Enbridge Energy, Limited Partnership
Enbridge Pipelines (Southern Lights) L.L.C.

Environmental Mitigation Plan

Alberta Clipper
and
Southern Lights Diluent
Pipeline Projects

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ENBRIDGE ENERGY, LIMITED PARTNERSHIP
ENBRIDGE PIPELINES (SOUTHERN LIGHTS) L.L.C.

ENVIRONMENTAL MITIGATION PLAN
ALBERTA CLIPPER AND SOUTHERN LIGHTS DILUENT PROJECTS

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ATTACHMENTS

FIGURES[1]

[1] **Site-specific plans supersede any design presented in the typical details.**

INTRODUCTION

This Environmental Mitigation Plan (EMP) outlines construction-related environmental policies, procedures, and mitigation measures developed by Enbridge Energy, Limited Partnership and Enbridge Pipelines (Southern Lights) L.L.C. (Enbridge or Company) for the construction of the Alberta Clipper and Southern Lights Diluent Pipeline Projects. This EMP was developed based on Enbridge's experience implementing best management practices during construction. It is intended to meet or exceed applicable federal, state and local environmental protection and erosion control specifications and practices. The EMP is designed to address typical circumstances that may be encountered along the Enbridge Alberta Clipper and Southern Lights Diluent Projects. Project specific permit conditions and/or landowner agreements may supersede general practices described in this document. Project-specific procedures for the Alberta Clipper and Southern Lights Diluent Projects have been incorporated into the EMP. The measures described in the EMP are consistent with relevant portions of the State of Minnesota *Stormwater Manual* and the Minnesota *Protecting Water Quality in Urban Areas Manual; Wisconsin Technical Standards;* North Dakota's *Guide to Temporary Erosion-Control Measures for Contractors, Designers, and Inspectors.*

This document includes the following sections:

- Section 1.0 of the EMP describes general mitigation measures, including soil erosion and sedimentation control procedures, to be implemented during upland construction and upland restoration;
- Section 2.0 discusses stream and river construction, crossing, and restoration;
- Section 3.0 describes practices for wetland construction, crossings, and restoration;
- Section 4.0 discusses highway, road, and rail crossings;
- Section 5.0 discusses construction dewatering;
- Section 6.0 outlines water appropriation practices;
- Section 7.0 addresses revegetation measures;
- Section 8.0 addresses winter construction issues;

Alternative construction procedures implemented in lieu of this EMP must provide an equal or greater level of protection to the environment, and must be approved in writing by Enbridge. Modifications for the construction of dual pipelines are highlighted below in the appropriate sections. State-specific measures for Minnesota and Wisconsin construction activities are found in Attachments A and B, respectively.

Unless otherwise specified, the construction Contractor (Contractor) will be responsible for implementing the requirements of this EMP. Enbridge will make the requirements of the EMP and applicable environmental permits known to the Contractor. If the Contractor has questions concerning these environmental requirements, the Contractor will contact an Enbridge representative.

Enbridge will provide appropriate construction oversight to confirm Company and Contractor compliance with the measures of this EMP and requirements of applicable federal, state, and local permits. Enbridge's Environmental Inspectors (EIs) will assist the Contractor in

interpreting and implementing the requirements of the EMP, and verify compliance with these procedures for the company. Enbridge employs experienced EIs to manage unforeseen situations that are not directly addressed by the project documents. Enbridge relies on the experience and judgment of the EIs through coordination and consultations with project management staff to address those unforeseen situations should they occur in the field. The EI will be expected to use judgment in the field to interpret environmental conditions and requirements, but will not be authorized to make major modifications or changes without the prior written approval of Enbridge. The EI will have the authority to stop activities and order corrective mitigation for actions that are not in compliance with the measures in this EMP, Landowner agreements, or environmental permit requirements. The EI will maintain appropriate records to document compliance with these and other applicable environmental permit conditions.

Enbridge will also hire Independent Environmental Monitors (Monitors or IEMs), approved by Enbridge and the applicable state agencies, to document compliance with permits and plans. Monitors will work collaboratively with Enbridge's environmental and agricultural inspection team to achieve compliance. Monitors will work in an auditing role to assess the success of Enbridge's compliance program. Environmental Monitors will be responsible for monitoring Enbridge's compliance with permits issued by the applicable state and federal agencies. Monitors will communicate through daily reports submitted to the applicable state agencies and Enbridge, as well as through daily communication with Enbridge's Environmental Inspection Team. Monitors will communicate directly with their respective agency contacts and with Enbridge's Environmental Inspectors, but will not communicate directly with the Contractor or sub-Contractor unless an Enbridge EI is present. Monitors will not have the authority to direct construction team activities, and will work through Enbridge's Environmental Inspection Team, if compliance issues are identified.

1.0 GENERAL MITIGATION MEASURES

1.1 TEMPORARY EROSION AND SEDIMENT CONTROLS

Temporary erosion and sediment controls (ECDs) include but are not limited to slope breakers, sediment barriers, stormwater diversions, trench breakers, mulch and revegetation. The goal of ECDs is to minimize erosion onsite, and prevent construction-related sediment from migrating offsite into sensitive resource areas such as streams, wetlands, lakes, or drainage ditches (dry or flowing). The Contractor will, at all times, maintain erosion and sediment control structures as required in the project construction documents and as required by all applicable permits. Non-functional erosion and sediment control features must be repaired, replaced, or supplemented with functional materials as soon as field conditions allow access, but no later than 24 hours after discovery.

ECDs will be installed after initial clearing and before disturbance of the soil and will be replaced by permanent erosion controls as restoration is complete. Additional information on ECDs is provided in the upland, waterbody and wetland sections.

1.2 RIGHT-OF-WAY ACCESS

Access to the right-of-way will be from public roadways and Enbridge-approved private access roads only. The Contractor is responsible for creating signs or other methods to identify approved access roads in the field and to ensure that access is confined to only the approved roads. Vehicle tracking of soil from the construction site will be minimized by installation of Best Management Practices (BMPs) such as stone pads, timber mats, or equivalent. Street sweeping will be used if the EIs or Enbridge Construction Management determine that BMPs are not adequate to prevent soil from being tracked onto public roads.

1.3 ROAD REPAIR

The Contractor will repair private roads and lanes damaged when moving equipment or obtaining access to the right-of-way.

1.4 RIGHT-OF-WAY REQUIREMENTS

All construction equipment and vehicles will be confined to the approved right-of-way and extra workspace. Right-of-way requirements may vary between projects. For the Alberta Clipper and Southern Lights Diluent Projects, construction activities will generally use a right-of-way as shown in Figures 1A and 1B. These drawings illustrate the Typical Right-of-Way Configuration for the projects. The construction right-of-way configurations may be modified to avoid and/or minimize disturbance to sensitive resource areas such as wetlands and waterways.

Prior to commencement of clearing operations, the outer limits of the construction right-of-way and extra workspace areas will be marked with distinctive stakes and flagging by Enbridge. Construction activities will be restricted to the approved designated areas. Other areas (pipe storage and contractor yards, borrow and disposal areas, access roads, etc.) will be posted for use by the Contractor during construction activities.

The construction ROW (construction workspace) for the Alberta Clipper and Southern Lights Diluent Projects will include a portion of Enbridge's existing easement, new permanent easement, permitted temporary workspace, and site-specific extra workspaces as defined below. Typically the construction ROW will be 140-feet-wide. The right-of-way width will be

reduced to 125-feet-wide in selected locations (e.g., wetlands, waterbodies, and forested windbreaks) in accordance with applicable permit conditions, as indicated on the project construction alignment sheets and in the field by the use of staking.

(a) Right-of-Way (Permanent Easement)

Enbridge's existing right-of-way (permanent easement or ROW) is generally 125 feet wide. Enbridge is acquiring up to an additional 105 feet of permanent easement from landowners for the Alberta Clipper and Southern Lights Diluent Projects south of Clearbrook. For the Alberta Clipper Project north of Clearbrook Enbridge is acquiring up to an additional 75 feet of permanent easement. The right-of-way/permanent easement is maintained to facilitate access and aerial inspection of the pipeline system.

(b) Temporary Workspace

In addition to the right-of-way/permanent easement, construction will require Temporary Workspaces (TWS). The TWS will be located adjacent to and contiguous with the proposed right-of-way/permanent easement and will be identified on the construction alignment sheets and by distinctive staking of construction limits prior to clearing.

(c) Extra Workspace

Site-specific extra workspace (EWS) locations, (construction work areas beyond the permanent easement and TWS previously described), will be required at select locations such as steep slopes, road, waterbody, railroad, and some wetland crossings, and where it is necessary to cross under the existing pipelines or foreign utilities. EWS will typically be located in uplands adjacent to the construction right-of-way and 50-feet back from sensitive resource boundaries where site-specific field conditions allow. To complete work safely, Enbridge may need to locate EWS within a wetland or within the 50-foot setback from a wetland or waterbody based on site-specific conditions. EWS adjacent to waterbodies and/or wetlands is addressed further in Sections 2.4 and 3.3.1, respectively.

Enbridge will acquire additional extra workspace from the landowner where necessary; use of unauthorized workspace is prohibited without Enbridge's approval. In all cases, the size of extra workspace will be kept to the minimum necessary to safely conduct work. Enbridge has conducted a preconstruction review of the entire project area to determine specific extra workspace locations. EWS locations are depicted on the construction alignment sheets.

1.5 LINE LIST AND PERMITS

Enbridge will provide the Contractor with a construction Line List that describes special requirements (*e.g.*, timber salvage, topsoil segregation, restoration measures, fencing requirements, etc.) as agreed upon with Landowners. The Contractor must comply with these special requirements and/or permit conditions.

The Line List reflects requirements and comments provided by Landowners; however it is not a comprehensive list of construction requirements. The Line List must be considered in conjunction with other project documents and permits. Any third party agreements between the Contractor and the landowner must be pre-approved by Enbridge.

Unless otherwise noted within this EMP, Enbridge will obtain the necessary permits for the installation of the pipeline. Permit requirements may be more stringent than the requirements of this EMP. In all cases the more restrictive requirements will apply.

1.6 UPLAND CLEARING

The initial stage of construction involves the clearing of brush, trees, and tall herbaceous vegetation from the right-of-way. Clearing may be accomplished with chain saws, mowers, and hydraulic tree-cutting equipment.

1.6.1 Disposal of Non-Merchantable Timber

Unless otherwise directed by Enbridge, non-merchantable timber and slash will be disposed of by mowing, chipping, grinding, and/or hauling off site to an approved disposal facility or used in stabilizing erodible slopes or construction entrances. In non-agricultural, non-wetland areas, chips may be uniformly broadcast (less than 1 inch thickness) across the ROW where they would ultimately be incorporated into the topsoil layer during grading activities, with landowner approval. Burning of non-merchantable wood may be allowed only where the Contractor has acquired all applicable permits and approvals (e.g. agency and landowner) and in accordance with all state and local regulations. Burning will not be allowed within 100 feet of a wetland or waterbody without site specific approval from Enbridge.

The Contractor must provide Enbridge with copies of these permits and/or approvals prior to initiating burning. Burning will not be allowed in wetlands. No chips, mulch, or mechanically cut woody debris will be stockpiled in a wetland and no upland woody debris will be disposed of in a wetland (see section 3.3 for further information on clearing in a wetland). Non-merchantable timber may not be disposed of by placing it off the right-of-way. No woody debris disposal will be allowed in agricultural areas or wetlands.

1.6.2 Disposal of Merchantable Timber

All merchantable timber will be the property of the company and the Contractor will be responsible for merchandising timber. If a commercial buyer cannot be found, the timber may be considered non-merchantable and disposed of as referenced in Disposal of Non-Merchantable Timber.

1.6.3 Upland Grading and Stump Removal

Grading generally follows clearing and involves leveling and smoothing the construction right-of-way, including TWS, and EWS areas as necessary, to create a safe, even working surface for equipment and vehicles. To facilitate proper cleanup and restoration in upland areas, tree stumps outside the ditchline will be ground no less than four-inches below normal ground surface or removed and hauled off to an approved disposal facility. Stumps in the ditch line will be completely removed, ground, and/or hauled off to an approved disposal facility. Topsoil and subsoil disturbed during grading operations will not be mixed with foreign material (e.g., stumps and brush).

1.6.4 Fencing

Before or during clearing of the right-of-way, existing fences and livestock barriers will be cut as necessary to access the right-of-way. Existing fencing will be braced and secured prior to cutting to prevent the slacking of wires. Temporary gates and/or fencing will be installed

where necessary to maintain existing access restrictions, contain livestock and protect sensitive areas. These temporary measures will remain in place until construction is completed and permanent repairs or new fencing can be installed.

1.6.5 Trees and Shelterbelts

Care will be taken to minimize tree removal. To the extent practicable, wind breaks and shelterbelts will be crossed by minimizing the width of the right-of-way. When clearing, trees will be felled onto the right-of-way to minimize damage to off-right-of-way vegetation. Shelterbelts within the TWS must be reestablished in accordance with applicable project permits and/or landowner agreements.

1.6.6 Irrigation Systems

If pipeline construction activities interfere with the operation of spray irrigation systems, Enbridge will establish with the landowner or Tenant, an acceptable amount of time the irrigation system may be out of service. If feasible, temporary measures will be implemented to allow an irrigation system to continue to operate across the right-of-way during pipeline construction. Any damage to irrigation systems caused by construction-related activities will be repaired following backfilling.

1.6.7 Drain Tile Inlets

Enbridge will attempt to locate existing drain tile inlets that are located near the construction work area prior to construction. Drain tile inlets will be marked using flags. Located drain tile inlets with the potential to receive stormwater from the construction project will be protected by using the appropriate ECDs until sources with the potential to discharge has been stabilized. The determination of the specific ECD will be made based on the location of an inlet with respect to the project area, drainage area from the construction work area to the inlet, topography, vegetation, soils, and accessibility to the inlet. Where drain tile inlets are located off of Enbridge's right-of-way, Enbridge may not have authorization to install ECDs at the inlet site. In these cases, sediment control measures (typically silt fence) will be installed along the edge of the construction work area that drains to the inlet structure.

1.6.8 Upland Topsoil Segregation

Topsoil generally has physical and chemical properties that are conducive to good plant growth. Because subsoil properties are usually less favorable, mixing of topsoil and subsoil can result in lowering the overall productivity of soils. To prevent soil mixing during construction, topsoil will be segregated in selected areas where soil productivity is an important consideration. A visible separation must be maintained between the topsoil and subsoil piles to prevent mixing. These areas include cropland, hay fields, pasture, residential areas and other areas as requested by the landowner. Topsoil will not be used to construct trench breakers (see section 1.6.10) or to pad the pipe. Gaps must be left in stockpiled topsoil and spoil piles at water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage.

Topsoil Segregation Methods

The following topsoil segregation methods may be employed during construction:

- Ditch Plus Spoil Side (see Figures 2A and 2B)
- Full Right-of-Way (see Figures 3A and 3B)

- Trench Line Only (see Figures 4A and 4B)

The Ditch-Plus-Spoil topsoil segregation method will typically be used in active cropland unless full construction right-of-way width topsoil segregation is requested by the landowner. The Trench-Line-Only topsoil segregation method may be used where Enbridge determines that the width of the construction right-of-way is insufficient for other methods to be used. Enbridge may also use the Trench-Line-Only topsoil segregation method in areas where there is a thick sod layer such as in hay fields, pastures, golf courses, and residential areas, unless otherwise requested by the landowner.

Topsoil is not typically segregated in forested areas, standing water wetlands, and nonagricultural open areas. However, in areas of steep side slopes adjacent to wetlands and waterbodies, including forested areas, where subsoil will be excavated (e.g. two-toned, side-cut, etc.) to create a level workspace, topsoil will be segregated to the extent practicable and at the direction of Enbridge.

Depth of Upland Topsoil Stripping

Topsoil will be stripped to a maximum depth of 12 inches in cultivated lands, unless otherwise requested by the landowner. Additional space may be needed for spoil storage if more than 12 inches of topsoil are segregated. If less than 12 inches of topsoil are present, the Contractor shall attempt to segregate to the depth that is present.

1.6.9 Temporary Erosion and Sediment Controls

ECDs are intended to slow the velocity of water off-site to minimize erosion, stop the movement of sediments off the construction right-of-way, and prevent the deposition of sediments into sensitive resources that may be on or adjacent to the right-of-way. ECDs typically used are silt fence and/or trenched-in and staked straw bales and other barriers such as compacted earth (e.g., drivable berms across travel ways), sand bags, or other appropriate materials. If temporary ECDs are removed during the day to allow equipment access, they must be reinstalled at the end of the day.

Temporary ECDs will be installed after clearing and prior to grubbing and grading activities at the base of sloped approaches to streams, wetlands, and roads. Temporary ECDs will also be installed at the edge of the right-of-way as needed, and/or in other areas determined by the EI to slow water leaving the site and prevent siltation of waterbodies and wetlands downslope or outside of the construction right-of-way (e.g., swales and side slopes). Temporary ECDs will be placed across the entire construction right-of-way at the base of slopes greater than five percent where the base of the slope is less than fifty feet from tile line inlets, drainage ways, wetlands and/or waterbodies until the area is revegetated and there is no potential scouring or sediment transport to surface waters.

If silt fence is in use, when the depth of sediment reaches about one-third of the height, the sediment will be removed. Non-functional ECDs will be repaired, replaced, or supplemented with functional structures as soon as possible, but no later than 24 hours after discovery.

Temporary ECDs installed across the travel lane may be removed during active daytime construction; however, these must be reinstalled after equipment passage is completed or activities in the area are completed for the day. These ECDs must also be repaired and/or

replaced prior to forecasted inclement weather. The Contractor is responsible for monitoring weather conditions and adjusting resources as needed to address pending and/or existing weather conditions.

Temporary Stabilization

Installation of temporary seeding, mulch, and erosion control mats may be necessary in certain locations if there are construction delays within a spread of at least 21 days. The Contractor may be required by Enbridge to install temporary stabilization materials sooner based on site conditions, or other conditions that increase sediment transport potential. Temporary seeding will be conducted in accordance with Enbridge's Revegetation and Restoration Monitoring Plan.

On slopes greater than 5% that would be exposed over the winter and drain to surface waters, category 3 or similar quality erosion control blanket will be installed on exposed slopes before snowfall to ensure maximum protection of exposed slopes prior to spring melt off, and the frequent winter storms that occur in northern Minnesota and Wisconsin in March and April.

Mulch

Mulch will be applied as indicated in Enbridge's Revegetation and Restoration Monitoring Plan. If exposed soils have not been stabilized prior to freezing of the ground, and soil conditions are such that disking is still effective, crimp in straw mulch to help stabilize these areas, but on steeper slopes blanket is still preferable.

1.6.10 Temporary Slope Breakers

Temporary slope breakers will to be installed to minimize concentrated or sheet flow runoff in disturbed areas in accordance with the following maximum allowable spacing unless otherwise specified in permit conditions.

Slope (%)	Approximate Spacing (ft)
1	300
2	200
3-5	150
>5	<100

If the length of the slope is less than the distance of the required spacing, slope breakers are not required unless a sensitive resource area (*e.g.*, wetland) is located immediately down slope, or as direct by the Environmental Inspector. Temporary slope breakers may be constructed using earthen subsoil material, silt fence, hay bales or in non-agricultural land rocked trenches may be used. On highly erodible slopes, slope breakers in the form of either earthen berms or rocked trenches will be used whenever possible.

Temporary slope breakers will be constructed according to the following specifications:

- earthen berms will be installed with a two to four percent out slope, with a minimum four foot base and a minimum height of 1.5 feet (see Figures 5 and 6);
- hay bales used as slope breakers will be trenched in and staked so as to not allow spacing between bales or allow flow underneath the bales;

- the outfall of temporary slope breakers will be directed off the construction right-of-way into a stable well-vegetated upland area or into an appropriate energy-dissipating sediment control device (e.g., silt fence, straw bales, rock aprons) to prevent the discharge of sediments (see Figures 7 and 8);

- proper slope breaker outfalls will be established where topsoil segregation and/or grading has created a barrier at the edge of the construction workspace;

- gaps will be created through spoil piles where necessary to allow proper out letting of temporary berms;

- temporary slope breakers will be inspected daily and repaired as necessary, but no more than 24 hours after discovery, to maintain operational integrity and prevent erosion in active construction areas.

1.6.11 Noise and Dust Control

The Contractor will take all reasonable steps to control construction-related noise and dust near residential areas and other areas as directed by Enbridge. Control practices may include wetting the right-of-way and access roads, limiting working hours in residential areas, reestablishment of vegetation and/or additional measures as appropriate based on site-specific conditions.

1.7 PIPE DELIVERY, BENDING & WELDING

Typically, individual joints of pipe will be strung along the construction right-of-way before excavating the pipeline trench. This operation involves specially designed equipment to deliver pipe from pipe storage yards to the right-of-way. Where practical, Enbridge will drive stringing trucks along an alignment which corresponds closely to the pipeline centerline to minimize the potential for soil compaction.

After pipe stringing is complete, the pipe will be bent, as necessary, to conform to changes in ground contour and pipeline alignment. Individual pipe joints will be welded together and the welds will be radiographically inspected. The welds will then be coated to protect them from corrosion.

1.8 UPLAND TRENCHING

Trenching in uplands consists of excavating the trench for the pipeline, and is typically accomplished with a backhoe excavator or a rotary wheel ditching machine. Excavated material will be sidecast (stockpiled) within the approved construction right-of-way separate from topsoil (see section 1.6.8), and stored such that the area subject to erosion is minimized. Enbridge will coordinate with Landowners to minimize disruption of access caused by the trench during construction. Where deemed appropriate by the company, Enbridge will leave plugs of soil in the ditch or will construct temporary access bridges across the trench for the landowner to move livestock or equipment. Trenches will also be sloped where started and ended to allow ramps for wildlife to escape.

1.8.1 Timing

The length of time a trench is left open will be minimized to ensure that installation of the pipe and restoration of the right-of-way occurs in a timely fashion. Enbridge will limit the amount

of excavated open trench to two days of anticipated welding production or approximately 14,400 feet per spread, per pipe. Site specific activities such as HDDs, guided bores, road bores and valve work may be performed independent of a spread. Each spread will be fully equipped and staffed to operate independently of another.

1.8.2 Pipeline Depth

At a minimum, the pipeline will be buried in accordance with U.S. Department of Transportation regulations (40 CFR Part 195), which stipulate a minimum of three (3) feet of top cover for normal excavations, and 18 to 30 inches of cover for rock excavations (depending on the location), to prevent damage to the pipeline from normal use of the land.

For the Alberta Clipper and Southern Lights Diluent Projects, the depth of cover will vary from 36 inches to 72 inches, depending on state law, permit requirements, landowner agreements, and site-specific conditions (e.g., depth of drain tile). If a state-level agency specifies a more stringent requirement for pipeline depth than the DOT and/or landowner requirements, the Company may request a waiver of that requirement. Increased pipeline depth will result in greater amounts of ditch spoil and, consequently, may require additional temporary workspace for storage of the spoil.

1.9 PIPE INSTALLATION

Once the trench has been inspected for proper depth, rocks, or other obstructions, the welded pipe is lowered into the trench. In rocky soils, the pipe may be wrapped with a protective shielding if necessary to prevent damage to the pipe coating during backfilling.

1.10 TRENCH BREAKERS

Trench breakers will be installed as deemed necessary by Enbridge in sloped areas after the pipe has been lowered into the trench. Trench breakers protect against subsurface water flow along the pipe after the trench is backfilled. Trench breakers will be constructed with bags filled with rock-free subsoil or sand. They will be placed from the bottom of the trench to near the top of the trench, completely surrounding the pipe (see Figures 9 and 10). The following conditions apply to the placement and installation of trench breakers unless otherwise directed by Enbridge:

- Trench breakers will be spaced as described for permanent berms (see section 1.6.10) or as otherwise specified by Enbridge.
- Trench breakers will be installed on slopes greater than five percent adjacent to streams, wetlands, or other waterbodies.
- Topsoil will not be used to construct trench breakers.
- Where the pipeline exits a wetland towards areas of lower relief, trench breakers will be installed where there is a potential for underground drainage along the pipe in order to prevent wetland or waterbody drainage

1.11 DRAIN TILE REPAIR

Where drain tiles are cut during trenching, the locations will be flagged by the Contractor and the Contractor will notify the EI and/or Agricultural Inspector of the locations. The Contractor will probe each drain tile line that is crossed by the trench using a sewer rod or pipe

snake (or equivalent), prior to backfilling, to determine if the tile lines were damaged during construction. Drain tiles damaged during construction will be repaired to their preconstruction condition or better.

1.12 UPLAND BACKFILLING

Backfilling follows pipe installation and consists of replacing the material excavated from the trench. In areas where topsoil has been segregated, the subsoil will be replaced first, and the topsoil will be spread uniformly over the area from which it was removed. Prior to backfilling, the trench shall be dewatered in accordance with the methods discussed in EMP section 5.1.

1.13 WET WEATHER SHUTDOWN

During construction, certain activities may be suspended in wet soil conditions, based on consideration of the following factors:

- plasticity of the surface soil to a depth of approximately four to eight inches;
- extent of surface ponding;
- extent and depth of rutting and mixing of soil horizons;
- areal extent and location of potential rutting and compaction (i.e., can traffic be rerouted around wet area); and
- type of equipment and nature of the construction operations proposed for that day.

If the above factors cannot be achieved to the satisfaction of the Enbridge, the Contractor shall cease work in the applicable area until such a time that Enbridge determines that site conditions are such that work may continue.

The Contractor is responsible for appropriately planning for work, considering for the potential for wet conditions, and being prepared to implement mitigative measures in the event of wet weather conditions. This is particularly important when conducting work in unsaturated wetlands. The Contractor is responsible for implementing any and all such corrective measures should conditions subsequently worsen where the above described criteria cannot be met.

1.14 CONTROLLING SPREAD OF UNDESIRABLE SPECIES

It is Enbridge's intent to minimize the potential introduction and/or spread of undesirable species (i.e., invasive species and noxious weeds) along its right-of-way due to pipeline construction activities. It is not practicable for Enbridge to eradicate undesirable species along its right-of-way where undesirable species are present adjacent to Enbridge's right-of-way. Enbridge will minimize the potential for the establishment of undesirable species by minimizing the time duration between final grading and permanent seeding. Enbridge will also require that construction equipment be cleaned before arriving on site to prevent the introduction of undesirable species to the project area. A more detailed discussion of controls for noxious weeds is provided in Enbridge's Noxious Weed Plan.

1.15 CLEANUP AND ROUGH/FINAL GRADING

Initial cleanup and rough grading activities may take place simultaneously. Cleanup involves removing construction debris (including litter generated by construction crews and excess rock). Rough and final grading includes restoring the contours as near as practicable to preconstruction conditions, returning the topsoil where topsoil has been stripped, preparing a seedbed (where applicable) for permanent seeding, installing or repairing temporary erosion control measures, repairing/replacing fences, and installing permanent erosion controls

1.16 TIMING

The Contractor shall begin cleanup and rough grading (including installation of temporary erosion and sediment control measures) within 24 hours after backfilling. The Contractor shall attempt to complete this cleanup within 72 hours, weather and soil conditions permitting.

Where two pipelines (Alberta Clipper and Southern Lights Diluent) are being installed, timing of cleanup and rough grade will be applicable after the installation of the second pipeline.

1.17 PERMANENT EROSION AND SEDIMENT CONTROLS

During final grading, slopes in areas other than cropland will be stabilized with erosion control structures (see Figure 11). Erosion control treatments of specific physical land features are described below.

Slopes

Permanent berms (diversion dikes or slope breakers) will be installed on all slopes, according to the following maximum spacing requirements unless otherwise specified in permit conditions:

Slope (%)	Approximate Spacing (ft)
<5	125
5-10	100
10-20	75
20-30	50
>35	25

Permanent berms will be constructed according to the following specifications:

- Permanent berms will be installed with a two to four percent outslope.
- Permanent berms will be constructed of compacted earth.
- The outfall of berms will be directed toward appropriate energy-dissipating devices, and off the construction right-of-way if possible
- Permanent berms will be inspected and repaired as deemed necessary by Enbridge to maintain function and prevent erosion. Figures 5 and 6 illustrate berm specifications.

- Erosion control blankets (curlex, jute, or equivalent) will be placed on slopes over 30 percent (see Figure 12) or that are a continuous slope to a sensitive resource area (e.g., wetland or waterway).

1.18 SOIL COMPACTION TREATMENT

Cultivated fields and compacted or rutted areas will be tilled with a deep tillage device or chisel plowed to loosen compacted soils. If subsequent construction and cleanup activities result in further compaction, additional measures will be undertaken to alleviate the soil compaction.

1.19 STONE REMOVAL

A diligent effort will be made to remove excess stones larger than four inches in diameter from the upper 12 inches of soil or as specified in permit conditions or landowner agreements. Stone removal efforts will cease when the size and density of stones on the right-of-way are similar to undisturbed areas adjacent to the right-of-way. Excess rock will be piled in upland areas where landowner permission has been obtained, or will be hauled off-site to an Enbridge approved disposal site.

1.20 OFF-ROAD VEHICLE CONTROL MEASURES

Off-road vehicle control measures will be installed as requested by Landowners or as directed by land management agencies. No Trespassing signs will be installed at aboveground facilities, according to the provisions of M.S. 609.6055 (Trespass on Critical Public Service Facility; Utility; or Pipeline) to provide clear notice to the public and protect the integrity of the pipeline. All fences and gates removed or damaged will be repaired or replaced.

1.21 REPAIR OF DAMAGED CONSERVATION PRACTICES

All soil conservation practices (such as terraces, grassed waterways, etc.) that are damaged by the pipeline construction will be restored to preconstruction conditions to the extent practicable.

1.22 LAND LEVELING FOLLOWING CONSTRUCTION

Following the completion of the pipeline, the right-of-way will be restored to its pre-construction conditions as practical. Should uneven settling or documented surface drainage problems occur following the completion of pipeline construction, Enbridge will take appropriate steps to remedy the issue.

Permanent soil erosion and sediment control will begin as soon as soil conditions permit seed bed preparation and seed germination. Actively cultivated lands will be restored but will not be reseeded unless requested by the landowner.

2.0 STREAM AND RIVER CROSSING GENERAL REQUIREMENTS

Pre-construction planning is an essential part of stream crossings. Stream crossing requirements, including construction methods, timing, erosion control, and restoration are described in this section and in the stream crossing permits issued by state and federal agencies. If the Contractor considers certain parts of these procedures to be technically impractical due to site-specific engineering constraints, the Contractor may seek modifications through the On-Site Modification Request Process. The On-Site Modification Request Process will be developed in conjunction with state and federal regulatory agencies and may differ between states and will be provided in Enbridge's Construction Environmental Control Plans (CECP). Prior to construction, the Contractor must identify alternative provisions that would provide an equal or greater level of protection to stream and river ecosystems. Enbridge will review the Contractor's alternatives and consult with appropriate regulatory agencies. The Contractor must receive written approval from Enbridge prior to implementing the alternatives. The EI will confer with the Independent Environmental Monitor during wet and high runoff conditions to determine whether conditions warrant additional considerations for construction activities.

