Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

ENVIRONMENTAL PROTECTION PLAN

TUNDRA ENERGY MARKETING LIMITED, PIPELINE PROJECT
WASKADA PIPELINE 11-30-001-25 W1M TO 14-19-001-25 W1M

Report Prepared for:
TUNDRA ENERGY MARKETING LIMITED

Prepared by:
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November 2013
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DISCLAIMER

We certify that this report is accurate and complete and accords with the information available during the site investigation. Information obtained during the site investigation or provided by third parties is believed to be accurate but is not guaranteed. We have exercised reasonable skill, care and diligence in assessing the information obtained during the preparation of this report.

This report was prepared for Tundra Energy Marketing Limited. The report may not be relied upon by any other person or entity without our written consent and that of Tundra Energy Marketing Limited. Any uses of this report by a third party, or any reliance on decisions made based on it, are the responsibility of that party. We are not responsible for damages or injuries incurred by any third party, as a result of decisions made or actions taken based on this report.

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1 INTRODUCTION

Tundra Energy Marketing Limited is constructing 1.01 km of pipeline within a 25 m pipeline right-of-way (RoW; the Project) that will be used to transport product from the 11-30-001-25 W1M battery site to the 14-19-001-25 W1M riser site.

This pipeline environmental protection plan (EPP) describes the environmental protection procedures, mitigation measures and monitoring commitments to be implemented during the construction of the pipeline.

2 PURPOSE

This EPP addresses the potential effects from pipeline construction identified in *Tundra Energy Marketing Limited 11-30-001-25 W1M to 14-19-001-25 W1M Proposed Pipeline Pre-development Assessment Summary Letter* (Matrix 2013) and from regulatory responses.

2.1 Project Environmental Setting

The pipeline is located in the Aspen Parkland Ecoregion of Canada (Environment Canada 2000). This ecoregion is a transitional area between the boreal forest and grasslands ecoregions. A large proportion of this ecoregion has been converted to agricultural land uses; however patches of aspen parkland remain in a native condition. Native patches are characterized by stands of trembling aspen, bur oak, Manitoba maple and mixed tall shrubs intermixed with fescue grasslands. Stands of trembling aspen, Manitoba maple and tall shrubs occur throughout the region on a variety of sites while grasslands occupy increasingly drier sites. Stands of Bur oak are typically associated with richer soils located along bottomland habitats such as riparian areas and floodplains.

2.2 Extent and Limits of the Environmental Protection Plan

Unforeseen conditions or circumstances during construction may warrant the revision of a specific mitigation measure noted in this EPP or require additional mitigation measures in order to satisfactorily mitigate the effects of the construction program. In the event that an unforeseen condition or circumstance arises during construction for which no mitigation measures have been approved, the Project Manager, Contractor and the Environmental Monitor will develop an action plan, including mitigation measures, in consultation with the appropriate regulator, if necessary.

2.3 Change Management

If a conflict arises between the construction contract documents and the environmental requirements (including but not limited to applications, the EPP, approvals, permits and/or licence conditions)

regarding an environmental protection measure or environmental requirements, the more rigorous protection measure will take precedence.

During construction, if it is determined an EPP requirement cannot be met or new procedures are required to address site conditions not anticipated in the EPP:

- contact the eEnvironmental mMonitor immediately
- develop mitigation to address the change in cooperation with the Construction Manager, Environmental Monitor, Project Manager and the Contractor
- the change management procedure must not conflict with regulatory approval, permitting, licence and/or authorization conditions
- as required, the change will be discussed with the appropriate regulator

Revisions to permits, approvals or authorizations may be required as construction and time scheduling and/or construction methods are refined. The Contractor and Construction Manager will be responsible for complying with revised requirements.

3 ENVIRONMENTAL COMPLIANCE

Environmental compliance is a critical component for Project success. Tundra will ensure compliance with environmental commitments, procedures, mitigation measures and conditions of permits, approvals, licences or authorizations and applicable environmental regulations.

3.1 Environmental Inspection During Construction

Environmental Monitors will be commissioned by Tundra to ensure that the mitigation measures presented in this EPP, the pre-development assessment letter (Matrix 2013), alignment sheets, permits, licences and approvals are properly implemented.

