PLAN OF STUDY (POS)
TO IDENTIFY AND DELINEATE
POTENTIAL JURISDICTIONAL WETLANDS
FOR THE NEW WORLD PROJECT

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1.0 INTRODUCTION

Section 404 of the Federal Clean Water Act requires that activities that result in dredging or filling of wetlands be permitted by the U.S. Army Corps of Engineers (COE). Until recently, Montana mining operations did not address wetland inventories or mitigation. In 1990, however, the Office of the U.S. President issued a "no net loss" policy statement and directed various federal agencies to implement this policy and become more active in enforcing wetland protection. It now appears that Montana mining operations will be required to specifically address Section 404 of the Clean Water Act for all future operations.

The first step in the compliance process involves an inventory to identify and delineate potential wetlands that may be affected by a project. Involved federal agencies (COE, Environmental Protection Agency, Fish and Wildlife Service and Soil Conservation Service) prepared an interagency publication in January, 1989 to establish uniform procedures for baseline inventories. This publication, "Federal Manual for Identifying and Delineating Jurisdictional Wetlands", lists three components of the inventory: 1) hydrophytic vegetation, 2) hydric soils and 3) wetland hydrology. For each component, criteria are defined and inventory methods are presented. The Federal Manual, after receiving substantial adverse comment, has been revised and a draft has been recently released for review and comment. The 1989 version of the manual will be utilized until the revised manual has been adopted.

Subsequent steps in the wetland permitting process involve an assessment of impacts to on-site and off-site wetlands, a detailed discussion of affected wetland functions and values, and an evaluation of procedures to avoid, minimize and mitigate impacts to wetlands. An application must include an evaluation of all reasonable project alternatives, including facility siting alternatives, as well as a comparison of potential wetland impacts between alternatives sufficient to demonstrate that the proposed project offers the best opportunity to first avoid, second minimize and then mitigate any unavoidable impacts to wetlands. Since subsequent steps depend on results of the wetlands baseline inventory, this POS (Plan of Study) addresses only the required inventory process. This POS does not address the application preparation for the COE nor any necessary compliance with the National Environmental Policy Act (NEPA).

2.0 WETLAND IDENTIFICATION AND DELINEATION

Four basic approaches are presented in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (FICWD 1989). The first approach is an offsite determination whereby existing information is used in the office to delineate wetlands. Although substantial baseline information is available for the study area, some supplementary information would be necessary for accurate wetland delineation. The remaining three approaches are onsite determinations varying in the degree of intensity of onsite investigation. The three onsite methods are: 1) routine, 2) intermediate-level and 3) comprehensive. The

intermediate-level onsite determination method will be conducted on the New World project area in conjunction with existing data.

Wetlands possess three essential characteristics: 1) hydrophytic vegetation, 2) hydric soils and 3) wetland hydrology, which is the driving force creating all wetlands. These characteristics and their technical criteria for identification are described in the following sections. The three technical criteria specified are mandatory, and all must be met for an area to be identified as wetland (FICWD 1989).

2.1 HYDROPHYTIC VEGETATION

Hydrophytic vegetation is defined as macrophytic plant life growing in water, soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content (FICWD 1989).

The FWS in cooperation with COE, EPA and SCS has published the "National List of Plant Species That Occur in Wetlands" from a review of the scientific literature and review by wetland experts and botanists (Reed 1988a). The list separates vascular plants into four basic groups, commonly called "wetland indicator status", based on a plant species' frequency of occurrence in wetlands: 1) *obligate wetland plants* (OBL) that occur almost always (estimated probability >99%) in wetlands under natural conditions; 2) *facultative wetland plants* (FACW) that usually occur in wetlands (estimated probability 67-99%), but occasionally are found in nonwetlands; 3) *facultative plants* (FAC) that

