NST Express Pipeline

Environmental Mitigation Plan

ND PSC Case No. PU-xx-xxx

May 2015

1.0 INTRODUCTION

NST Express, LLC, (NST) has prepared this Environmental Mitigation Plan (EMP) for the construction of a 23.5-mile, 12-inch-diameter pipeline (NST Express) that will connect two crude oil storage facilities, located near the towns of Alexander and Fairview, located in McKenzie County, North Dakota.

This EMP outlines general construction-related mitigation measures that will be implemented by NST and its construction contractor (Contractor) during construction of the NST Express project. Specific conditions associated with agency permits are not specifically addressed herein.

This EMP has been developed to meet or exceed applicable industry standards and regulatory requirements. Guidance documents used in the preparation of this EMP include North Dakota's Guide to Temporary Erosion-Control Measures for Contractors, Designers, and Inspectors (2001), U.S. Bureau of Reclamation Engineering and O&M Guidelines for Crossings (2008), and several USACE regional conditions for projects operating under Nationwide Permits in North Dakota.

The NST Express will cross the Yellowstone River and irrigation canals associated with the Lower Yellowstone Irrigation Project. NST proposes to cross the Yellowstone River via horizontal directional drilling (HDD). The Yellowstone River is classified as a jurisdictional waterway under Section 10 of the Rivers and Harbors Act. A Section 10 permit from the U.S. Army Corps of Engineers (USACE) will be obtained for the Yellowstone River crossing and site-specific details for that crossing are not included in this EMP.

Crossings of irrigation canals associated with the Lower Yellowstone Irrigation Project will be conducted by boring, as permitted through the Bureau of Reclamation Montana Area Office. Site-specific details for those crossings are not included in this EMP.

2.0 GENERAL MITIGATION MEASURES

2.1 Contractor

NST will make the requirements of this EMP and applicable environmental permits a contractual obligation for the Contractor. The Contractor will ensure that persons engaged in construction of the NST Express are informed of these construction requirements.

2.2 Line List and Permits

NST will provide the Contractor with a construction list that describes special requirements, as agreed upon with private landowners and as required through agency permitting processes (e.g., stream crossing, road crossing permits).

2.3 Third-party Inspector

NST will provide construction oversight to confirm Contractor compliance with the measures of this EMP and any landowner agreements as well as applicable federal, state, and local environmental permits. NST will have third-party inspectors on each construction segment who are knowledgeable of the environmental mitigation requirements for this project. The third-party inspector will have the authority to stop construction activities and order corrective mitigation for actions

that are not in compliance with this EMP, any landowner agreements, or environmental permit requirements. The third-party inspectors will maintain appropriate records to document compliance with these and other applicable environmental permit conditions. At the end of each week, the third-party inspector will summarize daily reports into a weekly report that will be submitted to NST and the North Dakota Public Service Commission.

2.4 Rights-Of-Way

Access to the pipeline construction right-of-way will be from public roadways and private landowner-approved access roads. The Contractor will mark access routes with signs to clearly identify approved access roads.

All construction equipment and vehicles will be confined to approved access roads, the permitted pipeline construction right-of-way, additional temporary workspaces, and to the Alexander and Fairview facility sites.

2.5 Dust Control

Dust control related to construction activities will be accomplished through physical and administrative means.

All construction-related vehicles will adhere to posted speed limits on public roadways and as designated in landowner agreements on private lands. Work hours near residential areas may be limited.

The Contractor may use multiple methods to wet the right-of-way to control airborne dust, including water trucks and sprinklers, or additional measures as appropriate, based on site-specific conditions.

2.6 Undesirable Species Control

NST will require that all construction-related equipment be thoroughly cleaned prior to moving the equipment to the job site to limit the potential for the spread of noxious weeds, insects and soil-borne pests. All equipment will be cleaned with high-pressure washing equipment.

NST will perform a noxious weed survey prior to construction. If a noxious weed species is present within the construction right-of-way, the extent of infestation areas will be clearly demarcated in the field with flagging or staking. Construction crews will be informed of these areas and instructed to minimize the construction equipment and the number of passes by this equipment through infested areas.

During construction, the Contractor will clean the surface area of all vehicles, and construction machinery, including the undercarriage, to remove excess soil and vegetative debris, if that equipment is known to have passed through a weed or soil-borne pest infested area.

Only certified weed free vegetative components (e.g., mulch, straw/hay bales, seed mixes) will be used on the project.

2.7 Non-Hazardous Wastes

The Contractor will handle and dispose of human wastes by use of portable, self-contained toilets. Wastes from these units will be collected by a licensed contractor for disposal only at licensed and approved facilities.

The Contractor will remove all trash from the construction right-of-way on a daily basis unless otherwise approved or directed by NST.

