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## LIST OF ACRONYMS/ABBREVIATIONS

(%EPT) Percent ephemeroptera, plecoptera, or tricoptera	(CFR) Code of Federal Regulations
(°F) degrees Fahrenheit	(cfs) cubic feet per second
(µg/L) microgram(s) per liter	(CH <sub>4</sub> ) methane
(µg/m <sup>3</sup> ) microgram(s) per cubic meter	(cm/sec) centimeter(s) per second
(µm) micrometer(s)	(CO) carbon monoxide
(ACHP) Advisory Council on Historic Preservation	(CO <sub>2</sub> ) carbon dioxide
(ACI) Aquatic Connectivity Index	(CO <sub>2e</sub> ) carbon dioxide equivalents
(ACM) Asbestos-Containing Material	(CPS) Central Pumping Station
(AERA) Air Emissions Risk Analysis	(CPT) Cone Penetrometer Testing
(AERMOD) American Meteorological Society/USEPA Regulatory Model	(CR) County Road
(amsl) above mean sea level	(cRNA) candidate Research Natural Area
(ANFO) Ammonium Nitrate Fuel Oil Mixture	(CSAPR) Cross State Air Pollution Rule
(AOC) Area of Concern	(CWA) Clean Water Act
(APE) Area of Potential Effect	(DA) Department of the Army
(AQRV) Air Quality Related Value	(DAT) Deposition Analysis Threshold
(AST) Aboveground Storage Tank	(dB) decibel(s)
(ASTM) American Society for Testing and Materials	(dBA) A-weighted decibel(s)
(Au/PGE) gold and platinum group elements	(dbh) diameter at breast height
(AWMP) Adaptive Water Management Plan	(dBL) linear-weighted decibel(s)
(BACT) Best Available Control Technology	(DDT) dichlorodiphenyltrichloroethane
(BART) Best Available Retrofit Technology	(DEIS) Draft Environmental Impact Statement - October 2009
(Barr) Barr Engineering	(DOT) Department of Transportation
(BBER) Bureau of Business and Economic Research	(DRI) direct reduced iron
(BBLV) Beaver Bay to Lake Vermilion	(dv) deciview
(bgs) below ground surface	(e.g.) for example
(Bois Forte) Bois Forte Band of Chippewa	(EAW) Environmental Assessment Worksheet
(BP) before present	(ECS) Ecological Classification System
(BWCAW) Boundary Waters Canoe Area Wilderness	(EDR) Environmental Data Resources, Inc.
(CAA) Clean Air Act	(EIS) Environmental Impact Statement
(CAIR) Clean Air Interstate Rule	(EJ) Environmental Justice
(CALPUFF) California Puff Model	(ELT) Ecological Land Type
(CCP) Coordination and Communication Plan	(EO) Executive Order
(CEAA) Cumulative Effects Assessment Area	(EPCRA) Emergency Planning and Community Right-to-Know Act
(CEQ) United States Council on Environmental Quality	(EQB) Environmental Quality Board
(CERCLA) Comprehensive Environmental Response, Compensation, and Liability Act	(ERC) Emergency Response Commission
(CFE) chemical for evaluation	(ERM) Environmental Resources Management

(ESA) Endangered Species Act	(Hz) Hertz
(ESSA) Effective Stress Stability Analysis	(i.e.) that is
(ETSC) Endangered, Threatened, and Special Concern	(IBI) Index of Biological Integrity
(FEIS) Final Environmental Impact Statement	(IMPROVE) Interagency Monitoring of Protected Visual Environments
(FEMA) Federal Emergency Management Agency	(in/s) inch(es) per second
(FLAG) Federal Land Managers' Air Quality Related Values Work Group	(IPCC) Intergovernmental Panel on Climate Change
(FLM) Federal Land Manager	(ISO) International Standards Organization
(FLPMA) Federal Land Policy and Management Act	(kg) kilogram(s)
(Fond du Lac) Fond du Lac Band of Lake Superior Chippewa	(kg/ha/yr) kilogram(s) per hectare per year
(Forest Plan) 2004 Superior National Forest Land and Resource Management Plan	(kg/m <sup>2</sup> ) kilogram(s) per square meter
(FR) Federal Register	(km) kilometer
(FSH) Forest Service Handbook	(ksf) kip(s) per square foot
(ft) foot or feet	(L10) noise level exceeding standard for 10% of the monitored time
(ft/day) feet per day	(L50) noise level exceeding standard for 50% of the monitored time
(ft/ft) feet per foot	(LAU) Lynx Analysis Unit
(ft/sec) feet per second	(lb/MMBTU) pound(s) per million British thermal units
(ft <sup>2</sup> ) square feet	(lbs/yr) pounds per year
(FTE) Full-time Equivalent	(LDPE) low-density polyethylene
(GAP) Gap Analysis Program	(Leq) equivalent noise levels
(GHG) greenhouse gas	(LLDPE) linear low-density polyethylene
(GIS) Geographic Information System	(LQ) location quotient
(GLIFWC) Great Lakes Indian Fish & Wildlife Commission	(LTA) Land Type Association
(GLO) General Land Office	(LTVSMC) LTV Steel Mining Company
(g/m <sup>2</sup> /yr) grams per square meter per year	(MAAQS) Minnesota Ambient Air Quality Standards
(gpm) gallon(s) per minute	(MACT) Maximum Achievable Control Technology
(GPS) Global Positioning System	(MBS) Minnesota Biological Survey
(gpy) gallon(s) per year	(MCL) Maximum Contaminant Level
(gr/dscf) grains per dry standard cubic foot	(MCWCS) Minnesota Comprehensive Wildlife Conservation Strategy
(Grand Portage) Grand Portage Band of Lake Superior Chippewa	(MDH) Minnesota Department of Health
(H <sub>2</sub> S) hydrogen sulfide	(MDNR) Minnesota Department of Natural Resources
(HAP) Hazardous Air Pollutant	(MDO) major difference of opinion
(HBI) Hilsenhoff Biotic Index	(MeHg) methylmercury
(HEPA) High-efficiency Particulate Air	(MEPA) Minnesota Environmental Policy Act
(Hg(p)) particle-bound mercury	(MEQB) Minnesota Environmental Quality Board
(Hg) mercury	(mg/kg) milligram(s) per kilogram
(Hg <sup>+2</sup> ) oxidized mercury	
(HI) Hazard Index	
(hp) horsepower	
(HRL) Health Risk Limit	
(HUC) Hydrologic Unit Code	