are equally likely to occur in wetlands or nonwetlands (estimated probability 34-66%) and 4) *facultative upland plants* (FACU) that usually occur in nonwetlands (estimated probability 67-99%), but occasionally are found in wetlands (estimated probability 1-33%). If a species occurs almost always (estimated probability >99%) in nonwetlands under natural conditions, it is considered an *obligate upland plant* (UPL). These latter plants do not usually appear on the wetland plant list; they are listed only when found in wetlands with a higher probability in one region of the country. If a species is not on the list, it is presumed to be an obligate upland plant. The "National List of Plant Species That Occur in Wetlands" has been subdivided into regional and state lists. The study area is in Region 9 (Northwest). A wetland plant list developed by Reed (1988b) for this region and FWS lists specific to Montana (Reed 1988c) and Wyoming (Reed 1988d) will be consulted.

The national, regional and state plant lists use a plus (+) sign or a minus (-) sign to specify a higher or lower portion of a particular wetland indicator frequency for the three facultative-type indicators; for purposes of identifying hydrophytic vegetation according to the Federal Manual, however, FACW+, FACW-, FAC+ and FAC are included as FACW and FAC, respectively, in the hydrophytic wetland criterion (FICWD 1989).

2.1.1 Hydrophytic Vegetation Criteria (from FICWD 1989)

An area has hydrophytic vegetation when, under normal circumstances: 1) more than 50 percent of the composition of the dominant species from all strata are obligate wetland (OBL), facultative wetland (FACW) and/or facultative (FAC) species, or 2) a frequency analysis of all species within the community yields a prevalence index value of less than 3.0 (where OBL = 1.0, FACW = 2.0, FAC = 3.0, FACU = 4.0 and UPL = 5.0). When a plant community has less than or equal to 50 percent of the dominant species from all strata represented by OBL, FACW and/or FAC species, or a frequency analysis of all species within the community yields a prevalence index value of greater than or equal to 3.0, and hydric soils and wetland hydrology are present, the area also has hydrophytic vegetation. These areas are considered problem area wetlands.

For each stratum (e.g., tree, shrub and herb) in the plant community, dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50 percent of the total dominance measure (e.g., basal area or areal coverage) for the stratum, plus any additional species comprising 20 percent or more of the total dominance measure for the stratum. All dominants are treated equally in determining the presence of hydrophytic vegetation.

2.1.2 Hydrophytic Vegetation Assessment Procedure

The vegetation unit sampling procedure will be conducted as part of the intermediate-level onsite determination method. The following steps will be completed:

1) Vegetation community types and sample plots from the baseline inventory will be reviewed to determine which types or sample sites meet hydrophytic vegetation criteria.

2) The indicator status of each species in a type will be listed.

3) The extent of each wetland type will be mapped.

4) Field forms will be filled out for any wetland types not sampled during the baseline inventory or for sites where it is not obvious whether hydrophytic vegetation criteria are met (such as sites close to 50 percent composition of wetland species).

5) Determine whether the hydrophytic vegetation criterion is met.

6) The extent of each wetland type will be verified on the ground since office mapping tends to overestimate wetland acreage. The width of hydrophytic vegetation and water surface along drainages and ponds will be measured to obtain accurate acreage calculations.

2.2 HYDRIC SOILS

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service 1987). In general, hydric soils are flooded, ponded, or saturated for usually one week or more during the period when soil temperatures are above

biologic zero 41°F as defined by "Soil Taxonomy" (USDA Soil Survey Staff 1975). These soils usually support hydrophytic vegetation. The National Technical Committee for Hydric Soils has developed criteria for hydric soils and a list of the nation's hydric soils (USDA Soil Conservation Service 1987). In addition, the SCS has listed hydric soils specific to Montana (USDA Soil Conservation Service 1985a) and Wyoming (USDA Soil Conservation Service 1985b)

2.2.1 Hydric Soil Criteria (from FICWD 1989)

An area has hydric soils when the National Technical Committee for Hydric Soils (NTCHS) criteria for hydric soils are met.