The Contractor will dispose of horizontal directional drilling (HDD) cuttings and drilling mud. Disposal options may include spreading over the construction right-of-way in an upland location approved by the landowner or hauling to an approved licensed landfill. All waste will be properly disposed of per regulatory agency requirements.

2.8 Hazardous Wastes

The Contractor will ensure that all hazardous and potentially hazardous materials are transported, stored, and handled in accordance with all applicable regulations. Workers exposed to or required to handle hazardous materials will have received proper training in use of those materials, in accordance with the applicable regulations and the manufacturer's recommendations.

The Contractor will dispose of all hazardous materials at licensed waste disposal facilities.

If toxic or hazardous waste materials or containers are encountered during construction, the Contractor will stop work immediately and notify NST. The Contractor will not restart work until clearance is granted by NST.

2.9 Burning and Fire Prevention

The Contractor will comply with all federal, state, county, and local fire regulations regarding prevention of uncontrolled fires.

The Contractor will maintain a contact list and information of jurisdictional fire authorities. Fire control equipment, including water and chemical fire extinguishers, will be available at construction sites and construction personnel will be properly trained in the use of such equipment.

Flammable materials kept on a construction site will be stored in approved containers away from ignition sources. All flammable wastes will be removed from construction sites on a regular basis.

Smoking will be prohibited at construction sites, except in designated areas away from flammable materials.

2.10 Wet Weather

The Contractor will restrict certain construction activities and work during excessively wet soil conditions to minimize rutting and soil compaction. Activities may be suspended based on the following conditions:

- type of equipment and nature of construction activity planned for that day;

- potential that rutting may cause mixing of topsoil with subsoil layers;
- extent of surface ponding; and,
- the potential for excessive soil compaction.

If these conditions cannot be appropriately mitigated through equipment rerouting or the use of construction mats, then construction work will be suspended until adequate protection measures, approved by the Commission, are taken to avoid irreparable damage to roads or land.

3.0 SPILL PREVENTION

3.1 General

The Contractor will ensure that all equipment is free of leaks prior to use on the construction right-of-way and access roads. Throughout the period of construction, the Contractor will conduct regular maintenance and inspections of the equipment to reduce the potential for spills or leaks.

All equipment parked overnight will be at least 100 feet from a watercourse or wetland, unless otherwise approved by the EI.

Stationary equipment will be placed within a secondary containment if it will be operated or require refueling within 100 feet of a wetland or waterbody boundary.

3.2 Storage

Fuels and lubricants will be stored only at designated staging areas. Storage of fuel and lubricants will be at least 100 feet away from the edge of any perennial watercourse, wetland, storm drain, or any high consequence area.

No bulk fuel or storage tanks will be placed in the construction right-of-way. Bulk fuel storage at temporary work or construction staging areas will be located in a lined, earthen-berm secondary containment structure.

3.3 Refueling

Refueling and lubrication of equipment will be restricted to upland areas at least 100 feet away from any perennial watercourse, wetland, storm drain, or any high consequence area, except where equipment is required to be within 100 feet of a waterbody (e.g., trench dewatering pump).

Rubber-tired vehicles (e.g., pickup trucks) normally will refuel at the construction staging areas or commercial gas stations. Tracked machinery (e.g., backhoes, bulldozers) will be refueled and lubricated on the construction right-of-way. Equipment maintenance will be conducted in staging areas when practical. When necessary and with EI approval, equipment repairs may be made on the construction right-of-way.

Each fuel truck that transports and dispenses fuel to construction equipment or project vehicles along the construction right-of-way or within equipment staging areas will carry oil spill response equipment and materials onboard at all times. Truck drivers and construction crew personnel will be trained on proper use of this equipment and materials.

3.4 Cleanup and Emergency Notification

Construction activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Each construction crew will have sufficient tools and material to stop leaks and supplies of absorbent and barrier materials to allow rapid containment and recovery of spilled materials. Crew members must know and follow the procedure for reporting spills.

Emergency notification procedures between the Contractor and NST will be established in the planning stages of construction. In the event of a spill meeting agency reporting criteria, the Contractor will immediately notify NST who will then promptly notify the appropriate regulatory agency.

4.0 TEMPORARY EROSION AND SEDIMENT CONTROL

4.1 General

Temporary erosion and sediment control measures will be installed as detailed in the Stormwater Pollution Prevention Plan (SWPPP) for this project prior to initial disturbance of the soil, maintained throughout construction, and reinstalled as necessary until replaced by permanent erosion control structures or restoration of the construction right-of-way is complete.

The Contractor will inspect all temporary erosion control measures within 24 hours of each significant rainfall event of 0.25 inches or greater. The Contractor will repair or replace all ineffective temporary erosion control measures as expediently as practicable, but prior to the next rainfall event.

