materials - Changes in supply costs.