The procedures in this section apply to streams, rivers, and other waterbodies such as jurisdictional ditches, ponds, and lakes. These procedures require that judgment be applied in the field and will be implemented under the supervision Enbridge. The intent of the mitigation procedures is to minimize construction-related disturbance to streams and waterbodies by limiting the duration of construction in these areas and by minimizing erosion and sedimentation.

2.1 TIME WINDOW FOR CONSTRUCTION

In-stream trenching will be conducted during periods permitted by the appropriate regulatory agencies and applicable permits.

2.2 PRE-CONSTRUCTION CONSIDERATIONS

2.2.1 Hazardous Materials

Hazardous materials, chemicals, fuels, lubricating oils, will not be stored and/or concrete coating activities will not occur within 100 feet of streams and waterbodies. Refer to Enbridge's Spill Prevention, Containment and Control Plan (Spill Plan) for additional requirements pertaining to hazardous materials.

2.2.2 Refueling/Equipment Care

Construction equipment will be refueled at least 100 feet from streams and waterbodies. Where the Contractor and EI determines that conditions require construction equipment (e.g., barge-mounted backhoes, trench dewatering pumps) to be refueled within 100 feet of streams, the Contractor must follow the procedures described in Enbridge's Spill Plan and implement additional provisions based on site-specific conditions. No equipment will be washed, lubricated, or parked overnight within 100 feet of streams or waterbodies. Maintenance of construction equipment will not be allowed within the 100 foot buffer zone without approval from the EI with additional special provisions for containment.

2.2.3 Alignment of Crossing

Stream crossings will be designed as close to perpendicular to the axis of the stream channel as engineering and routing constraints allow, creating the shortest crossing length.

2.3 CLEARING AND GRADING

The Contractor will leave a 20-foot buffer (from the waterbody bank) of undisturbed vegetation on all stream banks during initial clearing, except where grading is needed for bridge installation, or where restricted by applicable regulations and/or permit conditions (such as impaired waterways). Woody vegetation within this buffer may be manually cut and removed during clearing. Non-woody vegetation and the soil profile will be left intact until the Contractor is ready to begin trenching the stream crossing. The Contractor will properly install and maintain sediment control measures at the 20-foot buffer line adjacent to streams immediately after clearing and prior to initial ground disturbance (see Figures 13A, 13B, 14A, 14B, 15A, 15B, and 16). This buffer should not be confused with the 50-foot setback required for extra workspace (see section 2.4).

2.4 EXTRA WORKSPACE

Extra workspaces, as defined in Section 1.4, include work areas outside the boundary of the typical construction right-of-way. These spaces are typically used to assemble pipe segments and for temporary spoil storage. Clearing of forested and brushy areas for EWS will be avoided as much as possible. Woody vegetation in wetlands and riparian areas will typically not be cleared for the purpose of EWS unless approved by appropriate regulatory agencies as stipulated in permits issued for the project. Extra workspaces will be constructed as follows:

- Extra workspaces will be located at least 50 feet away from waters edge if topographic or other physical conditions such as stream channel meanders allow (see Figures 13A, 13B, 14A and 14B).

- If conditions do not allow for a 50-foot setback, extra workspaces should be located no closer than 10 feet from the waters edge, subject to site-specific approval by Enbridge.

- Extra workspaces will be limited to the minimum size needed to construct the stream crossing.

Minnesota Impaired Waters

In Minnesota, where discharges of stormwater may occur to waters designated under Section 303(d) of the Clean Water Act as Impaired Waters, additional BMPs will be implemented as indicated on the site-specific drawings provided in the Stormwater Pollution Prevention Plan. These additional measures may include the following:

- During construction all exposed soil areas with a slope of 3:1 or steeper and with a continuous positive slope to a designated Impaired Water must have temporary erosion protection or permanent cover within three (3) days after the areas is no longer actively being worked. All other slopes with a continuous positive slope to an Impaired Water must have temporary erosion protection or permanent cover within seven (7) days after the area is no longer actively being worked.

- An undisturbed buffer zone of not less than 100 linear feet from the special water shall be maintained at all times, or until the water crossing is installed. In areas where the pre-construction vegetation provides less than a 100 foot buffer, the existing buffer will be maintained and documented unless otherwise directed by the applicable agency.

2.5 BRIDGES

Temporary equipment bridges will be used on most waterways (upon approval by the appropriate agency), including small waterways such as ditches and intermittent streams, where there is a potential for stormwater runoff or rain events to transport sediment downstream from equipment crossing the waterway. Rocked "Texas crossings" may be approved in some locations, based on review by the appropriate state regulatory agency. Bridges will be constructed as described below and will be removed as soon as possible during final restoration. Bridges will not typically be installed at directionally drilled streams.

Only clearing equipment and equipment necessary for installation of equipment bridges will cross waterbodies prior to bridge installation unless restricted by applicable permits. The number of such crossings of each waterbody will be limited to one per piece of clearing equipment.

Bridges at jurisdictional waterbodies must be built and maintained in accordance with applicable permits.

2.5.1 Types of Bridges

Equipment bridges will be constructed using one of the following techniques:

- Timber mats (see Figure 17)
- Clean rock and flume (see Figure 18)
- Railroad flat cars
- Flexi-floats
- Other methods as approved by Enbridge and appropriate agencies

2.5.2 Bridge Design and Maintenance

Equipment bridges will be designed to withstand the maximum foreseeable flow of the stream, and will be securely anchored with cables or cable-like material. Bridges will not restrict flow or pool water while the bridge is in place, and will be constructed with clean materials. Bridges will be designed and maintained to prevent soil from entering the waterbody. Soil that accumulates on the bridge decking will be removed as needed, or deemed necessary by the EI.

2.6 STREAM AND RIVER CROSSING CONSTRUCTION METHODS

The following stream and river crossing methods are typically used, subject to further restrictions by Enbridge and applicable permits and subject to modifications as approved by appropriate regulatory agencies during construction. Only clearing equipment and equipment necessary to install equipment bridges will be allowed one opportunity to ford waters crossed by the project, unless otherwise restricted in applicable permits.

2.6.1 Wet Trench Method

Installation

The wet trench method will be used to cross streams and rivers not permitted to be flumed, dam and pumped, or directionally drilled (see Figures 13A and 13B). The following procedures will be used during wet trench crossings:

- Sediment control measures will be in place before grading from the 20-foot vegetative buffer left on each stream bank. Spoil containment structures will be installed back from the stream bank so that spoil does not migrate into the stream. Grading will be directed away from the waterbody to minimize the potential for sediment to enter the stream. Grading of stream banks will be restricted to the trench line and areas necessary for safe bridge installation.

- After grading, backhoes or draglines will be used to excavate the trench. Excavating equipment will operate from one or both banks, without entering the stream. If equipment must encroach into the stream, it will operate on clean construction mats. Streambed material will be segregated and placed within a spoil containment structure in approved construction work area limits.

- In-stream trenching and backfilling will typically be completed within 24 hours or less on minor waterbodies (<10 feet wide) and 48 hours or less on intermediate (>10 feet to 100 feet wide) or major waterbodies (>100 feet wide) (not including HDD crossings) or as directed by applicable permits.

- Earthen trench plugs (hard plugs) between the stream and the upland trench will be left undisturbed during excavation of the in-stream trench to prevent diversion of the stream flow into the open trench and to prevent water that may have accumulated in the adjacent upland trench from entering the waterbody. Trench plugs will be removed immediately prior to pipe placement, and then replaced when the pipe is in place.

- If trench dewatering is necessary, the pump intake will be suspended off the trench bottom and dewatering will take place into a sediment filter bag or a straw bale dewatering structure (see Figures 19 and 20). The trench will be dewatered in such a manner that no heavily silt-laden water flows into streams or wetlands (see section 5.1). Only non-woven fabric will be used for filter bags. It is the Contractor's responsibility to meet applicable water quality standards**.**

- Backfilling will begin after the pipe is positioned in the trench at the desired depth. Backfill material will consist of the spoil material excavated from the trench and parent streambed unless otherwise specified in state or federal permits. The in-stream trench will be backfilled so that the stream bottom is as near as practicable to its pre-construction contour, with no impediments to normal water flow.

Temporary Stabilization

Enbridge will restore the stream banks as near as practicable to pre-construction contours unless that slope is determined to be unstable. Once the banks have been reshaped,

ECDs will be installed within 24 hours of backfilling the crossing. Temporary slope breakers will be installed on all sloped approaches to streams in accordance with the spacing requirements outlined in Section 1.6.10.

A temporary seed mix (e.g., annual rye) and mulch and/or erosion control blankets will be installed within a 50-foot buffer on either side of the stream. Silt fence will be installed upslope of the temporary seeding area.

2.6.2 Dam and Pump Method

Installation

The dam and pump method is a dry crossing method that is suitable for low flow streams and is a preferred alternative to fluming for crossing meandering channels. The dam and pump method involves damming of the stream with sandbags, inflatable dams, and/or steel plates upstream and downstream of the proposed trench before excavation (see Figures 14A and 14B) and pumping water around the construction area. The following procedures will be used for dam and pump crossings:

- Pumping of the stream across the right-of-way will commence simultaneously with dam construction to prevent interruption of downstream flow. Stream flow will be pumped across the construction area through a hose and will be discharged onto an energy-dissipation device, such as plywood boards, to prevent scouring of the stream bed.

- The pumps will be located on the upstream side of the crossing and will be placed in impermeable, sided structures which will act as containment units for the pumps and fuel containers. The pumps used for the Dam and Pump crossing method will not be placed directly in the stream or on the streambed. The discharge will be directed into an energy dissipation device to prevent scouring of the streambed. Pumps will have a capacity greater than the anticipated stream flow. The pumping operation will be staffed 24 hours a day and pumping will be monitored and adjusted as necessary to maintain an even flow of water across the work area and near-normal water levels upstream and downstream from the crossing. A backup pump of equal or greater capacity will be on-site at all times in the event that the primary pump fails.

- Spill kits will be stored adjacent to pumps and fuel.

- Dams will be constructed of sandbags, inflatable dams, aqua-dams, and/or steel plates. The dams will prevent the stream from flowing into the construction area. The dams will be continuously monitored for a proper seal. Additional sandbags, plastic sheeting, steel plating, or similar materials will be used where necessary to minimize the amount of water seeping around the dams and into the construction work area.

- Backhoes located on one or both stream banks will excavate a trench across the stream bed. Spoil generated during trenching will be stored in a straw bale/silt fence containment area within approved construction work area limits. Existing streambed material will be segregated and placed within a spoil containment structure in approved construction work area limits.

- Trench (earth) plugs between the stream and the upland trench will be used during excavation of the in-stream trench to prevent diversion of the seeped groundwater into the open trench. Trench plugs will be removed immediately before pipe placement, and then replaced when the pipe is in place.

- Standing water that is isolated in the construction area by the dams will be pumped into a sediment filter bag or a straw bale dewatering structure located in such a manner that no heavily silt-laden water flows into streams or wetlands (see Section 5.0). Only non-woven fabric will be used for filter bags.

- Backfilling will begin after the pipe is positioned in the trench to the desired depth. Backfill material will consist of the spoil material and parent streambed excavated from the trench unless otherwise specified in state or federal permits. The in-stream trench will be backfilled so that the stream bottom is similar to its pre-construction contour, with no impediments to normal water flow.

Temporary Stabilization

Restoration of the right-of-way and the installation of temporary erosion controls will be similar to that described for the wet trench method above. Once the stream banks have been stabilized, the dams and pump will be removed.

2.6.3 Flume Method

Installation

The flume method is a dry crossing method that is suitable for crossing sensitive, relatively narrow streams that have straight channels and are relatively free of large rocks and bedrock at the point of crossing. This method involves placement of flume pipe(s) in the stream bed to convey stream flow across the construction area without introducing sediment to the water (see Figures 15A and 15B). The procedures for using the flume method are described below.

- The flume(s) will be of sufficient diameter to transport the maximum flows anticipated to be generated from the watershed. The flume(s), typically 40 to 60 feet in length, will be installed before trenching and will be aligned so as not to impound water upstream of the flume(s) or cause downstream bank erosion. The flumes will not be removed until after the pipeline has been installed, trench has been backfilled, and the stream banks have been restored.

- The upstream and downstream ends of the flume(s) will be incorporated into dams made of sand bags and plastic sheeting (or equivalent). The upstream dam will be constructed first and will funnel stream flow into the flume(s). The downstream dam will prevent backwash of water into the trench and construction work area. The dams will be continuously monitored for a proper seal. Adjustments to the dams will be made where necessary to prevent large volumes of water from seeping around the dams and into the trench and construction work area.

- After the stream bed is dewatered, backhoes located on one or both stream banks will excavate a trench across the stream bed. Spoil generated during trenching will be stored in a straw bale/silt fence containment area located away from the stream banks within approved construction work areas. Existing streambed material will be segregated and placed within a spoil containment structure in approved construction work area limits.

- Trench (earth) plugs between the stream and the upland trench will be used, during excavation of the in-stream trench to prevent diversion of the stream flow into the open trench. Trench plugs will be removed immediately before pipe placement, and then replaced when the pipe is in place.

- If trench dewatering is necessary to complete the installation of the pipe, the discharge will be pumped into a sediment filter bag or a straw bale dewatering structure in such a manner that no heavily silt-laden water flows into streams or wetlands (see Section 5.0). Non-woven fabric must be used for filter bags.

- Backfilling will begin after the pipe is positioned in the trench to the desired depth. Backfill material will consist of the spoil material excavated from the trench and parent streambed unless otherwise specified in state or federal permits. The in-stream trench will be backfilled so that the stream bottom is similar to its pre-construction contour, with no impediments to normal water flow.

Temporary Stabilization

Restoration of the right-of-way and the installation of temporary erosion controls will be similar to that described for the wet trench method above. After the stream banks have been stabilized, the dams will be removed from the stream bed allowing water to resume its flow in the channel. The flume pipe(s) and dams will then be removed.

2.6.4 Directional Drill and/or Guided Bore Method

Installation

Installing the pipe underneath a stream will involve placing a drill unit on one side of the stream (see Figure 16). A small-diameter pilot hole will be drilled under the stream along a prescribed profile. After the pilot hole has been completed, barrel reams will be used to enlarge the pilot hole to accommodate the desired pipeline diameter. Drilling mud will be necessary to remove cuttings and maintain the integrity of the hole. Water from an approved source (typically the river to be crossed) will be used to prepare the slurry of drilling mud, and will be appropriated according to applicable permits. The pipe section will be pulled through the hole by the drilling rig and welded to the adjoining sections of pipe on each side of the river.

Drilling Mud

During drilling operations, drilling mud and slurry will be stored back from the river bank in an earthen berm sediment control structure, in tanks, or by other methods so that it does not flow into the stream, adjacent wetlands or off the workspace.

Enbridge has developed a contingency plan to address measures to be performed in the event of a release of drilling mud onto the ground surface or waterbody. See the Enbridge *Drilling Mud Containment, Response, and Notification Plan* for additional details.

After the pipe is in place, excess drilling mud and slurry will be spread over an upland area approved by Enbridge and the landowner, or hauled off site to an Enbridge approved disposal location.

Temporary Stabilization

The directional drilling/guided bore method normally does not result in the disturbance of the stream banks or riparian vegetation, which reduces the potential for erosion and sedimentation at the stream crossing. Consequently, temporary erosion control measures that are installed at open-cut crossings typically are not necessary for drilled/bored crossings.

2.7 DRAINAGE DITCHES AND INTERMITTENT STREAMS

Intermittent streams and agricultural ditches will typically be crossed using the wet trench method (see section 2.6.1) as specified in the applicable permits. For dry intermittent streams and agricultural drainage ditches, standard upland construction procedures may be used, which involve stringing, welding, excavating the trench with backhoes, installing the pipe in the trench, and backfilling the trench with native material. The banks of each crossing will be reshaped, mulched, and, if required, seeded in accordance with Enbridge's Revegetation and Restoration Monitoring Plan to stabilize the crossing until permanent erosion control is implemented. No refueling, fuel storage, or equipment maintenance is allowed within 100 feet of a drainage ditch or intermittent stream. Where dry swales cross the right-of-way, silt fence or straw bales will be installed at the edge of the right-of-way to prevent the flow of sediment from the right-of-way.

2.8 PERMANENT RESTORATION

Stream Banks

Stream banks will be stabilized with erosion control materials such as curlex or jute and seeded in accordance with Enbridge's Revegetation and Restoration Monitoring Plan. Permanent stabilization will be initiated within 24 hours after installation of the crossing, unless site and permit conditions delay permanent installation. Where the banks have been disturbed, Enbridge will restore the slopes as near as practicable to pre-construction contours unless that slope is determined to be unstable. Bank restoration will attempt to transition the disturbed areas into the natural stream bank with the intent to stabilize the bank and create a blended, natural appearance.

Berms or other sediment filter devices will be installed at the base of sloped approaches to streams greater than five percent and the outlet of the berm will be directed away from the stream into a well vegetated area (see Figures 5 and 6). Temporary sediment control devices will remain in place until the area has stabilized and adequate revegetation has established.

2.8.1.1 Vegetative Bank Restoration

Typically, waterbody banks will be restored as near as practicable to preconstruction contours after backfilling is complete and will be seeded with an appropriate seed mix as specified in the Revegetation and Restoration Monitoring Plan. Erosion controls, (e.g. erosion control blankets, silt fences, etc.) will be installed as necessary based on site-specific conditions.

2.8.1.2 Bioengineering Restoration

Enbridge will plant willows and/or other suitable species (sometimes called "bioengineering") at select streambank locations where woody vegetation exists at the time of

construction, and where installation of the pipeline creates unstable soil conditions due to either stream meanders or stream crossing angle, Enbridge will consult with the appropriate agencies to identify areas that may need the additional site stabilization. Species and planting densities will be determined on a site-specific basis.

2.8.1.3 Rock Riprap Restoration

Unstable soils and/or site-specific factors such as stream velocity and flow direction may require additional restoration efforts, such as installation of rock rip-rap, to stabilize disturbed stream banks, Rock rip-rap will be used only where site-specific conditions require and where applicable state permits or approvals have been acquired. Geotextile fabric and rock riprap will be placed according to site and permit conditions (see Figure 21). Disturbed soils upslope and on either side of the riprap will be prepared for seeding according to the Revegetation and Restoration Monitoring Plan and other stream bank protection requirements.

2.8.1.4 Bridge Removal

Equipment bridges will be removed during final cleanup or, if access is needed, after final cleanup and permanent seeding. Restoration of the bridge area will be completed upon bridge removal. Bridges installed for winter construction (if applicable) will be removed before spring break up.

2.8.1.5 Swales

Swales will be restored as near as practicable to original contours. Swales will be seeded and either mulched with straw or erosion control blankets will be installed to the perceivable top of bank for the width of the right-of-way.

2.8.1.6 Drainage Ditches and Intermittent Streams

Drainage ditches and intermittent streams will be permanently restored and stabilized with erosion control blanket, permanent seeding, or other appropriate measures.

3.0 WETLAND CROSSING GENERAL REQUIREMENTS

Typical pipeline construction in wetlands will consist of clearing, stringing, trenching, dewatering, installation, backfilling, final grading, cleanup, and revegetation. However, due to the unstable nature of some wetland soils, construction activities may differ somewhat from those described for upland areas. Construction activities will be minimized in wetlands to the extent practicable. Enbridge will also use special construction techniques to minimize the disturbance to plants and soils and to protect wetland hydrology.

Pre-construction planning is an essential part of wetland crossings. Wetland crossing requirements, including construction methods, timing, erosion control, and restoration, are described in this section and in the wetland crossing permits issued by state and federal agencies. If the Contractor considers certain parts of these procedures to be technically impractical due to site-specific engineering constraints, the Contractor may seek modifications via the On-Site Modification Request Process. The On-Site Modification Request Process will be developed in conjunction with state and federal regulatory agencies and may differ between states. Prior to construction, the Contractor must identify alternative provisions that would provide an equal or greater level of protection to wetland ecosystems. Enbridge will review the Contractor's alternatives and consult with appropriate regulatory agencies. The Contractor must receive approval from Enbridge prior to implementing the alternatives.

The procedures in this section apply to all jurisdictional wetlands that will be affected by the project. These procedures require that judgment be applied in the field and will be implemented under the supervision of the Enbridge and the EI. The intent of these procedures is to minimize construction-related disturbance and sedimentation of wetlands and to restore wetlands as nearly as possible to pre-existing conditions.

3.1 WETLAND ACCESS

The Contractor must use the construction right-of-way and only approved roads to access wetland areas.

3.2 SPILL PREVENTION

3.2.1 Storage of Fuels and Other Materials

No storage of hazardous materials, chemicals, fuels, and lubricating oils, and no concrete coating activities will be permitted in, or within 100 feet of, any wetland. Vehicles and equipment left on the right-of-way overnight must be parked at least 100 feet from a delineated wetland.

3.2.2 Refueling, Fuel Handling, and Equipment Maintenance

Construction equipment will be refueled in upland areas at least 100 feet from a wetland. Where the Contractor and EI determines that conditions require construction equipment (e.g., swamp hoe, trench dewatering pumps, or portable generators) to be refueled within 100 feet of a wetland, the Contractor must follow the procedures described in Enbridge's Spill Plan and implement additional provisions based on site-specific conditions. No equipment will be washed, lubricated, or parked overnight within 100 feet of a wetland. Maintenance of construction equipment will not be allowed within the 100 foot buffer zone without approval from the EI with additional special provisions for containment.

3.3 CLEARING

Clearing the construction right-of-way in wetlands will be similar to clearing in uplands. For construction to proceed, obstructions (e.g., trees, brush, and logs) need to be removed. Typically, low ground pressure equipment will be used, limiting disturbance to the wetland. When clearing in wetlands, the following restrictions apply:

- The construction right-of-way width will typically be limited to 125 feet or less.

- Staging areas, additional spoil storage areas, and other additional work areas will be located in upland areas at least 50 feet away from wetland boundaries (see Figures 23A and 23B), where site conditions permit. If site conditions do not permit a 50-foot setback, then these areas will be located as far away from the wetland as is practicable. Vegetation will not be cleared between these areas and the wetland in any event. No construction activities including vegetation clearing or earthwork will occur between the EWS and sensitive resource areas (wetlands or waterways).

Extra Workspace in Wetlands

Enbridge attempted to locate EWS outside of wetlands wherever practicable; however, EWS have been sited in select wetlands where the wetland is adjacent to a waterbody, road, railroads, foreign utility crossings and/or pipeline cross-over. Clearing of forested wetlands for EWS will be avoided as much as possible. Woody vegetation in wetlands will not be cleared for the purpose of EWS unless approved by appropriate regulatory agency.

- The size of the additional workspace areas will be limited to the minimum needed to construct the wetland crossing.

- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be removed from the wetland for disposal. Chips, hydro-axe debris, or similar can be left in the wetland if spread evenly in the right-of-way to a depth not to exceed 1 inch in thickness and in a manner, as determined by the EI, which will allow for normal revegetation.

3.4 GRADING IN A WETLAND

Grading in a wetland, if required, will be conducted in a manner consistent with applicable federal, state, and local permits. Grading activities will be confined to the area of the trench. Grading outside the trench is only permitted where required to ensure safety and restore the right-of-way after backfilling the trench.

ECDs (e.g., silt fence) will be installed across the entire construction right-of-way upslope of the wetland boundary, where necessary, to prevent sediment flow into the wetland. Where wetlands are adjacent to the construction right-of-way and the right-of-way slopes toward the wetlands, ECDs will be installed along the edge of the construction right-of-way as necessary to prevent sediment flow into the wetlands. ECDs will be installed along the edge of the construction right-of-way, as necessary, to contain spoil and sediment within the construction right-of-way through wetlands.

ECDs will be maintained in proper working order to prevent the flow of sediment into wetlands from spoil piles or sloped approaches that are adjacent to the wetlands. When the depth of sediment reaches one-third of the height of a sediment barrier, the barrier will be replaced and/or the sediment removed. Non-functional sediment-control measures will be repaired, replaced, or supplemented with functional features as soon as possible but in all cases within 24 hours of discovery.

3.5 CONSTRUCTION MATTING

Supplemental equipment supports, such as timber mats (see Figures 23A and 23B), will be used in wetlands to provide temporary portable support for heavy construction equipment to reduce ground pressure and minimize soil compaction and/or soil mixing. No more than two layers of equipment mats will be used to support equipment on the construction right-of-way unless prior approval is obtained from Enbridge. The Contractor is responsible for having a sufficient number of construction mats to perform the work. Tree stumps, brush riprap, imported soil, and rock fill may not be brought in to stabilize the right-of-way in wetlands. Timber riprap (also known as corduroy road) cannot be used without prior written approval from the company and the appropriate regulatory agencies. Pre-existing corduroy roads in wetlands may be used but may not be improved, maintained, restored, or replaced without site-specific authorization from applicable agencies. The Contractor will remove any portion of a pre-existing corduroy road damaged during construction activities where removal is practicable without causing significant additional wetland disturbance and/or disturbance outside of the construction work area. Subsoil excavated from the pipeline trench in the wetland may be placed on top of equipment mats for additional stabilization.

All timber mats, construction debris, and larger woody vegetative debris (greater than 1.5 inch diameter) will be removed during cleanup of wetlands.

3.6 TRENCHING

Excavation of the pipeline trench in wetlands typically will be accomplished using backhoe excavators. The duration of open trench will be minimized to the extent possible, but typically not longer than 24 hours.

3.6.1 Topsoil Segregation

Typically, when constructing in wetland areas without standing water, up to one foot of topsoil (organic layer) will be stripped from the trench line and stockpiled separate from trench spoil (see Figure 23A and 23B) as described in section 1.6.8: Trench-Line Only Topsoil Segregation Method. In standing water wetlands, organic soil segregation is not typically practical; however, Enbridge will attempt to segregate as much of the organic layer as possible based on site/saturation conditions. If normally unsaturated wetlands are saturated at the time of construction, topsoil segregation will be attempted according to Figures 23A and 23B and based on recommendations from the EI and appropriate regulatory agencies.

3.6.2 Trench Breakers

Where the EI determines that the pipeline trench has the potential to drain or partially drain a wetland, trench breakers will be installed as necessary to maintain the original wetland hydrology.

3.7 PIPELINE INSTALLATION

The following procedures are intended to minimize siltation and disturbance to wetlands during installation.

3.7.1 Push/Pull Method

Large wetlands with standing water can generally not be crossed with typical crossing methods. In these areas, the pipeline will be assembled in an upland area and positioned in the trench using the “push-pull" and/or "float" techniques.

Usually this fabrication requires use of extra temporary workspace adjacent to the right-of-way. The trench will be dug by a backhoe (or equivalent) supported on timber mats. The prefabricated section of pipeline will then be pushed-pulled into position or floated across the wetland. When the pipeline is in position, floats, if used, will be removed and the pipeline will sink into position. The trench will then be backfilled and the wetland will be restored by a backhoe or similar equipment working from construction mats or by low ground pressure equipment.

3.7.2 Non-Winter Construction within Extremely Saturated Wetlands

When completing construction within extremely saturated wetlands in non-frozen conditions, the Contractor will implement pipeline construction practices commonly used across the United States. Specialized equipment (e.g., floatation hoes) designed to operate in these unique conditions may be required to construct the pipelines.

Based on Enbridge’s past experience, the non-cohesive soils in these wetlands will likely result in the trench being wider than the typical trench width. Because the pipelines are being installed adjacent to existing pipelines, maintaining the safety and integrity of the existing pipelines is a concern. Where necessary, Enbridge will implement a 40-foot offset between pipelines (new and existing) in anticipation of slumping soils during excavations. Refer to Figures 24, 25, and 26 for typical right-of-way configurations in these select wetland conditions.

3.7.3 Temporary Erosion and Sediment Controls

ECDs at approaches to wetlands will be installed as described in section 1.6.9 and 3.4, according to the specifications presented on Figures 7 and 8.

3.7.4 Concrete Coating

Concrete will generally be mixed off-site, and concrete coated pipe will be transported to the right-of-way on trucks. If required, pre-fabricated concrete weights will also be used to provide negative buoyancy. Concrete weights will be manufactured off-site and transported to the right-of-way. Weights will be strung along the construction right-of-way, where necessary, until they are placed over the pipe within the excavated ditch. Limited mixing and coating activities may occur on the construction right-of-way for coating pipe joints and concrete weight repairs. Washing equipment used for mixing, pouring, casting, or coating will not be conducted within 100-feet of any wetland. Erosion and sediment controls will be installed downslope of equipment wash areas where needed to capture sediments and minimize erosion from runoff. Concrete coating on the pipe must be cured for a minimum of 3 days prior to installation in a wetland due to potential toxic effects on wetland and aquatic biota.

3.8 BACKFILLING

The Contractor shall restore wetlands as near as practicable to pre-construction conditions. During backfilling of wetland areas, subsoil material removed from the trench during construction will be replaced so that any crowning that remains will be within limits designated by applicable permits or licenses. After the trench has been backfilled with subsoil, previously segregated topsoil will be returned to the disturbed areas. Any excess backfill material will be removed to an upland area approved by Enbridge.

3.9 ROUGH GRADING, CLEANUP, AND TEMPORARY RESTORATION

Cleanup and rough grading activities may take place simultaneously. Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring original conditions within the disturbed areas (i.e., ditchline, spoil storage areas, and equipment travel lane) and installing or repairing temporary erosion control measures. Temporary slope breakers will be installed near the boundary between the wetland and adjacent sloped approaches, to prevent sediment flow into the wetland.

3.9.1 Timing

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting.

3.9.2 Temporary Stabilization

Where necessary to prevent erosion, disturbed wetland areas will be stabilized by seeding with a temporary cover in accordance with Enbridge's Revegetation and Restoring Monitoring Plan

No fertilizer, lime, or mulch will be applied in wetlands. Enbridge does not propose permanent planting or seeding in wetlands, except in accordance with restoration and compensatory mitigation plans and procedures still in development in cooperation with the U.S. Army Corps of Engineers. It has been Enbridge's experience that the natural seed bank within the wetland provides the most effective revegetation.

4.0 HIGHWAY, ROAD AND RAIL CROSSINGS

4.1 ADDITIONAL WORKSPACE

Additional workspaces for bored road and railroad crossings and open-cut road crossings will be determined on a site-specific basis. These workspaces will be adjacent to the road or railroad and limited to the size needed to contain spoil from the crossing.

4.2 MAINTENANCE

Roadway crossings will be maintained in a condition that will prevent tracking of mud onto the roadway. If mud is tracked onto a roadway, the Contractor shall remove accumulated material from the road and place within a sediment barrier as soon as possible, but in no circumstances more than 24 hours after discovery.