4.2 Sediment Barriers

Sediment barriers will be constructed of silt fence, staked hay or straw bales, fiber rolls, compacted earth (e.g., drivable berms across travel lanes), sand bags, or other appropriate materials.

Sediment barriers will be installed below disturbed areas where there is hazard of offsite sedimentation. Areas where temporary sediment barriers will be placed include: the base of sloped approaches to roadways, flowing streams, and wetlands: along the edge of the construction right-of-way, as needed to prevent downslope siltation of adjacent waterbodies and wetlands; and, along trench or test water discharge locations, as required.

Sections of temporary sediment barriers may be designed to allow passage of construction equipment. Sediment barriers will be reinstalled to their original specifications when equipment passage is no longer required, heavy precipitation is imminent, or at the end of the work day, whichever is sooner.

The Contractor will maintain hay or straw bale/wattle and silt fence sediment barriers by removing collected sediment when it reaches one-half the height of the barrier and replacing the damaged control. If bale filters cannot be replaced due to access problems, the Contractor will place a new row of sediment barriers upslope.

The Contractor will use hay or straw bales that are free of noxious weeds.

The Contractor will remove sediment barriers, except those needed for permanent

erosion and sediment control, during cleanup of the construction right-of-way.

4.3 Temporary Slope Breakers

Temporary slope breakers will be installed to minimize concentrated or sheet flow runoff in disturbed areas at the following recommended spacing:

Slope (%)	Spacing (feet)
1	300
2	200
3-5	150
>5	100

Temporary slope breakers will be constructed of earthen material, silt fence, staked hay or straw bales, fiber rolls, sand bags, or similar materials.

When earthen berms are constructed, they will be constructed of subsoil material, when practical, and have a two to eight percent slope with a 4-foot base and 1.5-foot height, or as site conditions require.

Temporary slope breakers will direct outfall to a stable, well-vegetated area or an appropriate energy-dissipating device (e.g., silt fence, hay or straw bales/wattles) at the end of the slope breaker and off the construction right-of-way. The outfall of each temporary slope breaker will be installed to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources.

A hard plug will be left in place where a slope breaker crosses an open trench.

Temporary slope breakers will not be installed on cultivated land except by landowner request.

4.4 Temporary Mulching

If a disturbed construction work area is inactive for one month or is expected to be inactive for one month or more, the Contractor will apply temporary seed and/or mulch to reduce risk of erosion. The Contractor will not apply temporary mulch in cultivated areas unless specifically requested by the landowner. The Contractor will not apply mulch within wetland boundaries.

Temporary mulch of straw or equivalent applied on slopes will be spread uniformly to cover at least 75 percent of the ground surface at an approximate rate of 2 tons per acre of straw or its equivalent. Mulch application on slopes within 100 feet of waterbodies and wetlands will be increased to an approximate rate of 3 tons per acre.

5.0 HIGHWAY, ROAD, AND RAILROAD CROSSINGS

Construction across paved roads, highways, and railroads will be in accordance with the requirements of the road and railroad crossing permits and approvals obtained by NST. All graded roads will be bored unless the responsible governing agency permits NST to use the open cut crossing method.

Unpaved secondary and tertiary roads will be crossed using the open-cut method where permitted by local authorities or private owners. The open-cut method will require temporary closure of the road to traffic and establishment of detours. The Contractor will take measures, such as posting signs along detour routes, to ensure safety and minimize traffic disruptions.

6.0 UPLANDS

6.1 Clearing

The initial stage of construction will involve clearing the construction right-of-way to allow for a safe operating environment. Clearing of trees, brush, and other vegetation from the right-of-way may be accomplished with hand-held chainsaws, brush hogs, and hydraulic tree-cutting equipment. Woody material will be chipped or mulched onsite or hauled off to an appropriate disposal location, or as otherwise directed by the landowner. No burning will conducted as part of this project.

6.2 Grading

After clearing, the construction right-of-way will be graded to develop a right-of-way that allows for a safe working surface for equipment and meets the bending limitations of the pipe. All work will be conducted in accordance with applicable permits, regulations, or guidelines. All grading will be undertaken with the understanding that original contours and drainage patterns will be re-established to the extent practicable.

6.3 Topsoil Removal and Storage

Measures will be taken to preserve the physical and chemical property integrity of topsoil so it may be used during final reclamation of the construction right-of-way. Generally, these measures will segregate the topsoil from underlying subsoil layers to prevent mixing during construction and to allow for easy retrieval during reclamation. Topsoil will not be used for construction of earthen berms, trench breakers, to fill low areas, or to backfill the trench.

Topsoil, to a maximum depth of 12 inches or topsoil to the depth of cultivation, whichever is greater, will be stripped from the area above the pipeline, unless full construction right-of-way width topsoil segregation is requested by the landowner. Stripped topsoil will be stockpiled in a windrow along the edge of the right-of-way. After backfilling is completed, excess subsoil must be placed over the excavated, blending the grade to the existing topography. Topsoil is replaced to the area of excavation after the subsoil is replaced.