(mg/L) milligram(s) per liter	(PAX) potassium amyl xanthate
(MGD) million gallons per day	(Pb) lead
(MIBC/DF250) methyl isobutyl carbinol and polyglycol ether	(PCB) polychlorinated biphenyl
(MIH) Management Indicator Habitat	(PGE) platinum group element
(mm) millimeter(s)	(Phase I ESA) Phase I Environmental Site Assessment
(mm/s) millimeter(s) per second	(PM) particulate matter
(MMBTU) 1 million British thermal units	(PM <sub>10</sub> ) particulate matter up to 10 micrometers in diameter
(MN-fiber) Minnesota regulated fiber	(PM <sub>2.5</sub> ) particulate matter up to 2.5 micrometers in diameter
(MnRAM) Minnesota Routine Assessment Method	(PMC) coarse particulate matter
(MOA) Memorandum of Agreement	(pMCL) Primary Maximum Contaminant Level
(MODFLOW) groundwater model	(PMF) fine particulate matter
(MOU) Memorandum of Understanding	(PMP) probable maximum precipitation
(MPCA) Minnesota Pollution Control Agency	(PolyMet) PolyMet Mining Corporation
(m/s) meter(s) per second	(POTW) Publically Owned Treatment Works
(MSDS) Material Safety Data Sheet	(ppm) part(s) per million
(MSHA) Mine Safety and Health Act	(PPV) peak particle velocity
(mtpy) metric ton(s) per year	(PRB) permeable reactive barrier
(NA) not applicable	(PSB) permeable sorptive barrier
(NAAQS) National Ambient Air Quality Standards	(PSD) Prevention of Significant Deterioration
(NAC) Noise Area Classification	(psig) pounds per square inch gauge
(NAICS) North American Industrial Classification System	(QHEI) Qualitative Habitat Evaluation Index
(NEPA) National Environmental Policy Act	(RCI) Riparian Connectivity Index
(NESHAP) National Emission Standards for Hazardous Air Pollutants	(REL) reference exposure level
(NFS) National Forest System	(RFSS) Regional Forester Sensitive Species
(ng/L) nanogram(s) per liter	(RGU) Responsible Governmental Unit
(NHFEU) National Hierarchy Framework of Ecological Units	(RME-OSW) reasonable maximum exposed off-site worker
(NHIS) Natural Heritage Information System	(RNA) Research Natural Area
(NHPA) National Historic Preservation Act	(RO) reverse osmosis
(NIOSH) National Institute for Occupational Safety and Health	(ROD) Record of Decision
(NO <sub>2</sub> ) nitrogen dioxide	(ROS) Recreation Opportunity Spectrum
(NOI) Notice of Intent	(ROW) right-of-way
(NO <sub>x</sub> ) nitrogen oxides	(SAP) Sampling and Analysis Plan
(NPDES) National Pollutant Discharge Elimination System	(SDD) Scoping Decision Document
(NRCS) Natural Resources Conservation Service	(SDEIS) Supplemental Draft Environmental Impact Statement
(NRHP) National Register of Historic Places	(SDS) State Disposal System
(NSPS) New Source Performance Standards	(SGCN) Species of Greatest Conservation Need
(NWI) National Wetlands Inventory	(SHPO) State Historic Preservation Office
(O <sub>3</sub> ) ozone	(SIC) Standard Industrial Classification
(OSHA) Occupational Safety and Health Administration	

(SIL) Significant Impact Limit	(USGS) United States Geological Survey
(SIO) Scenic Integrity Objective	(USSA) Undrained Strength Stability Analysis
(SIP) State Implementation Plan	(USSR) Undrained Shear Strength Ratio
(sMCL) Secondary Maximum Contaminant Level	(UST) Underground Storage Tank
(SNA) Scientific and Natural Area	(VIC) Voluntary Investigation and Cleanup
(SO <sub>2</sub> ) sulfur dioxide	(VOC) Volatile Organic Compound
(SO <sub>4</sub> ) sulfate	(WCA) Wetland Conservation Act
(SPCC) Spill Prevention, Control, and Countermeasure	(WWTF) Wastewater Treatment Facility
(stpd) standard ton(s) per day	(WWTP) Wastewater Treatment Plant
(stpy) standard ton(s) per year	(WQBEL) water quality based effluent limit
(S) sulfur	(XP-SWMM) surface water model
(SVOC) Semi-volatile Organic Compound	
(SWPPP) Storm Water Pollution Prevention Plan	
(TBD) to be determined	
(TCP) Traditional Cultural Property	
(TDS) Total Dissolved Solids	
(106 Group) The 106 Group Ltd.	
(the Bands) Bois Forte Band of Chippewa, Grand Portage Band of Lake Superior Chippewa, and the Fond du Lac Band of Lake Superior Chippewa	
(THPO) Tribal Historic Preservation Office	
(TMDL) Total Maximum Daily Load	
(tpd) ton(s) per day	
(TPPP) Toxic Pollution Prevention Plan	
(tpy) ton(s) per year	
(Tract 1) Hay Lake Lands	
(Tract 2) Lake County Lands	
(Tract 3) Wolf Lands	
(Tract 4) Hunting Club Lands	
(Tract 5) McFarland Lake Lands	
(TRI) Toxics Release Inventory	
(TSI) Trophic Status Index	
(TSP) total suspended particulates	
(TWP) Treated Water Pipeline	
(U.S. Steel) United States Steel Corporation	
(UBA) Unique Biological Area	
(UMD) University of Minnesota Duluth	
(USACE) United States Army Corps of Engineers	
(USC) United States Code	
(USDA) United States Department of Agriculture	
(USEPA) United States Environmental Protection Agency	
(USFS) United States Forest Service	
(USFWS) United States Fish and Wildlife Service	

## GLOSSARY

**1854 Treaty Authority:** An inter-tribal natural resource management agency that manages the off-reservation hunting, fishing, and gathering rights of the Grand Portage and Bois Forte Bands of the Lake Superior Chippewa in the territory ceded under the Treaty of 1854.

**1854 Treaty of La Pointe:** In 1854, the Chippewa of Lake Superior entered into a treaty with the United States whereby the Chippewa ceded to the United States ownership of their lands in northeastern Minnesota. These lands are generally known as the "1854 ceded territory." Article 11 of the 1854 Treaty provides, "*...And such of them as reside in the territory hereby ceded, shall have the right to hunt and fish therein, until otherwise ordered by the President.*" The Chippewa of Lake Superior who reside in the ceded territory are the Fond du Lac, Grand Portage, and Bois Forte Bands.

**Acid rock drainage:** Produced by the oxidation of sulfide minerals, chiefly iron pyrite disulfide (FeS<sub>2</sub>). This is a natural chemical reaction which can proceed when minerals are exposed to air and water. Acidic drainage is found around the world, as a result of both naturally occurring processes and activities associated with land disturbances, such as highway construction and mining where acid-forming minerals are exposed to air. These acidic conditions can cause metals in geologic materials to dissolve, which can lead to impairment of water quality when acidic and metal-laden discharges enter waters used by terrestrial and aquatic organisms.

**Ad valorem tax:** A tax based on the value to real estate or personal property. Municipal ad valorem taxes are also known as "property taxes."

**Adverse effect (for cultural resources):** A significant alteration to the qualifying characteristics of a historic property included in or eligible for inclusion in the National Register.

**Adverse effect:** A harmful or undesired effect from the proposed project on the environment.

**AERMOD air dispersion model:** The United States Environmental Protection Agency (USEPA)-approved model designed to predict short-range (up to 50 kilometers) dispersion of air pollutant emissions from stationary industrial sources.

**Air dispersion model:** A computer program that incorporates a series of mathematical equations used to predict downwind concentrations in the ambient air resulting from emissions of a pollutant. Inputs to a dispersion model include the emission rate; characteristics of the emission release such as stack height, exhaust temperature, and flow rate; and atmospheric dispersion parameters such as wind speed and direction, air temperature, atmospheric stability, and height of the mixed layer.

**Airblast overpressure:** A transient air pressure, such as the shock wave from an explosion, that is greater than the surrounding atmospheric pressure.

**Ambient air quality:** The quality of the portion of the atmosphere, external to buildings, to which the public has general access.

**Ammonium nitrate fuel oil (ANFO):** Primary blasting agent used in open-pit mining; a mixture of solid ammonium nitrate and liquid fuel oil.

**Amphibole:** A class of silicate minerals containing iron and magnesium.

**Anthropogenic:** Relating to or resulting from the influence of human beings on nature.

**Aquatic biota:** Collective term describing the organisms living in or depending on the aquatic environment.

**Aquifer:** A subsurface saturated rock unit or formation of sufficient permeability to transmit groundwater and yield usable quantities of water to wells and springs.