3.2 Identification and Reporting of Environmental Incidents

The incident and the person who witnesses the incident shall report it immediately to the Eenvironmental Monitor and Construction Manager or designate. Environmental incidents include, but are not limited to:

- Any release or leak, on or offsite, directly related or attributable to the Project.
- Any activity conducted that is not in compliance with environmental regulations, permits, authorizations, approvals, company environmental procedures, this pipeline EPP and/or Project environmental commitments (as communicated to an external stakeholder or regulator).
- Any incident that results in an impact to fish, wildlife or the environment (air, land or water).

The Project Manager will work with the Environmental Monitor and Construction Manager or designate to direct corrective and/or emergency action to be taken in the field, and will determine what regulatory reporting is required. If the incident requires regulatory reporting, the Environmental Monitor shall conduct the appropriate reporting, within the appropriate timeframes.

3.3 Emergency Contact Information

Organization	Contact Number
Manitoba Conservation and Water Stewardship Environmental Emergency Line	204.944.4888
Environment Canada Environmental Emergencies - Manitoba	403.468.8020

3.4 Regulator Contact Information

Organization	Contact	Contact Number	Position
Manitoba Department of Conservation and Water Stewardship	Dee Genaille	204.726.6177	Environmental Officer
Manitoba Department of Conservation and Water Stewardship	Eugene Kozera	204.946.7474	Water Control Systems Management Branch
Manitoba Department of Conservation and Water Stewardship	Rob Matthews	204.945.6118	Water Use Licensing
Manitoba Department of Conservation and Water Stewardship	Laureen Janusz	204.945.7789	Fisheries Biologist
Manitoba Department of Conservation and Water Stewardship	Wendy Ralley	204.945.8146	Water Quality Management
Manitoba Department of Conservation and Water Stewardship	Bruno Bruederlin	204.726.6452	Regional Fisheries Biologist
Manitoba Department of Conservation and Water Stewardship	Ed MacKay	204.726.6226	C.E.T., Senior Water Resource Officer
Fisheries and Oceans Canada	Jeff Hovdebo	306.780.8107	Senior Habitat Biologist

4 PIPELINE CONSTRUCTION ENVIRONMENTAL PROTECTION MEASURES

Unless otherwise noted, the Contractor will be responsible for implementing the mitigation measures noted in Section 4 of the Pipeline EPP.

4.1 Decision Criteria

Tundra and the construction Contractor will consider the following criteria when deciding which protection measure(s) and/or procedures to implement during construction of the pipeline:

- site conditions at the time of construction (i.e., soil texture, water table depth)
- weather conditions at the time of construction (i.e., wind, precipitation, air temperature)
- equipment and/or material availability at the time of construction
- contractor experience with conducting specific construction techniques

In the event that an unforeseen environmental issue arises during construction for which no mitigative measures have been approved, the Environmental Monitor will determine a plan of action in consultation with the appropriate government agencies, if necessary. Refer to Section 2.3 - Change Management for information regarding how unforeseen environmental issues will addressed during construction.

4.2 General Mitigation Measures

General mitigation measures, where warranted, have been developed to address both the resource-specific and general issues identified during the environmental assessment. The following subsections describe how the results of environmental assessment have been incorporated into management and protection measures for the Project and to ensure they are implemented during construction of the pipeline.

4.2.1 Wildlife

- A qualified biologist will complete a reconnaissance level investigation to identify potential impacts to wildlife and wildlife habitat.
- Prohibit construction personnel from harming, harassing or feeding wildlife. Do not allow pets, firearms or recreational use of all-terrain vehicles or snowmobiles during construction of the pipeline.
- Establish construction traffic speed limits and post speed limits on access roads to reduce the risk of collisions with wildlife.
- Report any incidents or collisions with wildlife to the Environmental Monitor, who will notify local wildlife authorities and the local police department, as appropriate.
- Remove trapped animals from the trench at the start of each day before conducting construction activities that may have the potential to harm an animal in the trench.
- Collect construction garbage daily and dispose of in approved locations to prevent attracting nuisance wildlife. Report scavenging or dangerous wildlife along with the location and details to regional wildlife authorities and, if appropriate, the local police department.