Rock tracking pads, constructed of stone no smaller than 4-inch or as required by the applicable permits, will be installed adjacent to paved public roads to prevent or minimize the tracking of soil onto the roadway. If the roadside ditch is part of a jurisdictional waterway, a permit must be obtained prior to installing the tracking pad or culvert. If permitted in wetlands, tracking pads will be limited in size to reduce impacts. Tracking pads installed in wetlands must be constructed with clean rock placed on geotextile fabric. All rock and fabric must be removed from the wetland during cleanup.

In the case of mud incorporation into the aggregate road surface, the fouled surface aggregate will be removed or covered with an equal layer of new aggregate (not less than six inches compacted depth). The new aggregate will be consistent with the existing road surface and must be approved by the landowner.

4.3 TEMPORARY EROSION AND SEDIMENT CONTROLS

Temporary ECDs (e.g., silt fence and/or double-staked straw bales) will be installed on sloped approaches to road crossings where vegetation has been disturbed (see Figures 27A and 27B) and as discussed in section 1.6.9.

5.0 CONSTRUCTION DEWATERING

5.1 TRENCH DEWATERING

Before the pipe is lowered into the trench, dewatering may be necessary to visually inspect the trench bottom for the presence of rocks. Trench dewatering may also occur where tie-in welds are necessary, at road-boring sites adjacent to wetlands or waterbodies where groundwater has seeped into the trench, locations where set-on weights are placed over the pipe, and in other areas where increased visibility or physical access to the trench is needed. Dewatering pumps and equipment placement are shown in Figures 19 and 20. Dewatering will be performed in accordance with applicable appropriation and discharge permits, but at a minimum, must comply with the following procedures:

- Dewatering of the trench will be conducted in a manner which will prevent soil erosion at the discharge point.
- Discharge rates will be monitored and adjusted as necessary to prevent failure of the dewatering structure and/or result in scouring at the discharge point.
- The trench will be dewatered into a well-vegetated upland area with an appropriate energy-dissipation device (see Figure 19). Whenever possible, the slope at the point of discharge will be away from any streams or wetlands.
- If the flow of a discharge cannot be kept out of streams, wetlands, drainage ditches, etc, the discharge shall be filtered by one of the methods described below. Dewatering discharge will be directed into a sediment filter bag or a straw bale/silt fence dewatering structure which discharges into a vegetated area to prevent heavily silt-laden water from flowing into wetlands and waterbodies (see Figures 19 and 20).
- Non-woven fabric filter bags must be used for dewatering.
- Filter bags and dewatering structures must be maintained in a functional condition throughout dewatering activity (e.g., clogged or ripped bags must be replaced) and will be attended at all times during active pumping. Non-functioning dewatering structures must be repaired prior to continuing dewatering activities. Accumulated sediment from the filter bags shall be spread in an approved location.
- The Contractor will assist Enbridge in complying with applicable permit requirements, including tracking volumes of water pumped, obtaining water samples (if needed) for testing, and taking necessary measures to meet effluent limitations.

5.1.1 Regulatory Notification and Reporting

Enbridge will notify appropriate state agencies prior to each discharge in accordance with its NPDES or state equivalent permit.

Reports regarding the volume and quality of the water withdrawn and discharged will be submitted by Enbridge, as required by the applicable state permit. The Contractor will assist

Enbridge in collecting appropriate data and any water samples required or in determining volumes of water appropriated.

5.1.2 Water Sampling

Water discharged from trench dewatering locations may need to be sampled as required by state-issued NPDES discharge permits. If required, the Contractor will assist Enbridge in obtaining these samples and will be responsible for complying with the permit limitations.

5.2 HYDROSTATIC TEST DISCHARGES

Hydrostatic testing involves filling the new pipeline segments with water acquired in accordance with applicable permits (See Section 6.0), raising the internal pressure level, and holding that pressure for a specific period of time per federal Department of Transportation specifications. Hydrostatic testing will be done to verify that there are no flaws in the pipe or welds. Pre-built sections may be hydrostatically tested prior to installation at significant streams and wetland crossings. Water used for hydrostatic testing will be discharged back to the waterbody it was appropriated from. After the hydrostatic test is completed, the line will be depressurized and the water expelled. During withdrawal and discharge, the water will be sampled as required by permits. Water volumes must be measured and recorded.

If site conditions or engineering constraints make adhering to these hydrostatic testing procedures and documentation impractical, Enbridge will propose alternative provisions to the regulatory agency issuing the NPDES permit. Any such alternative will provide an equal or greater level of protection to the environment than the condition from which Enbridge or its Contractor seeks relief.

5.2.1 Refueling

The operation and refueling of hydrostatic test equipment will be in accordance with the conditions outlined in Enbridge's Spill Plan.

5.2.2 Permit Requirements

Hydrostatic testing will be conducted in accordance with applicable appropriation and discharge permits obtained by Enbridge. Hydrostatic test waters will not be transferred from one waterbody to another, across watershed, or major drainage divides. Chlorinated source water will be sampled at appropriation. If chlorine levels are at or above aquatic toxicity standards, the water will not be discharged to a surface water.

5.2.3 Siting of Test Manifolds

Hydrostatic test manifolds will be installed where necessary to ensure proper test pressures. However, the selected location of test manifolds is based on engineering requirements to meet proper test pressures and incorporates changes due to topography. Where feasible, Enbridge will incorporate minor adjustments to the test manifold locations to avoid placement in wetlands and riparian areas. However, completely avoiding the placement of a test manifold in a wetland may not always be possible. The Contractor shall install appropriate erosion control measures where the EI determines that topographic conditions, primarily elevation changes, require test sections to be located in a wetland or riparian area.

5.2.4 Water Sampling

Water discharged from hydrostatic tests will be sampled as required by state-issued appropriation or discharge permits. Hydrostatic water discharges will comply with permit limitations as required by the applicable NPDES/SDS permit conditions. If required, the Contractor will assist Enbridge in obtaining these samples and will be responsible for complying with the permit limitations.

5.2.5 Best Management Practices

Prior to testing the pipeline, Enbridge will prepare the pipe by removing accumulated construction debris, mill scale, dirt and dust using a cleaning pig. The debris will be collected in a temporary receiver and shall be properly disposed of by the Contractor. Upon completion of the cleaning operation, the pipeline will be sealed with the test headers.

Test headers and pigs will be arranged to allow for rinse water to be installed ahead of the fill pigs. This rinse water will be collected and disposed by the Contractor at a licensed disposal facility, as necessary.

Following testing, the test section will be depressurized and the water will be discharged to a well-vegetated, upland area or an appropriate dewatering structure. Dewatering structure include geotextile filter bags and/or a hay bale structure that may or may not be lined with geotextile fabric. Direct discharges to surface waters will be directed with an energy dissipation device such as a splash pup.

At no time will the discharge rate exceed the applicable discharge rates specified in state-issued or other discharge permits. In the event no maximum discharge rate is identified, discharges shall be monitored and adjusted as necessary to avoid scouring or sediment transport from the discharge location.

5.2.6 Flow Measurement

The total volume of water discharged will be determined with a flow meter (or equivalent), or as required by the applicable state permit. The total volume of water discharged will not exceed the volume specified in the applicable permit.

6.0 WATER APPROPRIATION

6.1 GENERAL

Water may be drawn from local sources, such as lakes, streams, and private or municipal wells for construction activities such as dust control, horizontal directional drilling/guided boring, trench dewatering, and hydrostatic testing. The project will follow applicable permit conditions for the appropriation of water.

Where water is appropriated from lakes or streams, the intake hose will be suspended off of the stream or lake bottom and will be screened to prevent entrainment of fish. During withdrawal, adequate waterbody flow rates and volumes will be maintained to protect aquatic life and allow for downstream uses. The volume and rate of withdrawal will be monitoring to comply with applicable permit conditions.

6.2 WATER SOURCES

Water will only be withdrawn from sources approved by Enbridge and in accordance with applicable permits. No additives to the water are permitted unless written approval is received from Enbridge and applicable permits authorize such additives.

If appropriation is scheduled to occur during possible periods of low flow, including frozen conditions, a backup source will be identified.

6.3 FLOW MEASUREMENT

At no time will the withdrawal rate for the water source exceed the rate specified in the applicable permits.

The withdrawal rate and total volume of water appropriated must be measured with a flow meter (or equivalent) and recorded as required by the state-issued permit.

6.4 WATER SAMPLING

Where required by permit conditions, Enbridge will sample the water during appropriation. The Contractor will assist Enbridge in obtaining these samples.

6.5 REGULATORY NOTIFICATION AND REPORTING

Enbridge will notify appropriate state agencies of the time of appropriations if required by the state appropriations permits. Reports regarding the volume and quality of the water withdrawn will be submitted by Enbridge if required by the state permit.

7.0 REVEGETATION

General guidance regarding revegetation efforts is provided in this section. See Enbridge's Revegetation and Restoration Monitoring Plan for specific information. Permanent revegetation will involve preparing the seedbed and seeding disturbed, non-agricultural areas. The right-of-way will be seeded as soon as possible after backfilling, weather and soil conditions permitting. With the exception of wetland areas, fertilizer and pH modifying agents (e.g., lime) will be applied as specified by Enbridge, in consultation with appropriate state and federal agencies and Landowners.

The following steps will be taken to establish permanent vegetation in those portions of the site where the landowner does not plan to plant a crop during the next growing season.

- Seed will be purchased in accordance with Pure Live Seed (PLS) specifications for the seed mix.
- Seed will be used within 12 months of testing.

Legume seed will be treated with an inoculant specific to the species. When hydroseeding, four times the manufacturers recommended rate of inoculant will be used. Inoculated seed will not be held in a slurry with fertilizer for more than one hour.

A seed drill equipped with a cultipacker is preferred for applying seed, but broadcast or hydroseeding methods may be used at double the recommended seeding rate. When broadcast seeding, the seedbed will be firmed with a cultipacker or roller after seeding.

Specific seed mixes, application rates, and seeding dates are specified in Enbridge's Revegetation and Restoration Monitoring Plan.

Mulch will not be applied to cropland unless specifically requested by the landowner. In other areas, mulch will be applied according to the following specifications:

- After seeding, slopes greater than five percent or dry, sandy areas will be mulched with two tons per acre of straw or hay or as specified by Enbridge.
- All areas of dormant seeding must be mulched with two tons per acre of hay or straw or as specified by Enbridge.

Mulch will be anchored after placement to minimize loss by wind and water. If soil conditions allow, a mulch anchoring tool or farm disc set in the straight position will be used to crimp the mulch to a depth of two to three inches. Liquid tackifiers may be used with advance written approval from Enbridge.

Where conditions allow (e.g., unsaturated and unponded areas and wetland/upland boundaries), wetlands will be revegetated after final grading using the methods described in Enbridge's Revegetation and Restoration Monitoring Plan.

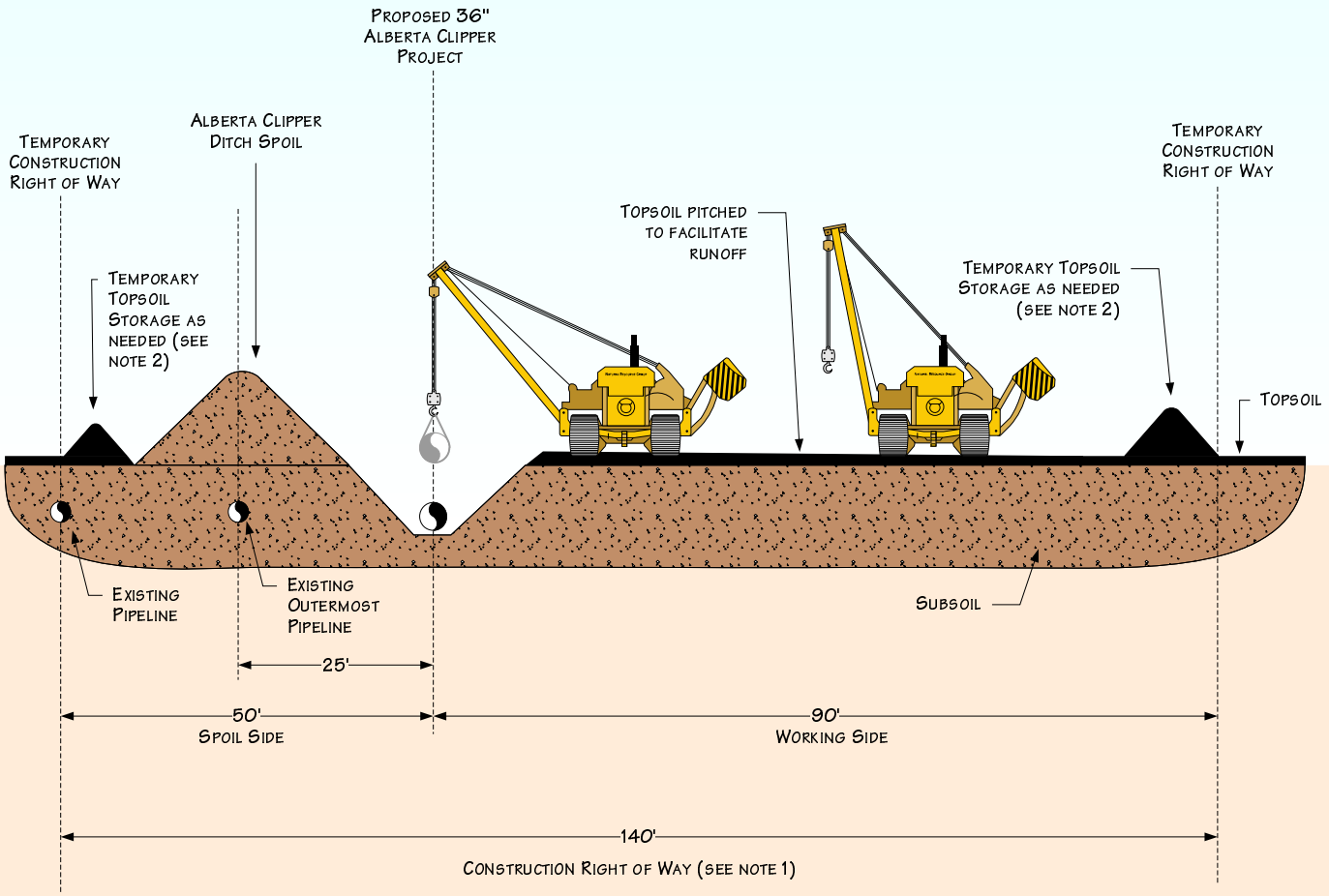
Permanent revegetation at stream crossings will be restored using the methods described in Enbridge's Revegetation and Restoration Monitoring Plan and section 7.0 of the EMP or as otherwise determined by appropriate regulatory agencies. Temporary fencing may be required to keep livestock off streambanks and other sensitive areas until re-establishment of vegetation.

8.0 WINTER CONSTRUCTION

At this time, winter construction plans have not been finalized for the Enbridge Alberta Clipper and Southern Lights Diluent Projects. When complete, Enbridge's winter construction plans will address right-of-way configuration, clearing, grading, erosion control, topsoil separation, and restoration during frozen ground conditions. The winter construction plans will be incorporated into this EMP (see Figures 28 through 32).

Environmental Mitigation Plan

Figures



Profile

Notes:

1. Construction Right of Way will typically be 140' wide. Spoil side will be approximately 50' wide.
2. This drawing reflects "Ditch Plus Spoil" side topsoil stripping procedure. Stockpile topsoil separately from ditch spoil shown or in other configuration approved by company.
3. The offset from outermost existing pipeline will be 25' for most locations but may be increased or decreased depending on the site specific construction requirements.

For environmental review purposes only.

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Figure 1A

Environmental Mitigation Plan
Typical Construction Layout
(Neche, ND to Clearbrook, MN)

DATE:	7/9/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL

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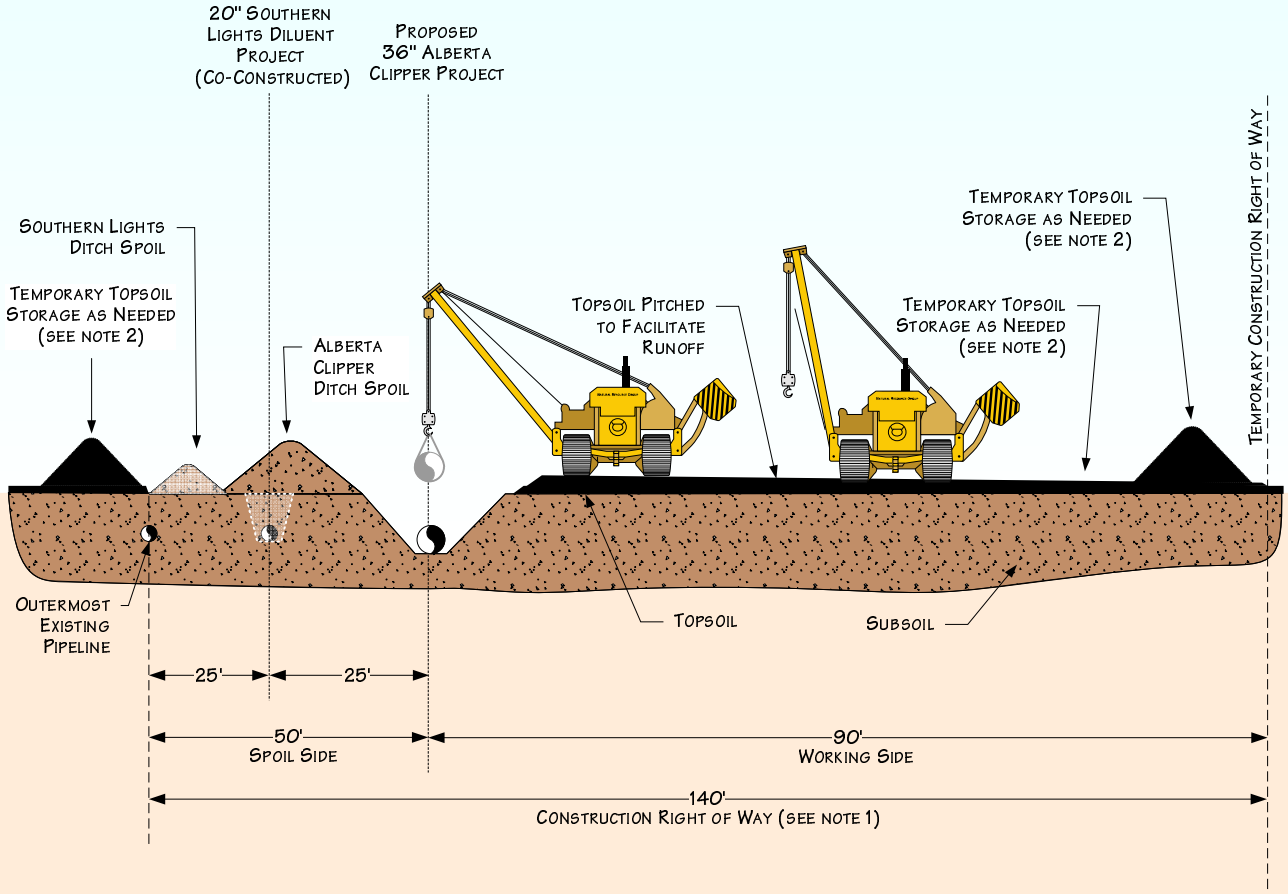

PROFILE

NOTES:

1. CONSTRUCTION RIGHT OF WAY WILL TYPICALLY BE 140' WIDE. THE SPOIL SIDE WILL BE APPROXIMATELY 50' WIDE AND GENERALLY WITHIN THE EXISTING MAINTAINED RIGHT-OF-WAY. THE WORKING SIDE WILL BE 90' WIDE.
2. THIS DRAWING REFLECTS "DITCH PLUS SPOIL SIDE" TOPSOIL STRIPPING PROCEDURE. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL AS SHOWN OR IN OTHER CONFIGURATIONS APPROVED BY THE COMPANY.
3. THE OFFSET FROM NORTHERNMOST OR SOUTHERNMOST EXISTING PIPELINE, WHERE APPLICABLE, WILL BE 25' FOR MOST LOCATIONS BUT MAY BE INCREASED OR DECREASED DEPENDING ON THE SITE SPECIFIC CONSTRUCTION REQUIREMENTS.

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Figure 1B

Environmental Mitigation Plan

Typical Construction Layout

(Clearbrook, MN to Superior, WI)

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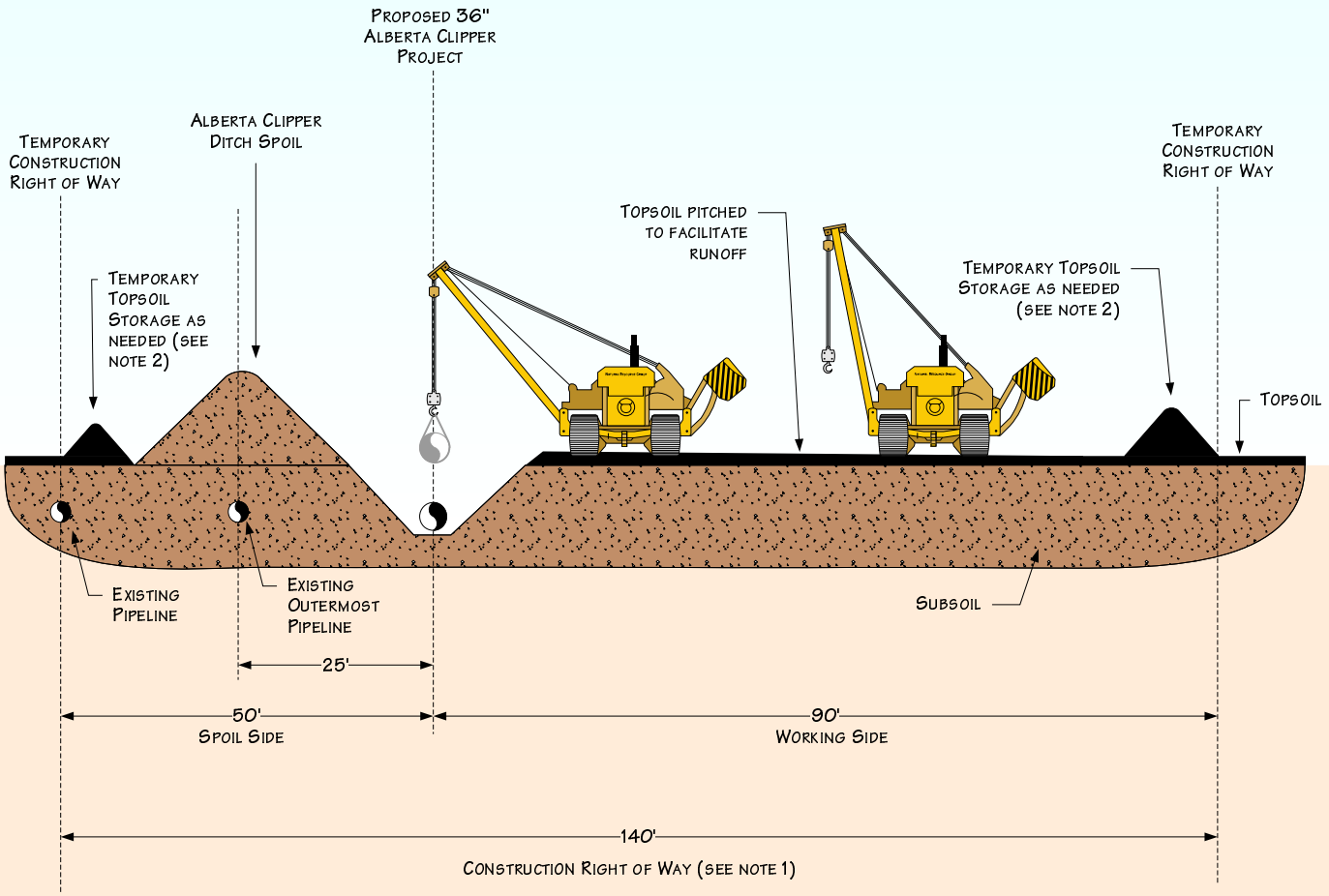

Profile

Notes:

1. Construction Right of Way will typically be 140' wide. Spoil side will be approximately 50' wide.
2. This drawing reflects "Ditch Plus Spoil" side topsoil stripping procedure. Stockpile topsoil separately from ditch spoil shown or in other configuration approved by company.
3. The offset from outermost existing pipeline will be 25' for most locations but may be increased or decreased depending on the site specific construction requirements.

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Figure 2A

Environmental Mitigation Plan
Typical Topsoil Segregation
Ditch Plus Spoil Side
(Neche, ND to Clearbrook, MN)

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SCALE:	NTS
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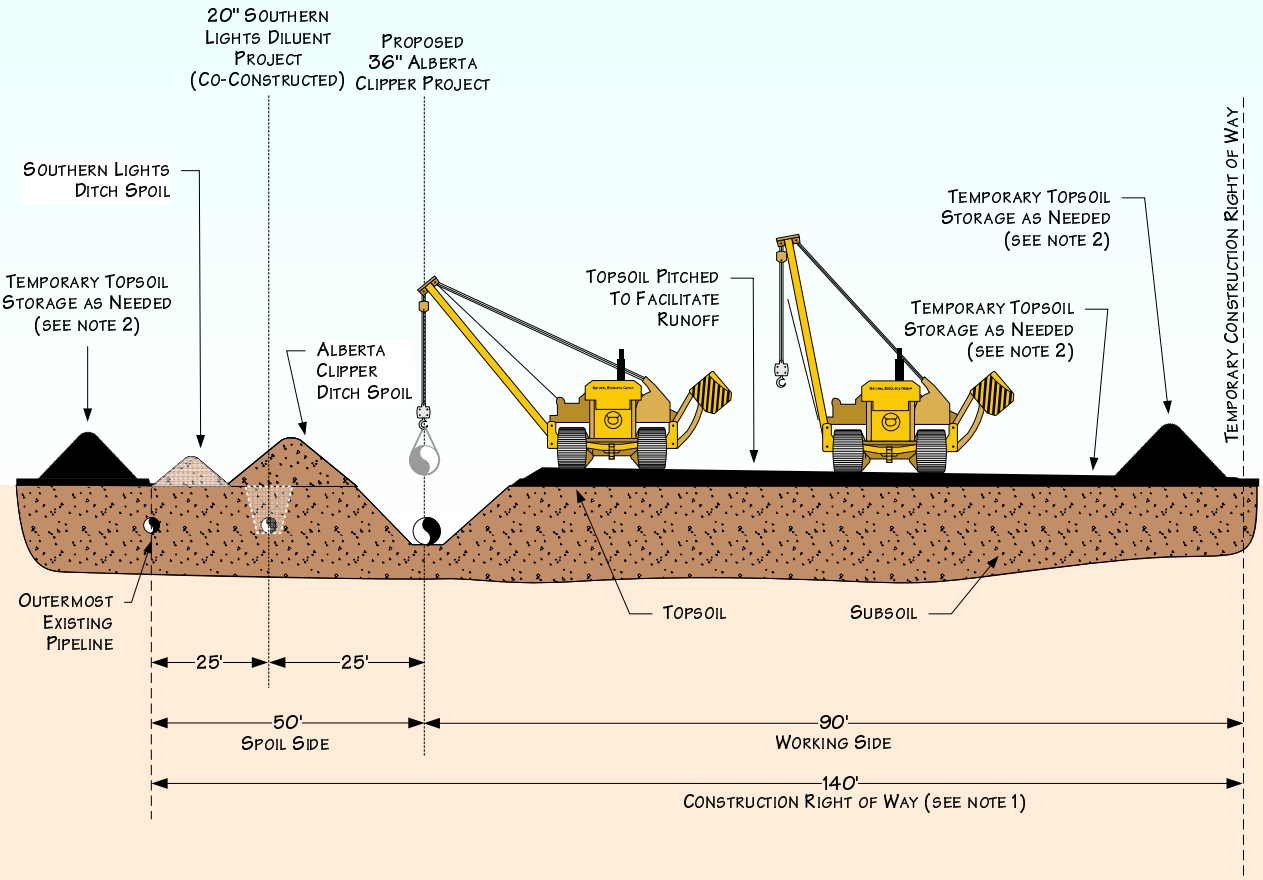

PROFILE

NOTES:

1. CONSTRUCTION RIGHT OF WAY WILL TYPICALLY BE 140' WIDE. THE SPOIL SIDE WILL BE APPROXIMATELY 50' WIDE AND GENERALLY WITHIN THE EXISTING MAINTAINED RIGHT-OF-WAY. THE WORKING SIDE WILL BE 90' WIDE.
2. THIS DRAWING REFLECTS "DITCH PLUS SPOIL SIDE" TOPSOIL STRIPPING PROCEDURE. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL AS SHOWN OR IN OTHER CONFIGURATIONS APPROVED BY THE COMPANY.
3. THE OFFSET FROM NORTHERNMOST OR SOUTHERNMOST EXISTING PIPELINE, WHERE APPLICABLE, WILL BE 25' FOR MOST LOCATIONS BUT MAY BE INCREASED OR DECREASED DEPENDING ON THE SITE SPECIFIC CONSTRUCTION REQUIREMENTS.