**Archaeological site:** The physical remains of any area of human activity, generally greater than 50 years of age, for which a boundary can be established. Examples of such resources could include domestic/habitation sites, industrial sites, earthworks, mounds, quarries, canals, roads, etc. Under the general definition, a broad range of site types would qualify as archaeological sites without the identification of any artifacts.

**Archaic period:** A cultural period circa 9,000 to 3,000 years ago, or 7,000 to 1,000 B.C.; its characteristic features included semi-permanent seasonal camps, atlatls and bannerstones, deer hunting, some copper tools, and the first long-distance trade.

**Area of Potential Effect (APE):** The geographic region in which a historic or cultural property may be impacted as a result of the construction and operation of the NorthMet Project Proposed Action or alternatives.

**Attainment:** Air quality in the locality that meets the established standards.

**Autoclave:** A mineral processing pressure vessel for conducting chemical reactions such as sulfide mineral oxidation and leaching of metals.

**Batholith:** A large emplacement of igneous intrusive rock that forms from cooled magma deep in the earth's crust.

**Bedrock isopach map:** A map of the bedrock thickness within a tabular unit or stratum, usually illustrated with contour lines.

**Bedrock outcrop:** A visible exposure of bedrock on the surface of the earth.

**Beneficiation:** Crushing and separating ore into valuable substances or waste.

**Bentonite:** An absorptive and colloidal clay used especially as a sealing agent or suspending agent.

**Best Available Control Technology (BACT):** An emission limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Clean Air Act that would be emitted from any proposed major stationary source or major modification, taking into account energy, environmental, and economic impacts and other costs.

**Best Management Practice (BMP):** The schedule of activities, prohibition of practices, maintenance procedures, and other management practices to avoid or minimize pollution or habitat destruction to the environment. BMPs can also include treatment requirements, operating procedures and practices to control runoff, spillage, or leaks; sludge or waste disposal; or drainage from raw material storage.

**Bioaccumulation:** The accumulations of chemicals in the tissue of organisms through any route, including respiration, ingestion, or direct contact with contaminated water or sediments.

**Bioassay:** A type of scientific experiment that is typically conducted to measure the effects of a substance on a living organism and is essential in monitoring environmental pollutants.

**Biodiversity:** The degree of variation in lifeforms within a given species, ecosystem, or biome. It is a measure of the health of ecosystems.

**Biotic community:** A group of interdependent organisms inhabiting the same region and interacting with each other.

**Biwabik Iron Formation:** An approximately 1.9-billion-year-old sequence of iron-rich sedimentary rocks that was metamorphosed at its easternmost extent by approximately 1.1-billion-year-old intrusions of the Duluth Complex.

**Brownfield site:** Abandoned or underutilized industrial or commercial property available for reuse which may be contaminated by the presence or potential presence of a hazardous substance or pollutant.

**Buffer zone:** An area or region distinguished from adjacent parts by a distinctive feature or characteristic.

**Calcareous fen:** Rare and distinctive wetlands characterized by a substrate of non-acidic peat and dependent on a constant supply of cold, oxygen-poor groundwater rich in calcium and magnesium bicarbonates.

**CALPUFF model:** The USEPA-approved non steady-state puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution long-range transport, transformation, and removal. CALPUFF can be applied in complex terrain conditions.

**Class I area:** Under the Clean Air Act, a Class I area is one in which some criteria pollutants, visibility, and other air quality related values (AQRVs) are protected more stringently than under the national ambient air quality standards. Class I areas include national parks, wilderness areas, monuments, and other areas of special national and cultural significance.

**Class II area:** Under the Clean Air Act, Class II areas are all areas that have been demonstrated to be in attainment with the federal National Ambient Air Quality Standards that are not designated as Class I areas; modest increments of new pollution would be allowed.

**Clean Air Act (CAA):** The Clean Air Act of 1970 is a United States federal law intended to control air pollution and protect air quality. The act—which underwent major revisions in 1990 and 2003—deals with ambient air pollution (that which is present in the ambient air) as well as source-specific air



pollution. The Clean Air Act sets standards for air quality that limit the amount of various pollutants to specified levels. The Clean Air Act also sets deadlines for governments and industries to meet the standards. The federal USEPA is ultimately responsible for establishing national standards and enforcing the Clean Air Act. State and local authorities that have approved plans to control air pollution are given local authority by the USEPA to administer these regulations.

**Clean Air Interstate Rule (CAIR):** The USEPA issued the CAIR in March 2005. This rule provides states with a solution to the problem of power plant pollution that drifts from one state to another. The rule uses a cap and trade system to reduce target pollutants—sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>)—by 70 percent.

**Clean Water Act (CWA):** A federal act that establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the Act was enacted in 1948 and was called the federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. “Clean Water Act” became the Act’s common name with amendments in 1972. Under the Clean Water Act, the United States has implemented pollution control programs including industrial wastewater standards and water quality standards for all contaminants in surface waters. The Act has made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit is obtained.

**CWA Section 404 Permit:** Permit that authorizes the discharge of dredged or fill material into waters of the United States, including many wetlands. Responsibility for implementing Section 404 is shared by the United States Army Corps of Engineers (USACE) and USEPA.

**Closure:** The process of terminating and completing final steps in reclaiming any specific portion of a mining operation. Closure begins when, as prescribed in the Permit to Mine, there will be no renewed use or activity by the permittee.

**Coarse tailings:** 50% or more of waste byproducts of mineral beneficiating processes other than heap and dump leaching, is retained on a No. 200 sieve and consists of rock particles, which have usually undergone crushing and grinding, from which the profitable mineralization has been separated.

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** Commonly known as Superfund, legislation enacted in 1980 which created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

**Comprehensive Land Use Plan:** A document adopted by local elected officials that establishes policies and guidance for land use, municipal growth, public services, and infrastructure. Comprehensive plans can provide the rationale and legislative basis for local zoning and subdivision ordinances.

**Coniferous bog recharge:** The amount of precipitation that maintains and refills coniferous bogs, which are perched wetlands with generally no groundwater connection.

**Connected action:** According to Council on Environmental Quality (CEQ) regulations (40 CFR Part 1508.25), actions are connected if they automatically trigger other actions which may require environmental impact statements, cannot or will not proceed unless other actions are taken previously or simultaneously, and/or are interdependent parts of a larger action and depend on the larger action for their justification.

**Consent decree:** Also referred to as a consent order, this is a final, binding judicial decree or judgment memorializing a voluntary agreement between parties to a suit or dispute in return for withdrawal of a criminal charge or an end to a civil litigation. In a typical consent decree, the defendant has already ceased or agrees to cease the conduct alleged by the plaintiff to be illegal and consents to a court injunction barring the conduct in the future.

**Consultation (for cultural resources):** The process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process. The Secretary’s “Standards and Guidelines for federal Agency Preservation Programs pursuant to the National Historic Preservation Act” provide further guidance on consultation.

**Contact period:** Relating to the period of initial interaction between an indigenous people with an outside culture. In the United States, the term refers to an era of initial interaction between Native Americans and Europeans.

**Cooperating Agency:** According to CEQ regulations (40 CFR Part 1508.5), “Cooperating Agency” means any federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment.

**Council on Environmental Quality (CEQ):** An agency within the Executive Office of the President that established the procedures to implement the National Environmental Policy Act of 1970. Regulations are found in 40 CFR 1500, et seq.

**Criteria air pollutant:** Seven common air pollutants for which the USEPA has set primary (may harm human health) or secondary (may affect the environment and/or cause property damage) national air quality standards. These pollutants are: particulate matter less than or equal to 10 microns in size, particulate matter less than or equal to 2.5 microns in size, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead.

**Cubic feet per second:** The rate of flow representing a volume of 1 cubic foot passing a given point in 1 second.

**Culpability Analysis:** The relative contribution of various contaminant sources to the overall contaminant load at a specific evaluation location.

