DEPARTMENT OF NATURAL RESOURCES

Minerals Coordinating Committee

February 3, 2021

Mineland Vision Project

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MN DNR - Division of Lands and Minerals

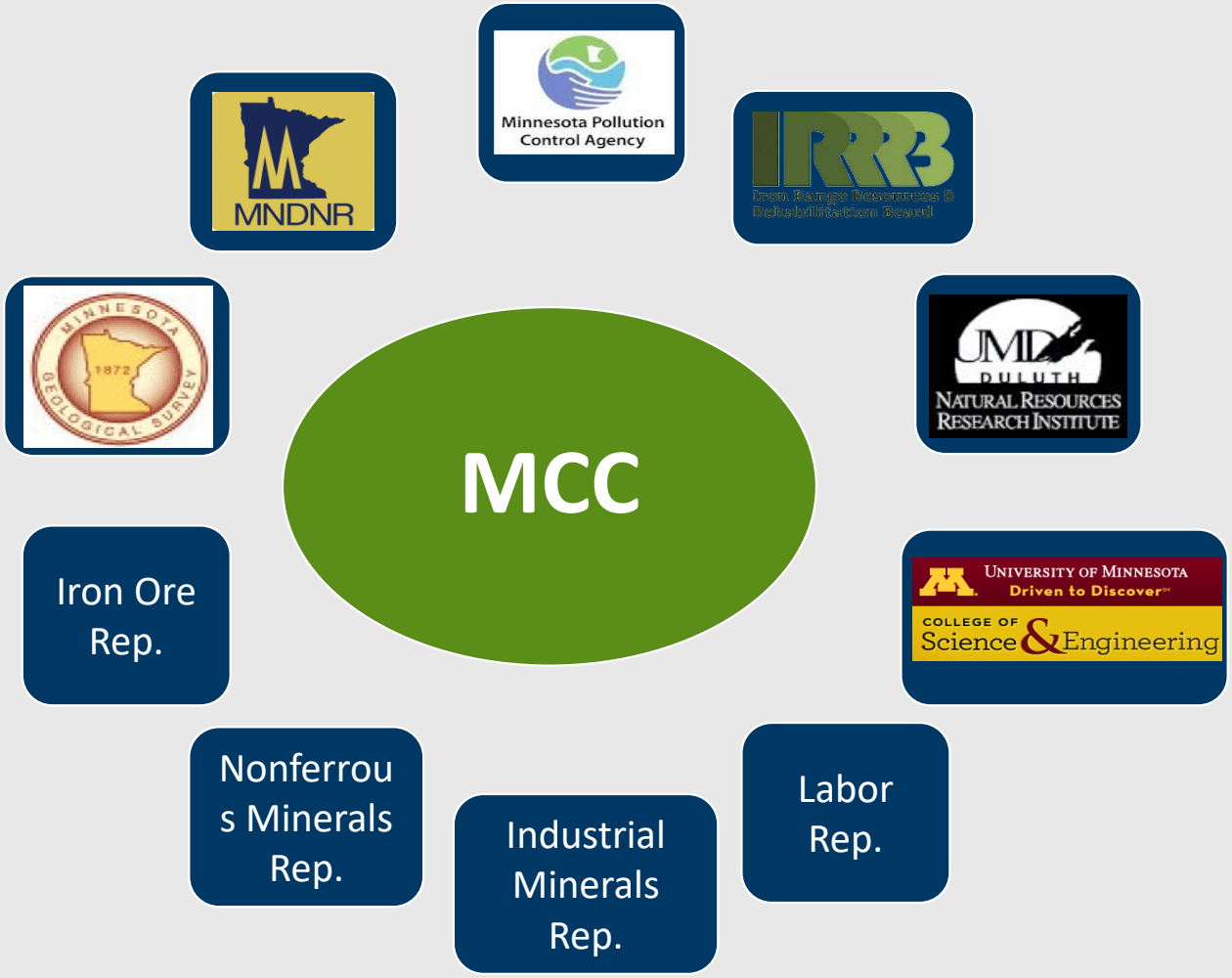
Minerals Coordinating Committee

MN Statutes 93.001:

The Policy for Mineral Development states that it is the policy of the state to provide for the diversification of the state's mineral economy through long-term support of mineral exploration, evaluation, environmental research, development, production, and commercialization