6.4 Tree and Shrub Mitigation

NST will address mitigation, reclamation and remediation measures with individual landowners and comply with any applicable state requirements, including the NDPSC's Tree and Shrub Mitigation Specifications.

NST will inventory all trees and shrubs anticipated to be cleared, including those that are considered invasive species or noxious weeds (e.g., *Caragana arborescens*, *Elaeagnus angustifolia*, *Rhamnus cathartica*, *Tamarix chinensis*, *T. parviflora*, *T. ramosissima*, *Ulmus pumila*) before cutting. The inventory will record the location, number, and species of trees and shrubs.

Two 2-year-old saplings will be planted for every one tree removed. Two shrubs (stem cuttings) will be planted for every one shrub removed.

Except in the case of invasive or noxious species, trees and shrubs will be replaced by the same species or similar species, suitable for North Dakota growing conditions, as recommended by the North Dakota Forest Service. Invasive or noxious species will be replaced by similar non-invasive or non-noxious species suitable for North Dakota growing conditions as recommended by the North Dakota Forest Service.

Tree and shrub replacement will not be conducted within a 20- to 30-foot wide path over the pipeline to facilitate visual inspections of the right-of-way in accordance with U.S. Department of Transportation safety regulations.

Landowners will be given the option of having replacement trees and shrubs planted on the landowner's property, either on or off the right-of-way. The landowner will also be given the opportunity to waive those options, in writing, to have replacement trees and shrubs planted off the landowner's property.

6.5 Trenching

Trenching in uplands is typically accomplished with a backhoe excavator or a rotary wheel ditching machine to provide a ditch of sufficient depth and width, with a bottom to continuously support the pipeline. The trench will be excavated to a depth that is in accordance with the NDPSC certifications (i.e. 48 inches in rangeland, 48 inches in cultivated land, 48 inches at the bottom of the ditch for road crossings, and 72 inches across undeveloped section lines). If an increased pipeline depth is requested by a state-level agency, modifications to additional temporary workspace may be necessary to accommodate the increased amount of trench spoil.

Excavated material will be sidecast within the construction right-of-way with consideration for topsoil segregation, as noted in Section 6.3. Excavated material will be stored in a manner to minimize erosion and sedimentation.

Gaps will be left in the right-of-way lateral spoil piles that coincide with breaks in the strung pipe to facilitate natural drainage patterns and to allow the passage of livestock or wildlife.

Trenching operations will be followed as closely as practicable by lower-in and backfill operations to minimize the length of time the ditch is open.

When pumping captured stormwater from the trench, the Contractor will ensure that adequate pumping capacity and sufficient hose is available. The discharge of pumped water will be through filter bags or other method detailed in the SWPPP and in accordance with the environmental mitigation measures outlined throughout this EMP. If shallow groundwater is encountered during trenching that requires more extensive dewatering, a separate dewatering discharge permit will be obtained.

If drain tile is encountered during construction, the Contractor will repair and/or replace the drain tile. Additionally, if any culverts are disturbed during construction the Contractor will repair and/or replace the culverts.

6.6 Pipe Preparation and Installation

Prior to lowering into the trench, pipe section ends are beveled to prepare them for welding. This process produces shavings which will be removed, to the extent practicable, immediately following beveling. Sections are then welded together to form a continuous pipe.

The pipe may be wrapped with a protective shielding (e.g., epoxy powder, urethane epoxy) to protect the pipe coating during backfilling. This process is typically completed prior to pipeline delivery to the right-of-way, except for a 3- to 6-inch section at each end to prevent the coating from interfering with the welding process. This bare section of pipe will be coated with an epoxy powder or liquid protectant. A tarp will be placed under the pipe to collect any overspray of epoxy powder or liquid droppings from the infield shielding application. This residual material is considered hazardous and will be disposed of in accordance with measures outlined in Section 2.8.

Prior to lowering into the trench, the coated and welded pipeline will be inspected to ensure it is free of defects.

6.7 Backfilling

The subsoil excavated during the trenching process is initially used to backfill the trench. Prior to backfilling, the trench will be dewatered and trench breakers (soft plugs) installed on slopes where necessary to minimize the potential for water movement and erosion of the trench after the trench is backfilled. Trench breakers will be constructed of materials such as sand bags, sand/cement bags, bentonite bags, or other suitable materials. Topsoil will not be used to construct trench breakers.

Stormwater accumulated in the trench will be removed and discharged, in accordance with the SWPPP and the environmental mitigation measures outlined throughout this EMP.

Backfill will be comprised of soil material with a maximum particle size of less than 1.5 inches to reduce the risk of damage to the pipeline or pipeline coating.

