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1320 Grand Avenue
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December 17, 2014

Ms. Jenny Skufca
Illinois Department of Natural Resources
Office of Water Resources
One Natural Resources Way
Springfield, IL 62702

Dear Ms. Skufca,

CCPS Transportation, LLC (Enbridge) is submitting the revised Habitat Conservation Plans and Incidental Take Authorization for pipeline maintenance work on existing Enbridge Line 55, Milepost 163.2808 in Mason County, Illinois as per your review and request for additional information.

If you have questions about the information presented in the revised Habitat Conservation Plans and Incidental Take Authorization, please contact me at (715) 398-4761.

Sincerely,

James Anklam
Senior Environmental Analyst
Enbridge Energy, Limited Partnership

Enclosures:

Cc: Lawrence Stock, Enbridge
Jake Maki, Construction Manager, Enbridge
Alina Heydt, Barr Engineering Company
Project Files

Integrity Dig Program, Line 55, Milepost 163.2808

Habitat Conservation Plans and Incidental Take Authorization—State of Illinois

Prepared for

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December 2014

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Note: This Habitat Conservation Plans and Incidental Take Authorization document, prepared by Barr Engineering Company (Barr) and submitted to the Illinois Department of Natural Resources by CCPS Transportation, LLC (Enbridge) draws heavily on a similar document (*Habitat Conservation Plans and Incidental Take Authorization – State of Illinois*, included as Attachment A) prepared for Enbridge by the URS corporation and submitted to the Illinois Department of Natural Resources (IDNR) by Enbridge on December 12, 2012. Barr's appropriation of text and materials used in the December 12, 2012 submittal was done with the full knowledge and approval of Enbridge.

It should also be noted that the Enbridge integrity dig referred to in this document is immediately adjacent to the project (construction of Enbridge's Flanagan South pipeline) area referenced in the December 12, 2012 document. The Incidental Take Authorizations (ITAs) requested in that document were approved by the IDNR and transmitted with a letter (dated June 17, 2013, and included as Attachment B) from Joseph A. Kath to Enbridge. Therefore, although this integrity dig is a separate project from the Flanagan South project and therefore requires a separate application for ITAs, there are already existing ITAs and mitigation plans in place for the three species of concern in the immediate area.

Habitat Conservation Plans and Incidental Take Authorization—State of Illinois

Integrity dig activities by CCPS Transportation, LLC (Enbridge) and their relation to the Yellow-headed Blackbird (Xanthocephalus xanthocephalus), King Rail (Rallus elegans) and Illinois Chorus Frog (Pseudacris streckeri illinoensis)

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I. Description of the project and its impact likely to result from the proposed taking of the identified species

CCPS Transportation, LLC (Enbridge), an indirect U.S. subsidiary of Enbridge Inc., is proposing to conduct an "integrity dig" (Project) – excavation of a section of pipeline for the purpose of investigating and conducting any required maintenance at a specific location along its existing Spearhead Pipeline.

The Project is part of an ongoing maintenance program that is conducted routinely for the entire span of Enbridge's pipeline system. **Figure 1** shows the Project location. It is expected that the location of this Project immediately adjacent to the recently-completed Flanagan South pipeline construction will help to minimize additional environmental disturbance.

Project impacts will also be minimized by keeping the duration of the disturbance as short as possible. All project activities, including restoration, can usually be completed within 10 to 20 days.

Enbridge has existing right-of-way (ROW) along the Spearhead Pipeline system and will keep Project operations within that ROW as much as possible during the course of the Project. Although some of the Spearhead ROW lacks a defined width, where defined it is generally fifty (50) to eighty (80) feet in width. In the vicinity of the proposed pipeline maintenance activity, the north edge of the Spearhead ROW directly abuts the south edge of the Flanagan South ROW.

The Project area is rural with agriculture as the primary land use. The Project site will be accessed from Highway 97, with the route following an existing gravel/dirt two-track roadway through a farm yard and upland pasture, proceeding to a soybean field and the Project staging area adjacent to ROW. For the actual excavation and inspection of the pipeline, including temporary stockpiling of topsoil and subsoil, the Project work area will be approximately 140' by 30' (0.10 acres). Excavation to expose the pipeline will take place in a relatively small portion (approximately 60' by 30") of the work area. An additional work area for staging and storing equipment (and at which no excavation will occur) will also be required. This additional work area will lie to the south of the Project area, and will have dimensions of approximately 150' by 100' (0.34 acres). Enbridge has a temporary easement agreement with the landowner to use this as the staging area. Clearing (mowing; "brush-hogging") of the access route and work areas will be required at the beginning of Project activities. **Figure 2** shows the Project work areas and access route.

As part of early endangered and threatened (E&T) species coordination for the recently-constructed Flanagan South pipeline, the Illinois Department of Natural Resources (IDNR) provided Enbridge with electronic E&T species location data for Mason County. (See **Attachment A** – Flanagan South Project - Habitat Conservation Plans and Incidental Take Authorization.)

Enbridge inserted this location data (including species buffer polygons) into the GIS mapping for the Flanagan South pipeline construction project. This mapping is also shown on **Figure 2,** which shows via hatching the mapped species buffer polygons that were included within the Flanagan South construction ROW. The hatching indicates that the current integrity dig Project activity has the

potential for impacts on three listed species: the Yellow-headed Blackbird, the King Rail, and the Illinois Chorus Frog.

The Illinois-mapped species buffer polygons in the Project vicinity are in the Mason County Sands area in the vicinity of Sand Lake, southeast of the town of Havana. According to Ground-water/Surface Water Interactions at Sand Lake, Mason County, Illinois, by the Illinois State Water Survey (1999), Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades.

As can be seen from the ground photos included in **Figure 3**, taken on November 2, 2012, the portion of Sand Lake crossed by the pipeline was used for agricultural production (corn and soybean) in 2012. The corridor and the surrounding area did not contain any intact wetland vegetation and no areas with standing water were observed on this date. At least in 2012, Sand Lake would not have provided good nesting habitat for the Yellow-headed Blackbird, which only nests at sites where the water level is on average deeper than 1 meter, and which has a mixture of open water and vegetation (usually cattails) that is referred to as a hemi-marsh. Similarly, the Sand Lake of 2012 would have provided relatively poor habitat for King Rails, which nest in sites with shallow water (saturated soil to about 7 inches (22 cm) deep) during the nesting season, with high coverage of short emergent vegetation, moderate coverage of tall emergent vegetation, high water-vegetation interspersion, and little or no coverage by woody vegetation. It is unknown if Sand Lake would have provided breeding habitat for the Illinois Chorus Frog, which is an early spring breeder (March-April), or if any ponded habitats lasted long enough for tadpoles to metamorphose, in about late May to mid-June. However, for the rest of the year, Illinois Chorus Frogs are highly fossorial (i.e., burrow and live underground). The preferred habitat for this portion of their life cycle is areas of sandy soil with sparse vegetation or absence of vegetation. Thus, the portion of Sand Lake crossed by the pipeline could potentially harbor these fossorial frogs.

Figure 4 provides additional photographs of the Project site taken in August of 2014. These photographs confirm the impressions made during the site visit in 2012. The area surrounding the Project site did not contain any intact wetland vegetation and no areas with standing water were observed. The area was dominated by corn and soybean fields, and grassed areas typical of upland regions.

II. Conservation Plan: Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)

II.A.1 Legal description, if available, or detailed description of the area to be affected by the proposed action

Figure 2 indicates the area (0.44 acres in total) of disturbance that may potentially affect the Yellow-headed Blackbird. This occurs on the following parcel:

Mason County Assessor PIN:	10-08-300-001-0021
Mason County Assessor Parcel No.:	454000.000000
Owner Name:	S & D FARMS, INC.
Legal Description:	PT NW1/4 SW1/4 8 21 8 126
Parcel size:	41.49 acres
Township No.:	5
Township Name:	Havana

II.A.2. Biological data on Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)

In Illinois, where it is at the eastern limit of its range, the Yellow-headed Blackbird has probably always been restricted to the prairie regions in the northern part of the state, where it was once a locally abundant breeding bird. The Illinois population is separated from the core of the Yellow-headed Blackbird population in western Iowa by about 420 miles (680 km). The Illinois population is small, declining, and isolated from the main North American breeding range for this species. It is an Illinois endangered species known from one 1994 occurrence in Mason County (Nyboer, R.W., J.R. Herkert, and J.E. Ebinger. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2—Animals).

The Yellow-headed Blackbird is a medium-sized, brilliantly colored blackbird. Adults have a pointed bill. The adult male is mainly black with a yellow head and breast; they have a white wing patch sometimes only visible in flight. The adult female is mainly brown with a dull yellow throat and breast. Both genders resemble the respective genders of the smaller Yellow-hooded Blackbird of South America. Total length is 9.5 inches, wingspan is 15 inches, and weight is 2.3 ounces.

The Yellow-headed Blackbird only nests at sites where the water level is on average deeper than 1 meter. The wetland must have a mixture of open water and vegetation (usually cattails) that is referred to as a hemi-marsh. The nest is built with and attached to marsh vegetation. They nest in colonies, often sharing their habitat closely with the red-winged blackbird (*Agelaius phoeniceus*). During the breeding and nesting season the males are very territorial and spend much of their time perched on reed stalks and displaying or chasing off intruders.

The Yellow-headed Blackbird is territorial during the breeding season. The size of the male's territory is indirectly proportional to the quality of the marsh habitat. A positive correlation exists between the surface area of marsh and territory size as well as between the surface area of the marsh and the number of fledglings per adult. The Yellow-headed Blackbirds flock with other blackbirds

during the non-breeding periods, feeding on grain and insects. The Yellow-headed Blackbird is a polygamous species that breeds in colonies. The males arrive at the marsh nesting area and establish territories before the females arrive. When the females arrive at the nesting area (late March to early May), one to five females build a nest, a basket woven around several strong stalks, within a male's territory. Females are protective of their nesting area but don't help the male defend his territory. During the breeding season the female forages close to the nest, while the male forages within his territory or upland in a flock. The female lays 2 to 6 brown-speckled, whitish eggs. The eggs are incubated (by the female) for 12 to 13 days, with incubation beginning with the second or third egg. Almost all parental care is done by the female. For the first 2 or 3 days after hatching she broods them during the day and feeds them small insects. The first day the chick's weight gain averages 60%. After the third day the female starts bringing bigger insects such as grasshoppers, damselflies, and dragonflies. After the young are 4 or 5 days old the female stays at the nest only long enough to deliver food and inspect for water. At 9 days old the chicks' weight gain has decreased to 5% per day and it has achieved about 60% of its adult weight. At 10-14 days old the young cannot fly but they leave the nest never to return. They hop around in the dense vegetation near the water surface and remain there until they learn to fly at about 3 weeks old. After the breeding season the birds leave the nesting area and flock in dense bulrush and cattail growths. They remain there all day, coming out only to feed in the morning and evening. Often the flocks are segregated with males in one and females and juveniles in another. In August the flocks leave the marsh, returning only at night to roost. Yearling females fledge significantly fewer young than older females.

These birds migrate in the winter to the southwestern United States and Mexico. They often migrate in huge flocks with other species of birds. These blackbirds are only permanent residents in the United States of the San Joaquin Valley and the Lower Colorado River Valley of Arizona and California. It is an extremely rare vagrant to Western Europe, with some records suspected to refer to escapes from captivity.

II.A.3 Description of the activities that may result in taking

Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. Such activities related to pipeline maintenance may include the following:

- Clearing and indirect Project traffic;
- Staging of maintenance equipment;
- Trenching and stockpiling of soils;
- Backfilling, and
- Post-backfilling grading and restoration.

The need for de-watering is not anticipated; however, if necessary, potential de-watering impacts will be minimized by discharging through filter bags into a vegetated upland area.

II.A.4. Explanation of the anticipated adverse effects on the species/estimated quantification of take

The number of Yellow-headed Blackbirds currently utilizing the Project area of Sand Lake is unknown. The areas directly affected by Project activities comprise 0.44 acres.

Enbridge does not expect to have any direct take of Yellow-headed Blackbirds because it intends to conduct Project activities during winter months and outside of the breeding season, thereby completely avoiding take. Any potential modification to habitat will be temporary as restoration procedures (explained below) typically result in return to the original contours and full restoration within 1 to 2 years of Project activities.

II.B.1. Measures to be taken to minimize and mitigate the impact on the species and the funding that will be available to undertake these measures

To minimize the environmental impact of pipeline maintenance activities, Enbridge's *Environmental Mitigation Plan, Pipeline Maintenance Projects* (EMP, provided as **Attachment C**) describes activities associated with pipeline maintenance and procedures that will be implemented during Project activities to minimize the environmental impacts of these activities. The EMP is intended to meet or exceed applicable federal, state, and local environmental protection and erosion control specifications and practices, is designed to address typical circumstances, and may be amended by Enbridge as necessary to address site-specific conditions. Specific activities that may affect habitat for the Yellow-headed Blackbird are described along with minimization procedures below.

Site Preparation

Low ground pressure equipment will be used, as practical, to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:

- The staging area will be located in upland if possible;
- The size of the additional workspace areas will be limited to the minimum needed; and,
- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal re-vegetation as allowed by permits.

Sediment Control Practices

Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization

Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation

Where feasible (normally in wetland areas without standing water or saturated soils), up to 1 foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Backfilling

During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration

Cleanup will involve removal of construction debris from the Project area. Rough grading will include restoring pre-construction contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

Disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

To the maximum extent practicable, Enbridge has set the timing of its pipeline maintenance activities to avoid disturbing nesting activities of all bird species, including the Yellow-headed Blackbird. Cleanup and restoration activities – part of normal Project activities – will take place immediately following work on the pipeline itself, and thus before breeding season. However, if it becomes impossible to conduct the maintenance activities during winter months, it is possible that some Project activities would be conducted during the nesting season. These activities will be minimized in Yellow-headed Blackbird habitat to the extent practicable.

The Contractor will also use special construction techniques (including timber mats, see discussion in **Section II.B.4**, below) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize maintenance-related disturbance of the habitat and to restore the habitat as nearly as possible to pre-construction conditions.

II.B.2. Plans to minimize the area affected by the proposed action, the estimated number of individuals of the species that will be taken and the amount of habitat affected

To comply with regulatory deadlines, Enbridge's goal is to complete maintenance activities for the Project by February 4, 2015. Enbridge will proceed with the work as soon as it obtains IDNR authorization to proceed. If authorization cannot be obtained in time for Enbridge to meet the February 4, 2015 deadline, Enbridge would still plan to complete the work before mid-March 2015, prior to the beginning of nesting season.

Therefore, the planned Project activities – including cleanup and restoration activities, which will take place immediately following work on the pipeline itself – would take place entirely outside of the Yellow-headed Blackbird's normal breeding or nesting periods. For this reason, it is estimated that the number of Yellow-headed Blackbirds to be taken by the proposed action is zero.

As is indicated on **Figure 2**, Project activities will be confined to limited and pre-determined areas within or immediately adjacent to the existing pipeline ROW.

Following the Project's completion, the existing 50' maintenance corridor for ongoing operation of the pipeline will remain. The maintenance corridor has been part of the site since the pipeline was constructed, and will not represent any new disturbance in this area.

II.B.3. Plans for management of the area affected by the proposed action that will enable continued use of the area by the species

Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during the time of Project activities is unknown at this time; however, unsaturated conditions are expected to be more prevalent during winter when the Project activities are scheduled to take place.

As indicated in Enbridge's EMP (**Attachment C**) up to 1 foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with the mix in **Table II-1** to provide temporary cover while the wetlands revegetate naturally. The natural re-vegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

Table II-1 Unsaturated Wetland Seed Mix—General Restoration Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	Percent (%) of Seed
American Slough Grass *(Beckmannia syzigachne))*	6	30%
Annual Rye Grass *(Lolium perene)*	8	40%
Fowl Bluegrass *(Poa palustris)*	6	30%
Total	**20.0 pounds**	**100%**

Should a standing water condition be found at Sand Lake during Project operations, Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

II.B.4. Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on the species

As discussed in **Section II.B.3**, topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation.

Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Immediately following completion of all Project activities during the non-breeding season, the Project area will be restored to its pre-construction conditions as practical.

While it is possible that some restoration activities would need to take place during the nesting season for the Yellow-headed Blackbird, restoration activities will be confined to the Project areas that will have been cleared and will not have suitable breeding habitat (e.g., cattails and emergent vegetation) until after restoration is complete and re-vegetation has been initiated by natural regrowth from the seed bank or reseeding with the approved wetland vegetation seed mix.

II.B.5. Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on the species

The habitat left after post-Project reclamation activities (emergent marsh with or without standing water, depending on precipitation cycles) will be the same as that which is taken.

In its Habitat Conservation Plan and Incidental Take Authorization for the Flanagan South pipeline (**Attachment A**), and following the procedure established by Ward, M.P, 2004, *Habitat Selection by Yellow-headed Blackbirds*, Enbridge committed to conduct a pre-construction survey during the breeding season (late spring-early summer of 2013) by locating Yellow-headed Blackbird nests by searching appropriate habitat within the construction project corridor in the Sand Lake vicinity. Once located, these nests were to be recorded using a hand-held GPS and photographs were to be taken. This survey procedure was to have been repeated during the first nesting season following construction. A brief report of survey results was to have been submitted to IDNR by December 31st of each survey year.

Surveys should document presence/absence of both species and habitat, and would be discontinued once habitat within the Project area becomes once again similar to the immediately adjacent habitat. No additional surveys are planned as part of the current Project.

We note that the Yellow-headed Blackbird is known from one 1994 occurrence in Mason County (Nyboer, R.W., J.R. Herkert and J.E. Ebinger. 2006. *Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2—Animals*).

II.B.6. Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of measures instituted to minimize or mitigate the effects of the proposed action on the species

As discussed above, Enbridge will either seed or not seed habitat after Project activities, depending on the presence or absence of standing water. Enbridge will document the restoration of any wetland within the Project area to adjacent wetland conditions. If similar habitat conditions do not return to the Project area, Enbridge will rehabilitate the Project area to match adjacent habitat conditions.

II.B.7. Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan

Enbridge verifies that all funding necessary for the implementation of conservation and mitigation activities discussed in this document has been reserved for that purpose.

II.C.1. A description of alternative actions the applicant considered that would not result in take, and the reasons that each of those alternatives was not selected. A “no-action” alternative is also described

The proposed action is a maintenance dig on an existing pipeline. As such, there are no alternative locations for the proposed action, because the pipeline is already in place. The successful completion of the proposed maintenance action requires excavation around a portion of the existing pipeline. There are no feasible maintenance alternatives that do not require excavation.

The proposed maintenance excavation will utilize the minimum dimensions necessary to complete the work. Adjacent stockpiling and staging areas will also be minimized, and will be located on or immediately adjacent to the pipeline ROW. Therefore, there are no alternative excavation techniques or configurations that would reduce impacts or eliminate take.

The No Action alternative would eliminate take; however, the No Action alternative is not feasible because it would not meet the Project's need as described above.

II.D.1. Information to indicate that the proposed taking will not reduce the likelihood of the survival of the species in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois

Impacts to potential habitat during Project activities, and during post-Project restoration activities will be minimized. The Project will be constructed following the construction protocols documented in the Enbridge Environmental Mitigation Plan and provided above. The Project's taking place along and adjacent to an existing pipeline ROW avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur in a previously-undisturbed location. Minimizing the footprint for Project activities, along with the very short duration of Project activities, combine to limit the Project's impacts on both an area and time basis.

Project activities in the Sand Lake area are not expected to reduce the likelihood of the survival of the Yellow-headed Blackbird in Illinois. It is anticipated that no birds would be taken by the Project because Project activities will occur outside of the breeding season of the Yellow-headed Blackbird. Any restoration that will occur later in 2015 will occur in areas previously cleared or mowed during Project activities, and thus unsuitable for nesting and breeding. Following Project completion, suitable habitat for the Yellow-headed Blackbird will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the Project area to match the immediately adjacent habitat.

II.E.1. Assurance of compliance with all other federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan

Project work within wetlands will be completed in accordance with the U.S. Army Corps of Engineers Nationwide Permit 12 and Illinois EPA Water Quality Certification Regional Conditions for NWP 12. Mason County will be notified prior to the start of Project work.

II.E.2. Copies of any final federal authorizations for a taking already issued to the applicant, if any

Not applicable, no federal authorizations for a taking have been issued or applied for as of this writing.

II.E.3. For projects that will result in the taking of endangered or threatened species of plants, copies of expressed written permission of the landowner

Copies of expressed written permission of the landowner of tracts from which endangered or threatened species of plants will be taken were provided to the Illinois Department of Natural Resources prior to the commencement of construction of the Flanagan South pipeline. The required permission was limited to a single landowner in the Sand Lake area. Because this Project will be occurring within the area for which permission has already been obtained, no further permission need be sought.

III. Conservation Plan: King Rail (*Rallus elegans*)

III.A.1. Legal description, if available, or detailed description of the area to be affected by the proposed action

Figure 2 indicates the area (0.44 acres in total) of disturbance that may potentially affect the King Rail. This occurs on the following parcel:

Mason County Assessor PIN:	10-08-300-001-0021
Mason County Assessor Parcel No.:	454000.000000
Owner Name:	S & D FARMS, INC.
Legal Description:	PT NW1/4 SW1/4 8 21 8 126
Parcel size:	41.49 acres
Township No.:	5
Township Name:	Havana

III.A.2. Biological data on King Rail (*Rallus elegans)*

The King Rail was formerly considered to be a common summer resident in suitable localities throughout the state. Now the King Rail is an Illinois endangered species known from Brown, Fulton, and Mason Counties. One 2007 occurrence is known from Brown County, one 1988 occurrence is known from Fulton County, and one 1994 occurrence is known from Mason County.

The King Rail is the largest North American rail. Its most common call is a low grunt. It is a large rusty rail with slender bill, longer than its head and slightly decurved. It has a laterally compressed body and long toes. Males are generally indistinguishable from females in plumage coloration but are slightly brighter and darker as well as slightly larger in size. Upper parts are olive brown, breast is rufescent, flanks are barred with black and white, and the tail is short and often uplifted. Total length is 15 to 19 inches, wingspan is 20 inches, and weight is 13 ounces. Immature birds are light brown on the head and darker brown on the back and wings.

They breed in marshes in eastern North America. Researchers have found King Rail nesting associated with various plant species in the Midwest (often cattail). A common finding in most of these studies is an association of the nesting site with shallow water (saturated soil to about 7 inches (22 cm) deep) during the nesting season. King Rails occupy wetlands that are characterized by high coverage of short emergent vegetation, moderate coverage of tall emergent vegetation, high water-vegetation interspersion, and little or no coverage by woody vegetation. The structure of wetland habitats may be more important to King Rails than individual plant species, which vary widely over the Rail's range. Percent emergent cover, vegetation height, and interspersion are also important habitat variables for breeding Rails. The nest is a raised platform built with marsh vegetation and covered by a canopy. The King Rail interbreeds with the Clapper Rail where their ranges overlap (not in Illinois); some researchers believe that these two birds belong to the same species.

Birds along the southeastern coasts of the United States are permanent residents. Other birds migrate to the southern United States and Mexico; in Canada, they are found in southern Ontario.

King Rails forage in shallow water near cover and mainly eat aquatic insects and crustaceans. They are still common in some coastal areas, although interior populations have declined due to habitat loss.

King rails arrive from wintering grounds beginning around mid-May. In Iowa, nesting begins soon after arrival in approximately the first week in May. Nesting period varies with latitude, but is 3 to 4 months in north and longer at southern latitudes. Males choose territory and initial occupation is indicated by mating call. Prenuptial courtship consists mainly of walking about with tail uplifted and white undertail coverts extended. Calls and courtship feeding are also performed. The male selects the nest site and is apparently more active in building nest than female. Egg laying has been recorded in Illinois from May 4 to June 26. The average clutch size is 10 to 12, laid one per day. Eggs are pale buff sparingly or irregularly spotted with browns, 1.6 by 1.2 inches in size. Incubation lasts 21 to 23 days and is performed by both sexes. Young either follow their parents to feeding areas or remain concealed in grasses waiting for food to be delivered. A pair may remain with its brood for over a month while staying within approximately 100 feet of the nest for the first 3 weeks. Young begin to fly at approximately 9 weeks.

During the nesting season, King Rails use deeper water in areas dominated by short emergent cover, while during the brood-rearing season they use shallower water in areas dominated by short emergent cover and avoid areas dominated by tall emergent cover. King Rails, like many other marsh birds, tend to select habitats based on structure rather than plant species.

III.A.3. Description of the activities that may result in taking

Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. Such activities related to pipeline maintenance may include the following:

- Clearing and indirect project traffic;
- Staging of maintenance equipment
- Trenching and stockpiling of soils;
- Backfilling, and
- Post-backfilling grading and restoration.

The need for de-watering is not anticipated; however, if necessary, potential de-watering impacts will be minimized by discharging through filter bags into a vegetated upland area.

III.A.4. Explanation of the anticipated adverse effects on the species/estimated quantification of take

The number of King Rails currently utilizing the Project area of Sand Lake is unknown. The areas directly affected by Project activities comprise 0.44 acres.

Enbridge does not expect to have any direct take of King Rails because it intends to conduct Project activities during winter months and outside of the breeding season, thereby completely avoiding take. Any potential modification to habitat will be temporary as construction procedures (explained below) typically result in return to the original contours and full restoration within 1 to 2 years of Project activities.

III.B.1. Measures to be taken to minimize and mitigate the impact on the species and the funding that will be available to undertake these measures

To minimize the environmental impact of Project activities, Enbridge's *Environmental Mitigation Plan, Pipeline Maintenance Projects* (EMP, provided as **Attachment C**) describes activities associated with pipeline maintenance and procedures that will be implemented during Project work to minimize the environmental impacts of these activities. The EMP is intended to meet or exceed applicable federal, state, and local environmental protection and erosion control specifications and practices, is designed to address typical circumstances, and may be amended by Enbridge as necessary to address site-specific conditions. Specific activities that may affect habitat for the King Rail are described along with minimization procedures below.

Site Preparation

Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:

- The staging area will be located in upland if possible;
- The size of the additional workspace areas will be limited to the minimum needed; and,
- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal re-vegetation as allowed by permits.

Sediment Control Practices

Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization

Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats.

Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation

Where feasible (normally in wetland areas without standing water or saturated soils), up to 1 foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Backfilling

During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration

Cleanup will involve removal of construction debris from the Project area. Rough grading will include restoring pre-construction contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

Disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

To the maximum extent practicable, Enbridge has set the timing of its pipeline maintenance activities to avoid disturbing nesting activities of all bird species, including the King Rail. Cleanup and restoration activities – part of normal Project activities – will take place immediately following work on the pipeline itself, and thus before breeding season. However, if it becomes impossible to conduct the maintenance activities during winter months, it is possible that some Project activities would be conducted during the nesting season. These activities will be minimized in King Rail habitat to the extent practicable.

The Contractor will also use special construction techniques (including timber mats, see discussion in **Section II.B.4**, below) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize maintenance-related disturbance of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

III.B.2. Plans to minimize the area affected by the proposed action, the estimated number of individuals of the species that will be taken and the amount of habitat affected

To comply with regulatory deadlines, Enbridge's goal is to complete maintenance activities for the Project by February 4, 2015. Enbridge will proceed with the work as soon as it obtains IDNR authorization to proceed. If authorization cannot be obtained in time for Enbridge to meet the February 4, 2015 deadline, Enbridge would still plan to complete the work before mid-March 2015, prior to the beginning of nesting season.

Therefore, the planned Project activities – including cleanup and restoration activities, which will take place immediately following work on the pipeline itself – would take place entirely outside of the King Rail's normal breeding or nesting periods. For this reason, it is estimated that the number of King Rails to be taken by the proposed action is zero.

As is indicated on **Figure 2**, Project activities will be confined to limited and pre-determined areas within or immediately adjacent to the existing pipeline ROW.

Following the Project's completion, the existing 50' maintenance corridor for ongoing operation of the pipeline will remain. The maintenance corridor has been part of the site since the pipeline was constructed, and will not represent any new disturbance in this area.

III.B.3. Plans for management of the area affected by the proposed action that will enable continued use of the area by the species

Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during the time of Project activities is unknown at this time; however, unsaturated conditions are expected to be more prevalent during winter when the Project activities are scheduled to take place.

As indicated in Enbridge's EMP (**Attachment C**) up to 1 foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping, separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with the mix in **Table III-1** to provide temporary cover while the wetlands revegetate naturally. The natural re-vegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

Table III-1 Unsaturated Wetland Seed Mix—General Restoration Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	Percent (%) of Seed
American Slough Grass *(Beckmannia syzigachne))*	6	30%
Annual Rye Grass *(Lolium perene)*	8	40%
Fowl Bluegrass *(Poa palustris)*	6	30%
Total	**20.0 pounds**	**100%**

Should a standing water condition be found at Sand Lake during Project operations, Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

III.B.4. Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on the species

As discussed in **Section III.B.3**, topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation.

Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Immediately following completion of all Project activities during the non-breeding season, the Project area will be restored to its pre-Project conditions as practical.

While it is possible that some restoration activities would need to take place during the nesting season for the King Rail, restoration activities will be confined to the Project areas that will have been cleared and will not have suitable breeding habitat (e.g., cattails and emergent vegetation) until after restoration is complete and re-vegetation has been initiated by natural regrowth from the seed bank or reseeding with the approved wetland vegetation seed mix.

III.B.5. Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on the species

The habitat left after Project post- construction reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is taken.

In its Habitat Conservation Plan and Incidental Take Authorization for the Flanagan South pipeline (**Attachment A**), Enbridge committed to conduct a pre-construction survey during the King Rail breeding season (between May 1 and May 14) within the construction project corridor in the Sand Lake vicinity using a version of the protocol established in Conway, C.J., 2011, *Standardized North American Marsh Bird Monitoring Protocol.* The survey was to be repeated during the first nesting season following construction. A brief report of survey results was to have been submitted to IDNR by December 31st of each survey year.

Surveys should document presence/absence of both species and habitat, and would be discontinued once habitat within the Project area becomes once again similar to the immediately adjacent habitat. No additional surveys are planned as part of the current Project.

We note that the King Rail is known in Mason County from one 1994 occurrence (Nyboer, R.W., J.R. Herkert and J.E. Ebinger, 2006, *Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2—Animals*).

III.B.6. Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of measures instituted to minimize or mitigate the effects of the proposed action on the species

As discussed above, Enbridge will either seed or not seed habitat after Project activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the Project area to adjacent wetland conditions. If similar habitat conditions do not return to the Project area, Enbridge will rehabilitate the Project area to match adjacent habitat conditions.

III.B.7. Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan

Enbridge verifies that all funding necessary for the implementation of conservation and mitigation activities discussed in this document has been reserved for that purpose.

III.C.1. A description of alternative actions the applicant considered that would not result in take, and the reasons that each of those alternatives was not selected. A “no-action” alternative is also described

The proposed action is a maintenance dig on an existing pipeline. As such, there are no alternative locations for the proposed action, because the pipeline is already in place. The successful completion of the proposed maintenance action requires excavation around a portion of the existing pipeline. There are no feasible maintenance alternatives that do not require excavation.

The proposed maintenance excavation will utilize the minimum dimensions necessary to complete the work. Adjacent stockpiling and staging areas will also be minimized, and will be located on or immediately adjacent to the pipeline ROW. Therefore, there are no alternative excavation techniques or configurations that would reduce impacts or eliminate take.

The No Action alternative would eliminate take; however, the No Action alternative is not feasible because it would not meet the Project’s need as described above.

III.D.1. Information to indicate that the proposed taking will not reduce the likelihood of the survival of the species in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois

Impacts to potential habitat during Project activities, and during post-Project restoration activities will be minimized. The Project will be constructed following the construction protocols documented in the Enbridge Environmental Mitigation Plan and provided above. The Project's taking place along and adjacent to an existing pipeline ROW avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur in a previously-undisturbed location. Minimizing the footprint for Project activities, along with the very short duration of Project activities, combine to limit the Project's impacts on both an area and time basis.

Project activities in the Sand Lake area are not expected to reduce the likelihood of the survival of the King Rail in Illinois. It is anticipated that no birds would be taken by the Project because Project activities will occur outside of the breeding season of the King Rail. Any restoration that will occur later in 2015 will occur in areas previously cleared or mowed during Project activities, and thus unsuitable for nesting and breeding. Following Project completion, suitable habitat for the King Rail will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the Project area to match the immediately adjacent habitat.

III.E.1. Assurance of compliance with all other federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan

Project work within wetlands will be completed in accordance with the U.S. Army Corps of Engineers Nationwide Permit 12 and Illinois EPA Water Quality Certification Regional Conditions for NWP 12. Mason County will be notified prior to the start of Project work.

III.E.2. Copies of any final federal authorizations for a taking already issued to the applicant, if any

Not applicable, no federal authorizations for a taking have been issued or applied for as of this writing.

III.E.3. For projects that will result in the taking of endangered or threatened species of plants, copies of expressed written permission of the landowner

Copies of expressed written permission of the landowner of tracts from which endangered or threatened species of plants will be taken were provided to the Illinois Department of Natural Resources prior to the commencement of construction of the Flanagan South pipeline. The required permission was limited to a single landowner in the Sand Lake area. Because this Project will be occurring within the area for which permission has already been obtained, no further permission need be sought.

IV. Conservation Plan: Illinois Chorus Frog (*Pseudacris streckeri illinoensis*)

IV.A.1. Legal description, if available, or detailed description of the area to be affected by the proposed action

Figure 2 indicates the area (0.44 acres in total) of disturbance that may potentially affect the Illinois Chorus Frog. This occurs on the following parcel:

Mason County Assessor PIN:	10-08-300-001-0021
Mason County Assessor Parcel No.:	454000.000000
Owner Name:	S & D FARMS, INC.
Legal Description:	PT NW1/4 SW1/4 8 21 8 126
Parcel size:	41.49 acres
Township No.:	5
Township Name:	Havana

IV.A.2. Biological data on Illinois Chorus Frog (*Pseudacris streckeri illinoensis*)

The Illinois Chorus Frog is restricted to areas of sandy substrates found in the floodplains of the Mississippi and Illinois rivers in Arkansas, Illinois, and Missouri. Because these habitats have been converted to agriculture or developed for other human activities, *P. s. illinoensis* is now uncommon. It is listed as a threatened species in Illinois and is known to occur in nine counties in Illinois.

The Illinois Chorus Frog breeds in sandy bottomed ponds, but does not coexist with predatory fish, which eat frog eggs and tadpoles. It requires loose sand for aestivation and hibernation. The Illinois Chorus Frog is an early spring breeder (March-April) and after breeding, adults return to their dispersed burrowing areas. If their natal ponds last long enough for tadpoles to metamorphose, in about late May to mid-June, the transformed froglets migrate to suitable habitat to spend the remainder of the year. They are highly fossorial (i.e., live underground) and migrate to preferred areas of sandy soil with sparse vegetation or absence of vegetation. They require substrates with poor to very poor sod development to accommodate their fossorial habits. Bare areas known as “blowouts” apparently provide good non-breeding habitat for the frogs. Blowouts are sandy depressions in a sand dune ecosystem (psammosere) caused by the removal of sediments by wind. Blowouts occur in partially vegetated dunefields or sandhills. A blowout forms when a patch of protective vegetation is lost, allowing strong winds to "blow out" sand and form a depression. The post-breeding activity is subterranean, with frogs seldom or never coming to the surface during non-breeding seasons. During the hotter summer months they live and feed underground where the temperature is more moderate. In the winter they stay underground and become dormant until spring. The heavy front legs of this species make it easy for them to dig through the sand headfirst. The diet of this frog consist of insects (both adults and larvae) while they are above ground and of a variety of small invertebrates when the frogs are underground. This frog species has two main requirements: sand substrates for burrowing during non-breeding seasons, and ephemeral, fishless bodies of water that persist long enough to

allow for breeding and transformation of at least some of the froglets. *P. s. illinoensis* is able to feed underground, a unique aspect of the biology of this frog.

Frog above-ground activity is strongly influenced by rainfall. Close correlations with rainfall should be expected in species that depend on ephemeral aquatic habitats for successful reproduction. For *Pseudacris s. illinoensis*, timing of surface movements may be particularly critical as at these times the frogs leave their relatively safe subterranean habitats to enter surface habitats where they are likely exposed to many sources of mortality not otherwise encountered by a fossorial frog. It appears that this frog is relatively short lived with low juvenile survivorship but rapid growth to maturity.

IV.A.3. Description of the activities that may result in taking

Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. Such activities related to pipeline maintenance may include the following:

- Clearing and indirect Project traffic;
- Staging of maintenance equipment
- Trenching and stockpiling of soils;
- Backfilling, and
- Post-backfilling grading and restoration.

The need for de-watering is not anticipated; however, if necessary, potential de-watering impacts will be minimized by discharging through filter bags into a vegetated upland area.

IV.A.4. Explanation of the anticipated adverse effects on the species/estimated quantification of take

The number of Illinois Chorus Frogs currently utilizing the Project area of Sand Lake is unknown. The areas directly affected by Project activities comprise 0.44 acres.

Project activities do have the potential for disturbing frog habitat if they were to take place during hibernation, and during breeding and metamorphosis periods. However, with Project activities scheduled to take place during winter, it is anticipated that disruption during the breeding and metamorphosis season (March to mid-June) would not take place. However, due to their fossorial habit, an unknown number of frogs could possibly be taken by pipeline excavation and during restoration (which necessarily must occur when soils are no longer frozen) while they burrowed or hibernated underground.

IV.B.1. Measures to be taken to minimize and mitigate the impact on the species and the funding that will be available to undertake these measures

To minimize the environmental impact of Project activities, Enbridge's *Environmental Mitigation Plan, Pipeline Maintenance Projects* (EMP, provided as **Attachment C**) describes activities associated with pipeline maintenance and procedures that will be implemented during Project activities to minimize the environmental impacts of these activities. The EMP is intended to meet or exceed applicable federal, state, and local environmental protection and erosion control

specifications and practices, is designed to address typical circumstances, and may be amended by Enbridge as necessary to address site-specific conditions. Specific activities that may affect habitat for the Illinois Chorus Frog are described along with minimization procedures below.

Site Preparation

Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:

- The staging area will be located in upland if possible;
- The size of the additional workspace areas will be limited to the minimum needed; and,
- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal re-vegetation as allowed by permits.

Sedimentation Control Practices

Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization

Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation

Where feasible (normally in wetland areas without standing water or saturated soils), up to 1 foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Trench Breakers

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

Backfilling

During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration

Cleanup will involve removal of construction debris from the Project area. Rough grading will include restoring pre-construction contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

Disturbed wetland areas will be re-vegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

To the maximum extent practicable, Enbridge has set the timing of its Project activities to avoid disturbing birds and amphibians, including the Illinois Chorus Frog. Cleanup and restoration activities – part of normal Project activities – will take place immediately following work on the pipeline itself, and thus before breeding season. All Project activities will be minimized in Illinois Chorus Frog habitat to the extent practicable.

The Contractor will also use special construction techniques (including timber mats, see discussion in **Section IV.B.4**, below) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize construction-related disturbance of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

IV.B.2. Plans to minimize the area affected by the proposed action, the estimated number of individuals of the species that will be taken and the amount of habitat affected

To comply with regulatory deadlines, Enbridge's goal is to complete maintenance activities for the Project by February 4, 2015. Enbridge will proceed with the work as soon as it obtains IDNR authorization to proceed. If authorization cannot be obtained in time for Enbridge to meet the February 4, 2015 deadline, Enbridge would still plan to complete the work before mid-March 2015, prior to the beginning of nesting season.

Therefore, the planned Project activities – including cleanup and restoration activities, which will take place immediately following work on the pipeline itself – would take place entirely outside of the Illinois Chorus Frog's normal breeding or metamorphosis periods. Moreover, field surveys

conducted in November 2012 and March 2013 on the adjacent Flanagan South pipeline site and surrounding area found little or no suitable habitat present for Illinois Chorus Frog, and there was no indication that Illinois Chorus Frogs were present[1]. In early 2013, the Flanagan South pipeline site and surrounding area, including the currently proposed pipeline maintenance site, had been converted to agricultural production (corn and soybeans), with no wetland vegetation or standing water present. An April 17, 2014 Google Earth image of the proposed pipeline maintenance dig also shows the site in recently plowed agricultural field, outside of more suitable Illinois Chorus Frog habitat further east.

Upon completion of the construction of the Flanagan South pipeline, Enbridge restored topsoil along the Flanagan South alignment to the locations from which it had been stripped and segregated. This facilitated establishment of natural wetland vegetation from the seed bank in the topsoil. Biologists conducting a July 29, 2014 survey of the restored area found a prevalence of wetland vegetation and scattered pockets of standing water. Based on the survey results, it appears that the restoration activities following the Flanagan South pipeline construction have re-established some degree of suitable habitat for Illinois Chorus Frog[2]. However, the April 2014 Google Earth image shows that the re-established habitat is along the Flanagan South alignment, north and east of the proposed pipeline maintenance site, which sits at the far southwest edge of the restored habitat.

In addition, it is not clear how quickly Illinois Chorus Frogs would re-inhabit the newly-restored habitat. As noted above, as recently as April 2014 the proposed pipeline maintenance site was in agricultural production. Even if suitable habitat began to re-establish during the 2014 growing season, it is unknown how many, if any, Illinois Chorus Frogs would have moved into the new habitat, and would subsequently be hibernating in the project area during winter 2014-2015. Therefore, it is important to complete the proposed pipeline maintenance in early 2015, prior to the growing season. This is because as habitat continues to re-establish in the area, Illinois Chorus Frogs are more likely to move into and utilize the habitat. Completing the pipeline maintenance prior to potential re-establishment of Illinois Chorus Frog populations is the best means of avoiding take of the species.

Based on the recent monitoring data for the Flanagan South/Sand Lake site, and the description of habitat conditions in recent years, the estimated probability of Illinois Chorus Frogs being present within the 0.44-acre footprint of the proposed action is extremely low. However, absence of Illinois Chorus Frog on the proposed pipeline maintenance site cannot be definitively established. Moreover, the typical dispersal range between ponded areas and winter hibernation sites is ~0.9 kilometer (~0.6 mile) for Illinois Chorus Frogs. This would put the proposed pipeline maintenance site within range of more suitable habitat; consequently, there is a chance that Illinois Chorus Frogs are present at the work site. Overall, given the marginal quality of habitat on the project site, but considering the presence of more suitable habitat within the dispersal range of the species, it is estimated that five or

[1] Enbridge Pipelines (FSP) L.L.C. 2014. Letter from Bobby Hahn (Enbridge) to Joseph Kath (IDNR), dated November 19, 2014. Subject: Post-Construction Restoration of the Sand Lake Area Enbridge Flanagan South Pipeline.
[2] Ibid.

fewer Illinois Chorus Frog individuals would be taken by the proposed pipeline maintenance activities.

As is indicated on **Figure 2**, Project activities will be confined to limited and pre-determined areas within or immediately adjacent to the existing pipeline ROW. The excavation that is necessary to expose the pipeline will take place in a relatively small portion (approximately 60' by 30") of the work area, thus minimizing direct impacts to hibernating frogs.

Following the Project's completion, the existing 50' maintenance corridor for ongoing operation of the pipeline will remain. The maintenance corridor has been part of the site since the pipeline was constructed, and will not represent any new disturbance in this area.

IV.B.3. Plans for management of the area affected by the proposed action that will enable continued use of the area by the species

Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during the time of Project activities is unknown at this time; however, unsaturated conditions are expected to be more prevalent during winter when the Project activities are scheduled to take place.

As indicated in Enbridge's EMP (**Attachment C**) up to 1 foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with the mix in **Table IV-1** to provide temporary cover while the wetlands revegetate naturally. The natural re-vegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

Table IV-1 Unsaturated Wetland Seed Mix—General Restoration Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	Percent (%) of Seed
American Slough Grass *(Beckmannia syzigachne))*	6	30%
Annual Rye Grass *(Lolium perene)*	8	40%
Fowl Bluegrass *(Poa palustris)*	6	30%
Total	**20.0 pounds**	**100%**

Should a standing water condition be found at Sand Lake during Project operations, Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the

reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

IV.B.4. Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on the species

As discussed in **Section IV.B.3**, topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation.

Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Immediately following completion of all Project activities outside of the breeding and metamorphosis season, the Project area will be restored to its pre-Project conditions as practical.

It is possible that some restoration could cause direct take by grading and crushing by heavy equipment. However, Enbridge intends to complete all restoration activities prior to the commencement of the Illinois Chorus Frog's breeding season.

IV.B.5. Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on the species

The habitat left after post-Project reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is disturbed.

In its Habitat Conservation Plan and Incidental Take Authorization for the Flanagan South pipeline (**Attachment A**), Enbridge committed to conduct a pre-construction survey of Illinois Chorus Frog breeding activity within the construction area using a nighttime calling survey to document the presence/absence of the species. The monitoring protocol was to be a modification of that described in Tucker, J.K and J.H. Chick, 2007, *State Wildlife Grant Proposal #T45 D-1*. The survey was to be repeated during the first breeding season following construction. A brief report of survey results was to have been submitted to IDNR by December 31st of each survey year.

Surveys should document presence/absence of both species and habitat, and would be discontinued once habitat within the Project area becomes once again similar to the immediately adjacent habitat. No additional surveys are planned as part of the current Project.

IV.B.6. Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of measures instituted to minimize or mitigate the effects of the proposed action on the species:

As discussed above, Enbridge will either seed or not seed habitat after Project activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the Project area to adjacent wetland conditions. If similar habitat conditions do not return to the Project area, Enbridge will rehabilitate the Project area to match adjacent habitat conditions.

IV.B.7. Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan

Enbridge verifies that all funding necessary for the implementation of conservation and mitigation activities discussed in this document has been reserved for that purpose.

IV.C.1. A description of alternative actions the applicant considered that would not result in take, and the reasons that each of those alternatives was not selected. A “no-action” alternative is also described

The proposed action is a maintenance dig on an existing pipeline. As such, there are no alternative locations for the proposed action, because the pipeline is already in place. The successful completion of the proposed maintenance action requires excavation around a portion of the existing pipeline. There are no feasible maintenance alternatives that do not require excavation.

The proposed maintenance excavation will utilize the minimum dimensions necessary to complete the work. Adjacent stockpiling and staging areas will also be minimized, and will be located on or immediately adjacent to the pipeline ROW. Therefore, there are no alternative excavation techniques or configurations that would reduce impacts or eliminate take.

The No Action alternative would eliminate take; however, the No Action alternative is not feasible because it would not meet the Project’s need as described above.

IV.D.1. Information to indicate that the proposed taking will not reduce the likelihood of the survival of the species in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois

Impacts to potential habitat during Project activities, and during post-Project restoration activities will be minimized. The Project will be constructed following the construction protocols documented in the Enbridge Environmental Mitigation Plan and provided above. The Project’s taking place along and adjacent to an existing pipeline ROW avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur in a previously-undisturbed location. Minimizing the footprint for Project activities, along with the very short duration of Project activities, combine to limit the Project’s impacts on both an area and time basis.

Project activities and restoration in the Sand Lake area is not expected to reduce the likelihood of the survival of the Illinois Chorus Frog in Illinois. It is anticipated that no breeding/metamorphosing

frogs would be taken by the Project because Project activities are scheduled to take place in advance of the breeding/metamorphosing season. However, an unknown number of burrowing/hibernating Illinois Chorus Frogs could be taken as a result of trenching or soil compaction during Project activities.

Any habitat restoration activities planned for the spring of 2015 would be preceded by monitoring activities to ensure that restoration activities did not impact breeding/metamorphosing ponds. Therefore, a minor amount of restoration may need to take place following this period. Following all Project and restoration activities, suitable habitat for the Illinois Chorus Frog will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the area affected by the Project to match the immediately adjacent habitat.

IV.E.1. Assurance of compliance with all other federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan

Project work within wetlands will be completed in accordance with the U.S. Army Corps of Engineers Nationwide Permit 12 and Illinois EPA Water Quality Certification Regional Conditions for NWP 12. Mason County will be notified prior to the start of Project work.

IV.E.2. Copies of any final federal authorizations for a taking already issued to the applicant, if any

No federal authorizations for a taking have been applied for by the applicant or issued for the Project as of this writing.

IV.E.3. For projects that will result in the taking of endangered or threatened species of plants, copies of expressed written permission of the landowner

Copies of expressed written permission of the landowner of tracts from which endangered or threatened species of plants will be taken were provided to the Illinois Department of Natural Resources prior to the commencement of construction of the Flanagan South pipeline. The required permission was limited to a single landowner in the Sand Lake area. Because this Project will be occurring within the area for which permission has already been obtained, no further permission need be sought.

V. Agreement

The implemented agreement, which includes:

V.A.1. The names and signatures of all participants in the execution of the above conservation plans.

CCPS Transportation, LLC (Enbridge)	Lawrence J. Stock	Senior Manager	12/17/14
	Name	Title	Date
Illinois Department of Natural Resources			
	Name	Title	Date

V.A.2. The obligations and responsibilities of each of the identified participants with schedules and deadlines for completion of activities included in the above conservation plans and a schedule for preparation of progress reports to be provided to the Department.

Completion of the Project according to the techniques outlined in the Enbridge Environmental Mitigation Plan, January 2013 (see **Attachment C**), is the responsibility of CCPS Transportation, LLC (Enbridge)Work on the Project in Illinois is to commence January 2015 and to conclude February 2015.