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Figure 2B
Environmental Mitigation Plan
Typical Topsoil Segregation
Ditch Plus Spoil Side
(Clearbrook, MN to Superior, WI)

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SCALE:	NTS
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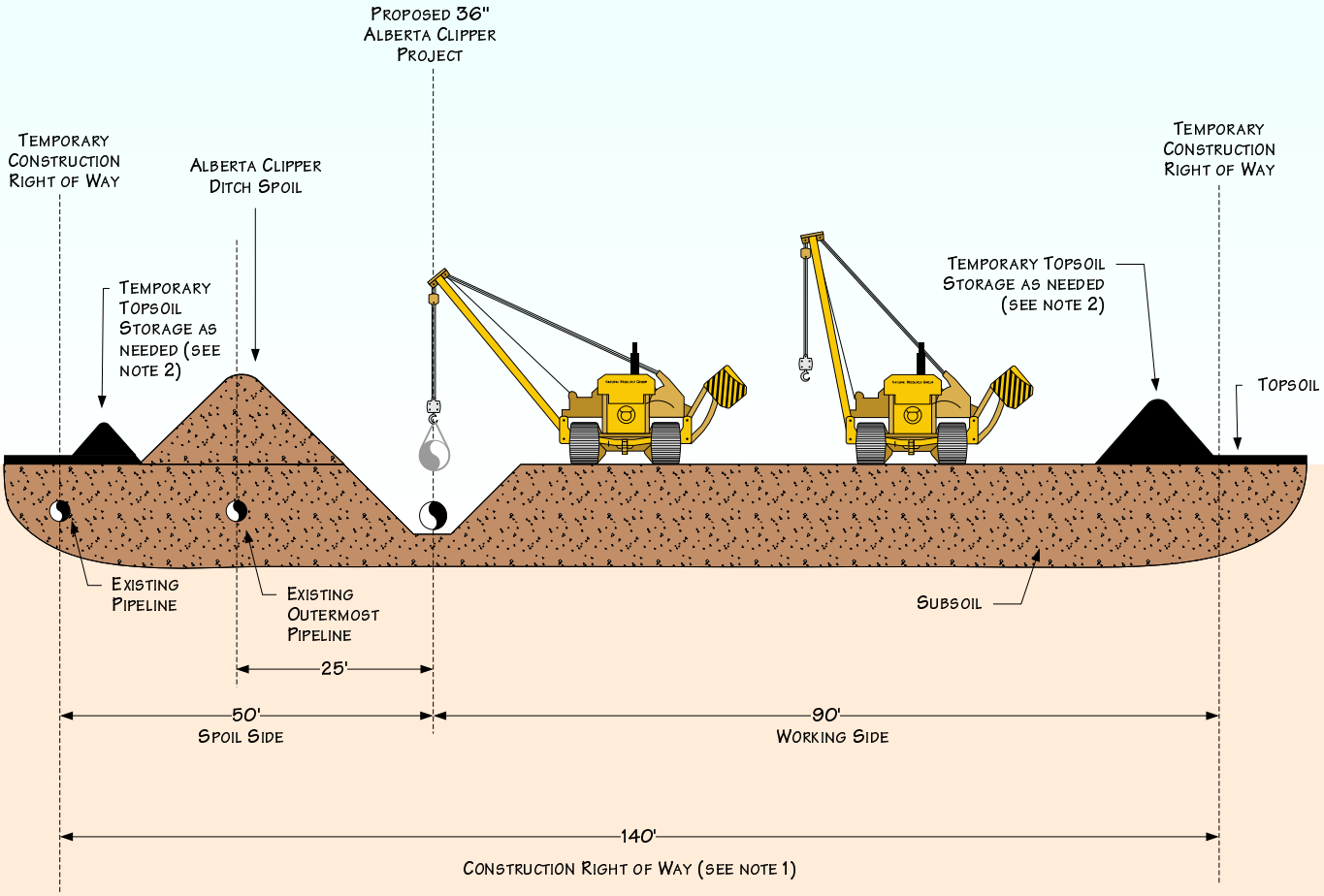

Profile

Notes:

1. Construction Right of Way will typically be 140' wide. Spoil side will be approximately 50' wide.
2. This drawing reflects "Full Right of Way" topsoil stripping procedure. Stockpile topsoil separately from ditch spoil shown or in other configuration approved by company.
3. The offset from outermost existing pipeline will be 25' for most locations but may be increased or decreased depending on the site specific construction requirements.

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Figure 3A

Environmental Mitigation Plan
Typical Topsoil Segregation
Full Right-of-Way
(Neche, ND to Clearbrook, MN)

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SCALE:	NTS
DRAWN BY:	KMKENDALL

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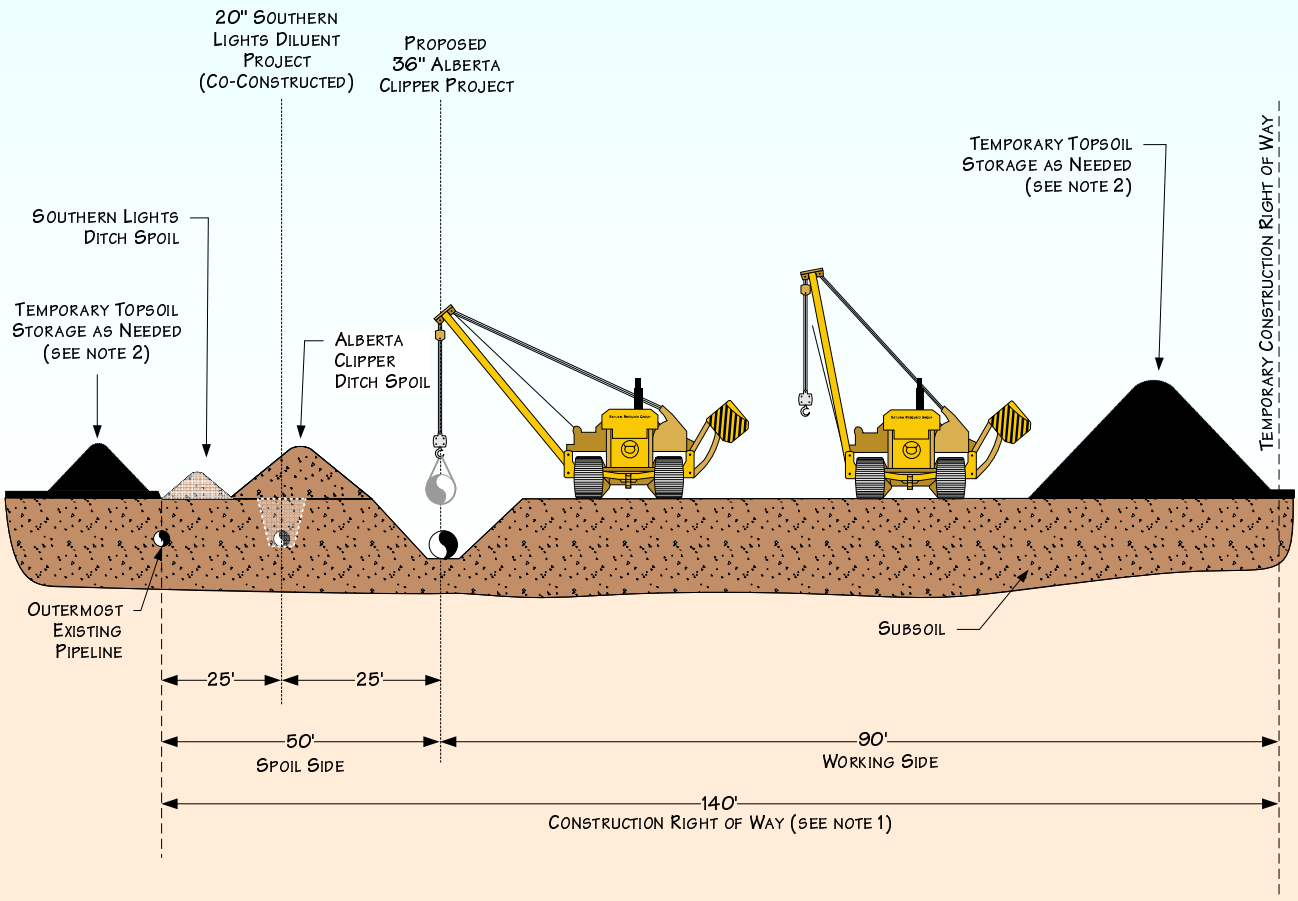

PROFILE

Notes:

1. Construction Right of Way will typically be 140' wide. The spoil side will be approximately 50' wide and generally within the existing maintained right-of-way. The working side will be 90' wide.
2. This drawing reflects "Full Right-of-Way" topsoil stripping procedure. Stockpile topsoil separately from ditch spoil as shown or in other configurations approved by the company.
3. The offset from northernmost or southernmost existing pipeline, where applicable, will be 25' for most locations but may be increased or decreased depending on the site specific construction requirements.

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Figure 3B
Environmental Mitigation Plan
Typical Topsoil Segregation
Full Right-of-Way
(Clearbrook, MN to Superior, WI)

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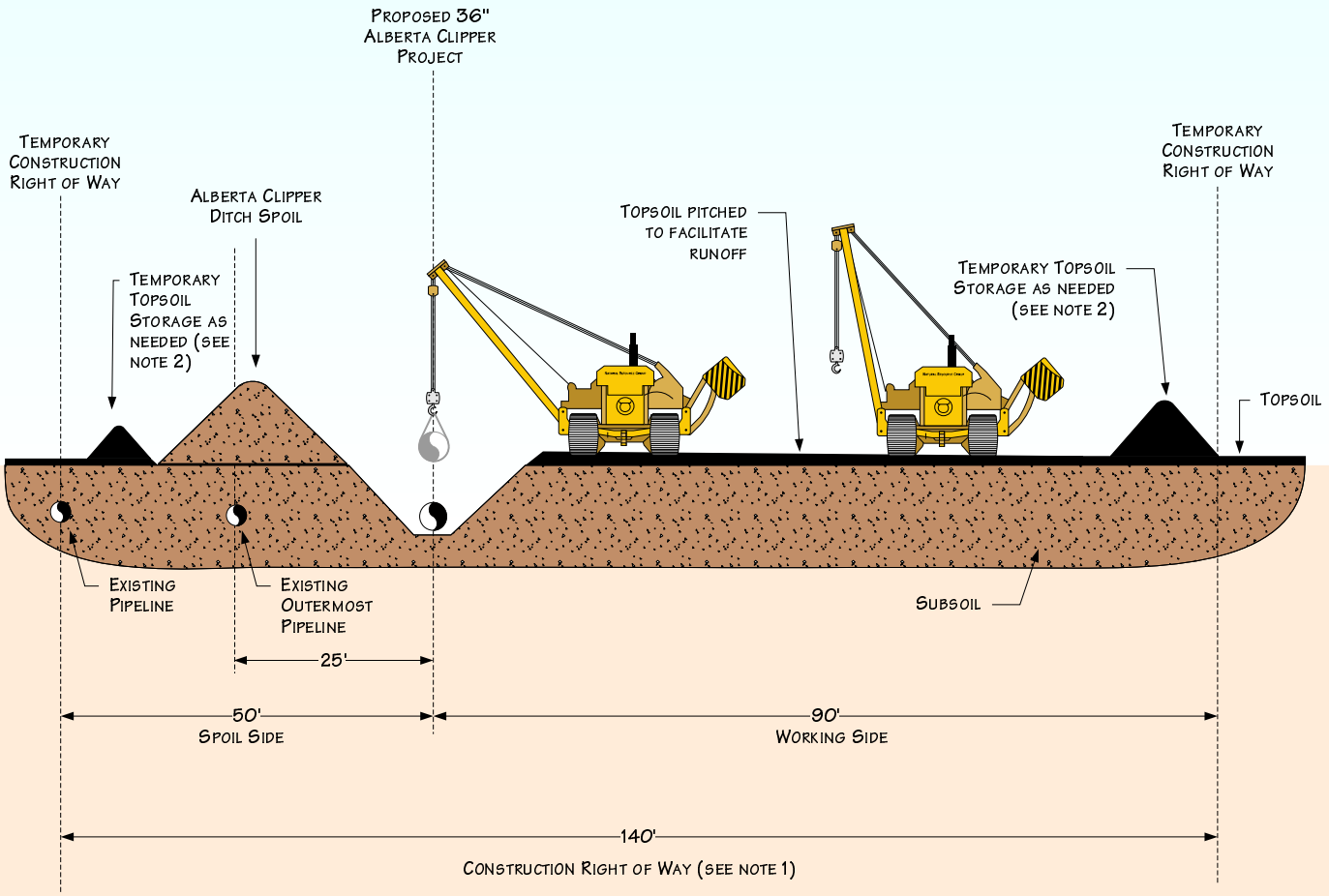

Profile

Notes:

1. Construction Right of Way will typically be 140' wide. Spoil side will be approximately 50' wide.
2. This drawing reflects "Trench line only" topsoil stripping procedure. Stockpile topsoil separately from ditch spoil shown or in other configuration approved by company.
3. The offset from outermost existing pipeline will be 25' for most locations but may be increased or decreased depending on the site specific construction requirements.

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Figure 4A
Environmental Mitigation Plan
Typical Topsoil Segregation
Trench Line Only
(Neche, ND to Clearbrook, MN)

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SCALE:	NTS
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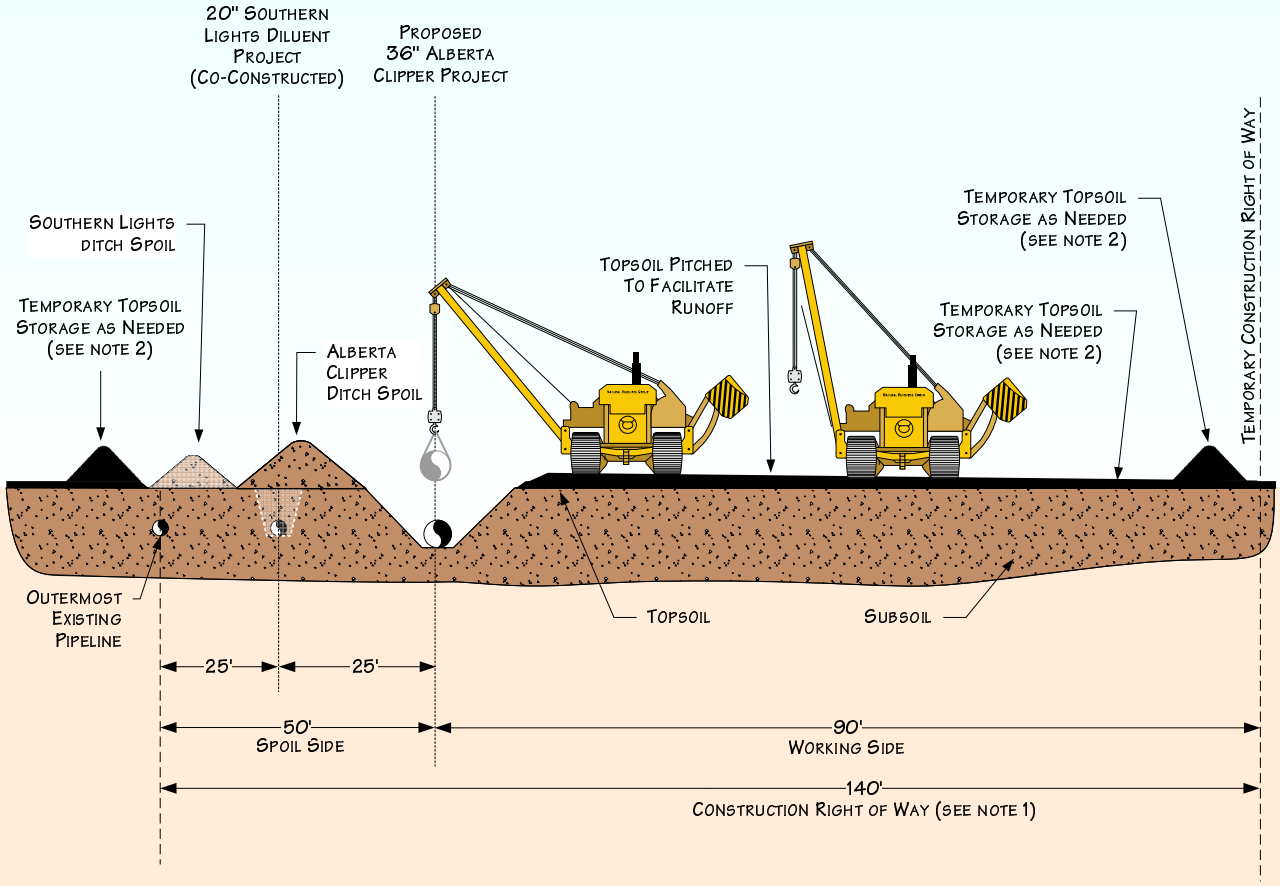

PROFILE

Notes:

1. Construction Right of Way will typically be 140' wide. The spoil side will be approximately 50' wide and generally within the existing maintained right-of-way. The working side will be 90' wide.
2. This drawing reflects "Trench Line Only" topsoil stripping procedure. Stockpile topsoil separately from ditch spoil as shown or in other configurations approved by the company.
3. The offset from northernmost or southernmost existing pipeline, where applicable, will be 25' for most locations but may be increased or decreased depending on the site specific construction requirements.

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Figure 4B

Environmental Mitigation Plan
Typical Topsoil Segregation
Trench Line Only
(Clearbrook, MN to Superior, WI)

DATE:	7/9/2001
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SCALE:	NTS
DRAWN BY:	KMKENDALL
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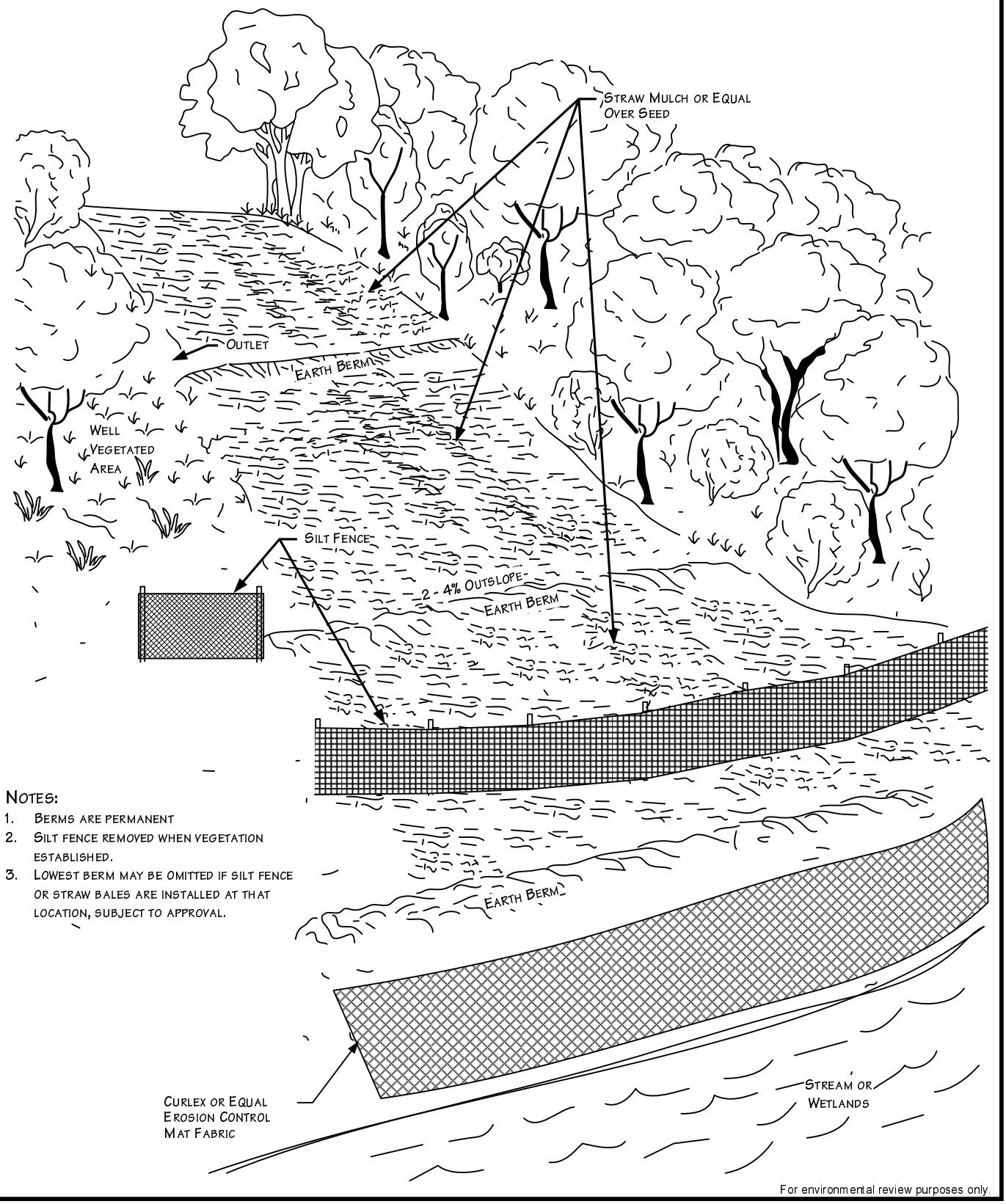

Notes:

1. Berms are permanent
2. Silt fence removed when vegetation established.
3. Lowest berm may be omitted if silt fence or straw bales are installed at that location, subject to approval.

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Figure 5

Environmental Mitigation Plan

Typical Temporary or Permanent Berms
Perspective View

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REVISED:	10/24/08
SCALE:	NTS
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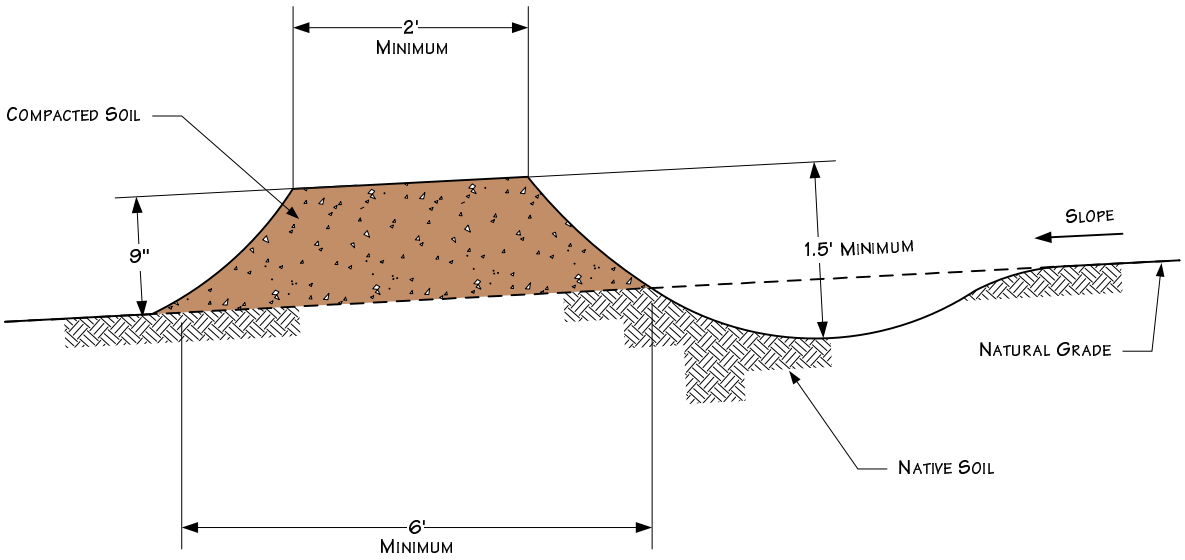

NOTES

1. BERMS SHALL BE CONSTRUCTED WITH 2 TO 4 PERCENT OUTSLOPE.
2. BERMS SHALL BE OUTLETED TO WELL VEGETATED STABLE AREAS, SILT FENCES, STRAW/HAY BALES OR ROCK APRONS.
3. BERMS SHALL BE SPACED AS DESCRIBED IN CONSTRUCTION SPECIFICATIONS.
4. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.

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Figure 6

Environmental Mitigation Plan

Typical Temporary or Permanent Berms
Elevation View

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SCALE:	NTS
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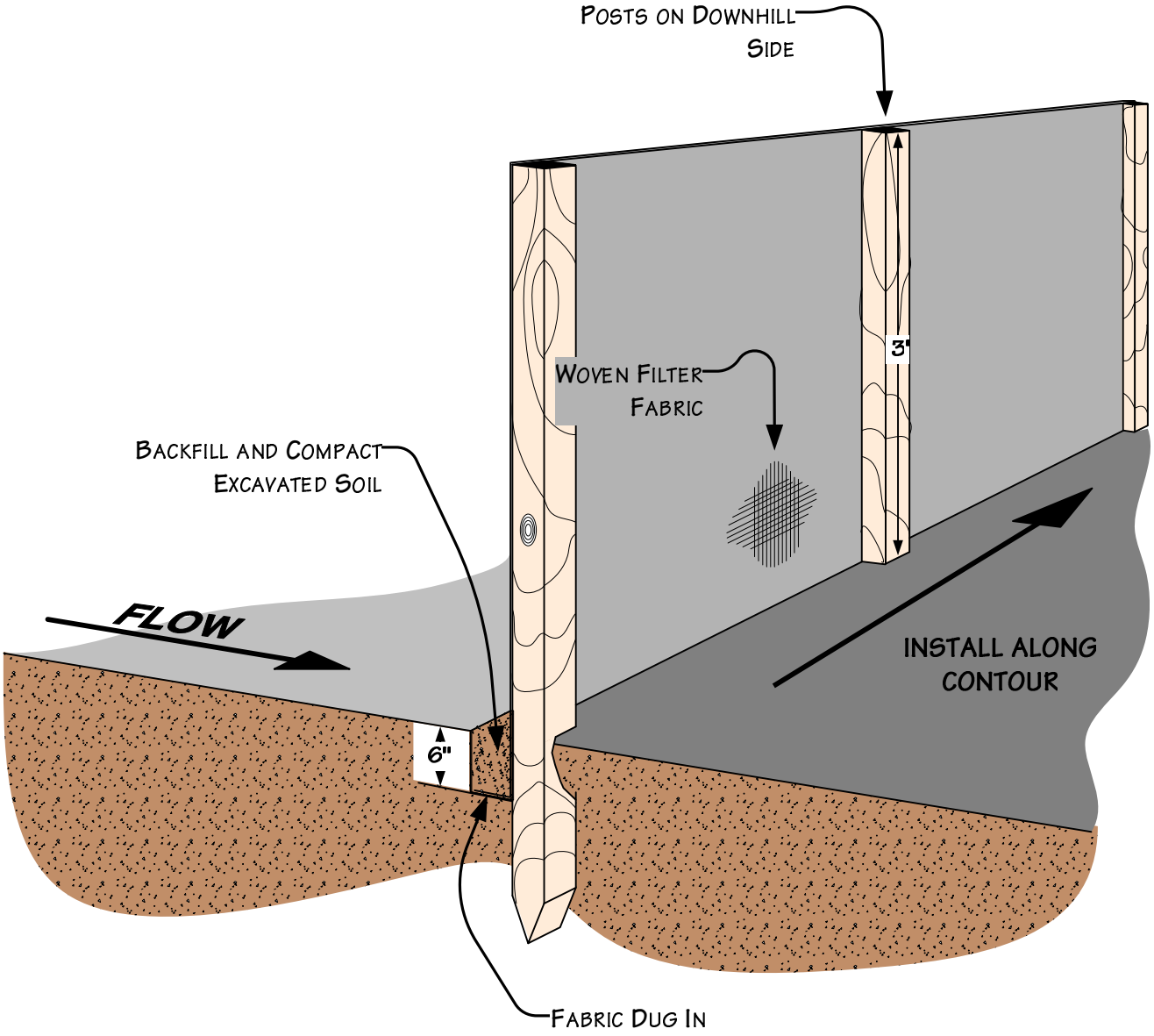

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Figure 7
Environmental Mitigation Plan
Typical Silt Fence Installation

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REVISED:	10/24/08
SCALE:	NTS
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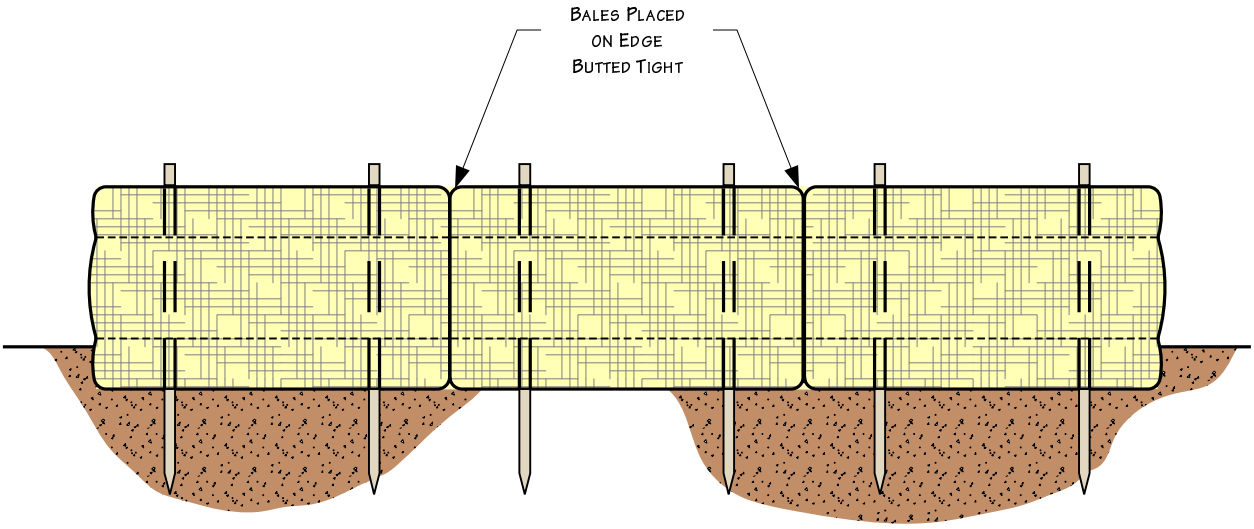
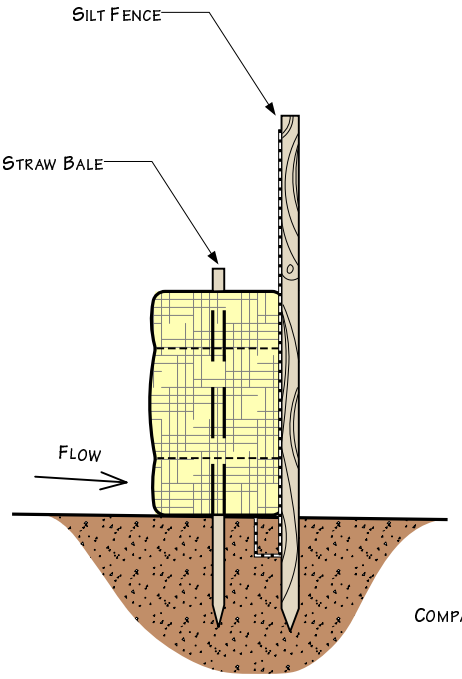
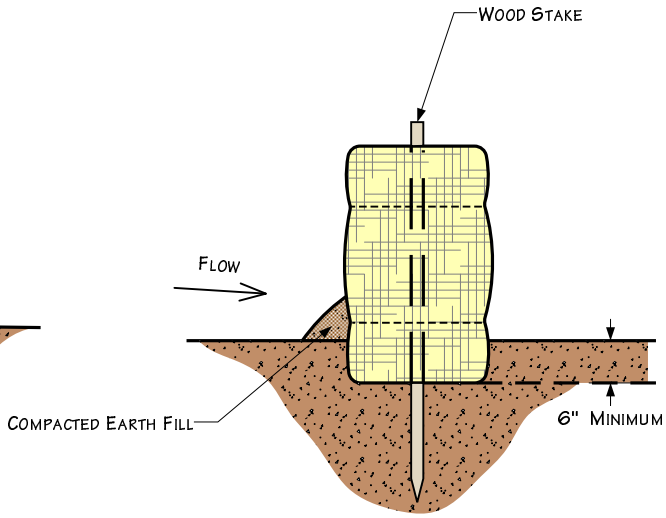




