

# REMEDIATION OF THE TAR PONDS AND COKE OVEN SITES

## DESIGN AND CONSTRUCTION OVERSIGHT SERVICES

### ENVIRONMENTAL MONITORING

### SUMMARY REPORT

### February 2012 MONTHLY REPORT

### 97918-MONTHLY-REP-N-049

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**Table of Contents**

<b>1.</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1.	Overview of Active Elements .....	1
1.2.	Environmental Reporting by Others .....	2
<b>2.</b>	<b>TP6A – FLOW DIVERSION.....</b>	<b>4</b>
2.1.	Summary of Construction Activities.....	4
2.2.	Dewatering.....	5
2.3.	Sediment Control Structures, Stabilization Areas, Silt Curtain and Oil-Absorbent Booms .....	5
2.4.	Surface Water Monitoring .....	7
2.5.	Access Roads .....	8
2.6.	Air Monitoring and Particulate Matter Control Measures .....	8
2.7.	Product Storage, Fueling and Waste Disposal .....	8
2.8.	Noise Control Measures.....	8
2.9.	Miscellaneous Environmental Monitoring Activities .....	8
2.10.	Summary of Environmental Monitoring Activities .....	9
<b>3.</b>	<b>TP6B – SOLIDIFICATION AND STABILIZATION (S/S).....</b>	<b>9</b>
<b>4.</b>	<b>TP7 – TAR PONDS SURFACE CAP .....</b>	<b>9</b>
<b>5.</b>	<b>TP6C – FERRY STREET BRIDGE .....</b>	<b>11</b>
<b>6.</b>	<b>CONCLUSION .....</b>	<b>11</b>

**Appendices**

Appendix A: Environmental Inspection Log

**Photos**

Photo 2-1: Newly Relocated Pumps with Suction Lines Installed at the Narrows ..... 4

Photo 2-2: Raised Narrows Stop Log ..... 5

Photo 2-3: Removing Derelict Silt Curtains from Battery Point Work Area..... 6

Photo 2-4: Silt Fencing and Hay Bales Installed Along the East Access Road ..... 7

Photo 4-1: Example of TP7 Environmental Controls Damaged by Winter Weather ..... 10

Photo 4-2: Hay Bales Installed during Repair Efforts ..... 10

**Tables**

Table 6-1: Overview of Environmental Disciplinary Reports (RFAs, NCRs) ..... 12

**Acronyms used in Report**

Agency	Sydney Tar Ponds Agency
All-Tech	All Tech Environmental Services Limited
AQMC	Air Quality Monitoring Consultant
BPDS	Batter Point dissipation structure
CBRM	Cape Breton Regional Municipality
CEPP	Contractor's Environmental Protection Plan
DE	Design Engineer
EIL	Environmental Inspection Log
EM	Environmental Monitor
EMP	Environmental Management Plan
EMSR	Environmental Monitor Summary Report
EPP	Environmental Protection Plan
IEC	Independent Environmental Consultant
MBJV	Marine-Beaver Joint Venture
MSDS	Material Safety Data Sheet
NCR	Non-Conformance Report
NDS	Narrows dissipation structure
NSE	Nova Scotia Environment
PM	Particulate matter
RFA	Request for Action
SI	Supplemental Instruction
S/S	Stabilization/Solidification
SSP	Steel Sheet Piles
TP6A	Flow Diversion
TP6B	Solidification, Stabilization and Channel Construction

TP6C	Ferry Street Bridge
TP7	Tar Ponds Surface Cap
VOC	Volatile organic compound
WHMIS	Workplace Hazardous Materials Information System

### Units used in Report

dBa	decibels
L	liters
L <sub>eq</sub>	equivalent sound
m	meters
mm	millimeters
NTU	nephelometric turbidity units
ppm	parts per million
µg/m <sup>3</sup>	micrometer per cubic meter

## 1. INTRODUCTION

The Government of Canada and Province of Nova Scotia are committed to remediate the Sydney Tar Ponds and Coke Ovens Sites, a project that is managed and implemented by the Sydney Tar Ponds Agency (the Agency). The Agency awarded AECOM and CBCL the bid for Design Engineer (DE) and to implement Construction Oversight. The project's goals are to reduce the health and ecological risks to area residents and the environment from existing soil, sediment and water contamination as well as to enhance the development potential of the land to drive economic investment in the Cape Breton Regional Municipality (CBRM). The [Project Environmental Protection Plan](#) (EPP) and the [Environmental Management Plan](#) (EMP) are the governing documents of the environmental aspects of the remediation work, and are available for public viewing on the Agency's website [www.tarpondscleanup.ca](http://www.tarpondscleanup.ca). An EPP is also designed specific to each of the construction elements, and these are available at the Agency's library located at 1 Inglis Street in Sydney, Nova Scotia. One (1) of the EPP requirements is for the Design Engineer to provide a monthly summary of environmental activities on Site, which this report fulfills.