Monitoring and reporting as outlined in this Conservation Plan is the responsibility of CCPS Transportation, LLC (Enbridge) and its designees. Monitoring and reporting to the Department are to occur in_____and_____.

The review of this Conservation Plan and subsequent issuance on the incidental take permit is the responsibility of the Illinois Department of Natural Resources, according to 17 IL ADMIN CODE, CH. 1, SEC. 1080.

V.A.3. Certification that each participant in the execution of the above conservation plans has the legal authority to carry out their respective obligations and responsibilities under the conservation plan.

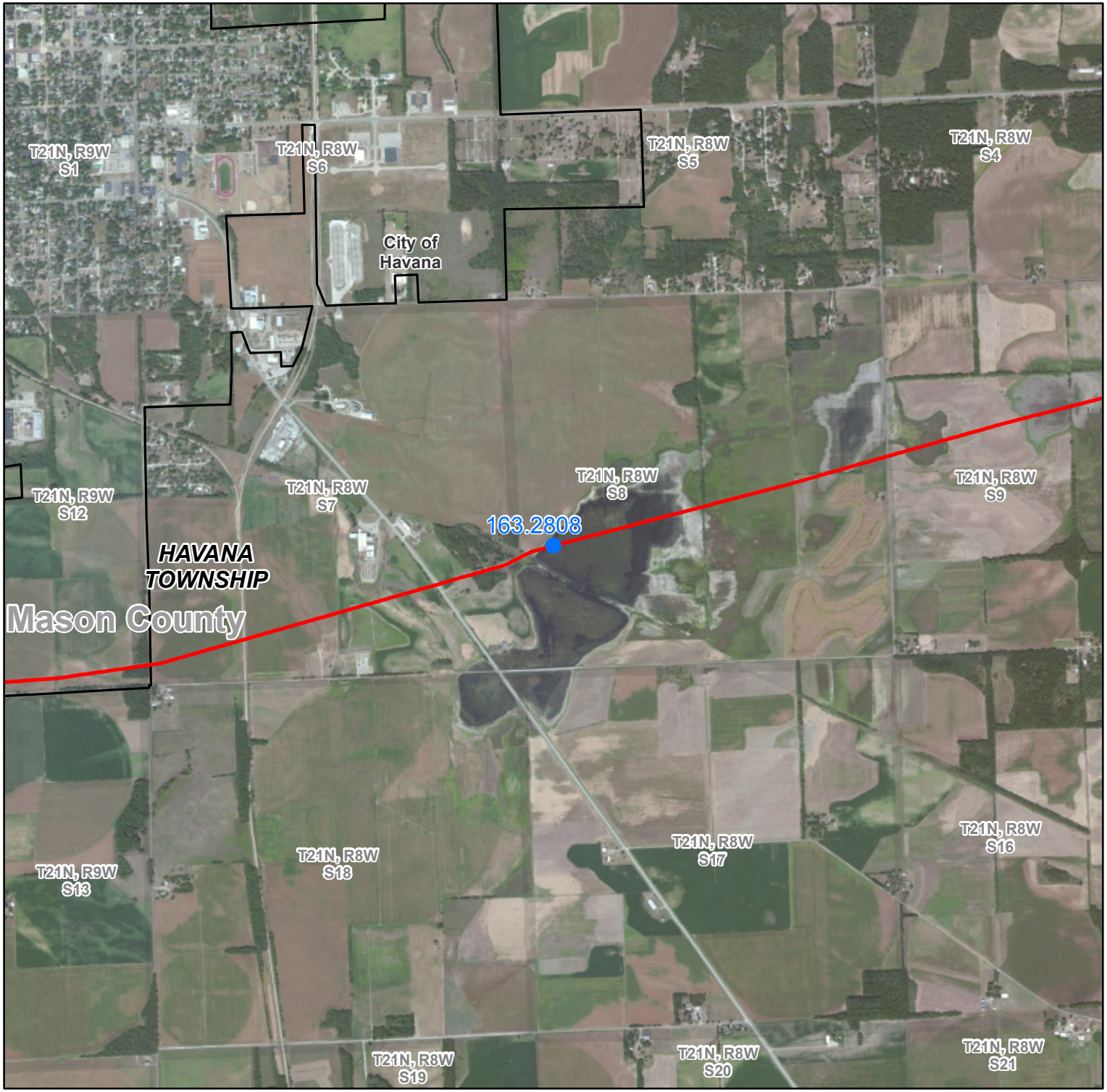
As Senior Manager of CCPS Transportation, LLC (Enbridge), I hereby certify that I have the legal authority to carry out the obligations and responsibilities of CCPS Transportation, LLC (Enbridge) under this Conservation Plan.

Lawrence J. Stock	12/17/14
Name	Date

As _____ of the Illinois Department of Natural Resources, I hereby certify that I have the legal authority to carry out the obligations and responsibilities of the Illinois Department of Natural Resources under this Conservation Plan.

Name	Date

Figures



Maintenance Location

0 2,000 4,000

Feet

1 Inch = 2,000 Feet

Imagery: Microsoft; 2011

Figure 1

MAINTENANCE ACTIVITY LOCATION

Line 55

Milepost 163.2808

ENBRIDGE

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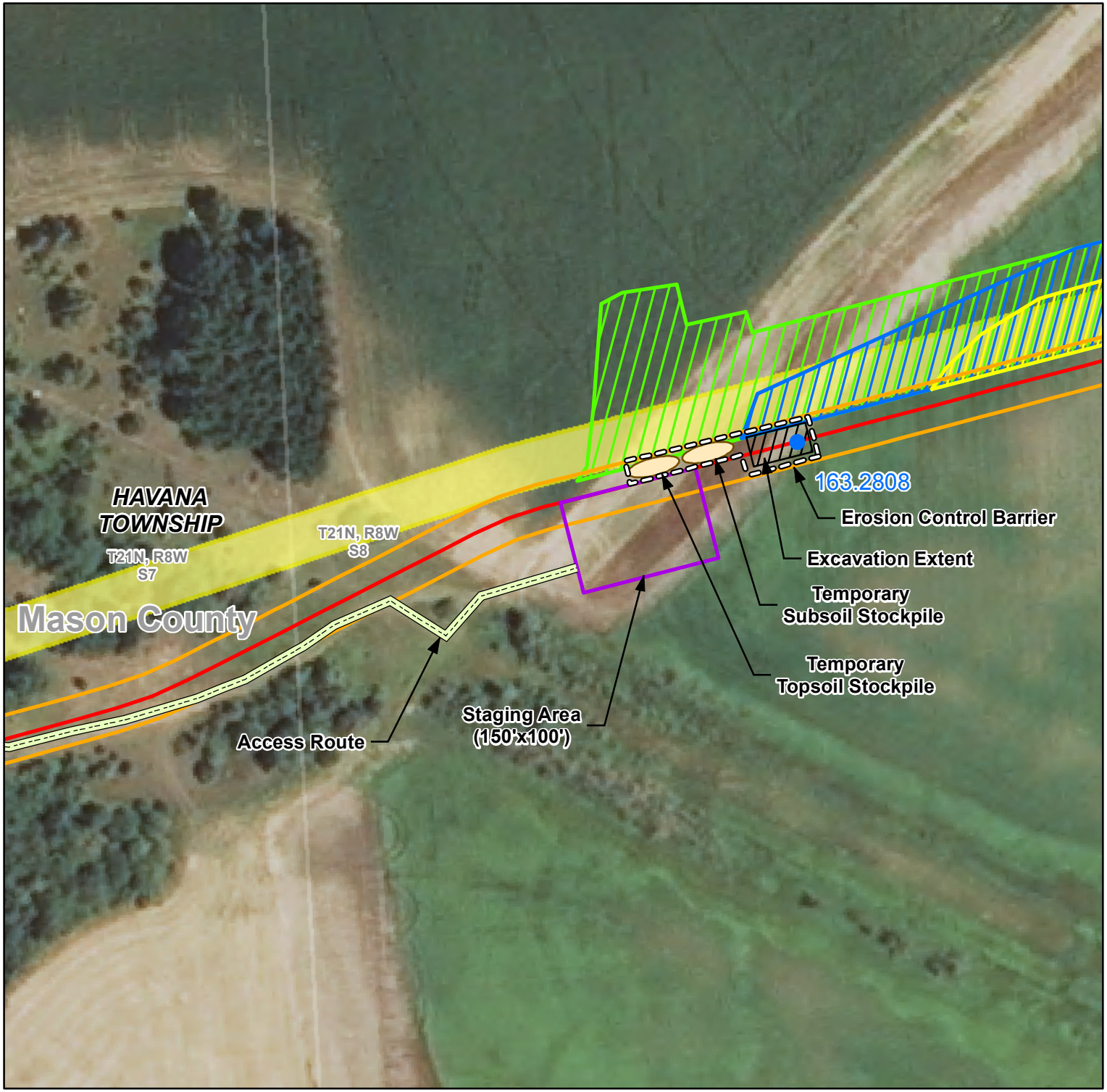

Maintenance Location
Line 55
ROW
Erosion Control Barrier
Access Route
Excavation Extent
Soil Stockpile
Staging Area
Flannigan South ROW

Approximate Sensitive Species Ranges
(Digitized From URS Take Application Figure)
Illinois Chorus Frog
King Rail
Yellow-Headed Blackbird

N

0 150 300
Feet

Imagery: FSA; 2012
1 Inch = 150 Feet

Figure 2
MAINTENANCE ACTIVITY SITE PLAN
Line 55
Milepost 163.2808

ENBRIDGE

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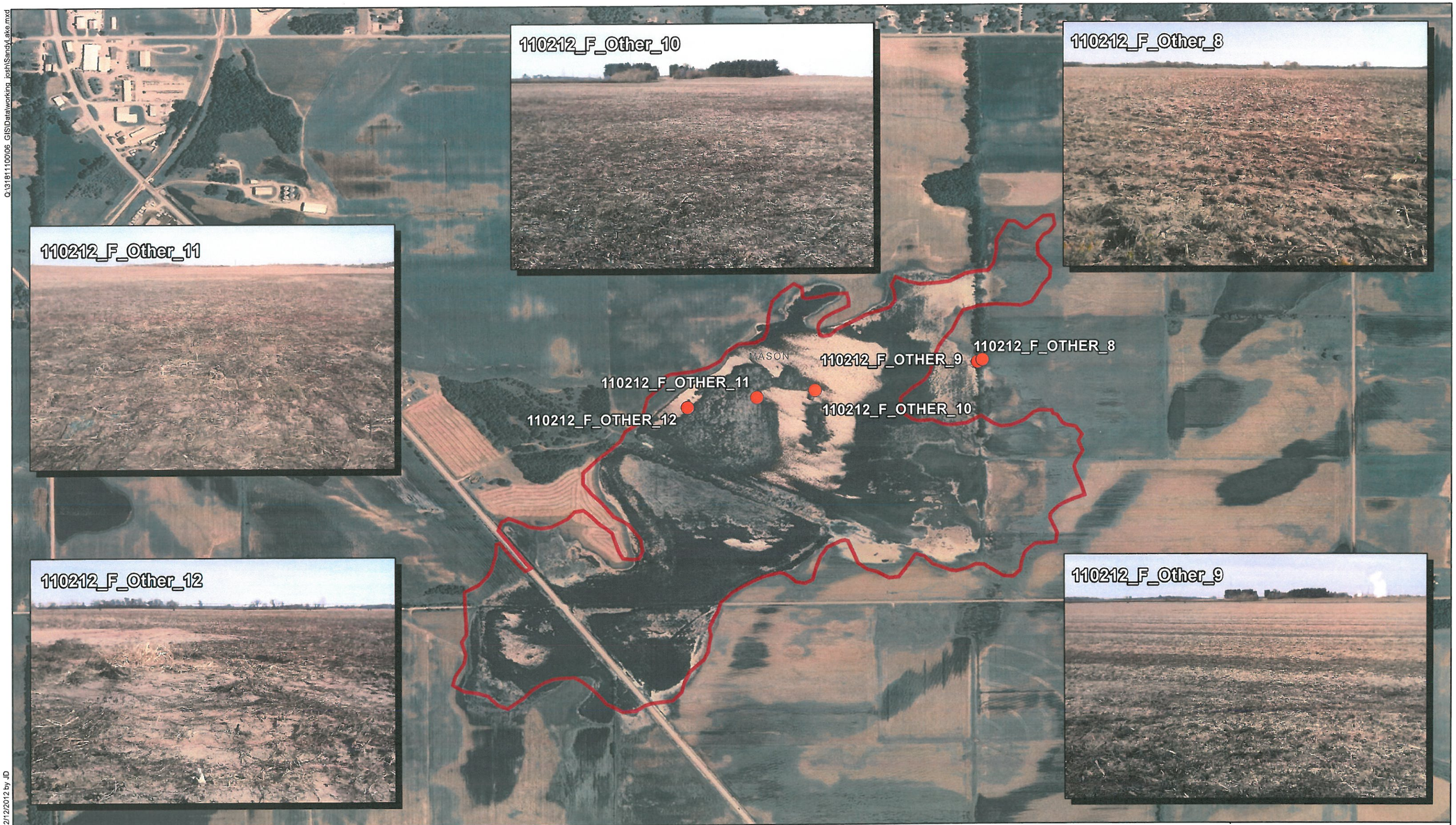

0 385 770 1,540 Feet

ENBRIDGE

Figure 3
SAND LAKE AERIAL AND PHOTOGRAPHS
Line 55--Milepost 163.2808
(Photos taken November 2012)

DATA SOURCES: 2010 USDA FSA NAIP Aerials, 2012 URS Ecological Field Survey, 2006 USGS NLCD Land Cover, 2012 GIE Tracts, USGS National Hydrography Dataset, ESRI Transportation

URS Corporation Revised 12/12/2012 by JD

Q:\31811100\06_GIS\Data\working_josh\SandyLake.mxd

Facing southwest. Access route.

Facing east. Access route.

Figure 4
PROJECT AREA PHOTOGRAPHS
Line 55 – Milepost 163.2808
(Photos taken August 2014)

Facing southeast. Access route.

Facing northeast. Access route and extra work space.

Figure 4
PROJECT AREA PHOTOGRAPHS
Line 55 – Milepost 163.2808
(Photos taken August 2014)

Facing southwest. Extra work space/parking area.

Facing northeast. Work area.

Figure 4
PROJECT AREA PHOTOGRAPHS
Line 55 – Milepost 163.2808
(Photos taken August 2014)

Facing southwest. Work space.

Facing south. Work area.

Figure 4
PROJECT AREA PHOTOGRAPHS
Line 55 – Milepost 163.2808
(Photos taken August 2014)

Attachments

Attachment A

Habitat Conservation Plans and Incidental Take Authorization—State of Illinois

FLANAGAN SOUTH PROJECT

HABITAT CONSERVATION PLANS AND INCIDENTAL TAKE AUTHORIZATION – STATE OF ILLINOIS

CONTAINS PRIVILEGED AND CONFIDENTIAL INFORMATION – DO NOT RELEASE

Enbridge Pipelines (FSP) L.L.C.
4628 Mike Colalillo Drive
Duluth, MN 55807

Date: December 12, 2012

URS Project No. 31811100

Construction And Operation Activities of the Flanagan South Project by Enbridge Pipelines (FSP) L.L.C. to the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), King Rail (*Rallus elegans*) and Illinois Chorus Frog (*Pseudacris streckeri illinoensis*)

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Attachment A Environmental Mitigation Plan

I. Description of the project and its impact likely to result from the proposed taking of the identified species

Enbridge Pipelines (FSP) L.L.C., an indirect U.S. subsidiary of Enbridge Inc., is proposing the construction of a new liquid petroleum pipeline in the States of Illinois, Missouri, Kansas and Oklahoma. The Flanagan South Project (Project) is approximately 589 miles long. Affiliate Enbridge Energy, Limited Partnership (Enbridge entities will be collectively referred to as "Enbridge") owns the U.S. portion of the world's longest liquid petroleum pipeline system. Combined with the Canadian portion of the pipeline system, the operationally-integrated pipeline spans approximately 3,200 miles across North America, portions of which have been in operation since 1950. Enbridge's pipeline system transports crude petroleum to serve refineries in Midwestern states and eastern Canada. Enbridge also transports volumes of crude oil from North Dakota and Montana through an interconnection with Enbridge-affiliated pipelines in North Dakota, and from the Gulf of Mexico coast via interconnections with other pipeline systems.

The Project is an independent project that begins at Enbridge's Flanagan Terminal and terminates at Enbridge's Cushing Terminal. The Project increases the crude petroleum transportation capacity from the growing crude oil supply from the Western Canadian Sedimentary Basin and the growing Williston Basin in North Dakota to refineries in the Midwest and the U.S. Gulf Coast, via interconnections at Cushing, Oklahoma. The Project is co-locating or "twinning" Enbridge's Spearhead Pipeline, running parallel to and where possible, using the existing rights-of-way (ROW) of the Spearhead Pipeline. The Project will also include three pump stations in Illinois (but not near the Sand Lake area) which will be adjacent to existing facilities to the maximum extent practicable. Construction of pump stations is anticipated to commence in May of 2013 and construction of mainline pipeline commencing in August 2013, with an in-service date of mid-2014.

Figure 1 shows the entire Project route location, the states that are crossed and United States Army Corps of Engineers (USACE) districts that are crossed. The Project route starts at the Flanagan Terminal located north of the City of Pontiac in Livingston County, Illinois, and crosses portions of Illinois, Missouri, Kansas and Oklahoma. Counties crossed in Illinois include Livingston, Woodford, Tazewell, Mason, Fulton, Schuyler, Brown and Adams. The route also crosses Havana, Illinois. The Project terminates at the Enbridge Cushing, Oklahoma, Terminal.

The Project area is mostly rural with agriculture as the primary land use; residential development is limited. Higher density population areas such as Quincy, Illinois have been avoided during strategic route alternatives review. Commercial and industrial land uses are limited to aboveground facilities to support energy infrastructure.

The Project route extends west-southwest across Illinois, from the MP 0 in Livingston County, Illinois to the Mississippi River at approximately MP 167.8. Enbridge has existing ROW along portions of the majority of the Project route because of its ownership of the Spearhead Pipeline system and will use that ROW as necessary to build and operate the Project. Although some of the Spearhead ROW lacks a defined width, where defined it is generally fifty (50) to eighty (80) feet in width.

The new pipe will be generally installed at a 50-foot offset from the center line of the Spearhead Pipeline to ensure adequate space for safe construction and on-going maintenance activities. The permanent easement for the new pipe will be 50 feet. Also, during construction, an additional 85 feet of temporary workspace will be needed (135 feet total construction ROW). In some cases, this construction ROW width may be reduced to minimize impacts on natural resources such as wetlands. Extra temporary workspace generally rectangular in size and ranging from 100 feet x 200 feet to 200 feet x 200 feet will be required in some locations to accommodate crossings of roads, wetlands, railways, and water-bodies. Co-location of the Project with existing ROW will greatly minimize environmental disturbance necessary for the Project.

As part of early endangered and threatened (E&T) species coordination, the Illinois Department of Natural Resources (IDNR) provided Enbridge with electronic E&T species location data for counties through which the Project passes. Enbridge inserted this location data (including species buffer polygons) into Project GIS mapping and noted those locations where the Project construction ROW crossed mapped species buffer polygons. **Figure 2** indicates via hatching the mapped species buffer polygons that are included within the construction ROW for the current Project alignment. The only place where Illinois-mapped species buffer polygons are within the construction ROW is in the Mason County Sands area in the vicinity of Sand Lake, southeast of the town of Havana. The construction ROW does not overlap with any other mapped species buffer polygons along its length in Illinois.

According to Ground-water/Surface Water Interactions at Sand Lake, Mason County, Illinois, by the Illinois State Water Survey (1999), Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades.

As can be seen from the ground photos included in **Figure 3**, taken on November 2, 2012, the portion of Sand Lake crossed by the pipeline was used for agricultural production (corn and soybean) in 2012. The corridor and the surrounding area did not contain any intact wetland vegetation and no areas with standing water were observed on this date. At least in 2012, Sand Lake would not have provided good nesting habitat for the Yellow-headed Blackbird, which only nests at sites where the water level is on average deeper than one meter, and which has a mixture of open water and vegetation (usually cattails) that is referred to as a hemi-marsh. Similarly, the Sand Lake of 2012 would have provided relatively poor habitat for King Rails, which nest in sites with shallow water (saturated soil to about 7 inches (22 cm) deep) during the nesting season, with high coverage of short emergent vegetation, moderate coverage of tall emergent vegetation, high water-vegetation interspersion, and little or no coverage by woody vegetation. It is unknown if Sand Lake would have provided breeding habitat for the Illinois Chorus Frog, which is an early spring breeder (March-April), or if any ponded habitats lasted long enough for tadpoles to metamorphose, in about late May to mid-June. However, for the rest of the year, Illinois Chorus Frogs are highly fossorial (i.e., burrow and live underground). The preferred habitat for this portion of their life cycle is areas of sandy soil with sparse vegetation or absence of vegetation. Thus, the portion of Sand Lake crossed by the pipeline could potentially harbor these fossorial frogs.

II. Conservation Plan Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)

II.A.1. Legal description, if available, or detailed description of the area to be affected by the proposed action: Figure 2 indicates via hatching the mapped species buffer polygon for the Yellow-headed Blackbird that is included within the construction ROW for the current Project alignment. This 0.48-acre overlap of mapped species buffer polygon for the Yellow-headed Blackbird with construction ROW occurs on the following parcel:

Enbridge GIS Parcel No.: IL-MA-0590.000;
Mason County Assessor PIN: 10-08-300-001-0021
Mason County Assessor Parcel No.: 454000.000000
Owner Name: S & D FARMS, INC.
Legal Description: PT NW1/4 SW1/4 8 21 8 126
Parcel size: 41.49 acres
Township No.: 5; Township Name: Havana

II.A.2. Biological data on Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*): In Illinois, where it is at the eastern limit of its range, the Yellow-headed Blackbird has probably always been restricted to the prairie regions in the northern part of the state, where it was once a locally abundant breeding bird. The Illinois population is separated from the core of the Yellow-headed Blackbird population in western Iowa by about 420 miles (680 km). The Illinois population is small, declining, and isolated from the main North American breeding range for this species. It is an Illinois endangered species known from one 1994 occurrence in Mason County (Nyboer, R.W., J.R. Herkert and J.E. Ebinger. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2 – Animals).

The Yellow-headed Blackbird is a medium-sized, brilliantly colored blackbird. Adults have a pointed bill. The adult male is mainly black with a yellow head and breast; they have a white wing patch sometimes only visible in flight. The adult female is mainly brown with a dull yellow throat and breast. Both genders resemble the respective genders of the smaller Yellow-hooded Blackbird of South America. Total length is 9.5 inches, wingspan is 15 inches and weight is 2.3 ounces.

The Yellow-headed Blackbird only nests at sites where the water level is on average deeper than one meter. The wetland must have a mixture of open water and vegetation (usually cattails) that is referred to as a hemi-marsh. The nest is built with and attached to marsh vegetation. They nest in colonies, often sharing their habitat closely with the red-winged blackbird (*Agelaius phoeniceus*). During the breeding and nesting season the males are very territorial and spend much of their time perched on reed stalks and displaying or chasing off intruders.

The Yellow-headed Blackbird is territorial during the breeding season. The size of the male's territory is indirectly proportional to the quality of the marsh habitat. A positive correlation exists between the surface area of marsh and territory size as well as between the surface area of the marsh and the number of fledglings per adult. The Yellow-headed Blackbirds flock with other blackbirds during the non-breeding periods, feeding on grain and insects. The Yellow-headed Blackbird is a polygamous species that breeds in colonies. The males arrive at the marsh nesting area and establish territories before the females arrive. When the females arrive at the nesting area (late March to early May), one to five females build a nest, a basket woven around

several strong stalks, within a male's territory. Females are protective of their nesting area but don't help the male defend his territory. During the breeding season the female forages close to the nest, while the male forage within his territory or upland in a flock. The female lays 2 to 6 brown-speckled, whitish eggs. The eggs are incubated (by the female) for 12 to 13 days, with incubation beginning with the second or third egg. Almost all parental care is done by the female. For the first two or three days after hatching she broods them during the day and feeds them small insects. The first day the chick's weight gain averages 60%. After the third day the female starts bringing bigger insects such as grasshoppers, damselflies and dragonflies. After the young are 4 or 5 days old the female stays at the nest only long enough to deliver food and inspect for water. At nine days old the chicks' weight gain has decreased to 5% per day and it has achieved about 60% of its adult weight. At 10-14 days old the young cannot fly but they leave the nest never to return. They hop around in the dense vegetation near the water surface and remain there until they learn to fly at about three weeks old. After the breeding season the birds leave the nesting area and flock in dense bulrush and cattail growths. They remain there all day, coming out only to feed in the morning and evening. Often the flocks are segregated with males in one and females and juveniles in another. In August the flocks leave the marsh, returning only at night to roost. Yearling females fledge significantly fewer young than older females.

These birds migrate in the winter to the southwestern United States and Mexico. They often migrate in huge flocks with other species of birds. These blackbirds are only permanent residents in the United States of the San Joaquin Valley and the Lower Colorado River Valley of Arizona and California. It is an extremely rare vagrant to Western Europe, with some records suspected to refer to escapes from captivity.

II.A.3. Description of the activities that may result in taking: Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. The main features of pipeline construction along these lines include the following:

- Clearing (indirect construction traffic;
- ROW preparation (grading, topsoil stripping);
- Pipeline fabrication (stringing, welding, grinding, coating, and x-ray);
- Trenching and spoil storage;
- Backfill; and,
- Post construction grading and restoration.

II.A.4. Explanation of the anticipated adverse effects on the species/estimated quantification of take: The number of Yellow-headed Blackbirds currently utilizing the Project construction ROW portion of Sand Lake is unknown. However, the overlap of mapped species buffer polygon for the Yellow-headed Blackbird with construction ROW covers approximately 0.48 acres. Enbridge does not expect to have any direct take of Yellow-headed Blackbirds because constructing outside of the breeding season completely avoids take. Any potential modification to habitat will be temporary as construction procedures (explained below) typically result in return to the original contours in wetlands and full restoration within one to two years of construction.

II.B.1. Measures to be taken to minimize and mitigate the impact on the species and the funding that will be available to undertake these measures: To minimize the environmental impact of pipeline construction, Enbridge's Environmental Mitigation Plan (EMP) described activities associated with pipeline construction and procedures that will be implemented during

Project construction to minimize the environmental impacts of these activities (see **Attachment A**). The EMP is intended to meet or exceed applicable federal, state, and local environmental protection and erosion control specifications and practices, is designed to address typical circumstances, and may be amended by Enbridge as necessary to address site-specific conditions. Specific activities that may affect habitat for the Yellow Headed Blackbird are described along with minimization procedures below.

Clearing

Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:

- Staging areas, additional spoil storage areas, and other additional work areas (outside of the temporary workspace (TWS) adjacent to the pipeline easement) will be located in upland areas at least 50 feet away from wetland boundaries. If topographic 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. This requirement will not apply where a wetland occurs within the extra workspace for a stream crossing;
- The size of the additional workspace areas will be limited to the minimum needed to construct the wetland or waterbody crossing; and,
- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched, burned or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal revegetation as allowed by permits.

Sedimentation Control Practices

Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization

Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation

Where feasible (normally in wetland areas without standing water or saturated soils), up to one foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Trench Breakers
Where the pipeline trench has the potential to partially drain a wetland, trench breakers will be installed as necessary to maintain the original wetland hydrology.

Backfilling
During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration
Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

Where required, disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

To the maximum extent practicable, Enbridge has set the timing of clearing and pipeline construction activities to avoid disturbing nesting activities of all bird species, including the Yellow-headed Blackbird (see **Attachment A**, Enbridge Environmental Mitigation Plan). Cleanup and restoration activities associated with construction will be done during non-breeding season. However, some clean-up and restoration activities post-construction may extend into the nesting season. Construction activities will be minimized in Yellow-headed Blackbird habitat to the extent practicable. The Contractor will also use special construction techniques (including timber mats, see discussion in **Section II.B.4**, below) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize construction-related disturbance and sedimentation of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

II.B.2. Plans to minimize the area affected by the proposed action, the estimated number of individuals of the species that will be taken and the amount of habitat affected: Clearing of the Project construction ROW and associated construction activities are anticipated to begin in August of 2013. These activities would be outside of the Yellow-headed Blackbird's normal nesting period.

Under normal circumstances, Enbridge plans to use a 135-foot-wide construction ROW to fabricate and install the pipeline. In heavily forested uplands, waterways, and emergent wetlands, the construction ROW, will be reduced to 110 feet. The ROW would be further reduced to 85 feet in forested and scrub/shrub wetlands, as well as the habitat of Sand Lake, and in waterways adjacent to these features. Following construction, an area measuring 50 feet in width will be maintained for operation of the pipeline.

II.B.3. Plans for management of the area affected by the proposed action that will enable continued use of the area by the species: Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during Project construction is unknown at this time; however, unsaturated conditions are expected to be more prevalent late fall and winter during planned clearing and construction activity.

As indicated in Enbridge's EMP (**Attachment A**, **Section 3.6.1**) up to one foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with the mix in **Table II-1** to provide temporary cover while the wetlands revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

Table II-1- Unsaturated Wetland Seed Mix – General Restoration Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	Percent (%) of Seed
American Slough Grass *(Beckmannia syzigachne))*	6	30%
Annual Rye Grass *(Lolium perene)*	8	40%
Fowl Bluegrass *(Poa palustris)*	6	30%
Total	**20.0 pounds**	**100%**

Should a standing water condition be found at Sand Lake during construction, Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

II.B.4. Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on the species: As discussed in II.B.3, topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation.

Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Following completion of all construction during the non-breeding season, the Project ROW will be restored to its pre-construction conditions as practical.

While some restoration activities may occur during the nesting season for the Yellow-Headed Blackbird, restoration activities will be confined to the construction right-of-way that will have been cleared and will not have suitable breeding habitat (e.g. cattails and emergent vegetation) until after restoration is complete and revegetation has been initiated by natural regrowth from the seed bank or reseeding with the approved wetland vegetation seed mix.

II.B.5. Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on the species: The habitat left after Project post-construction reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is taken. Following the procedure established by Ward, M.P, 2004, *Habitat Selection by Yellow-Headed Blackbirds*, Enbridge will conduct a preconstruction survey during the breeding season (late spring-early summer of 2013) by locating Yellow-headed Blackbird nests by searching appropriate habitat within the Project corridor in the Sand Lake vicinity. Once located, these nests will be recorded using a hand-held GPS and photographs will be taken. This survey procedure will be repeated during the first nesting season following construction. A brief report of survey results will be submitted to IDNR by December 31st of each survey year.

We note that the Yellow-Headed Blackbird is known from one 1994 occurrence in Mason County (Nyboer, R.W., J.R. Herkert and J.E. Ebinger. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2 – Animals). Surveys should document presence/absence of both species and habitat, and would be discontinued once habitat within the construction ROW is similar to the immediately adjacent habitat.

II.B.6. Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of measures instituted to minimize or mitigate the effects of the proposed action on the species: As discussed above, Enbridge will either seed or not seed habitat after construction activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the ROW to adjacent wetland conditions. If similar habitat conditions do not return to the construction ROW, Enbridge will rehabilitate the ROW to match adjacent habitat conditions.

II.B.7. Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan: Enbridge verifies that all funding necessary for

the implementation of conservation and mitigation activities discussed in this document has been reserved for that purpose.

II.C.1. A description of alternative actions the applicant considered that would not result in take, and the reasons that each of those alternatives was not selected. A "no-action" alternative is also described: Six alternatives involving other pipelines were initially considered, but removed from further consideration because they result in the need to develop solutions for the needed crude deliveries that would be displaced on the existing lines, and they do not provide the capacity needed without installing a parallel pipeline for at least 70 percent of the route or more.

The Project (7th Alternative), is the shortest distance, is co-located along Spearhead Pipeline ROW, optimizes existing pump station and power provided to existing locations. The proposed alternative is the preferred because following the existing Spearhead pipeline corridor for over 90% of its route reduces the impacts on new landowners and the environment. Efficiency in long-term operation is also gained by co-locating the pipelines in an existing Enbridge corridor

For the purposes of this analysis, a No-Action alternative is considered a No-Project Alternative. A No-Action alternative that did not involve use of an existing or construction of a new pipeline was initially considered. This alternative was found to be not feasible because it would not meet the Project's need as described above. The following sections review routing alternatives considered for this Project to meet purpose and need, design criteria and construction requirements, while minimizing the potential temporary and permanent impacts to social, economic, environmental, historic and cultural resources.

Route Alternatives

Co-locating or "twinning" a new crude oil pipeline parallel with the Enbridge Spearhead Pipeline was identified as the primary route to consider for the Project as this would minimize the aerial extent of property associated with the pipeline situated on new ROW, and minimize segmentation of and potential impact to land, habitats and properties The advantages of co-location include other societal and business considerations, such as decreased ROW acquisition requirements, ease of access for construction and maintenance, minimization of Project footprint by using existing appurtenances, and the efficiencies realized through grouping pump stations and valve facilities.

In addition, numerous environmental advantages result from collocation. Co-locating the pipeline with existing facilities avoids and minimizes environmental disturbance to the maximum practicable extent possible. This directly avoids new fragmentation that would occur with new route or greenfield construction and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The new disturbance area would be adjacent to an area that has already been disturbed, including the original construction as well as required ongoing maintenance. The new pipeline will not substantially increase the disturbance area for the Project, required maintenance areas, or required access areas.

To refine the new pipeline routing, the existing Spearhead pipeline route and adjacent conditions were reviewed using a GIS database of combined numerous metadata sets; these set were viewed

in relation to the Spearhead Pipeline overlay. This remote route analysis was conducted in November 2011, as well as March and June 2012. Each route analysis utilized the most current data sets available with new imagery populated in a GIS data management system. Datasets incorporated into the GIS database included:

- Recent aerial high resolution imagery provided by Enbridge;
- LIDAR data acquired by Enbridge;
- U.S. Geological Survey (USGS) topographic maps;
- U.S Department of Agriculture (USDA) soil series data;
- U.S. Fish and Wildlife Service National Wetland Inventory (NWI) data;
- Land ownership by tract;
- Urbanized areas;
- Federal and state lands including tribal lands, parks, wildlife refuges and US ACE property; and,
- Datasets and information from applicable State Historic Preservation Officers (SHPOs) and Tribal Historic Preservation Officers (THPOs).

The compiled datasets were simultaneously reviewed by representatives from Enbridge's ROW, engineering, construction and environmental staff. As the route was reviewed in detail for the length of the line, decisions were made to deviate from the Spearhead centerline to avoid of environmental features (such as wetlands), constructability constraints (such as encroachment of residential areas on the ROW) and to facilitate road and waterbody crossing designs. The review teams strived to route the Project as close to the Spearhead Pipeline as possible. Route deviations were limited to those necessary to avoid or mitigate resources, or to where engineering staff deemed the existing corridor to be difficult to follow for safety and constructability issues.

In some locations, however, new residential and other infrastructure development has occurred adjacent to the Spearhead Pipeline since pipeline completion in the early 1950s. Enbridge has considered routing the Project away from the Spearhead Pipeline in these areas to avoid engineering and safety constraints such as, close proximity to homes, construction impacts on these developments, and the increased disturbances to homes and infrastructure that would be encountered in these areas. The route has been designed to avoid these areas where possible.

As the pipeline route was refined, Enbridge further examined river and stream crossings and National Wetland Inventory mapping to identify opportunities for additional and/or slight route modifications where possible and practicable, to better avoid and minimize resource impacts.

Finally, as resources were surveyed, impacts on jurisdictional wetland areas have been further avoided and minimized through finely controlled corridor width adjustments.

II.D.1. Information to indicate that the proposed taking will not reduce the likelihood of the survival of the species in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois: Impacts to potential habitat during construction and post construction will be minimized. The Project will be constructed following the construction protocols documented in the Enbridge Environmental Mitigation Plan and provided above. Co-locating the Project with existing facilities avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur with a new route or greenfield

construction, and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The linear nature of the proposed Project, along with its short-term temporal time-frame, combines to limit the Project's impacts on both an area and time basis.

Project construction and restoration in the Sand Lake area is not expected to reduce the likelihood of the survival of the Yellow-Headed Blackbird in Illinois. It is anticipated that no birds would be taken by the Project because clearing and construction will occur well outside of the breeding season of the Yellow-Headed Blackbird, and any restoration that will be planned during spring 2014 will occur within the ROW where no suitable habitat will be present on the ROW as a result of the previous winters clearing and construction. Following construction, suitable habitat for the Yellow-headed Blackbird will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the ROW affected by construction to match the immediately adjacent habitat.

II.E.1. Assurance of compliance with all other federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan: Enbridge has applied to the Rock Island District, U.S. Army Corps of Engineers for Nationwide Permit 12 for this Project. A copy of the Permit verification from the Rock Island District will be supplied by Enbridge to the Illinois Department of Natural Resources upon its granting.

II.E.2. Copies of any final federal authorizations for a taking already issued to the applicant, if any: Not applicable, no federal authorizations for a taking have been issued or applied for as of this writing.

II.E.3. For projects that will result in the taking of endangered or threatened species of plants, copies of expressed written permission of the landowner: Copies of expressed written permission of the landowner of tracts from which endangered or threatened species of plants will be taken (if any) will be provided to the Illinois Department of Natural Resources prior to the commencement of construction. This is limited to a few landowners in the Sand Lake area. Enbridge is currently working on securing this permission and will provide documentation once it is obtained. This documentation will be provided prior to Project construction in the Sand Lake area.

III. Conservation Plan King Rail (*Rallus elegans*)

III.A.1. Legal description, if available, or detailed description of the area to be affected by the proposed action: Figure 2 indicates via hatching the mapped species buffer polygon for the King Rail that is included within the construction ROW for the current Project alignment. This 2.72-acre overlap of mapped species buffer polygon for the King Rail with construction ROW occurs on the following parcels:

Enbridge GIS Parcel No.: IL-MA-0590.000;
Mason County Assessor PIN: 10-08-300-001-0021
Mason County Assessor Parcel No.: 454000.000000
Owner Name: S & D FARMS, INC.
Legal Description: PT NW1/4 SW1/4 8 21 8 126
Parcel size: 41.49 acres
Township No.: 5; Township Name: Havana

Enbridge GIS Parcel No.: IL-MA-0589.000;
Mason County Assessor PIN: 10-08-300-004-0021
Mason County Assessor Parcel No.: 453000.000000
Owner Name: S & D FARMS, INC.
Legal Description: NE1/4 SW1/4 8 21 8 126
Parcel size: 40.94 acres
Township No.: 5; Township Name: Havana

III.A.2. Biological data on King Rail (Rallus elegans): The King Rail was formerly considered to be a common summer resident in suitable localities throughout the state. Now the King Rail is an Illinois endangered species known from Brown, Fulton and Mason Counties. One 2007 occurrence is known from Brown County, one 1988 occurrence is known from Fulton County and one 1994 occurrence is known from Mason County.

The King Rail is the largest North American rail. Its most common call is a low grunt. It is a large rusty rail with slender bill, longer than its head and slightly decurved. It has a laterally compressed body and long toes. Males are generally indistinguishable from females in plumage coloration but are slightly brighter and darker as well as slightly larger in size. Upper parts are olive brown, breast is rufescent, flanks are barred with black and white, and the tail is short and often uplifted. Total length is 15 to 19 inches, wingspan is 20 inches and weight is 13 ounces. Immature birds are light brown on the head and darker brown on the back and wings.

They breed in marshes in eastern North America. Researchers have found King Rail nesting associated with various plant species in the Midwest (often cattail). A common finding in most of these studies is an association of the nesting site with shallow water (saturated soil to about 7 inches (22 cm) deep) during the nesting season. King Rails occupy wetlands that are characterized by high coverage of short emergent vegetation, moderate coverage of tall emergent vegetation, high water-vegetation interspersion, and little or no coverage by woody vegetation. The structure of wetland habitats may be more important to King Rails than individual plant species, which vary widely over the Rail's range. Percent emergent cover, vegetation height, and interspersion are also important habitat variables for breeding Rails. The nest is a raised platform built with marsh vegetation and covered by a canopy. The King Rail interbreeds with the Clapper Rail where their ranges overlap (not in Illinois); some researchers believe that these two birds belong to the same species.

Birds along the southeastern coasts of the United States are permanent residents. Other birds migrate to the southern United States and Mexico; in Canada, they are found in southern Ontario.

King Rails forage in shallow water near cover and mainly eat aquatic insects and crustaceans. They are still common in some coastal areas, although interior populations have declined due to habitat loss.

King rails arrive from wintering grounds beginning around mid-May. In Iowa, nesting begins soon after arrival in approximately the first week in May. Nesting period varies with latitude, but is 3 to 4 months in north and longer at southern latitudes. Males choose territory and initial occupation is indicated by mating call. Prenuptial courtship consists mainly of walking about

with tail uplifted and white undertail coverts extended. Calls and courtship feeding are also performed. The male selects the nest site and is apparently more active in building nest than female. Egg laying has been recorded in Illinois from May 4 to June 26. The average clutch size is 10 to 12, laid one per day. Eggs are pale buff sparingly or irregularly spotted with browns, 1.6 by 1.2 inches in size. Incubation lasts 21 to 23 days and is performed by both sexes. Young either follow their parents to feeding areas or remain concealed in grasses waiting for food to be delivered. A pair may remain with its brood for over a month while staying within approx. 100 feet of the nest for the first three weeks. Young begin to fly at approximately nine weeks.

During the nesting season, King Rails use deeper water in areas dominated by short emergent cover, while during the brood-rearing season they use shallower water in areas dominated by short emergent cover and avoid areas dominated by tall emergent cover. King Rails, like many other marsh birds, tend to select habitats based on structure rather than plant species.

III.A.3. Description of the activities that may result in taking: Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. The main features of pipeline construction along these lines include the following:

- Clearing (indirect construction traffic;
- ROW preparation (grading, topsoil stripping);
- Pipeline fabrication (stringing, welding, grinding, coating, and x-ray);
- Trenching and spoil storage;
- Backfill; and,
- Post construction grading and restoration.

III.A.4. Explanation of the anticipated adverse effects on the species/estimated quantification of take: The number of King Rails currently utilizing the Project construction ROW portion of Sand Lake is unknown. However, the overlap of mapped species buffer polygon for the King Rail with construction ROW covers approximately 2.72 acres. Enbridge does not expect to have any direct take of King Rails because constructing outside of the breeding season completely avoids take. Any potential modification to habitat will be temporary as construction procedures (explained below) typically result in return to the original contours in wetlands and full restoration within one to two years of construction.

III.B.1. Measures to be taken to minimize and mitigate the impact on the species and the funding that will be available to undertake these measures: To minimize the environmental impact of pipeline construction, Enbridge's Environmental Mitigation Plan (EMP) described activities associated with pipeline construction and procedures that will be implemented during Project construction to minimize the environmental impacts of these activities (see **Attachment A**). The EMP is intended to meet or exceed applicable federal, state, and local environmental protection and erosion control specifications and practices, is designed to address typical circumstances, and may be amended by Enbridge as necessary to address site-specific conditions. Specific activities that may affect habitat for the King Rails are described along with minimization procedures below.

Clearing

Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:

- Staging areas, additional spoil storage areas, and other additional work areas (outside of the temporary workspace (TWS) adjacent to the pipeline easement) will be located in upland areas at least 50 feet away from wetland boundaries. If topographic 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. This requirement will not apply where a wetland occurs within the extra workspace for a stream crossing;
- The size of the additional workspace areas will be limited to the minimum needed to construct the wetland or waterbody crossing; and,
- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched, burned or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal revegetation as allowed by permits.

Sedimentation Control Practices

Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization

Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation

Where feasible (normally in wetland areas without standing water or saturated soils), up to one foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Trench Breakers

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

Backfilling
During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration
Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

Where required, disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

To the maximum extent practicable, Enbridge has set the timing of clearing and pipeline construction activities to avoid disturbing nesting activities of all bird species, including the King Rail (see **Attachment A**, Enbridge Environmental Mitigation Plan). Cleanup and restoration activities associated with construction will be done during non-breeding season. However, some clean-up and restoration activities post-construction may extend into the nesting season. Construction activities will be minimized in King Rail habitat to the extent practicable. The Contractor will also use special construction techniques (including timber mats, see discussion in **Section III.B.4**, below) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize construction-related disturbance and sedimentation of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

III.B.2. Plans to minimize the area affected by the proposed action, the estimated number of individuals of the species that will be taken and the amount of habitat affected: Clearing of the Project construction ROW and associated construction activities are anticipated to begin in August of 2013. Both of these activities would be outside of the King Rail's normal nesting period.

Under normal circumstances, Enbridge plans to use a 135-foot-wide construction ROW to fabricate and install the pipeline. In heavily forested uplands, waterways, and emergent wetlands, the construction ROW, will be reduced to 110 feet. The ROW would be further reduced to 85 feet in forested and scrub/shrub wetlands, as well as the habitat of Sand Lake, and in waterways adjacent to these features. Following construction, an area measuring 50 feet in width will be maintained for operation of the pipeline.

III.B.3. Plans for management of the area affected by the proposed action that will enable continued use of the area by the species: Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the

wetland during Project construction is unknown at this time; however, unsaturated conditions are expected to be more prevalent late fall and winter during planned clearing and construction activity.

As indicated in Enbridge's EMP (**Attachment A**, **Section 3.6.1**) up to one foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with the mix in **Table III-1** to provide temporary cover while the wetlands revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

Table III-1- Unsaturated Wetland Seed Mix – General Restoration Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	Percent (%) of Seed
American Slough Grass *(Beckmannia syzigachne))*	6	30%
Annual Rye Grass *(Lolium perene)*	8	40%
Fowl Bluegrass *(Poa palustris)*	6	30%
Total	**20.0 pounds**	**100%**

Should a standing water condition be found at Sand Lake during construction, Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

III.B.4. Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on the species: As discussed in III.B.3, topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation.

Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Following completion of all construction during the non-breeding season, the Project ROW will be restored to its pre-construction conditions as practical.

While some restoration activities may occur during the nesting season for the King Rail, restoration activities will be confined to the construction right-of-way that will have been cleared and will not have suitable breeding habitat (e.g. cattails and emergent vegetation) until after restoration is complete and revegetation has been initiated by natural regrowth from the seed bank or reseeding with the approved wetland vegetation seed mix.

III.B.5. Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on the species: The habitat left after Project post-construction reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is taken. Enbridge will conduct one (1) preconstruction survey during the King Rail breeding season (between May 1 and May 14) within the Project corridor in the Sand Lake vicinity using a version of the protocol established in Conway, C.J., 2011. *Standardized North American Marsh Bird Monitoring Protocol*. The survey route will be the Project centerline and survey points will be spaced at 200-meter intervals along this route within Sand Lake. Because many marsh birds (including King Rails) are secretive, seldom observed and vocalize infrequently, the Standardized North American Marsh Bird Monitoring Protocol instructs surveyors to broadcast calls to elicit vocalizations during surveys. In the version to be used at Sand Lake, only King Rail calls will be broadcast. To prevent the call-broadcast at one point from affecting the distribution of birds at adjacent points, broadcast speakers will be directed in alternating directions perpendicular to the survey route (e.g., first NNW, then SSE) at successive survey points. Surveyors will estimate and record the distance and direction from the survey point to each individual King Rail that responds with vocalizations. The estimated locations of responding King Rails will be recorded on Project mapping. This survey procedure will be repeated during the first nesting season following construction. A brief report of survey results will be submitted to IDNR by December 31st of each survey year.

We note that the King Rail is known in Mason County from one 1994 occurrence (Nyboer, R.W., J.R. Herkert and J.E. Ebinger. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2 – Animals). Surveys should document presence/absence of both species and habitat, and would be discontinued once habitat within the construction ROW is similar to the immediately adjacent habitat.

III.B.6. Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of measures instituted to minimize or mitigate the effects of the proposed action on the species: As discussed above, Enbridge will either seed or not seed habitat after construction activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the ROW to adjacent wetland conditions. If similar habitat conditions do not return to the construction ROW, Enbridge will rehabilitate the ROW to match adjacent habitat conditions.

III.B.7. Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan: Enbridge verifies that all funding necessary for the implementation of conservation and mitigation activities discussed in this document has been reserved for that purpose.

III.C.1. A description of alternative actions the applicant considered that would not result in take, and the reasons that each of those alternatives was not selected. A "no-action" alternative is also described: Six alternatives involving other pipelines were initially considered, but removed from further consideration because they result in the need to develop solutions for the needed crude deliveries that would be displaced on the existing lines, and they do not provide the capacity needed without installing a parallel pipeline for at least 70 percent of the route or more.

The Project (7th Alternative), is the shortest distance, is co-located along Spearhead Pipeline ROW, optimizes existing pump station and power provided to existing locations. The proposed alternative is the preferred because following the Spearhead pipeline corridor for over 90% of its route reduces the impacts on new landowners and the environment. Efficiency in long-term operation is also gained by co-locating the pipelines in an Enbridge corridor

For the purposes of this analysis, a No-Action alternative is considered a No-Project Alternative. A No-Action alternative that did not involve use of an existing or construction of a new pipeline was initially considered. This alternative was found to be not feasible because it would not meet the Project's need as described above. The following sections review routing alternatives considered for this Project to meet purpose and need, design criteria and construction requirements, while minimizing the potential temporary and permanent impacts to social, economic, environmental, historic and cultural resources.