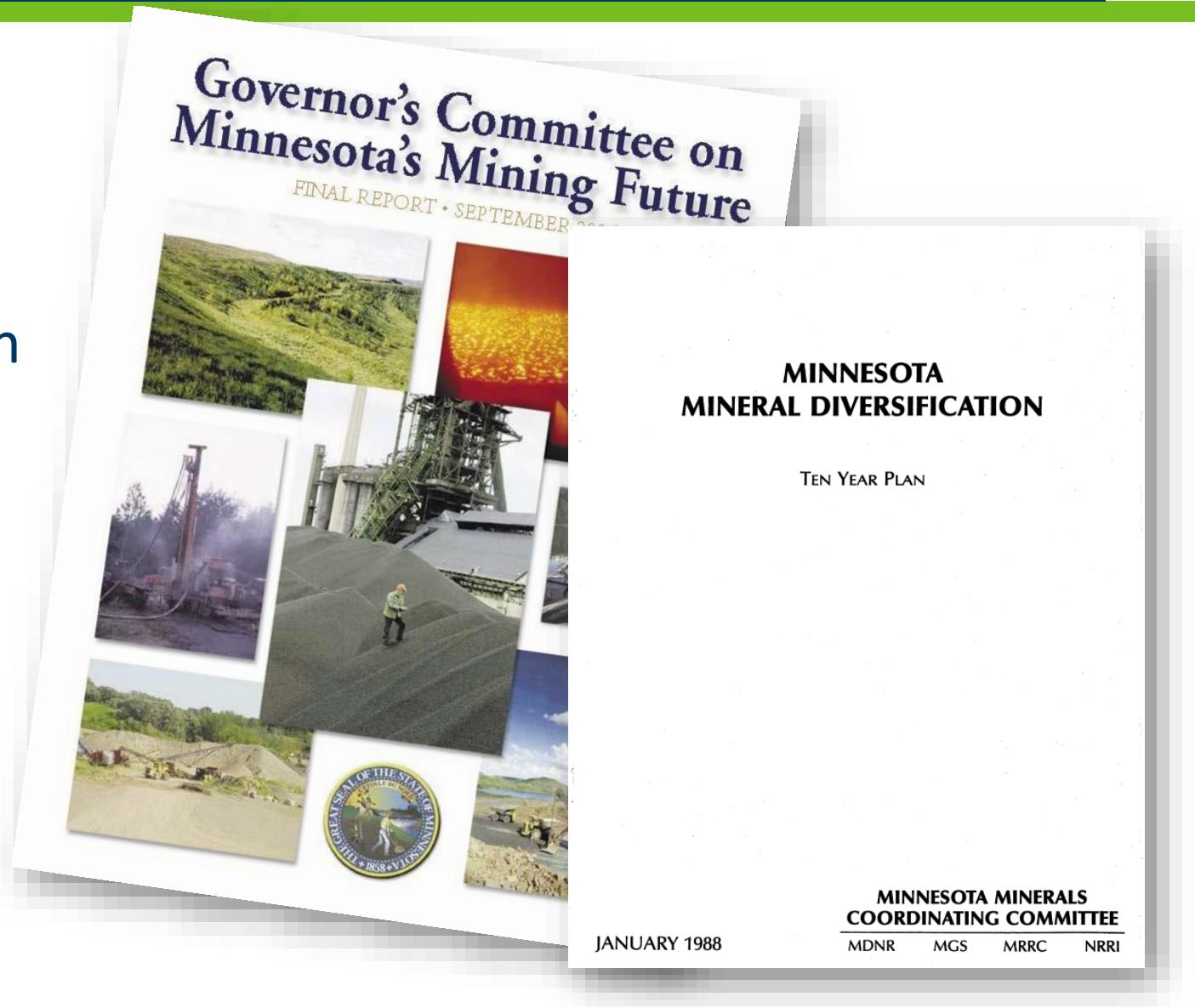
MN Statutes 93.0015:

The Mineral Coordinating Committee is established to plan for diversified mineral development