### 1.1. Overview of Active Elements

Construction activities continued throughout February 2012 for the Flow Diversion (TP6A) element only. The Solidification and Stabilization (S/S) and Channel Construction of the Tar Ponds (TP6B), Tar Ponds Surface Cap (TP7) and the Ferry Street Bridge (TP6C) elements were on a winter construction shutdown in February 2012. The TP7 Contractor made repairs to weather damaged environmental controls throughout February 2012 to ensure environmental protection of sensitive TP7 areas near the now active Phase I/II channels.

Activities completed by the TP6A and TP7 elements followed protocols outlined in the EPP and EMP. In general, the Contractors agree to monitor their construction activities for potential environmental impacts to determine whether the mitigation measures developed for the activity are effective. Each individual Contractor designates an Environmental Monitor (EM) to ensure that work being carried out on Site is being performed in compliance with the EPP and EMP and that sources of contaminants are identified before they impact the receiving environment.

As set out by the EPP, the Contractors' EMs are required to conduct environmental inspections every four (4) hours during active construction: at TP6A by MB2-Beaver Marine Joint Venture's (MBJV), at TP6B by Nordly's, at TP7 by Hazco's and at TP6C by Joneljim's. The EMs use the Environmental Inspection Logs (EILs) as a guide and as a log to record observations while inspecting the work activities and

environmental protection measures such as silt fences, oil absorbent booms, hazardous materials containment, etc. and in addition, sampling sheets may be attached to the EILs if relevant. Field representatives from the DE check the EILs on a daily basis to ensure that field observations match those recorded by the EM in the logs. In the event that environmental protection measures are not being followed or are not effective, the EM directs the Site Supervisor to take corrective action and notifies the Design Engineer's Environmental Coordinator or field representative. In the event that the EPP is not being adhered to and the issue is not resolved in the field, the DE may issue a Request for Action (RFA) or Non-Conformance Report (NCR) to the Contractor requesting improvement. A summary table of the NCRs, RFAs and Supplemental Instructions (SIs) are highlighted in Section 5.

This Environmental Monitoring Summary Report (EMSR) covers the key areas addressed in the EILs throughout February 2012 and will report environmental concerns, if any, that developed from remediation activities at TP6A, TP6B, TP7 and TP6C including how those issues were resolved. Past [EMSRs](#) are also available on the Agency's website and at the Agency's library.

## 1.2. Environmental Reporting by Others

Other publicly available environmental reports are prepared by various parties involved with the Project. These reports are available either on the Agency's website, [www.tarpondscleanup.ca](http://www.tarpondscleanup.ca), or from the Agency's library located at 1 Inglis Street in Sydney, Nova Scotia.

Construction monitoring of surface water and noise levels are captured in the Contractor Quality Control Monthly Reports, which are completed by Contractors for each active work element. These reports contain detailed testing results from surface water and noise monitoring, and can be found at the Agency's library.

Air monitoring reports, completed by All-Tech, the Air Quality Monitoring Consultant (AQMC), can be accessed on-line at the Agency's website. The Real-time Air Monitoring Program monitors air emissions at the Project fence line associated to each active element and the [Air Monitoring Reports](#) contain data from these monitoring activities. The Ambient Air Monitoring Program monitors the ambient air at monitoring stations throughout the community. The [Preliminary Event Reports](#) contain invalidated, preliminary data. The data is then compiled, validated and comprises the monthly [Ambient Air Monitoring Monthly Reports](#). The Preliminary Event Reports are removed from the website once the associated monthly report has been produced and uploaded. Also available on the Agency's website is the [Question and Answer for Odour Concerns Reporting Program](#) which discusses frequently asked questions regarding Project odour issues.