Route Alternatives

Co-locating or "twinning" a new crude oil pipeline parallel with the Enbridge Spearhead Pipeline was identified as the primary route to consider for the Project as this would minimize the aerial extent of property associated with the pipeline situated on new ROW, and minimize segmentation of and potential impact to land, habitats and properties The advantages of co-location include other societal and business considerations, such as decreased ROW acquisition requirements, ease of access for construction and maintenance, minimization of Project footprint by using existing appurtenances, and the efficiencies realized through grouping pump stations and valve facilities.

In addition, numerous environmental advantages result from collocation. Co-locating the pipeline with existing facilities avoids and minimizes environmental disturbance to the maximum practicable extent possible. This directly avoids new fragmentation that would occur with new route or greenfield construction and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The new disturbance area would be adjacent to an area that has already been disturbed, including the original construction as well as required ongoing maintenance. The new pipeline will not substantially increase the disturbance area for the Project, required maintenance areas, or required access areas.

To refine the new pipeline routing, the Spearhead pipeline route and adjacent conditions were reviewed using a GIS database of combined numerous metadata sets; these set were viewed in relation to the Spearhead Pipeline overlay. This remote route analysis was conducted in November 2011, as well as March and June 2012. Each route analysis utilized the most current

data sets available with new imagery populated in a GIS data management system. Datasets incorporated into the GIS database included:

- Recent aerial high resolution imagery provided by Enbridge;
- LIDAR data acquired by Enbridge;
- U.S. Geological Survey (USGS) topographic maps;
- U.S Department of Agriculture (USDA) soil series data;
- U.S. Fish and Wildlife Service National Wetland Inventory (NWI) data;
- Land ownership by tract;
- Urbanized areas;
- Federal and state lands including tribal lands, parks, wildlife refuges and US ACE property; and,
- Datasets and information from applicable State Historic Preservation Officers (SHPOs) and Tribal Historic Preservation Officers (THPOs).

The compiled datasets were simultaneously reviewed by representatives from Enbridge's ROW, engineering, construction and environmental staff. As the route was reviewed in detail for the length of the line, decisions were made to deviate from the Spearhead centerline to avoid of environmental features (such as wetlands), constructability constraints (such as encroachment of residential areas on the ROW) and to facilitate road and waterbody crossing designs. The review teams strived to route the Project as close to the Spearhead Pipeline as possible. Route deviations were limited to those necessary to avoid or mitigate resources, or to where engineering staff deemed the existing corridor to be difficult to follow for safety and constructability issues.

In some locations, however, new residential and other infrastructure development has occurred adjacent to the Spearhead Pipeline since pipeline completion in the early 1950s. Enbridge has considered routing the Project away from the Spearhead Pipeline in these areas to avoid engineering and safety constraints such as, close proximity to homes, construction impacts on these developments, and the increased disturbances to homes and infrastructure that would be encountered in these areas. The route has been designed to avoid these areas where possible.

As the pipeline route was refined, Enbridge further examined river and stream crossings and National Wetland Inventory mapping to identify opportunities for additional and/or slight route modifications where possible and practicable, to better avoid and minimize resource impacts.

Finally, as resources were surveyed, impacts on jurisdictional wetland areas have been further avoided and minimized through finely controlled corridor width adjustments.

III.D.1. Information to indicate that the proposed taking will not reduce the likelihood of the survival of the species in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois: Impacts to potential habitat during construction and post construction will be minimized. The Project will be constructed following the construction protocols documented in the Enbridge Environmental Mitigation Plan and provided above. Co-locating the Project with existing facilities avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur with a new route or greenfield construction, and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The linear nature of the proposed

Project, along with its short-term temporal time-frame, combines to limit the Project's impacts on both an area and time basis.

Project construction and restoration in the Sand Lake area is not expected to reduce the likelihood of the survival of the King Rail in Illinois. It is anticipated that no birds would be taken by the Project because clearing and construction will occur well outside of the breeding season of the King Rail, and any restoration that will be planned during spring 2014 will occur within the ROW where no suitable habitat will be present on the ROW as a result of the previous winters clearing and construction. Following construction, suitable habitat for the King Rail will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the ROW affected by construction to match the immediately adjacent habitat.

III.E.1. Assurance of compliance with all other federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan: Enbridge has applied to the Rock Island District, U.S. Army Corps of Engineers for Nationwide Permit 12 for this Project. A copy of the Permit verification from the Rock Island District will be supplied by Enbridge to the Illinois Department of Natural Resources upon its granting.

III.E.2. Copies of any final federal authorizations for a taking already issued to the applicant, if any: Not applicable, no federal authorizations for a taking have been issued or applied for as of this writing.

III.E.3. For projects that will result in the taking of endangered or threatened species of plants, copies of expressed written permission of the landowner: Copies of expressed written permission of the landowner of tracts from which endangered or threatened species of plants will be taken (if any) will be provided to the Illinois Department of Natural Resources prior to the commencement of construction. This is limited to a few landowners in the Sand Lake area. Enbridge is currently working on securing this permission and will provide documentation once it is obtained. This documentation will be provided prior to Project construction in the Sand Lake area.

IV. Conservation Plan Illinois Chorus Frog (*Pseudacris streckeri illinoensis*)

IV.A.1. Legal description, if available, or detailed description of the area to be affected by the proposed action: Figure 2 indicates via hatching the mapped species buffer polygons that are included within the construction ROW for the current Project alignment. This 5.45-acre overlap of mapped species buffer polygon for the Illinois Chorus Frog with construction ROW occurs on the following parcels:

Enbridge GIS Parcel No.: IL-MA-0590.000;
Mason County Assessor PIN: 10-08-300-001-0021
Mason County Assessor Parcel No.: 454000.000000
Owner Name: S & D FARMS, INC.
Legal Description: PT NW1/4 SW1/4 8 21 8 126
Parcel size: 41.49 acres
Township No.: 5; Township Name: Havana

Enbridge GIS Parcel No.: IL-MA-0589.000;

Mason County Assessor PIN: 10-08-300-004-0021
Mason County Assessor Parcel No.: 453000.000000
Owner Name: S & D FARMS, INC.
Legal Description: NE1/4 SW1/4 8 21 8 126
Parcel size: 40.94 acres
Township No.: 5; Township Name: Havana

IV.A.2. Biological data on Illinois Chorus Frog (Pseudacris streckeri illinoensis): The Illinois Chorus Frog is restricted to areas of sandy substrates found in the floodplains of the Mississippi and Illinois rivers in Arkansas, Illinois, and Missouri. Because these habitats have been converted to agriculture or developed for other human activities, *P. s. illinoensis* is now uncommon. It is listed as a threatened species in Illinois and is known to occur in nine counties in Illinois.

The Illinois Chorus Frog breeds in sandy bottomed ponds, but does not coexist with predatory fish, which eat frog eggs and tadpoles. It requires loose sand for aestivation and hibernation. The Illinois Chorus Frog is an early spring breeder (March-April) and after breeding, adults return to their dispersed burrowing areas. If their natal ponds last long enough for tadpoles to metamorphose, in about late May to mid-June, the transformed froglets migrate to suitable habitat to spend the remainder of the year. They are highly fossorial (i.e., live underground) and migrate to preferred areas of sandy soil with sparse vegetation or absence of vegetation. They require substrates with poor to very poor sod development to accommodate their fossorial habits. Bare areas known as “blowouts” apparently provide good non-breeding habitat for the frogs. Blowouts are sandy depressions in a sand dune ecosystem (psammosere) caused by the removal of sediments by wind. Blowouts occur in partially vegetated dunefields or sandhills. A blowout forms when a patch of protective vegetation is lost, allowing strong winds to "blow out" sand and form a depression. The post-breeding activity is subterranean, with frogs seldom or never coming to the surface during non-breeding seasons. During the hotter summer months they live and feed underground where the temperature is more moderate. In the winter they stay underground and become dormant until spring. The heavy front legs of this species make it easy for them to dig through the sand headfirst. The diet of this frog consist of insects (both adults and larvae) while they are above ground and of a variety of small invertebrates when the frogs are underground. This frog species has two main requirements: sand substrates for burrowing during non-breeding seasons, and ephemeral, fishless bodies of water that persist long enough to allow for breeding and transformation of at least some of the froglets. *P. s. illinoensis* is able to feed underground, a unique aspect of the biology of this frog.

Frog above-ground activity is strongly influenced by rainfall. Close correlations with rainfall should be expected in species that depend on ephemeral aquatic habitats for successful reproduction. For *Pseudacris s. illinoensis*, timing of surface movements may be particularly critical as at these times the frogs leave their relatively safe subterranean habitats to enter surface habitats where they are likely exposed to many sources of mortality not otherwise encountered by a fossorial frog. It appears that this frog is relatively short lived with low juvenile survivorship but rapid growth to maturity.

IV.A.3. Description of the activities that may result in taking: Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. The main features of pipeline construction along these lines include the following:

- Clearing (indirect construction traffic;
- ROW preparation (grading, topsoil stripping);
- Pipeline fabrication (stringing, welding, grinding, coating, and x-ray);
- Trenching and spoil storage;
- Backfill; and,
- Post construction grading and restoration.

IV.A.4. Explanation of the anticipated adverse effects on the species/estimated quantification of take: The number of Illinois Chorus Frogs currently utilizing the Project Construction ROW portion of Sand Lake is unknown. However, the overlap of mapped species buffer polygon for the Illinois Chorus Frog with construction ROW covers approximately 5.45 acres. This mapped species buffer polygon disturbed by construction would consist of Sand Lake as breeding and metamorphosis habitat. Since construction through Sand Lake would not take place during this window (March to mid-June), disruption of breeding and metamorphosis would not take place. However, due to their fossorial habit, an unknown number of frogs could possibly be taken by project construction and during restoration (which necessarily must occur when soils are no longer frozen) while they burrowed or hibernated underground.

IV.B.1. Measures to be taken to minimize and mitigate the impact on the species and the funding that will be available to undertake these measures: To minimize the environmental impact of pipeline construction, Enbridge's Environmental Mitigation Plan (EMP) described activities associated with pipeline construction and procedures that will be implemented during Project construction to minimize the environmental impacts of these activities (see **Attachment A**). The EMP is intended to meet or exceed applicable federal, state, and local environmental protection and erosion control specifications and practices, is designed to address typical circumstances, and may be amended by Enbridge as necessary to address site-specific conditions. Specific activities that may affect habitat for the Illinois Chorus Frog are described along with minimization procedures below.

Clearing

Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:

- Staging areas, additional spoil storage areas, and other additional work areas (outside of the temporary workspace (TWS) adjacent to the pipeline easement) will be located in upland areas at least 50 feet away from wetland boundaries. If topographic 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. This requirement will not apply where a wetland occurs within the extra workspace for a stream crossing;
- The size of the additional workspace areas will be limited to the minimum needed to construct the wetland or waterbody crossing; and,
- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched, burned or removed

from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal revegetation as allowed by permits.

Sedimentation Control Practices

Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization

Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation

Where feasible (normally in wetland areas without standing water or saturated soils), up to one foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Trench Breakers

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

Backfilling

During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration

Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

Where required, disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

To the maximum extent practicable, Enbridge has set the timing of clearing and pipeline construction activities to avoid disturbing nesting activities of birds and amphibians, including the Illinois Chorus Frog (see **Attachment A**, Enbridge Environmental Mitigation Plan). Cleanup and restoration activities associated with construction will be done during non-breeding season. However, some clean-up and restoration activities post-construction may extend into the nesting season. Construction activities will be minimized in Illinois Chorus Frog habitat to the extent practicable. The Contractor will also use special construction techniques (including timber mats, see discussion in **Section IV.B.4**, below) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize construction-related disturbance and sedimentation of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

IV.B.2. Plans to minimize the area affected by the proposed action, the estimated number of individuals of the species that will be taken and the amount of habitat affected: Clearing of the Project construction ROW and associated construction activities are anticipated to begin in August of 2013. Construction in the Sand Lake area will be completed well before the Illinois Chorus Frog's normal breeding and metamorphosis period.

Under normal circumstances, Enbridge plans to use a 135-foot-wide construction ROW to fabricate and install the pipeline. In heavily forested uplands, waterways, and emergent wetlands, the construction ROW, will be reduced to 110 feet. The ROW would be further reduced to 85 feet in forested and scrub/shrub wetlands, as well as the habitat of Sand Lake, and in waterways adjacent to these features. Following construction, an area measuring 50 feet in width will be maintained for operation of the pipeline.

IV.B.3. Plans for management of the area affected by the proposed action that will enable continued use of the area by the species: Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface a some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during Project construction is unknown at this time; however, unsaturated conditions are expected to be more prevalent late fall and winter during planned clearing and construction activity.

As indicated in Enbridge's EMP (**Attachment A**, **Section 3.6.1**) up to one foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with the mix in **Table IV-1** to provide temporary cover while the wetlands revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

Table IV-1- Unsaturated Wetland Seed Mix – General Restoration Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	Percent (%) of Seed
American Slough Grass *(Beckmannia syzigachne))*	6	30%
Annual Rye Grass *(Lolium perene)*	8	40%
Fowl Bluegrass *(Poa palustris)*	6	30%
Total	**20.0 pounds**	**100%**

Should a standing water condition be found at Sand Lake during construction, Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

IV.B.4. Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on the species: As discussed in IV.B.3, topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation.

Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Following completion of all construction outside of the breeding and metamorphosis season, the Project ROW will be restored to its pre-construction conditions as practical.

While some restoration activities may occur during the breeding season for the Illinois Chorus Frog, which could potentially cause direct take by grading and crushing by heavy equipment. Subsided areas along the trench may be very attractive frog breeding locations that would be disturbed during restoration of the original contours through grading. Monitoring of such locations will occur to ensure that Illinois Chorus Frog breeding locations are not restored while the frogs/tadpoles are still present.

IV.B.5. Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on the species: The habitat left after Project post-construction reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is disturbed. Enbridge will conduct a preconstruction survey of the Project corridor within Sand Lake for Illinois Chorus Frog breeding activity using a nighttime calling survey to document the presence/absence of the species. The monitoring protocol used will be a modification of that described in Tucker, J.K and J.H. Chick, 2007, *State Wildlife Grant Proposal #T45 D-1*. The Project corridor within Sand

Lake will be visited at night to conduct a calling survey. This frog characteristically calls after spring rainfall of at least 3 cm once temperatures have reached 15ºC. Enbridge will monitor local conditions in the Sand Lake area to establish the time for this one-night survey. Night calling surveys will take place over three nights once temperatures have reached 15ºC. This survey procedure will be repeated during the first breeding season following construction. A brief report of survey results will be submitted to IDNR by December 31st of each survey year.

IV.B.6. Adaptive management practices that will be used to deal with changed or unforeseen circumstances that affect the effectiveness of measures instituted to minimize or mitigate the effects of the proposed action on the species: As discussed above, Enbridge will either seed or not seed habitat after construction activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the ROW to adjacent wetland conditions. If similar habitat conditions do not return to the construction ROW, Enbridge will rehabilitate the ROW to match adjacent habitat conditions. Enbridge will conduct pre-restoration monitoring to ensure that Illinois Chorus Frog breeding locations are not restored while the frogs/tadpoles are still present.

IV.B.7. Verification that adequate funding exists to support and implement all mitigation activities described in the conservation plan: Enbridge verifies that all funding necessary for the implementation of conservation and mitigation activities discussed in this document has been reserved for that purpose.

IV.C.1. A description of alternative actions the applicant considered that would not result in take, and the reasons that each of those alternatives was not selected. A "no-action" alternative is also described: Six alternatives involving other pipelines were initially considered, but removed from further consideration because they result in the need to develop solutions for the needed crude deliveries that would be displaced on the existing lines, and they do not provide the capacity needed without installing a parallel pipeline for at least 70 percent of the route or more.

The Project (7th Alternative), is the shortest distance, is co-located along Spearhead Pipeline ROW, optimizes existing pump station and power provided to existing locations. The proposed alternative is the preferred because following the Spearhead pipeline corridor for over 90% of its route reduces the impacts on new landowners and the environment. Efficiency in long-term operation is also gained by co-locating the pipelines in an Enbridge corridor.

For the purposes of this analysis, a No-Action alternative is considered a No-Project Alternative. A No-Action alternative that did not involve use of an existing or construction of a new pipeline was initially considered. This alternative was found to be not feasible because it would not meet the Project's need as described above. The following sections review routing alternatives considered for this Project to meet purpose and need, design criteria and construction requirements, while minimizing the potential temporary and permanent impacts to social, economic, environmental, historic and cultural resources.

Route Alternatives

Co-locating or "twinning" a new crude oil pipeline parallel with the Enbridge Spearhead Pipeline was identified as the primary route to consider for the Project as this would minimize the aerial

extent of property associated with the pipeline situated on new ROW, and minimize segmentation of and potential impact to land, habitats and properties The advantages of co-location include other societal and business considerations, such as decreased ROW acquisition requirements, ease of access for construction and maintenance, minimization of Project footprint by using existing appurtenances, and the efficiencies realized through grouping pump stations and valve facilities.

In addition, numerous environmental advantages result from collocation. Co-locating the pipeline with existing facilities avoids and minimizes environmental disturbance to the maximum practicable extent possible. This directly avoids new fragmentation that would occur with new route or greenfield construction and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The new disturbance area would be adjacent to an area that has already been disturbed, including the original construction as well as required ongoing maintenance. The new pipeline will not substantially increase the disturbance area for the Project, required maintenance areas, or required access areas.

To refine the new pipeline routing, the Spearhead pipeline route and adjacent conditions were reviewed using a GIS database of combined numerous metadata sets; these set were viewed in relation to the Spearhead Pipeline overlay. This remote route analysis was conducted in November 2011, as well as March and June 2012. Each route analysis utilized the most current data sets available with new imagery populated in a GIS data management system. Datasets incorporated into the GIS database included:

- Recent aerial high resolution imagery provided by Enbridge;
- LIDAR data acquired by Enbridge;
- U.S. Geological Survey (USGS) topographic maps;
- U.S Department of Agriculture (USDA) soil series data;
- U.S. Fish and Wildlife Service National Wetland Inventory (NWI) data;
- Land ownership by tract;
- Urbanized areas;
- Federal and state lands including tribal lands, parks, wildlife refuges and US ACE property; and,
- Datasets and information from applicable State Historic Preservation Officers (SHPOs) and Tribal Historic Preservation Officers (THPOs).

The compiled datasets were simultaneously reviewed by representatives from Enbridge's ROW, engineering, construction and environmental staff. As the route was reviewed in detail for the length of the line, decisions were made to deviate from the Spearhead centerline to avoid of environmental features (such as wetlands), constructability constraints (such as encroachment of residential areas on the ROW) and to facilitate road and waterbody crossing designs. The review teams strived to route the Project as close to the Spearhead Pipeline as possible. Route deviations were limited to those necessary to avoid or mitigate resources, or to where engineering staff deemed the existing corridor to be difficult to follow for safety and constructability issues.

In some locations, however, new residential and other infrastructure development has occurred adjacent to the Spearhead Pipeline since pipeline completion in the early 1950s. Enbridge has considered routing the Project away from the Spearhead Pipeline in these areas to avoid

engineering and safety constraints such as, close proximity to homes, construction impacts on these developments, and the increased disturbances to homes and infrastructure that would be encountered in these areas. The route has been designed to avoid these areas where possible.

As the pipeline route was refined, Enbridge further examined river and stream crossings and National Wetland Inventory mapping to identify opportunities for additional and/or slight route modifications where possible and practicable, to better avoid and minimize resource impacts.

Finally, as resources were surveyed, impacts on jurisdictional wetland areas have been further avoided and minimized through finely controlled corridor width adjustments.

IV.D.1. Information to indicate that the proposed taking will not reduce the likelihood of the survival of the species in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois: Impacts to potential habitat during construction and post construction will be minimized. The Project will be constructed following the construction protocols documented in the Enbridge Environmental Mitigation Plan and provided above. Co-locating the Project with existing facilities avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur with a new route or greenfield construction, and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The linear nature of the proposed Project, along with its short-term temporal time-frame, combines to limit the Project's impacts on both an area and time basis.

Project construction and restoration in the Sand Lake area is not expected to reduce the likelihood of the survival of the Illinois Chorus Frog in Illinois. It is anticipated that no breeding/metamorphosing frogs would be taken by the Project because clearing and construction will occur well outside of the breeding/metamorphosing season of the Illinois Chorus Frog. However, an unknown number of burrowing/hibernating Illinois Chorus Frogs could be taken as a result of trenching or soil compaction during construction. Habitat restoration activities, planned during spring 2014 would be preceded by monitoring activities to ensure that restoration activities did not impact breeding/metamorphosing ponds. Therefore, a minor amount of restoration may need to take place following this period. Following all construction and restoration activities, suitable habitat for the Illinois Chorus Frog will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the ROW affected by construction to match the immediately adjacent habitat.

IV.E.1. Assurance of compliance with all other federal, State and local regulations pertinent to the proposed action and to execution of the conservation plan: Enbridge has applied to the Rock Island District, U.S. Army Corps of Engineers (USACE) for Nationwide Permit 12 for this Project. A copy of the USACE Permit verification from the Rock Island District will be supplied by Enbridge to the Illinois Department of Natural Resources upon its granting.

IV.E.2. Copies of any final federal authorizations for a taking already issued to the applicant, if any: No federal authorizations for a taking have been applied for by the applicant or issued for the Project as of this writing.

IV.E.3. For projects that will result in the taking of endangered or threatened species of plants, copies of expressed written permission of the landowner: Copies of expressed written permission of the landowner of tracts from which endangered or threatened species of plants will be taken (if any) will be provided to the Illinois Department of Natural Resources prior to the commencement of construction. This is limited to a few landowners in the Sand Lake area. Enbridge is currently working on securing this permission and will provide documentation once it is obtained. This documentation will be provided prior to Project construction in the Sand Lake area.

V. Agreement

The implemented agreement, which includes:

V.A.1. The names and signatures of all participants in the execution of the above conservation plans.

Enbridge Pipelines (FSP) L.L.C. _____

Name Title Date

Illinois Department of Natural Resources _____

Name Title Date

V.A.2. The obligations and responsibilities of each of the identified participants with schedules and deadlines for completion of activities included in the above conservation plans and a schedule for preparation of progress reports to be provided to the Department.

Construction of the Project according to the techniques outlined in the Enbridge Environmental Mitigation Plan, August 2012 (see **Attachment A**), is the responsibility of Enbridge Pipelines (FSP) L.L.C. Construction of the Project in Illinois is to commence _____ and to conclude _____.

Monitoring and reporting as outlined in this Conservation Plan is the responsibility of Enbridge Pipelines (FSP) L.L.C. and its designees. Monitoring and reporting to the Department are to occur in _____ and _____.

The review of this Conservation Plan and subsequent issuance on the incidental take permit is the responsibility of the Illinois Department of Natural Resources, according to 17 IL ADMIN CODE, CH. 1, SEC. 1080.

V.A.3a.5.C. Certification that each participant in the execution of the above conservation plans has the legal authority to carry out their respective obligations and responsibilities under the conservation plan.

As _____ of Enbridge Pipelines (FSP) L.L.C., I hereby certify that I have the legal authority to carry out the obligations and responsibilities of Enbridge Pipelines (FSP) L.L.C. under this Conservation Plan.

_____

Name Date

As _____ of the Illinois Department of Natural Resources, I hereby certify that I have the legal authority to carry out the obligations and responsibilities of the Illinois Department of Natural Resources under this Conservation Plan.

_____

Name Date

Attachment B

Incidental Take Authorization: Joseph A. Kath to Enbridge

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
http://dnr.state.il.us

Pat Quinn, Governor
Marc Miller, Director

June 17, 2013

Bobby Hahn
Senior Environmental Analyst
Enbridge Pipelines, L.L.C.
4628 Mike Colallilo Road
Duluth, Minnesota 55807

RE: *Incidental Take Authorization – Mason County, Illinois - Multiple species*
Enbridge Flanagan South Pipeline, - Pontiac, Illinois to Cushing, Oklahoma

Dear Mr. Hahn:

Pursuant to the Illinois Endangered Species Protection Act (520 ILCS 10/5.5), on behalf of Enbridge Pipelines, LLC, authorization for the incidental take of the State listed Yellow-headed blackbird, King rail, and Illinois chorus frog in Mason County, Illinois [associated with the Flanagan South Pipeline] is hereby granted, subject to the terms and conditions described in the attached Authorization and Implementing Agreement. The Illinois Department of Natural Resources has determined that this authorized take is incidental to the construction of the Flanagan South Pipeline across central and southwestern Illinois.

Please have an authorized Enbridge Pipelines, LLC Official(s) sign the last page of both copies of the Authorization and Implementing Agreement and return **both** copies to my the attention. Upon receipt, I will have the agreements signed and return one (1) fully executed copy to you for your official records. This authorization shall be effective once signed by the Department.

Thank you for your cooperation and assistance during the incidental take preparation and review process. Please do not hesitate to contact our office at (217)785-8764 with any questions or comments you may have regarding this authorization agreement.

Sincerely,

Joseph A. Kath
Endangered Species Manager
IDNR-Office of Resource Conservation

Enclosures

Printed on recycled and recyclable stock

Authorization for Incidental Take and Implementing Agreement

Pursuant to the Illinois Endangered Species Protection Act (520 ILCS 10/5.5) [on behalf of Enbridge Pipelines, LLC (EB), who retained URS Corporation (URS) to prepare a Conservation Plan in application to the Illinois Department of Natural Resources (IDNR) for an Incidental Take Authorization (ITA) for the incidental take of the State listed Species: Yellow-headed blackbird [*Xanthocephalus xanthocephalus*], King rail [*Rallus elegans*], and the Illinois chorus frog [*Pseudacris streckeri illinoensis*]) across central and southwestern Illinois - associated with the Flanagan South Pipeline Project; as described/shown in the conservation plan received by the Department on 14 December 2012] is hereby granted, subject to the terms and conditions described in the attached Authorization and Implementing Agreement. The Illinois Department of Natural Resources has determined that this authorized take is incidental to the construction of the Flanagan South Pipeline Project across central and southwestern Illinois.

Procedural History

URS [on behalf of Enbridge Pipelines, LLC] prepared a conservation plan for the Flanagan South Pipeline Project (FSP) as described by the Illinois Endangered Species Protection Act (520 ILCS 10/5.5). That plan and EB's request for authorization for incidental take of the: Yellow-headed blackbird [*Xanthocephalus xanthocephalus*], King rail [*Rallus elegans*], and the Illinois chorus frog [*Pseudacris streckeri illinoensis*]) across central and southwestern Illinois were received by the Illinois Department of Natural Resources (Department) on 14 December 2012. Public notice of EB's request for authorization of incidental take of these State listed species was published in the Breeze Courier (Official State newspaper) and the Mason County Democrat (Mason County) on January 9, 2013, as well as on January 16, and January 23, 2013. Public comments on EB's conservation plan were accepted by the Department until February 23, 2013. During the period of January 9, 2013 through February 23, 2013, no public comments were received for this project.

In March, 2012, Enbridge entered into a data agreement license with the Illinois Natural Heritage Database in order to assess the existence of listed species and/or sensitive parcels (i.e. INAI sites, Nature Preserves, etc.) within the Illinois portion of the pipeline corridor. This project was then submitted to the IDNR's Office of Realty and Environmental Planning (OREP) for official review under the Endangered Species Consultation Process in May, 2012. Upon review within OREP, the project manager, Rick Pietruszka, recommended that the applicant (Enbridge-EB) seek an ITA for the Illinois chorus frog, Yellow-headed blackbird, and King rail in July, 2012. With this recommendation, the Enbridge project was never formally elevated to the IDNR's internal Incidental Take Authorization (ITA) committee as Enbridge made the formal decision to immediately seek an IDNR ITA. Enbridge then prepared a formal Conservation Plan in order to seek an ITA from the IDNR for this pipeline project. This Conservation Plan was officially received by the Department in December, 2012. All formal e-mail correspondences documenting these decisions are maintained in the files of the Endangered Species Program (attn.: Joseph Kath) in Springfield, Illinois. As stated above, URS [on behalf of Enbridge Pipelines, LLC] prepared a conservation plan for the Flanagan South Pipeline Project (FSP) as described by the Illinois Endangered Species Protection Act (520 ILCS 10/5.5). That plan and EB's request for authorization for incidental take of the: Yellow-headed blackbird [*Xanthocephalus xanthocephalus*], King rail [*Rallus elegans*], and the Illinois chorus frog [*Pseudacris streckeri illinoensis*]) across central and southwestern Illinois were received by the Illinois Department of Natural Resources (Department) on 14 December 2012. Public notice of EB's request for authorization of incidental take of these State listed species was published in the Breeze Courier (Official State newspaper) and the Mason County Democrat (Mason County) on January 9, 2013, as well as on January 16, and January 23, 2013. Public comments on EB's conservation plan were accepted by the Department until February 23, 2013. During the period of January 9, 2013 through February 23, 2013, no public comments were received for this project.

Enbridge Pipelines (FSP) L.L.C., an indirect U.S. subsidiary of Enbridge Inc., is proposing the construction of a new liquid petroleum pipeline in the States of Illinois, Missouri, Kansas, and Oklahoma. The Flanagan South Project (Project) is approximately 589 miles long. Enbridge's pipeline system transports crude petroleum to serve refineries in Midwestern states and eastern Canada. Enbridge also transports volumes of crude oil from North Dakota and Montana through an interconnection with Enbridge-affiliated pipelines in North Dakota, and from the Gulf of Mexico coast via interconnections with other pipeline systems.

The Project is an independent project that begins at Enbridge's Flanagan Terminal and terminates at Enbridge's Cushing Terminal. The Project route starts at the Flanagan Terminal located north of the City of Pontiac in Livingston County, Illinois, and crosses portions of Illinois, Missouri, Kansas and Oklahoma. Counties crossed in Illinois include Livingston, Woodford, Tazewell, Mason, Fulton, Schuyler, Brown and Adams. The route also crosses Havana, Illinois. The Project terminates at the Enbridge Cushing, Oklahoma, Terminal.

The Project area is mostly rural with agriculture as the primary land use; residential development is limited. Higher density population areas such as Quincy, Illinois have been avoided during strategic route alternatives review. Commercial and industrial land uses are limited to above-ground facilities to support energy infrastructure.

The Project route extends west-southwest across Illinois, from the MP 0 in Livingston County, Illinois to the Mississippi River at approximately MP 167.8. Enbridge has existing ROW along portions of the majority of the Project route because of its ownership of the *Spearhead Pipeline* system and will use that ROW as necessary to build and operate the Project. Although some of the Spearhead ROW lacks a defined width, where defined, it is generally fifty (50) to eighty (80) feet in width.

Target Species
Yellow-headed blackbird [*Xanthocephalus xanthocephalus*] – "(Illinois) State" Endangered
King rail [*Rallus elegans*] – " Endangered
Illinois chorus frog [*Pseudacris streckeri illinoensis*] – " Threatened

Compliance with the Endangered Species Protection Act
The Illinois Endangered Species Protection Act includes six (6) criteria which must be met for the authorization of incidental take of an endangered or threatened species. These criteria and the Department's determination for each criterion are listed below.

1. The taking will not be the purpose of, but will only be incidental to, the carrying out of an otherwise lawful activity:

The Project route extends west-southwest across Illinois, from the MP 0 in Livingston County, Illinois to the Mississippi River at approximately MP 167.8. Enbridge has existing ROW along portions of the majority of the Project route because of its ownership of the Spearhead Pipeline system and will use that ROW as necessary to build and operate the Project. Although some of the Spearhead ROW lacks a defined width, where defined it is generally fifty (50) to eighty (80) feet in width.

The new pipe will be generally installed at a 50-foot offset from the center line of the Spearhead Pipeline to ensure adequate space for safe construction and on-going maintenance activities. The permanent easement for the new pipe will be 50 feet. Also, during construction, an additional 85 feet of temporary workspace will be needed (135 feet total construction ROW). In some cases, this construction ROW width may be reduced to minimize impacts on natural resources such as wetlands. Extra temporary workspace

generally rectangular in size and ranging from 100 feet x 200 feet to 200 feet x 200 feet will be required in some locations to accommodate crossings of roads, wetlands, railways, and water-bodies. Co-location of the Project with existing ROW will greatly minimize environmental disturbance necessary for the Project.

2. The parties to the conservation plan will, to the maximum extent practicable, minimize and mitigate the impact caused by the taking.

Target Species
Yellow-headed blackbird [*Xanthocephalus xanthocephalus*] – "(Illinois) State" Endangered
King rail [*Rallus elegans*] – " Endangered
Illinois chorus frog [*Pseudacris streckeri illinoensis*] – " Threatened

As part of early endangered and threatened (E&T) species coordination (IDNR OREP-Endangered Species Consultation Process), the Illinois Department of Natural Resources (IDNR) provided Enbridge with electronic E&T species location data for counties through which the Project passes. Enbridge inserted this location data (including species buffer polygons) into Project GIS mapping and noted those locations where the Project construction ROW crossed mapped species buffer polygons. *The only place where Illinois-mapped species buffer polygons are within the construction ROW is in the Mason County Sands area in the vicinity of Sand Lake, southeast of the town of Havana. The construction ROW does not overlap with any other mapped species buffer polygons along its length in Illinois.*

According to Ground-water/Surface Water Interactions at Sand Lake, Mason County, Illinois, by the Illinois State Water Survey (1999), Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades.

As can be seen from ground photos taken on November 2, 2012 (on file in Springfield, IL.), the portion of Sand Lake crossed by the pipeline was used for agricultural production (corn and soybeans) in 2012. The corridor and the surrounding area did not contain any intact wetland vegetation and no areas with standing water were observed on this date. At least in 2012, Sand Lake would not have provided good nesting habitat for the Yellow-headed blackbird, which only nests at sites where the water level is on average deeper than one meter, and which has a mixture of open water and vegetation (usually cattails) that is referred to as a hemi-marsh. Similarly, the Sand Lake of 2012 would have provided relatively poor habitat for King rails, which nest in sites with shallow water (saturated soil to about 7 inches (22 cm) deep) during the nesting season, with high coverage of short emergent vegetation, moderate coverage of tall emergent vegetation, high water-vegetation interspersion, and little or no coverage by woody vegetation.

At the time the Conservation Plan was received by the Department (14 December 2012), the following statement was prepared by URS: "It is unknown if Sand Lake would have provided breeding habitat for the Illinois chorus frog, which is an early spring breeder (March-April), or if any ponded habitats lasted long enough for tadpoles to metamorphose, in about late May to mid-June. However, for the rest of the year, Illinois chorus frogs are highly fossorial (i.e., burrow and live underground). The preferred habitat for this portion of their life cycle is areas of sandy soil with sparse vegetation or absence of vegetation. Thus, the portion of Sand Lake crossed by the pipeline could potentially harbor these fossorial frogs."

However, a formal survey report on file in Springfield, Illinois [Illinois chorus frog and potential impacts for the Enbridge-Flanagan South Pipeline Project/Mason County] prepared by Vernon LaGesse, Jr., and Audrey Schwing on 29 April 2013, cites the following information:

a. The new pipe will be generally installed at a 50-foot offset from the center line of the Spearhead Pipeline to ensure adequate space for safe construction and on-going maintenance activities. Also, during construction, an additional 85 feet of temporary workspace will be needed. In some cases, this width may be reduced to minimize impacts on natural resources such as wetlands. Extra temporary workspace ranging from 100 feet x 200 feet to 200 feet x 200 feet will be required in some locations to accommodate crossings of roads, wetlands, railways, and water-bodies. Co-location of the proposed pipeline with existing ROW will greatly minimize environmental disturbance necessary for the Project.

b. The Project will pass south of Havana, Illinois along a currently existing pipeline (Spearhead) that runs across the north end of the Sand Lake Area east of Route 97 and north of County Road 1500N. Illinois Chorus Frogs are known to use the Sand Lake Area when the Mahomet Aquifer surfaces in wet springs.

c. Nocturnal audible surveys were conducted in March 2013 to determine the presence/absence of ICF's within the Project boundaries. Surveys started after 8:00 pm on evenings with air temperatures near 50 degrees Fahrenheit, during times ICF's were known to be out calling. A known ICF reference site (Conn Pond) was also monitored to confirm that ICFs were calling within this same region of Illinois. For this study, areas West of Oakford, Illinois were used as the reference site. Surveys were conducted by automobile by driving to each location, turning the automobile off, and listening for breeding frogs calling. Weather, temperature, time, and frog results were recorded from each survey point for this investigation. Survey points were laid out during daylight hours to locate possible ICF habitat and to confirm the ICF Habitat Model (IDNR, 2009 – A. Hulin) locations. The ICF Habitat Model was created by Illinois Department of Natural Resources in 2008 and 2009. It is based on the presence of small ponds and hydric sandy soils and on the occurrence of a wet spring weather pattern.

d. Surveys were conducted on the evenings of March 22, 23, & 30, 2013. The Sand Lake Area was observed to be dry all spring of 2013. Only three species of amphibians were heard calling during this investigation and they all were found at the reference site, Conn Pond. These included the ICF, the Western Chorus Frog, *Pseudacris triserrata,* and the American Toad, *Bufo americanus*.

e. While ICF's were present at the reference site, no ICFs were documented in the survey corridor for this Project during this survey, including within the ICF Habitat Model zones near the Project area.

f. This report is an assessment for potential take of the ICF by the Project for the purposes of a State of Illinois Incidental Take Authorization. No ICFs were documented in the areas of interest for this survey. Illinois Chorus Frogs have been documented for the past 5 years in the Sand Lake Area, but due to a lack of water at the site at the time surveyed, they were not present this spring. Failure to breed in the project area of Sand Lake in Spring 2013

will reduce the likelihood that a new cohort of juvenile frogs will be present during project construction in the Fall of 2013. This reports Principal Investigator recommends proceeding with the construction as planned and use of Best Management Practices should be used within the Sand Lake Area.

3. The parties to the conservation plan will ensure that adequate funding for the conservation plan will be provided:

In an official correspondence to the Department dated 14 December 2012, EB verified that adequate funding exists to support and implement all (mitigation) activities described in the official Conservation Plan. The conservation plan states that during site development, and continuing through routine monitoring EB will provide all of the necessary funding for the implementation of the taking minimization measures. EB has complied with all other federal, state, and local regulations that are pertinent to the proposed action. Federal, state, and local permit requirements, ordinances, and approvals regarding siting, construction, and operation of the proposed Project were reviewed. EB has evaluated the applicability of the environmental local, state, and federal permits and their status for the Project.

4. Based on the best available scientific data, the Department has determined that the taking will *not* reduce the likelihood of the survival or recovery of the endangered species or threatened species in the wild in Illinois, the biotic community of which the species is a part, or the habitat essential to the species' existence in Illinois:

Target Species
Yellow-headed blackbird [*Xanthocephalus xanthocephalus*] – "(Illinois) State" Endangered
King rail [*Rallus elegans*] – " Endangered
Illinois chorus frog [*Pseudacris streckeri illinoensis*] – " Threatened

Part A:
Overall, impacts to potential habitat during construction and post construction will be minimized. The Project will be constructed following the construction protocols documented in the Enbridge Environmental Mitigation Plan and provided above. Co-locating the Project with existing facilities avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur with a new route or greenfield construction, and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The linear nature of the proposed Project, along with its short-term temporal time-frame, combines to limit the Project's impacts on both an area and time basis.

The *Action Area* for the Enbridge Conservation Plan and this ITA is defined as: The new pipe(line) will be generally installed at a 50-foot offset from the center line of the Spearhead Pipeline to ensure adequate space for safe construction and on-going maintenance activities. The permanent easement for the new pipe will be 50 feet. Also, during construction, an additional 85 feet of temporary workspace will be needed (135 feet total construction ROW). In some cases, this construction ROW width may be reduced to minimize impacts on natural resources such as wetlands (110 feet). The ROW would be further reduced to 85 feet in forested and scrub/shrub wetlands, as well as the habitat of Sand Lake, and in waterways adjacent to these features. Extra temporary workspace, generally rectangular in size and ranging from 100 feet x 200 feet to 200 feet x 200 feet, will be required in some locations to accommodate crossings of roads, wetlands, railways, and water-bodies. Overall, co-location of the Project with existing ROW will greatly minimize environmental disturbance necessary for the Project.

Part B:

-Yellow-headed blackbird (YHBB) [*Xanthocephalus xanthocephalus*]: As of May, 2013, there are 47 EORs (element occurrence records) for this species in the State of Illinois. The EB Flanagan South Pipeline Project (EFSP) encompasses portions of central and southwestern Illinois. As of May, 2013, the number of EORs for this species within the Action Area is 1. The EFSP therefore represents approximately 6% of all Yellow-headed blackbird EORs in the State of Illinois. The most recent EOR for the YHBB in the Action Area is: 1994. The major risk at this site for the YHBB is likely habitat loss. Although the EFSP Project represents approximately 6% of all YHBB EORs in the State of Illinois (less than 1/5 of the YHBB EORs in the State of Illinois), a degree of direct (financial) mitigation will however be sought for this species due to the elevated likelihood of take due to high quality habitat loss at Sand Lake in Mason County. Please see the Authorization section of this document for details.

-King rail (KR) [*Rallus elegans*]: As of May, 2013, there are 17 EORs (element occurrence records) for this species in the State of Illinois. The EB Flanagan South Pipeline Project (EFSP) encompasses portions of central and southwestern Illinois. As of May, 2013, the number of EORs for this species within the Action Area is 1. The EFSP therefore represents approximately 6% of all KR EORs in the State of Illinois. The most recent EOR for the KR in the Action Area is: 1994. The major risk at this site for the KR is likely habitat loss. Although the EFSP Project represents approximately 6% of all KR EORs in the State of Illinois (less than 1/5 of the KR EORs in the State of Illinois), a degree of direct (financial) mitigation will however be sought for this species due to the elevated likelihood of take due to high quality habitat loss at Sand Lake in Mason County. Please see the Authorization section of this document for details.

-Illinois chorus frog (ICF) [*Pseudacris streckeri illinoensis*]: As of May, 2013, there are 29 EORs (element occurrence records) for this species in the State of Illinois. The EB Flanagan South Pipeline Project (EFSP) encompasses portions of central and southwestern Illinois. As of May, 2013, the number of EORs for this species within the Action Area is 1. The EFSP therefore represents approximately 3% of all Illinois chorus frog EORs in the State of Illinois. The most recent EOR for the ICF in the Action Area is: 2002. The major risk at this site for the ICF is likely habitat loss. Although the EFSP Project represents approximately 3% of all ICF EORs in the State of Illinois (less than 1/5 of the ICF EORs in the State of Illinois), a degree of direct (financial) mitigation will however be sought for this species due to the elevated likelihood of take due to high quality habitat loss at Sand Lake in Mason County. Please see the Authorization section of this document for details.

Part C:

Yellow-headed blackbird

Below are the following commitments/measures that EB will make to minimize and/or mitigate potential effects to the YHBB:

The Yellow-headed blackbird is included within the construction ROW for the current Project alignment. This 0.48-acre overlap of mapped species buffer polygon for the Yellow-headed blackbird within the construction ROW occurs on the following parcel:

Owner Name: S & D FARMS, INC.
Legal Description: PT NW1/4 SW1/4 8 21 8 126
Parcel size: 41.49 acres
Township No.: 5; Township Name: Havana

I.

- The Yellow-headed blackbird has probably always been restricted to the prairie regions in the northern part of the state, where it was once a locally abundant breeding bird. The Illinois population is separated from the core of the Yellow-headed blackbird population in western Iowa by about 420 miles (680 km). The Illinois population is small, declining, and isolated from the main North American breeding range for this species. It is an Illinois endangered species known from one (1) 1994 occurrence in Mason County (Nyboer, R.W., J.R. Herkert and J.E. Ebinger. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2 – Animals).

- The number of Yellow-headed blackbirds currently utilizing the Project construction ROW portion of Sand Lake is unknown. However, the overlap of mapped species buffer polygon for the Yellow-headed blackbird with construction ROW covers approximately 0.48 acres. Enbridge does not expect to have any direct take of Yellow-headed blackbirds because constructing outside of the breeding season completely avoids take. Any potential modification to habitat will be temporary as construction procedures typically result in return to the original contours in wetlands and full restoration within one to two years of construction.

- Description of the activities that may result in taking: Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. The main features of pipeline construction along these lines include the following:
  - Clearing (indirect construction traffic);
  - ROW preparation (grading, topsoil stripping);
  - Pipeline fabrication (stringing, welding, grinding, coating, and x-ray);
  - Trenching and spoil storage;
  - Backfill; and,
  - Post construction grading and restoration.

- Specific activities that may affect habitat for the Yellow-headed blackbird are described along with minimization procedures below.

Clearing:
Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in *wetlands*, the following restrictions will apply:

-Staging areas, additional spoil storage areas, and other additional work areas (outside of the temporary workspace (TWS) adjacent to the pipeline easement) will be located in upland areas at least 50 feet away from wetland boundaries. If topographic 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. This requirement will not apply where a wetland occurs within the extra workspace for a stream crossing;

-The size of the additional workspace areas will be limited to the minimum needed to construct the wetland or waterbody crossing; and,

-Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched, burned or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal revegetation as allowed by permits.

Sedimentation Control Practices:
Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and water-bodies from spoil piles or sloped approaches that are adjacent to wetlands and water-bodies. 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.

Right-of-Way Stabilization:
Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation:
Where feasible (normally in wetland areas without standing water or saturated soils), up to one foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Trench Breakers:
Where the pipeline trench has the potential to partially drain a wetland, trench breakers will be installed as necessary to maintain the original wetland hydrology.

Backfilling:
During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration:
Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

II.
Where required, disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

-To the maximum extent practicable, Enbridge has set the timing of clearing and pipeline construction activities to avoid disturbing nesting activities of all bird species, including the Yellow-headed blackbird.

-Cleanup and restoration activities associated with construction will be done during the non-breeding season. However, some clean-up and restoration activities post-construction may extend into the nesting season. Construction activities will be minimized in Yellow-headed blackbird habitat to the extent practicable. The Contractor will also use special construction techniques (including timber mats) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize construction-related disturbance and sedimentation of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

-Clearing of the Project construction ROW and associated construction activities are anticipated to begin in August of 2013. These activities would be outside of the Yellow-headed blackbird's normal nesting period.

III.

Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during Project construction is unknown at this time; however, unsaturated conditions are expected to be more prevalent late fall and winter during planned clearing and construction activity.

As indicated by Enbridge, up to one foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with a mix first approved by the IDNR (attn.: Joseph Kath), to provide temporary cover while the wetlands revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch shall be applied in wetlands.

This Unsaturated Wetland Seed Mix must be approved by the IDNR PRIOR to any planting in or around the Action Area.

Should a standing water condition be found at Sand Lake during construction, Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs best through natural process without supplemental seeding.

IV.

Topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation.

Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Following completion of all construction during the non-breeding season, the Project ROW will be restored to its pre-construction conditions as practical.

While some restoration activities may occur during the nesting season for the Yellow-headed blackbird, restoration activities will be confined to the construction right-of-way that will have been cleared and will not have suitable breeding habitat (e.g. cattails and emergent vegetation) until after restoration is complete and revegetation has been initiated by natural regrowth from the seed bank or reseeding with the approved wetland vegetation seed mix.

V.

The habitat left after Project post-construction reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is taken. Following the procedure established by Ward, M.P, 2004, Habitat Selection by Yellow-headed blackbirds, Enbridge will conduct a preconstruction survey during the breeding season (late spring-early summer of 2013) by locating Yellow-headed blackbird nests by searching appropriate habitat within the Project corridor in the Sand Lake vicinity. Once located, these nests will be recorded using a hand-held GPS and photographs will be taken. This survey procedure will be repeated during the first, fifth, and tenth (1st, 5th, 10th) nesting seasons following final construction – final construction shall be defined as: pipeline completely buried and all cleanup, grading, and surface restoration efforts have been completed. A brief report of ALL survey results (pre and post construction) will be submitted to IDNR by December 31st of each survey year.

Copies of these reports shall be sent to the following:

Illinois Department of Natural Resources
Division of Natural Heritage
Attn: Joseph Kath
One Natural Resources Way
Springfield, Illinois 62702-1271

Illinois Endangered Species Protection Board
Attn: Anne Mankowski
One Natural Resources Way
Springfield, Illinois 62702-1271

Illinois Department of Natural Resources
Natural Heritage Database
Attn: Tara Kieninger
One Natural Resources Way
Springfield, Illinois 62702-1271

It should be noted that the Yellow-headed blackbird is known from one (1) 1994 occurrence in Mason County (Nyboer, R.W., J.R. Herkert and J.E. Ebinger. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2 – Animals).

VI.

Enbridge will either seed or not seed habitat after construction activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the ROW to adjacent wetland conditions. If similar habitat conditions do not return to the construction ROW, Enbridge will rehabilitate the ROW to match adjacent habitat conditions.

VII.

Co-locating the Project with existing facilities avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur with a new route or greenfield construction, and minimizes Project impacts by expanding the existing corridor cut previously

through these habitats, rather than introducing a new corridor. The linear nature of the proposed Project, along with its short-term temporal time-frame, combines to limit the Project's impacts on both an area and time basis.

Project construction and restoration in the Sand Lake area is not expected to reduce the likelihood of the survival of the Yellow-headed blackbird in Illinois. It is anticipated that no birds would be taken by the Project because clearing and construction will occur well outside of the breeding season of the Yellow-headed blackbird, and any restoration that will be planned during spring 2014 will occur within the ROW where no suitable habitat will be present on the ROW as a result of the previous winters clearing and construction. Following construction, suitable habitat for the Yellow-headed blackbird will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the ROW affected by construction to match the immediately adjacent habitat.