**Cultural resources:** Archaeological, traditional, and built environment resources, including but not necessarily limited to buildings, structures, objects, districts, and sites.

**Cumulative effect:** The effects on the environment that would result from the incremental effect of the NorthMet Project Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

**Cutoff trench:** A trench which is below the foundation base line of a dam or other structure and is filled with an impervious material, such as clay or concrete.

**Cuyuna Range:** An iron range to the southwest of the Mesabi Range, largely between Brainerd and Aitkin within Crow Wing County, Minnesota.

**Density factor:** A pre-determined qualitative value which is then assigned to wild rice stands based on the density of wild rice present.

**Detection limit:** The lowest quantity of a material that can be detected from the absence of that material within a stated confidence.

**Direct effect (for cultural resources):** A physical alteration to the qualifying characteristics of a historic property included in or eligible for inclusion in the National Register.

**Disseminated sulfide:** Deposits of sulfide minerals which are distributed more or less uniformly within the surrounding waste rock.

**Dissolved oxygen:** The amount of gaseous oxygen dissolved into an aqueous solution, whether through diffusion from the air, aeration by agitation, or as a waste product of photosynthesis.

**Drawdown:** The lowering of the water level relative to a background condition.

**Drift:** Material such as sand, clay, gravel, and rocks transported and deposited by a glacier or glacial process.

**Drilling log:** A record of events or features of the formations penetrated or encountered during boring. Also known as a boring log.

**Duluth Complex:** A mafic intrusive igneous geological formation with quantities of copper, nickel, cobalt, platinum, palladium, and gold. The Duluth Complex lies at the eastern end of the Mesabi Iron Range in northeastern Minnesota.

**Ecological land type:** A hierarchical level of the National Hierarchical Framework of Ecological Units and Ecological Classification System that is determined based on differences in vegetation, soils, climate, geology, and/or hydrology.

**Effect (for cultural resources):** Alteration to the qualifying characteristics of a historic property included in or eligible for inclusion in the National Register.

**Effluent:** An outflow or discharge of a liquid.

**Eligible (for cultural resources):** Cultural properties formally determined as such in accordance with the regulations of the Secretary of the Interior and all other properties that meet the National Register criteria.

**Emergency Planning and Community Right-to-Know Act (EPCRA):** A federal act enacted in 1986 to help communities plan for emergencies involving hazardous substances. It establishes requirements for federal, state, and local governments; Indian tribes; and industry regarding emergency planning and

“Community Right-to-Know” reporting on hazardous and toxic chemicals.

**Endangered Species:** The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range as defined in the Endangered Species Act (ESA).

**Endangered Species Act:** A federal act enacted in 1973 to provide for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. The ESA authorizes the determination and listing of species as endangered and threatened, and prohibits unauthorized taking, possession, sale, and transport of endangered species. Section 7 of the ESA requires federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitats.

**Environmental Justice:** The fair treatment and meaningful involvement of all people regardless of race, color, national origin, age, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people—including racial, ethnic, age or socioeconomic groups—should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. Executive Order 12898 directs federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations.

**Ephemeral:** Lasting for a short time or a short-lived organism. An ephemeral water body is a wetland, stream, or pond that exists briefly during and following a period of rainfall or snow melt.

**Evapotranspiration:** The amount of water removed from a land area by the combination of direct evaporation from the soil and plant transpiration.

**Factor of Safety:** Used to describe the ratio of resisting forces to driving forces along a potential failure surface, whereby a Factor of Safety of 1.0 represents equilibrium between the estimated resisting shear strength to the applied shearing load. Systems are often designed to a Factor of Safety above 1.0 to allow for unexpected loads, unexpected

operating conditions, and variations in estimated material properties.

**Fen:** Peat-forming wetlands that receive nutrients from sources other than precipitation—usually from upslope sources through drainage from surrounding mineral soils and from groundwater movement. These systems are often covered by grasses, sedges, rushes, and wildflowers. Over time, peat may build up and separate the fen from its groundwater supply. When this happens, the fen receives fewer nutrients and may become a bog.

**Final closure:** The period of time when ore-extracting activities of a mine or ore-production activities of a processing facility cease to continue, and decommissioning and reclamation activities are being completed.

**Fine tailings:** More than 50% of waste byproducts of mineral beneficiating processes, other than heap and dump leaching, passes the No. 200 sieve and consists of rock particles, which have usually undergone crushing and grinding, from which the profitable mineralization has been separated.

**Fish assemblage:** The list of fish species that occupy a given area, which is used as a sensitive indicator of overall ecosystem health, habitat degradation, or environmental contamination.

**Fish consumption advisory:** Federal, state, or local government guideline restricting the amount of fish consumption when certain species of fish are unsafe to eat due to the presence of harmful chemicals in their tissues.

**Floodplain:** The lowland areas adjacent to lakes, wetlands, streams, and rivers that are prone to being inundated by water during flood conditions.

**Flotation tailings:** Materials left over after valuable minerals have been separated during a flotation process.

**Footwall:** The mass of rock underlying a mineral deposit or the bedrock located beneath a fault plane.

**Forb:** A flowering, herbaceous (non-woody) plant other than a grass species.

**Fragmentation:** A decrease in the area of contiguous habitat available to wildlife.

**Fugitive dust:** Particulate matter composed of soil that is not emitted from a stack, vent, or hood; can include emissions from haul roads, wind erosion or exposed surfaces, and other activities in which soil is removed and redistributed.

**GAP land cover:** A hierarchically organized vegetation cover map developed as part of the U.S. Geological Survey's Gap Analysis Program (GAP). Units of analysis are Minnesota Ecological Classification System subsections.

**General Land Office (GLO):** The GLO records managed by U.S. Bureau of Land Management are the repository for all Federal land title records issued between 1820 and the present.

**Geographic Information System (GIS):** A system designed to store, modify, analyze, or present various types of geographical spatial data.

**Geosynthetic membrane cover system:** A process designed to exclude certain waste rock materials from oxidation, and which would include the installation of limestone, overburden, a geomembrane material, cover soil, and a vegetative soil layer.

**Geotechnical assessment:** An assessment of the stability of a slope or ground surface under load; used to identify risks or potential hazards of structural failure.

**Giants Range:** The Giants Range batholith is a body of granite in northeastern Minnesota that lies between the Mesabi and Vermilion iron-mining ranges. It outcrops as a narrow belt that strikes east-northeast and occupies an area of about 1,000 square miles. The Giants Range goes from just north of Hibbing (the "Hill of Three Waters" is in the Hull-Rust Mine) to Babbitt and rises from 200 to 400 feet above the surrounding area.

**Glacial deposit:** A collection of various-sized rocks and debris that is deposited by a glacier as it advances or recedes across a landscape. There are many types of deposits, including till, drift, erratics, and moraines.

**Glacial till:** Direct glacial deposits of rocks, gravel, or boulders that are unsorted and unstratified.

**GoldSim:** A probabilistic simulation platform for visualizing and simulating many types of physical, financial, or organizational systems. Most GoldSim applications fall into one of three categories: environmental systems modeling, business and economic modeling, or engineered systems modeling.

**Greenhouse gas:** Gases that trap heat in the atmosphere. Some greenhouse gases, such as carbon dioxide, occur naturally and are emitted to the atmosphere through natural processes and human activities. The principal greenhouse gases that enter the atmosphere because of human activities are

carbon dioxide, methane, nitrous oxide, and fluorinated gases.

**Groundwater Containment System:** An active or passive measure (typically, either is engineered) put into place to prevent or significantly reduce the migration of contaminants or groundwater flow, in groundwater or in the groundwater aquifer.