The Project is also subject to extensive environmental effects monitoring for air, surface water, groundwater and marine water quality. The Project's Independent Environmental Consultant (IEC) was retained to undertake environmental effects monitoring and to collect data during Project remediation activities. This data is used to detect environmental impacts resulting from the Project, as well as to determine long-term trends. Environmental effects reports are available on the Agency's website and at the Agency's library. For surface water monitoring, data is collected regularly and [Monthly Compliance Reports](#) are prepared and submitted to the Agency. For groundwater quality and quantity information, data is collected and [Quarterly Groundwater Reports](#) are prepared and submitted to the Agency. For activities in the marine environment, data is collected according to a required schedule and an [Annual Marine Report](#) is prepared and submitted to the Agency. Sydney Harbour is monitored for changes in sediment chemistry, crab and bi-valve tissue chemistry and species diversity. A Biodiversity Study Report is currently its second draft revision and will be available to the public once complete.

## 2. TP6A – FLOW DIVERSION

The TP6A element provides the flow diversion necessary to conduct Stabilization/Solidification (S/S) work within the isolated sections of the North and South Tar Ponds. TP6A also includes the construction of energy dissipation outlet structures that are utilized during dewatering of the Tar Ponds under TP6B, as well as provisions for temporary bridges and water well decommissioning. As this element deals directly with diverting bodies of water, namely Wash Brook, Coke Ovens Brook, CBRM storm drains and the Tar Ponds, the most important environmental concerns relate to water. Surface water monitoring, sediment control structures and aquatic life protection are of particular interest for this element. Silt curtains, oil absorbent booms and fish screens are the most commonly deployed environmental control measures at TP6A.

### 2.1. Summary of Construction Activities

TP6A Contractor construction activities in February 2012 consisted primarily of assembling pipe manifolds at the Narrows pump pad, connecting pump discharge lines to manifolds (see Photo 2-1), transporting pipe sections along the Phase II east access road, fusing 48” pipe along the Phase II east access road, fusing 24” pipe at the Narrows pump pad, transporting pumps and pipe fittings from Coke Oven Brook and Wash Brook, installing a second temporary support and working platform at Battery Point, and fabricating a waler frame for cut-off wall #2 at Battery Point.



Photo 2-1: Newly Relocated Pumps with Suction Lines Installed at the Narrows

## 2.2. Dewatering

At this point in the project the Wash Brook and Coke Oven Brook pumps have been shut down allowing water to flood the completed channel in Phase I/II. The water then flows through the backflow valves in the Narrows structure and into the Phase III pond. To prevent flooding, the Narrows structure was monitored daily during February, 2012 to ensure functionality of the check valves and note the water elevations. In the event of heavy rainfall and/or higher than normal tides, the contractor is directed by the DE, to raise the stop-logs in the Narrows structure to allow for a greater volume of water to exit the Phase I/II area and reduce the risk of upstream flooding. The TP6A Contractor pulled the Narrows stop-logs for flood mitigation at approximately midnight and lowered them back into place at 18:20 on February 12, 2012 in response to rainfall accumulation of 42.8 mm on February 11, 2012 (see Photo 2-2).



**Photo 2-2: Raised Narrows Stop Log**

## 2.3. Sediment Control Structures, Stabilization Areas, Silt Curtain and Oil-Absorbent Booms

The TP6A Contractor has silt curtains and oil absorbent booms in place north of the Narrows Dissipation Structure as a contingency measure in the event of a potential sediment or product release entering the Phase III North Tar Pond and migrating towards Battery Point. The contractor also has silt curtains and an oil boom at Battery Point between the East and West dolphins. During February 2012 the TP6A

Contractor monitored and maintained these structures on a daily basis to assure their continued effectiveness.

Derelict silt curtains which have been replaced were removed from Battery Point on February 7, 2012 (see Photo 2-3). Silt Fences near the Narrows pump pad were repaired on the afternoon of February 23, 2012. Hay bales and silt fencing were installed along east access road to minimize possible turbidity associated with leaking water from force mains during Phase III hydro testing on February 24, 2012 (see Photo 2-4).



**Photo 2-3: Removing Derelict Silt Curtains from Battery Point Work Area**



**Photo 2-4: Silt Fencing and Hay Bales Installed Along the East Access Road**

#### **2.4. Surface Water Monitoring**

Turbidity samples are taken by boat within the Tar Ponds every four (4) hours and at this phase of the project this occurs off of the east and west shores of Battery Point; the northernmost active TP6A Contractor work area. At times, taking turbidity samples in the Tar Ponds by boat is not possible due to low tides causing the boat to agitate bottom sediments skewing turbidity results or if high winds make it unsafe to use a boat. The EILs from February 2012 report occasions where it was more appropriate to collect water samples from the shoreline or the Narrows catwalk rather than from the boat due to environmental concerns, such as low tides, health and safety concerns such as high winds, ice, and extremely high water flow. In these cases a thirteen (13) metre pole is used to collect samples far from the water's edge. Reasons for collecting from the shoreline were detailed in each occurrence's respective EIL.