NTCHS Criteria for Hydric Soils (USDA Soil Conservational Service 1987) include:

"1. All Histosols except Folists; or

2. Soils in Aquic suborders, Aquic subgroups, Albolls suborder, Salorthids great group, or Pell great groups of Vertisols that are:

   a. somewhat poorly drained and have water table less than 0.5 feet from the surface for a significant period (usually a week or more) during the growing season, or

   b. poorly drained or very poorly drained and have either:

      (1) water table at less than 1.0 feet from the surface for a significant period (usually a week or more) during the growing season if permeability is equal to or greater than 6.0 inches/hour in all layers within 20 inches, or

(2) water table at less than 1.5 feet from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6.0 inches/hour in any layer within 20 inches; or

3. Soils that are ponded for long duration or very long duration during the growing season; or

4. Soils that are frequently flooded for long duration or very long duration during the growing season."

Long duration is defined as inundation for a single event that ranges from seven days to one month; very long duration is defined as inundation for a single event that is greater than one month. Frequently flooded is defined as flooding likely to occur often under usual weather conditions, i.e. more than 50 percent chance of flooding in any year or more than 50 times in 100 years (FICWD 1989).

2.2.2 Hydric Soils Assessment Procedure

- Previous soils, vegetation and wetland hydrology baseline mapping will be reviewed. Special attention will be given to those sites within proposed disturbances that may meet hydric soils criteria.

  1) Identify approximate limits of those areas that meet and/or may meet hydric soil criteria, or are recognized as hydric soils in Montana.

  2) Approximate limits of any obvious wetlands hydrology and hydrophytic vegetation will be identified.

Field Verification

1) Verify presence of hydric soils by digging a shallow pit (at least 18 inches) and noting indicators such as gleying, mottling and Munsell color index. All soil descriptions will be recorded on field forms and will adhere to criteria set forth in the Manual. Sites exhibiting hydrophytic vegetation or wetland hydrology where soils do not readily exhibit hydric indicators (e.g., sandy soils, reddish parent materials, glacial tills and some floodplain soils) and hydric soils located within proposed disturbances warrant additional attention.

2) Map the extent of hydric soils on topographic maps or aerial photos.

2.3 WETLAND HYDROLOGY

Permanent or periodic inundation, or soil saturation to the surface, at least seasonally, are the driving forces behind wetland formation. The presence of water for a week or more during the growing season typically creates anaerobic conditions in the soil, which affect the types of plants that can grow and the types of soils that develop. Numerous factors influence the wetness of an area, including precipitation, stratigraphy, topography, soil permeability and plant cover. All wetlands usually have at least a seasonal abundance of water. This water may come from direct precipitation, overbank flooding, surface water runoff due to precipitation or snow melt, or ground water discharge. The frequency and duration of inundation and soil saturation vary widely from permanent flooding or saturation to irregular flooding or saturation. Of the three technical criteria for

wetland identification, wetland hydrology is often the least exact and most difficult to establish in the field, due largely to annual, seasonal and daily fluctuations (FICWD 1989).

2.3.1 Wetland Hydrology Criteria (from FICWD 1989)

An area has wetland hydrology when saturated to the surface or inundated at some point in time during an average rainfall year, as defined below:

1. Saturation to the surface normally occurs when soils in the following natural drainage classes meet the following conditions:

   A. In somewhat poorly drained mineral soils, the water table is less than 0.5 feet from the surface for usually one week or more during the growing season; or

   B. In low permeability (<6.0 inches/hour), poorly drained mineral soils, the water table is less than 1.5 feet from the surface for usually one week or more during the growing season; or

   C. In more permeable ($\geq$6.0 inches/hour), poorly drained or very poorly drained mineral soils, the water table is less than 1.0 feet from the surface for usually one week or more during the growing season; or

   D. In poorly drained or very poorly drained organic soils, the water table is usually at a depth where saturation to the surface occurs more than rarely. (Note: Organic soils that are cropped are often drained, yet the water table is closely managed to minimize oxidation of organic matter; these soils often retain their hydric characteristics and if so, meet the wetland hydrology criteria).