**Groundwater divide:** The boundary between two adjacent groundwater basins represented by a high point in the water table.

**Groundwater drawdown:** The lowering of the groundwater level (water table) relative to a background condition in a specific aquifer.

**Groundwater mound:** The increase or rise in height of a water table due to concentrated recharge in a given area.

**Groundwater plume:** The downgradient extension or spread of contaminated groundwater within the pore spaces or fractures of soil or rock.

**Groundwater:** The water located beneath the ground surface in soil or rock pore spaces or fractures.

**Hardness:** A measure of the amount of minerals that are dissolved in a water source; a higher mineral content indicates harder water, while lower mineral content indicates softer water. See Total dissolved solids (TDS).

**Hazardous air pollutant:** Air pollutants that are not covered by ambient air quality standards, but may present a threat of adverse human health effects or adverse environmental effects, and are specifically listed on the federal list of 189 hazardous air pollutants in 40 CFR 61.01 or in section 112(b) of the CAA.

**Hazardous material:** Any item or agent (biological, chemical, physical) that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. The term includes hazardous substances, hazardous waste, marine pollutants, and elevated-temperature materials—materials designated as hazardous under the provisions of 49 CFR 172.101. Hazardous material categories include: explosives, gases, flammable liquids, flammable solids, spontaneous combustibles/dangerous when wet, oxidizers and organic peroxides, poisons and infectious substances, and corrosives.

**Hazardous waste:** Defined in the *Minnesota Statutes* as any refuse, sludge, or other waste material (or combinations of materials) in solid, semi-solid,

liquid, or contained gaseous form which, because of its quantity, concentration, or chemical, physical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

**Hazardous Materials Response Team:** Personnel specially trained to handle dangerous goods, which include materials that are radioactive, flammable, explosive, corrosive, oxidizing, asphyxiating, biohazardous, toxic, pathogenic, or allergenic.

**Health Risk Limit (HRL):** A concentration of a substance or chemical adopted by rule of the Commissioner of Health that is a potential drinking water contaminant because of a systemic or carcinogenic toxicological result from consumption (*Minnesota Statute 103H.005*).

**Herbaceous:** Plants with leaves and stems that die down at the end of each growing season, and have no woody or persistent stems above ground.

**Herbivore:** An organism that is anatomically and physiologically adapted to survive by consuming only plant-based foods.

**Hilsenhoff Biotic Index:** An index of organic pollution that utilizes macroinvertebrate tolerances of pollution to assess water quality in streams and rivers.

**Historic property:** Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

**Humidity cell:** Geochemical kinetic tests designed to mimic weathering at the laboratory or at bench scale (controlled setting) to obtain bulk reaction rates. The test determines the rate of acid generation and the variation over time in leachate water quality.

**Hydraulic conductivity:** A measure of the ease with which a medium transmits water, such as water moving through pore spaces or fractures in soil or rock.

**Hydrograph:** A graph showing the variation of discharge with respect to time, with discharge meaning the volume of water flowing past a specific point versus the time it takes for it to do so, generally cubic feet per second (cfs).

**Hydrology:** The science dealing with the origin, distribution, and circulation of waters of the earth such as rainfall, streamflow, infiltration, evaporation, and groundwater storage.

**Hydrometallurgical residue:** Waste residues in the form of sludges that contain concentrations of metals as well as sulfur-bearing minerals in crystalline and amorphous form.

**Hydrometallurgical:** Pertaining to hydrometallurgy; involving the use of liquid reagents in obtaining metals from their ores.

**Igneous rock:** Rock formed from cooling and solidification of magma (molten rock).

**Impaired water:** As defined under Section 303(d) of the Clean Water Act, waters that are too polluted or degraded to meet the water quality standards set by states, territories, or authorized tribes.

**IMPLAN:** Economic modeling software that analyzes how local economies function and the economic consequences for a particular project in a geographic region.

**In-advance mitigation:** A form of mitigation that is designed, permitted, and constructed in advance of a permitted impact.

**Indirect effect (for cultural resources):** An alteration to the qualifying characteristics of a historic property included in or eligible for inclusion in the National Register that would not be considered a direct effect, which could include effects to a property's use, setting, or feeling, or introduction of incompatible visual, atmospheric, or audible elements.

**Infiltration:** The process of water entering the soil at the ground surface and the ensuing movement downward. Infiltration becomes percolation when water has moved below the depth at which it can return to the atmosphere by evaporation or evapotranspiration.

**In-kind mitigation:** The replacement of the impacted aquatic site with one of the same hydrologic regime and plant community types (same species composition).

**In-place mitigation:** The replacement of the impacted aquatic site would take place in the same 8-digit Hydrologic Unit Code (HUC) watershed as the proposed impacted resource. The USACE St. Paul District Policy uses the term “in-place” to include on site, which is defined as an area located on the same parcel of land as the impact site, or on a parcel of land contiguous to the impact site.

**In situ:** This refers to actions happening “in place” or “in position” where they would naturally occur.

**Integrity (for cultural resources):** The ability of a property to convey its significance based on its location, design, setting, materials, workmanship, feeling, and association.

**Invasive species:** Organisms that cause, or are likely to cause, harm to the economy, environment, or human health due to their tendency to out-compete other species.

**Laurentian Divide:** A geological formation that runs along the crest of low, rocky hills and divides the Red River and Rainy River basins from the Minnesota River and Lake Superior basins. The Laurentian Divide is part of the Northern Divide, a continental divide that separates drainages to the Hudson Bay and Arctic Ocean from all other drainages in North America. Streams on the north slope of the divide flow through Canada to Hudson Bay. On the south side of the divide, streams flow south to either Lake Superior and the Atlantic Ocean, or the Mississippi River and the Gulf of Mexico.

**Laydown area:** Material and equipment storage area during the construction phase of a project.

**L<sub>dn</sub>:** The day-night average sound level.

**Leachate:** Solution of product obtained by leaching, in which a substance is dissolved by the action of a percolating liquid.

**Legacy contamination:** Historic or existing pollution.

**Location quotient:** The ratio between the local economy and the economy of a reference unit.

**Logging slash:** The residue (e.g., treetops and branches) left on the ground after logging.

**Long-term closure:** An assessment of the sustainability of the site “post-closure” and defining the need for long-term monitoring and maintenance required by the site (i.e., the “burden” placed on succeeding generations).

**Low solubility:** Not easily dissolved in water.

**Lynx analysis unit:** Landscape-scale analysis areas used for lynx management.

**Macroinvertebrate:** An invertebrate (i.e., animal without vertebrae or backbone) that is large enough to be seen without the use of a microscope. Freshwater benthic macroinvertebrates comprise the following three animal phyla: Athropoda (crustaceans, insects, spiders), Annelida (segmented worms), and Mollusca (mollusks).

**Management Area:** The framework that defines intended land and resource uses on national forest lands, including timber harvesting regimes, Recreational Opportunity Spectrum designations, and other similar characteristics.

**Management Indicator Habitat (MIH):** Categories of forest types, including dominant species, stand age class, and stand condition.

**Maximum Contaminant Level (MCL):** The highest level of a contaminant that is allowed in drinking water under the Safe Drinking Water Act. MCLs are enforceable standards.

**Maximum Contaminant Level Goals (MCLGs):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.

**Mercury:** A highly toxic element that is found both naturally and as an introduced contaminant in the environment. Although concentrations in water are very low, mercury accumulates through the aquatic food chain, resulting in high concentrations in fish that can threaten the health of people and wildlife.