Straw/Hay Bales & Silt Fence



Straw/Hay Bales Only

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Figure 8
Environmental Mitigation Plan
Typical Straw Bale Installation

DATE:	5/25/01
REVISED:	10/24/08
SCALE:	Not to Scale
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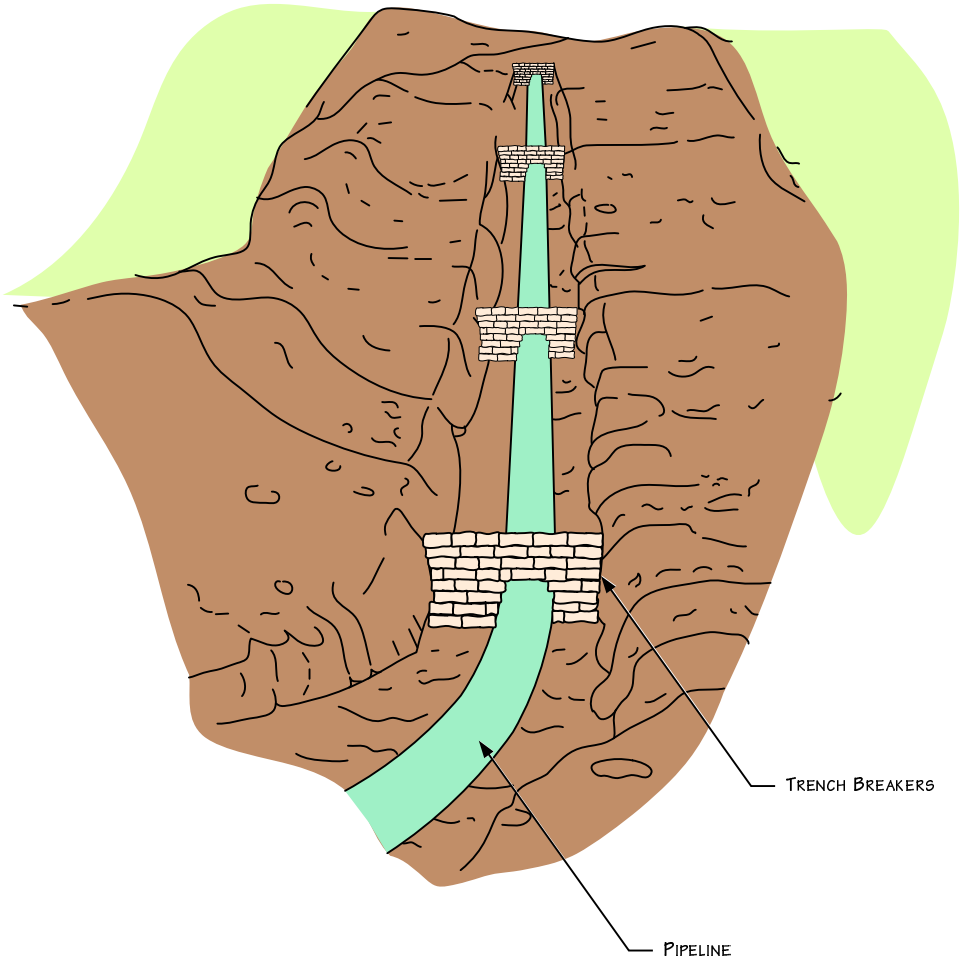

NOTES

1. BAGS WILL NOT BE FILLED WITH TOPSOIL.
2. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.

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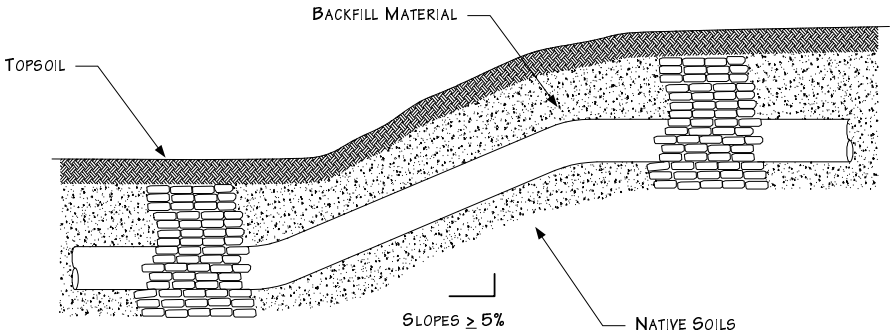
Figure 9

Environmental Mitigation Plan

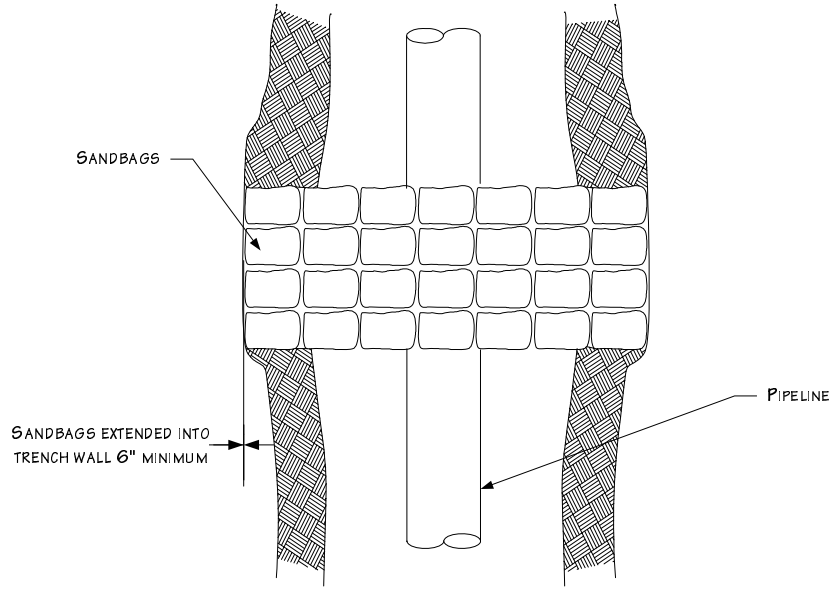
Typical Trench Breakers - Perspective View

DATE:	5/25/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\1.9.VSD	

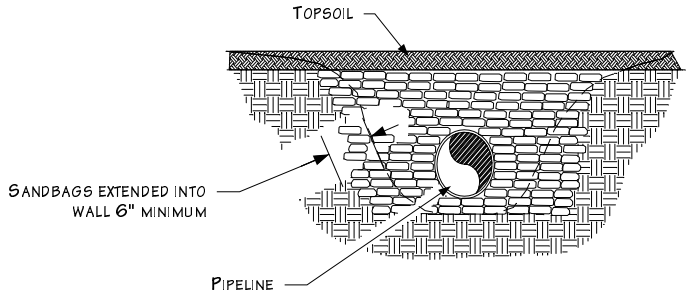
NATURAL RESOURCE GROUP, INC.



PROFILE VIEW
(NOT TO SCALE)



PLAN VIEW
(NOT TO SCALE)



FACE VIEW
(NOT TO SCALE)

NOTES

1. BAGS WILL NOT BE FILLED WITH TOPSOIL
2. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS

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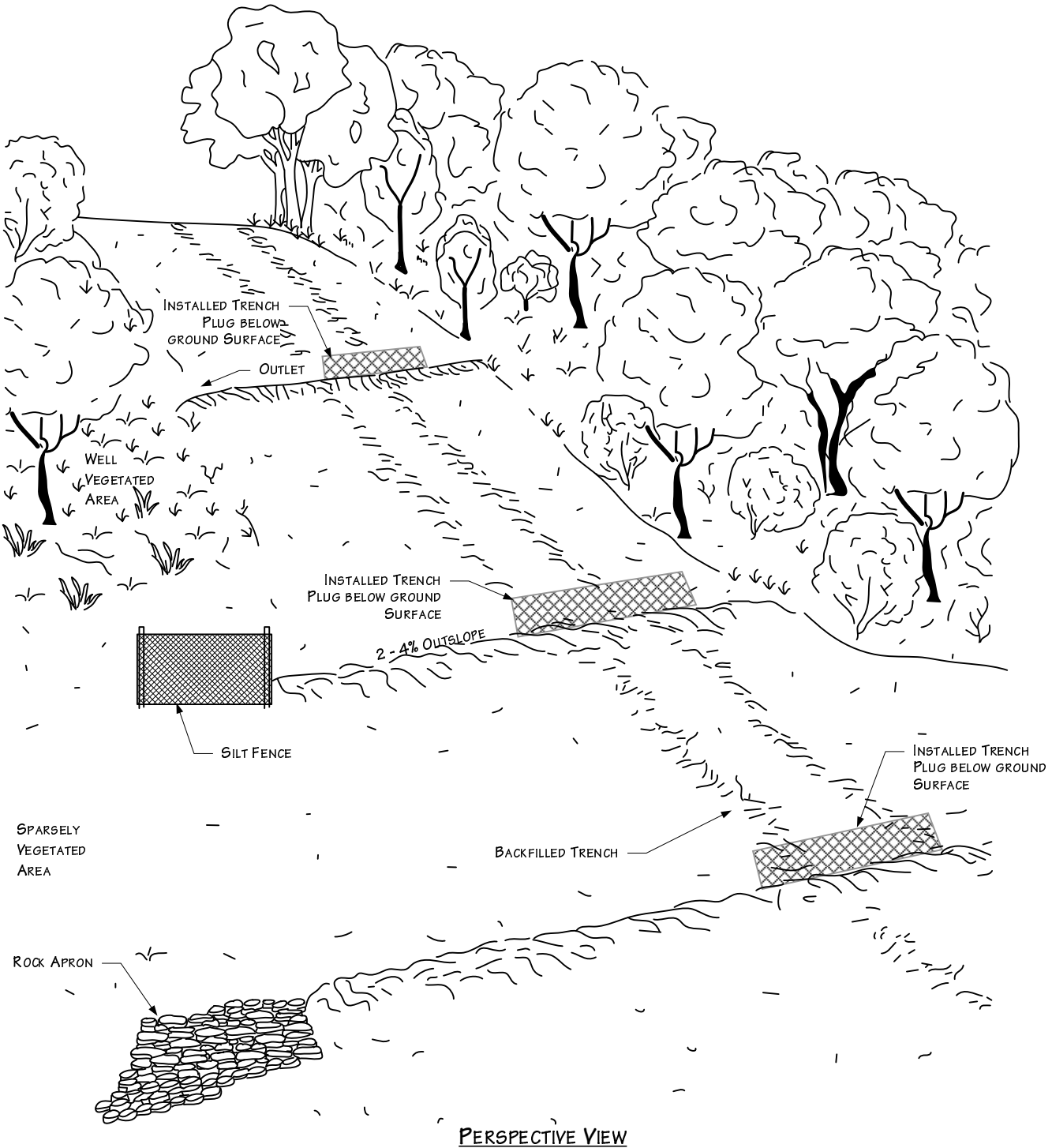
Figure 10
Environmental Mitigation Plan
Typical Trench Breakers – Plan & Profile View

DATE:	11/15/2000
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\1.10.VSD	

NATURAL RESOURCE GROUP, INC.



PERSPECTIVE VIEW
(NOT TO SCALE)

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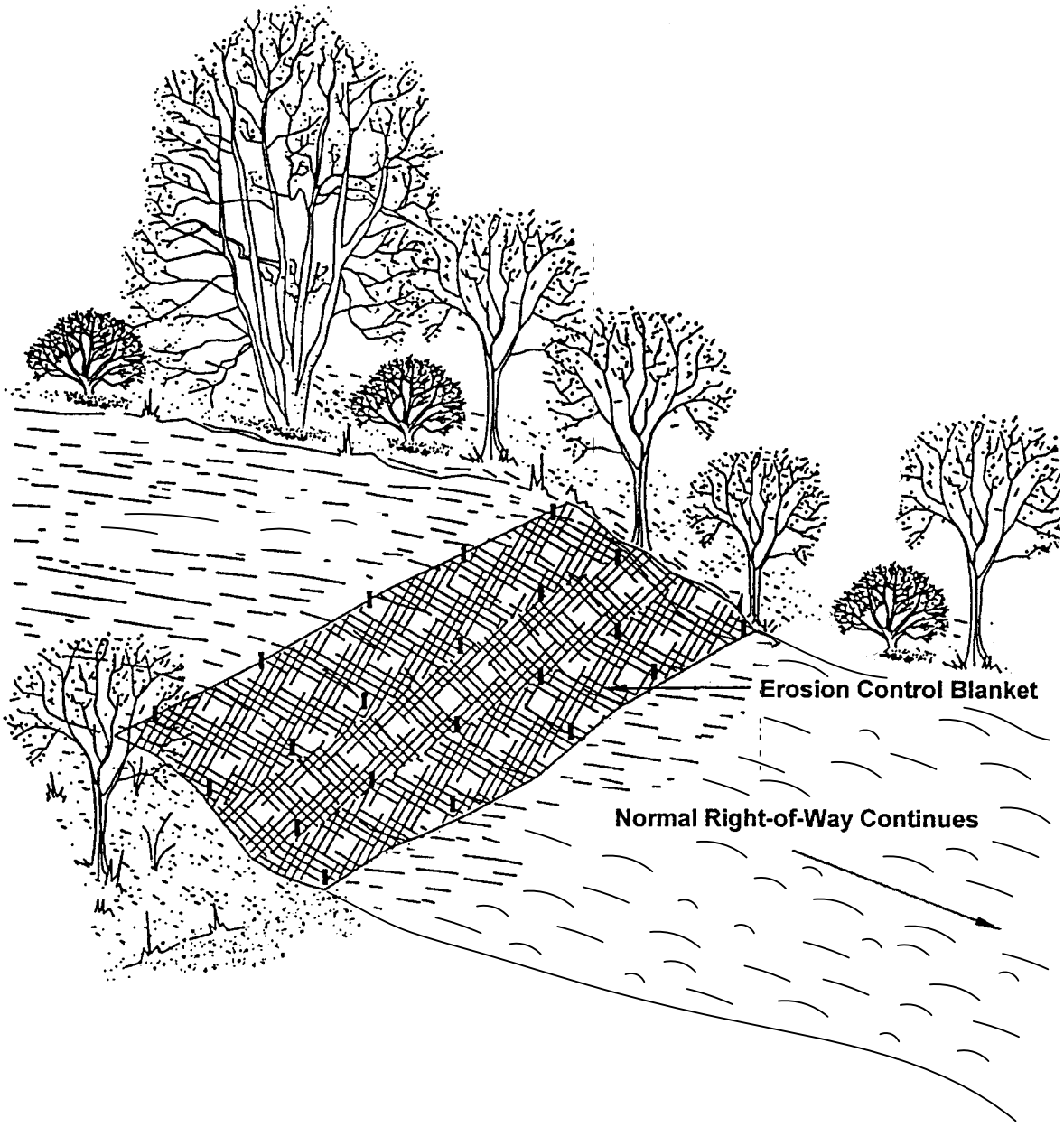
Figure 11

Environmental Mitigation Plan

Permanent Slope Breakers - Perspective View

DATE:	5/25/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\7.1.VSD	

NATURAL RESOURCE GROUP, INC.



NOTES

1. Install erosion control blanket as per manufacturer's specifications.
2. Additional information included on other drawings.

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Figure 12

Environmental Mitigation Plan

Erosion Control Blanket - Steep Slopes (≥30%)

DATE:	11/15/2000
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\7.2.VSD	

NATURAL RESOURCE GROUP, INC.

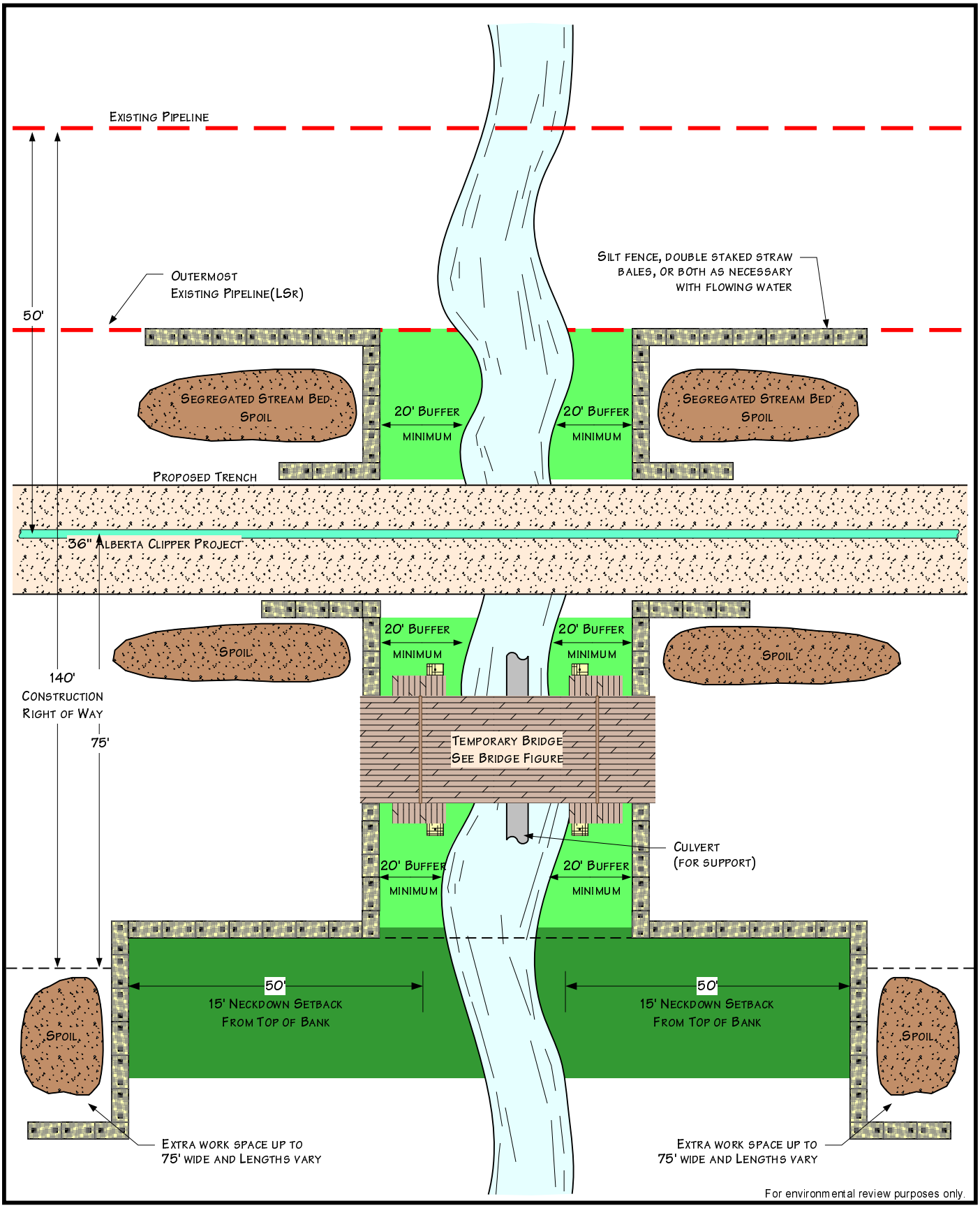

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Figure 13A

Environmental Mitigation Plan
Typical Waterbody Crossing
Wet Trench Method
(Neche, ND to Clearbrook, MN)

DATE:	11/29/2005
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KJA

NATURAL RESOURCE GROUP, INC.

K:\335\ALBERTA\2006-135\400\EMP_2.1-1VSD.VSD

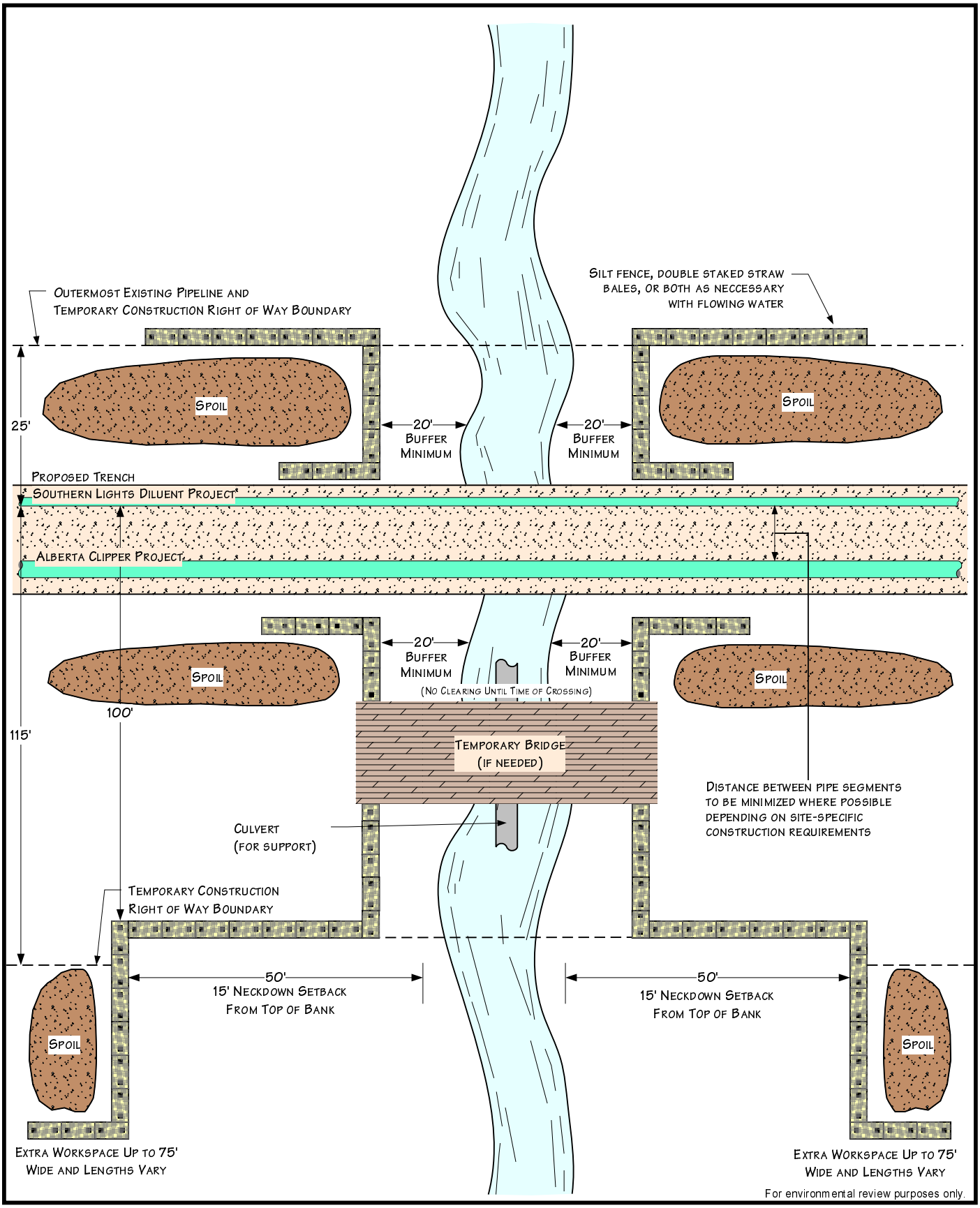

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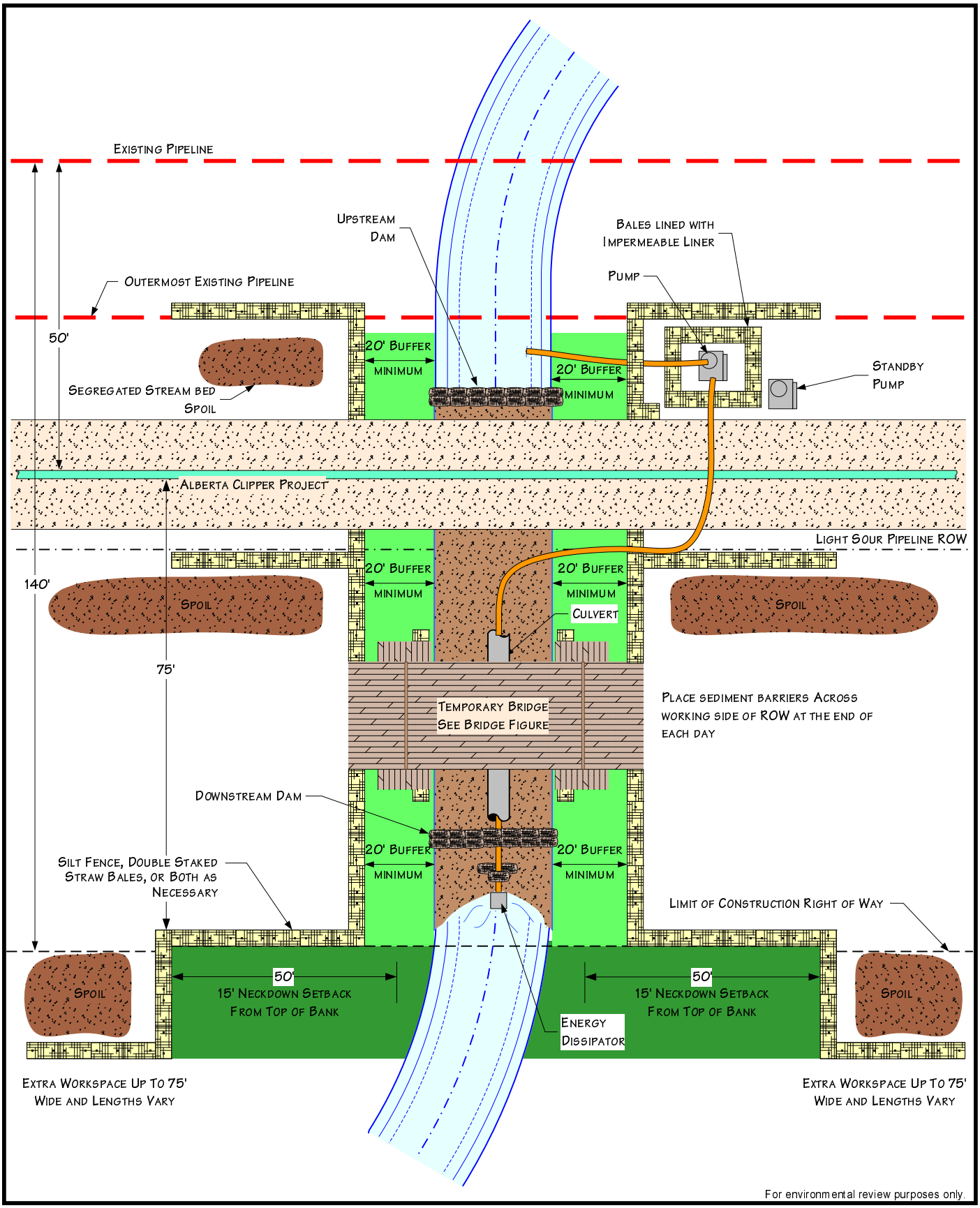
Figure 13B
Environmental Mitigation Plan
Typical Waterbody Crossing
Wet Trench Method
(Clearbrook, MN to Superior, WI)

DATE:	11/29/2005
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KJA

NATURAL RESOURCE GROUP, INC.

K:\335\ALBERTA\2006-135\400\EMP_OPEN_CUT.VSD



For environmental review purposes only.

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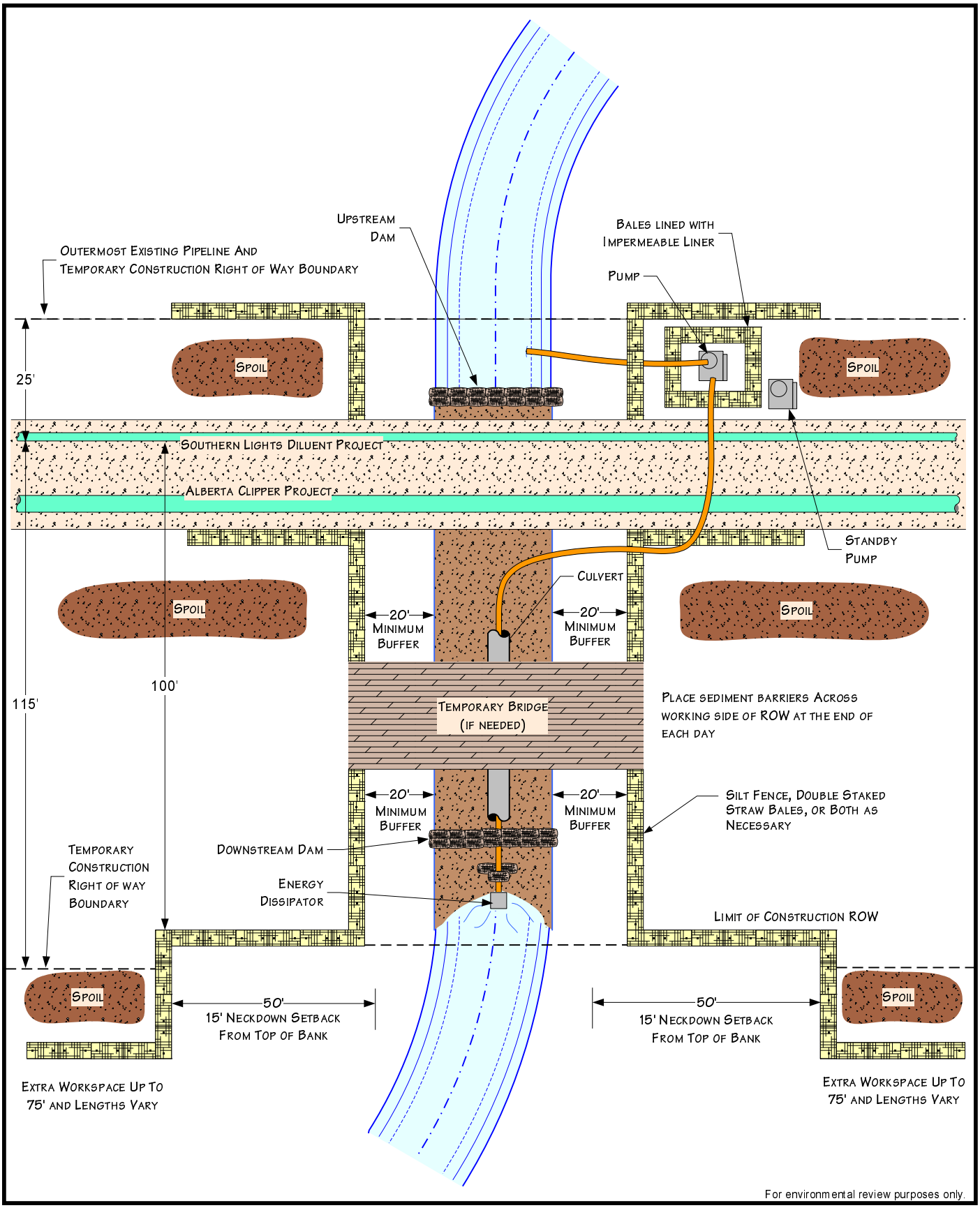
Figure 14A

Environmental Mitigation Plan
Typical Waterbody Crossing
Dam and Pump Method
(Neche, ND to Clearbrook, MN)

DATE:	11/29/2005
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KJA

NATURAL RESOURCE GROUP, INC.