The lesser of 4 feet or the actual depth of topsoil cover, will not be backfilled with soil containing rocks of any greater concentration or size than existed prior to pipeline construction in the pipeline trench, bore pits, or other excavations.

To reduce the potential for ditch line subsidence, spoil will be replaced and compacted by backhoe bucket or by the wheels or tracks of equipment traversing down the trench.

6.10 Cleanup

Cleanup activities to restore the right-of-way and other disturbed areas to the approximate pre-construction conditions will be conducted immediately following backfilling operations, as weather conditions permit.

All non-hazardous and hazardous materials will be disposed of in accordance with measures outlined in Section 2.7 and Section 2.8.

The right-of-way will be re-contoured with spoil material to approximate pre-construction contours and surface drainage patterns. Loading of slopes with unconsolidated spoil material will be avoided during slope re-contouring. Topsoil will be replaced after re-contouring of the grade with subsoil. The topsoil will be replaced on the subsoil storage area and over the trench so that after settling occurs, the topsoil's approximate original depth and contour (with an allowance for settling) will be achieved. Subsoil will not be placed on top of topsoil.

Temporary sediment barriers will be removed and accumulated sediment will be re-contoured with the rest of the right-of-way. As needed, permanent erosion controls will be installed.

6.9 Permanent Erosion and Sediment Control

After final grading and contouring of upland areas, sloped areas will be stabilized with permanent erosion control structures.

6.9.1 Permanent Slope Breakers

Permanent slope breakers will be installed to minimize concentrated or sheet flow runoff in disturbed areas. Permanent slope breakers will be constructed of earthen material. Slope breakers will divert surface runoff to adjacent stable vegetated areas or to energy-dissipating devices. In general, permanent slope breakers should be installed immediately downslope of all trench breakers. Permanent slope breakers will be installed as specified on the construction drawings or generally with a minimum spacing as shown on the following table:

Slope (%)	Spacing (feet)
<5	125
5-10	100
10-20	75
20-30	50
>30	25

The gradient (fall) for each slope breaker will be two to eight percent unless otherwise modified as required by site-specific conditions.

6.10 Reclamation and Revegetation

Reclamation and revegetation activities are designed to return disturbed areas to approximately pre-construction use and capability. The following mitigation measures will be utilized, unless otherwise modified to address site specific conditions or circumstances.

6.10.1 Soil Compaction

Compacted cultivated land and any other severely compacted or rutted areas within the construction right-of-way will be tilled or chiseled to loosen compacted soils. The subsoil surface will be graded smooth and any subsoil

clumps broken up (disc and harrow) in an effort to avoid topsoil mixing. The Contractor will use a penetrometer (or similar device) to test compaction of the construction right-of-way in agricultural areas for comparison with soils immediately adjacent to the right-of-way in an effort to approximate pre-construction conditions.

Plowing under of organic matter, including wood chips and manure, or planting of a green crop such as alfalfa, to decrease soil bulk density and improve soil structure or any other measures will be considered, in consultation with the NRCS, if mechanical relief of compaction is unsuccessful.

In the first year after construction, NST will inspect the construction right-of-way to identify areas of erosion or settling. Subsequently, NST will monitor erosion and settling through aerial patrols and through landowner reporting.

6.10.2 Rock Removal

On agricultural land, rocks greater than 4 inches in diameter that are exposed on the surface due to construction activity will be removed from the right-of-way prior to and after topsoil replacement.

Clearing of rocks may be conducted with a mechanical rock picker or by manual means, provided that preservation of topsoil is assured. Rock removed from the right-of-way will be hauled off the landowner's premises or disposed of on the landowner's premises at a location that is mutually acceptable to the landowner and to NST.

6.10.3 Seeding and Mulching

The final seed mixture will be based on recommendations from the local Natural Resources Conservation or otherwise specified by the landowner with NDPSC approval.

Certificates of seed analysis are required for all seed mixes to restrict the introduction of noxious weeds.

Seed will be used within 12 months of testing. Seeding will follow cleanup, re-grading, and topsoil replacement as closely as possible. Seed will be applied to all disturbed surfaces, except cultivated fields unless requested by the landowner.

If mulch was applied for temporary erosion control during construction activities, the Contractor will remove and dispose of the excess mulch prior to seedbed preparation to ensure that seedbed preparation equipment and seed drills do not become plugged with mulch. After seeding, the Contractor may evenly re-apply and anchor (straw crimp) the removed temporary mulch on the construction right-of-way.

Seeding will be completed at a rate appropriate for the region and stability of the reclaimed surface. Seeding rates will be based on pure live seed specifications for the seed mix.

The Contractor will use a drill seeder equipped with a cultipacker designed and equipped to apply grass and grass-legume seed mixtures. Equipment will include mechanisms (e.g., seed box agitator) to allow even distribution of all species in each seed mix, an adjustable metering mechanism to accurately deliver the specified seeding rate, and with a mechanism (e.g., depth bands) to accurately place the seed at the specified depth.