Examples of Past MCC and Governor's Planning

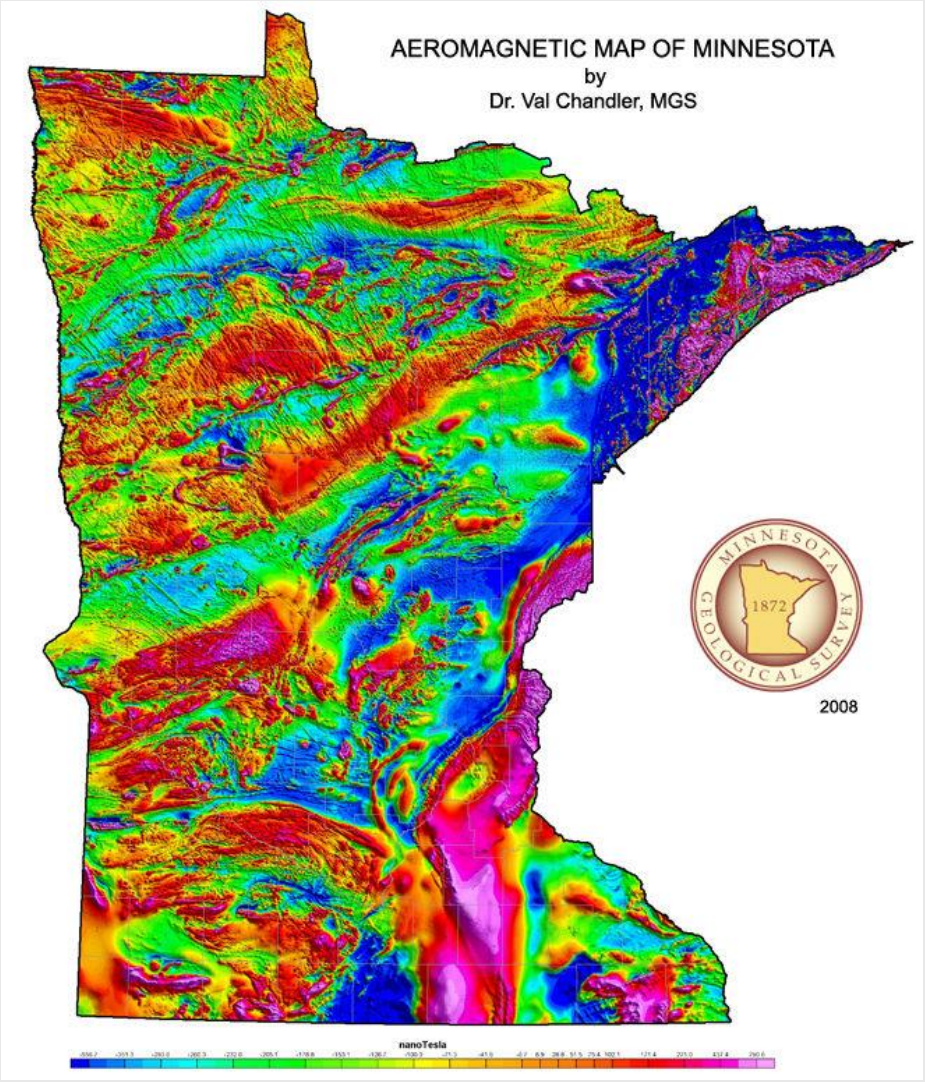
- 1988: Minnesota Mineral Diversification Ten-Year Plan
- 2004: Governor's Committee on Minnesota's Mining Future