K:\335\ALBERTA\2006-135\400\EMP_2.2-1.VSD



For environmental review purposes only.

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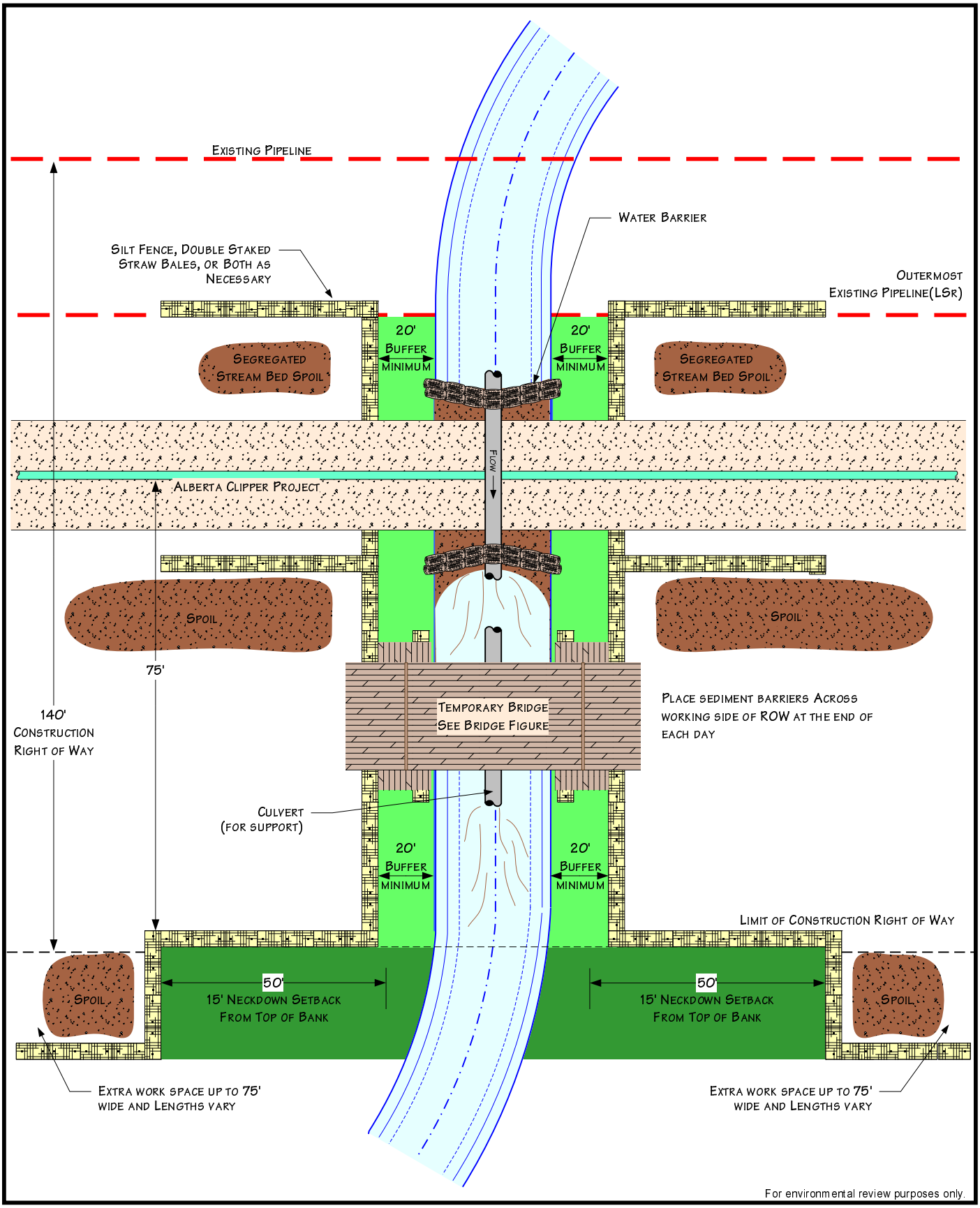
Figure 14B
Environmental Mitigation Plan
Typical Waterbody Crossing
Dam and Pump Method
(Clearbrook, MN to Superior, WI)

DATE:	11/29/2005
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KJA

NATURAL RESOURCE GROUP, INC.

K:\335\ALBERTA\2006-135\400\EMP_2.2.VSD



For environmental review purposes only.

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Figure 15A

Environmental Mitigation Plan
Typical Waterbody Crossing
Flume Method
(Neche, ND to Clearbrook, MN)

DATE:	11/29/2005
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KJA

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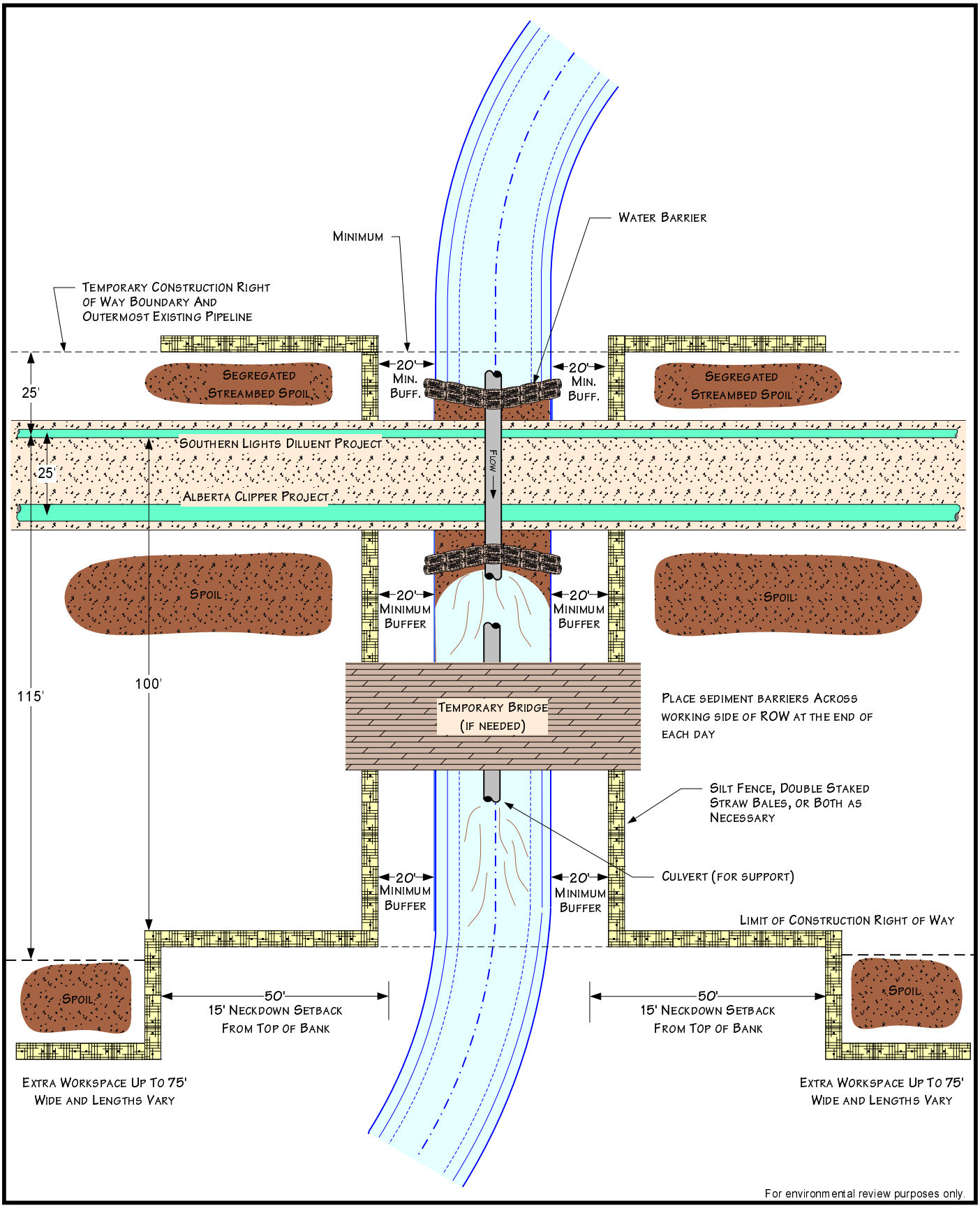
K:\335\ALBERTA\2006-135\400\EMP_2.3.1.VSD



For environmental review purposes only.

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Figure 15B

Environmental Mitigation Plan
Typical Waterbody Crossing
Flume Method
(Clearbrook, MN to Superior, WI)

DATE:	11/29/2005
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KJA

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K:\335\ALBERTA\2006-135\400\EMP_2.3.VSD

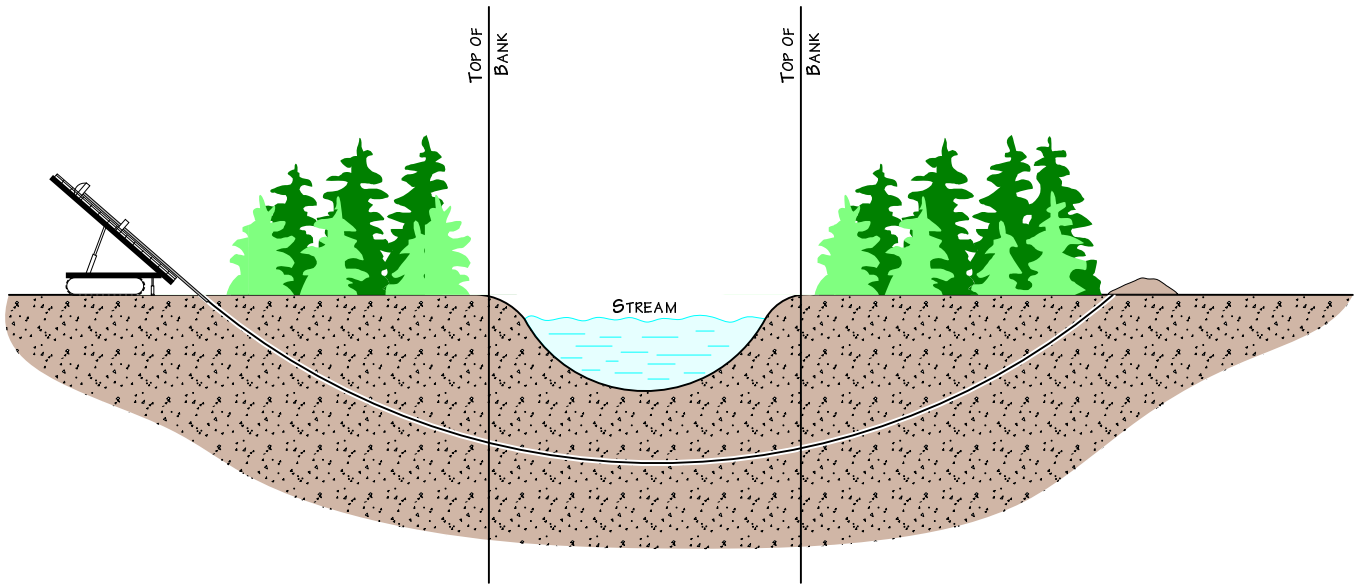

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Figure 16

Environmental Mitigation Plan

Typical Waterbody Crossing
Directional Drill Method

DATE:	7/14/2000
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\2.4.VSD	

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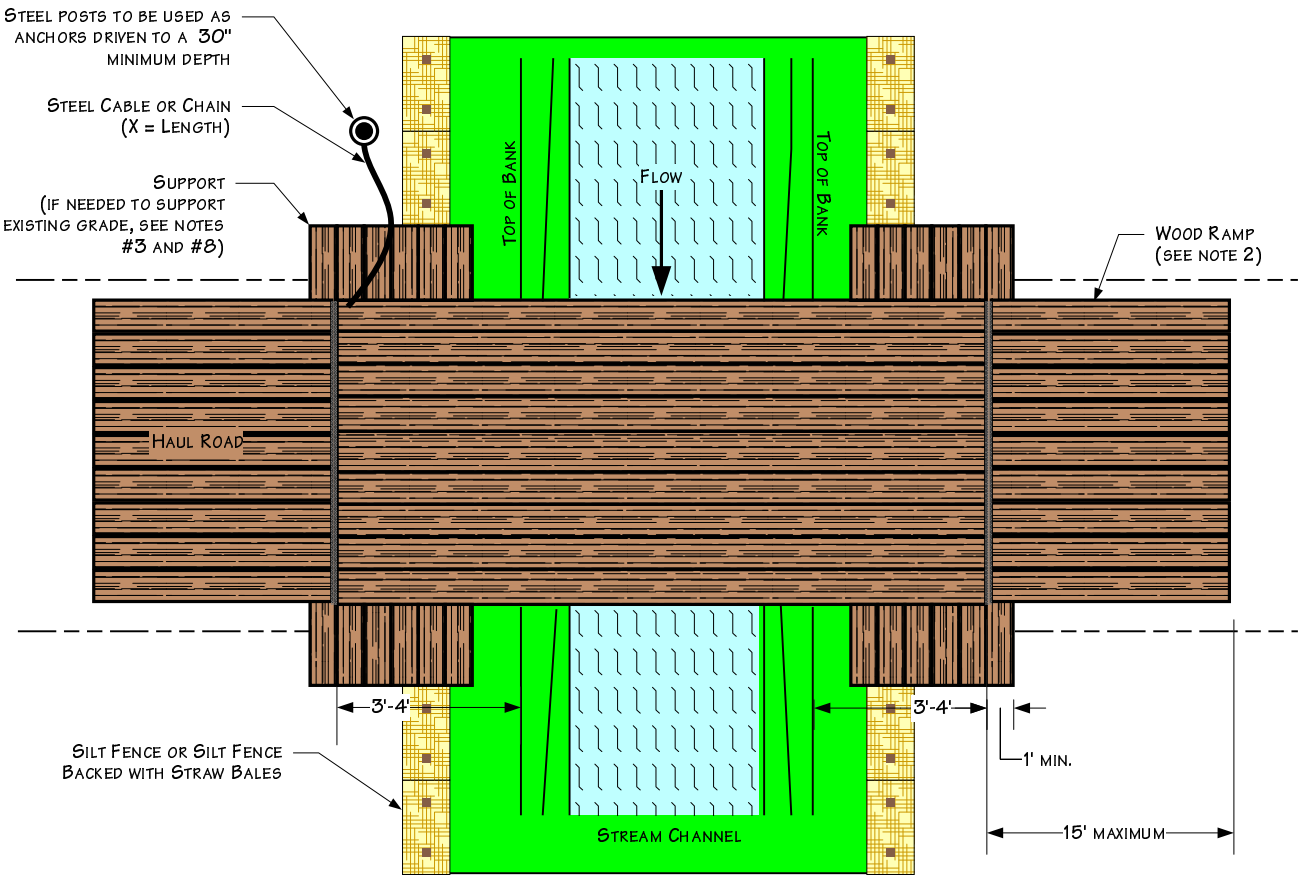
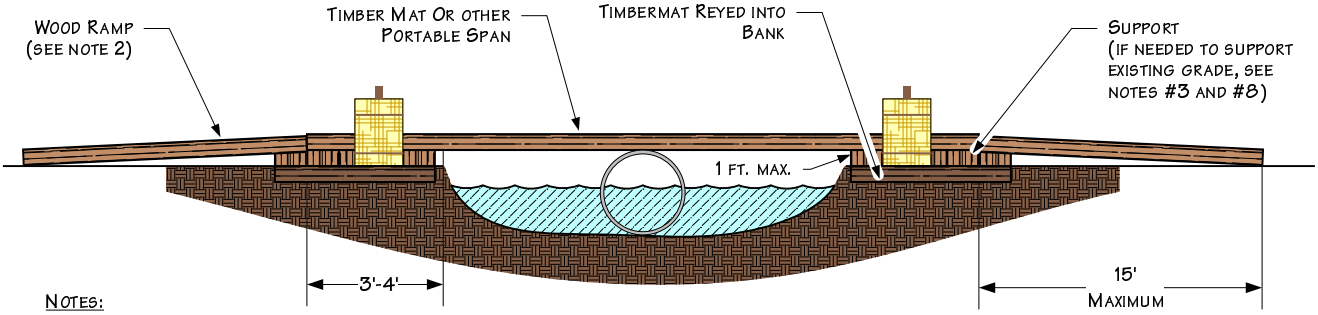
Plan View



Profile View



Notes:

1. Inspect bridge opening periodically and following rainfalls of over ½". Remove any debris restricting flow and deposit it at an upland site outside of floodplain.
2. If physical circumstances prohibit wood or metal ramps, earthen ramps may be used as approved.
3. Inspect bridge elevation so bridge remains supported above high bank and does not sink into bank.
4. The culvert support must be anchored to the stream bottom and may not be supported with fill.
5. Earthen ramp cannot be taller than 1' and cannot extend for more than 15' on either side of the crossing.
6. The bridge must span from top of bank to top of bank.
7. The bridge must be firmly anchored to prevent it from being transported downstream during high flow.
8. Additional support must be added on top of bank and under span if initial support starts to settle.
9. Erosion and sedimentation control measures shall be inspected and maintained in accordance with the company's Environmental Mitigation Plan

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Figure 17

Environmental Mitigation Plan

Typical Span Type Bridge
With or Without Instream Support

DATE:	3/11/2003
REVISED:	10/24/2008
SCALE:	NTS
DRAWN BY:	KMK6792
K:\335\ALBERTA\2006-135\400\2.5.VSD	

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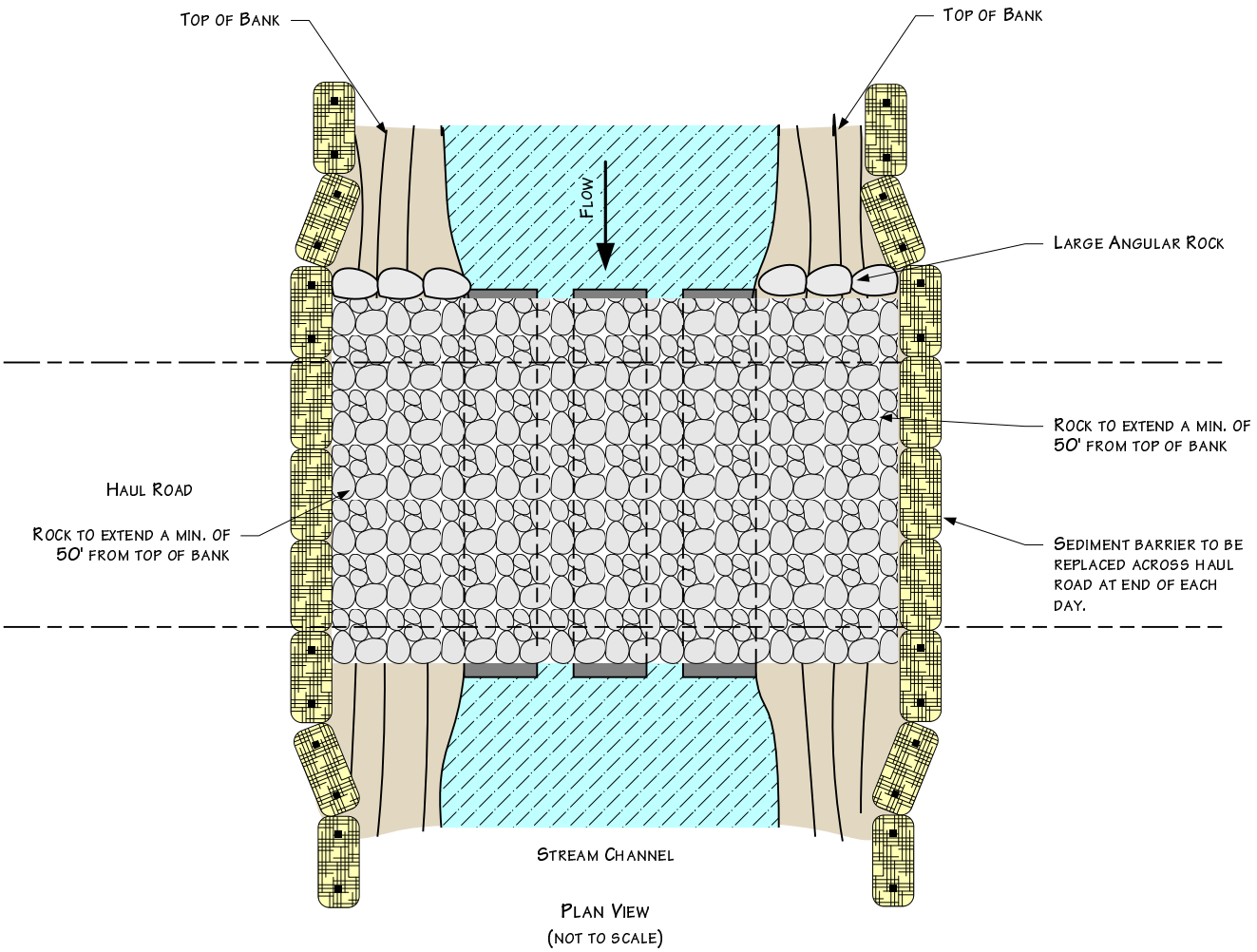

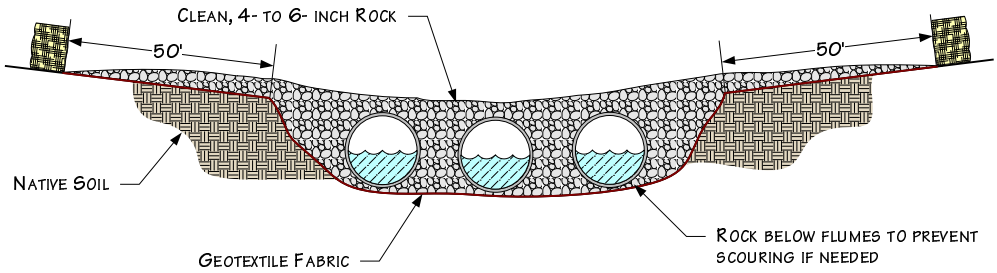

NOTES:

1. STEEL FLUME PIPE(S) SIZED TO ALLOW FOR STREAM FLOW AND EQUIPMENT LOAD.
2. STRAW BALES SHALL BE PLACED ACROSS BRIDGE ENTRANCE EVERY NIGHT.
3. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS.

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Figure 18

Environmental Mitigation Plan

Typical Rock Flume Bridge

DATE:	5/25/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\2.6.VSD	

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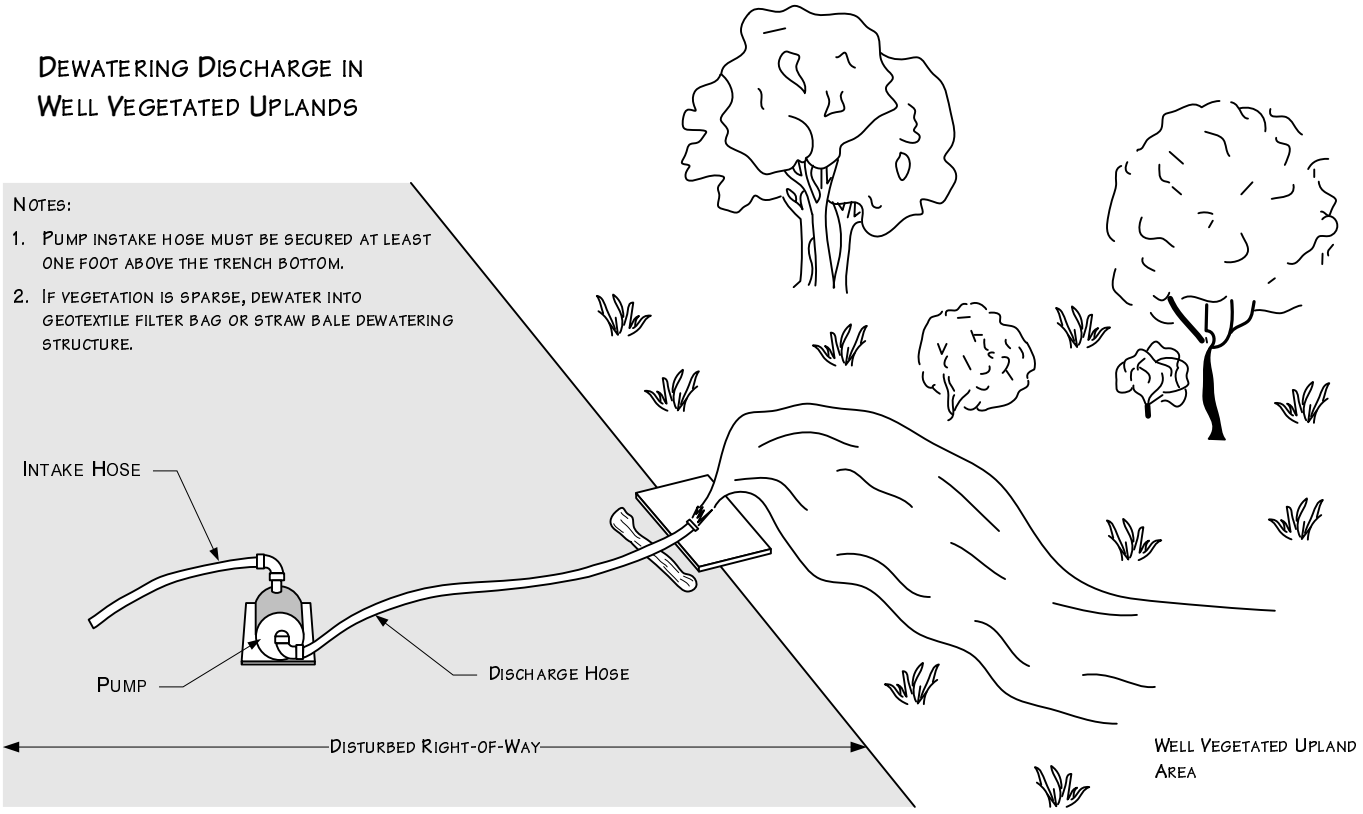
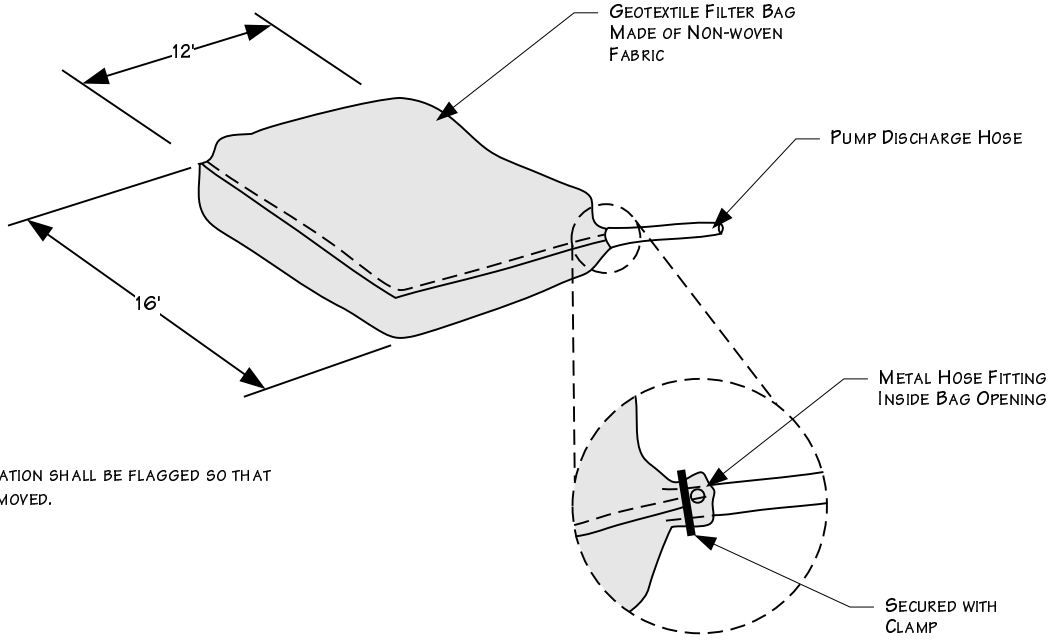
Dewatering Discharge in Well Vegetated Uplands



Geotextile Filter Bag



Note:

1. Filter bag location shall be flagged so that bag can be removed.

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Figure 19
Environmental Mitigation Plan
Typical Dewatering Measures

DATE:	5/25/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL

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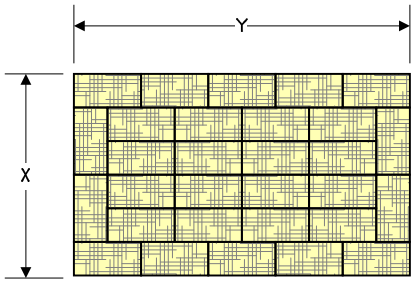
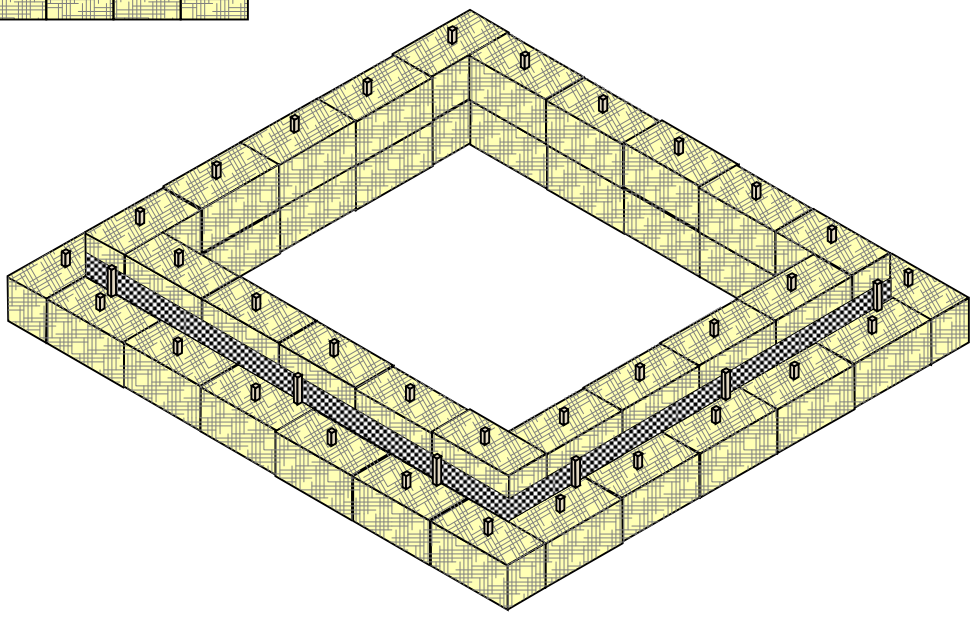
K:\335\ALBERTA\2006-135\400\2.7.VSD

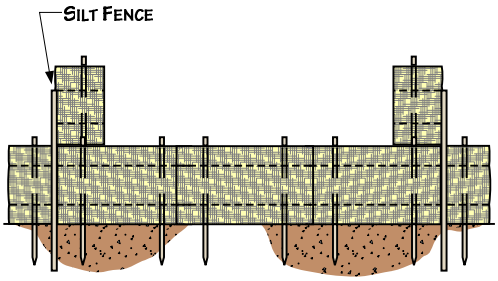


NOTES

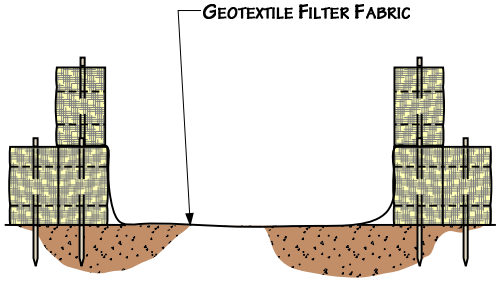
1. ARRANGE THE STRAW BALES TO THE X AND Y DIMENSIONS AS SPECIFICIED BELOW.
2. IF BOTTOM OF STRUCTURE IS NOT LINED WITH STRAW BALES (OPTION 1), LINE ENTIRE STRUCTURE WITH GEOTEXTILE FILTER FABRIC.