The Contractor will plant seed at depths consistent with the local or regional agricultural practices.

Broadcast or hydro seeding, used in lieu of drilling, will require double the recommended seeding rates. Where seed is broadcast, a cultipacker or other equipment will be used immediately following broadcasting to incorporate the seed to the specified depth and to firm the seedbed.

Areas that are too steep or otherwise cannot be safely harrowed or cultipacked will be hand-raked in order to incorporate the broadcast seed to the specified depth.

NST will work with landowners to discourage intense livestock grazing of the construction right-of-way during the first growing season by use of temporary fencing or a decreased grazing regimen.

Immediately after seeding, the Contractor will apply certified weed free mulch on all areas with high erosion potential and on slopes greater than 5 percent. The Contractor will spread mulch uniformly over the area to cover at least 75 percent of the ground surface at an approximate rate of 2 tons per acre of hay or straw or their equivalent. The Contractor will not apply mulch in cultivated areas unless requested by the landowner.

If a mulch blower is used, the majority of strands of the mulching material will not be shredded to less than 8 inches in length to allow anchoring. The Contractor will anchor mulch immediately after application to minimize loss by wind and water. Depending upon the length of straw mulch, a soil tackifier may be applied to the soil before the mulch is blown onto help anchor the mulch.

When anchoring (straw crimping) by mechanical means, the Contractor will ensure that the straw stalks are a minimum of 12 inches in length and will use a tool specifically designed for mulch anchoring with flat, notched disks to properly crimp the mulch to a depth of 2 to 3 inches.

6.10.4 Fences

Upon completion of all backfilling, cleanup, and restoration, including mulching and seeding of the construction right-of-way, permanent repairs will be made to all fences by using either the original material or good quality new material similar to existing fences.

Historic fences will be carefully reassembled by hand from the original material. Where the original material has deteriorated to a state that makes

it unsalvageable, replacement material similar to the original will be used if possible.

6.10.5 Right-of-Way and Pipeline Markers

Upon completion of all cleanup and restoration activities and during the time when the Contractor is making permanent repairs to fences, the Contractor will install pipeline markers on each side of all roads, railroads, section line crossings, fence lines, stream crossings, and other areas where the pipeline markers do not conflict with intended land use.

7.0 WETLAND CROSSINGS

7.1 General

The Contractor will comply with requirements of all permits issued for the wetland crossings by federal, state or local agencies.

Wetland boundaries will be clearly marked in the field with signs and/or highly visible flagging during construction.

In the event a waterbody crossing is located within or adjacent to a wetland crossing, the measures of both Section 7 and Section 8 will be implemented to the extent practicable.

7.2 Easement and Workspace

The Contractor will maintain wetland boundary markers during construction in all areas and until permanent seeding is complete in non-cultivated areas.

The Contractor will locate extra work areas (such as staging areas and additional spoil storage areas) at least 100 feet away from wetland boundaries, where topographic conditions permit.

The Contractor will limit clearing of vegetation between extra work areas and the edge of the wetland to the construction right-of-way and limit the size of extra work areas to the minimum needed to construct the wetland crossing.

7.3 Wetland Crossing Methods

The following general mitigation procedures will be followed by the Contractor in all wetland areas, unless otherwise approved or directed by NST, based on site-specific conditions. All work will be conducted in accordance with applicable permits.

- limit the duration of construction-related disturbance within wetlands to the extent practicable;
- use no more than two layers of timber riprap to stabilize the construction right-of-way;
- cut vegetation off at ground level leaving existing root systems in place and remove it from the wetland for disposal;
- limit pulling of tree stumps and grading activities to directly over the trench line unless safety concerns require the removal of stumps from the working-

side of the construction ROW;

- segregate a maximum of 12 inches of topsoil from the area disturbed by trenching in dry wetlands, where practicable;
- restore topsoil to its approximate original stratum, after backfilling is complete;
- dewater the trench in a manner to prevent erosion and heavily silt-laden flowing directly into any wetland or waterbody;
- remove all timber riprap and prefabricated equipment mats upon completion of construction;
- locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable;
- prohibit storing hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating activities in a wetland, or within 100 feet of any wetland boundary;
- perform all equipment maintenance and repairs upland locations at least 100 feet from waterbodies and wetlands;
- avoid parking equipment overnight within 100 feet of a watercourse or wetland;
- prohibit washing equipment in streams or wetlands;
- install trench breakers and/or seal the trench to maintain the original wetland hydrology, where the pipeline trench may drain a wetland;
- attempt to refuel all construction equipment in an upland area at least 100 feet from a wetland boundary (otherwise follow the procedures outlined in Section 3); and,
- avoid sand blasting in wetlands to the extent practicable. If sandblasting is performed within a wetland, the Contractor shall place a tarp or suitable material in such a way as to collect as much waste shot as possible and dispose of the collected waste. The Contractor shall clean up all visible deposits of wastes and dispose of the waste at an approved disposal facility.