2. An area is inundated at some time if ponded or frequently flooded with surface water for one week or more during the growing season.

(Note: An area saturated for a week during the growing season, especially early in the growing season, is not necessarily a wetland. However, in the vast majority of cases, an area that meets the NTCHS criteria for hydric soil is a wetland.)

2.3.2 Wetland Hydrology Assessment Procedures

There are considerable water resources baseline data available for the project area and wetland identification and delineation will involve both onsite and offsite methods. Offsite procedures will utilize data available from the site and onsite procedures will involve field surveys and verification utilizing the intermediate-level onsite determination methods as defined by FICWD (1989). The objective will be to identify and delineate areas meeting the wetland hydrology criteria as outlined in Section 2.3.1 of this study plan.

Offsite work will include:

1) Preparation of a summary description of water resources associated with each of the potential wetland areas. This will utilize data from the baseline study and aerial photos and maps available for the project.

2) Delineation of areas where soil saturation occurs and water table is near the ground surface or where water is ponded or frequently flooded during a portion of the growing season.

3) Preliminary identification of wetland functions and values affected by the proposed plan and mitigation. Similarly, potential wetland effects on ground water discharge and recharge, flood storage, erosion, sediment trapping and nutrient retention and removal will be identified.

To verify and to more accurately identify and delineate potential wetland areas, onsite investigations will be conducted in selected areas. This will involve confirmation of wet soils, areas of ponded water and areas of shallow ground water.

Another criteria to be used in the hydrology component of the wetland investigation are areas having hydrophytic vegetation and hydric soils. These wetland indicators will be valuable in delineation of hydrological boundaries of wetlands.

Wetland hydrology will be mapped on project maps at a scale consistent with soils and vegetation maps. Wetland hydrology data will be recorded on field forms and will adhere to wetlands delineation criteria.

2.4 INTEGRATION OF WETLAND COMPONENTS

The technical criteria for all three wetland components are mandatory and must be satisfied in making a wetland determination. Areas that meet the NTCHS hydric soil criteria and under normal circumstances support hydrophytic vegetation are normally wetlands. Field indicators and other information provide direct and indirect evidence for determining if each of the three criteria is met (FICWD 1989).

Draft maps for each component (vegetation, soils and hydrology) will be prepared based on completed baseline inventories. A composite of the

three maps will be prepared for preliminary identification of wetlands. Preliminary wetlands will be field verified and a final wetlands map drafted.

3.0 STUDY AREA

Baseline study areas for the three disciplines were variable. In order to address agency regulations and policy, the study area will include:

1) Areas directly affected by the proposed action.

2) Areas indirectly affected by the proposed action including off-site areas where water quality, quantity or timing of flow may be affected sufficiently to affect wetlands.

3) Wetland areas directly or indirectly affected by reasonable alternatives. These areas would be included in the EA or EIS for comparative impact analysis and to evaluate whether the proposed action is more desirable from a standpoint of avoiding or minimizing wetland impacts.

Specific areas to be inventoried include:

- Proposed disturbances as identified in the mine permit application (the Proposed Action).
- Alternative tailings sites SB-4 (East and West) and SB-1.
- The powerline corridor from Cody, Wyoming to the mine site (assuming a conceptual centerline).

4.0 SCHEDULE

	Task	Date
1.	Field work	August 26 - September 20
2.	Report preparation/mapping	September 20 - November 22

5.0 REFERENCES

Federal Interagency Committee for Wetland Delineation (FICWD). 1989. Federal manual for identifying and delineating jurisdictional wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and USDA Soil Conservation Service, Washington, D.C. Cooperative technical publication. 76 p. + appendices.

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