PERSPECTIVE VIEW



OPTION 1



OPTION 2

MINIMUM SUMP DIMENSIONS (FEET)		MAXIMUM PUMPING RATE
X	Y	GALLONS PER MINUTE
10	20	300
15	20	350
20	20	400
20	25	450
25	25	500
25	30	550
30	30	660

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Figure 20
Environmental Mitigation Plan
Typical Straw-Bale Dewatering Structure

DATE:	5/25/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\2.8.VSD	

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NOTE: PLACE JUTE BLANKET A MINIMUM OF ONE (1) FOOT UNDER RIP RAP. EXTEND JUTE BLANKET FROM MEAN HIGH WATER LEVEL TO SEVERAL FEET BEHIND HIGH BANK.

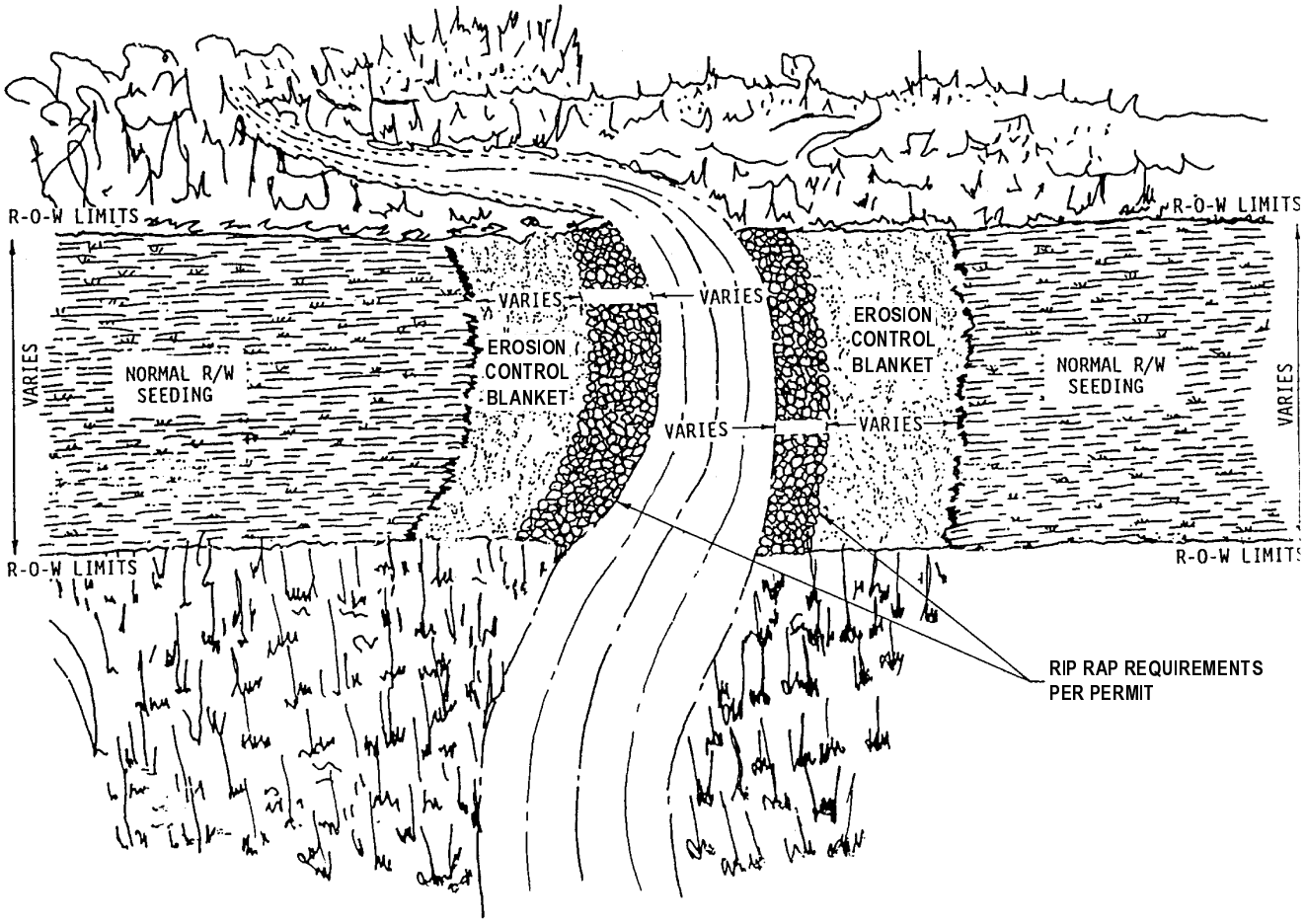

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Figure 21

Environmental Mitigation Plan

Typical Final Stream Bank Stabilization
Rip Rap & Erosion Control

DATE:	7/19/2000
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL
K:\335\ALBERTA\2006-135\400\7.3.VSD	

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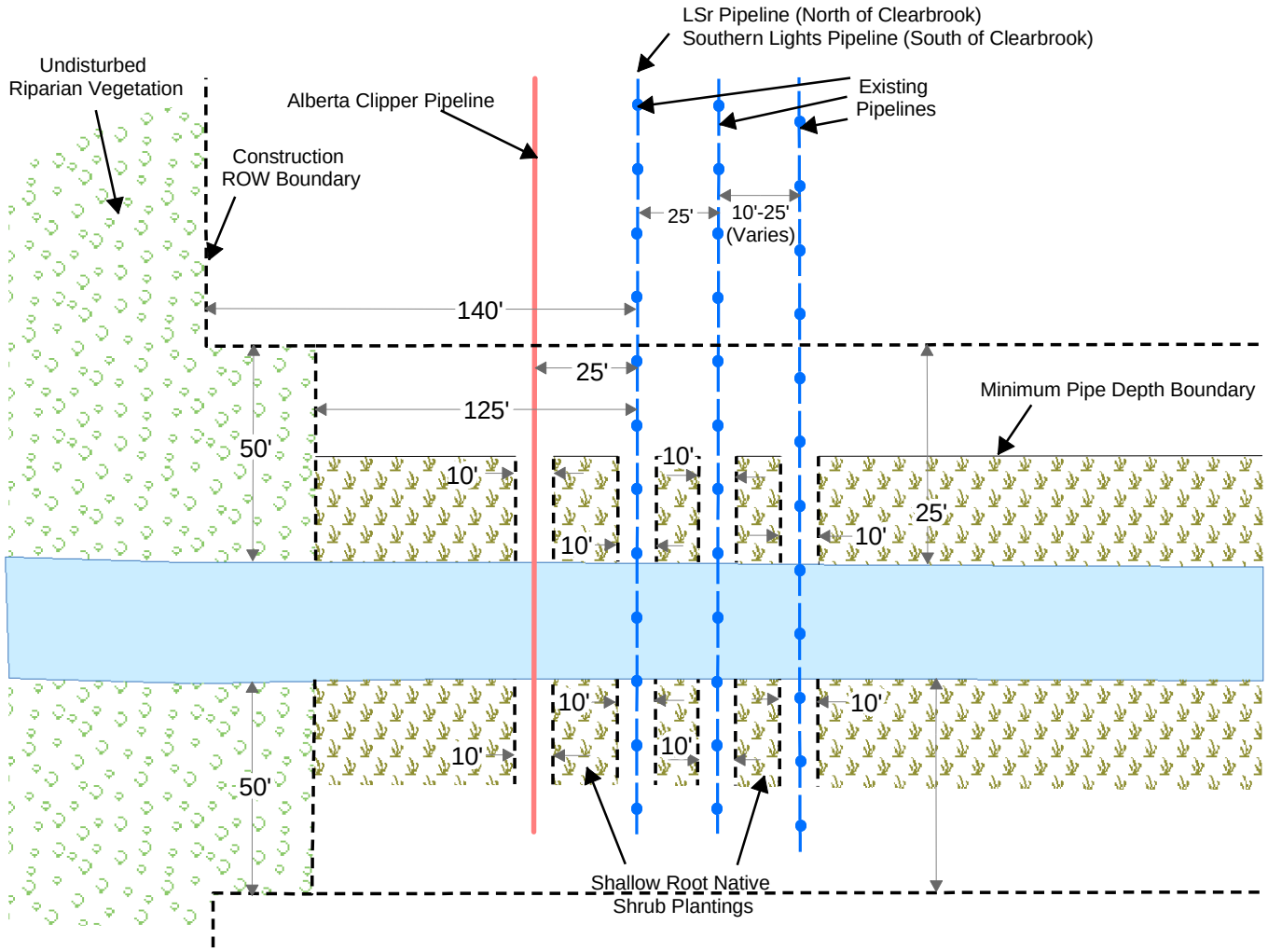
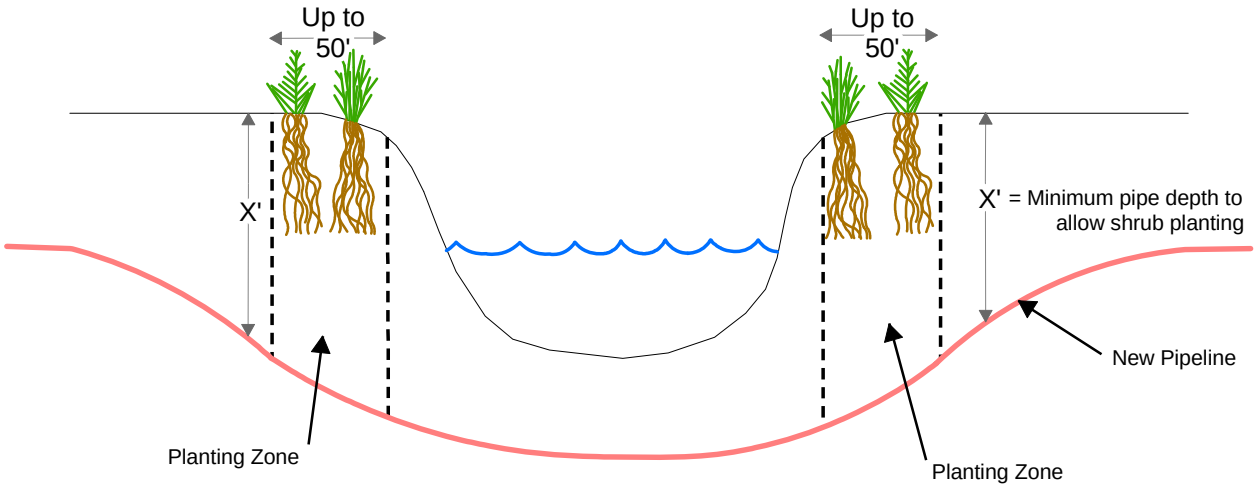


Plan View



Profile

This information is for environmental review purposes only.

Figure 22
Alberta Clipper Stream Crossing Replanting-Typical

M:\Clients\D-F\EEL\Alberta_Clipper_ArcGIS\2008\04\Forested_Crossing_Drawing_EEL_ALC_Drawings.mxd	DATE: 10/24/08	REVISED: 10/24/08	DRAWN BY: KJAnderson

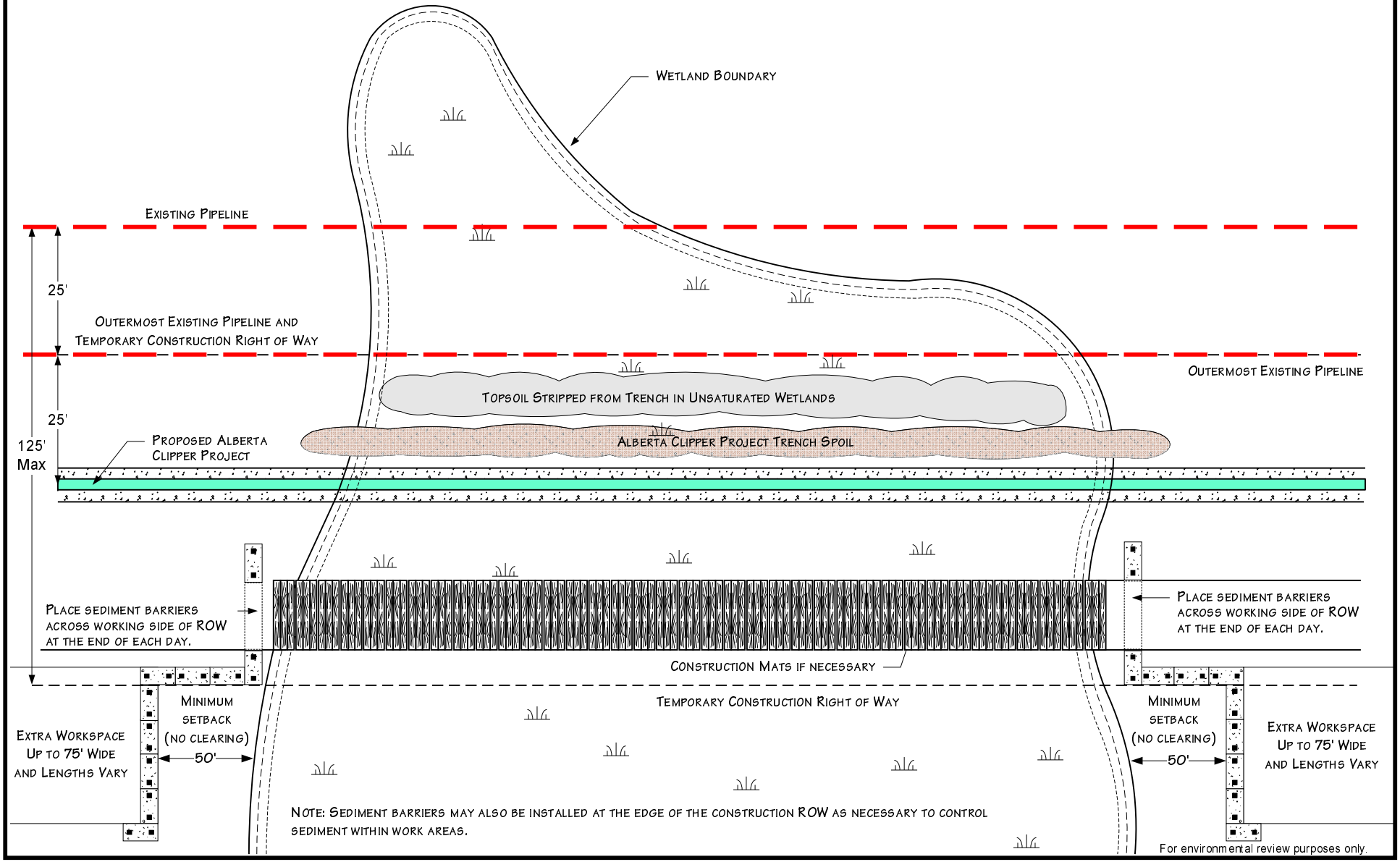


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Figure 23A

Environmental Mitigation Plan
Typical Wetland Crossing Method
(Neche, ND to Clearbrook, MN)

DATE:	5/25/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL

NATURAL RESOURCE GROUP, INC.

K:\335\ALBERTA\2006-135\400\3.1.VSD

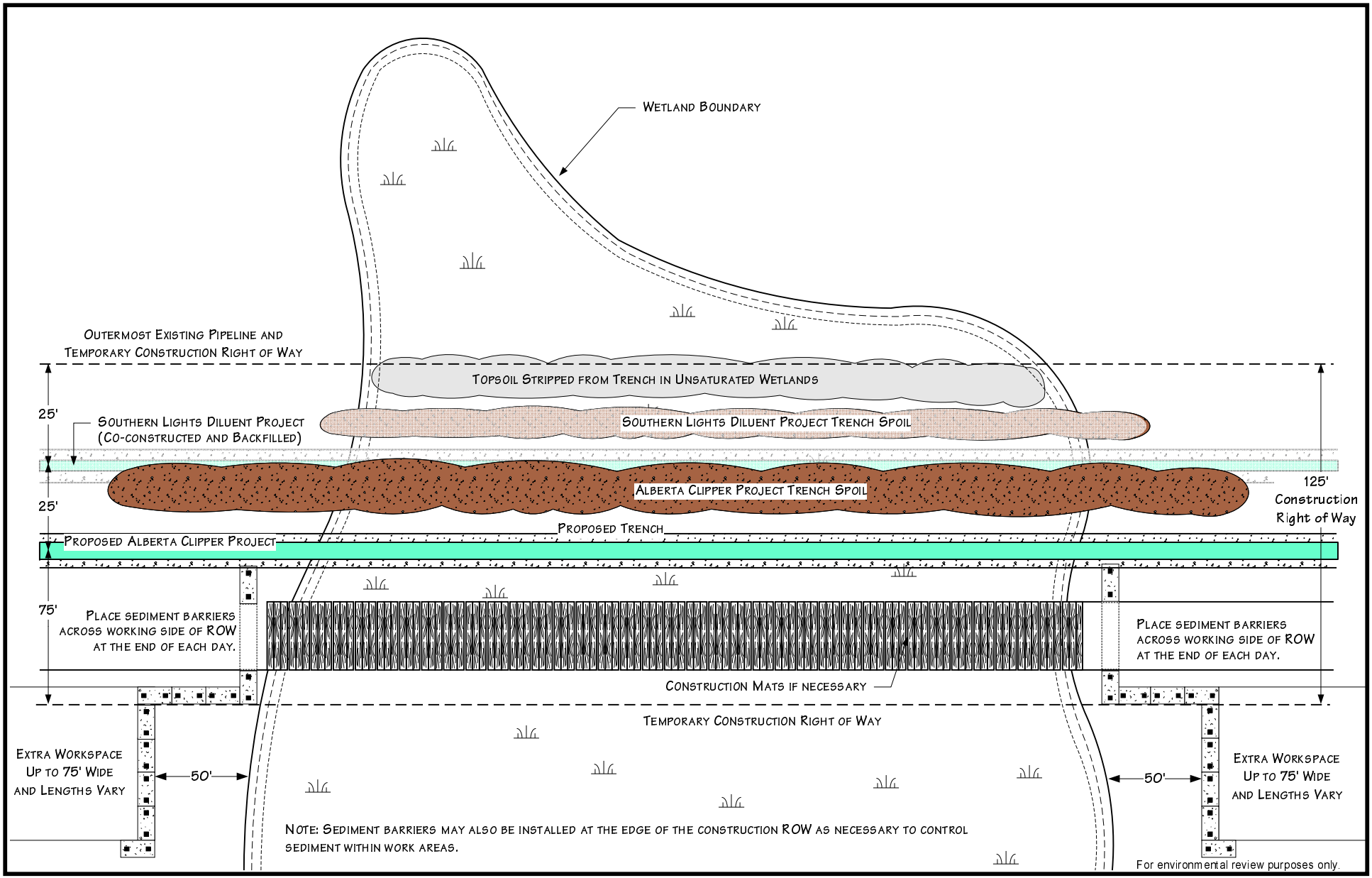

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Figure 23B

Environmental Mitigation Plan
Typical Wetland Crossing Method
(Clearbrook, MN to Superior, WI)

DATE:	5/25/2001
REVISED:	10/24/08
SCALE:	NTS
DRAWN BY:	KMKENDALL

NATURAL RESOURCE GROUP, INC.

K:\335\ALBERTA\2006-135\400\WETX2.VSD

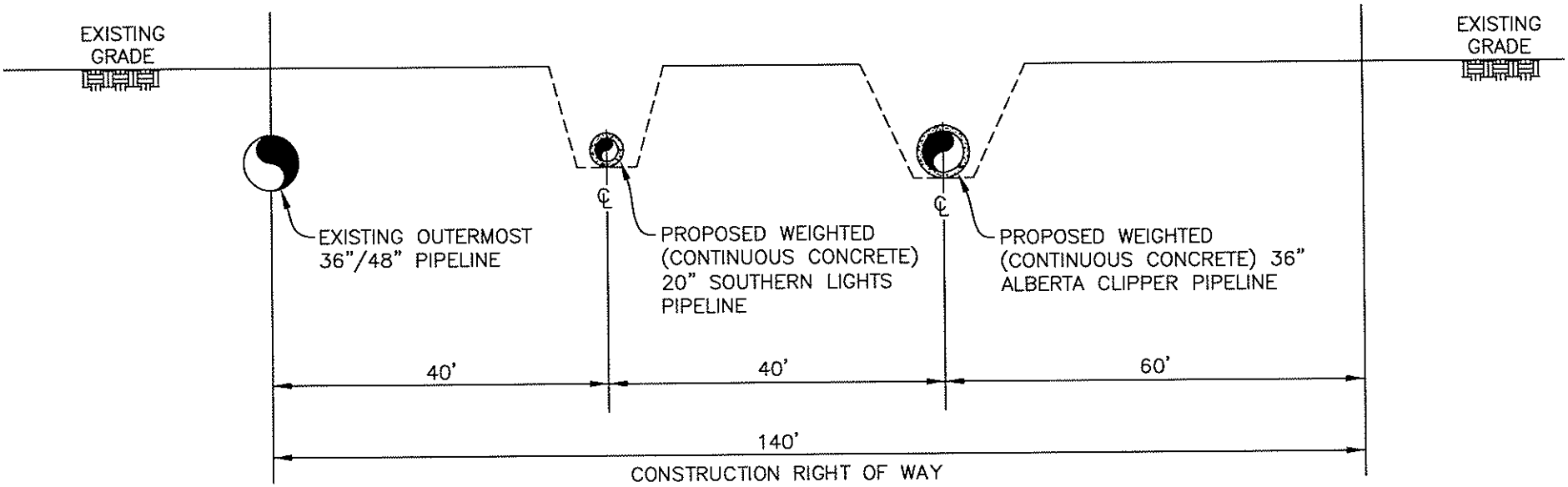

FIGURE 24

SUMMER SATURATED WETLAND CONSTRUCTION RIGHT OF WAY CONFIGURATION

K:\335\ALBERTA\2006-135\400\EMP_24.VSD	SCALE: NTS	DATE: 5/23/2007	REVISED: 10/24/2008	DRAWN BY: RSMcGregor

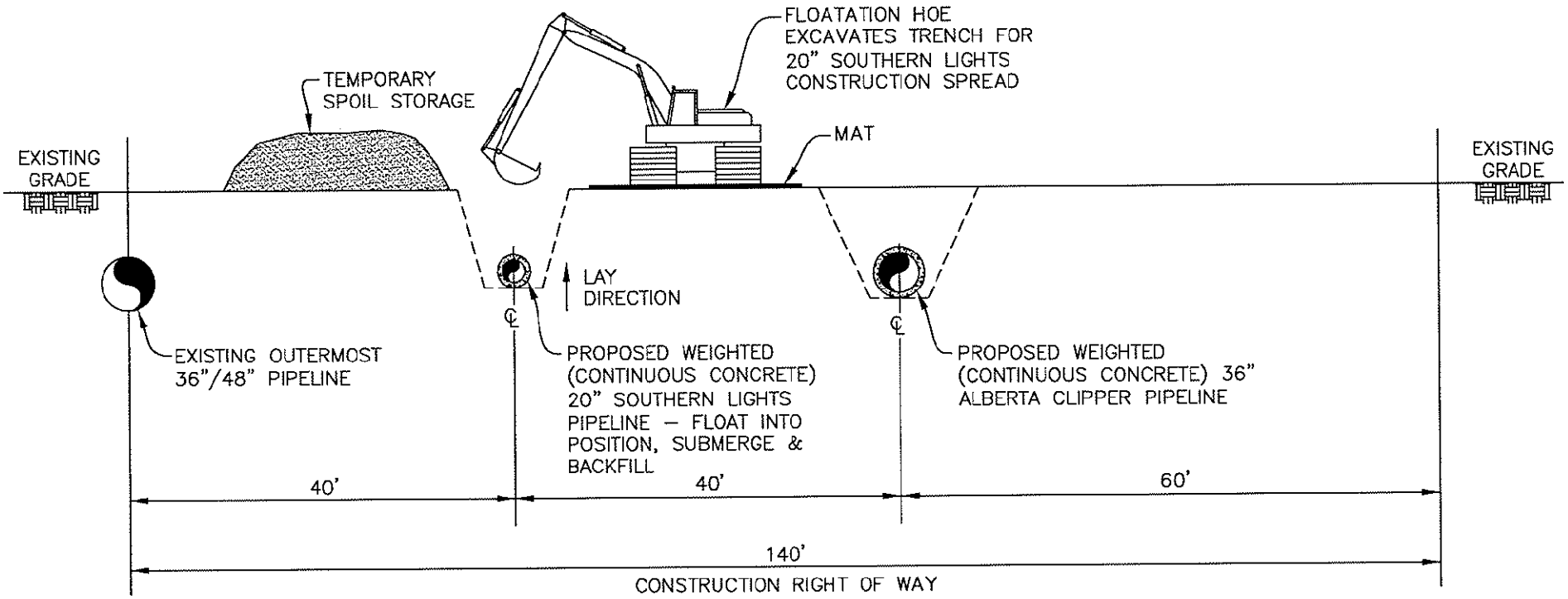

FIGURE 25

SUMMER SATURATED WETLAND CONSTRUCTION
20" SOUTHERN LIGHTS CONSTRUCTION
RIGHT OF WAY CONFIGURATION

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K:\335\ALBERTA\2006-135\400\EMP_25.VSD	SCALE: NTS	DATE: 5/23/2007	REVISED: 10/24/2008	DRAWN BY: RSMcGregor

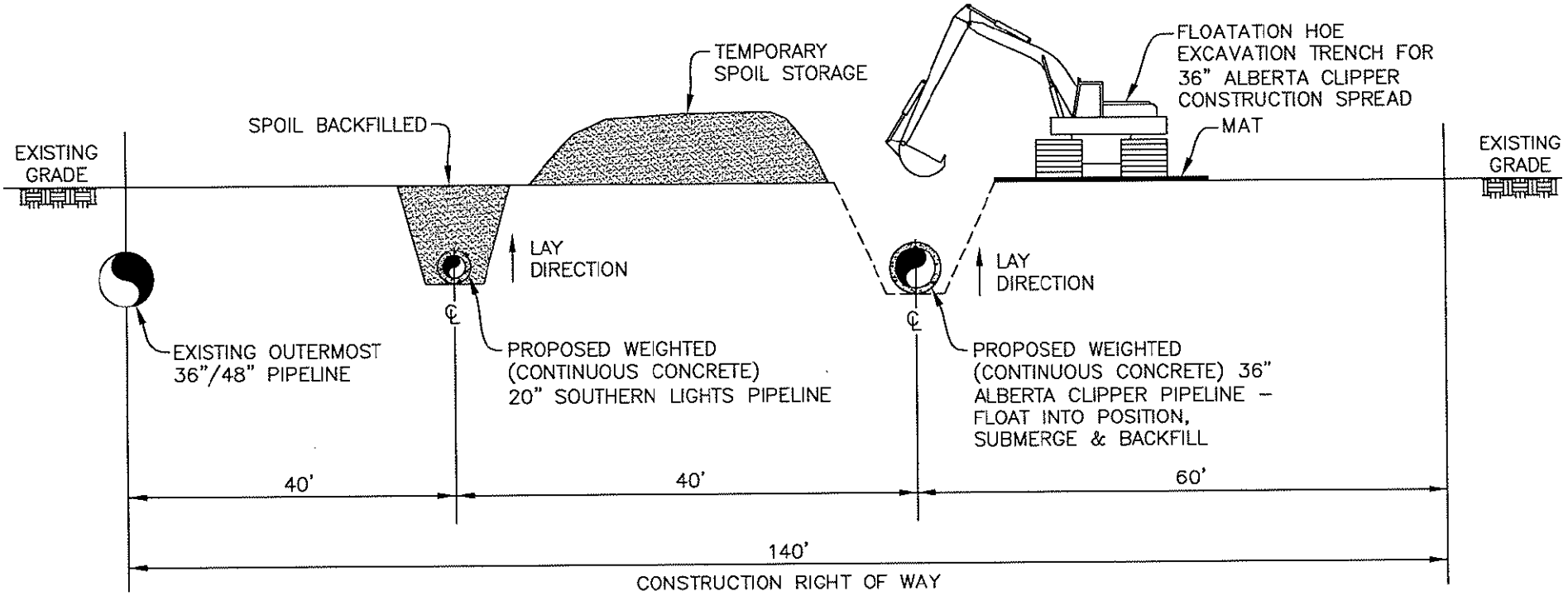
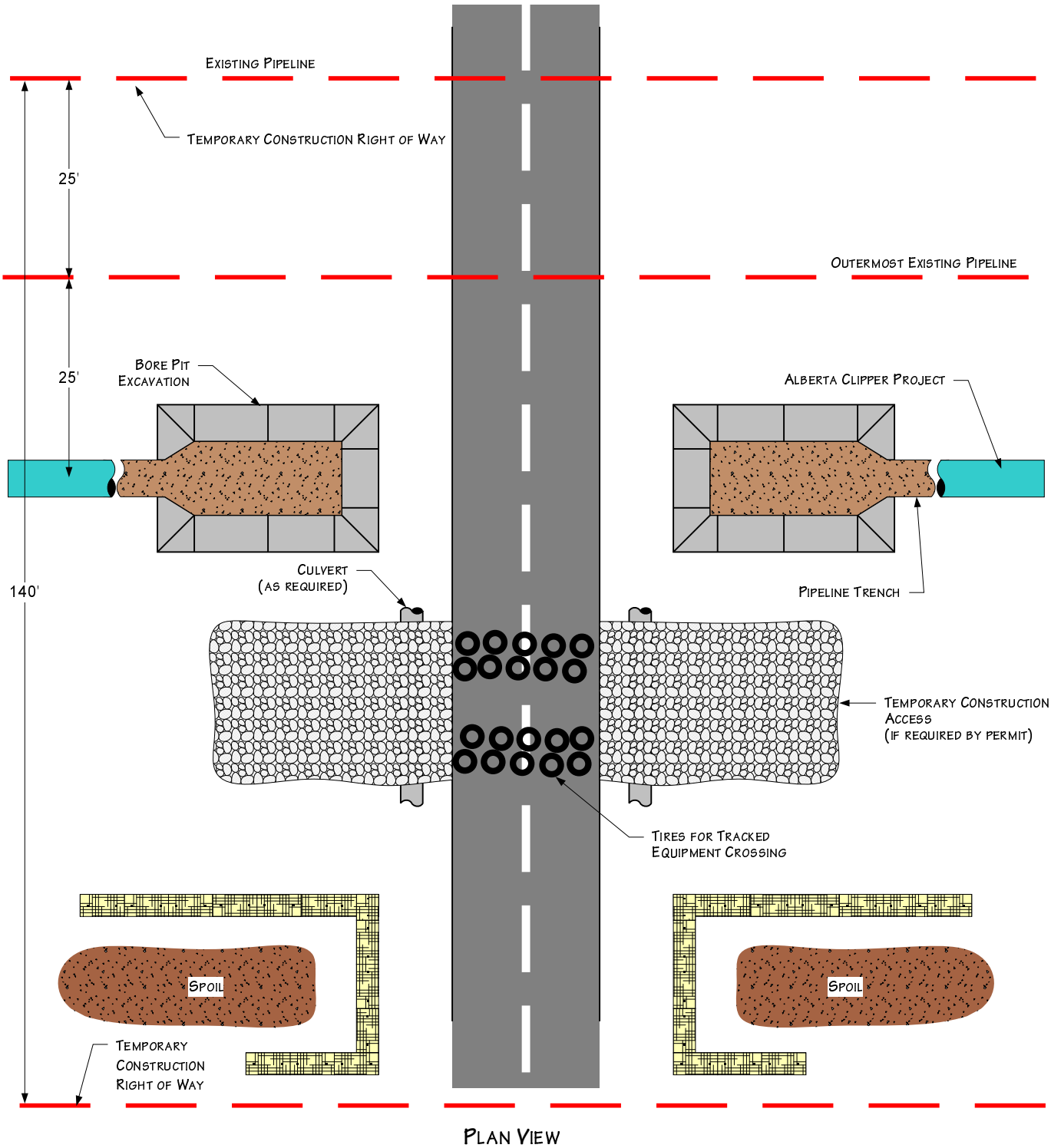


FIGURE 26

SUMMER SATURATED WETLAND CONSTRUCTION
36" ALBERTA CLIPPER CONSTRUCTION
RIGHT OF WAY CONFIGURATION

K:\335\ALBERTA\2006-135\400\EMP_26.VSD	SCALE: NTS	DATE: 5/23/2007	REVISED: 10/24/2008	DRAWN BY: RSMcGregor



PLAN VIEW

NOTES

1. PROCEDURES SHOWN IN THIS DRAWING APPLY TO IMPROVED ROADS.
2. ROADS MUST BE CLEANED AFTER EQUIPMENT CROSSES AND DIRT PLACED IN SPOIL CONTAINMENT AREAS.
3. TEMPORARY ACCESS MATERIALS MUST BE REMOVED UPON PROJECT COMPLETION.
4. ADDITIONAL INFORMATION INCLUDED ON OTHER DRAWINGS OR PERMITS.
5. CONSTRUCTION AREAS LOCATED OUTSIDE ROAD ROW.