King rail

Below are the following commitments/measures that EB will make to minimize and/or mitigate potential effects to the KR:

The King rail is included within the construction ROW for the current Project alignment. This 2.72-acre overlap of mapped species buffer polygon for the King rail with construction ROW occurs on the following parcels:

Owner Name: S & D FARMS, INC.
Legal Description: PT NW1/4 SW1/4 8 21 8 126
Parcel size: 41.49 acres
Township No.: 5; Township Name: Havana

Owner Name: S & D FARMS, INC.
Legal Description: NE1/4 SW1/4 8 21 8 126
Parcel size: 40.94 acres
Township No.: 5; Township Name: Havana

I.

- The King rail was formerly considered to be a common summer resident in suitable localities throughout the state. Now the King rail is an Illinois endangered species known from Brown, Fulton and Mason Counties. One 2007 occurrence is known from Brown County, one 1988 occurrence is known from Fulton County and one 1994 occurrence is known from Mason County.

- Description of the activities that may result in taking: Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. The main features of pipeline construction along these lines include the following:
  - Clearing (indirect construction traffic);.
  - ROW preparation (grading, topsoil stripping);
  - Pipeline fabrication (stringing, welding, grinding, coating, and x-ray);
  - Trenching and spoil storage;
  - Backfill; and,
  - Post construction grading and restoration.

- Specific activities that may affect habitat for the King rail are described along with minimization procedures below.

Clearing:
Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:
-Staging areas, additional spoil storage areas, and other additional work areas (outside of the temporary workspace (TWS) adjacent to the pipeline easement) will be located in upland areas at least 50 feet away from wetland boundaries. If topographic 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. This requirement will not apply where a wetland occurs within the extra workspace for a stream crossing;
-The size of the additional workspace areas will be limited to the minimum needed to construct the wetland or waterbody crossing; and,
-Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched, burned or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal revegetation as allowed by permits.

Sedimentation Control Practices:
Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization:
Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation:
Where feasible (normally in wetland areas without standing water or saturated soils), up to one foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Trench Breakers:
Where the pipeline trench has the potential to partially drain a wetland, trench breakers will be installed as necessary to maintain the original wetland hydrology.

Backfilling:
During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

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Rough Grading, Cleanup, and Temporary Restoration:
Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

II.
Where required, disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

-To the maximum extent practicable, Enbridge has set the timing of clearing and pipeline construction activities to avoid disturbing nesting activities of all bird species, including the King rail.

-Cleanup and restoration activities associated with construction will be done during non-breeding season. However, some clean-up and restoration activities post-construction may extend into the nesting season. Construction activities will be minimized in King rail habitat to the extent practicable. The Contractor will also use special construction techniques (including timber mats) to minimize the disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize construction-related disturbance and sedimentation of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

-Clearing of the Project construction ROW and associated construction activities are anticipated to begin in August of 2013. Both of these activities would be outside of the King rail's normal nesting period.

III.
Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during Project construction is unknown at this time; however, unsaturated conditions are expected to be more prevalent late fall and winter during planned clearing and construction activity.

As indicated in Enbridge's EMP, up to one foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with a mix first approved by the IDNR (attn.: Joseph Kath), to provide temporary cover while the wetlands revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch shall be applied in wetlands.

This Unsaturated Wetland Seed Mix must be approved by the IDNR PRIOR to any planting in or around the Action Area.

IV.

Topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation. Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Following completion of all construction during the non-breeding season, the Project ROW will be restored to its pre-construction conditions as practical.

While some restoration activities may occur during the nesting season for the King rail, restoration activities will be confined to the construction right-of-way that will have been cleared and will not have suitable breeding habitat (e.g. cattails and emergent vegetation) until after restoration is complete and revegetation has been initiated by natural regrowth from the seed bank or reseeding with the approved wetland vegetation seed mix.

V.

The habitat left after Project post-construction reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is taken. Enbridge will conduct one (1) preconstruction survey during the King rail breeding season (between May 1 and May 14) within the Project corridor in the Sand Lake vicinity using a version of the protocol established in Conway, C.J., 2011. Standardized North American Marsh Bird Monitoring Protocol. The survey route will be the Project centerline and survey points will be spaced at 200-meter intervals along this route within Sand Lake. Because many marsh birds (including King rails) are secretive, seldom observed and vocalize infrequently, the Standardized North American Marsh Bird Monitoring Protocol instructs surveyors to broadcast calls to elicit vocalizations during surveys. In the version to be used at Sand Lake, only King rail calls will be broadcast. To prevent the call-broadcast at one point from affecting the distribution of birds at adjacent points, broadcast speakers will be directed in alternating directions perpendicular to the survey route (e.g., first NNW, then SSE) at successive survey points. Surveyors will estimate and record the distance and direction from the survey point to each individual King rail that responds with vocalizations. The estimated locations of responding King rails will be recorded on Project mapping. This survey procedure will be repeated during the first, fifth, and tenth (1st, 5th, 10th) nesting seasons following final construction. Final construction shall be defined as: pipeline completely buried and all cleanup, grading, and surface restoration efforts have been completed. A brief report of ALL survey results (pre and post construction) will be submitted to IDNR by December 31st of each survey year.

It should be noted that the King rail is known in Mason County from one (1) 1994 occurrence (Nyboer, R.W., J.R. Herkert and J.E. Ebinger. 2006. Endangered and Threatened Species of Illinois: Status and Distribution, Volume 2 – Animals). Surveys should document presence/absence of both species and habitat, and would be discontinued once habitat within the construction ROW is similar to the immediately adjacent habitat.

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Copies of these reports shall be sent to the following:

Illinois Department of Natural Resources
Division of Natural Heritage
Attn: Joseph Kath
One Natural Resources Way
Springfield, Illinois 62702-1271

Illinois Endangered Species Protection Board
Attn: Anne Mankowski
One Natural Resources Way
Springfield, Illinois 62702-1271

Illinois Department of Natural Resources
Natural Heritage Database
Attn: Tara Kieninger
One Natural Resources Way
Springfield, Illinois 62702-1271

VI.
Enbridge will either seed or not seed habitat after construction activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the ROW to adjacent wetland conditions. If similar habitat conditions do not return to the construction ROW, Enbridge will rehabilitate the ROW to match adjacent habitat conditions.

VII.
Co-locating the Project with existing facilities avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur with a new route or greenfield construction, and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The linear nature of the proposed Project, along with its short-term temporal time-frame, combines to limit the Project's impacts on both an area and time basis.

Project construction and restoration in the Sand Lake area is not expected to reduce the likelihood of the survival of the King rail in Illinois. It is anticipated that no birds would be taken by the Project because clearing and construction will occur well outside of the breeding season of the King rail, and any restoration that will be planned during spring 2014 will occur within the ROW where no suitable habitat will be present on the ROW as a result of the previous winters clearing and construction. Following construction, suitable habitat for the King rail will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the ROW affected by construction to match the immediately adjacent habitat.

Illinois chorus frog
Below are the following commitments that EB will make to minimize and/or mitigate potential effects to the ICF:

The Illinois chorus frog is included within the construction ROW for the current Project alignment. This 5.45-acre overlap of mapped species buffer polygon for the Illinois chorus frog with construction ROW occurs on the following parcels:

Owner Name: S & D FARMS, INC.
Legal Description: PT NW1/4 SW1/4 8 21 8 126
Parcel size: 41.49 acres
Township No.: 5; Township Name: Havana

Owner Name: S & D FARMS, INC.
Legal Description: NE1/4 SW1/4 8 21 8 126
Parcel size: 40.94 acres
Township No.: 5; Township Name: Havana

I.

- The Illinois chorus frog is restricted to areas of sandy substrates found in the floodplains of the Mississippi and Illinois rivers in Arkansas, Illinois, and Missouri. Because these habitats have been converted to agriculture or developed for other human activities, *P. s. illinoensis* is now uncommon. It is listed as a threatened species in Illinois and is known to occur in nine counties in Illinois.

- Description of the activities that may result in taking: Activities that may potentially result in taking all involve either direct ground disturbance, or indirect disturbance by trafficking. The main features of pipeline construction along these lines include the following:

• Clearing (indirect construction traffic);
• ROW preparation (grading, topsoil stripping);
• Pipeline fabrication (stringing, welding, grinding, coating, and x-ray);
• Trenching and spoil storage;
• Backfill; and,
• Post construction grading and restoration.

- Specific activities that may affect habitat for the Illinois chorus frog are described along with minimization procedures below.

Clearing:

Low ground pressure equipment will be used, as practical to limit disturbance to the wetland. When clearing in wetlands, the following restrictions will apply:

-Staging areas, additional spoil storage areas, and other additional work areas (outside of the temporary workspace (TWS) adjacent to the pipeline easement) will be located in upland areas at least 50 feet away from wetland boundaries. If topographic 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. This requirement will not apply where a wetland occurs within the extra workspace for a stream crossing;

-The size of the additional workspace areas will be limited to the minimum needed to construct the wetland or waterbody crossing; and,

-Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact; clearing debris will generally be chipped/mulched, burned or removed from the wetland for disposal. Chips, hydro-axe debris, or similar material may be left in the wetland if spread evenly on the ROW, in a manner which will allow for normal revegetation as allowed by permits.

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Sedimentation Control Practices:
Silt fence and other erosion control methods will be installed and maintained in proper working order to prevent the flow of sediment into wetlands and waterbodies from spoil piles or sloped approaches that are adjacent to wetlands and waterbodies. 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.

Right-of-Way Stabilization:
Tree stumps, brush riprap, imported dirt, and rock fill will not be brought in to stabilize the ROW in wetlands. Where a wetland cannot support construction equipment, and low ground-weight equipment is not used, construction activities will be accomplished from timber construction mats. Subsoil from the pipeline trench within the immediate wetland may be placed on top of equipment mats for additional stabilization. Timber mats are preferred materials that can be brought into a wetland and placed on the working side of the construction ROW. Timber mats may be placed over the ditch line to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

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.

Topsoil Segregation:
Where feasible (normally in wetland areas without standing water or saturated soils), up to one foot of native topsoil will be stripped from the trench line and stockpiled separate from trench spoil.

Trench Breakers:
Where the pipeline trench has the potential to partially drain a wetland, trench breakers will be installed as necessary to maintain the original wetland hydrology.

Backfilling:
During backfilling of wetland areas, subsoil material removed from the trench during construction will be placed back into the trench. Segregated topsoil will not be used as padding and will be returned to its original horizon over the backfilled trench.

Rough Grading, Cleanup, and Temporary Restoration:
Cleanup typically will involve removing construction debris and replacing fences removed during construction. Rough grading will include restoring contours 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. Every effort will be made to begin cleanup and rough grading (including installation of temporary erosion control measures) as soon as practical after the trench is backfilled, weather permitting.

II.
Where required, disturbed wetland areas will be revegetated naturally or in an agreed upon manner. No fertilizer, lime, or mulch will be applied in wetlands.

-To the maximum extent practicable, Enbridge has set the timing of clearing and pipeline construction activities to avoid disturbing nesting activities of all bird and amphibian species, including the Illinois chorus frog.

-Cleanup and restoration activities associated with construction will be done during non-breeding season. However, some clean-up and restoration activities post-construction may extend into the nesting season. Construction activities will be minimized in Illinois chorus frog habitat to the extent practicable. The Contractor will also use special construction techniques (including timber mats) to minimize the

disturbance to plants and soils and to protect wetland hydrology in this habitat. The intent of these techniques is to minimize construction-related disturbance and sedimentation of the habitat and to restore the habitat as nearly as possible to pre-existing conditions.

Clearing of the Project construction ROW and associated construction activities are anticipated to begin in August of 2013. Construction in the Sand Lake area will be completed well before the Illinois chorus frog's normal breeding and metamorphosis period.

III.

Saturated wetlands have water to the ground surface or contain standing water. Unsaturated wetlands have the free water surface at some depth below the soil surface. Since Sand Lake is considered an intermittent lake, existing about half the time during the growing seasons over the last several decades, the saturation status of the wetland during Project construction is unknown at this time; however, unsaturated conditions are expected to be more prevalent late fall and winter during planned clearing and construction activity.

As indicated in Enbridge's EMP, up to one foot of topsoil in unsaturated wetlands will be stripped, stored separately on the ROW, and subsequently restored to the locations from which it was removed. Similarly, topsoil stripping separate segregation, and restoration to the soil surface will be attempted, as practicable, in saturated wetlands. The stripping, separate segregation, and replacement of topsoil in wetlands will facilitate the rapid, natural regeneration of wetland vegetation from the seed bank.

Should an unsaturated condition be found, the wetland habitat will be seeded with a mix first approved by the IDNR (attn.: Joseph Kath), to provide temporary cover while the wetlands revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the ROW after pipe installation. No fertilizer, lime, or mulch shall be applied in wetlands.

This Unsaturated Wetland Seed Mix must be approved by the IDNR PRIOR to any planting in or around the Action Area.

IV.

Topsoil management will be employed to the extent practicable to ensure that, subsequent to backfill, wetland topsoil is available during restoration to provide a seed bank that results in rapid establishment of the native vegetation. Timber mats are supplemental equipment supports which 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. Timber mats are placed on the working side of the construction ROW. Timber mats may be placed over ditch lines to facilitate trench excavation. All timber mats will be removed during cleanup of wetlands.

Cleanup and rough grading (including installation of temporary erosion control measures) will begin as soon as practical after the trench is backfilled, weather permitting. Following completion of all construction during the non-breeding season, the Project ROW will be restored to its pre-construction conditions as practical.

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Some restoration activities may occur during the breeding season for the Illinois chorus frog, which could potentially cause direct take by grading and crushing by heavy equipment. Subsided areas along the trench may be very attractive frog breeding locations that would be disturbed during restoration of the original contours through grading. Monitoring of such locations will occur to ensure that Illinois chorus frog breeding locations are not restored while the frogs/tadpoles are still present.

V.

The habitat left after Project post-construction reclamation activities (emergent marsh with or without standing water depending on precipitation cycles) will be the same as that which is disturbed. Enbridge will conduct a preconstruction survey of the Project corridor within Sand Lake for Illinois chorus frog breeding activity using a nighttime calling survey to document the presence/absence of the species. The monitoring protocol used will be a modification of that described in Tucker, J.K and J.H. Chick, 2007, State Wildlife Grant Proposal #T45-D-1. The Project corridor within Sand Lake will be visited at night to conduct a calling survey. This frog characteristically calls after spring rainfall of at least 3 cm once temperatures have reached 15°C. Enbridge will monitor local conditions in the Sand Lake area to establish the time for this one-night survey. Night calling surveys will take place over three nights once temperatures have reached 15°C. This survey procedure will be repeated during the first, fifth, and tenth (1st, 5th, 10th) breeding seasons following final construction – final construction shall be defined as: pipeline completely buried and all cleanup, grading, and surface restoration efforts have been completed. A brief report of ALL survey results (pre and post construction) will be submitted to IDNR by December 31st of each survey year.

Copies of these reports shall be sent to the following:

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Natural Heritage Database
Attn: Tara Kieninger
One Natural Resources Way
Springfield, Illinois 62702-1271

VI.

Enbridge will either seed or not seed habitat after construction activities, depending on the presence or absence of standing water. Enbridge will document the restoration of the wetland within the ROW to adjacent wetland conditions. If similar habitat conditions do not return to the construction ROW, Enbridge will rehabilitate the ROW to match adjacent habitat conditions. Enbridge will conduct pre-restoration monitoring to ensure that Illinois chorus frog breeding locations are not restored while the frogs/tadpoles are still present.

VII.

Co-locating the Project with existing facilities avoids and minimizes environmental disturbance to the maximum extent practicable. This directly avoids new fragmentation that may occur with a new route or greenfield construction, and minimizes Project impacts by expanding the existing corridor cut previously through these habitats, rather than introducing a new corridor. The linear nature of the proposed Project, along with its short-term temporal time-frame, combines to limit the Project's impacts on both an area and time basis.

Project construction and restoration in the Sand Lake area is not expected to reduce the likelihood of the survival of the Illinois chorus frog in Illinois. It is anticipated that no breeding/metamorphosing frogs would be taken by the Project because clearing and construction will occur well outside of the breeding/metamorphosing season of the Illinois chorus frog. However, an unknown number of burrowing/hibernating Illinois chorus frogs could be taken as a result of trenching or soil compaction during construction. Habitat restoration activities, planned during spring 2014 would be preceded by monitoring activities to ensure that restoration activities did not impact breeding/metamorphosing ponds.

Therefore, a minor amount of restoration may need to take place following this period. Following all construction and restoration activities, suitable habitat for the Illinois chorus frog will continue to exist in the impacted area because it is Enbridge's intention to restore the habitat within the ROW affected by construction to match the immediately adjacent habitat.

5. Any measures required under Section 5.5 of the Illinois Endangered Species Protection Act [520 ILCS 10/5.5 - 17 IL. Adm. Code Part 1080.40(b)], will be performed:

Additional measures are listed below under "Authorization." This authorization is, by definition, subject to those terms and conditions and official EB signature(s) on this authorization indicates their commitment to performing those measures.

The proposed Project has the potential to affect three listed species and/or their habitat beyond the currently existing conditions. These species could be potentially harassed, injured or killed during the construction, operation, and/or maintenance of the Project; and there could be a potential for lost habitat as a result of the construction, operation, and/or maintenance of the Enbridge Flanagan South Pipeline Project.

NOTE: For projects that will result in the taking of endangered or threatened species of plants, copies of expressed written permission of the landowner: Copies of expressed written permission of the landowner of tracts from which endangered or threatened species of plants will be taken (if any) will be provided to the Illinois Department of Natural Resources (attn.: Joseph Kath) prior to the commencement of construction. This is limited to a few landowners in the Sand Lake area. Enbridge is currently working on securing this permission and will provide documentation once it is obtained. This documentation will be provided to IDNR/Joseph Kath prior to Project construction in the Sand Lake area.

6. The public has received notice of the application and has had the opportunity to comment before the Department made any decision regarding the application:

URS [on behalf of Enbridge Pipelines, LLC] prepared a conservation plan for the Flanagan South Pipeline Project (FSP) as described by the Illinois Endangered Species Protection Act (520 ILCS 10/5.5). That plan and EB's request for authorization for incidental take of the: Yellow-headed blackbird [*Xanthocephalus xanthocephalus*], King rail [*Rallus elegans*], and the Illinois chorus frog [*Pseudacris streckeri illinoensis*]) across central and southwestern Illinois were received by the Illinois Department of Natural Resources

(Department) on 14 December 2012. Public notice of EB's request for authorization of incidental take of these State listed species was published in the Breeze Courier (Official State newspaper) and the Mason County Democrat (Mason County) on January 9, 2013, as well as on January 16, and January 23, 2013. Public comments on EB's conservation plan were accepted by the Department until February 23, 2013. During the period of January 9, 2013 through February 23, 2013, no public comments were received for this project.

Authorization

It is the determination of the Department that the measures to be implemented by of Enbridge Pipelines, LLC (EB), who retained URS Corporation (URS) to prepare a Conservation Plan, will adequately minimize and mitigate for the anticipated taking (disturbance/harassment) of a small number of: Yellow-headed blackbird [*Xanthocephalus xanthocephalus*], King rail [*Rallus elegans*], and the Illinois chorus frog [*Pseudacris streckeri illinoensis*]) across central and southwestern Illinois - associated with the Flanagan South Pipeline. Further, it is our opinion that the take (disturbance/harassment) authorized herein would not diminish the likelihood of the survival of either these aforementioned species in the wild within the State of Illinois, the biotic community of which the species is a part, or the habitat essential to the species' existence in Illinois. Pursuant to Section 5.5 of the Illinois Endangered Species Protection Act [520 ILCS 10/5.5 - 17 IL. Adm. Code Part 1080.40(b)], this authorization is issued subject to the following additional terms and conditions:

1. This authorization is effective upon signature of the Department and shall remain in effect for a period of 10 (ten) years from the date of final signature on this Authorization document, unless terminated pursuant to Section 5.5. of the Illinois Endangered Species Protection Act [520 ILCS 10/5.5 - 17 IL. Adm. Code Part 1080.80]. EB shall recognize that any future construction and/or maintenance activities related to this pipeline project may require the submittal of new Conservation Plans and the issuance of separate ITAs by the Department.

2. The following Daily Monitoring Measures shall be implemented with regards to the Enbridge Flanagan South Pipeline Project (EFSP):

Daily monitoring shall consist of routine observations of species and reporting of road kills, vehicle collisions, mortalities related to construction activities, etc. by EB and/or construction staff in conjunction with their normal duties. The IDNR shall be notified of any Yellow-headed blackbird, King rail, and/or Illinois chorus frog observations and/or road kills, etc. in the project area within 72 hours of detection. EB will report **any** endangered species road kills, construction mortalities, etc. found within the Project area to the IDNR within 72 hours of the initial sighting. Sightings shall be reported to:

Illinois Department of Natural Resources
Division of Natural Heritage
Attn: Joseph Kath
One Natural Resources Way
Springfield, Illinois 62702-1271
Phone: (217)785-8764; Email: Joe.Kath@illinois.gov

3. a) Enbridge will conduct a preconstruction survey during the breeding season (late spring-early summer of 2013) by locating Yellow-headed blackbird nests by searching appropriate habitat within the Project corridor in the Sand Lake vicinity. Once located, these nests will be recorded using a hand-held GPS and photographs will be taken. This survey procedure will be repeated during the first, fifth, and tenth (1st, 5th, 10th) nesting seasons following final construction – final construction shall be defined as: pipeline completely buried and all cleanup, grading, and surface restoration efforts have been completed. A brief report of ALL survey results (pre and post construction) will be submitted to IDNR by December 31st of each survey year.

b) Enbridge will conduct one (1) preconstruction survey during the King rail breeding season (between May 1 and May 14) within the Project corridor in the Sand Lake vicinity using a version of the protocol established in Conway, C.J., 2011. This survey procedure will be repeated during the first, fifth, and tenth (1st, 5th, 10th) nesting seasons following final construction – final construction shall be defined as: pipeline completely buried and all cleanup, grading, and surface restoration efforts have been completed. A brief report of ALL survey results (pre and post construction) will be submitted to IDNR by December 31st of each survey year.

c) Enbridge will conduct a preconstruction survey of the Project corridor within Sand Lake for Illinois chorus frog breeding activity using a nighttime calling survey to document the presence/absence of the species. The monitoring protocol used will be a modification of that described in Tucker, J.K and J.H. Chick, 2007, State Wildlife Grant Proposal #T45-D-1. This survey procedure will be repeated during the first, fifth, and tenth (1st, 5th, 10th) breeding seasons following final construction – final construction shall be defined as: pipeline completely buried and all cleanup, grading, and surface restoration efforts have been completed. A brief report of ALL survey results (pre and post construction) will be submitted to IDNR by December 31st of each survey year.

Copies of all of these reports shall be sent to the following:

Illinois Department of Natural Resources
Division of Natural Heritage
Attn: Joseph Kath
One Natural Resources Way
Springfield, Illinois 62702-1271

Illinois Endangered Species Protection Board
Attn: Anne Mankowski
One Natural Resources Way
Springfield, Illinois 62702-1271

Illinois Department of Natural Resources
Natural Heritage Database
Attn: Tara Kieninger
One Natural Resources Way
Springfield, Illinois 62702-1271

4. With regards to the Enbridge Flanagan South Pipeline across central and southwestern Illinois: Enbridge Pipelines, LLC (EB) will be responsible for overseeing all minimization, monitoring, and mitigation efforts identified within the 14 December 2012 Conservation Plan and this Final Authorization document.

The Project route extends west-southwest across Illinois, from the MP 0 in Livingston County, Illinois to the Mississippi River at approximately MP 167.8. Enbridge has existing ROW along portions of the majority of the Project route because of its ownership of the Spearhead Pipeline system and will use that ROW as necessary to build and operate the Project. Although some of the Spearhead ROW lacks a defined width, where defined it is generally fifty (50) to eighty (80) feet in width.

NOTE: The *Action Area* for the Enbridge Conservation Plan and this ITA is defined as: The new pipe will be generally installed at a 50-foot offset from the center line of the Spearhead Pipeline to ensure adequate space for safe construction and on-going maintenance activities. The permanent easement for the new pipe will be 50 feet. Also, during construction, an additional 85 feet of temporary workspace will be needed (135 feet total construction ROW). In some cases, this construction ROW width may be reduced to minimize impacts on natural resources such as wetlands (110 feet). The ROW would be further reduced to 85 feet in forested and scrub/shrub wetlands, as well as the habitat of Sand Lake, and in waterways adjacent to these features. Extra temporary workspace, generally rectangular in size and ranging from 100 feet x 200 feet to 200 feet x 200 feet, will be required in some locations to accommodate crossings of roads, wetlands, railways, and water-bodies.

5. Direct financial mitigation responsibilities of EB for this Project:
-For the Yellow-headed blackbird: Based upon the information that EB/URS received from the Illinois Natural Heritage Database in 2012 and the corresponding pipeline route traversing the Sand Lake Area in Mason County, Illinois, it has been determined that 0.48 acres of suitable habitat will likely be impacted.

-For the King rail: Based upon the information that EB/URS received from the Illinois Natural Heritage Database in 2012 and the corresponding pipeline route traversing the Sand Lake Area in Mason County, Illinois, it has been determined that 2.72 acres of suitable habitat will likely be impacted.

-For the Illinois chorus frog: Based upon the information that EB/URS received from the Illinois Natural Heritage Database in 2012 and the corresponding pipeline route traversing the Sand Lake Area in Mason County, Illinois, it has been determined that 5.45 acres of suitable habitat will likely be impacted.

Accordingly, the number of acres that will likely be impacted [for the above listed species] totals 8.65 acres. As derived from the State of Illinois' Interagency Wetlands Policy Act of 1989, a mitigation ratio of 5.5:1 is employed when endangered/threatened species are at risk. Accordingly, it is the responsibility of the applicant (EB) to provide the Department with a mitigation-compensation cost equal to the value of approximately: 48 acres (8.65 x 5.5) of land in the local project area. According to May 2013 calculations from IDNR's Office of Realty and Environmental Planning, land values in Mason County range from a low of $1,100.00/acre to a high of $11,250.00/acre. The average value per acre for soils similar to the Sand Lake Area in Mason County is: $4,550.00. Given the condition and proximity of the impact zone, as well as described minimization responsibilities of EB for this project, a value of $4,550.00/acre will be employed in this Incidental Take Authorization for mitigation purposes.

Accordingly, this yields a total mitigation amount of:
-The number of mitigation acres dues for this project: 48 acres
-Of the 8.65 acres identified as suitable habitat for the species above, we will assume an average wildlife occupancy rate of: 0.70 or 70% of this habitat actually being utilized by the subject species, especially the Illinois Chorus Frog (Tucker, 2002; Tucker, 2008; Gould et. al., 2011; Schowalter, 2011).
-48 mitigation acres x 0.70 occupancy rate = 33.6 assigned mitigation acres
-33.6 assigned mitigation acres x $4,550.00/acre = $152,880.00 due to the Department from EB.

Therefore, the applicant (EB) shall provide the Department with a check made out to the Illinois Wildlife Preservation Fund in the amount of: $152,880.00. This check shall be received within 12 months after formal implementation of the ITA (after this document is signed by both EB and the IDNR). These funds will be used solely for management and recovery actions of the Yellow-headed blackbird, King rail, and Illinois chorus frog in Illinois.

6. Please note that this Incidental Take Authorization issued by the Illinois Department of Natural Resources (Department) may be officially revised, and that additional minimization and mitigation measures specific to the Federally endangered Indiana bat (*Myotis sodalis*) may be required by the Department based upon any and all decisions made by the U.S. Fish and Wildlife Service (Service) relevant to this species. The Department is aware that Enbridge Pipelines, LLC has entered into formal consultation with the Service regarding potential impacts to the Indiana bat from pipeline construction activities. Enbridge shall be responsible for implementing any and all Conservation Measures developed by the Service which appear in a Service approved (official) Biological Assessment and/or Biological Opinion.

The Department recognizes that this (Indiana bat) consultation effort may take many months. As a courtesy to Enbridge, the Department has issued this ITA specific to the Yellow-headed blackbird, King rail, and Illinois chorus frog. The Department retains the right to rescind this ITA and require additional minimization/mitigation measures specific to the Indiana bat based upon the outcome of official consultation with the Service. This ITA does not absolve Enbridge from any Indiana bat minimization/mitigation measures imposed by the Service.

7. Please note that the conditions of this agreement do not apply to any lands protected under the Illinois Natural Areas Preservation Act (525 ILCS 30/) (INAPA). Any adverse impacts to said protected lands and the species therein is considered a violation of the INAPA and grounds for referral to the Office of the Attorney General or State's Attorney.

8. The effective period of this authorization may be altered by mutual agreement between Enbridge Pipelines, LLC and the Department.

9. This authorization may be revoked pursuant to Section 5.5 of the Act if the Department finds that Enbridge Pipelines, LLC has failed to comply with any of these terms and conditions or has been responsible for the take of any State Listed Species beyond that which is incidental to the construction of the Flanagan South Pipeline Project across central and southwestern Illinois.

10. The Enbridge Pipelines, LLC official(s) identified below is/are authorized to execute this agreement. Execution by an official from any one of these organizations indicates acceptance of all terms and conditions described in this document.

Authorization for Incidental Take and Implementing Agreement

Pursuant to the Illinois Endangered Species Protection Act (520 ILCS 10/5.5) [on behalf of Enbridge Pipelines, LLC (EB), who retained URS Corporation (URS) to prepare a Conservation Plan in application to the Illinois Department of Natural Resources (IDNR) for an Incidental Take Authorization (ITA) for the incidental take of the State listed Species: Yellow-headed blackbird [*Xanthocephalus xanthocephalus*], King rail [*Rallus elegans*], and the Illinois chorus frog [*Pseudacris streckeri illinoensis*]) across central and southwestern Illinois - associated with the Flanagan South Pipeline Project; as described/shown in the conservation plan received by the Department on 14 December 2012] is hereby granted, subject to the terms and conditions described in the attached Authorization and Implementing Agreement. The Illinois Department of Natural Resources has determined that this authorized take is incidental to the construction of the Flanagan South Pipeline Project across central and southwestern Illinois.

For the IL. Department of Natural Resources

_____

Dr. James Herkert, Director
IDNR Office of Resource Conservation

_____

Date Signed

For Enbridge Pipelines, LLC

_____

Signature

_____

Please print name and official title

_____

Date Signed

Printed on recycled and recyclable stock

Attachment C

Environmental Mitigation Plan—Pipeline Maintenance Projects

Enbridge Energy Company, Inc.

Environmental Mitigation Plan
Pipeline Maintenance Projects

January 2013

ENVIRONMENTAL MITIGATION PLAN

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

INTRODUCTION

This Environmental Mitigation Plan (EMP) outlines maintenance-related environmental policies, procedures, and mitigation measures developed by Enbridge Energy Company, Inc., Enbridge (U.S.) Inc. and their subsidiaries (collectively referred to herein as "Enbridge") as a baseline for pipeline maintenance projects. Unless specified otherwise, "Enbridge" includes contractors performing pipeline maintenance project work. This EMP was developed based on Enbridge's experience implementing best management practices during maintenance. It is intended to meet or exceed applicable federal, state, tribal, and local environmental protection and erosion control specifications and practices. The EMP is designed to address typical circumstances that may be encountered during a pipeline maintenance project. Project-specific permit conditions and/or landowner agreements may supersede general practices described in this document.

This document includes the following sections:

- Section 1 of the EMP describes general mitigation measures, including soil erosion and sedimentation control procedures, to be implemented during upland maintenance work and upland restoration. Section 1 includes permits, avoidance areas, special resources, and hydrovac procedures;
- Section 2 discusses stream and river maintenance, crossing, and restoration;
- Section 3 describes practices for maintenance work in wetland areas, crossings, and restoration;
- Section 4 describes the horizontal directional drilling method for certain types of crossings;
- Section 5 discusses hydrostatic testing practices;
- Section 6 discusses highway, road, and rail crossings;
- Section 7 discusses dewatering;
- Section 8 addresses revegetation measures;
- Section 9 addresses winter maintenance work issues;
- Section 10 addresses waste management and contaminated soil; and
- Section 11 addresses spill prevention, containment, and control procedures.

The EMP includes figures depicting typical best management practices and maintenance circumstances. The typicals, Figures 1 through 27, are located at the end of this EMP.

Alternative 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 Environment.

Unless otherwise specified, the Contractor (Contractor) is 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 Environment representative.

Enbridge will provide appropriate oversight to confirm Company and Contractor compliance with the measures of this EMP and requirements of applicable federal, state, tribal, and local permits. In certain instances, 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. EIs and/or site inspectors 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 or environmental permit requirements. The EI will maintain appropriate records to document compliance with these and other applicable environmental permit conditions

1.0 GENERAL MITIGATION MEASURES

1.1 PERMITS

Enbridge plans maintenance work to minimize environmental impacts. Unless otherwise noted, Enbridge will obtain the necessary permits and/or notifications for the maintenance of the pipeline. Environmental regulatory requirements for a maintenance project are dependent upon the scope of the project, the complexity of environmental issues, and the regulatory jurisdiction of the project. Permit requirements may be more stringent than the requirements of this EMP. In all cases, the more restrictive requirements will apply.

Applicable requirements and permit conditions will be communicated to the appropriate parties, including, but not limited to Construction Managers and EIs. This communication may come via an environmental clearance email outlining specific permit requirements with a copy of the permit(s), and/or authorization provided for review and posting at the project site. For sites that require multiple permits, or as requested, a permit book is compiled and provided to the Enbridge Construction Manager. A review of environmental approval/permit conditions may be conducted at a maintenance project kick-off meeting, or during the mobilization phase of a project.

Maintenance should be planned to be completed prior to the expiration of all environmental permits, authorizations, and approvals. If these conditions cannot be met, renewals or extensions will be required. Changes in the project schedule should be communicated to Environment so that appropriate regulatory agencies can be notified.

1.2 TEMPORARY EROSION AND SEDIMENT CONTROLS

Temporary erosion and sediment control devices (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 must, at all times, maintain erosion and sediment control structures as required by all applicable permits. Non-functional erosion and sediment control features must be repaired, replaced, or supplemented with functional materials within 24 hours after discovery, or as otherwise specified in the project permits.

ECDs must be installed before disturbance of the soil, and must be replaced by permanent erosion controls as restoration is completed. ECDs should be inspected weekly and/or after each ½-inch rain event by the EI and/or the site inspectors during active maintenance. Site inspectors should include these inspections in their daily reports. Additional information on ECDs is provided in the upland, waterbody, and wetland sections.

1.3 RIGHT-OF-WAY ACCESS

An EI will conduct a preliminary visit (Phase I) to the dig site to evaluate the potential access route, distances to waterbodies, potential erosion controls, and dewatering requirements. Routing possibilities will be identified by an Enbridge ROW representative and evaluated by Enbridge Environment within a project area and corridor to reduce potential negative effects such as disturbance to soils, wetlands, waterbodies, invasive species, threatened and endangered species, and cultural

resources. Enbridge Environment will identify a preferred route and will notify the Enbridge ROW representative so that a final route can be selected and permitting requirements can be addressed.

Access to the right-of-way (ROW) will be from public roadways and Enbridge-approved private access roads only. Vehicle tracking of soil from the site will be minimized by installation and implementation of Best Management Practices (BMPs) such as stone pads, timber mats, reducing equipment/vehicle access to the ROW where practicable (off-ROW parking), or equivalent. Installation of stone or timber mat access pads must be in accordance with applicable permits and state/federal specifications. If such BMPs are not adequate to prevent sediment from being tracked onto public roads, street sweeping, or other equivalent means of collecting sediment, must be used. If soil is tracked onto a roadway, the Contractor must remove accumulated material from the road and returned to the construction ROW within an upland area as soon as possible, but in no circumstances more than 24 hours after discovery. In addition, soil on roadways cannot be broomed and/or graded into the road ditch or onto the shoulder.

1.4 STAKING/FLAGGING AVOIDANCE AREAS

Enbridge shall stake, flag, fence, and/or post signs for environmental features such as wetlands, waterbodies, drainages/drain tiles, foreign lines, buffer zones, rare plant or ecological community sites, invasive species and noxious weed locations, regulated wildlife habitat, cultural resources, erosion-prone or steep slopes, hydrovac slurry, protected or ornamental trees, and special agricultural land.

1.5 ROAD REPAIR

The Contractor must repair private roads, lanes, and public roads damaged when moving equipment or obtaining access to the ROW.

1.6 RIGHT-OF-WAY REQUIREMENTS

All maintenance activities, equipment and vehicles will be confined to the approved ROW and extra workspace. A typical maintenance site configuration is depicted on Figure 1. A typical maintenance site utilizing a trench box is depicted on Figure 2.

(a) ROW

Enbridge's existing permanent ROW varies in width. The ROW is maintained to facilitate access and aerial inspection of the pipeline system.

(b) Temporary or Extra Workspace

In addition to the ROW/permanent corridor, maintenance work will sometimes require Temporary Workspaces (TWS) or Extra Workspace (EWS). The TWS will be located adjacent to and contiguous with the ROW/permanent corridor. Enbridge will acquire TWS/EWS from the landowner where necessary; use of unauthorized workspace is prohibited without Enbridge's approval. In all cases, the size of TWS/EWS will be the minimum feasible to safely conduct the work.

Site-specific EWS locations (work areas beyond the permanent corridor and TWS previously described), will be required at select locations such as steep slopes, road, waterbody, railroad, some wetland crossings. EWS will typically be located in uplands adjacent to the ROW and set back from sensitive

resources. EWS adjacent to waterbodies and/or wetlands is addressed further in Sections 2.4 and 3.2.1, respectively.

1.7 UPLAND CLEARING

The initial stage of maintenance may involve the clearing of brush, and tall herbaceous vegetation from the ROW. Clearing activities are not to be conducted prior to approval by Enbridge Environment. Obtain clearance from Enbridge Environment prior to clearing trees. Clearing may be accomplished with chain saws, mowers, and hydraulic tree-cutting equipment. Clearing activities should avoid topsoil/subsoil mixing. Use equipment that will result in minimal soil disturbance. On erosion-prone or steep slopes, consider postponing clearing until immediately prior to maintenance activity, leaving a temporary buffer zone extending back from the crest of the slope, implementing hand clearing, or using equipment that will leave stumps and roots in place. Clearing of, or within, environmental features that have been marked with stakes, flagging, fencing, and/or signs should be avoided. If a tree to be cleared contains an active bird nest, or if a ground nest, burrow or den is discovered during clearing, suspend work activity in the vicinity of the site, fence or flag off the area, and contact the EI.

Dispose of cleared vegetation by chipping or removal from the ROW and disposal at an approved location. Chipped material to remain on the ROW should be spread evenly to a depth not to exceed 1 inch in thickness and in a manner as determined by Enbridge Environment, which will allow for normal revegetation. Spread chips evenly, no thicker than 1 inch, over disturbed areas of the ROW on slopes as soon as practical after grading, following seeding, to act as erosion control. Upland wood chips may not be spread on agricultural land, pasture, native grasslands, or within wetlands. Burning of brush is prohibited unless approved by Enbridge Environment.

1.7.1 Drain Tile Inlets

Enbridge will attempt to locate existing drain tile inlets that are located near the maintenance work area prior to construction. Drain tile inlets must be marked using flags. The Contractor must protect located drain tile inlets with the potential to receive stormwater from the maintenance project using the appropriate ECDs until sources with the potential to discharge have 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 maintenance work area to the inlet, topography, vegetation, soils, and accessibility to the inlet. Where drain tile inlets are located off of Enbridge's ROW, 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 work area that drains to the inlet structure to minimize sedimentation.

1.7.2 Upland Topsoil Segregation

Topsoil generally has physical and chemical properties that are conducive to good plant growth. To prevent the mixing of topsoil with less productive subsoil during work, topsoil will be segregated (see Figures 3 through 5). A minimum one foot of separation must be maintained between the topsoil and subsoil piles to prevent mixing. Where the one foot separation cannot be maintained, a physical barrier, such as silt fence, may be used between the spoil and topsoil piles to prevent mixing.

Depth of Upland Topsoil Stripping

Topsoil must be stripped to a maximum depth of 12 inches in active crop lands, unless otherwise requested by the landowner. If less than 12 inches of topsoil are present, the Contractor shall attempt to segregate to the depth that is present.

1.7.3 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 ROW, and prevent the deposition of sediments into sensitive resources that may be on or adjacent to the ROW. ECDs typically used are silt fence and/or trenched-in and staked straw bales/biologs and other barriers such as compacted earth (e.g., drivable berms across travel ways), sand bags, rubber conveyor belt barriers, or other appropriate materials (refer to Figures 8 through 12). If temporary ECDs are removed during the day to allow equipment access, they must be reinstalled at the end of the day.

Temporary ECDs must 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 ROW as needed, and/or in other areas to slow water leaving the site and prevent siltation of waterbodies and wetlands downslope or outside of the workspace (e.g., swales and side slopes). Temporary ECDs will be placed across the entire workspace at the base of slopes greater than 5 percent where the base of the slope is less than 50 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 must be removed. Non-functional ECDs will be repaired, replaced, or supplemented with functional structures within 24 hours after discovery, or as otherwise specified in the project permits.

Temporary ECDs installed across the travel lane may be removed during active daytime work; however, ECDs must be properly reinstalled after equipment passage, or activities in the area are completed for the day. Additional ECDs may be necessary prior to forecasted inclement weather.

Temporary Stabilization

Installation of temporary seeding, mulch (straw or hydromulch), and erosion control mats may be required by Enbridge in certain locations if there are maintenance delays of at least 14 days. The Contractor may be required by Enbridge to install temporary stabilization materials sooner based on site conditions, or as required in project permits. Temporary stabilization measures as outlined in Section 8.0 must be implemented to minimize erosion and for sediment control.

The Contractor must install the appropriate class of erosion control blanket in accordance with manufacture recommendations and/or state Department of Transportation specifications on slopes greater than 5 percent that would be exposed over the winter and drain to surface waters (refer to Figures 10 and 11). The Contractor must attempt to install erosion control blankets on the exposed slopes prior to snowfall; however, work progress and/or seasonal weather variations may prevent installation prior to the first snowfall. Installation of erosion control blankets and additional BMPs, as applicable based on site conditions, would continue after the first snowfall to protect slopes prior to spring melt and runoff.

Mulch

Mulch will be applied as indicated in Section 8.5 in accordance with applicable regulations and permit conditions. If exposed soils have not been stabilized prior to freezing of the ground, and soil conditions are such that discing is still effective, crimp in straw mulch to help stabilize these areas, but on steeper slopes erosion controls blankets are still preferable.

Cat Tracking

Cat tracking, also known as horizontal slope grading, may be implemented based on site conditions (sandy or silt soils) to reduce erosion potential. Cat tracking is achieved by driving a bulldozer vertically up and down the slope which results in the tracks being oriented horizontally; creating small speed bumps for water (refer to Figure 13).

1.7.4 Temporary Slope Breakers

Temporary slope breakers must 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)
3-5	250
5-15	200
15-25	150
>25	<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. Temporary slope breakers may be constructed using earthen subsoil material, silt fence, straw 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 must be used whenever possible.

Temporary slope breakers must be constructed according to the following specifications and as depicted on Figures 6 and 7:

- earthen berms must be installed with a 2 to 4 percent outslope, with a minimum 4 foot base and a minimum height of 1.5 feet (refer to Figures 6 and 7);
- straw bales used as slope breakers must 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 must be directed off the construction ROW 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 (refer to Figure 16);
- proper slope breaker outfalls must be established where topsoil segregation and/or grading has created a barrier at the edge of the construction workspace;

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

- temporary slope breakers must be inspected daily and repaired as necessary, but no more than 24 hours after discovery or as soon otherwise specified in the project permits, to maintain operational integrity and prevent erosion in active maintenance areas.

1.7.5 Noise and Dust Control

The Contractor must take all reasonable steps to control construction-related noise and dust near residential areas and other areas as directed by Enbridge. Dust control practices may include wetting the workspace and access roads, limiting working hours in residential areas, reestablishment of vegetation and/or additional measures as appropriate based on site-specific conditions. Noise control practices may include altering equipment, erecting noise barriers, properly locating compressors and generators, adjusting work schedules, and reducing unnecessary idling of equipment.

1.8 THREATENED AND ENDANGERED SPECIES/CULTURAL RESOURCES

Enbridge Environment will evaluate the maintenance site and access route for potential disturbance to threatened and endangered (T&E) species (plants and wildlife) and to cultural resources. Surveys may be necessary for T&E species habitats, invasive species, wetland delineation, and/or cultural resources.

Mitigation measures that may be required by a regulatory agency to avoid rare plants and wildlife and/or cultural resources may include, but not be limited to, modifying the access route; fencing/flagging the area, appropriate scheduling, timber matting, and/or transplanting vegetation, Mitigation measures will be decided upon by Enbridge Environment, a qualified botanist/biologist or cultural resource specialist, and the appropriate regulatory agency. Mitigation measures will be included in the clearing email or permit book for the dig site. In the event that T&E species or evidence of cultural resources are identified or suspected along the ROW during maintenance, notify the EI and Enbridge Environment. Flag or fence the area until the species or resource can be confirmed.

Cultural, historic, and archaeological resources are collectively known as cultural resources. In the event of a cultural resources discovery on site prior to or during maintenance activity, suspend work immediately and notify Enbridge Environment who will notify a qualified cultural resource specialist and the appropriate regulatory agency. At some locations, a qualified cultural resource specialist will visit the site and may be present to monitor excavation operations. Personnel are not permitted to photograph, touch, collect and/or keep any artifacts. All cultural resources identified must be cataloged by, collected by, and submitted to the appropriate regulatory or tribal agency.

1.9 POTHOLING/HYDROVAC SLURRY

Hydrovac excavation is used to positively identify pipelines and other buried utilities. Construct an unlined but bermed containment area or identify comparable containment (e.g., silt fence containment or open top tank) to hold the hydrovac slurry in an upland area. Once the slurry is drained and dry, it may be reused as fill. Do not discharge hydrovac slurry on to topsoil. The soil contained in the slurry will degrade the quality of the topsoil and potentially affect revegetation. Record locations of spread, mixed, or buried hydrovac slurry.

It is recommended that the topsoil be stripped from the area of the excavation and from the upland containment area prior to hydrovacing of soils, particularly if the excavation is in an active agricultural area.

If contaminated soils are expected or encountered, refer to procedures for encountering contaminated soil in Section 10.2 and/or procedures for initial spill management/clean up in Section 11.3.

1.10 UPLAND MAINTENANCE DIG EXCAVATION

At each dig site the scope of work is to locate the anomaly indication, excavate soil to expose the pipeline, perform visual and physical inspections, and then repair if needed. An excavation approximately 8 feet deep by 8 feet wide at the base will be excavated to expose the pipeline. Length of the excavation varies, but typically will be approximately 60 to 80 feet long and 30 to 40 feet wide, depending on the depth of the pipe (see Figure 1). Excavations typically are accomplished with a backhoe excavator. Excavated material will be sidecast (stockpiled) within the approved workspace separate from topsoil (see Section 1.7.2), and stored such that the area subject to erosion is minimized.

1.10.1 Timing

The length of time an excavation is left open must be minimized to ensure that inspection/repair of the pipe and restoration of the ROW occurs in a timely fashion. Typically, inspection/repair is completed within seven to ten days, weather permitting.

1.11 TRENCH BREAKERS

Trench breakers protect against subsurface water flow along the pipe after the trench is backfilled (see Figures 14 and 15). All trench breakers that are disturbed as a result of maintenance work will be repaired and restored to pre-maintenance conditions.

1.12 DRAIN TILE REPAIR

If underground drainage tile is damaged by the pipeline's maintenance, it will be repaired in a manner that assures the tile line's proper operation at the point of repair. The following standards and polices shall apply to the tile line repair:

- If the location of the tile lines is know precisely, those tile lines will be staked or flagged prior to maintenance to alert construction crews to the possible need for tile line repairs. If previously unidentified tile lines are encountered and cut during grading or excavating activities, they will be flagged at that time.

- Tile lines that are damaged, cut, or removed must be staked and/or flagged by the Contractor in such a manner that they will remain visible until permanent repairs are made prior to final backfilling of the excavation. The location of damaged, cut, or removed tile lines will also be recorded using GPS technology or equivalent.

- All damaged lines must be screened or otherwise protected to prevent the entry of foreign materials, small mammals, etc. into the tile lines.

- If water is flowing through any damaged tile line, the tile will be immediately temporarily repaired until such time that permanent repairs can be made. If the tile

lines are dry and water is not flowing, temporary repairs are not required if the permanent repairs can be made within 24 hours of the time the damage occurred.

- Permanent repairs must be conducted in accordance with the contract specifications and must utilize double-walled drain tile and have rock shield installed between the drain tile and newly installed pipeline.

- The original tile alignment and gradient shall be maintained. A laser transit shall be utilized to ensure the proper gradient is maintained for repairs, regardless of length.

- Before completing permanent repairs, the Contractor will probe the tile lines or examine by other suitable means on both sides of the excavation for their entire length within the work areas to check for tile that might have been damaged by vehicular traffic or construction equipment. If tile lines are found to be damaged, they must be repaired so that they function as intended.