**Mesabi Iron Range:** A vast deposit of iron ore and the largest of four major iron ranges in the region collectively known as the Iron Range of Minnesota. Discovered in 1866, it is the chief deposit of iron ore in the United States. The Mesabi Iron Range is a belt of iron ore 110 miles long, averaging 1 to 3 miles wide, and reaching a thickness as great as 500 feet. It is located between Grand Rapids and Babbitt, Minnesota. The Mesabi Range was known to the local Ojibwe as *Mesabe Widjiu* which means “Giant’s Mountain” or “Big-Man’s Mountain.”

**Mesic prairie:** A plant community dominated by native grasses, with soil moisture content that is between wet and dry.

**Mesotrophic:** Refers to a body of water having a moderate amount of dissolved nutrients.

**Metamorphic rock:** Rock that has been changed from an original form to a new form due to heat and pressure.

**Meteoric water:** The water derived from precipitation (snow and rain). This includes water from lakes, rivers, and icemelts, which all originate from precipitation indirectly.

**Methylmercury (MeHg):** A form of organic mercury which can accumulate up the food chain in aquatic systems and lead to high concentrations in predatory fish, which, when consumed by humans, can result in an increased risk of adverse effects in highly exposed or sensitive populations.

**Mine pit dewatering:** Removal of water from the mine pit(s).

**Mineland reclamation:** To reclaim, restore, enhance, or develop areas that have been affected by mining.

**Mineral interest:** The ownership rights to exploit, mine, and/or produce any or all of the minerals lying below the surface of a property.

**Minerotrophic:** Soils and vegetation whose water supply comes mainly from streams or springs, resulting in high nutrient levels and reduced acidity.

**Minnesota Ambient Air Quality Standards (MAAQS):** Air quality standards established under authority of *Minnesota Rules* 7009 that apply for outdoor air to protect human health and public welfare.

**Mitigation measure:** Actions to reduce, avoid, or offset the potential adverse environmental consequences of development activities.

**Modeling:** Predicting the probability of an outcome given a set amount of input data.

**Monte Carlo simulation:** A computerized mathematical technique that allows people to account for risk in quantitative analysis and decision-making. The simulation furnishes the decision-maker with a range of possible outcomes and the probabilities they will occur for any choice of action.

**MODFLOW:** A computer model used to simulate the flow of groundwater through aquifer.

**National Ambient Air Quality Standards (NAAQS):** Air quality standards established under authority of the Clean Air Act that apply for outdoor air to protect human health and public welfare.

**National Environmental Policy Act (NEPA) of 1970:** Under NEPA, projects and activities that require federal agency approvals or funding must undergo an evaluation of their impacts. The CEQ regulations (40CFR 1500, et seq.) contain the procedures for implementing NEPA.

**National Historic Preservation Act (NHPA):** Legislation enacted in 1966 intended to preserve historical and archaeological sites in the United States. Among other things, the Act requires federal agencies to evaluate the impact of all federally funded or permitted projects on historic properties (buildings, archaeological sites, etc.) through a process known as Section 106 Review. The main purpose for the establishment of the Section 106 Review process is to minimize potential harm and damage to historic properties. It allows interested parties an opportunity to comment on the potential impact projects may have on significant archaeological or historic sites. Additionally, the Act established the Advisory Council on Historic Preservation, State Historic Preservation Offices, National Register of Historic Places, and the list of National Historic Landmarks.

**National Pollutant Discharge Elimination System (NPDES) Permits:** Permits issued to regulate wastewater discharges to lakes, streams, wetlands, and other surface waters. In Minnesota, these permits establish specific limits and requirements to protect surface and groundwater quality for a variety of uses, including drinking water, fishing, and recreation. An individual NPDES permit for an industrial facility may cover a number of different waste types and activities, including industrial process wastewater, contact and non-contact cooling water, stormwater, contaminated groundwater pumpouts, water supply treatment backwash, and wastewater treatment sludges.

**National Register criteria:** The criteria established by the Secretary of the Interior for use in evaluating the eligibility of properties for inclusion on the National Register (36 CFR part 60).

**National Register of Historic Places:** The official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.

**New Source Performance Standards:** Pollution control standards issued by the USEPA and under Section 111 of the Clean Air Act which dictate the level of pollution that a new stationary source (constructed on or after January 30, 2004) may emit.

**Noise-sensitive receptors:** Locations or areas where dwelling units or other fixed, developed sites of frequent human use occur.

**Non-contact Stormwater:** Stormwater that has not been affected by sulfides and metal leachates from oxidized rock exposed through mining.

**Non-degradation:** As applied under the Clean Water Act and federal regulations, the term refers to both a policy and a regulatory process for the preservation of existing uses, preventing unnecessary degradation of high water quality, and protecting and maintaining specific waterbodies with outstanding characteristics.

**North American Industrial Classification System (NAICS):** The standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the United States business economy.

**Oligotrophic:** Lacking in plant nutrients such as phosphates, nitrates, and organic matter, and consequently having few plants and a large amount of dissolved oxygen throughout.

**One Hundred Mile Swamp:** A large wetland located between Babbitt and Hoyt Lakes, Minnesota that has been rated high quality due to high watershed integrity, large amount of interior forest, and high-quality lowland coniferous forests.

**Open bog:** A carpet of living sphagnum moss growing over a layer of acid peat.

**Ore stripping ratio:** Ratio of waste rock to ore.

**Ore Surge Pile:** A temporary ore storage pile located near the Rail Transfer Hopper, which would help maintain a steady delivery of ore to the Processing Plant.

**Ore:** A type of rock that contains minerals with important elements including metals that are economically extracted through mining processes.

**Outcrop area:** A visible exposure of bedrock or ancient superficial deposits on the surface of the Earth.

**Outfall:** The discharge point of a waste stream into a body of water; alternatively, it may be the outlet of a

river, drain, or a sewer where it discharges into a lake or other body of water.

**Out-of-kind mitigation:** The replacement of an impacted aquatic site with one of a different hydrologic regime and plant community type (different species composition).

**Out-of-place mitigation:** The replacement of the impacted aquatic site would take place in a different 8-digit HUC watershed as the proposed impacted resource.

**Outlier:** An observation that is numerically distant from the rest of the data.

**Overburden:** Material of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials, ores, or coal, especially those deposits that are mined from the surface by open cuts.

**Overstory:** The larger, taller trees which occupy a forest area and shade young trees, hardwoods, brush, and other deciduous varieties that are growing beneath the larger trees (i.e., understory).

**Oxidation:** A common chemical reaction involving the combination of a substance such as sulfide minerals with oxygen.

**P90:** 90<sup>th</sup> percentile probability, which means that there is at least a 90 percent probability that a constituent would not exceed the evaluation criteria.

**Paleoindian period:** A cultural period circa 12,000 to 9,000 years ago, or 10,000 to 7,000 B.C.; the earliest North American archaeological epoch, characterized by retreating glaciers, mastodons and other large mammals, and small mobile groups of hunters.

**Particulate matter:** Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in ambient air or emissions.

**Paste or thickened tailings:** Tailings that have been significantly dewatered to a point where they will form a homogeneous nonsegregated mass when deposited from the end of a pipe.

**Peat deposit:** Deposits of partially decayed organic material (vegetation) that typically forms in wetland bog areas.

**Perched:** Contained by an underlying impervious layer, often used in reference to wetlands.

**Perennial:** Occurring or persisting for more than 2 years, often in reference to plant species.



**Perimeter dam:** Outer constructed embankments of a tailings basin.

**Permeability:** A measure of the ability of a material (such as soil or rock) to transmit fluids.

**Permeable reactive barrier:** On-site method for remediating contaminated water that combines a passive chemical or biological treatment zone with subsurface fluid flow management.