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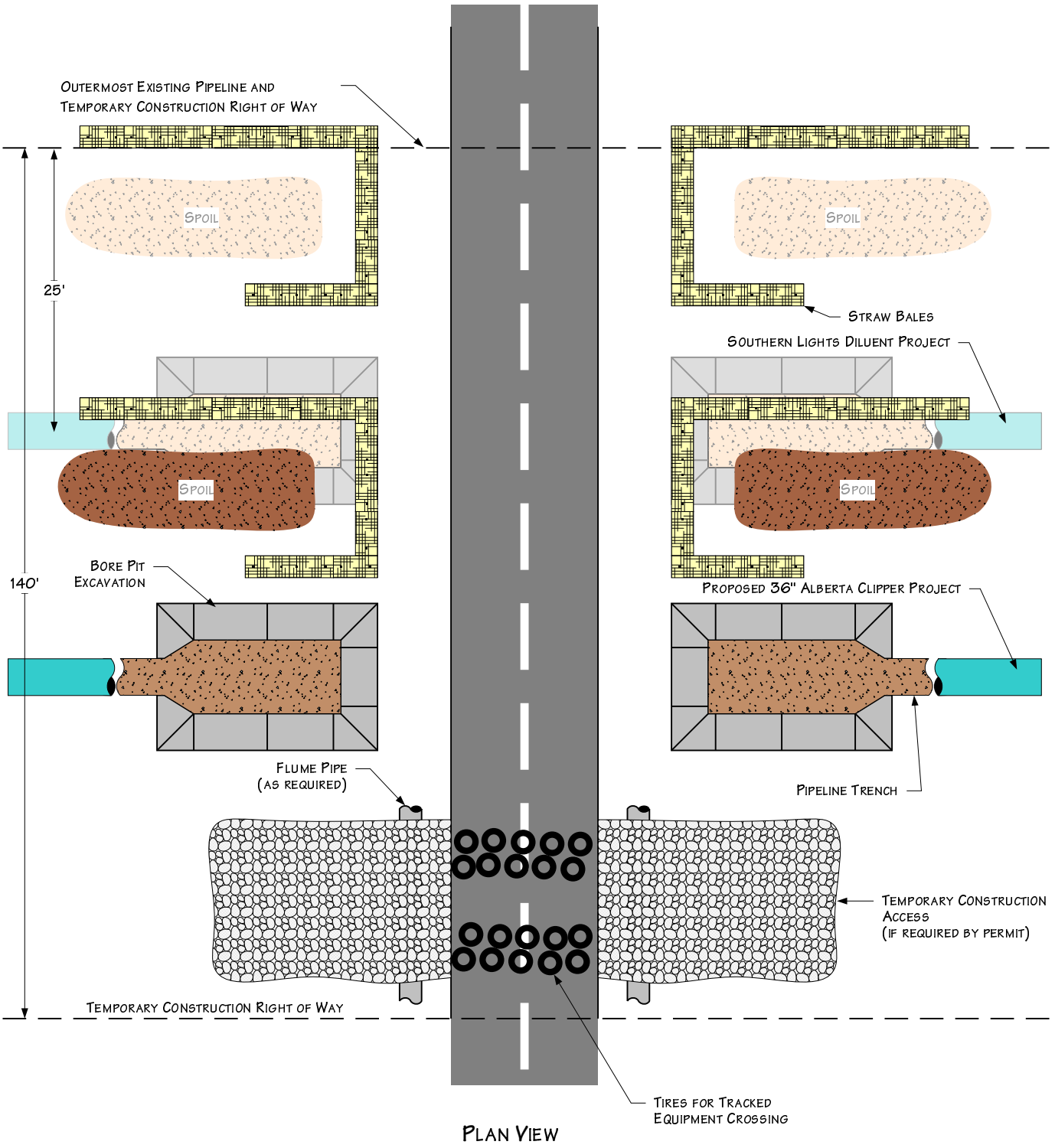
Figure 27A

Environmental Mitigation Plan
Typical Improved Road Crossing
Directional Bore Method
(Neche, ND to Clearbrook, MN)

DATE:	7/13/1999
REVISED:	10/24/2008
SCALE:	NTS
DRAWN BY:	KMKENDALL

K:\335\ALBERTA\2006-135\400\4.1.VSD



Plan View

Notes

1. Procedures shown in this drawing apply to improved roads.
2. Roads must be cleaned after equipment crosses and dirt placed in spoil containment areas.
3. Temporary access materials must be removed upon project completion.
4. Additional information included on other drawings or permits.
5. Construction areas located outside road ROW.

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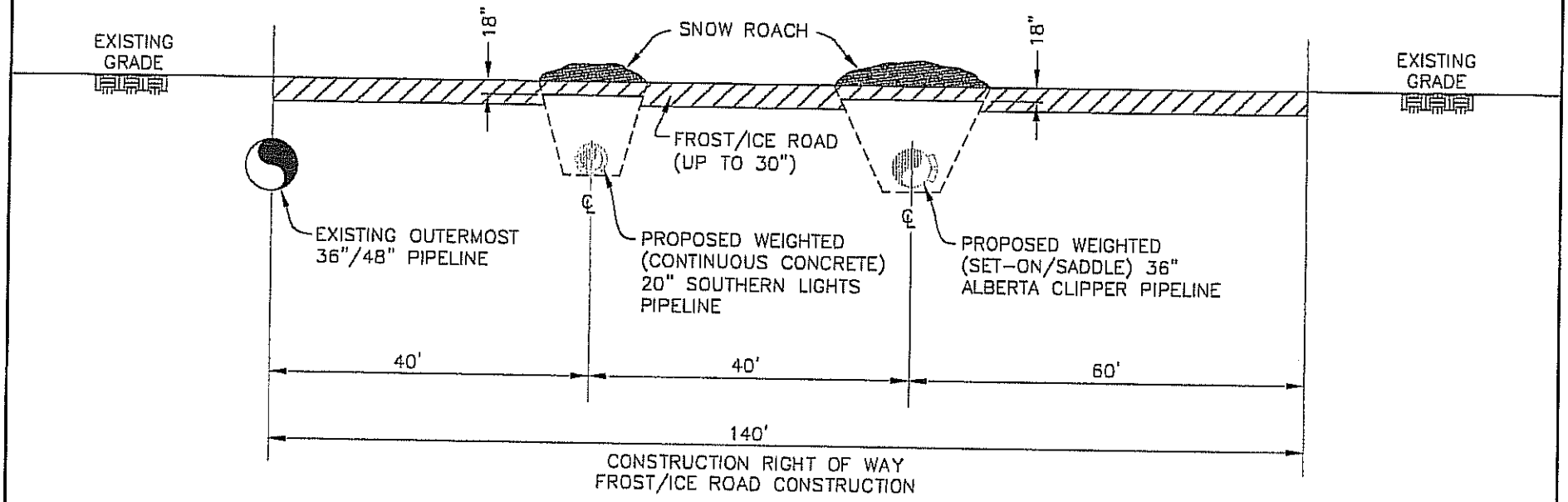
Figure 27B
Environmental Mitigation Plan
Typical Improved Road Crossing
Directional Bore Method
(Clearbrook, MN to Superior, WI)

DATE:	7/13/1999
REVISED:	10/24/2008
SCALE:	NTS
DRAWN BY:	KMKENDALL

K:\335\ALBERTA\2006-135\400\IMPROVED ROAD CROSSINGREV.VSD

C:\Work\1396\pipeline\typicals\row winter fig_1.dwg Plotted on: Dec 19, 2007 - 7:24am by ccrowe



NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D

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PROJ. ENGR.	RH	11/15/07
PROJ. MGR.	DC	11/15/07
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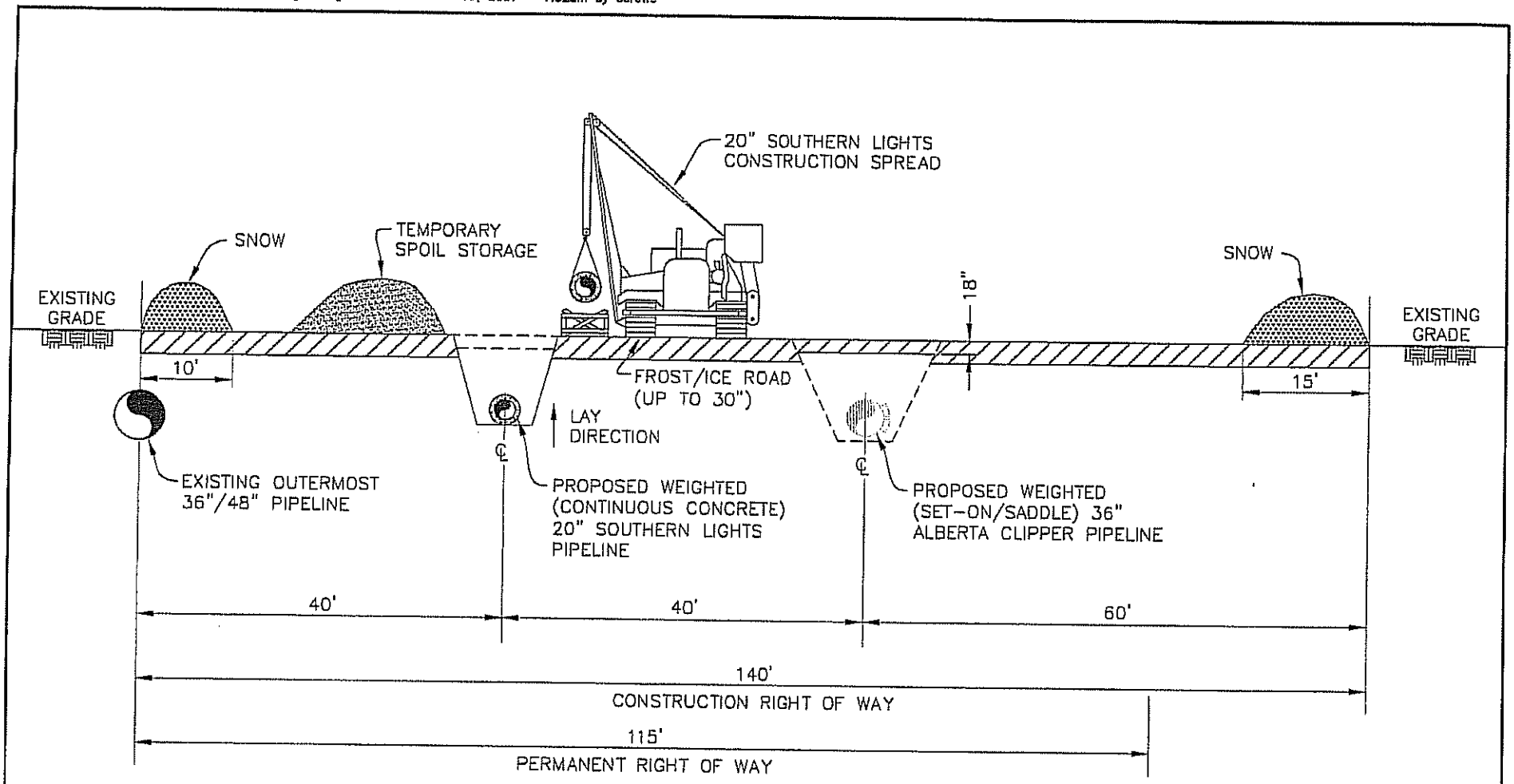
WINTER WETLAND CONSTRUCTION
FROST/ICE ROAD CONSTRUCTION
RIGHT OF WAY CONFIGURATION

Figure 28

SCALE: N.T.S.

DWG. NO.: A-65/67-1.77-FIG01-A

C:\Work\1386\pipeline\typicals\row winter fig_2.dwg Plotted on: Dec 19, 2007 - 7:52am by ccrowe



NO.	REVISION-DESCRIPTION	BY	DATE	CK'D	APP'D

GULF INTERSTATE ENGINEERING
HOUSTON, TEXAS

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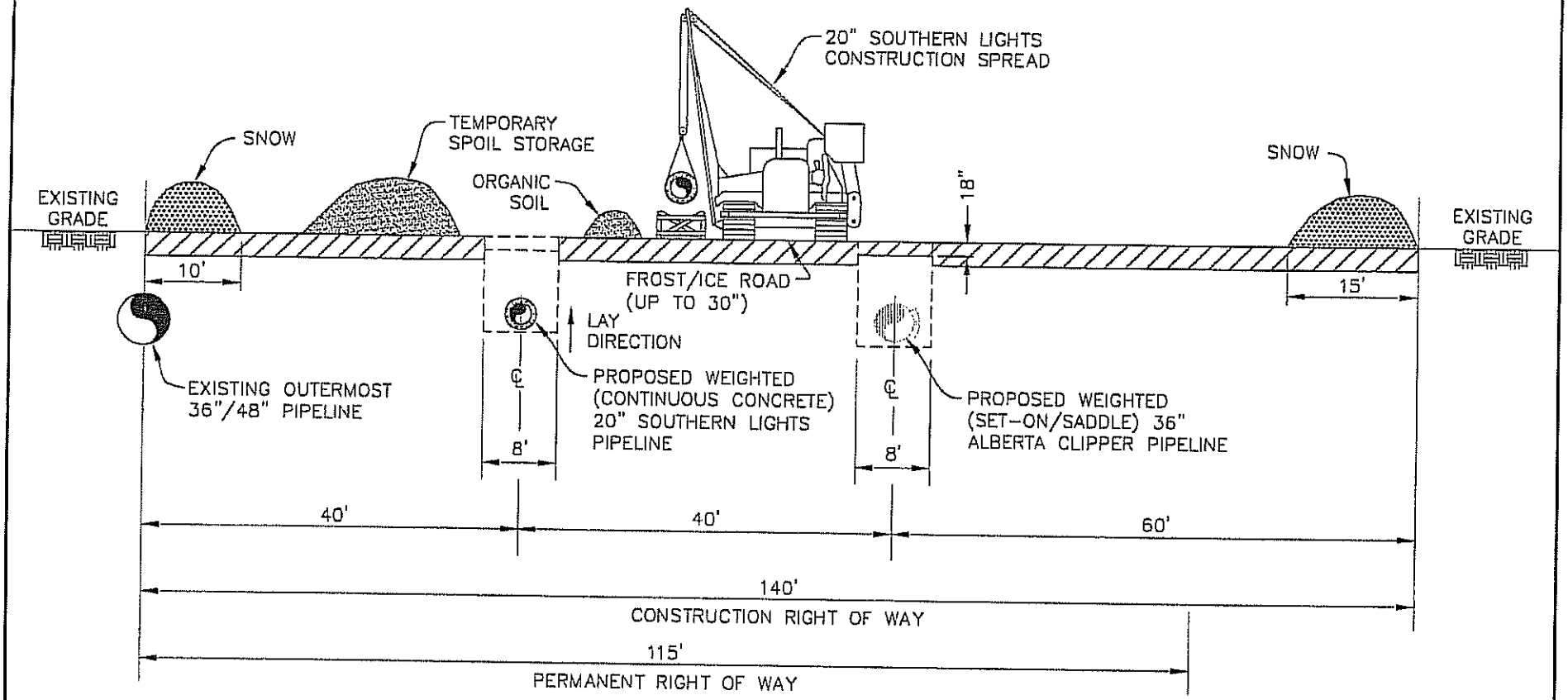
WINTER SATURATED WETLAND CONSTRUCTION
20" SOUTHERN LIGHTS CONSTRUCTION
RIGHT OF WAY CONFIGURATION
Figure 29

SCALE: N.T.S.
DWG. NO.: A-65/67-1.77-FIG02-A

C:\Work\1388\pipeline\typicals\row winter fig_2a.dwg Plotted on: Dec 19, 2007 - 7:52am by ccrowe



NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D

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DWN. BY:	GIE	DATE 11/15/07
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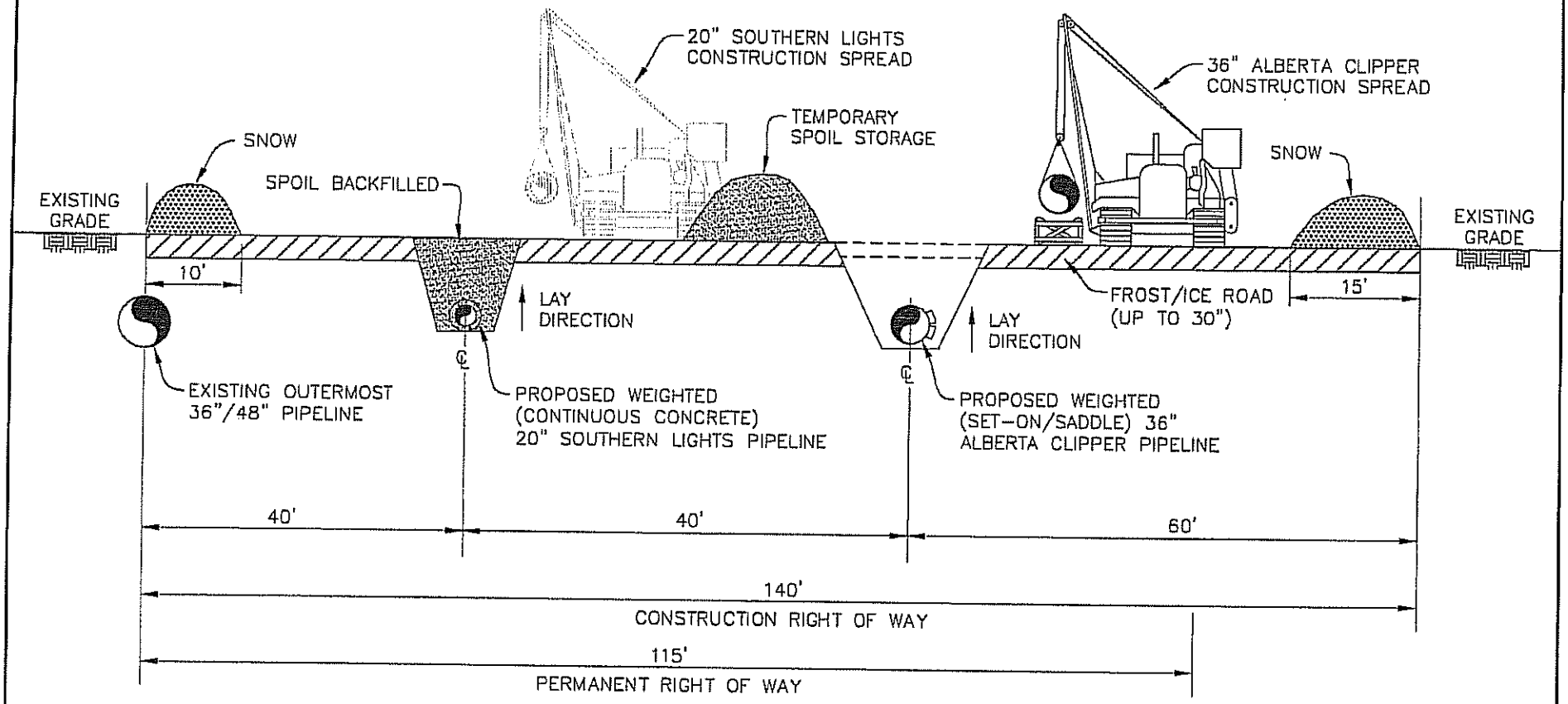
WINTER NON-SATURATED WETLAND CONSTRUCTION
20" SOUTHERN LIGHTS CONSTRUCTION
RIGHT OF WAY CONFIGURATION
Figure 30

SCALE: N.T.S.
DWG. NO.: A-65/67-1.77-FIG02A-A

C:\Work\1386\pipeline\typicals\row winter fig_3.dwg Plotted on: Dec 19, 2007 - 7:52am by ccrowe



NO.	REVISION-DESCRIPTION	BY	DATE	CH'K'D	APP'D

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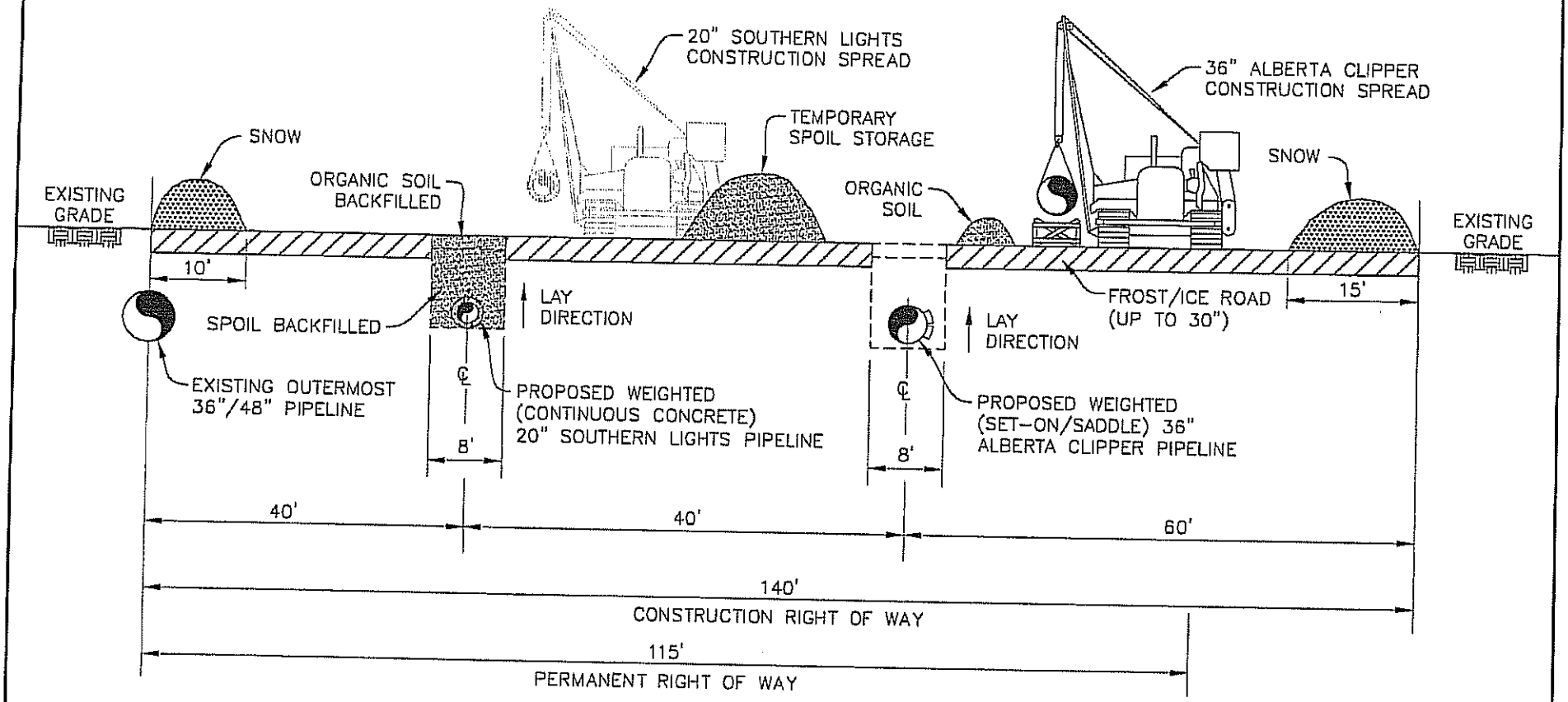
WINTER SATURATED WETLAND CONSTRUCTION
36" ALBERTA CLIPPER CONSTRUCTION
RIGHT OF WAY CONFIGURATION
Figure 31

SCALE: N.T.S.

DWG. NO.: A-65/67-1.77-FIG03-A

C:\Work\1386\pipeline\typicals\row winter fig_3a.dwg Plotted on: Dec 19, 2007 - 7:52am by ccrowe



NO.	REVISION-DESCRIPTION	BY	DATE	CHK'D	APP'D

GULF INTERSTATE ENGINEERING
HOUSTON, TEXAS

		DATE
DWN. BY:	GIE	11/15/07
CHK.	JC	11/15/07
PROJ. ENGR.	RH	11/15/07
PROJ. MGR.	DC	11/15/07
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WINTER NON-SATURATED WETLAND CONSTRUCTION
36" ALBERTA CLIPPER CONSTRUCTION
RIGHT OF WAY CONFIGURATION
Figure 32

SCALE: N.T.S.
DWG. NO.: A-65/67-1.77-FIG03A-A

Attachment A

Minnesota Specific Measures

INTRODUCTION

The measures found in the EMP with Minnesota-specific requirements are listed below along with references to source documents where these requirements are further described. Agricultural Monitors will audit Enbridge's compliance with the provisions of the Minnesota Agricultural Mitigation Plan.

1.0 GENERAL MITIGATION MEASURES

1.2 RIGHT-OF-WAY ACCESS

Additional details are provided in Section 14 (Temporary Roads) of Enbridge's Minnesota Agricultural Mitigation Plan (AMP).

1.6.6 IRRIGATION SYSTEMS

Additional information is provided in Section 11 (Interference with Irrigation Systems) of Enbridge's AMP.

1.8.2 PIPELINE DEPTH

The depth of cover is discussed further in Section 1 (Pipeline Depth of Cover) of Enbridge's AMP.

1.11 DRAIN TILE REPAIR

Additional details are provided in Section 1.B and 1.C (Pipe Depth of Cover), and Section 3 (Repair of Damaged and Adversely Affected Tile) of Enbridge's AMP.

1.12 UPLAND BACKFILLING

Prior to backfilling, the trench shall be dewatered in accordance with the methods discussed in Section 16 (Pumping of Water from Open Trenches of Enbridge's AMP.

1.13 WET WEATHER SHUTDOWN

Enbridge will manage the construction right-of-way by shutting down affected locations, dewatering, or implementing other measures as outlined in the AMP (Section 17). Shutdown of wet areas on the construction right-of-way will occur when the mitigation measures outlined in the AMP do not alleviate mixing conditions.

1.18 SOIL COMPACTION TREATMENT

Additional details are contained in Section 7 (Compaction, Rutting, Fertilization, Liming, and Soil Restoration) of Enbridge's AMP.

2.0 STREAM AND RIVER CROSSING GENERAL REQUIREMENTS

2.3 CLEARING AND GRADING

Construction activities at approaches to Impaired Waters refer to Section 2.5.3 for more restrictive buffer zones.

2.8.1.5 Installation of Wildlife Buffers in Minnesota

Enbridge will reestablish suitable woody species in designated areas in order to reestablish wildlife travel corridors in riparian areas. Woody species will be chosen that are characteristic of the ecological zone of the crossing in consultation with appropriate regulatory agencies. Enbridge will maintain a 10-foot strip of herbaceous vegetation centered over each pipeline. The woody species to be planted between the pipelines (new and existing) will be allowed to grow up to 15 feet in height, after which time Enbridge may maintain the vegetation in accordance with operational standards. The replanting zone will extend across the new and existing permanent right-of-way, and up to 50 feet from the waterbody bank (see Figure 22). The extent of replanting from the waterbody bank will be designed to correspond to the existing riparian zone, and as approved by the associated landowner.

Attachment B

Wisconsin-Specific Measures

[Pending WDNR Application]