4.2.2 Spill Prevention and Management

Spills of hazardous materials during construction have the potential to affect environmental resources such as soil, wetlands, vegetation, wildlife habitat and aquatic ecosystems.

- Ensure that no fuel, lubricating fluids, hydraulic fluids, antifreeze, herbicides, biocides or other chemicals are dumped on the ground or into any watercourse.

- Maintain appropriate spill equipment at all worksites. Assess the risk potential for site-specific spills to determine the appropriate type of response equipment to be stored onsite and suitable location for storage.

- Refuel and service mobile equipment a minimum of 100 m from water bodies.

- Employ the following measures to reduce the risk of fuel spills:
  - all containers, hoses and nozzles are free of leaks;
  - all fuel nozzles are equipped with automatic shut-offs;
  - operators are stationed at both ends of the hose during fuelling unless the ends are visible and readily accessible by one operator; and
  - fuel remaining in the hose is returned to the storage facility.

- Report all spills, regardless of size, to the Environmental Monitor and the Manitoba Conservation Environment Officer in accordance with the requirements of Manitoba Regulation 439/87 respecting Environmental Accident Reporting.

- Do not dispose of petroleum products or waste into waterways or on the ground.

4.2.3 Waste Management

Tundra is committed to the proper management of all company wastes, which are generated through normal operational, construction and emergency activities. The following waste management mitigations will be implemented:

- Collect waste from work site on a daily basis and dispose of at an approved facility to avoid the attraction of nuisance animals. Waste containers shall accompany each working unit. No waste shall be disposed of in the trench.

- Transport and dispose all wastes in accordance with provincial and federal regulatory requirements and local guidelines (i.e., Workplace Hazardous Materials Information System [WHMIS] and Transport of Dangerous Goods [TDG]).

- Ensure the construction site is left in a tidy and organized condition at the end of each day.

- Burning of construction wastes or domestic garbage is prohibited.

- Locate temporary toilets at convenient locations on/along the construction site.

- Report all incidents involving waste and hazardous material to the Environmental Monitor.

4.2.4 Clearing and Grubbing

- Disturbance in native vegetation communities will be minimized.
- No additional vegetation will be disturbed beyond the trench without contacting the Environmental Monitor to ensure species at risk are not removed..
- Do not allow clearing or grubbing beyond the staked boundary of the pipeline RoW unless additional workspace rights have been obtained.
- If a tree to be cleared contains an active bird nest, or if a ground nest, burrow or den is discovered during clearing, suspend the work activity in the vicinity of the site, fence or flag off the area, and contact the Environmental Monitor.

4.2.5 Topsoil Salvage

- Maintain separation between the topsoil pile and the subsoil piles.
- Where topsoil is less than 30 cm, salvage topsoil to colour change, bottom of sod or duff layer, plough layer or 10 cm, whichever is deepest.
- Salvage topsoil from all areas that require grading. Avoid overstripping. Avoid grading of native grassland, bush, hay lands or pasture lands on level terrain, where practicable. In areas of native grassland, minimize the amount of stripping, where practicable and strip soil only from travel lane, trench line and spoil.
- Under wet/thawed soils conditions where wheelslip, mud build-up on tires and cleats, water ponding and ruts are occurring, the decision to temporarily shut down construction activities will be made based on the plasticity of the surface soil to a depth of 10 to 20 cm, the depth of the wetting front and/or ruts in relation to the A and B horizons and the type of construction operations proposed for that day.

4.2.6 Grading

- Reduce grading throughout the pipeline RoW, especially at watercourses and wetlands, and on hay, tame pasture, native prairie and treed lands with a competent sod layer. Reduce the width of grading in order to limit the potential for erosion and subsoil compaction.
- Follow-up grading will be conducted in areas affected by settling after construction.

4.2.7 Pressure Testing

Industry standards and government regulations require that pipelines and other facilities are pressure tested before commissioning for integrity purposes.