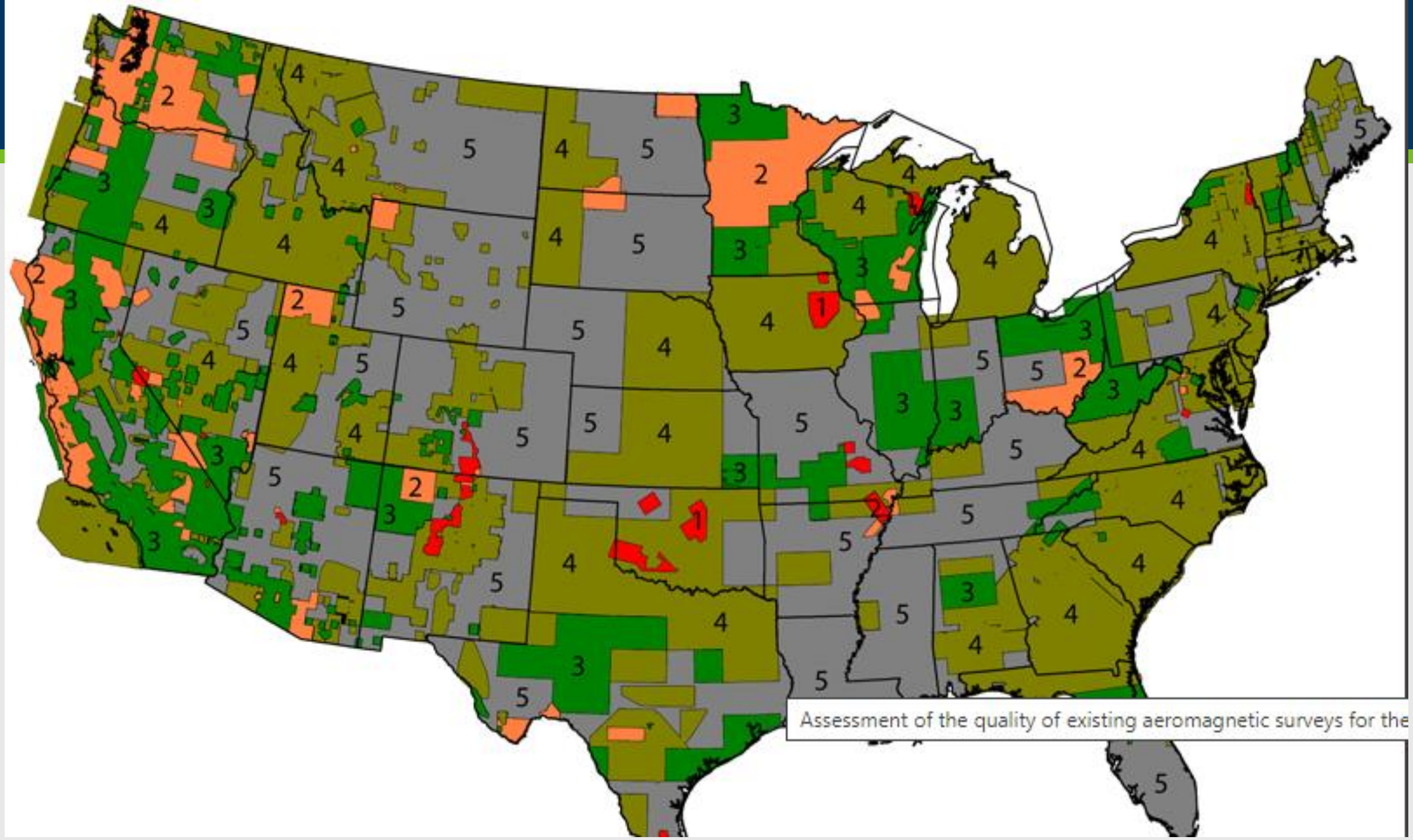


Minerals Coordinating Committee - Accomplishments

Approximately 100 projects dating back to 1989!

- Geology, geochemistry, and mineral potential
- Environmental protection and reclamation
- Economic analysis
- Strategic planning
- Coordinated legislative activity
- Annual marketing of Minnesota's opportunities!




Assessment of the quality of existing aeromagnetic surveys for the

Recent MCC Coordination Activities

- 2019-2020 – Multiagency coordination for Earth MRI
- Aug 2019 – Cloquet Workshop on Environmental Research and Monitoring
- July 2019 – 2019 Mining Tour
- Oct 2018 – SME Twin Cities Conference; Mineral Potential Workshop at USGS
- Jul 2018 – Field Tour to northern MN and New Gold Mine in Canada
- Apr 2018 – Cloquet Workshop on multi-agency coordination
- Jan 2018 – Multi-agency workgroups and extended abstracts
- Nov 2016 – Cloquet Workshop on agency activities

Three MCC Goals

Each with two strategies

Information - To ensure that sound land stewardship is informed by the best readily available information on industrial and metallic mineral potential

Mining - To facilitate life-of-mine planning that utilizes the most advantageous processing technology and that is guided by prevailing and emerging environmental standards and research

Communications - To build inclusive communications, so society will be willing to grant social license to the industry, and well-informed perceptions are held by the global industry

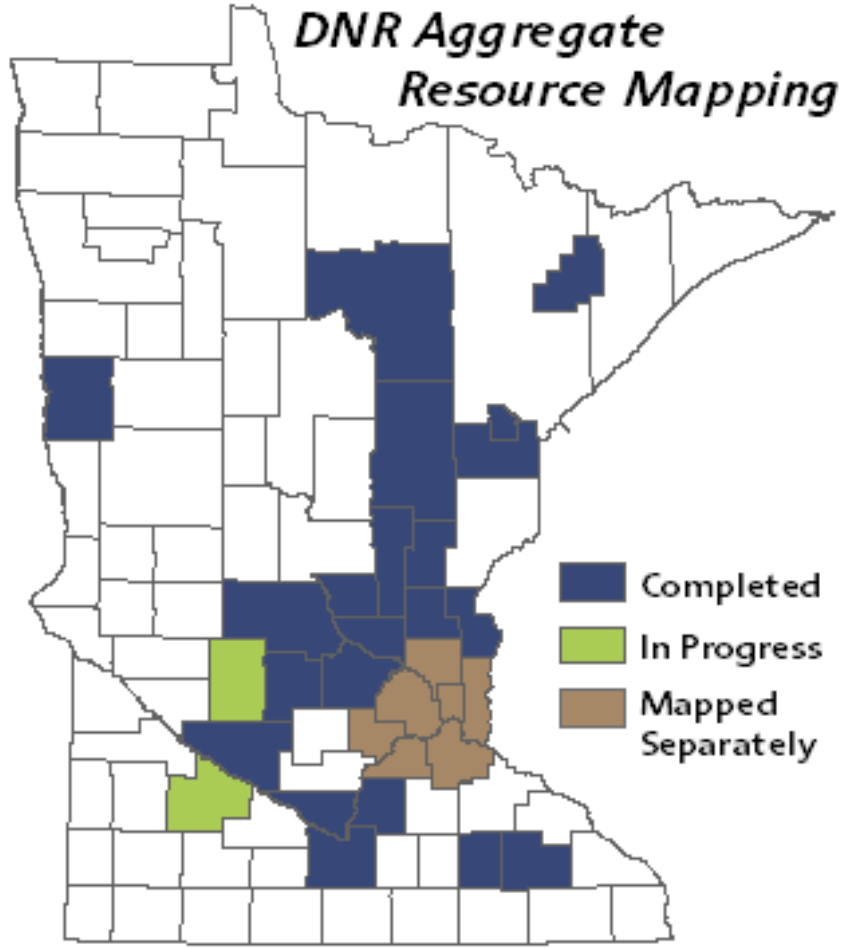
Information
Industrial Mineral Potential