Specific procedures for each type of wetland crossing method are listed below and shall be designated on the construction drawings but may be modified depending on site conditions at the time of construction. All work shall be conducted in accordance with applicable permits

Dry Wetland Crossing Method

Topsoil shall be segregated. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.

The dry wetland crossing procedure shall be used where this type of wetland is identified on the construction drawings. The following are exceptions to standard wetland crossing methods:

- The width of the construction right-of-way for upland construction is maintained through the wetland.
- Where extra work areas (such as staging areas and additional spoil storage areas) are designated on the construction drawings, they may be placed no closer than 100 feet from the wetland's edge.
- If the wetland is cultivated, the topsoil shall be stripped using the trench and spoil side method at the same depth as the adjacent upland areas.
- Seeding requirements for agricultural lands shall be applied to farmed wetlands.

Standard Wetland Crossing Method

Topsoil stripping is impracticable due to the saturated nature of the soil. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace. Based upon the length of a standard wetland crossing and presence of sufficient water to float the pipe, the Contractor may elect to install a standard wetland crossing utilizing the "push/pull" method.

The standard wetland crossing procedure shall be used where this type of wetland is identified on the construction drawings.

Procedures unique to standard wetlands include:

- limiting construction right-of-way width to a maximum of 75 feet unless site conditions warrant a wider width;
- utilizing low-ground-pressure construction equipment or support equipment on timber riprap or timber mats; and,
- installing sediment barriers across the entire right-of-way where the right-of-way enters and exits the wetland.

7.4 Restoration and Reclamation

All timber riprap, timber mats, and prefabricated equipment mats and other construction debris shall be removed upon completion of construction. As much as is feasible, the Contractor shall replace topsoil and restore original contours with no crown over the trench. Any excess spoil shall be removed from the wetland. The Contractor shall stabilize wetland edges and adjacent upland areas by establishing permanent erosion control measures and revegetation, as applicable, during final clean up.

In the absence of detailed revegetation plans or until the appropriate seeding season for permanent wetland vegetation in standard wetlands, the Contractor shall apply a temporary cover crop on the construction right-of-way at a rate adequate for germination and ground cover unless standing water is present. The Contractor shall apply the temporary cover crop during final cleanup. For farmed wetlands, the Contractor shall apply seeding requirements for agricultural lands or as required by the landowner.

The Contractor shall not use fertilizer, lime, or mulch in wetlands unless required in writing by the appropriate land management agency.

All wetland areas within conservation lands or easements shall be restored to a level consistent with any additional criteria established by the relevant managing agency.

8.0 WATERBODIES AND RIPARIAN AREAS

8.1 General

The Contractor will comply with requirements of all permits issued for the waterbody crossings by federal, state or local agencies.

Waterbody is defined as any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes.

NST proposes to utilize a HDD to cross the Yellowstone River, which is classified as a jurisdictional waterway under Section 10 of the Rivers and Harbors Act (33 United States Code [USC] 403). A Section 10 permit from the U.S. Army Corps of Engineers (USACE) will be sought for the Yellowstone River crossing and site-specific details for that crossing are not included in this EMP.

Crossings of irrigation canals associated with the Lower Yellowstone Irrigation Project will be conducted by HDD and/or bore as permitted through the Bureau of Reclamation Montana Area Office. Site-specific details for those crossings are not included in this EMP.

In the event a waterbody crossing is located within or adjacent to a wetland crossing, the measures of both Section 7 and Section 8 will be implemented to the extent practicable.

The use and storage of chemicals, fuels, lubricating oils, or other hazardous materials will be performed according to measures outlined in Section 2 and Section 3.

NST will complete site-specific crossing plans for waterbody crossings if required by the applicable regulatory agencies during federal or state permitting processes.

NST may allow modification of the following specifications as necessary to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits.

8.2 Easement and Work Space

Extra work areas will be limited to the minimum size needed to construct the stream crossing. Construction activities will be contained within these areas and the construction right-of-way.

The Contractor will locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet from the water's edge taking into account engineering and topographic constraints. If conditions do not allow for a

50-foot setback, extra work areas will be located no closer than 10 feet from the water's edge.

At all waterbody crossings, the Contractor will install flagging across the construction right-of-way at least 10 feet from the water's edge prior to clearing and ensure that riparian cover is maintained where practicable during construction.

8.3 Vehicle Access and Equipment Crossings

Equipment bridges, long wood mats used as air bridges, designed to withstand the maximum foreseeable flow of the stream will be installed at all flowing waterbodies. Bridges will not restrict flow or pool water while the bridge is in place.