- Only withdraw water from approved locations. Avoid water withdrawal sites with known environmental sensitivities (i.e., steep slopes or other sensitive areas).

- Recover all methanol, ethylene glycol and water contaminated by freezing depressants in tanks. Do not allow contaminants to enter natural bodies of water or soils.

- Recover all water contaminants with drying agents (i.e., methanol), if used, in tanks and return to the supplier or dispose of contaminated test water at approved sites/facilities.

4.2.8 Erosion Control

Permanent soil erosion and sedimentation control begins as soon as possible upon completion of backfilling. Erosion control is also necessary at some locations to maintain soil capability and habitat quality, to reduce siltation in watercourses and wetlands, and to avoid creating a nuisance to nearby landowners and land users.

- Select the appropriate erosion and sediment control option for the site-specific conditions in consultation with the Environmental Monitor.

- Prevent or control soil erosion and water siltation to the satisfaction of the Environmental Monitor and the applicable regulatory authority. Make available personnel and equipment to control erosion when warranted.

- To reduce drifting soils and loss of topsoil in areas prone to wind erosion, options include sowing a fast growing cover crop or the application of a tackifier.

- Place erosion control matting, rollback or tackifier on steep slopes or exposed sites that will be difficult to stabilize as directed by the Environmental Monitor.

- After final grading, stabilize disturbed steep slopes in areas other than cultivated land with permanent erosion control structures, especially if heavy runoff, heavy storms are likely and there is a risk of substantial soil erosion. Consider any of the following:

    - install netting or silt fencing
    - apply tackifier
    - hydromulch
    - hydroseed
    - seed an annual native cover crop
    - plant native shrubs or willow cuttings

- During construction, restoration, operation and maintenance all necessary measures will be implemented to prevent erosion of soil into water bodies and watercourses.

4.2.9 Watercourse Crossings

- All crossings will comply with the Department of Fisheries and Oceans (DFO) Canada Letter of Advice, DFO Operational Statements (DFO 2010) and the Transport Canada *Minor Works and Waters Order* (Transport Canada 2009).

- All crossings in Manitoba will comply with the *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat* (MNR and DFO 1996).

- Prior to the commencement of any work to cross rivers, streams or creeks in Manitoba, Tundra will consult with the Manitoba Department of Conservation and Water Stewardship, Regional Fisheries Biologist.

4.2.10 Horizontal Directional Drilling

Horizontal directional drilling (HDD) involves using a slant drill to drill under a watercourse and the approach slopes. An accidental release of drilling mud into a watercourse during the construction of a trenchless crossing could adversely affect the environment. Both the Contractor and Tundra must be diligent during all aspects of HDD to ensure that the potential for an instream drilling mud release is minimized or, if it does occur, that environmental impacts are minimized.

- Review the Contractors Directional Drilling Release Contingency Plan prior to commencing construction.

- Before any crossing work starts, stockpile all required materials onsite. Install surface water runoff and seepage controls before construction and maintain throughout installation.

- Set up drilling equipment a minimum of 100 m from the edge of the watercourse. Do not clear or grade within this 100 m buffer area.

- Before starting any drilling operations, clearly flag the entire expected drill path, including both sides of the watercourse.

- Salvage the topsoil in the drill work space and store it to the side, away from the work area, unless mats are used.

- Construct containment structures as applicable to collect any drilling mud returns that occur during HDD activities.

- Conduct a water quality monitoring program and provide progress information to the drilling Contractor.

- After the pullback is complete, replace topsoil and clean-up the site after the pipelines are tied-in.

- Reclaim entry and exit sumps that contained drilling mud immediately after completion of drilling and remediate to meet appropriate regulatory authority guidelines.

- For HDD crossings, monitor both onshore and instream portions of the drill path and surrounding area for signs of drilling mud release.

- In the case of a mud release, review and adhere to the measures presented in the Contractor's Directional Drilling Release Contingency Plan.

4.2.11 Wetlands

Pipeline construction has the potential to affect habitat, hydrologic and water quality functions of wetlands. This section describes mitigation measures to minimize and prevent impacts of pipeline crossings of wetlands along the pipeline RoW:

- Construction will occur in wetlands and in riparian areas under dry or frozen conditions. Tundra will bore under any other wetlands.