STRATEGY 1: Clarify industrial mineral potential statewide, focusing on aggregate, to support land stewardship, and to ensure competitive construction costs

- Aggregates are needed for concrete and asphalt used for buildings and roads
- Sand and gravel or crushed stone are mined in almost every county
- Sources are being depleted, resulting in an ongoing need for new permits
- Local decisions makers need information to permit and protect future supplies

Information
Industrial Mineral Potential

- Statutes direct DNR to map the location and quality of aggregate sources
- The pace of the mapping has fallen short of needs
- Statewide mapping within 10 years requires $10M, and completion of 6 counties/year



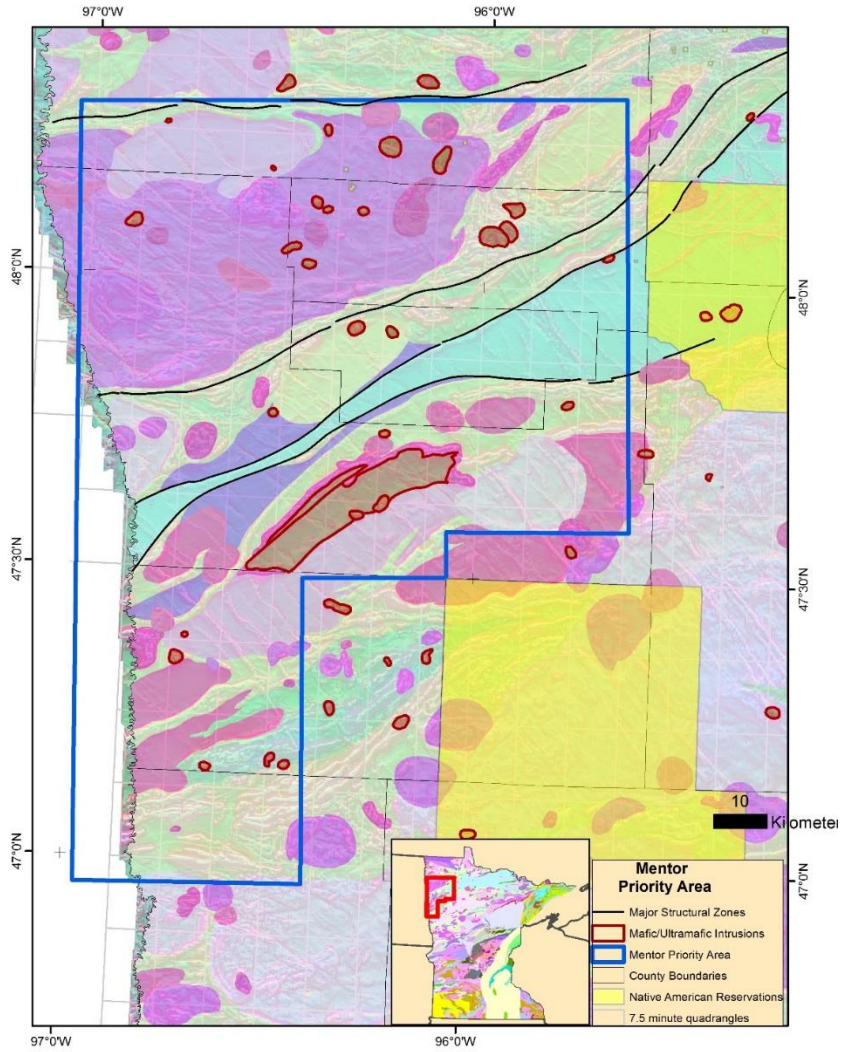
Information
Metallic Mineral Potential

STRATEGY 2: Clarify metallic mineral potential statewide, to support land stewardship, and to facilitate economic development

- DNR is the steward for Minnesota's 12 million acre mineral estate and is responsible for generating revenue for the state and local units of government
- Wise land use decisions are informed by exploration data, the drill core library, geophysical and geological mapping, and mineral deposit modeling
- Our geophysical surveys are based on 40-year-old technology, and large databases remain in filing cabinets, awaiting digitizing