The Contractor will maintain equipment bridges to prevent soil from entering the waterbody.

Equipment crossings will be perpendicular to drainage bottoms wherever possible.

Erosion and sediment control barriers will be installed and maintained around vehicle access points as necessary to prevent sediment from reaching the waterway.

8.4 Waterbody Crossing Methods

Construction methods pertinent to waterbody crossings are presented below.

- Horizontal Directional Drill Crossing

In conjunction with the appropriate jurisdictional agency, NST will develop specific crossing plans for major water bodies that contain recreationally or commercially important fisheries, or are classified as special use. NST will consult with state fisheries agencies with respect to applicable construction windows for each crossing.

Where required, the HDD method shall be utilized for designated major and sensitive waterbodies, including the Yellowstone River crossing. The Contractor shall construct each directional drill waterbody crossing in accordance with a site specific plan as shown in the construction drawings.

Drilling fluids and additives utilized during implementation of a directional drill shall be non-toxic to the aquatic environment.

The Contractor shall develop a contingency plan to address a frac-out during a directional drill. The plan shall include instructions for monitoring during the directional drill and mitigation in the event that there is a release of drilling fluids. Additionally, the waterbody shall be monitored downstream by the Contractor for any signs of drilling fluid.

The Contractor shall dispose of all drill cuttings and drilling mud at a NST-approved location. Disposal options may include spreading over the construction right-of-way in an upland location approved by NST or hauling to an approved licensed landfill or other site approved by NST.

- Boring Crossing Method

NST Express will utilize a slick-bore process for boring under roads and irrigation canals crossings. An entry bore pit and exit bore pit will be excavated on both sides of the crossing. The boring machine shall be placed in the entry pit where it will drill a pilot hole through to the exit pit. This hole will then be widened to accept the carrier pipe by back reaming. A section of pipeline that is already welded together, inspected, and pressure tested is then pulled back through the drilled hole. The minimum depth of cover for these road and irrigation canal crossings shall be 5 feet or greater depending upon the minimum depth as specified by the crossing permit. The bored crossing pipe will extend at least 10 feet beyond either side of the road right-of-way and 25 feet beyond the toe of the canals. A pipeline marker shall be placed at either end of the bored crossing when completed.

9.0 HYDROSTATIC TESTING

9.1 General

The Contractor will provide for the safety of all pipeline construction personnel and the general public during hydrostatic test operations by placing warning signs in populated areas.

Staging and work areas for filling the pipeline with water will be located a minimum of 100 feet from a waterbody or wetland boundary if topographic conditions permit.

The Contractor will locate hydrostatic test manifolds 100 feet outside wetlands and riparian areas to the extent practicable.

9.2 Test Water Source

NST will provide the Contractor with a copy of the appropriate withdrawal/discharge permits for hydrostatic test water. The Contractor will keep water withdrawal/discharge permits on site at all times during testing operations.

In some instances sufficient quantities of water may not be available from the permitted water sources at the time of testing. Withdrawal rates may be limited as stated by the permit. If the quantity of water from the permitted source is insufficient to allow for hydrostatic testing of the pipeline, an alternative source will be identified and permit authorization sought by NST.

The Contractor will be responsible for obtaining any required water analyses from each source to be used in sufficient time to have a lab analysis performed prior to any filling operations. The analysis will determine the pH value and total suspended solids and other parameters that may be required by the North Dakota Department of Health.

No chemicals will be used in the test water.

9.3 Water Discharge

The Contractor will comply with state-issued National Pollutant Discharge Elimination System permits for discharging test water.

The Contractor will not discharge any water containing oil or other substances that are in sufficient amounts as to create a visible color film (“sheen”) on the surface of the receiving water.

The Contractor will not discharge into state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and local permitting agencies grant written permission. To avoid impacts from introduced species, no inter-basin transfers (discharge) of hydrostatic test water will occur.

The discharge operation will be monitored and water samples will be collected and analyzed prior to the beginning of the discharge to ensure that it complies with the project and permit requirements. If required by state permits, additional water quality testing will be conducted during discharge, in accordance with permit conditions.

The Contractor will regulate the PIG velocity discharge rate (3,000 gpm maximum), use energy dissipation devices, and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive stream flow. Water must be disposed of using good engineering judgment so that all federal, state, and local environmental standards are met. Dewatering lines will be of sufficient strength and be securely supported and tied down at the discharge end to prevent whipping during this operation.

Selected road, railroad, and river crossing pipe sections may be specified to be pre-tested for a minimum of 4 hours. The water for pre-testing of any road and railroad crossings will be hauled by a tanker truck from an approved water source. Since the volume of water utilized in these pre-tests will be relatively small, the water will be discharged overland along the construction right-of-way and allowed to soak into the ground utilizing erosion and sediment control measures.