- Tundra will discontinue trenching activities in wetlands where water is encountered.

- Minimize traffic through wetlands to the extent possible. Where warranted, use shoo-fly access to divert construction traffic around wetlands.

- Install a temporary sediment barrier (e.g., silt fence), where warranted, to eliminate the flow of sediment from clean spoil piles and disturbed areas into nearby wetlands.

- Inspect the temporary erosion control structures on a daily basis and repair, if warranted, before the end of each working day.

- Where feasible, salvage the upper surface material on all wetlands to maintain the root stock for replacement. Salvage surface material to a maximum depth of 40 cm, or to the depth of colour change where there is less than 40 cm of surface material, or as directed by the Environmental Monitor.

- Adhere to the boundaries of wetlands and stripping widths at the time of construction, unless otherwise directed by the Environmental Monitor.

- Store salvaged surface material at a sufficient distance from the trench so that it does not slump or flow into the trench.

Where wetland reclamation is required post-construction, the following reclamation activities will be implemented:

- Remove any sediment barriers or other erosion control materials that remain after the disturbed area is revegetated and the area is stable.

- Replace salvaged organic topsoil and upper soil material over the stripped area. Ensure wetland contours and drainage channels are restored and a permanent trench crown is not created. Replace salvaged topsoil or upper surface material as evenly as possible over the stripped area.

- Recontour the wetland and restore surface hydrology patterns to as close to the pre-construction profile as practical during reclamation.

- Wetlands generally revegetate naturally. Where warranted, revegetate disturbed wetland areas with native wetland vegetation, unless there is standing water or permanent planting.

- In the event that natural regeneration does not occur in a timely manner, apply a native aquatic plant seed mix using species present on site at the time of reclamation. Native seed will be tested for viability and purity prior to application. Application of the native seed will occur in appropriate weather conditions and the appropriate season.

- Do not apply fertilizer, lime or mulch in wetlands.

- Replant salvaged trees/shrubs along the disturbed margin(s) of the wetland as directed by the Environmental Monitor.

- Where practicable, allow wetlands to naturally regenerate following construction.

- Install willow staking along the wetland to stabilize disturbances and reduce sedimentation risk to wetland where shrubs were present prior to construction and where directed by the Environmental Monitor.

4.2.12 Revegetation

Revegetation of the construction RoW involves preparing the seed bed and seeding disturbed areas to establish a permanent ground cover. Poor revegetation may result in reduced agricultural, recreational and other land use capabilities, reduced wildlife habitat and elevated risk of erosion and weed infestations. In addition, public relations with landowners and regulatory authorities may be adversely affected if revegetation does not meet expectations.

- Till or cultivate any severely compacted or rutted areas on cultivated, hay or tame pasture lands with deep tillage device or chisel plow to loosen compacted soils.

- All revegetation in native communities shall implement a seed mix native to the area to prevent the spread of invasive species.

- Consult with landowners for the appropriate seed mix for the land to be revegetated. Use only Certified Canada No. 1 seed from a local source and retain the Certificates of Analysis for future documentation.

- Ensure seed mixes used to revegetate the construction RoW are free of noxious weed seed. All seed mixes must have Certificates of Analysis for weed and undesirable species content, and germination tests for each lot of each species in the mix.

5 POST-CONSTRUCTION MONITORING

Tundra will undertake Post-Construction monitoring to:

- evaluate the reclamation of areas disturbed through construction of the Project
- assess the status of outstanding environmental issues documented through environmental inspection
- identify any outstanding or new environmental issues that may be present
- recommend remedial measures and coordinate their implementation to address any outstanding or new environmental issues
- document monitoring results and post-construction remedial measures

Post-construction monitoring will include the following elements:

- Follow-up monitoring, re-seeding, maintenance and weed control to be conducted until disturbed areas are re-vegetated and approved by Manitoba Conservation.

- Upon completion of construction of the pipeline a wetland monitoring program will be initiated to assess the natural regeneration of wetlands impacted by the pipeline.

6 REFERENCES

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