Information
Metallic Mineral Potential

- A coordinated state-federal decadal plan is needed to bring mineral potential mapping up to current standards
- Renewed funding is needed to enhance DNR, MGS, and NRRI databases
- The federal Earth MRI initiative presents leveraging opportunities



STRATEGY 3: Ensure that mineral diversification in the state is supported by the best possible knowledge on mineral processing technology

- Industry can be more competitive, and impacts reduced, through development of mineral processing methods specific to our geology
- Mineral processing separates minerals from their ores, utilizing comminution, beneficiation, concentration, dewatering, and tailings management
- UMN has a well-known legacy in this field, initially in the Twin Cities, and since 1985, the NRRI Coleraine lab has worked with existing and potential mining operations

Mining
Mineral Processing

- The work builds on NRRI, MGS, and DNR knowledge of rock characteristics
- Research includes higher value iron production, more efficient iron extraction, and processes to produce titanium
- NRRI mineral processing work is being supported through multiple avenues

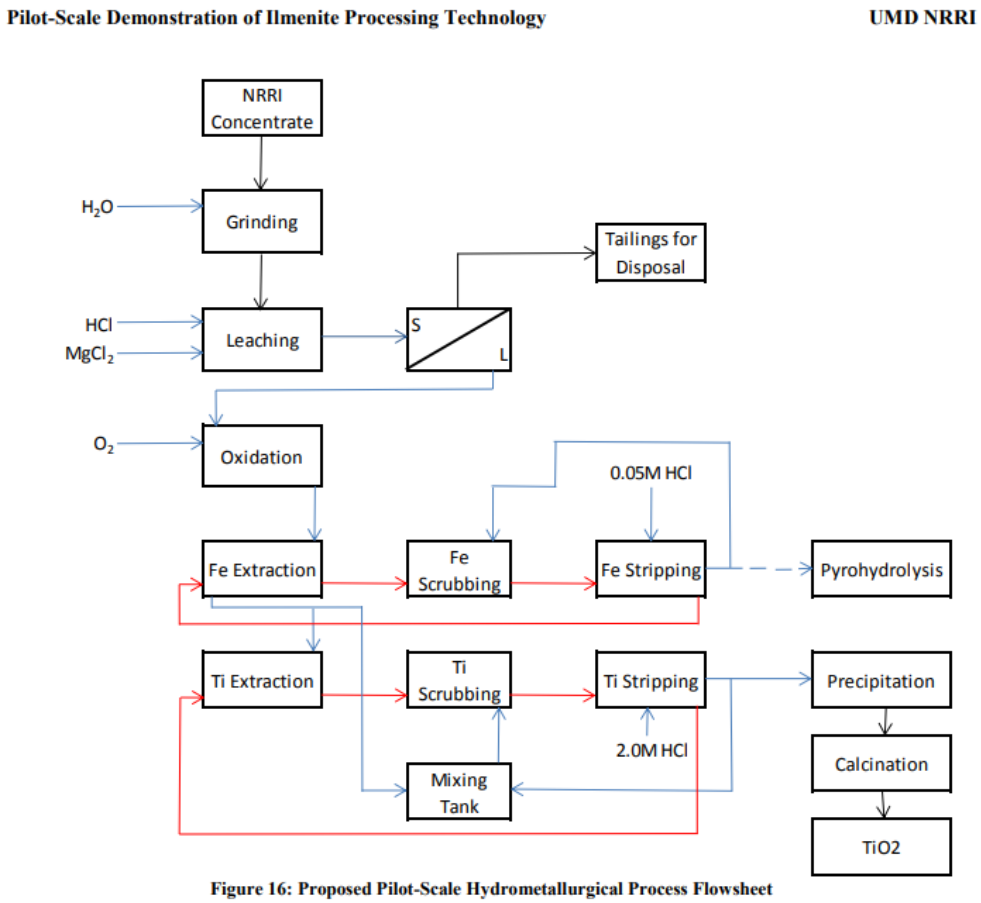


Figure 16: Proposed Pilot-Scale Hydrometallurgical Process Flowsheet

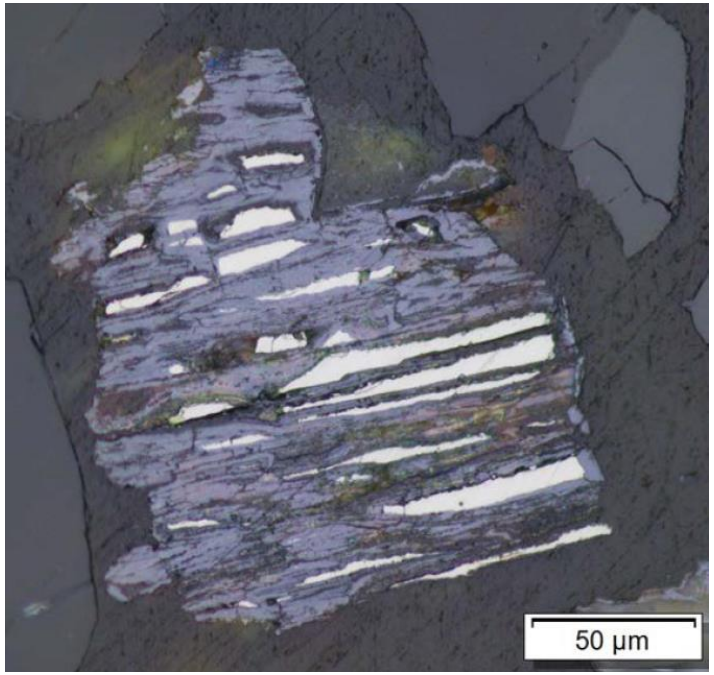
Environmental monitoring and research

STRAGEGY 4: More fully implement life-of-mine planning, and support needed environmental monitoring and research

- In MN, we are strongly committed to environmental, social, and economic goals
- Concurrently, industry is seeking to manage risk, increase certainty in permitting and costs, and to reduce waste, through coordinated public/private life-of-mine planning
- Today's intricate environmental and social issues are of interest to an increasingly knowledgeable public, and can have significant impacts on project proponents
- Regulation of the mining industry therefore has to be based on adequate technical information

Mining
Environmental monitoring and research

- To develop defensible permits, agencies must be data-driven, and permitting decisions must have a sound technical basis