- Permanent tile line repairs must be made within 24 hours of pipeline maintenance, weather and soil conditions permitting.

1.13 UPLAND BACKFILLING

Backfilling follows maintenance work 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 excavation must be dewatered in accordance with the methods discussed in Section 7.0.

Topsoil will not be used to repair trench breakers (see Section 1.11) or to pad the pipe. Gaps must be left and ECDs installed where stockpiled topsoil and spoil piles intersect with water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage.

1.14 WET WEATHER SHUTDOWN

During maintenance, 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 4 to 8 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 maintenance operations proposed for that day.

If the above factors cannot be achieved to the satisfaction of Enbridge, the Contractor must cease work in the applicable area until 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/or excessive stream flow, and being prepared to implement mitigative measures in the event of wet weather conditions. This is particularly important when conducting work in or near unsaturated wetlands and waterbodies. The Contractor is responsible for implementing any and all such

corrective measures should conditions subsequently worsen where the above described criteria cannot be met.

1.15 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, noxious weeds, and crop disease) along its ROW due to pipeline maintenance activities. However, it is not practicable for Enbridge to eradicate undesirable species that are adjacent to its ROW. Enbridge will minimize the potential for the establishment of undesirable species by minimizing the time duration between backfilling or final grading and permanent seeding.

1.15.1 Prevention and Control Measures

To prevent the introduction of the noxious weeds, invasive species, and/or crop disease identified into the project area from other sites, construction equipment must be cleaned prior to arriving at the project site. This cleaning must consist of removing visible dirt from the equipment and blowing loose material from equipment using compressed air. Equipment found to be in non-compliance with the cleaning requirement will not be allowed on the project site until it has been adequately cleaned.

Areas of infestation identified along the access route should be avoided to the extent feasible. Minimize the equipment used and limit the number of passes equipment makes through weed infested areas. Store topsoil salvaged from an affected area separately. Timber mats may be placed within infestation areas to minimize the spread of invasive species. If the project is located in an area where forest pathogens (e.g., emerald ash borer) may be of a concern, follow regulatory protocols for clearing and transportation of trees and wood.

Equipment designated for use within waterbodies or wetlands must be washed and dried prior to use. Purge and clean all pumps before proceeding from one location to the next if designated noxious weeds or invasive species (e.g. zebra mussels, etc.) are known to be present in the area.

Prior to clearing and grading of the workspace and pending landowner permission, major infestation areas identified may be treated with the recommended herbicides or their equivalents as identified through consultation with local authorities. All proposed herbicides must be reviewed and approved by Enbridge's Environment Department prior to use. The Contractor(s) must obtain necessary permits and/or certifications for the use of the applicable herbicides and must comply with state laws regarding the use of those herbicides. Contractor(s) must keep proper documentation of the locations where the herbicides have been used and provide such documentation to Enbridge Environment if requested.

1.16 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) and large woody debris (greater than 1.5 inch diameter and/or 12 inches in length). Rough and final grading includes restoring disturbed areas as near as practicable to pre-construction 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.

1.17 TIMING

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

1.18 PERMANENT EROSION AND SEDIMENT CONTROLS

During final grading, slopes in areas other than cropland will be stabilized with erosion control structures. Erosion control treatments of specific physical land features are described below. Refer to Section 8.0 for procedures related to revegetation.

Slopes

With exception to actively cultivated areas, permanent berms (diversion dikes or slope breakers) will be installed on all disturbed slopes, according to the following maximum spacing requirements unless otherwise specified in permit conditions:

Slope (%)	Approximate Spacing (ft)
3-5	250
5-15	200
15-25	150
>25	<100

Maintenance activities or access to maintenance locations may require disturbance to existing permanent berms on Enbridge ROW. The Contractor shall restore permanent berms to their pre-construction condition. Permanent berms must be constructed according to the following specifications (refer to Figure 16).

- Permanent berms must be installed with a 2 to 4 percent outslope.
- Permanent berms must be constructed of compacted earth.
- The outfall of berms will be directed toward appropriate energy-dissipating devices, and off the construction ROW if possible.
- Permanent berms will be inspected and repaired as deemed necessary by Enbridge to maintain function and prevent erosion.
- Erosion control blankets (curlex, jute, or equivalent) will be placed on slopes over 30 percent (refer to Figure 6) or that are a continuous slope to a sensitive resource area (e.g., wetland or waterway).

1.19 SOIL COMPACTION TREATMENT

Cultivated fields and compacted or rutted areas may require being tilled with a deep tillage device or chisel plow to loosen compacted soils, depending upon traffic levels. If subsequent maintenance and cleanup activities result in further compaction, additional measures will be undertaken to alleviate the soil compaction.

1.20 STONE REMOVAL

A diligent effort will be made to remove excess stones equal to or larger than 4 inches in diameter from the upper 8 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 ROW are similar to undisturbed areas adjacent to the ROW. 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.

1.21 REPAIR OF DAMAGED CONSERVATION PRACTICES

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

1.22 LAND LEVELING FOLLOWING MAINTENANCE

Following the completion of the pipeline maintenance, the ROW will be restored to its pre-construction conditions as practical. Should uneven settling or documented surface drainage problems occur following the completion of pipeline maintenance, Enbridge will take appropriate steps to remedy the issue. Feather out excess spoil over the salvaged portion of the ROW on non-forested uplands to minimize the creation of a permanent mound.

2.0 STREAM AND RIVER GENERAL REQUIREMENTS

Careful planning prior to initiating maintenance work is an essential part of working in and near waterbodies. Specific requirements for working in a waterbody, including construction methods, timing, erosion control, and restoration are described in this section and in the permits issued by local, state and federal agencies and by tribal authorities (as applicable). If the Contractor considers certain parts of these procedures to be technically impractical due to site-specific engineering constraints, they may submit a request to Enbridge Environment for approval of alternative measures. Prior to maintenance work, the Contractor must identify alternative provisions that would provide an equal or greater level of protection to stream and river ecosystems. Enbridge Environment will review the Contractor's alternatives and consult with appropriate regulatory agencies and tribal resource specialists (as applicable). The Contractor must receive written approval from Enbridge Environment prior to implementing the alternatives. During wet and high runoff conditions, it may be necessary in consultation with Enbridge Environment to determine whether conditions warrant additional considerations.

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 implemented under the supervision of Enbridge. The intent of the mitigation procedures is to minimize construction-related disturbance to streams, waterbodies, and aquatic resources by limiting the duration of maintenance activities in these areas and by minimizing erosion and sedimentation.

2.1 TIME WINDOW FOR MAINTENANCE

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

2.2 PRE-MAINTENANCE CONSIDERATIONS – HAZARDOUS MATERIALS

Hazardous materials, chemicals, fuels, lubricating oils, will not be stored within 100 feet of streams and waterbodies. Refer to Section 11.0 for additional information on handling hazardous materials, refueling construction equipment, washing equipment, overnight parking, and maintenance.

2.3 CLEARING AND GRADING

The Contractor will leave a 10-foot buffer (from the ordinary high water mark, OHWM, or Ordinary High Water Level, OHWL) of undisturbed herbaceous 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). If grading within the buffer, the Contractor must install temporary sediment barriers to prevent sediment from disturbed areas from flowing into the waterbody.

Woody vegetation within the 10-foot buffer may be cut and removed during clearing, leaving the stumps and root structure intact. Non-woody vegetation and the soil profile will be left intact until the Contractor is ready to begin excavation within the stream crossing. The Contractor must properly install and maintain sediment control measures at the 10-foot buffer line adjacent to streams immediately after clearing and prior to initial ground disturbance. This buffer should not be confused with the 50-foot setback required for extra workspace.

Avoid environmental and cultural features that have been marked with stakes, flagging, fencing, and/or signs.

Dispose of cleared vegetation by chipping or removal from the ROW and disposal at an approved location. Chipped material to remain on the ROW should be spread in an upland area, evenly to a depth not to exceed 1 inch in thickness and in a manner as determined by Enbridge Environment, which will allow for normal revegetation. Spread chips evenly, no thicker than 1 inch, over disturbed upland areas of the ROW on slopes as soon as practical after grading, following seeding, to act as erosion control. Upland wood chips may not be spread on agricultural land, pasture, native grasslands, or within wetlands. Burning of brush is prohibited unless approved by Enbridge Environment.

Contact Enbridge Environment prior to removal of a temporary impoundment structure, such as a beaver dam.

2.3.1 Impaired Waters

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 specified in the applicable project permits. When working in an impaired water, equipment designated for use within waterbodies must be washed and dried prior to use. Purge and clean all pumps before proceeding from one location to the next if designated noxious weeds or invasive species (e.g., zebra mussels, etc.) are known to be present in the area.

2.4 EXTRA WORKSPACE

Extra workspaces, as defined in Section 1.6, include work areas outside the boundary of the permanent corridor and temporary workspaces. These spaces are typically used 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 Enbridge Environment and 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 the OHWM/OHWL if topographic or other physical conditions such as stream channel meanders allow (refer to Figures 17 through Figure 20).

- If safe work practices or site conditions do not allow for a 50-foot setback, extra workspaces should be located no closer than 10 feet from the OHWM/OHWL, subject to site-specific approval by Enbridge Environment.

- Extra workspaces must be limited to the minimum size needed to perform the maintenance work.

2.5 BRIDGES

Temporary equipment bridges will be used where necessary to transport equipment across 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. Bridges will be constructed as described below

and will be removed as soon as possible during final restoration. Restore and stabilize streambeds, banks, and other disturbed areas following removal of temporary equipment bridges.

With exception to clearing-related equipment, fording of waterways is prohibited (i.e. civil survey, potholing, or other equipment are not permitted to ford waterways prior to bridge placement). Clearing equipment and equipment necessary for installation of equipment bridges will be allowed a single pass across waterbodies prior to bridge installation, unless restricted by applicable permits.

2.5.1 Types of Bridges

Equipment bridges may require permitting and will be constructed using one of the following techniques:

- Existing bridge
- Timber mats (refer to Figure 21)
- Rock Flume (refer to Figure 22)
- Railroad flat cars
- Flexi-float or other pre-fabricated portable bridges
- Ice bridge
- Other methods as approved by Enbridge Environment and appropriate agencies

2.5.2 Bridge Design and Maintenance

Bridges must be designed as close to perpendicular to the axis of the stream channel, creating the shortest crossing length and must be built and maintained in accordance with applicable permits. Bridges must be clear-span with no part of the bridge placed in the bed of the waterbody, unless specifically permitted otherwise. Equipment bridges must be designed to withstand the maximum foreseeable flow of the stream. Bridges must not restrict flow or pool water while the bridge is in place, and must be constructed with clean materials. Bridges must be designed and maintained to prevent soil from entering the waterbody. Soil that accumulates on the bridge decking must be removed as needed. Regulatory approvals may be required to leave temporary bridges in place during spring break-up.

2.6 IN-STREAM MAINTENANCE PROCEDURES

For inspection/repair work within existing stream and river crossings, in-stream work methods are dictated by site-specific conditions. The following methods are typically used, subject to further restrictions by Enbridge and applicable permits and subject to modifications as approved by appropriate regulatory agencies and tribal resource specialists (as applicable) during maintenance work.

Concrete coating activities are not permitted within 100 feet of a waterbody without prior approval from Enbridge Environment and the appropriate regulatory agency. Concrete generally will be mixed off-site and will be transported to the ROW in trucks. Limited mixing and coating activities may occur on the permanent ROW for coating pipe joints and concrete weight repairs according to the concrete usage specifications determined in conjunction with Enbridge Environment. Washing equipment used for mixing, pouring, casting, or coating will be conducted and contained in a leak-proof containment facility or impermeable liner. Erosion and sediment controls will be installed downslope of equipment wash areas where needed to capture sediments and minimize erosion from runoff.

2.6.1 Dam and Pump Method

Installation

The dam and pump method is a dry method that is suitable for low flow streams and is a preferred alternative to fluming for work in meandering channels. The dam and pump method involves damming of the stream with sandbags, inflatable/portable dams, sheet piling, and/or steel plates upstream and downstream of the proposed trench before excavation (see Figure 18) and pumping water around the excavation area. The following procedures will be used for dam and pump crossings:

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

- The pumps must be located on the upstream side and must be placed in impermeable, sided structures which will act as containment units for the pumps and fuel containers (refer to Section 11.0 for sizing specifications of secondary containment structures). The pumps used for the Dam and Pump method must not be placed directly in the stream or on the streambed. Pumps must have a capacity greater than the anticipated stream flow. The pumping operation must be staffed 24 hours a day and pumping must 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 maintenance work. A backup pump of equal or greater capacity must be on-site at all times in the event that the primary pump fails.

- The pump intake must be suspended to prevent sediment from being sucked from the bottom of stream and must be equipped with a screen with less than one-inch diameter openings, or equivalent device, to prevent fish uptake.

- Dams may be constructed of sandbags, inflatable dams, aqua-dams, sheet piling, and/or steel plates. The dams must prevent the stream from flowing into the work 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 work area.

- Standing water that is isolated in the area by the dams will be pumped into a sediment filter bag and/or a straw bale dewatering structure located in such a manner that no silt-laden water flows into streams or wetlands or other waterbodies (refer to Section 7.0). Only non-woven fabric will be used for filter bags.

- Backhoes located on one or both stream banks will excavate a trench along the stream bed. Streambed material will be segregated and placed within a spoil containment structure in approved work area limits. Spoil from in-stream excavation must not be placed in the stream bed unless specifically permitted by the appropriate agencies.

- Backfilling will begin after inspection/repair is complete. 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 excavation will be backfilled so that

the stream bottom is similar to its pre-construction condition, with no impediments to normal water flow.

Temporary Stabilization

The Contractor must restore the stream banks as near as practicable to pre-construction conditions unless that slope is determined to be unstable (refer to Section 2.9). Once the banks have been reshaped, ECDs must be installed within 24 hours of backfilling. The disturbed areas adjacent to the waterbody will be permanently seeded and stabilized with mulch or erosion control blankets as specified in Sections 2.9 and 8.0. Temporary slope breakers will be installed on all sloped approaches to streams in accordance with the spacing requirements outlined in Section 1.7.4.

Silt fence or other sediment barriers may be installed upslope of disturbed areas where positive slope leads to the disturbed area.

2.6.2 Flume Method

Installation

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

- The flume(s) must 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, must be installed before excavating and will be aligned so as not to impound water upstream of the flume(s) or cause downstream bank erosion. The flumes must not be removed until after the pipeline has been inspected/repaired, the excavation has been backfilled, and the stream banks have been stabilized.

- The upstream and downstream ends of the flume(s) must be incorporated into dams made of sand bags and plastic sheeting (or equivalent). The upstream dam must be constructed first and will funnel stream flow into the flume(s). The downstream dam must prevent backwash of water into the excavation and work area. The dams must 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 excavation and work area.

- Standing water that is isolated in the area by the dams will be pumped into a sediment filter bag and/or a straw bale dewatering structure located in such a manner that no silt-laden water flows into streams, wetlands, or waterbodies (refer to Section 7.0). Only non-woven fabric will be used for filter bags.

- After the isolated section of stream bed is dewatered, backhoes located on one or both stream banks will excavate the maintenance site along the stream bed. Spoil generated during excavation will be stored in a straw bale and/or silt fence containment area located away from the stream banks within approved work areas. Spoil from in-stream

excavation must not be placed in the stream bed unless specifically permitted by the appropriate agencies.

- If additional excavation dewatering is necessary to complete the inspection/repair, 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 (refer to Section 7.0). Non-woven fabric must be used for filter bags.

- Backfilling will begin after the inspection/repair is complete. 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 excavation will be backfilled so that the stream bottom is similar to its pre-construction condition, with no impediments to normal water flow.

Temporary Stabilization

The Contractor must restore the stream banks as near as practicable to pre-construction conditions unless that slope is determined to be unstable (refer to Section 2.9). Once the banks have been reshaped, ECDs must be installed within 24 hours of backfilling. The disturbed areas adjacent to the waterbody will be permanently seeded and stabilized with mulch or erosion control blankets as specified in Sections 2.9 and 8.0. Temporary slope breakers will be installed on all sloped approaches to streams in accordance with the spacing requirements outlined in Section 1.7.4.

Silt fence or other sediment barriers may be installed upslope of disturbed areas where positive slope leads to the disturbed area.

2.7 WATER QUALITY MONITORING

Water quality monitoring shall be implemented as directed by regulatory permits, or at the direction of Enbridge Environment. Water quality monitoring typically involves assessing or measuring turbidity and total suspended solids during in-stream maintenance. A water quality monitoring crew will be selected by Enbridge Environment. A monitoring plan will include sample locations, depths, frequency, duration and procedures. The monitoring crew will inform Enbridge Environment of ongoing monitoring results frequently during maintenance work. The information may provide guidance for maintaining or modifying maintenance activities.

2.8 DRAINAGE DITCHES AND INTERMITTENT STREAMS

Maintenance work in intermittent streams and agricultural ditches will typically employ the wet trench method (refer to Figure 17), unless otherwise specified in the applicable permits. For small, dry intermittent streams and agricultural drainage ditches, standard upland procedures may be used, which involves excavating the trench with backhoes, performing inspection/repair in the excavation, and backfilling the excavation with native material. The Contractor must have adequate stream work supplies on hand if an intermittent stream begins to flow. The banks will be reshaped, mulched (or erosion control blanket), and, if required, seeded in accordance with Section 8.0 for stabilization 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 without approval from Enbridge Environment with additional special provisions for containment. Where dry swales cross the ROW, silt fence or straw bales will be installed at the edge of the ROW to prevent the flow of sediment from the ROW.

2.9 PERMANENT RESTORATION

Stream banks disturbed during maintenance work will be stabilized with erosion control materials such as jute or equivalent and seeded in accordance with Section 8.0. Permanent stabilization will be initiated prior to restoring flow using the dam and pump or flume method, unless site and permit conditions delay permanent installation. Where the banks have been disturbed, the Contractor must restore the slopes as near as practicable to pre-construction conditions unless that slope is determined to be unstable. Where the slope of the banks is determined to be unstable or has the potential to erode or fail, the banks will be reshaped 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. Temporary sediment control devices will remain in place until the area has stabilized and adequate revegetation has established.

2.9.1 Vegetative Bank Restoration

Typically, waterbody banks will be restored as near as practicable to pre-construction conditions after backfilling is complete and will be seeded with an appropriate seed mix as specified in Section 8.0 and covered with an erosion control blanket. Erosion controls, (e.g. straw bales, biologs, willow stakes, silt fences, etc.) will be installed as necessary based on site-specific conditions.

2.9.2 Fill Material

Gravel, cobble, rip-rap, or other fill materials may be necessary for backfill, restoration, or bank stabilization and must be approved by Enbridge Environment and the appropriate permitting agencies prior to use. Fill materials must arrive clean on site.

2.9.3 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 permits or approvals have been acquired. Geotextile fabric and rock riprap will be placed according to site and permit conditions (refer to Figure 25). Disturbed soils upslope and on either side of the riprap will be prepared for seeding according to Section 8.0 and other stream bank protection requirements.

2.9.4 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 maintenance (if applicable) will be removed before spring break up unless otherwise approved by Enbridge Environment.

2.9.5 Swales

Swales will be restored as near as practicable to original conditions. 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 ROW.

2.9.6 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 maintenance in wetlands consists of excavation, dewatering, repair/inspection, backfilling, final grading, cleanup, and revegetation. However, due to the unstable nature of some wetland soils, maintenance activities may differ somewhat from those described for upland areas. Work must be minimized in wetlands to the extent practicable. The Contractor will also use special techniques to minimize the disturbance to plants and soils and to protect wetland hydrology.

Careful planning prior to maintenance work is an essential part of working in wetlands. Wetland requirements, including construction methods, timing, erosion control, and restoration, are described in this section and in the wetland permits issued by county, state and federal agencies and applicable tribes. If the Contractor considers certain parts of these procedures to be technically impractical due to site-specific engineering constraints, they may submit a request to Enbridge Environment for approval of alternative measures. Prior to work, the Contractor must identify alternative provisions that would provide an equal or greater level of protection to wetland ecosystems. Enbridge Environment will review the Contractor's alternatives and consult with appropriate regulatory agencies. The Contractor must receive approval from Enbridge Environment prior to implementing the alternatives.

Permits may be required for work in certain wetlands – allow for adequate lead time for environmental review, permit processing, and potential wetland delineation and/or T&E, surveys.

The procedures in this section apply to all 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 Enbridge and Enbridge Environment. 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.

Follow guidelines for spill prevention, containment, and control, as set forth in Section 11.0.

3.1 WETLAND ACCESS

The Contractor must use the Enbridge ROW and only approved roads to access wetland areas. Where practical, avoid or reduce the number and/or length of wetland crossings to minimize potential disturbance to wetland function, native vegetation and wildlife habitat. The selection of vehicle wetland crossing methods should be determined by the Enbridge Construction Manager in consultation with Enbridge Environment and, when necessary, the appropriate regulatory agency. Enbridge Environment approval is needed prior to removal of a temporary impoundment structure, such as a beaver dam.

In general, timber mats are used to avoid or minimize impacts to wetlands such as rutting, compaction, damage to vegetation, and mixing of soil layers. In some areas, mats may be required by regulatory permits. The following are strategies to consider in addition to timber matting:

- Winter execution of wet digs. In northern areas, the preferred timing for maintenance in a wetland area may be during frozen conditions when frost/ice roads can be constructed. Ice roads, or well-frozen workspaces, allow for work to proceed on a frozen wetland surface, reducing wetland disturbance.
- Evaluate alternate access routes considering landownership issues and equipment access challenges.

- Execute maintenance during a dry period, if possible.
- Use low pressure equipment such as swamp buggies and swamp hoes.
- Restrict vehicle access to the required number and type of vehicles.
- Coordinate maintenance with other nearby sites that would use the same access route.

3.2 CLEARING

Clearing the ROW in wetlands will be similar to clearing in uplands. For maintenance work to proceed, obstructions (e.g., brush, and logs) need to be removed. Obtain clearance from Enbridge Environment prior to clearing trees. Typically, low ground pressure (non-mechanized) equipment will be used, limiting disturbance to the wetland. Vegetation 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. Hydro-axe debris, or similar (less than 1.5 inch diameter and/or 12 inches in length) can be left in the wetland if spread evenly in the ROW to a depth not to exceed 1-inch in thickness and in a manner, as determined by Enbridge Environment, which will allow for normal revegetation.

Clearing of, or within, environmental features that have been marked with stakes, flagging, fencing, and/or signs should be avoided. If a tree to be cleared contains an active bird nest, or if a ground nest, burrow or den is discovered during clearing, suspend work activity in the vicinity of the site, fence or flag off the area, and contact the EI. Salvage flagged or fenced live trees or shrubs for replanting from the banks of wetlands if requested by the EI. Store salvaged trees and shrubs on the side of the ROW in a manner such that they will not dry out before replanting during restoration.

Wetlands identified as having high quality wildlife habitat, rare plants, or rare ecological communities may not be pre-cleared or pre-mowed, unless otherwise approved the appropriate regulatory agency.

3.2.1 Extra Workspace in Wetlands

In general, Enbridge attempts to locate TWS/EWS outside of wetlands wherever practicable; however, EWS may be sited in select wetlands where the wetland is adjacent to a waterbody, road, railroads, foreign utility crossings, and/or pipeline cross-over with prior approval from the applicable regulatory agencies and Enbridge Environment. Clearing of forested wetlands for TWS/EWS will be avoided. Woody vegetation in wetlands will not be cleared for the purpose of EWS unless approved by appropriate regulatory agency and Enbridge Environment.

- Staging areas, additional spoil storage areas, and other additional work areas (EWS) will be located in upland areas at least 50 feet away from wetland boundaries (refer to Figure 26), where safe work practices or 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).

- The size of the additional workspace areas will be limited to the minimum needed to perform the maintenance work.

3.3 GRADING IN A WETLAND

Grading in a wetland, if required, must be conducted in a manner consistent with applicable federal, state, and local permits. Grading activities must be confined to the area of the excavation and will be minimized to the extent practicable. Grading outside the excavation will only be allowed where required to ensure safety and restore the ROW after backfilling the excavation with prior approval from Enbridge Environment.

ECDs (e.g., silt fence) must be installed across the entire disturbed ROW upslope of the wetland boundary, where necessary, to prevent sediment flow into the wetland. Where wetlands are adjacent to the ROW and the ROW slopes toward the wetlands, ECDs must be installed along the edge of the workspace or ROW as necessary to prevent sediment flow into the wetlands. ECDs must be installed along the edge of the maintenance workspace as necessary to contain spoil and sediment within the workspace through wetlands.

ECDs must 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 field conditions allow, but no later than 24 hours after discovery.

3.4 RIGHT-OF-WAY STABILIZATION

Tree stumps, brush, riprap, imported soil, and rock fill cannot be brought in to stabilize the ROW in wetlands. Where low-ground-pressure equipment is not used, work activities will be accomplished from timber construction mats or equivalent means (refer to Figure 26). The contractor is responsible for having a sufficient number of construction mats to perform the work. To prevent the spread of noxious and invasive plant species, timber mats must be free of soil and plant material prior to being transported onto the ROW and/or moved from one area of the ROW to another area. Timber riprap (also known as corduroy road) cannot be used without prior written approval from Enbridge Environment 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 corduroy road damaged during maintenance activities.

Subsoil from the pipeline excavation within the immediate wetland may be placed on top of equipment mats for additional stabilization. In select areas, permits may require that excavated topsoil or spoils be stored on timber mats, geotextile fabric, or plywood. All timber mats, construction debris, and larger woody vegetative debris (greater than 1.5 inch diameter and/or 12 inches in length) will be removed from the wetland during cleanup.

3.5 EXCAVATION

Excavation of the pipeline in wetlands typically will be accomplished using backhoe excavators. The duration of open excavation must be minimized to the extent possible. Maintain wetland spoils within the approved workspace. Storage of upland soils within wetlands is not allowed. Trenchless methods may be considered for sensitive or highly functioning wetlands or where wetlands are too deep for an open excavation crossing on a case-by-case basis for those wetlands. See Section 4.0 for a discussion of Horizontal Directional Drilling (HDD) methods.

3.5.1 Topsoil Segregation

Typically, when working in wetland areas without standing water, up to one foot of topsoil (organic layer) will be stripped from the excavation area and stockpiled separate from excavation spoil as described in Section 1.7.2 to preserve the native seed stock. In standing water wetlands, organic soil segregation is not typically practical; however, the Contractor 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 maintenance, topsoil segregation will be attempted according to Figure 26 and based on recommendations from the EI and appropriate regulatory agencies.

3.5.2 Trench Breakers

Where it is determined that the pipeline trench has the potential to drain or partially drain a wetland, trench breakers (sack, foam, or bentonite) will be installed as necessary to maintain the original wetland hydrology. All trench breakers that are disturbed as a result of maintenance work will be repaired and restored to pre-maintenance conditions. Trench breakers must be keyed into the trench wall.

3.5.3 Concrete Coating

Concrete will generally be mixed off-site and will be transported to the ROW on trucks. Limited mixing and coating activities may occur on the permanent ROW for coating pipe joints and concrete weight repairs according to the concrete usage specifications determined in conjunction with Enbridge Environment. Washing equipment used for mixing, pouring, casting, or coating will not be conducted within 100 feet of any wetland and will be conducted and contained in a leak-proof containment facility or impermeable liner. Erosion and sediment controls will be installed downslope of equipment wash areas where needed to capture sediments and minimize erosion from runoff.

3.6 BACKFILLING

The Contractor shall restore wetlands as near as practicable to pre-construction conditions and must make a reasonable attempt to return the subsoil to its pre-construction density. During backfilling of wetland areas, subsoil material removed from the excavation during maintenance work will be replaced so that the material is not mounded above the adjacent ground surface. Subsoil that exceeds the elevation of the ground adjacent to the excavation will be removed from the wetland and disposed of in an upland area or an Enbridge-approved disposal site. After the excavation has been backfilled with subsoil, previously segregated topsoil will be spread over the excavation area and mounded no more than 12 inches above the adjacent, undisturbed soil.

3.7 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 maintenance. Rough grading will include restoring original conditions within the disturbed areas (i.e., excavation site, spoil storage areas, and equipment access route) and installing or repairing temporary erosion control measures. If a crown is left over the excavation in wetlands to account for settling of frozen backfill, leave periodic breaks to prevent ponding and restore preconstruction contours during clean-up the following spring or summer, as necessary. Temporary slope breakers will be installed near the boundary between the wetland and adjacent sloped approaches, to prevent sediment flow into the wetland.

3.7.1 Timing

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

3.7.2 Temporary Stabilization

Where necessary, disturbed wetland areas will be revegetated with annual ryegrass (40 lbs./acre) and/or another temporary seed mix (see tables in Appendix A) unless standing water is prevalent or unless permanent planting or seeding with native wetland vegetation is required by applicable permits. No fertilizer, lime, or mulch will be applied in wetlands. It has been Enbridge's experience that the natural seed bank within the wetland provides the most effective revegetation.

4.0 HORIZONTAL DIRECTIONAL DRILLING (HDD) METHOD

The horizontal directional drilling (HDD) method may be utilized for crossings at waterbodies, wetlands, or roadways where conventional methods are not feasible due to engineering, environmental, or site constraints (Figure 20). A pre-construction meeting will review environmental issues, permit requirements, mitigative measures, contingency measures, and water quality monitoring requirements.

Water from an Enbridge Environment-approved source will be used to prepare the slurry of drilling mud, and will be appropriated according to applicable permits. During drilling operations, drilling mud and slurry are to be stored back from the banks of any wetlands or waterbodies in an earthen berm sediment control structure, in tanks, or by other methods so that it does not flow into adjacent waterbodies or wetlands, or off the workspace.

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

After the pipe is in place, excess drilling mud and slurry are to be spread over an upland area approved by Enbridge Environment and the landowner, or hauled off site to an Enbridge-approved disposal location. Temporary erosion control measures that are routinely installed for other crossing methods are not usually necessary for HDD crossings.

5.0 HYDROSTATIC TESTING

Industry standards and government regulations require that certain replaced sections of pipeline and other facilities (e.g., new valve section) be pressure tested (hydrostatic tested) before re-commissioning the line to verify that there are no flaws in the pipe or welds. Hydrostatic testing involves filling new pipeline segments with water acquired in accordance with applicable permits, raising the internal pressure level, and holding that pressure for a specific period of time per federal Department of Transportation specifications.

Enbridge will obtain required permits from the appropriate regulatory agency(ies). Follow all conditions outlined in the permits for water withdrawal and discharge of test water. Water used for hydrostatic testing must be discharged in accordance with the dewatering agency permits (Section 7.0), or as otherwise directed by Enbridge Environment. After the hydrostatic test is completed, the line is depressurized and the water expelled. During withdrawal and discharge, the water must be sampled as required by permits. Water volumes must be measured and recorded if directed by Enbridge Environment. All relevant documentation, including copies of permits/notifications must be kept on site during the hydrostatic test.

Ensure that enough workers and equipment are available on site to repair any rupture, leak or erosion problem that arises during testing. Ensure that water truck tank interiors are clean. The operation and refueling of hydrostatic test equipment will be in accordance with the conditions outlined in Spill Prevention and Management (Section 11.0).

6.0 HIGHWAY, ROAD AND RAIL AREAS

6.1 ADDITIONAL WORKSPACE

Additional workspaces for maintenance work within a road right-of-way 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 roadway.

6.2 MAINTENANCE

Roadway crossings will be maintained in a condition that will prevent tracking of mud onto the roadway (refer to Section 1.3).

Rock tracking pads, where required, will be 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, as approved by Enbridge Environment and with approval from applicable regulatory agencies. All rock and fabric must be removed from the wetland during cleanup.

6.3 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 (refer to Figure 27) as discussed in Section 1.7.3.

7.0 CONSTRUCTION DEWATERING

7.1 EXCAVATION DEWATERING

At each location where dewatering is to be conducted, the contractor must consider the following conditions in planning the dewatering event. Prior to initiating dewatering activities, the contractor must check the water discharge situation to ensure that the best management practices are applied in such a way as to minimize the potential for water containing sediment from reaching a wetland or waterbody. Furthermore, landowner approval is required in advance of placement of dewatering structures outside of the approved construction ROW. The contractor shall attempt to dewater to an upland location whenever possible. To prevent spills, dewatering equipment such as pumps and generators should be placed within secondary containment in accordance with Section 11.2.2.

1. **Water Discharge Setting** – The contractor shall assess each water discharge situation to include:
   a. Soil Type - The soil type the discharged water would flow over. The management of discharged water traveling over sandy soil is more likely to infiltrate into the ground as compared to clay soils. Do not locate discharge outlet where it will flow across exposed soils.
   b. Ground Surface - The topography in the area that would influence the surface flow of the discharged water.
   c. Adjustable Discharge rate - The flow rate of the discharged water (which may need to vary) can be managed based on the site conditions to minimize instances of water from reaching a sensitive resource area such as a wetland or waterbody. (Example - Water discharged at 500 gallons per minute may infiltrate into the ground while if discharged at a higher flow rate would cause water to flow via overland runoff into a sensitive resource area).
   d. Discharge Outfall - The amount of hose (utilizing up to 500 feet) needed to attempt to discharge water at a location which drains away from waterbodies or wetlands.
   e. Traffic – Discharge in an area with little to no foot/equipment traffic.

2. **Pump Intake** – Use floating suction hose or other similar measures to prevent sediment from being sucked from the bottom of the excavation. If the water level reaches the bottom of the excavation, consider excavation of a small sump to allow for water to be removed without intake of sediment. The intake hose may be placed into a 5-gallon bucket that has been drilled and filled with rock to reduce the uptake of sediment. Well point installation may be approved by Enbridge Environment on a site-specific basis and with approval from the appropriate agencies.

3. **Overwhelming Existing Drainage** – If the discharge (assumed to be clean) does enter a stream, the flow added to the stream cannot exceed 50 percent of the peak storm event flow (to prevent adding high water volumes to a small stream channel that causes erosion due to imposing high flow conditions on the stream. Additional permits may be required for high volume or high flow rate discharges.

4. **Filtering Mechanism –** All dewatering discharges will be directed through a filtering device as indicated below.

    a. Well-Vegetated Upland Area – Water can be directed to a well-vegetated upland area through a nonwoven geotextile filter bag. Geotextile bags need to be sized and changed out appropriately for the discharge flow and suspended sediment particle size. Dispose of geotextile bags in an approved disposal facility.
    b. Straw Bale Dewatering Structure – Where the dewatering discharge point cannot be located in an upland area due to site conditions and/or distance, the discharge should be directed into a straw bale dewatering structure. The size of the straw bale dewatering structure is dependent on the maximum water discharge rate (refer to Figures 23 through 24C). A straw bale dewatering structure should be used in conjunction with a geotextile filter bag to provide additional filtration near sensitive resource areas.
    c. Alternative dewatering methods (e.g., use of water cannons, well points, or portable filtration units) may be approved by Enbridge Environment on a site-specific basis. Flocculent use during dewatering to increase the settling of suspended solids and reduce the turbidity of the discharge must be pre-approved by Enbridge Environment and may require additional permitting.

7.1.1 Regulatory Notification and Reporting

Enbridge Environment and ROW will notify appropriate tribal, state and federal agencies as required by all permits/authorizations. The contractor is responsible for notifying Enbridge Environment of all dewatering activities.

Reports regarding the volume and quality of the water withdrawn and discharged will be submitted by Enbridge Environment, as required by the applicable state and/or tribal permits. The Contractor will provide Enbridge Environment with the appropriate data to determine volumes of water appropriated.

7.1.2 Flow Measurement

The volume of water discharged from the excavation must be recorded as required by the applicable permits. The volume may be determined using a flow meter, or equivalent method as dictated by permit stipulations.

7.1.3 Water Sampling

Water discharged from excavation dewatering locations may need to be sampled as required by tribal permits and/or state-issued discharge permits. If required, the Contractor will assist Enbridge in obtaining these samples and will be responsible for complying with the permit limitations. If a hydrocarbon sheen is observed, contact the Enbridge Construction Manager, the EI, or Enbridge Environment immediately so that mitigative measures can be determined and implemented. Mitigative measures may include, but not be limited to, temporary suspension of dewatering activities, deployment of sorbent booms, water sample collection, or storage and disposal of excavation water. Refer to Section 10.0, Waste Management and Contaminated Soil.

8.0 REVEGETATION & MONITORING

This section was developed in conjunction with Natural Resources Conservation Service (NRCS) guidelines. If it is found that any conditions or requirements of this section or any other supporting documents are not in compliance with any governmental law or ordinance, the applicable law or ordinance will take precedent, but will not nullify other portions of this section or supporting documentation. In addition, project-specific permit conditions and Landowner requests (with exception to wetlands) for specific seed mixes take precedence over this section.

8.1 LANDOWNER CONCERNS

The Enbridge ROW Agent will coordinate with Enbridge Environment, the Construction Manager, and/or the EI to inform the contractor of any special environmental concerns (e.g., seed mixtures) the landowner may have that can be addressed prior to final restoration. The Enbridge ROW Agent will communicate with railroad companies; and municipal, county, state, and federal highway departments. In certain instances and areas, restoration visits and procedures may need to be coordinated with Enbridge ROW Agent through the Enbridge Construction Manager.

Operations and Maintenance Plans have been developed between Enbridge and several national forests with specific regulations and procedures. In certain instances and areas, restoration visits and procedures may need to be coordinated with Enbridge ROW Agent through the Enbridge Construction Manager.

8.2 PROJECT SEED SPECIFICATIONS

Seed will be purchased on a "Pure Live Seed" (PLS) basis for seeding (both temporary and permanent) revegetation areas. Seed tags will identify:

- purity;
- germination;
- date tested;
- total weight and PLS weight;
- weed seed content; and
- seed supplier's name and business information.

The seed tags on the seed sacks will certify that the seed is "Noxious Weed Free. The Contractor's proposed seed sources must be submitted to Enbridge Environment for review and approval prior to maintenance activity. Following seeding, seed tags will be provided to Enbridge Environment for tracking purposes.

The species components of individual mixes are subject to availability at the time of purchase. Grass species may be substituted with alternative native or non-invasive species that are included in the NRCS guidelines and subject to approval by Enbridge Environment.

The Contractor must arrange for appropriate storage of the seed. Seed will be used within 12 months of testing as required by applicable state rules and regulations.

8.3 TEMPORARY REVEGETATION

The primary focus of Enbridge's temporary revegetation measures is to quickly establish ground cover vegetation, minimize potential soil erosion, and minimize noxious weed establishment. Contractors will utilize appropriate species for use as a temporary cover crop at an appropriate rate, as shown in Appendix A, Table 1; other species can be utilized with prior approval from Enbridge Environment. Unless specifically requested by landowners or land managing agencies, Enbridge does not intend to establish temporary vegetation in actively cultivated land, standing water wetlands, and/or other standing water areas.

8.4 TIMING FOR TEMPORARY VEGETATION

Temporary vegetation should be established between **April 1 and September 30** in work areas where 30 days or more will elapse between:

- the completion of final grading at a site and the establishment of permanent vegetation; and/or,
- where there is a high risk of erosion due to site-specific soil conditions and topography.

Enbridge may require the Contractor(s) to conduct temporary seeding in areas that will have bare soil for less than 30 days at site-specific locations near sensitive resource areas and/or areas prone to wind/water erosion. Attempts at temporary revegetation outside the above dates should be assessed on a site-specific basis and with approval from Enbridge.

Cover crop species should be selected based on availability and timing of the scheduled planting. Cool-season species should be selected for use in spring and late summer or fall planting windows; whereas warm-season species should be utilized for late spring and summer plantings. Mixes can be created to utilize warm-season and cool-season species and ensure successful establishment of temporary cover.

8.5 TEMPORARY USE OF MULCH

Straw mulch may be used to help stabilize areas during the establishment of temporary vegetation. Refer to Section 8.18 for mulch application procedures. The contractor(s) will apply mulch during the establishment of temporary vegetation in areas:

- requested by the Landowner or land managing agency;
- specified by the applicable permits or licenses; and/or
- as requested by Enbridge Environment and/or Enbridge ROW.

8.6 PERMANENT REVEGETATION

Permanent vegetation will be established in areas where grading has occurred or where there is bare soil except in actively cultivated areas and standing water wetlands. The seed mixes for permanent seeding include native seed varieties commonly found and/or available from local seed distributors. Enbridge's seed mixes (refer to Appendix A) are selected to augment revegetation via natural recruitment from native seed stock in the topsoil and are not intended to change the natural species composition. Rates provided are assumed for a drill application and must be adjusted as discussed in Section 8.14.

8.7 UPLAND AREAS

Enbridge has a standard upland seed mix for restoring disturbed areas affected by the project (Appendix A, Table 2). The mix includes species that will provide for effective erosion control and revegetation of the project area. This seed mix will be used by Enbridge as the standard upland mix unless an alternate seed mix is specified by landowners or land managing agencies.

8.8 PERMANENT SEEDING OF WETLAND AREAS

8.8.1 Unsaturated Wetland Areas

Non-standing water wetlands will be seeded with annual ryegrass (40 lbs./acre) to provide temporary cover and allowed to revegetate naturally. The natural revegetation process will be encouraged by the seeds and rhizomes in the topsoil spread back over the right-of-way after pipe installation. No fertilizer, lime, or mulch will be applied in wetlands.

8.8.2 Saturated/Standing Water Wetlands

Enbridge does not propose to seed standing water wetland areas. It has been Enbridge's experience that the reestablishment of vegetation within standing water wetlands occurs without supplemental seeding.

8.8.3 Forested Wetland Restoration

Enbridge proposes to allow natural reforestation of the temporary workspace areas outside the permanent pipeline easement via stump sprouting, root sprouting, and natural recruitment. Specific forested wetland restoration provisions will be followed as indicated in applicable permits issued for the project.

8.9 PERMANENT SEEDING OF WATERBODY BANKS

Enbridge will reestablish stream bank vegetation using the Upland seed mix listed in Appendix A, Table 2, unless an alternate seed mix is requested by applicable agencies. Additional vegetation requirements may also be contained within project specific permits (e.g., planting of native shrubs, willow stakes, and/or bioengineered techniques). Where a waterbody is located within a wetland, Enbridge will reseed the banks with the applicable wetland seed mix.

8.10 SPECIALIZED SEED MIXES

The following specialized seed mixes (Appendix A, Tables 3 through 7) are available upon landowner request on a site-specific basis.

- Residential Areas: This seed mix will be used to reestablish residential lawns or other types of "turf-type" land cover.
- Pasture Areas: This seed mix will be used to reestablish active pastures and hayfields.
- Wildlife Areas: This seed mix will be used to provide a desirable food source for wildlife, specifically deer.
- High-quality Vegetation Areas: In consultation with the NRCS, a native seed mix was also developed for restoring areas currently dominated by native plant species. The mix includes naturally occurring species and provide for effective erosion control and revegetation of the project area. This seed mix will be used by Enbridge at locations identified as high quality vegetation areas unless an alternate seed mix is specified by landowners or regulatory agencies.

- Roadways: This seed mix will be used to reestablish vegetation within upland areas of roadway easements.

8.11 TREE PLANTING

Replanting of select areas may be required by regulatory agencies and will be coordinated through Enbridge Environment and/or Enbridge ROW.

8.12 CONSERVATION RESERVE PROGRAM (CRP) PROPERTIES

Enbridge's Land Agents will contact landowners where work areas may occur in land enrolled in CRP. Enbridge will work with the respective landowners to identify the parcel-specific CRP seed mixes. CRP lands will be seeded at the direction of the landowner per the site-specific landowner CRP requirements for that parcel and no non-CRP approved seed mix will be planted on CRP lands. CRP parcels will also be seeded with Enbridge's temporary cover seed mix. Seed for CRP seeding must meet the same criteria as other seed described in Section 8.2.

8.13 SEED BED PREPARATION AND SEEDING PROCEDURES

After final grading, deep tillage will be performed in actively cultivated areas and in non-agricultural areas (as directed by Enbridge Environment) to relieve soil compaction and promote root penetration. Deep tillage will not be conducted in non-farmed wetlands. The soil will then be tilled to a minimum depth of 4 inches with a disc, field cultivator, or chisel plow (or equivalent) to prepare a seedbed, breaking up large clods and firm the soil surface. The resulting seedbed must be soft enough to permit seed to be covered and mulch to be anchored, yet firm enough to support the weight of an adult without sinking into the soil more than about 1/2 inch. Tillage and equipment operations related to seeding and mulching will be performed parallel to ground contours as much as practicable. Fertilizer and other soil amendments will be incorporated into the soil during seedbed preparation as specified in the project-specific Line List requirements and permits. No soil amendments will be applied in wetlands unless directed by the appropriate agencies.

8.14 SEEDING METHODS

Seed will be applied uniformly at specified rates across the prepared ROW by drilling, broadcasting, or hydroseeding. Seeding activities will be suspended if conditions are such that equipment will cause rutting of the surface in the designated seeding areas. Enbridge will continue to monitor conditions to resume seeding activities as site conditions improve and according to the general seeding timing restrictions listed in Section 8.16.

8.14.1 Drill Seeding

Seeding equipment will be capable of uniformly distributing the seed and sowing it at the appropriate depth. Drills will be equipped with a feeding mechanism that will provide a uniform flow of seed at the desired application rate. Double-disc furrow openers equipped with depth bands and packer wheels to firm the soil over the seed will be used where practicable.

8.14.2 Broadcast Seeding

Broadcast seeding rate will be <u>double</u> the drill-seeding rate. Seed will be uniformly distributed by a mechanical or hand operated seeder. Following seeding, a cultipacker, harrow, or hand rake will be used to cover the seeds and firm the seedbed as is appropriate for the area.

8.14.3 Hydroseeding

Hydroseeding rate will be double the drill seeding rate, or the same as broadcast seeding rate. Seed will be applied alone or in a seed, fertilizer and/or hydromulch slurry. If seeding is applied alone, the amount of hydromulch material will be adjusted to the seed slurry to show where seeding has taken place, providing a means to identify uniform cover of the ROW. Hydroseeders must provide continuous agitation and be capable of supplying a continuous, non-fluctuating flow of slurry. Hydroseed slurry will not be held in the tank more than 1 hour before use. All hydromulch products used must be pre-approved by Enbridge Environment and be on the applicable state Department of Transportation product list.

8.15 SOIL AMENDMENTS

No fertilizer or lime will be added with native seed mixes. When using non-native species on dry, dry-mesic and mesic sites for permanent seeding a minimum of 150 pounds of 20-10-10, and 2 tons of 80-85 lime or equivalent will be applied, unless otherwise restricted by the landowner or land managing agency. Soil amendments may be applied to agricultural, pasture, and/or residential lands if requested by landowners and/or land managing agencies. Enbridge will apply phosphate free fertilizers to areas within 100 feet of a waterway if soil amendments are required unless prohibited by a permit or a site-specific operations and maintenance plan. Enbridge will not fertilize banks of waterbodies or steep approach slopes to waterbodies where the potential exists for fertilizer to wash into waterbodies.

8.16 SEEDING PERIODS

Preferred seeding periods have been established in consultation with local and state agencies that have knowledge of the best times to establish vegetation in the work area. Date of seeding is a critical factor to determine the success of the revegetation effort. Seed should be applied as early as possible within the given seeding periods once favorable soil conditions have been attained. Seeding conducted outside of these periods may limit the success of revegetation.

Seeding Periods

Native Mixes with warm-season grasses	
Spring Permanent Seeding	May 1 to June 30 (for Northern tier states);April 15 to June 15 (elsewhere)
Dormant Seeding	When soil temperature is 55 degrees Fahrenheit or cooler.
Non-native Mixes with cool-season grasses	
Temporary seeding	April 1 to September 1 (for Northern tier states) March 15 to September 15 (elsewhere)
Spring permanent seeding	April 1 to June 15 (for Northern tier states); March 15 to June 1 (elsewhere)
Summer permanent seeding	August 1 to September 15 (for northern tier states) August 20 to September 30 (elsewhere)

During winter months, Enbridge may elect to permanently seed sites regardless of temperature or ground conditions. There is evidence that seed placed during the late fall and winter months will germinate in the spring. Enbridge will install temporary erosion controls during frozen conditions.

8.17 TIMING OF FINAL SEEDING

Upon final grading of the ROW, and upon the restoration of wetland and waterways, seeding and restoration/stabilization will occur within 48 hours. Other methods of stabilization will be used if temporary seeding is not appropriate (e.g., mulch, erosion control matting).

8.18 MULCH

Straw mulch will be applied to disturbed areas (except for actively cultivated land and wetlands) if requested by the Landowner or land managing agency, if specified by the applicable permits or licenses, or as requested by Enbridge. Mulch will specifically be required on:

- Slopes greater than 5 percent; and
- Dry, sandy areas that can blow or wash away (field decision).

Mulch will be free of noxious weeds as listed in applicable state laws. Certified weed-free mulch may also be required at site-specific locations. The Contractor will be responsible for identifying and acquiring sources of weed-free and certified weed-free mulch. Sources must be approved by Enbridge Environment prior to purchase and copies of the applicable documentation must be provided to Enbridge Environment.