**Permit to Mine:** Pursuant to *Minnesota Rules* 6132, a Permit to Mine means a legal approval issued by the commissioner of the Minnesota Department of Natural Resources to conduct a mining operation. Under Wetlands Conservation Act provisions, wetlands must not be impacted as part of a project for which a permit to mine is required, except as approved by the commissioner (*Minnesota Rules* 8420.0930).

**pH:** A measure of relative acidity or alkalinity of a solution, expressed on a scale from 0 to 14, with the neutral point at 7. Acid solutions have pH values lower than 7, and basic (alkaline) solutions have pH values higher than 7.

**Phase I Environmental Site Assessment (ESA):** An environmental site assessment and report that identify potential or existing environmental contamination liabilities associated with a specific property.

**Piezometer:** A device that measures the pressure or level of groundwater at a specific point.

**Point source discharge:** Discharge of wastewater or other materials at a single location.

**Porosity:** A measure of the void (i.e., “empty”) spaces in a material.

**Post-closure:** Phase of activities (inspection, maintenance, and reporting) that occur after the closure activities are complete.

**Post-contact period:** Relating to the period of time subsequent to the initial interaction of an indigenous people with an outside culture. In the United States, the term refers to an era of significant European influence for which a written record exists.

**Precipitation:** Any product of the condensation of atmospheric water vapor that falls under gravity. The main forms of precipitation include drizzle, rain, sleet, snow, and hail.

**Pre-contact period:** Relating to the period of time before contact of an indigenous people with an outside culture. In the United States, the term refers

to an era before significant European influence for which a written record does not exist.

**Prevention of Significant Deterioration:** A federal preconstruction permitting program that applies to areas that are not violating National Ambient Air Quality Standards.

**Private mineral estate:** The ownership of mineral rights on land, which allows the owner to mine or produce any minerals lying below the surface of the property.

**Process water:** Any water that, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

**Progressive reclamation:** Reclamation activities that could occur while the mining project is still in operation, allowing for a portion of the disturbed areas to be reclaimed prior to closure.

**Proposed Connected Actions:** The Proposed Connected Actions would involve both the NorthMet Project Proposed Action and the Land Exchange Proposed Action.

**Proposed Connected Actions Alternative B:** Proposed Connected Actions Alternative B would involve the NorthMet Project Proposed Action and the Land Exchange Alternative B.

**Pumping test:** Conducted to evaluate an aquifer by “stimulating” the aquifer through constant pumping, and observing the aquifer’s drawdown in observation wells. It is a tool that hydrogeologists use to characterize a system of aquifers, aquitards, and flow system boundaries.

**Rail Transfer Hopper:** A unit located at the Mine Site and would consist of a raised platform from which haul trucks would dump ore into a hopper over a pan feeder, which would discharge into a rail car below it.

**Reclamation:** Activities that successfully accomplish the requirements of *Minnesota Rules* parts 6132.2000 to 6132.3200. Actions intended to return the land surface to an equivalent undisturbed condition. Restoration of mined land to original contour, use, or condition. Steps or operations integral to mining that prepare the land for post-mining use are called reclamation. When the objective of reclamation is to return the land to pre-mining conditions and uses, it is sometimes called restoration.

**Recreation Opportunity Spectrum (ROS):** The framework expressing the desired range of recreational activities that will be encouraged and permitted on national forest lands.

**Reject concentrate:** Process water or brine that would result from the reverse osmosis process.

**Remediation:** Actions taken to respond to a hazardous material release or threat of a release that could affect human health and/or the environment.

**Riparian:** Relating to or located on the bank of a natural watercourse (or a river or stream).

**Rock buttress:** A rock aggregate structure built against a slope for reinforcement and support.

**Rosgen geomorphic survey:** A four-level hierarchy survey designed to classify streams based on quantifiable field measurements to produce consistent and reproducible descriptions of stream types and conditions.

**Saturated overburden:** That material unable to contain or hold more moisture of any nature, consolidated or unconsolidated, that overlies a deposit of useful materials, ores, or coal, especially those deposits that are mined from the surface by open cuts.

**Scenic Integrity Objective (SIO):** A statement of the intended visual conditions of national forest lands. Scenic Integrity Objectives are part of the United States Forest Service Scenery Management System.

**Section 303(d) of the Clean Water Act:** A portion of the federal act that requires states, territories, and authorized tribes to develop lists of impaired waters. These impaired waters do not meet water quality standards that the regulatory authorities have set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop total maximum daily loads for these waters.

**Section 404 of the Clean Water Act:** see CWA Section 404 Permit.

**Section 401 water quality certification:** According to the Clean Water Act, anyone who wishes to obtain a federal permit for any activity that may result in a discharge to navigable waters of the United States must first obtain a state Section 401 water quality certification to ensure that the project will comply with the state water quality standards. For example, if

someone proposes to discharge dredged or fill material into waters of the United States, including many wetlands, they generally must obtain a Section 404 permit from the USACE and, in Minnesota, a Section 401 water quality certification from the Minnesota Pollution Control Agency.

**Sedge meadow:** An open, groundwater-influenced, sedge- and grass-dominated wetland that typically borders streams but is also found on pond and lake margins and above beaver dams. Soils are nearly always sapric peat and range from strongly acid to neutral in pH.

**Sedimentary rock:** Rock formed from consolidation of loose sediment that has accumulated in layers.

**Severed mineral interest:** Any whole or partial interest in any or all minerals underlying land that has been separated from surface land ownership.

**Significance (for cultural resources):** The importance of a cultural property for its historical, architectural, archeological, engineering, or cultural values based upon the National Register criteria.

**Significant effect:** An effect that is predicted to be above an identified threshold and/or an effect that was determined by the lead agencies to have a magnitude that is large based on the context and intensity of that effect.

**Slimes:** The mixture of fine particles derived from ore, tailings, rock, or clay generally held in suspension in water as generated during ore processing.

**Sludge:** A semi-solid residue containing a mixture of solid waste material and water from air or water treatment processes.

**Slug test:** A type of aquifer test where water is quickly added or removed from a groundwater well to monitor and determine the hydraulic conductivity of the material in which the well is located.

**Slurry wall:** An underground reinforced wall in areas of soft earth or with a high water table typically made of concrete or bentonite; often used to restrict flow of groundwater from one area to another.

**Spigots:** Devices used to discharge tailings for conventional storage. They are typically located along the embankment(s) of a facility.

**Spill Prevention Control and Countermeasure (SPCC) Plan:** A written plan that includes requirements for oil spill prevention, preparedness,

and response to prevent oil discharges to navigable waters and adjoining shorelines.

**Standard:** A level of quality or attainment set by Minnesota water use classifications (*Minnesota Rules* 7060, 7050, and 7052), USEPA primary MCLs (pMCL), USEPA secondary MCLs (sMCL), and MDH HRLs.

**Standard Industrial Classification (SIC) codes:** A system for categorizing businesses in the United States, used by the United States government from 1937 to 1996. The Standard Industrial Classification system was replaced by the North American Industry Classification System in 1997.

**State Disposal System (SDS) permit:** In Minnesota, this is a permit that establishes the terms and conditions that must be met when a facility discharges wastewater to the ground surface or subsurface.

**State Historic Preservation Office (SHPO):** The office and official appointed or designated pursuant to section 101(b)(1) of the National Historic Preservation Act to administer the State Historic Preservation Program or a representative designated to act for the State Historic Preservation Officer.

**Stormwater:** According to *Minnesota Rules*, Chapter 7090, stormwater is defined as storm water runoff, snow melt runoff, and surface runoff and drainage.

**Strahler Order:** A stream order system used to classify stream segments based on the number of tributaries upstream, with headwater streams being first-order streams.