- Active topics include regional contaminant background, material characterization, water treatment, natural and engineered containment, contaminant fate, and reclamation
- Needed work includes further DNR effort on waste-rock characterization and reclamation, NRRI research on mineral processing and water treatment, PCA monitoring, and UMN wastewater remediation research



Communications
Outreach to the public

STRATEGY 5: Ensure that people have the knowledge needed to grant the minerals industry social license, and to fulfil goals regarding environment, health, and heritage

- MCC agencies help ensure that people of the state have the knowledge they need to grant social license to the mineral industry
- Social license to operate consists of support among communities and stakeholders affected by existing and potential operations, obtained by responding to concerns, and by establishment of a shared understanding
- For example, MCC has helped to facilitate fieldtrips with broad participation to encourage shared awareness

Communications
Outreach to the public

- Also, agencies partner to host the Minnesota Minerals Education Workshop (MMEW), a professional development workshop for K-12 teachers that provides hands-on experiences on MN mining and geology
- Success will require effort to update communication materials, to clarify communities we need to engage with, and to enhance effectiveness

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Communications
Outreach to the industry

STRATEGY 6: Ensure that a positive impression and high level of awareness of opportunities are maintained among international mining industry leadership

- MCC agencies help to ensure that communication is maintained with industry leadership at conferences and trade shows
- Included are Society for Mining, Metallurgy & Exploration (SME) conferences, and the Prospectors and Developers Association of Canada (PDAC) convention
- The annual PDAC booth and reception, coordinated by IRRR and DNR, allow us to meet with over 25,000 mining industry professionals from over 100 countries