Mulch will be applied at a rate of 2 tons per acre unless otherwise stipulated by permit conditions. Mulch will be uniformly distributed by a mechanical mulch blower, or by hand in areas not accessible to the mulch blower. Strands of mulch will be a minimum of 8 inches in length to allow proper anchoring. Mulch will be anchored/crimped to a depth of 2 to 3 inches using a mulch-anchoring tool or disc set in the straight position to minimize loss by wind and water. In areas not accessible to a mulch-anchoring tool, the mulch may be anchored by liquid tackifiers, with advance written approval from Enbridge Environment. The manufacturer's recommended method and rate of application will be followed. Mulch will not be applied in wetlands or actively cultivated farmland. Additional erosion control measures (e.g. silt fence, erosion control blankets, hydromulch) may also be applied as previously outlined.

Hydro-mulch and liquid tackifier can be used in place of straw or weed-free hay mulch with prior approval from Enbridge Environment. All hydromulch and liquid tackifier products used must be on the applicable state Department of Transportation product list and must be pre-approved by Enbridge Environment. Application rates will be at the manufacturer's recommended rate, equal to or greater than 2 tons per acre of straw mulch. Tackifier equipment must be free of weeds and chemical contaminants. All products will be biodegradable and nontoxic, and water withdrawal must be from an approved source.

8.19 EROSION & SEDIMENT CONTROL

Erosion control blankets, such as sewn straw mats, jute mats, coconut erosion control blankets, or biodegradable synthetic erosion control blankets, as approved by Enbridge Environment, will be used on slopes over 30 percent, on streambanks and ditchbanks and as directed by Enbridge. Erosion control blankets will be used according to the manufacturer's recommendations as to weight and material for the specific application. Erosion control blankets will be anchored according to the manufacturer's recommendations.

8.20 DORMANT SEEDING

Dormant seeding is conducted after soil temperatures have cooled to 55 degrees Fahrenheit or cooler to prevent seed germination. Procedures for applying soil amendments, seedbed preparation, seeding, and mulching are the same as outlined for permanent revegetation in this Plan.

Where dormant seeding is conducted, one or more of the following temporary erosion and sediment controls will be put in place over the freshly seeded area unless the local soil conservation authority, landowner, or land managing agency specifies otherwise. The temporary measures will be in place within 48 hours of seeding, and are as follows:

- straw mulch, at not more than 2 tons/acre, anchored;
- hydromulch, at 2 tons/acre, anchored; and/or
- erosion control blanket.

Additional erosion control measures will be applied as requested by Enbridge.

8.21 MONITORING

Enbridge will monitor and address all areas where stabilization techniques have been implemented in accordance with conditions identified in the applicable permits and/or licenses. Monitoring is generally undertaken one growing season following final clean-up, and in subsequent years, as required by the regulatory agency. Potential post-construction monitoring could include soil assessment and monitoring of revegetation, invasive species/noxious weeds/crop disease, erosion control, and/or wetland function.

9.0 WINTER MAINTENANCE

Frozen conditions can preclude effective topsoil segregation. When soil is frozen to a depth greater than the depth of topsoil, the soil will come off in thick slabs that contain both topsoil and subsoil, and mixing can result. A ripper should be used to break up the frozen topsoil. Care should be taken to only rip to the actual depth of topsoil or to a maximum depth of 12 inches, whichever is less. Topsoil in the spoil storage area should be graded smooth to minimize mixing during backfilling. Sufficient time is needed to allow the newly graded topsoil to freeze in place prior to excavating.

Heavy construction equipment use and travel along the ROW, which may not be possible in summer conditions due to saturated, unstable soil conditions, can be accomplished in the winter by establishing temporary winter frost/ice roads. These frost/ice roads protect underlying vegetation and upper layers of wetland surfaces from disturbance potentially created during summer maintenance.

The Contractor must monitor areas until final restoration is complete.

The following actions may improve restoration at sites completed in the late fall and winter months:

- Minimize the area of open excavation to reduce the amount of frozen backfill.
- Cover soil stockpiles with mulch (except in wetlands) in extreme cold weather to reduce freezing of the stockpiles and improve backfilling and site grading.
- Backfill and re-grade sites as quickly as possible to reduce freezing of soil.
- Store snow graded from the ROW in a manner that will not lead to increased erosion during spring melt. Ensure that melting “dirty” snow is not allowed to run off directly into a waterbody.
- Permanently seed sites regardless of temperature or ground conditions. There is evidence that seed placed during the late fall and winter months will germinate in the spring.
- Thoroughly mulch sites to assist in soil stabilization and retain soil moisture. Crimp or anchor mulch to the extent feasible to greatly increase soil stability during spring run-off events.
- Install erosion and sediment controls in a manner that will hold up over the winter months and during the spring run-off period. This may include erosion control blankets on steeper slopes (>30%).

Other than those issues discussed above, most environmental requirements can be successfully implemented by the Contractor during winter maintenance.

10.0 WASTE MANAGEMENT AND CONTAMINATED SOIL

Unless specified otherwise, "Enbridge" includes contractors performing pipeline maintenance project work.

Solid and hazardous materials and wastes that are used or generated as a result of the maintenance activities will be handled and stored in accordance with applicable federal and/or state criteria. All waste materials are to be collected daily in approved containers that do not attract nuisance animals. At the end of the maintenance project the containers of waste from the site shall be removed and disposed of in accordance with all federal, state and local regulations, licenses and ordinances. The Contractor and Enbridge will determine if the materials and wastes classify as hazardous materials and/or wastes in accordance with applicable federal and/or state criteria. All wastes determined to be hazardous will be handled and disposed of in accordance with federal and state regulations including but not limited to assurances that waste contain proper labeling, are handled safely by trained personnel, and disposal received proper documentation. All free standing hazardous materials containers and secondary containment structures shall be placed on asphalt, concrete or competent ground at least 100 feet away from environmentally sensitive receptors or conveyances to such receptors (e.g., ditches).

Do not leave spent welding rods, filings/shavings, cut off pipe rings, or refuse on the ground or in the excavation. Where spray or paint-on coatings are applied, place a tarp of sufficient size to block overspray from contacting the ground under the operation. Remove timber mats, geotextiles, and ramps from all maintenance locations on the ROW.

10.1 ABRASIVE BLAST

The Contractor is responsible for containing all abrasive blast at maintenance locations and placing all spent abrasive into appropriate containers as provided by Enbridge. The containers shall be covered with appropriate means of rainwater and stormwater control to prevent waters from entering or exiting the container. Enbridge will be responsible for disposal of the spent abrasive in accordance with applicable federal, state and local regulatory requirements.

10.2 CONTAMINATED SOIL

While unlikely, oily soil may be encountered during maintenance excavations as result of past (old) contamination or from an ongoing source. During the initial environmental review phase, maintenance locations will be checked for proximity to known, historical releases.

Consider soils contaminated if free product is present, the soil is a notably different color than the surrounding soil (black, gray, blue, green), hydrocarbon odors are present, or there is a sheen on excavation water. The Contractor shall report all occurrences of oily soil to Enbridge Environment immediately. The Contractor is not to report externally. Enbridge will coordinate proper response including storage and disposal if necessary. Excavated contaminated soil must be contained so contamination is not spread to other soils or to water through infiltration, run-on, or runoff. Enbridge will assist in the identification of a suitable location for containment or disposal of contaminated soils where it will not interfere with the project or other activities that may be occurring on site. Containment shall be accomplished through the construction of a containment cell consisting of an earthen berm with a plastic liner. Contaminated soil shall be placed in the containment cell and covered with plastic extending outside the bermed area and anchored with clean soil or other material. Locate contaminated soil piles a minimum of 100 feet from a wetland or waterbody. Enbridge Environment will

arrange for soil sampling, soil disposal, and import of soil backfill, if necessary. Contaminated soil shall not be used for backfill without prior written approval.

If oil is visible and a fresh leak is suspected, shut down or remove all equipment from the area. The Enbridge Construction Manager and Enbridge Environment will determine if conditions are suitable to resume work.

Before pumping potentially contaminated excavation water, contact Enbridge Environment.

11.0 SPILL PREVENTION, CONTAINMENT, AND CONTROL PROCEDURES

This section describes planning, prevention and control measures to minimize impacts resulting from spills of fuels, petroleum products, or other regulated substances as a result of maintenance work. These measures will be implemented by the Contractor working on Enbridge maintenance digs, unless otherwise indicated by Enbridge. Unless specified otherwise, "Enbridge" includes contractors performing pipeline maintenance project work.

Enbridge requires its Contractors to implement proper planning and preventative measures to minimize the likelihood of spills, and to quickly and successfully clean up a spill should one occur. Potential sources of construction-related spills include machinery and equipment failure, fuel handling, transfer accidents and storage tank leaks. The Contractor will be responsible for implementing, at a minimum, the following planning and prevention measures.

In the event of a spill, the Contractor will abide by all applicable federal, tribal, state and local regulations with respect to cleaning up the spill. All cleanup and other construction related spill activities must be completed by, and costs assumed by the Contractor.

11.1 PLANNING

11.1.1 Equipment

- The Contractor must maintain spill kits containing a sufficient quantity of absorbent and barrier materials to adequately contain and recover foreseeable spills. These kits may include, but are not limited to absorbent pads, straw bales, absorbent clay, sawdust, floor-drying agents, spill containment barriers, plastic sheeting, skimmer pumps, and holding tanks. This equipment shall be located near fuel storage areas and other locations as necessary to be readily available to control foreseeable spills.

- All fuel, and where necessary, service vehicles, shall carry spill containment materials adequate to control foreseeable spills on land and water. Such material may include but not be limited to absorbent pads and booms, commercial absorbent material, plastic bags with ties, and a shovel.

- Construction equipment shall be removed from wetlands and parked a minimum of 100 feet away from streams, wetlands, ditches, and other waterbodies at the end of each work day.

- In large wetlands where no upland site is available for refueling, auxiliary fuel tanks on construction equipment are recommended.

- All fuel nozzles shall be equipped with functional automatic shut-offs and over-flow alarms.

11.1.2 Supervision and Inspection

- The Contractor shall perform a pre-construction inspection and test of all equipment to ensure that it is in good repair.

- During maintenance work, the Contractor shall regularly inspect hoses, pipes, valves, and tanks to ensure equipment is free of leaks. Any equipment that is leaking or in need of repair will be immediately removed from service by Contractor and repaired, prior to resuming work.

11.2 HANDLING OF FUELS/HAZARDOUS LIQUIDS

11.2.1 Refueling

- Fuels shall be dispensed during daylight hours only.

- Fuel dispensing operations shall be attended at all times. Personnel must be stationed at both ends of the hose during fueling unless both ends are visible and are readily accessible by one person.

- Fuel dispensing equipment (i.e., portable gas cans, nozzles, hoses, etc.) shall be of the appropriate type. Consult with the Contractor Safety Program (CSP) for details. Fuel nozzles are to be equipped with an automatic shut-off.

11.2.2 Refueling and Fuel Storage near Wetlands and Waterbodies

Enbridge requires that the storage of petroleum products, refueling, equipment washing, lubricating and maintenance operations take place in upland areas that are more than 100 feet from wetlands, streams, and waterbodies (including drainage ditches), and water supply wells. In addition, the Contractor must store hazardous materials, chemicals, fuel, and lubricating oils outside these areas. Auxiliary fuel tanks solidly attached to construction equipment or pumps are not considered storage and are acceptable.

In certain instances, refueling or fuel storage, or servicing of equipment within the 100-foot buffer may be unavoidable due to site-specific conditions or unique construction requirements (e.g. continuously operating pumps or equipment on barges). These locations must be identified by the Contractor and approved in advance by Enbridge Environment. Site-specific precautions, in addition to those practices described above, will be taken when refueling or maintenance activities are required within 100 feet of streams, wetlands or other waterbodies. These precautions include, but are not limited to:

- All containers, hoses, and nozzles are to be free of leaks.

- Adequate amounts of absorbent materials and containment booms must be kept on hand by each construction crew to enable the rapid cleanup of any spill which may occur.

- If fuel must be stored within wetlands or near streams for refueling of continuously operating pumps, secondary containment must be provided.

- Secondary containment structures must be used and must be lined with suitable plastic sheeting, provide a containment volume of at least 150 % of the storage vessel, and allow for at least one (1) foot of freeboard.

- Overnight parking of equipment is not allowed within 100 feet of a wetland or waterbody unless special containment provisions have been implemented.

- Equipment to be used for in-stream maintenance must be inspected to ensure that systems are free of leaks, grease, oil or other fluids, mud, dirt, and vegetation prior to entering the waterbody and upon completion of in-stream activity.

11.3 INITIAL SPILL MANAGEMENT, NOTIFICATION, CONTAINMENT AND CLEANUP

11.3.1 Immediate Response

Immediately upon learning of any fuel, oil, hazardous material or other regulated substance spill, or upon learning of conditions that will lead to an imminent spill, the Contractor discovering the situation shall do the following, regardless of volume:

- Initiate actions to contain the fluid that has spilled or is about to spill, and initiate action to eliminate the source of the spill to the maximum extent that is safely possible.

- Notify the Construction Manager and Enbridge Environment and provide them with the following information:

    - Location and cause of the spill

    - The type of material that has spilled

    - Whether the spill has reached or is likely to reach any surface water

    - Whether the spill is beyond the scope of on-site equipment and personnel

- In the event of a pipeline spill, Enbridge's Emergency Pipeline Control Center must be notified at 1-800-858-5253 (24-hours/day), as well as the Construction Manager and Enbridge Environment. Actions requiring emergency response employees and contractors will be coordinated by the Construction Manager.

11.3.2 Reporting

The Contractor shall complete a Spill Report Form (Appendix B) for each release of a regulated substance, regardless of volume. The Spill Report Form must be submitted to the Construction Manager and Enbridge Environment within 24 hours of the occurrence of a spill.

Enbridge Environment will report spills to the appropriate federal, tribal, state and local agencies as soon as possible.

Follow-up written reports, associated laboratory analyses, confirmatory field sampling and other documentation may also be required separately on a site-specific basis as directed by Enbridge Environment. Documentation is the responsibility of the Contractor. The Contractor is responsible for ensuring that all cleanup activities required by a jurisdictional agency are satisfactorily met and provide documentation to Enbridge Environment demonstrating this compliance.

11.3.3 Spill Control

- If a spill should occur during refueling operations, STOP the refueling operation until the spill can be controlled and the situation corrected.

- The source of the spill must be identified and contained immediately.

- If a spill is from a truck, contain the spill and have the tanker pumped dry into appropriate containers or another tanker, and removed from the site.

- For large spills on land, the spill must be contained and pumped immediately into tank trucks. The Contractor or, if necessary, an Emergency Response Contractor, shall excavate contaminated soil.

- The spilled material and the contaminated soil must be treated and/or disposed of in accordance with all applicable federal, state, and local agency requirements.

- Smaller spills on land shall be cleaned up with absorbent materials. Contaminated soil or other materials associated with these releases shall also be collected and disposed of in accordance with applicable regulations.

- Flowing spills must be contained and/or absorbed before reaching surface waters or wetlands.

- Absorbent material(s) shall be placed over spills to minimize spreading and to reduce its penetration into the soil.

- The Construction Manager, in consultation with appropriate agencies, determines when spill sites will be evacuated as necessary to safeguard human health. Evacuation parameters shall include consideration for the potential of fire, explosion, and hazardous gases.

- If a spill occurs near or into a stream, wetland or other waterbody, regardless of size, the following apply:

    - Contractor Representative must notify the National Response Center immediately.

- Construct berms and/or trenches to contain spilled product prior to entry into a watercourse or wetland, as necessary.

    - For spills in standing water, sorbent booms and pads shall be on hand and used by the Contractor to contain and recover released materials. In addition, other spill response materials and equipment shall be on hand as appropriate for each waterbody and used to contain and recover foreseeable spills. This may include containment booms, skimmer pumps, holding tanks, boats, and other equipment.

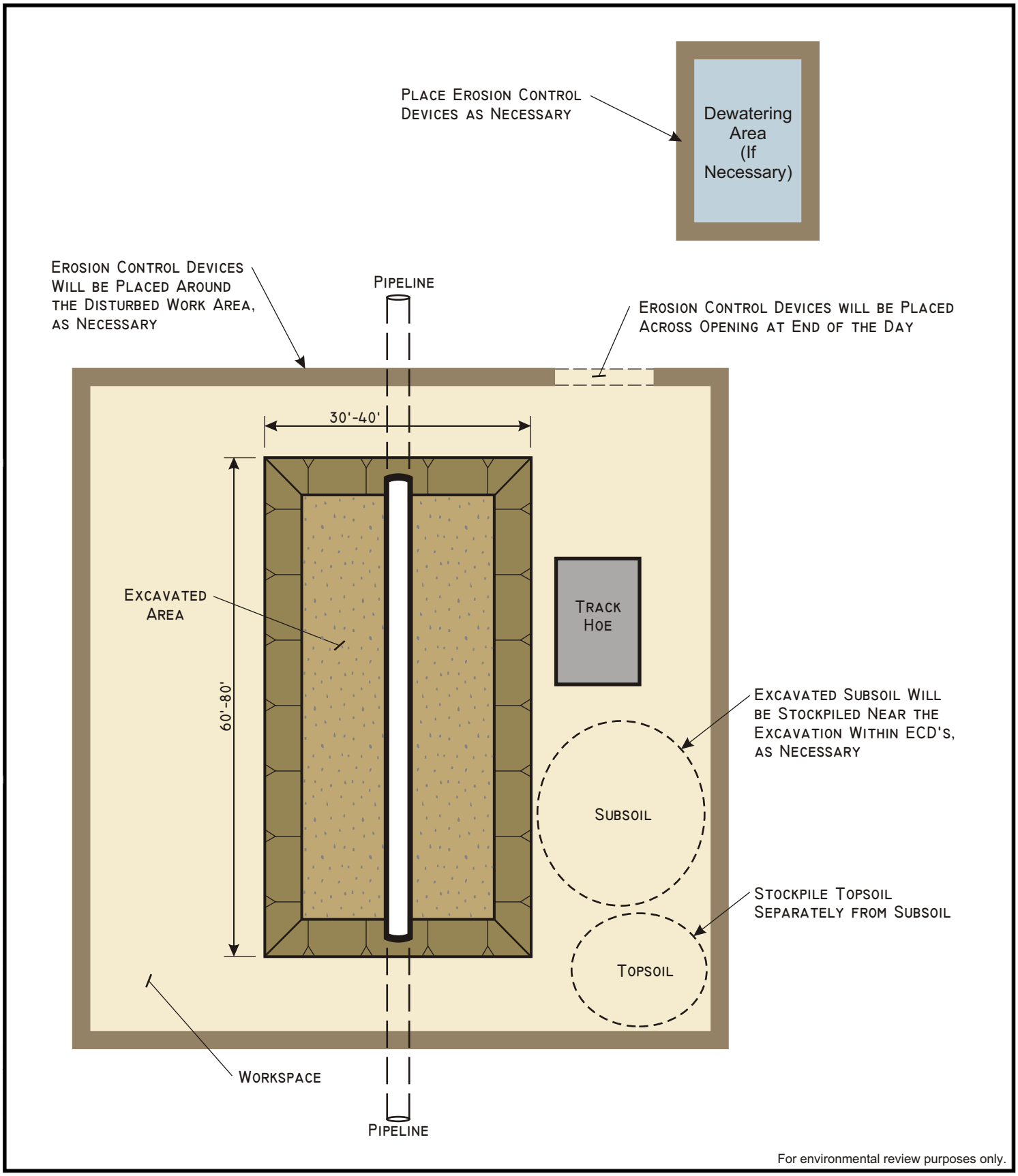
    - If necessary, for large spills in waterbodies, an Emergency Response Contractor must be secured to further contain and clean up the spill.

    - Contaminated soils in wetlands must be excavated and temporarily placed on plastic sheeting in a bermed area, a minimum of 100 feet away from any wetlands or waterbodies. Contaminated soils shall be covered with plastic sheeting while being stored temporarily and properly disposed of as soon as possible.

11.4 STORAGE AND DISPOSAL OF CONTAMINATED MATERIALS

All contaminated soils, absorbent materials, and other wastes shall be labeled, stored, transported, and disposed of by the Contractor in accordance with all applicable state and federal regulations.

Figures



For environmental review purposes only.

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ENBRIDGE™

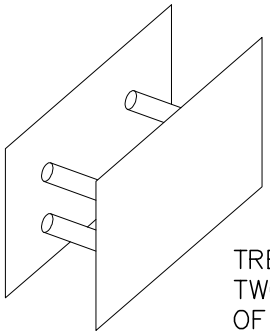
Figure 1

Environmental Mitigation Plan
Typical Maintenance Excavation
Plan View

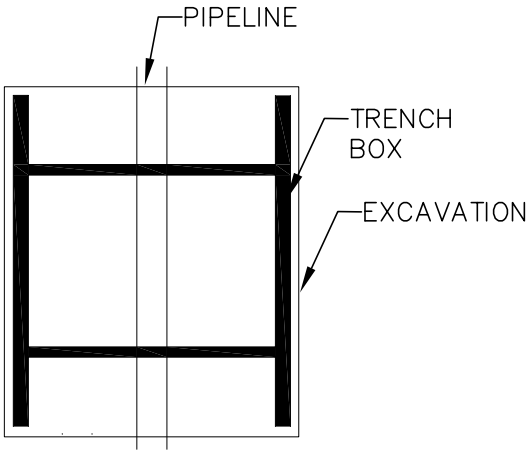
Date: 12/12/2012

Revised:

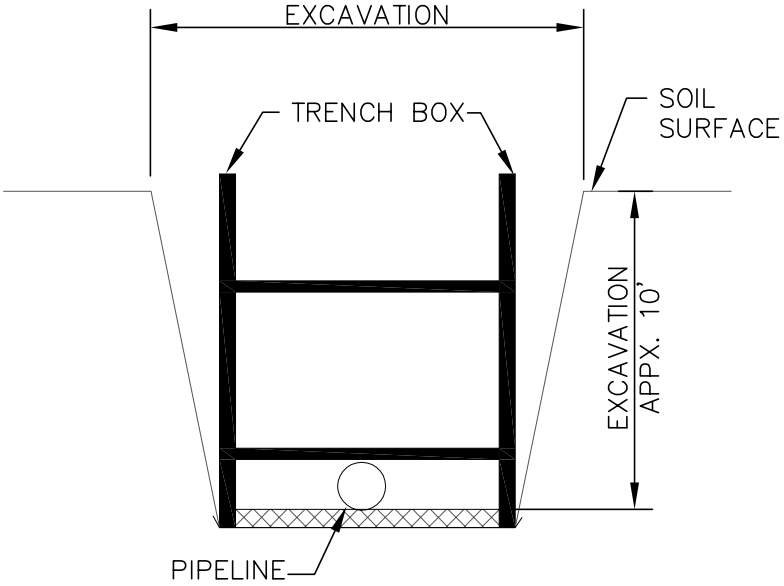
Scale: Not to Scale



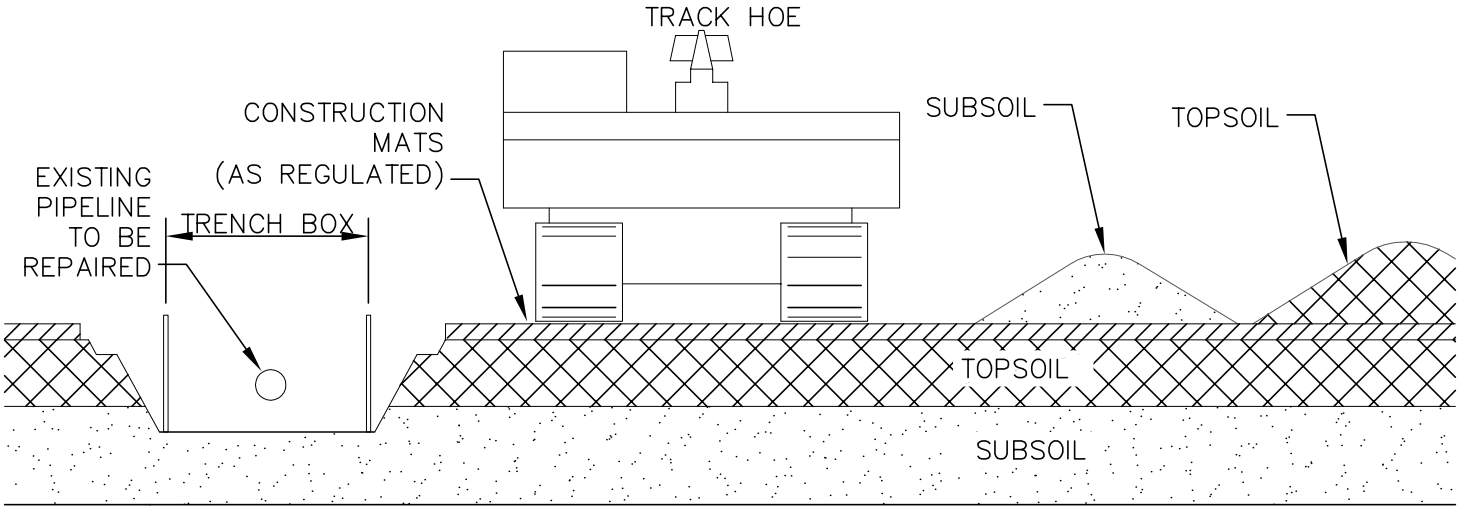
TRENCH BOXES CONSIST OF TWO STEEL PLATES THAT HOLD UP THE SIDES OF AN EXCAVATION. THE PLATES ARE HELD IN PLACE BY STEEL BRACES.



PLAN: TRENCHBOX



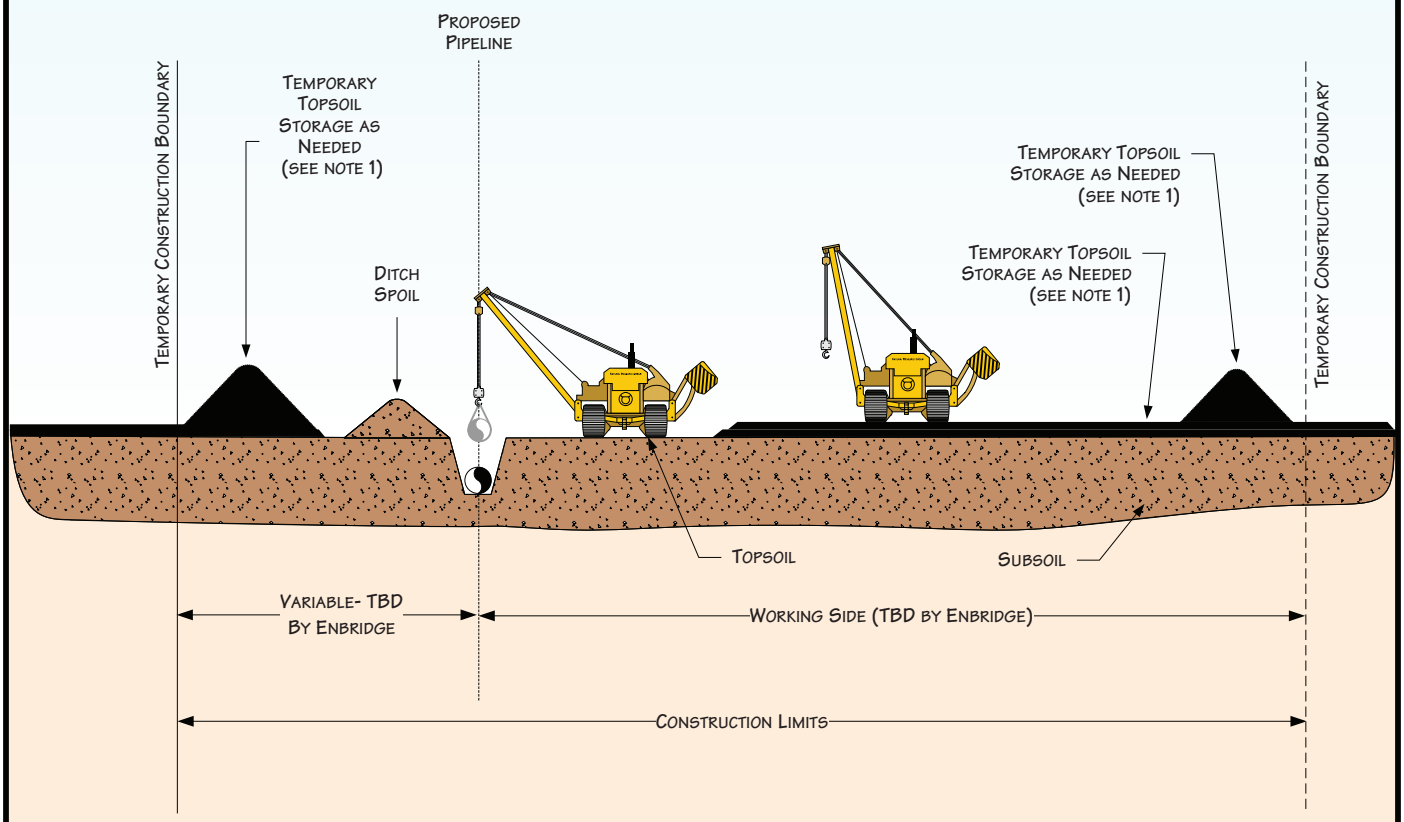
PROFILE: TRENCHBOX



PROFILE: TRENCHBOX

ENBRIDGE®

Scale	NONE	FOR ENVIRONMENTAL PERMITTING TRENCHBOX TYPICAL	BARR PROJECT No. 49/16-0146
Date	1/3/2013		CLIENT PROJECT No.
Drawn	CFN	FIGURE 2	
Checked	EMM		SHEET No. / REV. No.
Designed	EMM		
Approved	EMM		



PROFILE

NOTES:

1. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL AS SHOWN OR IN OTHER CONFIGURATIONS APPROVED BY THE COMPANY.

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Figure 3

Environmental Mitigation Plan

Typical Topsoil Segregation – Modified Ditch Plus Spoil Side

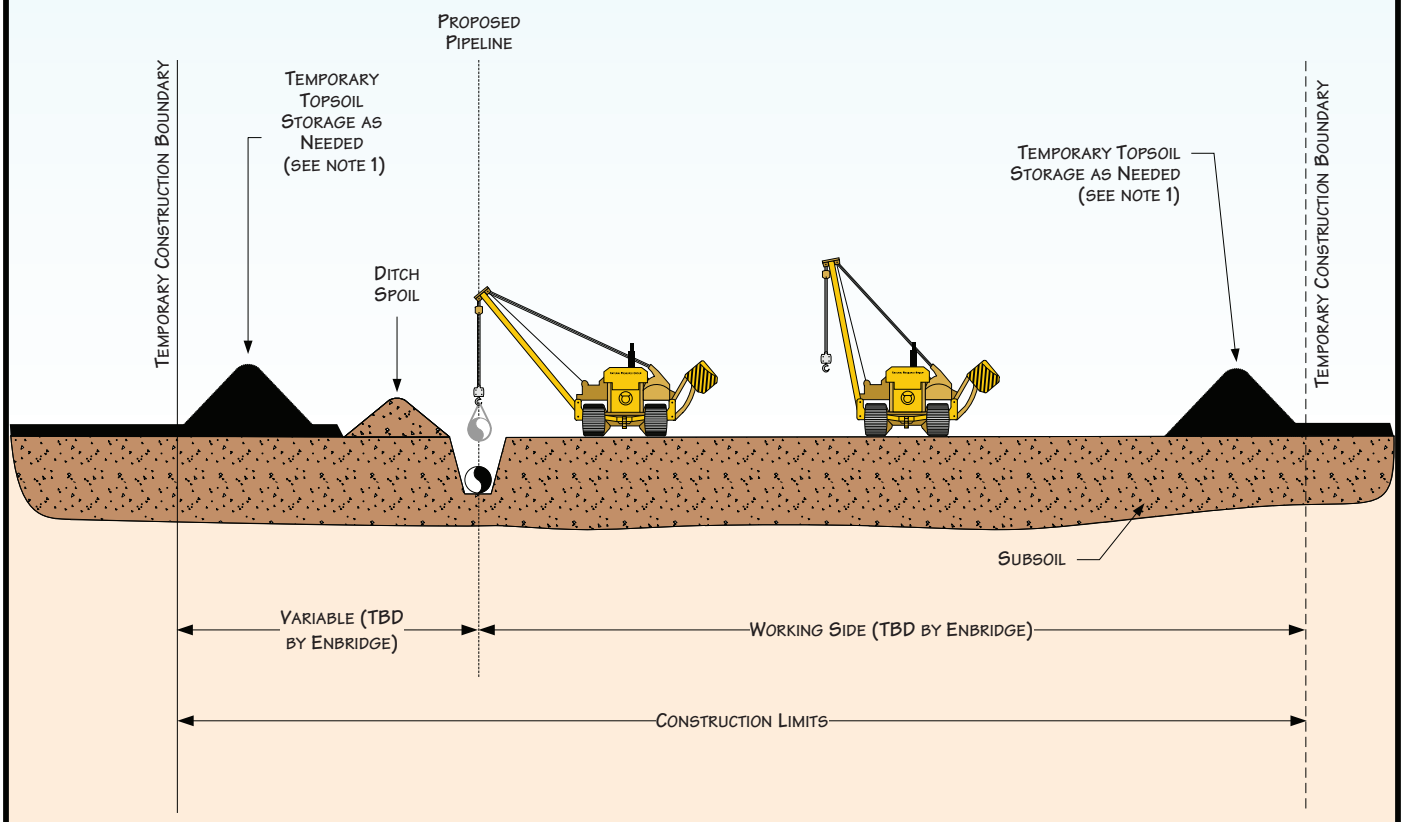
DATE: 7/9/2001

REVISED: 3/11/2011

SCALE: NTS

DRAWN BY: JPBOENTJE

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_1-3_TYPICAL_TOPSOIL_SEGREGATION.VSD



PROFILE

NOTES:

1. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL AS SHOWN OR IN OTHER CONFIGURATIONS APPROVED BY THE COMPANY.

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Figure 4

Environmental Mitigation Plan

Typical Topsoil Segregation - Full Right-of-Way

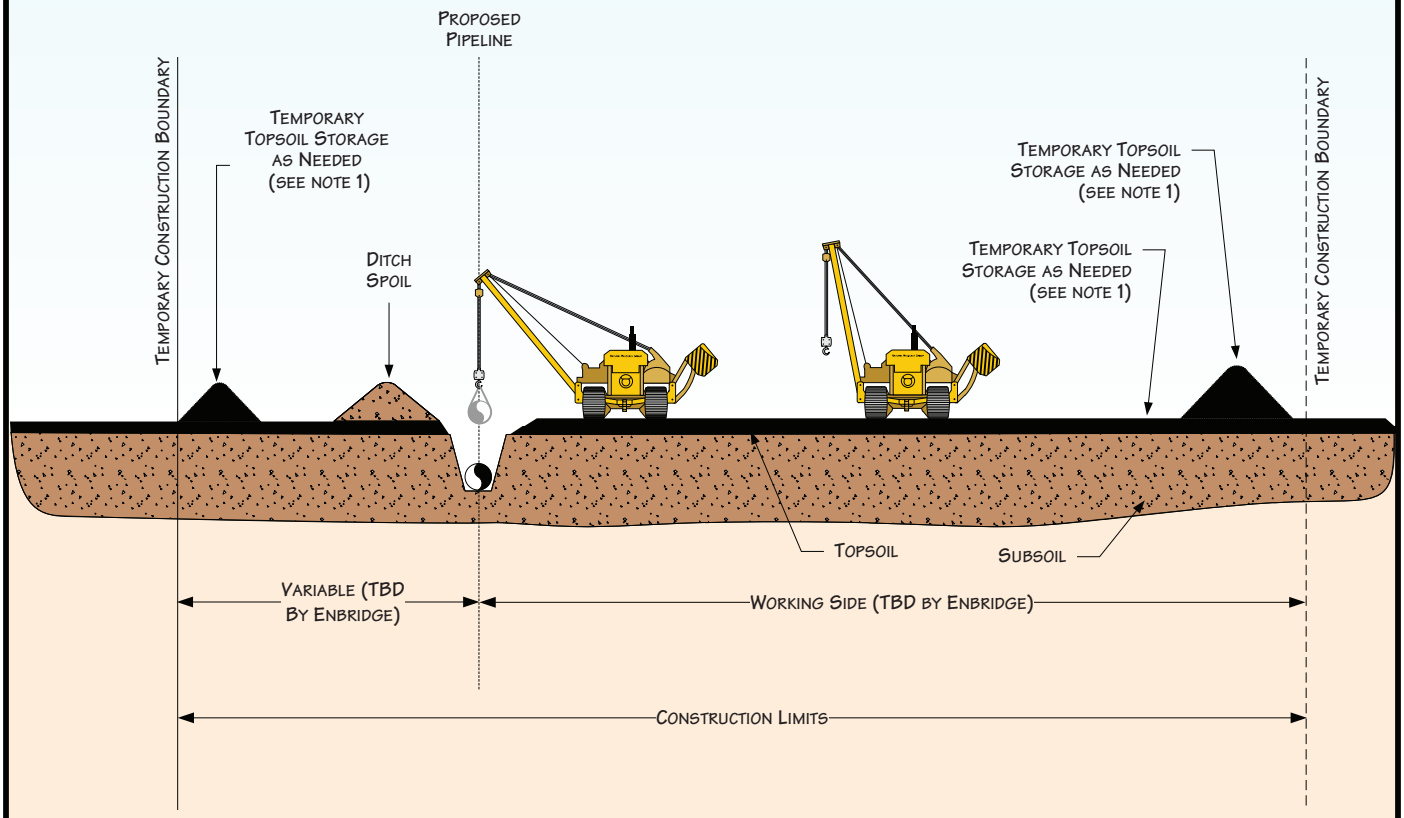
DATE: 7/9/2001

REVISED: 3/11/2011

SCALE: NTS

DRAWN BY: JPBOENTJE

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_1-3_TYPICAL_TOPSOIL_SEGREGATION.VSD



PROFILE

Notes:

1. Stockpile topsoil separately from ditch spoil as shown or in other configurations approved by the company.

ENBRIDGE

Figure 5

Environmental Mitigation Plan

Typical Topsoil Segregation – Trench Line Only

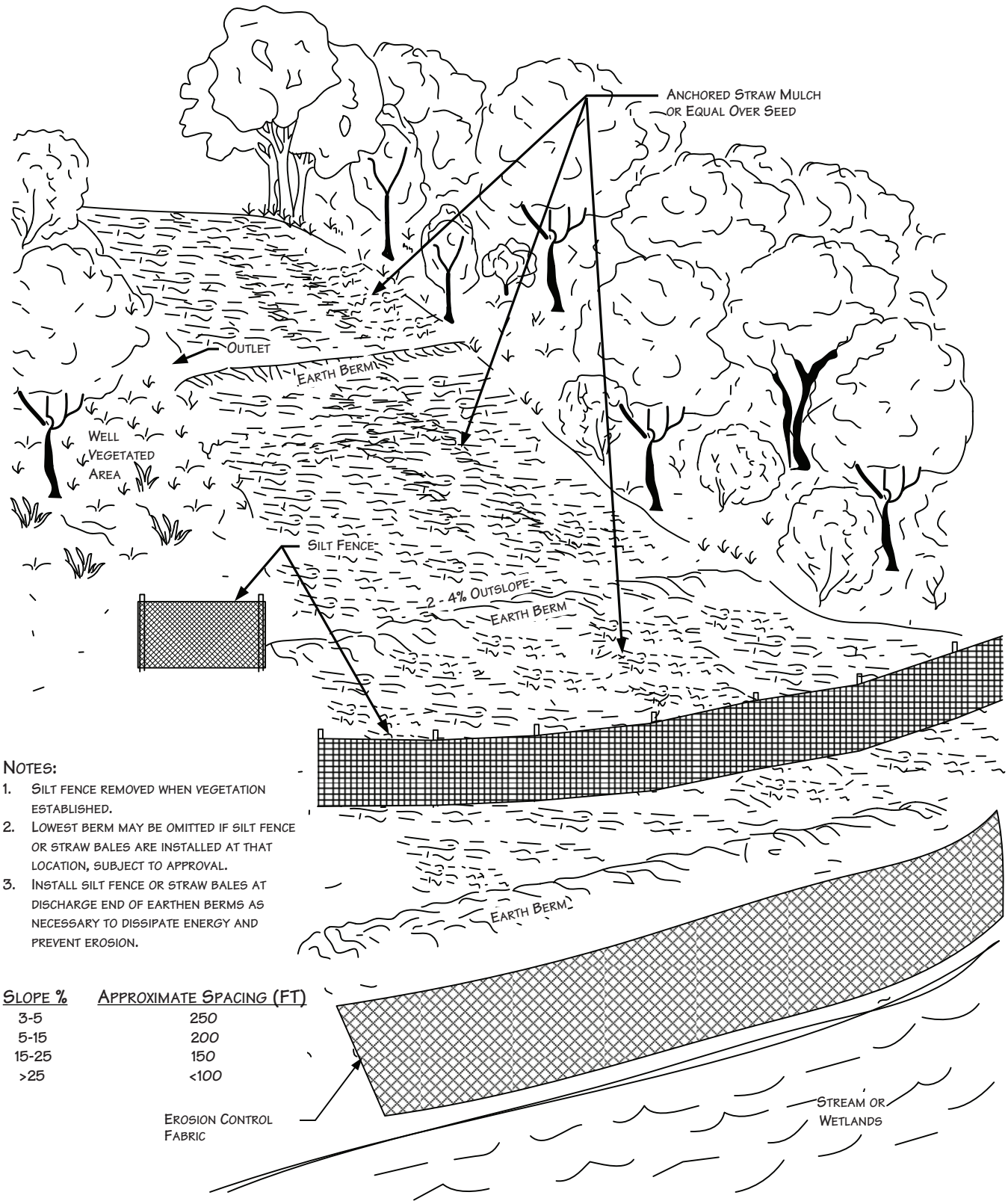
DATE: 7/9/2001

REVISED: 3/11/2011

SCALE: NTS

DRAWN BY: JPBOENTJE

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_1-3_TYPICAL_TOPSOIL_SEGREGATION.VSD



Notes:

1. Silt fence removed when vegetation established.
2. Lowest berm may be omitted if silt fence or straw bales are installed at that location, subject to approval.
3. Install silt fence or straw bales at discharge end of earthen berms as necessary to dissipate energy and prevent erosion.

Slope %	Approximate Spacing (FT)
3-5	250
5-15	200
15-25	150
>25	<100

For environmental review purposes only.

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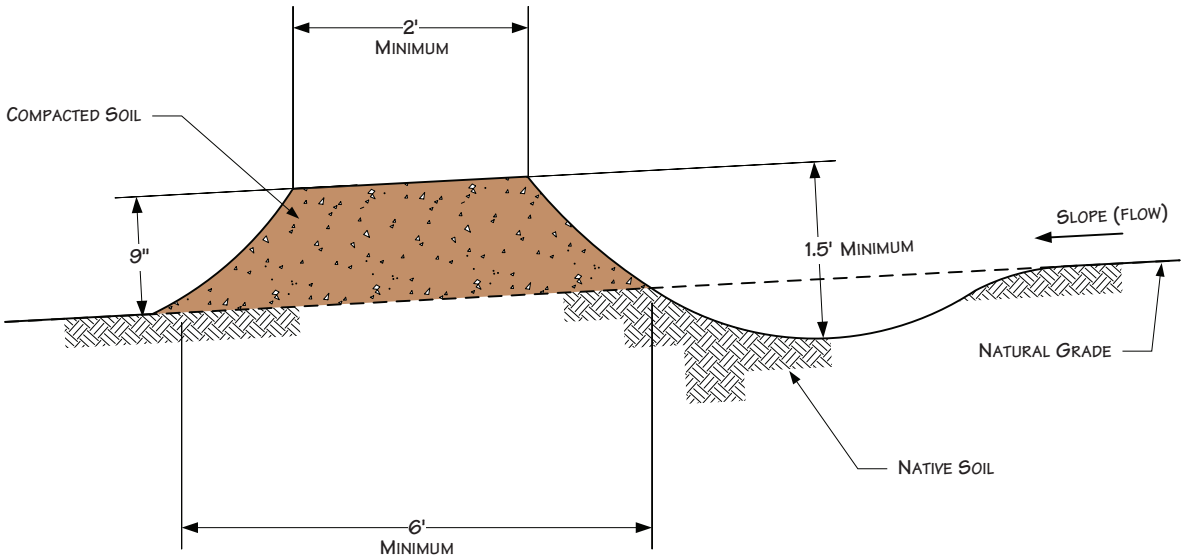
Figure 6

Environmental Mitigation Plan

Typical Temporary or Permanent Berms
Perspective View

DATE: 11/14/2000
REVISED: 3/11/2011
SCALE: NTS
DRAWN BY: KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_4_BERMS_PERSPECTIVE_VIEW.VSD



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 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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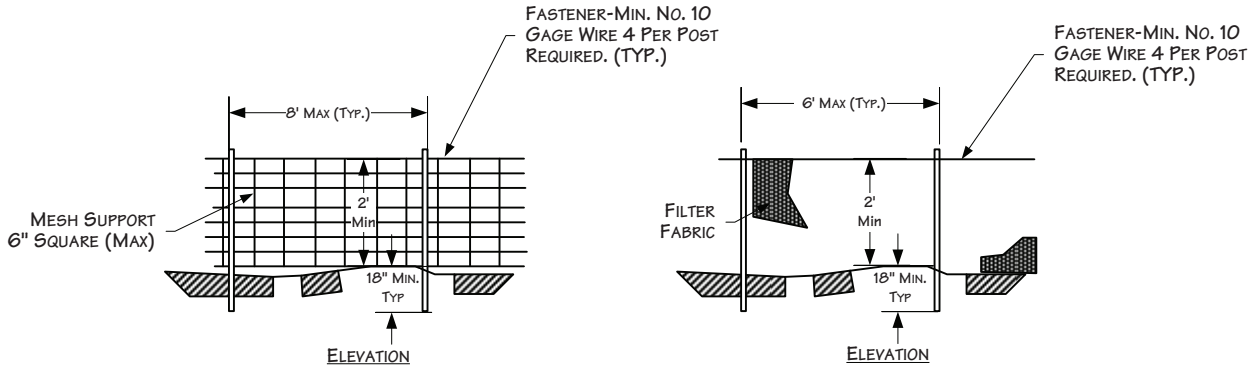
Figure 7

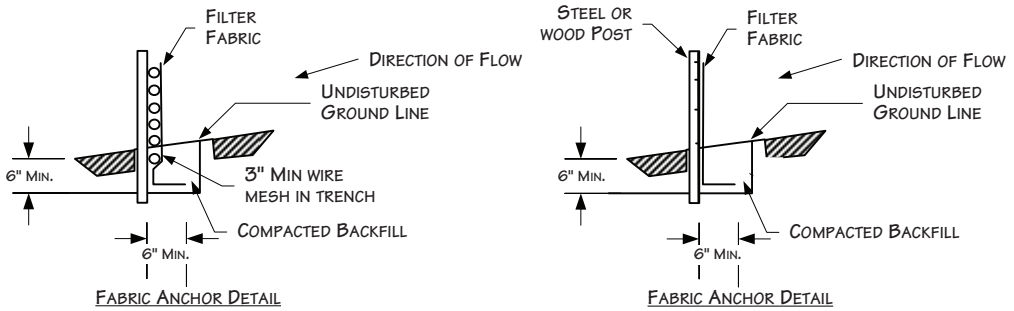
Environmental Mitigation Plan

Typical Temporary or Permanent Berms
Elevation View

DATE:	5/25/2001
REVISED:	3/11/2011
SCALE:	NTS
DRAWN BY:	KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_5_BERMS_ELEVATION_VIEW.VSD





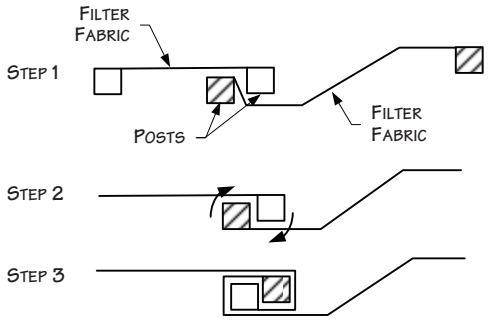
Silt Fence with wire support Plan

Silt Fence Plan

NTS

Notes:

1. Wires of mesh support shall be min. gage no. 12.
2. Filter fabric shall meet the requirements of the specification with equivalent opening size of at least 30 for nonwoven and 50 for woven. (Sieve No.)
3. The posts used to support the silt fence should be hardwood material with a minimum cross sectional area of 4 inches square and 4 feet long. Metal posts should be used in areas that pond water.



Attaching two silt fences

Notes:

1. Place the end post of the second fence inside the end post of the first fence.
2. Rotate both posts at least 180 degrees in a clockwise direction to create a tight seal with the fabric material.
3. Drive both posts a minimum of 18 inches in the ground and bury the flap.