**Stream geomorphic monitoring:** The monitoring of changes in stream geology or features over time.

**Streamflow:** The flow of water in streams, rivers, and other channels. A major element of the water cycle, it is one component of the runoff of water from the land to waterbodies, with the other component being surface runoff.

**Structure (for cultural resources):** Any human-built, aboveground object, which may include, but is not limited to, a building, bridge, road, railroad, etc. Although not exclusive, structures are generally considered to be from contact and post-contact periods, as opposed to archaeological sites, which are generally considered to be associated with the pre-contact period.

**Subaqueous:** Existing or situated under water.

**Subsistence:** The source from which food and other items necessary to exist are obtained.

**Substrate:** The type of material that rests at the bottom of a stream, river, lake, etc., which could include sand, gravel, mud, or boulders.

**Sulfate:** A negatively charged ion that can be produced when metal sulfides are oxidized, consisting of one atom of sulfur and four atoms of oxygen, SO<sub>4</sub>.

**Sulfide mineral:** A class of minerals containing sulfides, many of which contain metals.

**Sulfide:** A form of sulfur that often is found in the environment bound to metals.

**Surface right:** The landowner's rights to the upper boundary (surface) of the land only, which does not include subsurface rights.

**Surface water divide:** The boundary between two adjacent surface water basins, often dictated by land topography.

**Surficial aquifer:** Shallow aquifers typically less than 50 feet.

**Surficial glacial deposit:** A collection of various sized rocks and debris deposited by glacial activity that is left on the earth's surface after the glacier recedes.

**Surficial groundwater:** Groundwater in surficial aquifers, which continuously is unconfined and moves along the hydraulic gradient from areas of recharge to streams and other places of discharge.

**Surrogate:** A method to statistically analyze using modified data.

**Taconite:** A low-grade iron ore, containing about 27 percent iron and 51 percent silica found as a hard rock formation in the Lake Superior region.

**Tailings:** Waste byproducts of mineral beneficiating processes other than heap and dump leaching, consisting of rock particles, which have usually undergone crushing and grinding, from which the profitable mineralization has been separated.

**Tailings basin:** Land on which is deposited, by hydraulic or other means, the material that is separated from the mineral product in the beneficiation or treatment of ferrous minerals including any surrounding dikes constructed to contain the material.

**Take:** To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct, a threatened or endangered wildlife species. To pick, dig, collect, or destroy, or to attempt to engage in any such conduct, a threatened or endangered plant species.

**Threatened Species:** Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range as defined in the Endangered Species Act.

**Till:** See Glacial Till.

**Total dissolved solids (TDS):** A measure of the total amount of ions (minerals, salts, or metals) that are dissolved in a given volume of water. See Hardness.

**Total maximum daily load (TMDL):** A calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.

**Toxics Release Inventory (TRI):** A USEPA maintained database containing data on disposal or other releases of over 650 toxic chemicals from thousands of United States facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment.

**Traditional Cultural Property (TCP):** A property that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community.

**Tribal Historic Preservation Officer (THPO):** The tribal office or official appointed by the tribe's chief governing authority or designated by a tribal ordinance or preservation program who has assumed the responsibilities of the State Historic Preservation Officer for purposes of Section 106 compliance on tribal lands in accordance with section 101(d)(2) of the Act.

**Trygg:** John William Trygg was a land use consultant, appraiser of natural resources, and early surveyor of Minnesota in the 1950s. He developed a system used to make historical appraisals on behalf of various Indian tribes in the Midwest. The Trygg Composite Maps, like the General Land Office (GLO) maps, depict both Native American and Euro-American features.

**Unconsolidated deposit:** Sediment not cemented together; may consist of sand, silt, clay, and organic material.

**Underdrain:** A drain, installed in porous fill, for drawing off surface water or water from the soil, as under the slab of a structure.

**Unique Biological Areas:** This management area designation by the United States Forest Service is allocated to areas to preserve features with unique biological value within the Superior National Forest.

**United States Forest Service Regional Foresters Sensitive Species (RFSS):** A list developed by the Regional Forester that identifies sensitive species. Sensitive species are defined as "*plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by: (a) significant current or predicted downward trends in population numbers or density, and/or (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.*" Sensitive species are usually designated for an entire region, but independent "Forest Sensitive" lists are maintained by some individual National Forests.

**United States Geological Survey (USGS) gaging station:** Facilities used by hydrologists to automatically monitor streams, wells, lakes, canals, reservoirs, and or other water bodies. Instruments at these stations collect information such as water height, discharge, water chemistry, and water temperature.

**Unsaturated overburden:** All mineral overburden, including zones of soil formation, located above the water table.

**Usufructuary:** Pertains to a person or group who has the legal right to use resources within a property that is not owned by them. Specific to the NorthMet Project Proposed Action, this pertains to the rights—derived from treaties, statutes, agreements, executive orders, and the like—of the Bands to hunt, fish, and gather 1854 Treaty resources on lands within the 1854 Ceded Territory.

**Virginia Formation:** Geological sedimentary rock formation located above the Biwabik Iron Formation.

**Volatile organic compound:** Organic chemicals that have a high vapor pressure at ordinary, room-temperature conditions.

**Voluntary Investigation and Cleanup (VIC) program:** The Minnesota Pollution Control Agency's program to allow property transactions to move forward while promoting redevelopment of contaminated property and mitigating health or environmental risks. Program benefits to

communities include new development, jobs, and an increased tax base in old industrial zones.

**Waste rock:** Rock without economic value that surrounds ore.

**Wastewater treatment facility (WWTF):** A facility at which chemical, biological, or mechanical procedures are applied to an industrial or municipal discharge to remove, reduce, or neutralize contaminants.

**Wastewater treatment plant (WWTP):** An industrial structure designed to remove biological or chemical waste products from water, thereby permitting the treated water to be used for other purposes.

**Water appropriation permit:** A permit from the Minnesota Department of Natural Resources required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year.

**Water clarity:** A measure of how far light penetrates through water. The deeper light penetrates, the clearer the water. How far down light penetrates through water depends on how many particles are suspended in the water. Suspended particles reduce water clarity by absorbing and scattering light.

**Water quality standard:** The foundation of the water quality-based pollution control program mandated by the Clean Water Act. Water quality standards define the goals for a water body by designating its uses, setting criteria to protect those uses, and establishing provisions such as antidegradation policies to protect waterbodies from pollutants.

**Watershed:** A geographic area from which water is drained by a river and its tributaries to a common outlet. A ridge or drainage divide separates a watershed from adjacent watersheds.

**Wetland Conservation Act (WCA):** Minnesota legislation, codified in *Minnesota Rules*, Part 8420, designed to achieve no net loss in the quantity, quality, and biological diversity of existing Minnesota wetlands, by avoiding impacts to them or restoring and enhancing diminished wetlands. This program is administered by local governments with oversight by the Board of Water and Soil Resources.

**Wetland delineation:** The act of establishing the boundary between wetlands and uplands (or non-wetlands) using soils, hydrology, and vegetation as indicators.

**Wetland:** Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that, under normal circumstances, do support a prevalence or vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

**Wild rice:** A tall aquatic annual grass (*Zizania palustris*) of North America, bearing edible grain that typically grows in shallow lakes or slow-moving rivers and streams.

**Woodland period:** A cultural period circa 2,500 to 850 years ago, or 500 B.C. to 1250 A.D.; characterized by the beginnings of modern tribes, clay pottery, agriculture, and ceremonial burial mounds.

**XP-SWMM:** Comprehensive modeling software for surface water systems.

**Zoning ordinance:** Locally adopted regulations that divide a town, city, village, or county into separate districts (e.g., residential, commercial, or industrial), define the permitted and prohibited land uses in those districts, and set forth specific development requirements (such as minimum lot size, height restrictions, etc).

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