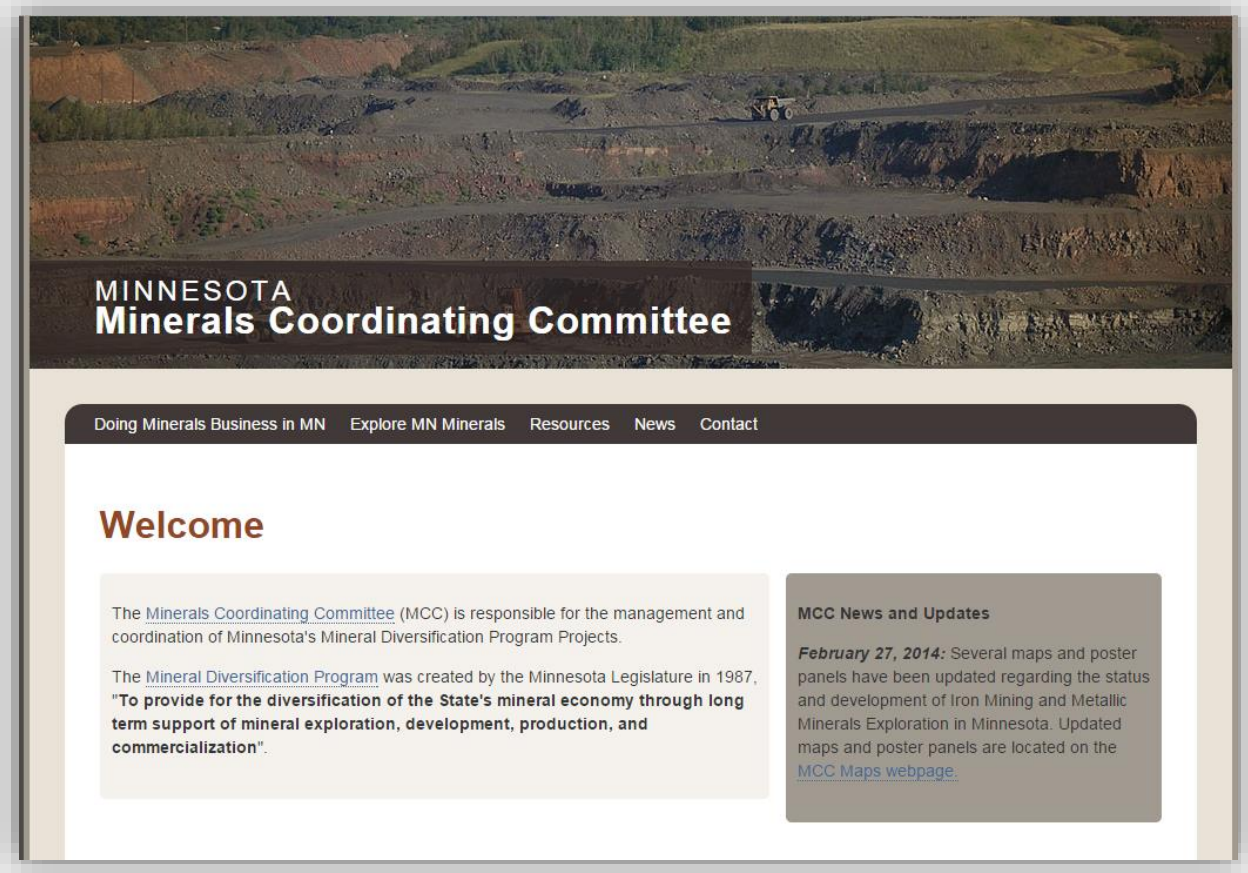
Communications
Outreach to the industry

- An MCC online presence is maintained, to support exploration-community professionals
- Success is gauged through DNR non-ferrous leasing activity and Fraser report rankings
- MCC has sustained consistent communications over two decades

PDAC – Competing on the World Stage!

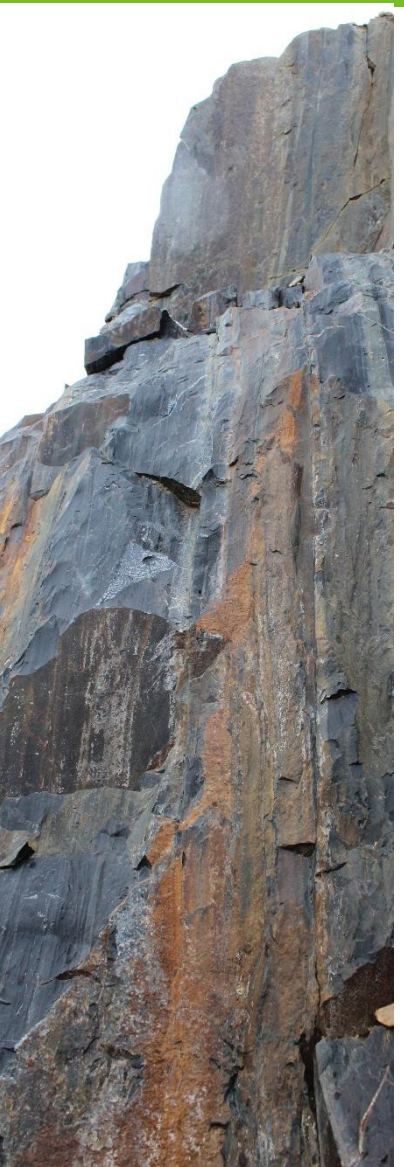
Minnesota Minerals Coordinating Committee Website

- Information clearinghouse for Minnesota's mining and mineral resources
- Mineral fact sheets
- Catalog of GIS data & maps
- Information on doing business in Minnesota



HTTP://MCC.MN.GOV

Summary of Six Strategies



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- Clarify metallic mineral potential statewide, to support land stewardship, and to facilitate economic development
- Ensure that mineral diversification in the state is supported by the best possible knowledge on mineral processing technology
- More fully implement life-of-mine planning, and support needed environmental monitoring and research
- Ensure that people have the knowledge needed to grant the minerals industry social license, and to fulfill goals regarding environment, health, and heritage
- Ensure that a positive impression and high level of awareness of opportunities are maintained among international mining industry leadership

Thank You

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3 February 2020