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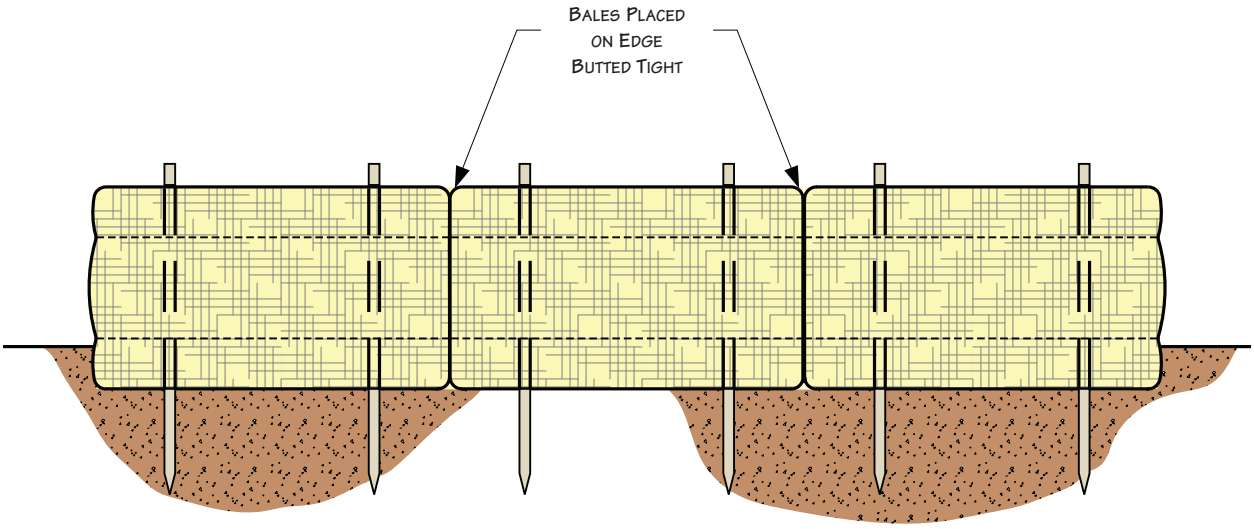
Figure 8

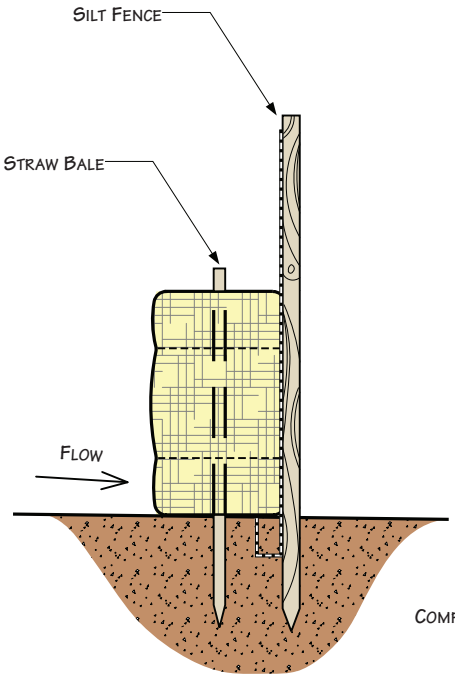
Environmental Mitigation Plan

Typical Silt Fence Installation

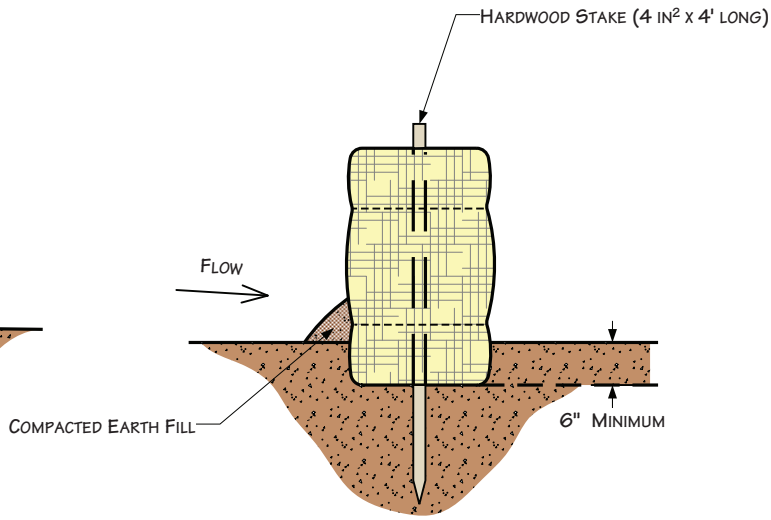
DATE:	5/25/2001
REVISED:	3/23/2011
SCALE:	NTS
DRAWN BY:	KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_6_SILT_FENCE_INSTALL.VSD





Straw Bales & Silt Fence



Straw Bales Only

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Figure 9
Environmental Mitigation Plan
Typical Straw Bale Installation

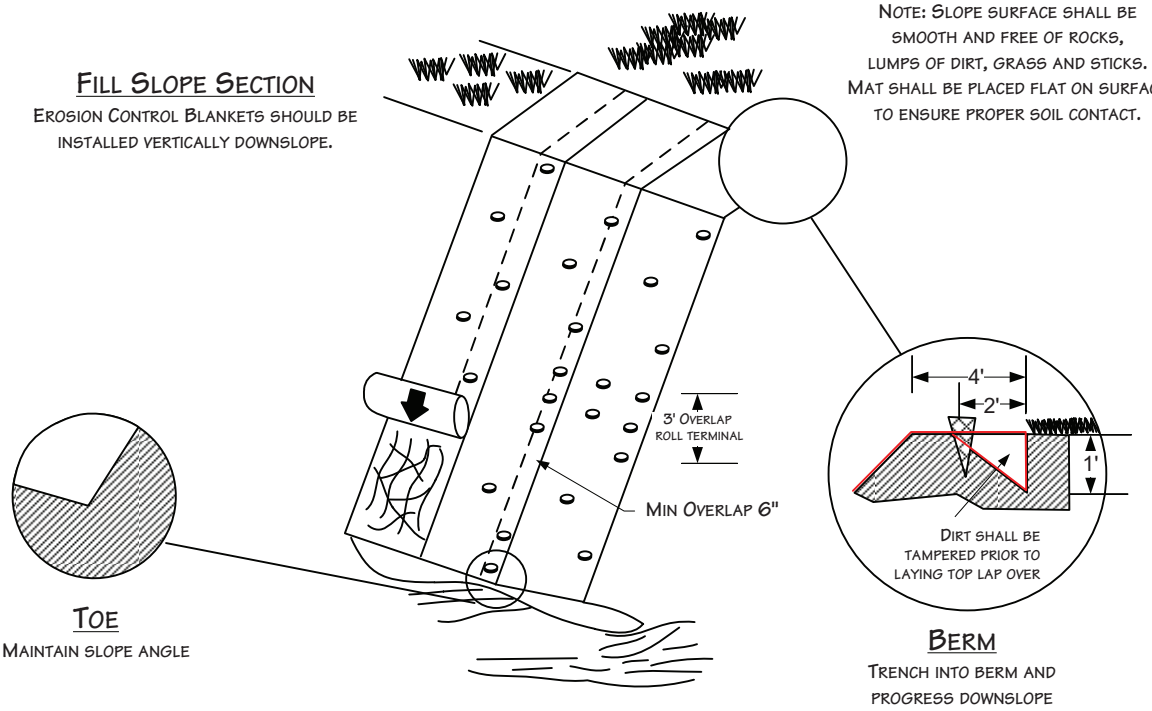
DATE:	5/25/01
REVISED:	3/11/11
SCALE:	Not to Scale
DRAWN BY:	KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_7_STRAW_BALE_INSTALL.VSD

Fill Slope Section

Erosion Control Blankets should be installed vertically downslope.

Note: Slope surface shall be smooth and free of rocks, lumps of dirt, grass and sticks. Mat shall be placed flat on surface to ensure proper soil contact.



Toe

Maintain slope angle

Berm

Trench into berm and progress downslope

Stream Channel

Erosion Control Blankets should be installed Horizontally with Stream Flow.

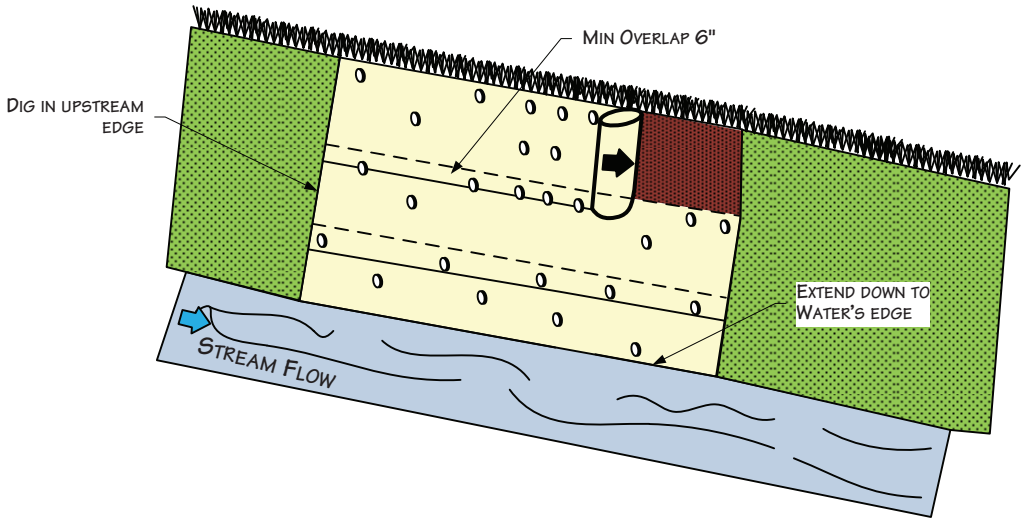


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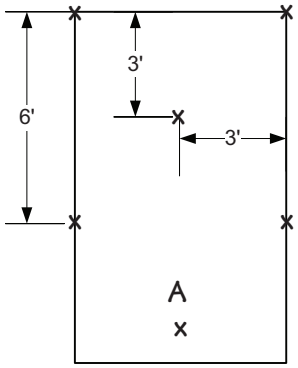
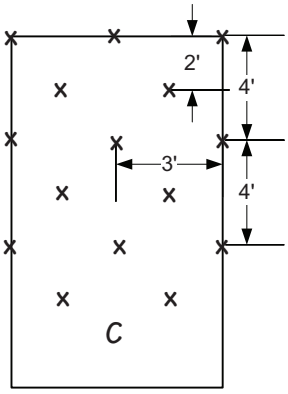
Figure 10
Environmental Mitigation Plan
Typical Erosion Control Blanket Installation

DATE:	5/25/2001
REVISED:	3/23/2011
SCALE:	NTS
DRAWN BY:	KMKENDALL

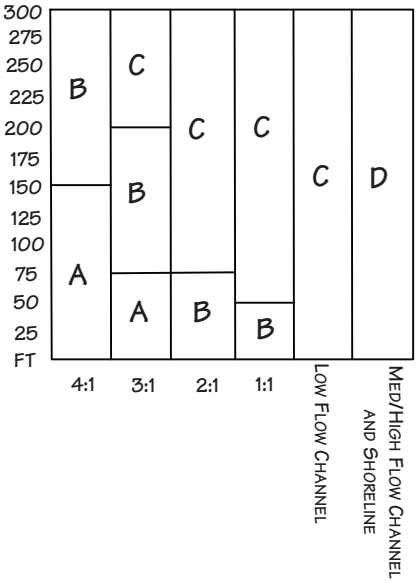
K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_8_EROSION_CONTROL_BLANKET_INSTALL.VSD

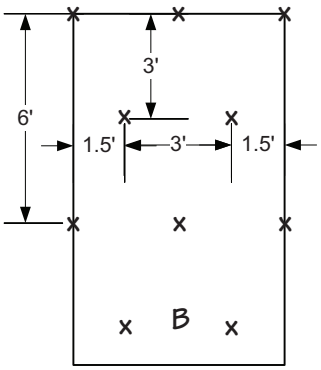


1 Staple Per Sq. Yd



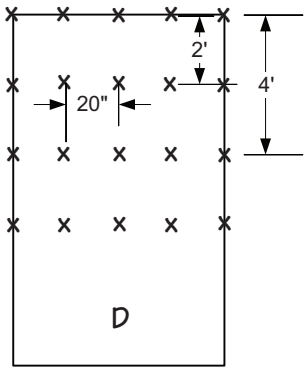
2 Staples Per Sq. Yd





1 ½ Staples Per Sq. Yd

For optimum results, these recommended staple pattern guides must be followed. Suggested anchoring methods vary according to the manufacturer. This chart shows how to slope lengths and how gradients affect sampling patterns.



3 1/2 Staples Per Sq. Yd

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Figure 11

Environmental Mitigation Plan
Typical Staple Pattern for
Erosion Control Fabric

DATE: 5/25/2001
REVISED: 3/24/2011
SCALE: NTS
DRAWN BY: KMKENDALL
K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_9_STAPLE_PATTERN_EROSION_CONTROL_FABRIC.VSD

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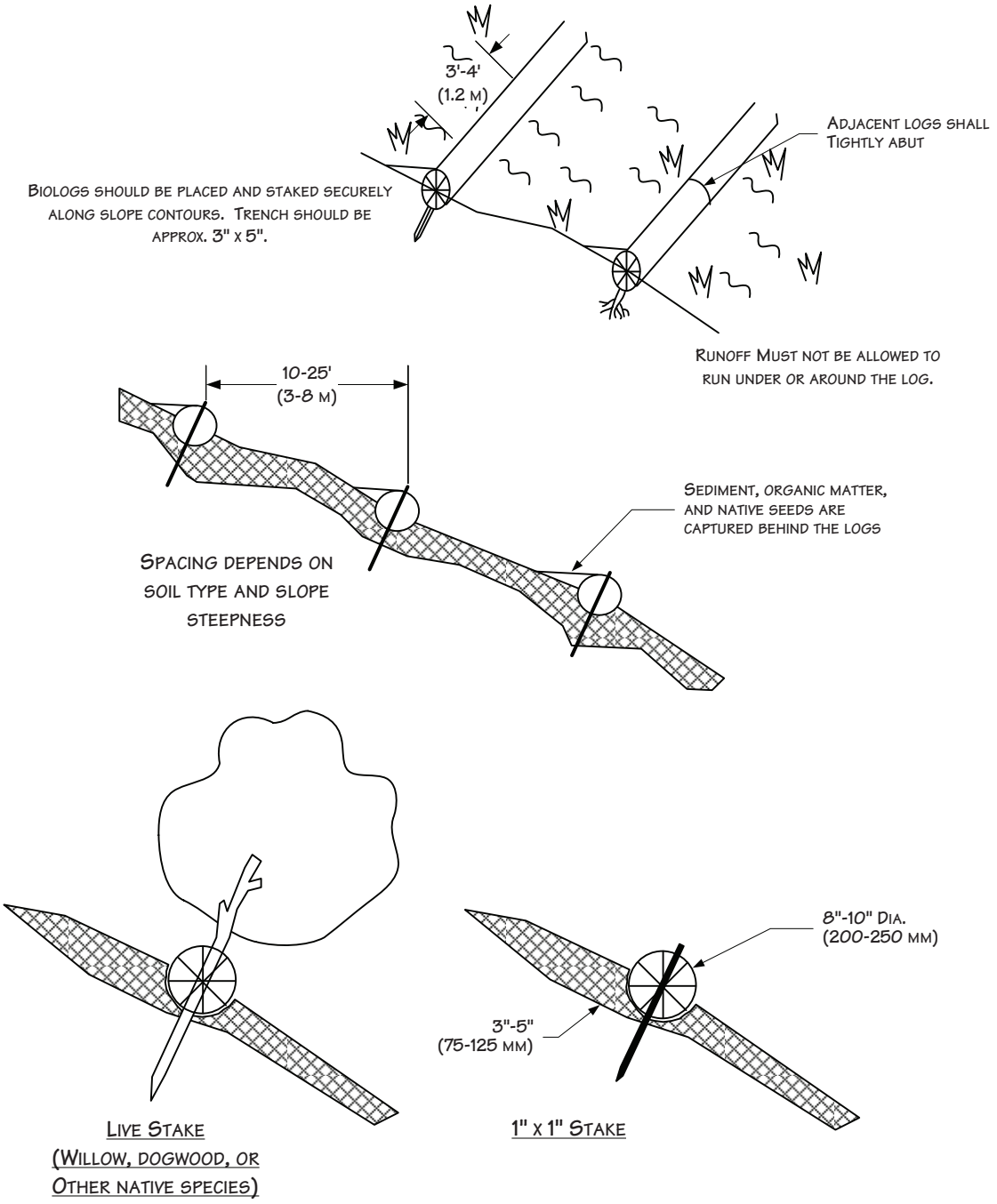

NOTE: IF BIOLOG IS NOT TRENCHED IN, STAPLES SHOULD BE USED, SPACED 1'-2' APART.

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Figure 12

Environmental Mitigation Plan
Typical Biolog Installation

DATE:	5/25/2001
REVISED:	3/24/2011
SCALE:	NTS
DRAWN BY:	KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_10_BIOLOG INSTALL.VSD

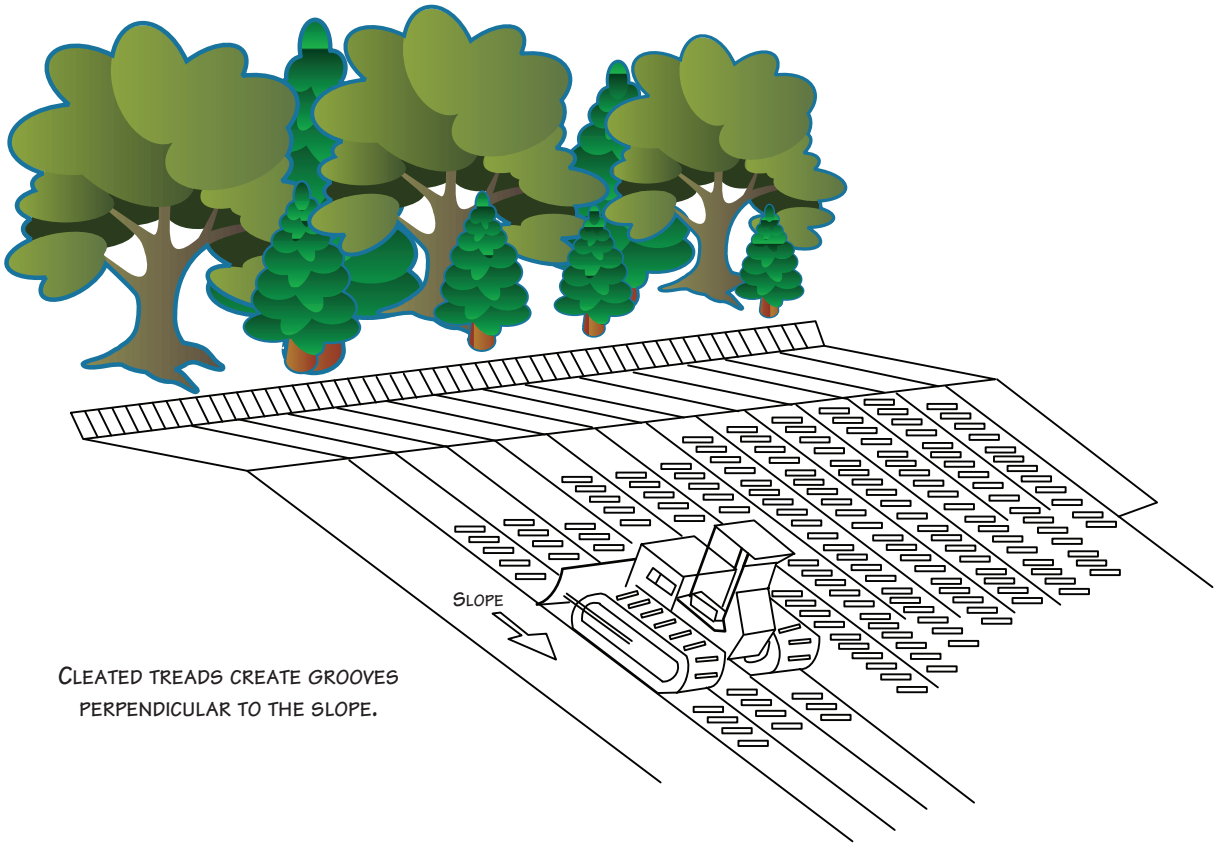

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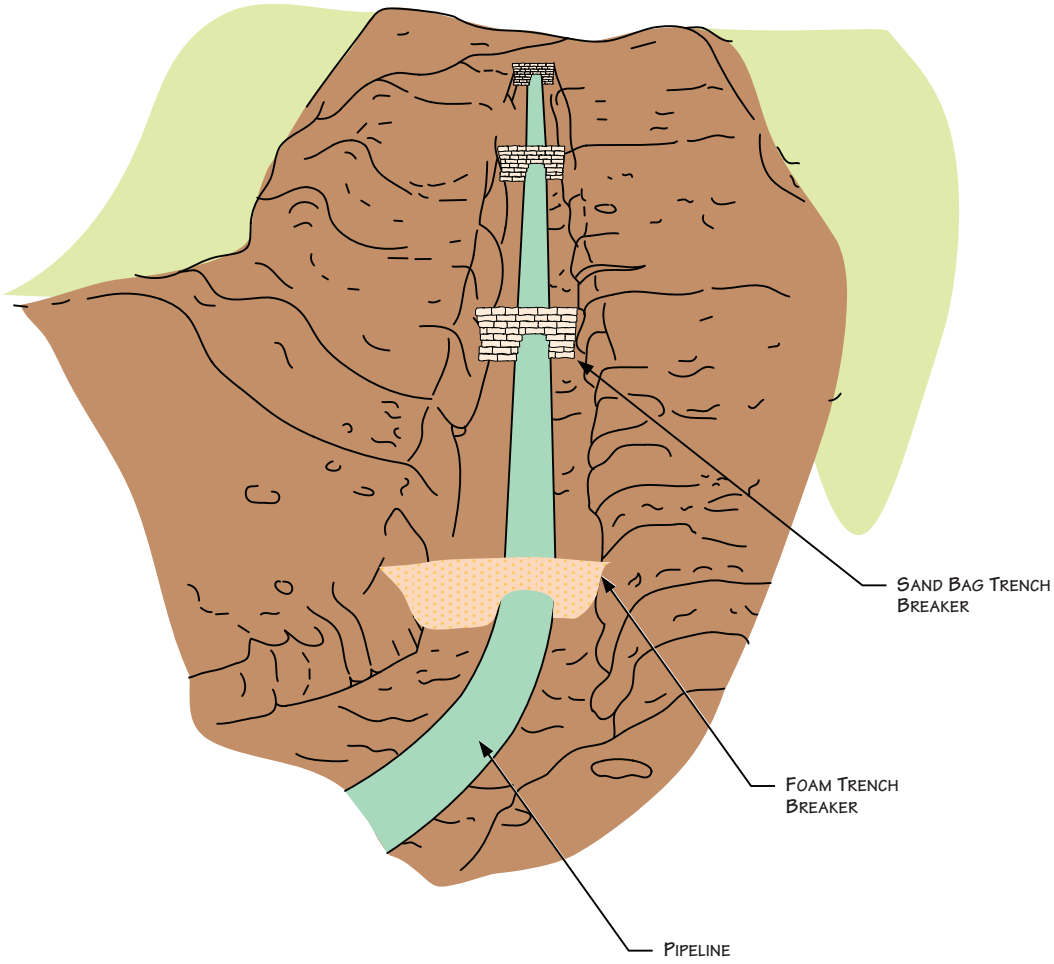
Figure 13

Environmental Mitigation Plan
Typical Cat Tracking

DATE: 5/25/2001
REVISED: 3/24/2011
SCALE: NTS
DRAWN BY: KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_11_CAT_TRACKING.VSD



Notes

1. Bags will not be filled with topsoil.
2. Additional information included on other drawings.

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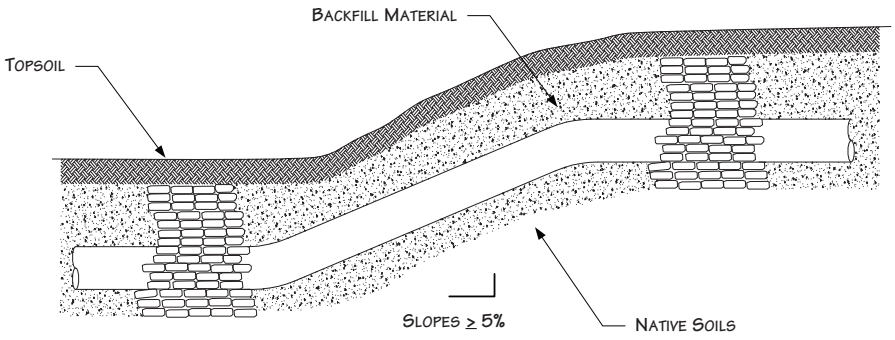
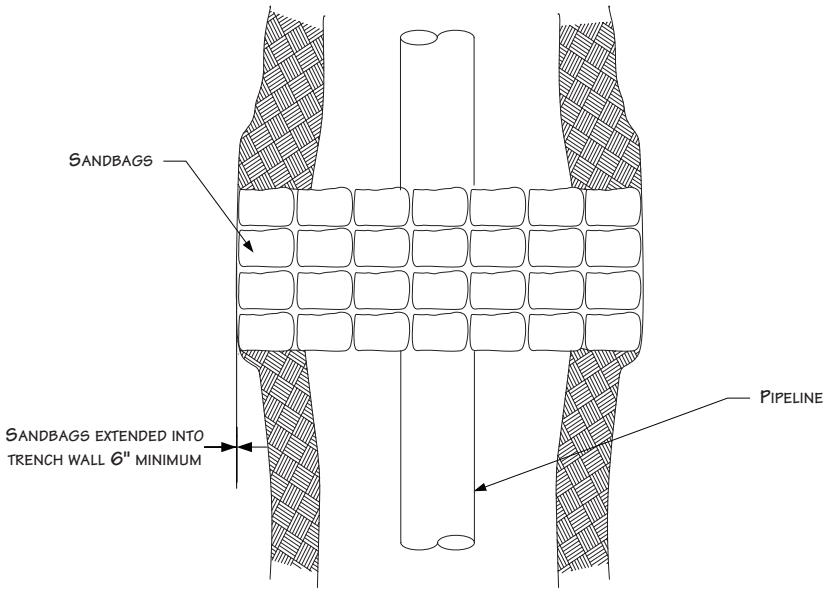
Figure 14
Environmental Mitigation Plan
Typical Trench Breakers - Perspective View

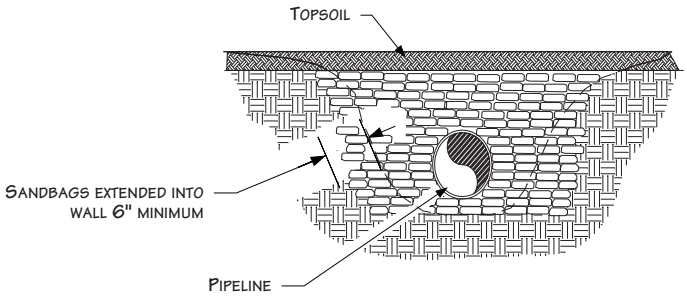
DATE: 5/25/2001
REVISED: 3/11/11
SCALE: NTS
DRAWN BY: KMKENDALL
K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_12_TRENCH_BREAKER_PERSPECTIVE_VIEW.VSD



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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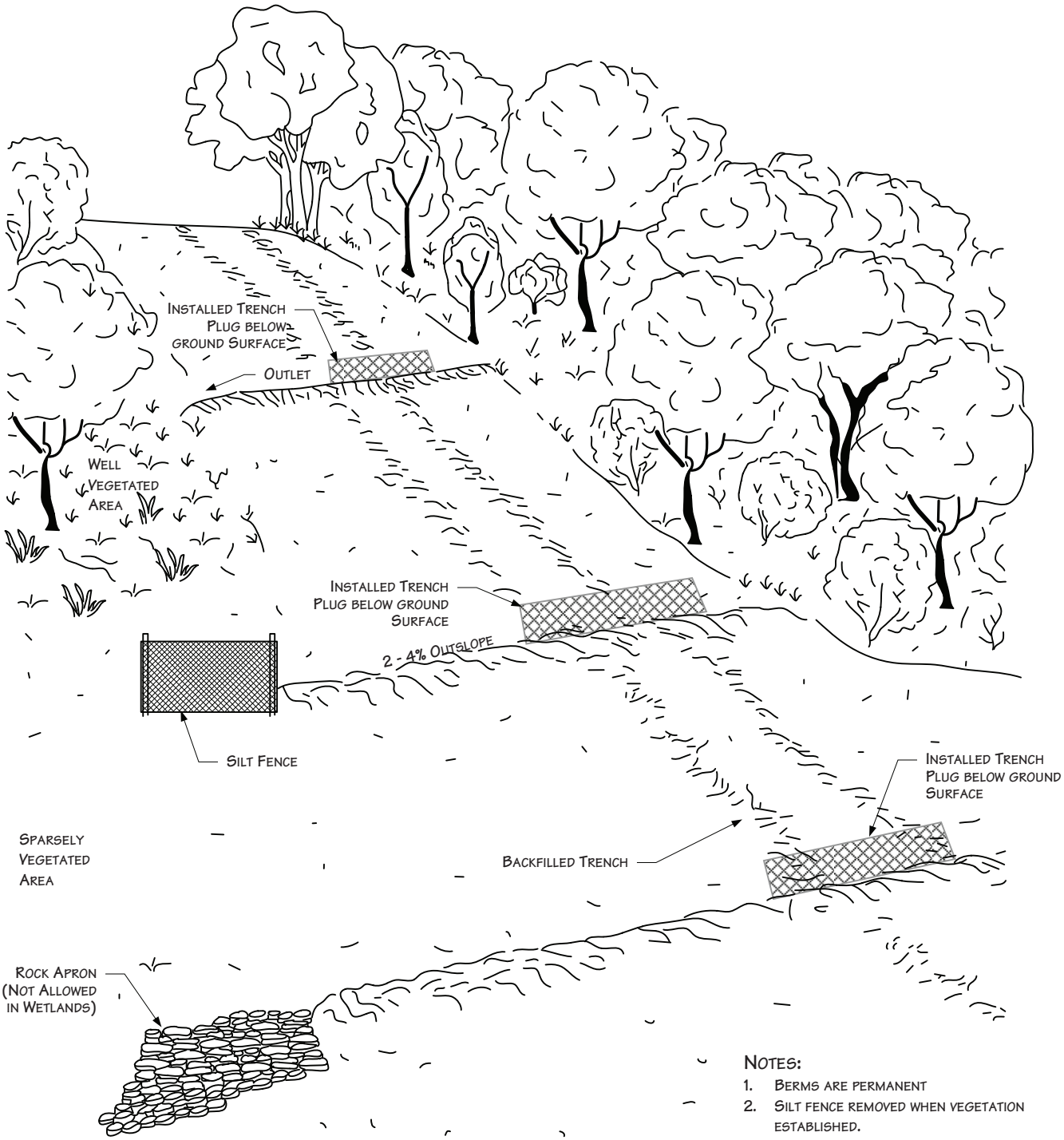
ENBRIDGE

Figure 15
Environmental Mitigation Plan
Typical Trench Breakers – Plan & Profile View

DATE:	11/15/2000
REVISED:	3/11/11
SCALE:	NTS
DRAWN BY:	KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_13_TRENCH_BREAKER_PLAN_PROFILE_VIEW.VSD

NATURAL RESOURCE GROUP



Perspective View

(not to scale)

Slope %	Approximate Spacing (FT)
3-5	250
5-15	200
15-25	150
>25	<100

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.
4. Install silt fence or straw bales at discharge end of earthen berms as necessary to dissipate energy and prevent erosion.

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Figure 16

Environmental Mitigation Plan

Permanent Slope Breakers - Perspective View

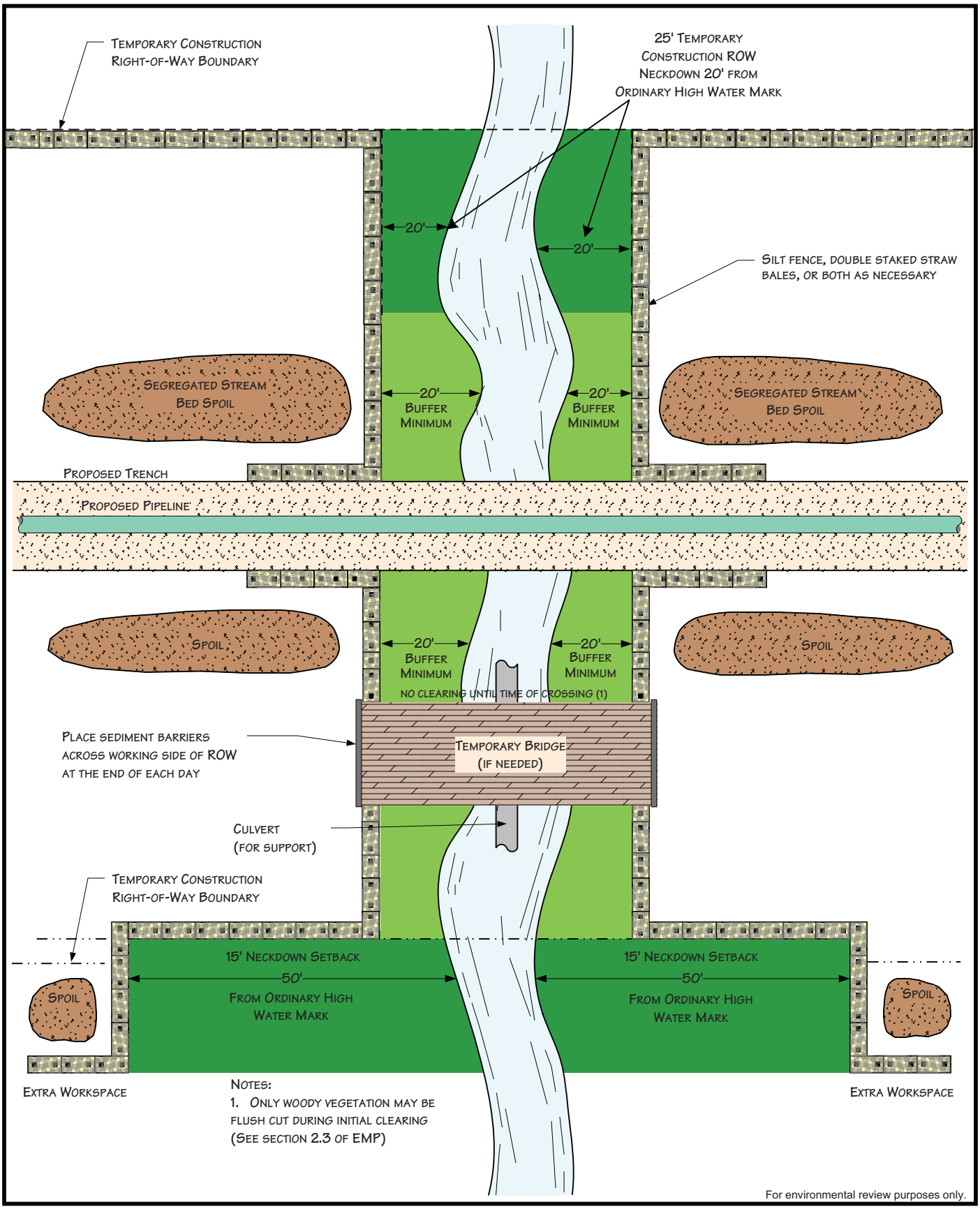
DATE: 5/25/2001

REVISED: 3/11/11

SCALE: NTS

DRAWN BY: KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_14_SLOPE_BREAKERS_PERSPECTIVE_VIEW.VSD



Notes:
1. Only woody vegetation may be flush cut during initial clearing (See section 2.3 of EMP)

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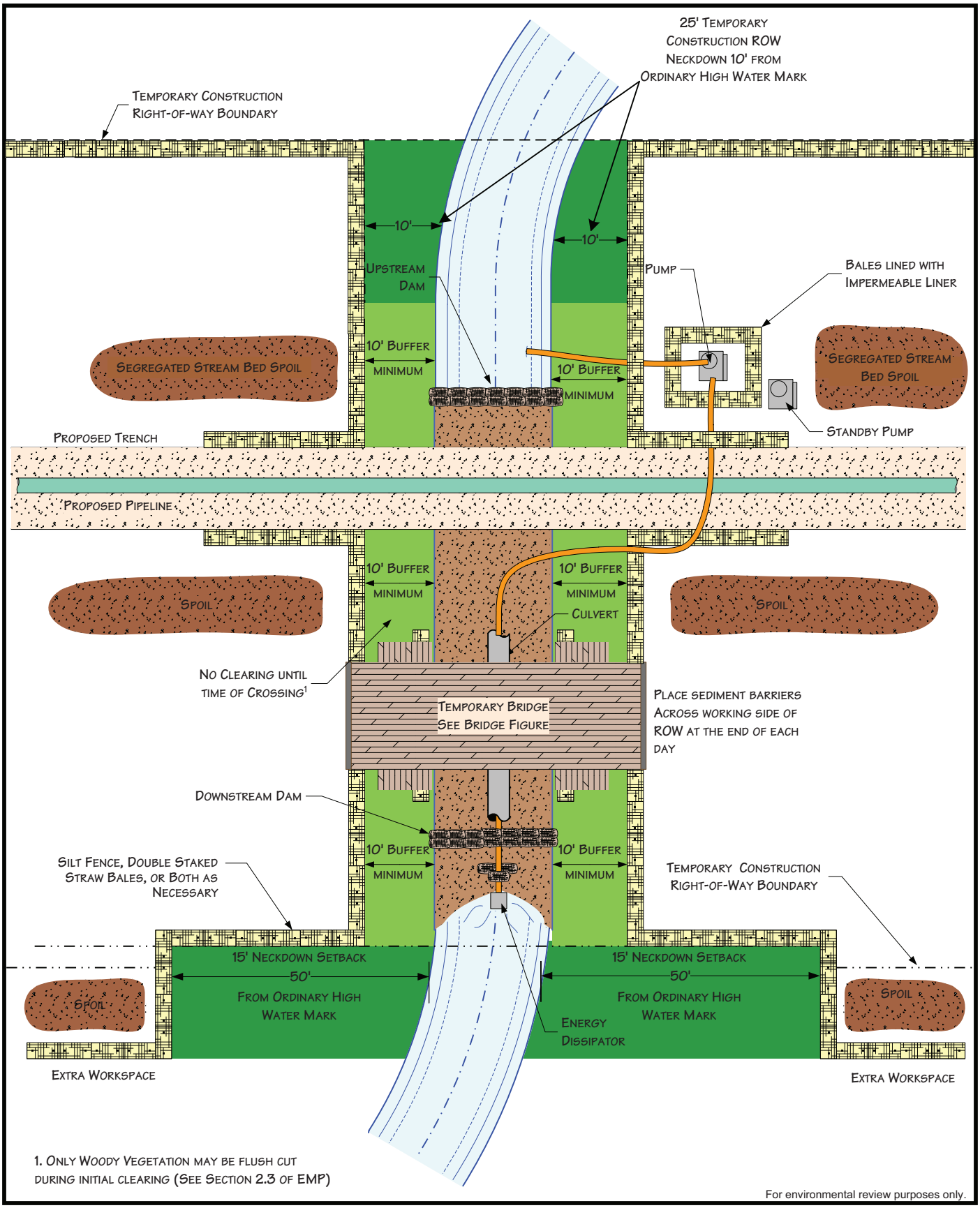
Figure 17
Environmental Mitigation Plan
Typical Waterbody Crossing
Open Cut - Wet Trench Method

DATE:	11/29/2005
REVISED:	3/11/11
SCALE:	NTS
DRAWN BY:	JPB

K:\ CLIENT_PROJECTS\D-F\EEL\2011-019\ FIG_15_WATERBODY_OPENCUT_WETTRENCH.VSD



1. Only woody vegetation may be flush cut during initial clearing (See Section 2.3 of EMP)

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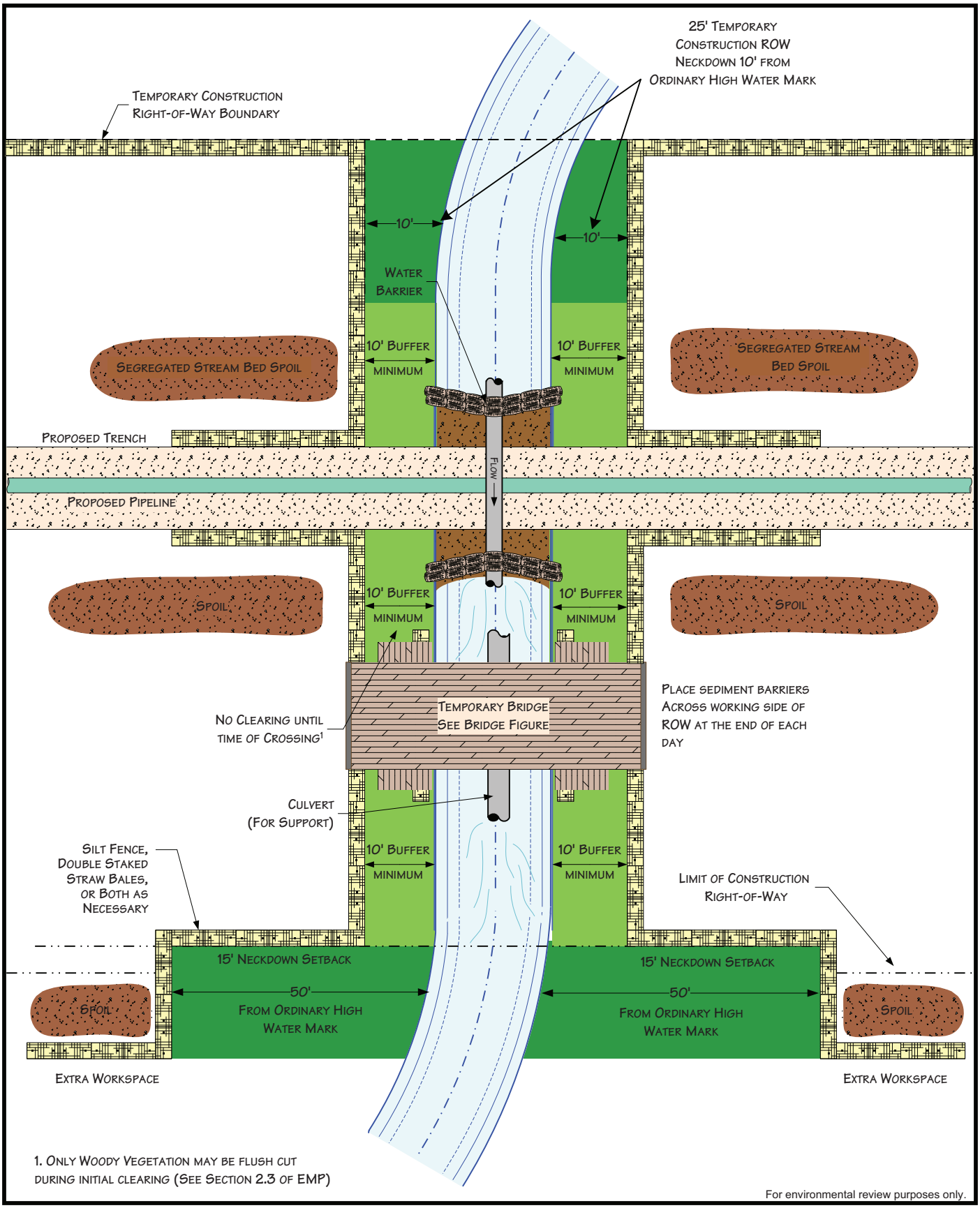
Figure 18
Environmental Mitigation Plan
Typical Waterbody Crossing
Dam and Pump Method

DATE: 11/29/2005
REVISED: 4/20/09
SCALE: NTS
DRAWN BY: JPB

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_16_WATERBODY_DAM_AND_PUMP.VSD



1. Only Woody Vegetation may be flush cut during initial clearing (See Section 2.3 of EMP)

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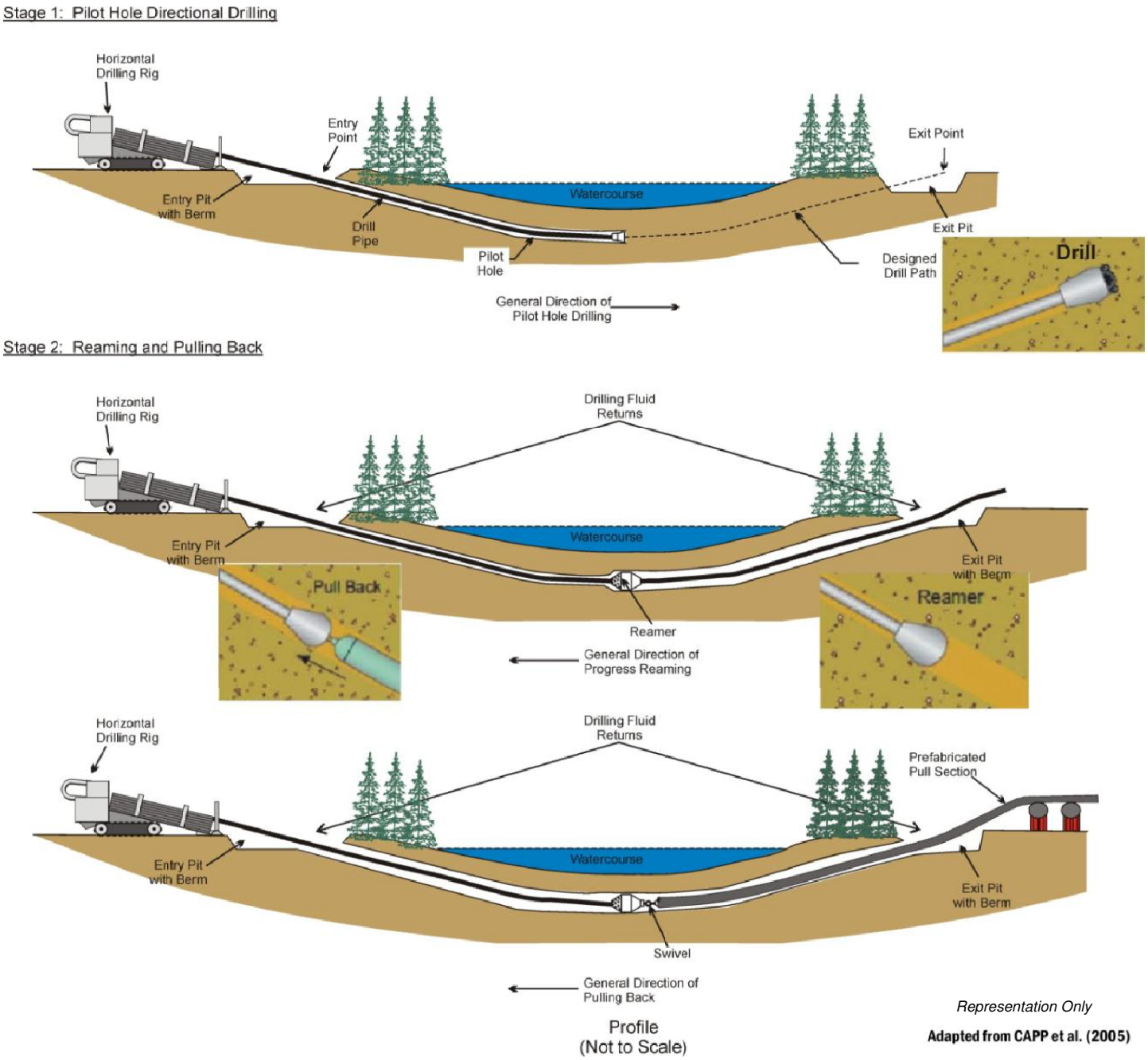
Figure 19
Environmental Mitigation Plan
Typical Waterbody Crossing
Flume Method

DATE:	11/29/2005
REVISED:	3/11/11
SCALE:	NTS
DRAWN BY:	JPB

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_17_WATERBODY_FLUME.VSD



For environmental review purposes only.

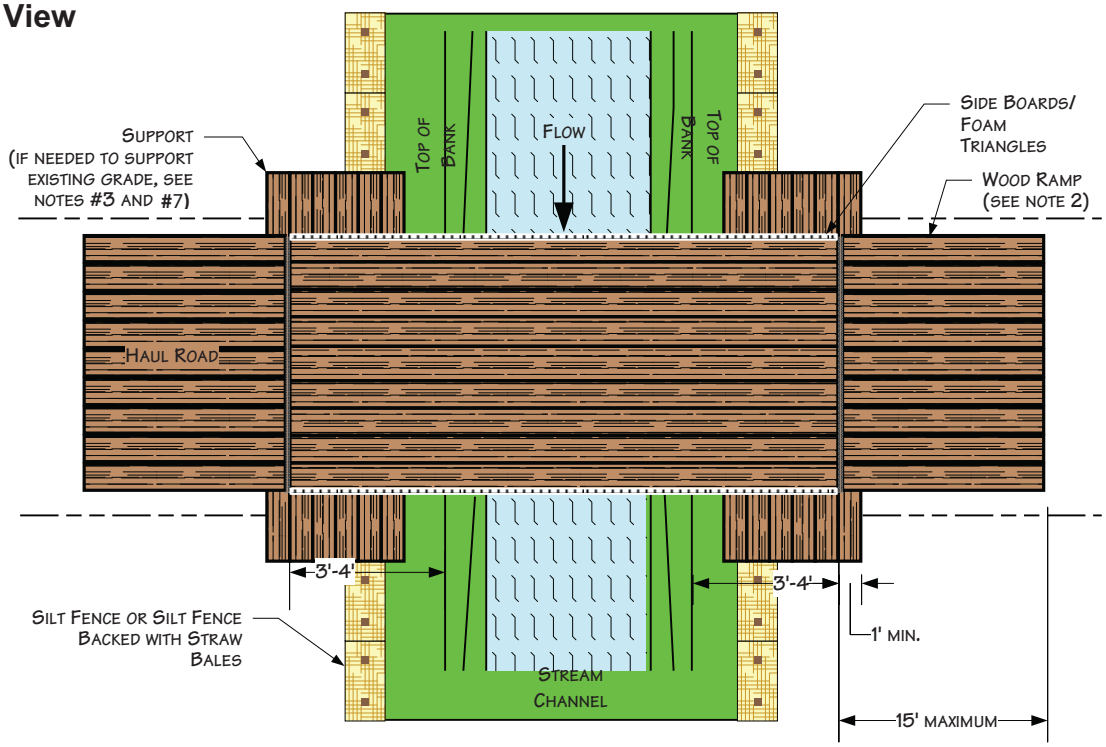
Barr Footer: ArcGIS 10.0, 2013-01-22 10:51 File: I:\Client\Enbridge_Energy\Work_Orders\Dirs\49160146\Work_Orders\EMP_Update\Maps\EMP_Waterbody_Crossing_Directional_Drill.mxd User: jlc

ENBRIDGE™

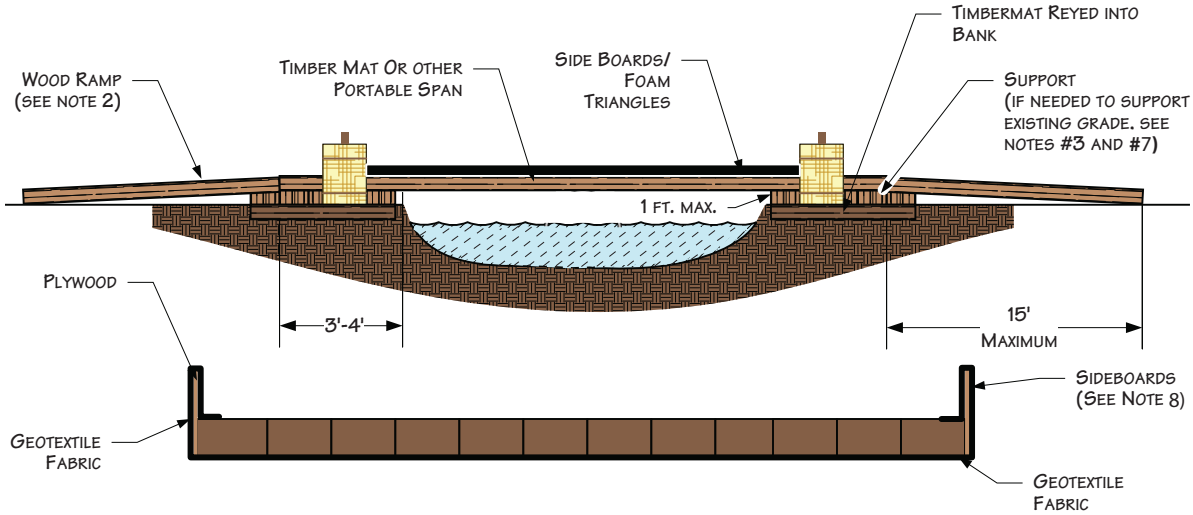
Figure 20
Environmental Mitigation Plan
Typical Waterbody Crossing
Directional Drill Method

Date: 7/14/2000
Revised:11/26/2012
Scale: NTS

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. Earthen ramp cannot be taller than 1' and cannot extend for more than 15' on either side of the crossing.
5. The bridge must span from top of bank to top of bank.
6. Additional support must be added on top of bank and under span if initial support starts to settle.
7. Erosion and sedimentation control measures shall be inspected and maintained in accordance with the company's Environmental Mitigation Plan
8. Sideboards will be installed on temporary bridges to minimize the potential for sediment transport. Sideboards may be constructed out of plywood, or equivalent, and affixed to the outer sides of the bridge. Geo-textile fabric, or equivalent, must also be adequately secured to the underside of the bridge to prevent material from falling through the bridge deck. The geo-textile fabric or an equivalent should be secured to the bottom of the bridge and wrapped around the sideboards in a continuous fashion.

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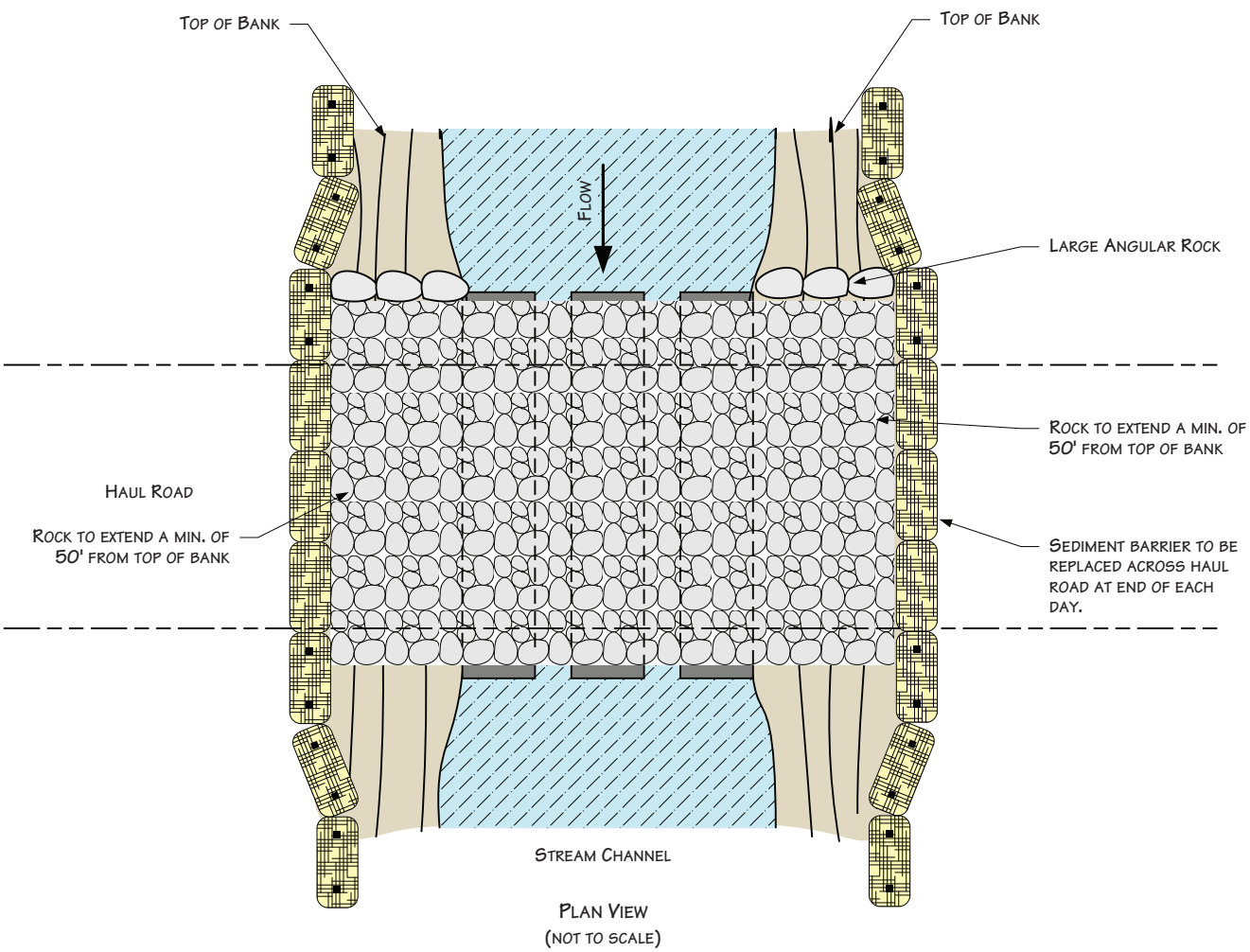
Figure 21

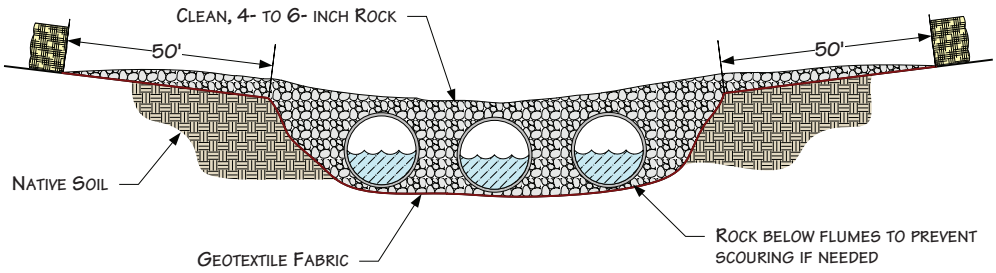
Environmental Mitigation Plan

Typical Span Type Bridge

DATE:	3/11/2003
REVISED:	3/25/2011
SCALE:	NTS
DRAWN BY:	KMK6792

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_19_BRIDGE_SPAN.VSD





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.

For environmental review purposes only.

ENBRIDGE

Figure 22

Environmental Mitigation Plan

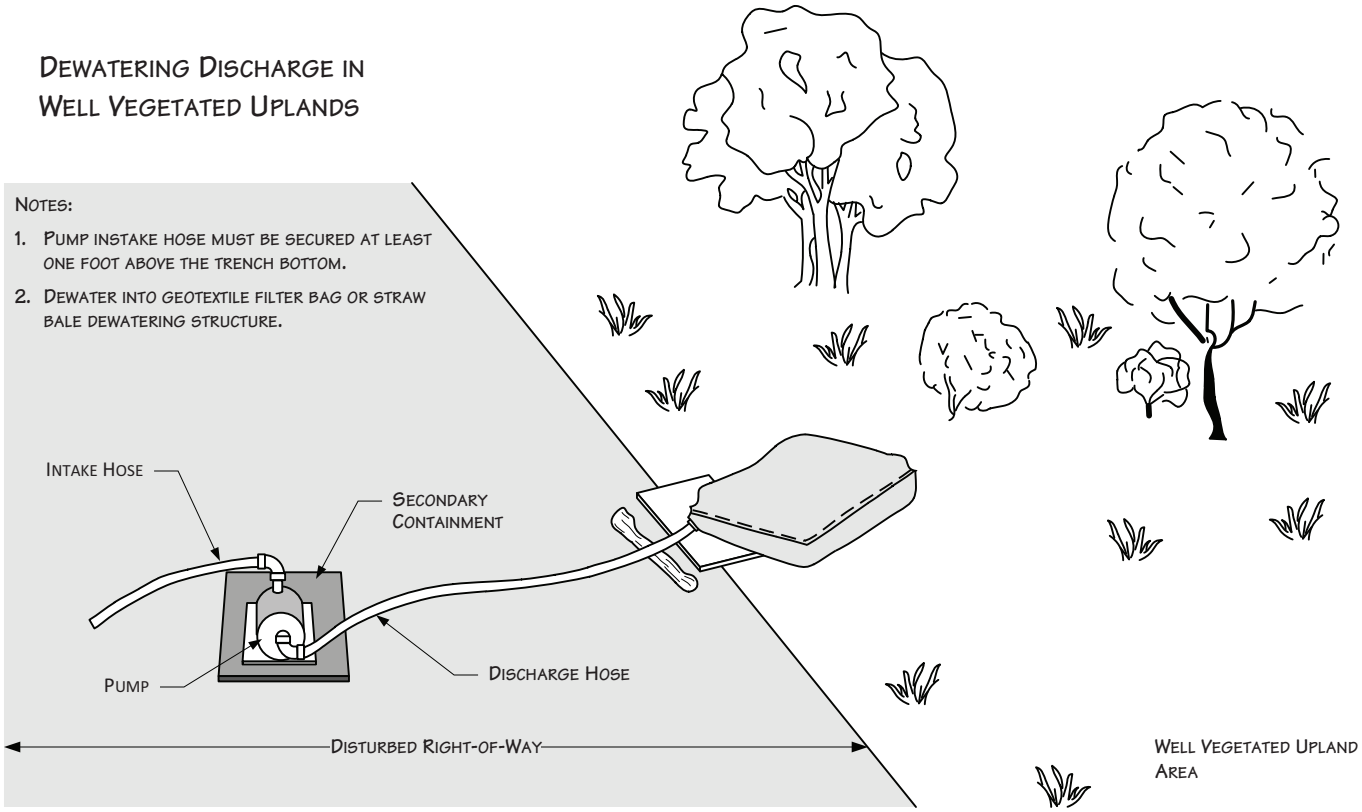
Typical Rock Flume Bridge

DATE:	5/25/2001
REVISED:	3/15/11
SCALE:	NTS
DRAWN BY:	KMKENDALL

NATURAL RESOURCE GROUP

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_20_ROCK_FLUME_BRIDGE.VSD

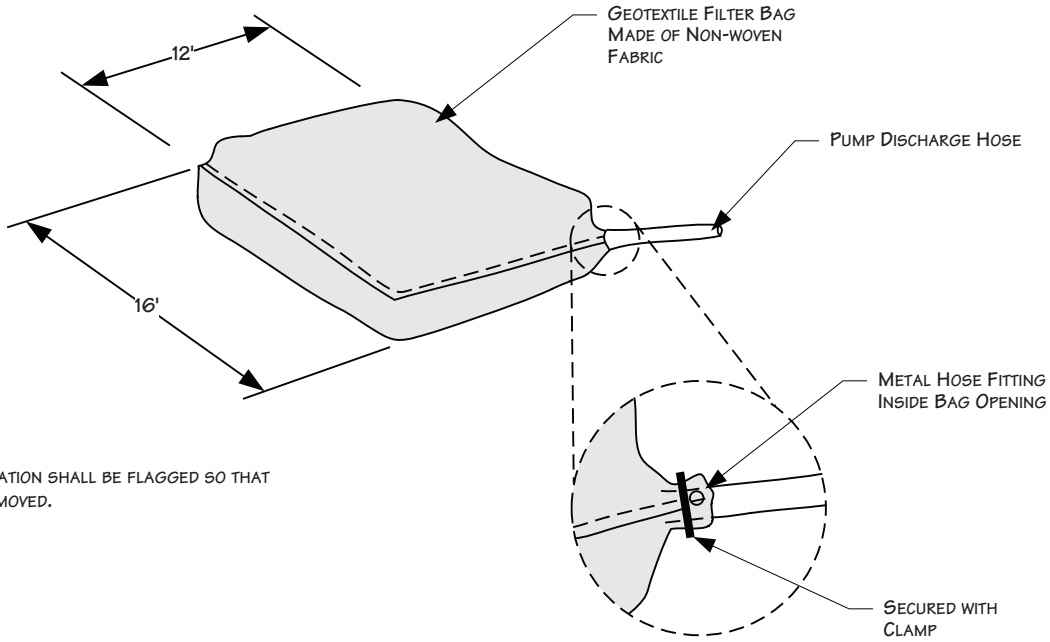
Dewatering Discharge in Well Vegetated Uplands



Notes:

1. Pump intake hose must be secured at least one foot above the trench bottom.
2. Dewater into geotextile filter bag or straw bale dewatering structure.

Geotextile Filter Bag



Note:

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

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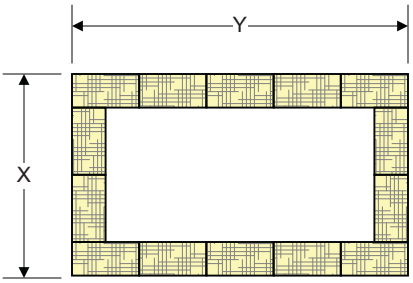
Figure 23
Environmental Mitigation Plan
Typical Dewatering Measures

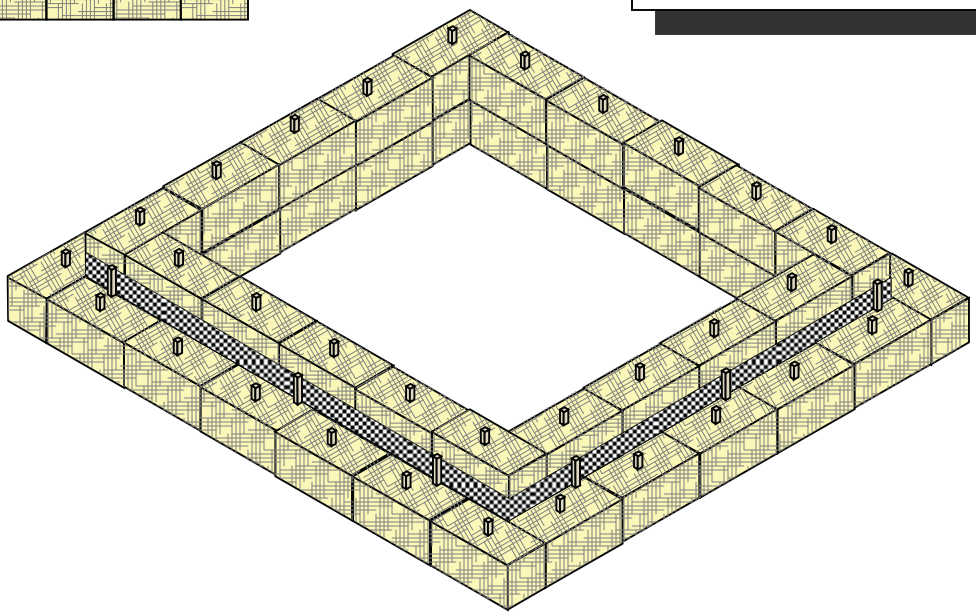
DATE:	5/25/2001
REVISED:	3/15/11
SCALE:	NTS
DRAWN BY:	KMKENDALL

K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_21_DEWATERING_MEASURES.VSD

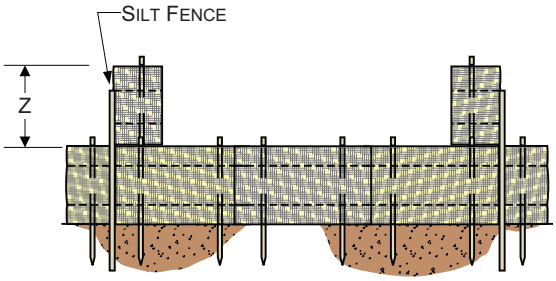


NOTES

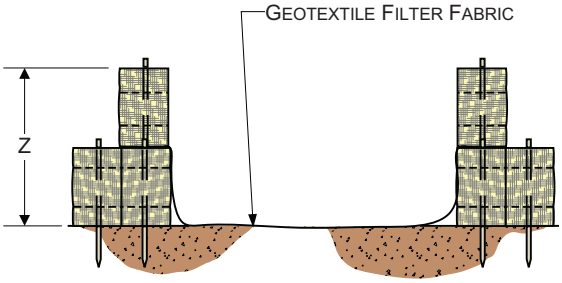
1. ARRANGE THE STRAW BALES TO THE X AND Y DIMENSIONS NECESSARY TO OBTAIN THE REQUIRED STORAGE CAPACITY.
2. IF BOTTOM OF STRUCTURE IS NOT LINED WITH STRAW BALES (OPTION 1), LINE ENTIRE STRUCTURE WITH GEOTEXTILE FILTER FABRIC.



PERSPECTIVE VIEW



OPTION 1



OPTION 2

MINIMUM STRUCTURE CAPACITY X*Y*Z = (CUBIC FEET)	MAXIMUM PUMPING RATE (GALLONS PER MINUTE)
1600	100
2400	150
3200	200
4000	250
4800	300
5600	350
6400	400

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Figure 24A
Environmental Mitigation Plan
Straw Bale Dewatering Structure

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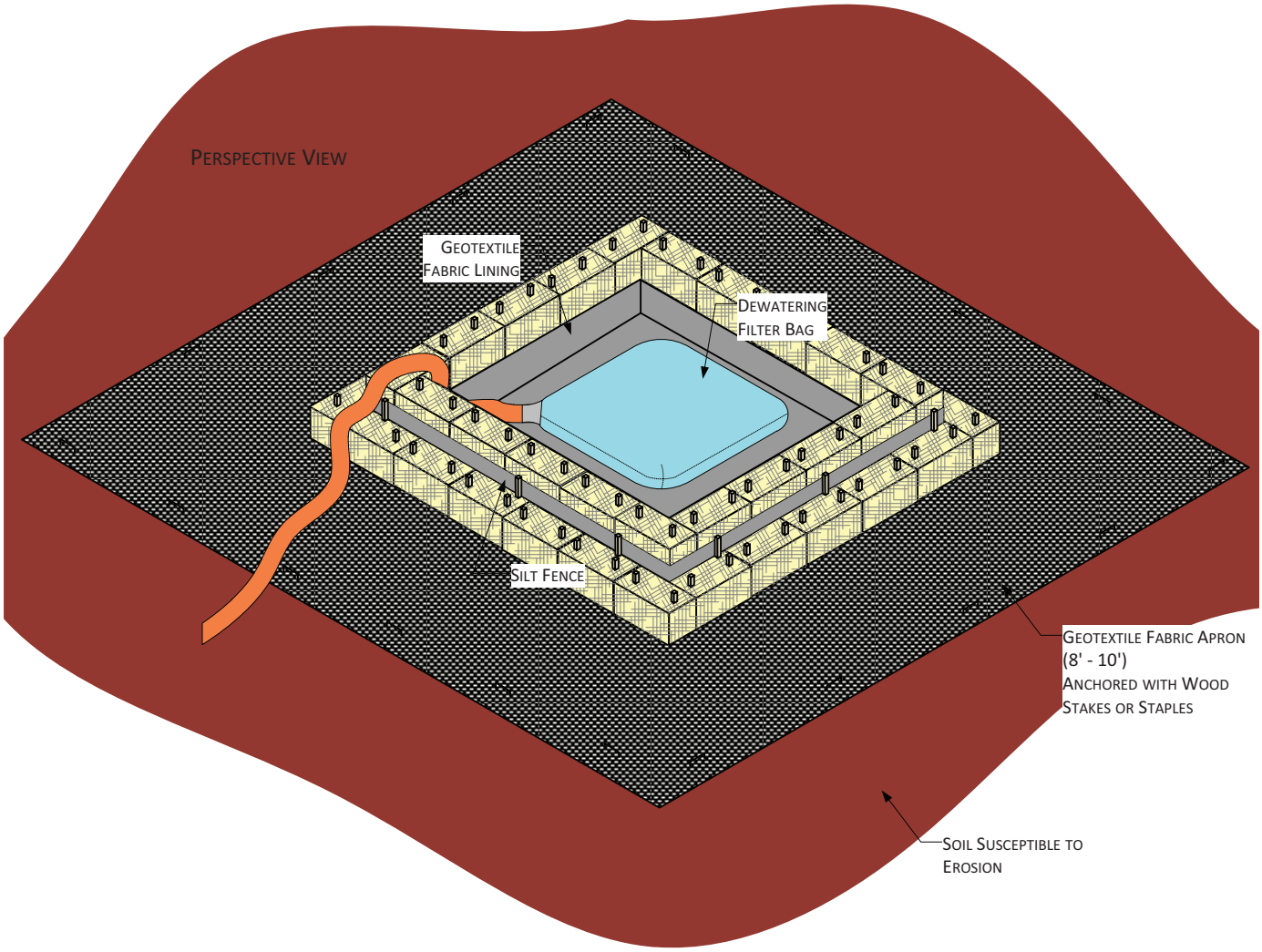
K:_RESTRUCTURED_K_DRIVE\CLIENT_PROJECTS\D-F\EEL\MANHATTAN2STREATOR\EROSION_CONTROL\DEWATERING STRUCTURE.VSD | SCALE: NTS | DATE: 3/11/2003 | REVISED: 9/25/2009 | DRAWN BY: KJANDERSON



Construct Dewatering Structure to accommodate anticipated pumping rates. See example below.

Example Pumping rate = 200 g.p.m.
Storage volume (c.f.) = 16 x 200 g.p.m. = 3200 c.f.
Height of straw bale structure = 3 feet (2 bales stacked) (based on height of bales, not silt fence)
Inside dimensions of structure = 33 x 33 feet square

Notes:

1. Silt fence ends must be wrapped to join two sections.
2. Install silt fence 2 inches above top of straw bales, and anchor a minimum of 8 inches straight down.
3. Silt fence post staking must be 4 feet or less.
4. Dewatering intake hose supported at least 1 foot from bottom of trench being dewatered.
5. Erosion and sedimentation control measures shall be inspected and maintained in accordance with the company's upland erosion control, revegetation, and maintenance plan.

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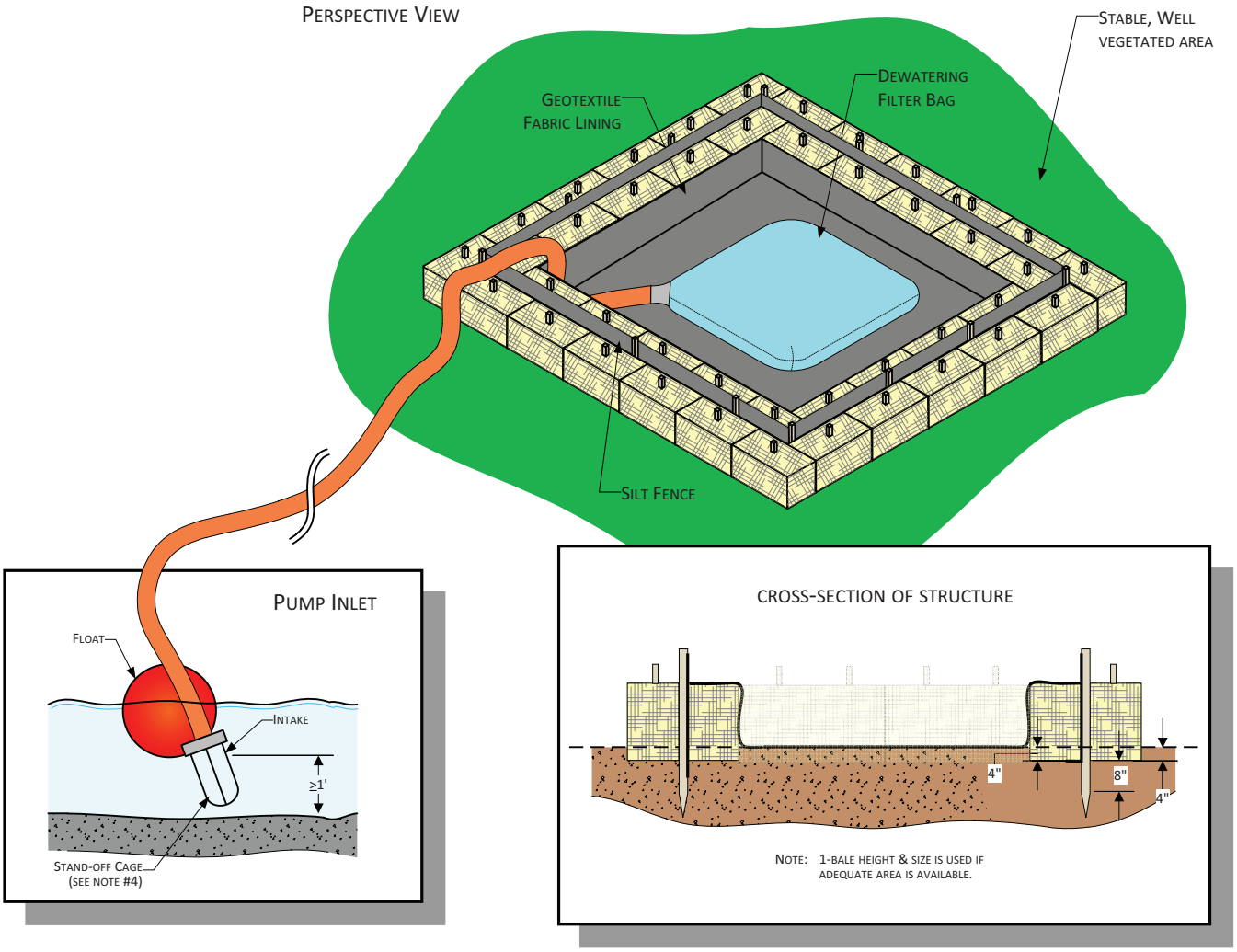
Figure 24B
Environmental Mitigation Plan
Straw Bale Dewatering Structure

ENBRIDGE

NATURAL RESOURCE GROUP

K:_CLIENT_PROJECTS\D-FIEEL\2011-019\
FIG_22_STRAW_BALE_DEWATERING_STRUCTURE_C.VSD

SCALE: NTS	DATE: 3/11/2003	REVISED: 3/25/2011	DRAWN BY: KJANDERSON



CONSTRUCT DEWATERING STRUCTURE TO ACCOMMODATE ANTICIPATED PUMPING RATES. SEE EXAMPLE BELOW.

EXAMPLE PUMPING RATE = 200 G.P.M.
STORAGE VOLUME (C.F.) = 16 X 200 G.P.M. = 3200 C.F.
HEIGHT OF STRAW BALE STRUCTURE = 1.5 FEET (1 BALE) (BASED ON HEIGHT OF BALES, NOT SILT FENCE)
INSIDE DIMENSIONS OF STRUCTURE = 46 X 46 FEET SQUARE

NOTES:

1. SILT FENCE ENDS MUST BE WRAPPED TO JOIN TWO SECTIONS.
2. INSTALL SILT FENCE 2 INCHES ABOVE TOP OF STRAW BALE, AND ANCHOR A MINIMUM OF 8 INCHES STRAIGHT DOWN.
3. SILT FENCE POST STAKING MUST BE 4 FEET OR LESS.
4. DEWATERING INTAKE HOSE SUPPORTED AT LEAST 1 FOOT FROM BOTTOM OF TRENCH BEING DEWATERED.
5. USE A FILTER BAG AT THE DISCHARGE HOSE END.
6. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE COMPANY'S UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN.

For environmental review purposes only.

Figure 24C
Environmental Mitigation Plan
Straw Bale Dewatering Structure

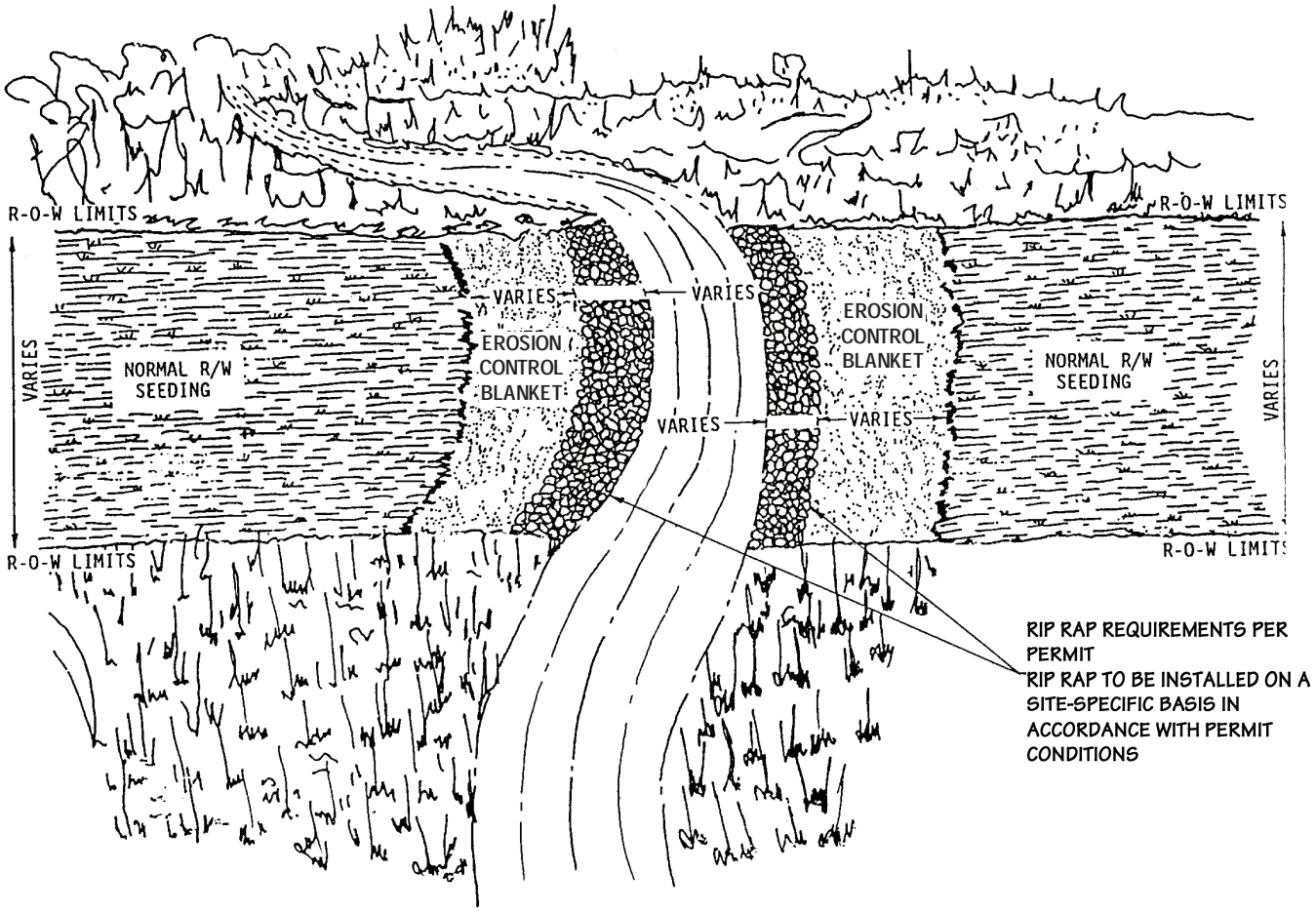
ENBRIDGE

NATURAL RESOURCE GROUP

K:_CLIENT_PROJECTS\D-FIEEL\2011-019\
FIG_22_STRAW_BALE_DEWATERING_STRUCTURE_C.VSD

SCALE: NTS	DATE: 3/11/2003	REVISED: 3/25/2011	DRAWN BY: KJANDERSON

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.



RIP RAP REQUIREMENTS PER PERMIT
RIP RAP TO BE INSTALLED ON A SITE-SPECIFIC BASIS IN ACCORDANCE WITH PERMIT CONDITIONS

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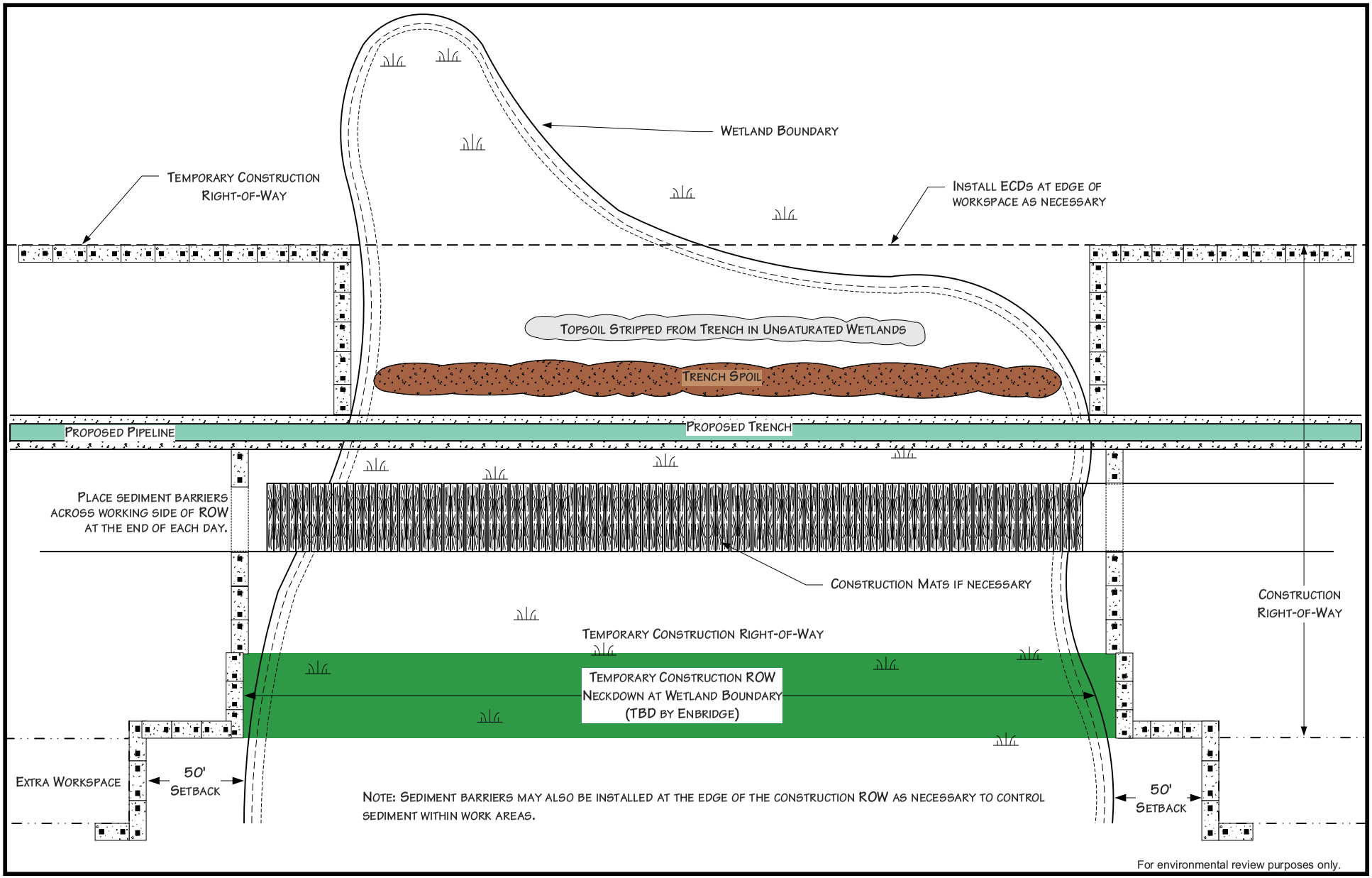
Figure 25
Environmental Mitigation Plan
Typical Final Stream Bank Stabilization
Rip Rap & Erosion Control

DATE: 7/19/2000
REVISED: 3/14/11
SCALE: NTS
DRAWN BY: KMKENDALL
K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_23_STREAM_BANK_STABILIZATION.VSD

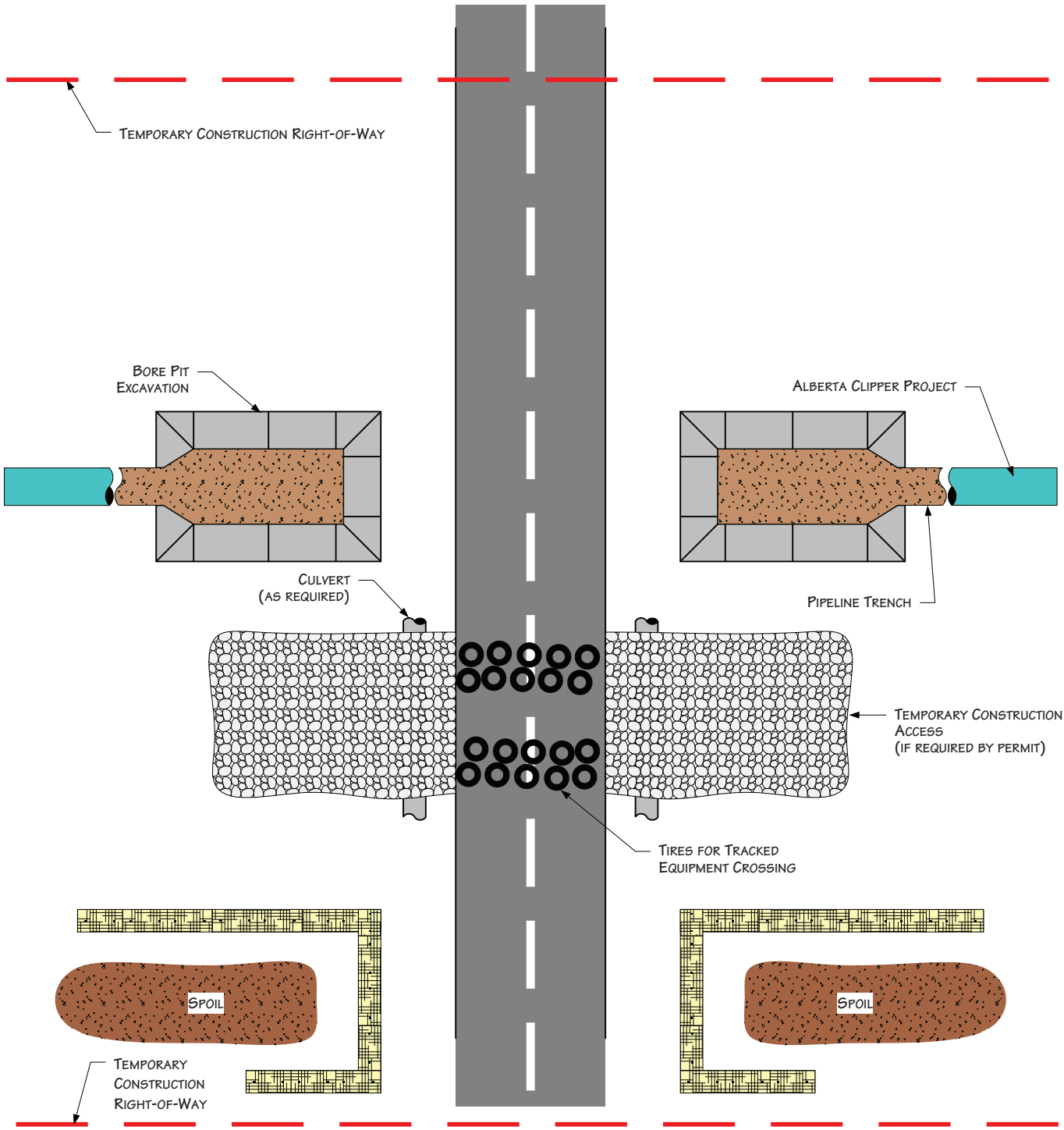
NATURAL RESOURCE GROUP



ENBRIDGE

Figure 26
Environmental Mitigation Plan
Typical Wetland Crossing Method

DATE: 5/25/2001
REVISED: 3/14/11
SCALE: NTS
DRAWN BY: KMKENDALL
K:_CLIENT_PROJECTS\D-F\EEL\2011-019\FIG_24_WETLAND_CROSSING_METHOD.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 27
Environmental Mitigation Plan
Typical Improved Road Crossing
Directional Bore Method

DATE: 7/13/1999
REVISED: 3/14/11
SCALE: NTS
DRAWN BY: KMKENDALL

NATURAL RESOURCE GROUP

K:\ CLIENT_PROJECTS\D-F\EEL\2011-019\ FIG_25_IMPROVED_ROAD_BORE_CROSSING.VSD

Appendix A

Seed Mixes

Table 1 – Temporary Cover Crop Species and their recommended rates

Species Name	Pure Live Seed (Pounds Per Acre)
Oats (cool-season)	80
Annual ryegrass (cool-season)	20
Winter wheat (cool-season)	60
Sudangrass (warm-season)	30
Millet (warm-season)	30
[1]Species can be mixed together and individual rates reduced proportionally to the amount in the mix.	

Table 2 – Construction Area Standard Upland Seed Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	% of Seed
Perennial Ryegrass (*Lolium perenne*)	2	17%
Canada Wild-rye (*Elymus canadensis*)	4	33%
Switchgrass (*Panicum virgatum*) (unimproved native variety)	4	33%
Timothy (*Phleum pratense*)	2	17%
Total	12 pounds	100%
Associated Companion Crop Mix		
Oats *if summer seeding* (*Avena sativa*) or Winter Wheat *if late fall (dormant) or spring seeding* (*Triticum aestivum*)	16	80%
Annual Ryegrass (*Lolium italicum*), or Slender Wheat Grass (*Elymus trachycaulus*)	4	20%
Companion/Cover Crop Total	20	100%
GRAND TOTAL	32 pounds	100%

Table 3 – Residential Area Upland Seed Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	% of Seed
Kentucky Bluegrass *(Poa pratensis)*	80	53%
Perennial Ryegrass *(Lolium perenne)*	30	20%
Creeping Red Fescue *(Festuca rubra)*	35	23%
Annual Rye Grass *(Lolium italicum)*	5	3%
GRAND TOTAL	150	100%

Table 4 – Livestock Grazing and Hay Production Areas Upland Seed Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	% of Seed
Orchard Grass *(Dactylis glomerata)*	6	30%
Vernal Alfalfa (*Medicago sativa)*	2	10%
Climax Timothy *(Phleum pretense)*	3	15%
Tetraploid Perennial Ryegrass *(Lolium perenne)*	4	20%
Alsike Clover *(Trifolium hybridum)*	2	10%
Medium Red Clover *(Trifolium pretense)*	3	15%
Total	20	100%
Associated Cover Crop Mix		
Oats *if summer seeding* (*Avena sativa)* or Winter Wheat *if late fall (dormant) or spring seeding* *(Triticum aestivum)*	16	80%
Annual Ryegrass *(Lolium italicum)*, or Slender Wheat Grass (*Elymus trachycaulus)*	4	20%
Cover Crop Total	20	100%
GRAND TOTAL	40	100%

Table 5 – Wildlife Area Upland Seed Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	% of Seed
Red Clover *(Trifolium pretense)*	4.5	30%
Alsike Clover *(Trifolium hybridum)*	4.5	30%
White Clover (*Trifolium repens)*	4.5	30%
Creeping Red Fescue *(Festuca rubra)*	1.5	10%
Total	15	100%
Associated Cover Crop Mix		
Oats *if summer seeding* (*Avena sativa)* or Winter Wheat *if spring seeding* *(Triticum aestivum)*	16	80%
Annual Ryegrass *(Lolium italicum)*, Annual Alfalfa (*Medicago sativa*), or Slender Wheat Grass (*Elymus trachycaulus)*	4	20%
Cover Crop Total	20	100%
GRAND TOTAL	35	100%

Table 6 – Native Area Seed Mix [1/]

Seed Name	Pure Live Seed (Pounds Per Acre)	% of Seed
Big Bluestem *(Andropogon gerardi)*	4	44%
Western Wheatgrass ***(Pascopyrum smithii)***	4	29%
Switchgrass *(Panicum virgatum)*	0.5	12%
Canada Wildrye *(Elymus canadensis)*	2	15%
Purple Prairie Clover *(Dalea purpureum)*	2 (ounces)	
Total	10.5 pounds	100%
Associated Cover Crop Mix		
Oats *if summer seeding* (*Avena sativa)* or Winter Wheat *if spring seeding* *(Triticum aestivum)*	16	80%
Slender Wheat Grass (*Elymus trachycaulus)*	4	20%
Cover Crop Total	20	100%
GRAND TOTAL	30.5 pounds	100%

1/ Applicable seeding dates: May 1 to June 30 or dormant seeding after soil temperatures are below 55 degrees Fahrenheit, but the ground is not frozen.

Table 7 – Roadside Seed Mix

Seed Name	Pure Live Seed (Pounds Per Acre)	% of Seed
Kentucky Bluegrass – Certified Park (*Poa pratensis*)	22.3	32%
Canada Bluegrass (*Poa compressa*)	9.8	14%
Switch grass (*Panicum virgatum*)	2.1	3%
Slender Wheatgrass (*Elymus trachycaulus*)	2.8	4%
Perennial Rye-grass (*Lolium perenne*)	14.7	21%
Timothy (*Phleum pratense*)	2.1	3%
Redtop (*Agrostis gigantea*)	2.1	3%
Creeping Alfalfa (*Medicago sativa*)	4.2	6%
White clover (*Trifolium repens*)	2.1	3%
Hairy Vetch (*Vicia villosa)*	7.8	11%
Total	70 pounds	100%
Associated Cover Crop Mix		
Oats *if summer seeding* (*Avena sativa)* or Winter Wheat *if spring seeding* *(Triticum aestivum)*	16	80%
Annual Ryegrass *(Lolium italicum)*, Annual Alfalfa (*Medicago sativa*), or Slender Wheat Grass (*Elymus trachycaulus)*	4	20%
Cover Crop Total	20	100%

Appendix B

Spill Report Form

ENBRIDGE ENERGY, LIMITED PARTNERSHIP
Spill Report Form

Date of Spill:_____ Date of Spill Discovery:_____

Time of Spill:_____ Time of Spill Discovery:_____

Name and Title of Discoverer:_____

Type of material spilled and manufacturer's name:_____

Legal Description of spill location to the quarter section:_____

Directions from nearest community:_____

Estimated volume of spill:_____

Weather conditions:_____

Topography and surface conditions of spill site:_____

Spill medium (pavement, sandy soil, water, etc.):_____

Proximity of spill to surface waters: _____

Did the spill reach a waterbody? _____Yes _____No

If so, was a sheen present? _____Yes _____No

Describe the causes and circumstances resulting in the spill:_____

_____

_____

Describe the extent of observed contamination, both horizontal and vertical (i.e., spill-stained soil in a 5-foot radius to a depth of 1 inch): _____

_____

_____

Describe immediate spill control and/or cleanup methods used and implementation schedule: _____

_____

Current status of cleanup actions:_____

Name and Company for the following:

Construction Superintendent:_____

_____

Spill Coordinator:_____

_____

Enbridge Representative:_____

Person Who Reported the Spill:_____

_____

Environmental Inspector:_____

Form completed by:_____Date:_____

Spill Coordinator must complete this for any spill, regardless of size, and submit the form to the Enbridge Representative within 24 hrs of the occurrence.