The only turbidity exceedance for the month occurred at 11:30 at the west Battery Point (37.5 NTU) and east Battery Point (26.4 NTU) sample locations on February 23, 2012. An upstream sample was collected north of the Narrows Dissipation Structure (16.5 NTU). The TP6A Contractor attributed the high turbidity levels at Battery Point to lag time associated with flushing of Phase II channel and pond. Samples collected at 15:15 on February 23, 2012 yielded surface water turbidity results that were elevated based on historical readings for west Battery Point, east Battery Point, and north of the Narrows of 24.8

NTU, 20.2 NTU, and 32.2 NTU respectively. These results are not considered an exceedance of the EPP criteria since the upstream turbidity result was higher than the downstream sample result.

## **2.5. Access Roads**

Primary access roads were maintained by the Agency during February 2012.

## **2.6. Air Monitoring and Particulate Matter Control Measures**

All-Tech, the Air Quality Monitoring Consultant (AQMC), did not report high particulate or high volatile organic compound (VOC) concentrations associated with TP6A activities in February 2012.

## **2.7. Product Storage, Fueling and Waste Disposal**

All products and fuel were stored on site according to the protocols outlined in the TP6A EPP. Spent environmental controls were placed in appropriate waste storage bins for removal by a professional disposal service.

No fuel or hydraulic fuel oil spills were reported by the TP6A Contractor in February 2012.

## **2.8. Noise Control Measures**

Noise monitoring was conducted four (4) times in February 2012 at three (3) perimeter locations for two (2) hour averages to determine if the noise levels on site are under the EPP requirement of 65<sub>Leq</sub> (dBA). The Quest 2900 was used to perform sound monitoring at the TP6A Site.

Noise monitoring took place on February 8, 14, 21 and 29, 2012. On February 8, 2012 there was an exceedance of 74.6<sub>Leq</sub> (dBA) at the Battery Point Discharge Structure sampling location. The TP6A Contractor attributed this exceedance to excavation work taking place just north of the Dissipation Structure. On February 14, 2012 there was an exceedance of 70.1<sub>Leq</sub> (dBA) at the Battery Point Discharge Structure sampling location. The TP6A Contractor attributed this exceedance to crane activity in the area. All other noise monitoring conducted during February 2012 returned results under the EPP criteria.

## **2.9. Miscellaneous Environmental Monitoring Activities**

The debris nets at Wash Brook and debris net and fish screen at the Inglis Street culvert were cleaned regularly throughout February 2012 to ensure their effectiveness.

Battery Point steel sheet piling passed swab testing inspection performed by the Agency for PCBs on February 10, 2012. The tested steel sheet piles were removed from site via two (2) flat deck trailers on February 15, 2012.

## **2.10. Summary of Environmental Monitoring Activities**

The TP6A Contractor assembled pipe manifolds at the Narrows pump pad, connected pump discharge lines to manifolds, transported pipe sections along the Phase II east access road, fused 48” pipe along the Phase II east access road, fused 24” pipe at the Narrows pump pad, transported pumps and pipe fittings from Coke Oven Brook and Wash Brook to the Narrows, installed a second temporary support and working platform at Battery Point, and fabricated a waler frame for cut-off wall #2 at Battery Point. Silt curtains, silt fencing, and debris nets were continually monitored throughout February, 2012 and were replaced or repaired as necessary. One (1) relatively minor turbidity monitoring exceedance and two (2) noise exceedances were reported in February 2012. The DE did not issue any environmental RFAs or NCRs to the TP6A Contractor during February 2012.

## **3. TP6B – SOLIDIFICATION AND STABILIZATION (S/S)**

The TP6B element involves the remediation of contaminated soils and sediments and construction of channels and pressure relief wells that will provide pathways through the remediated sediments for surface water and groundwater. Cement is imported to the Site and mixed with the contaminated soils and sediments in order to encapsulate them in concrete.

No TP6B construction activities took place in February 2012 as the Contractor was on a winter shutdown.

## **4. TP7 – TAR PONDS SURFACE CAP**

The scope of the TP7 contract involves constructing a multi-layered cap over the S/S’ed Tar Ponds monolith. The Contractor places large quantities of exposed cohesive soil followed by topsoil adjacent to constructed and natural water courses and therefore erosion and sediment control measures are important aspects of the TP7 contract.

No TP7 construction activities took place in February 2012 as the Contractor was on a winter shutdown. However, the TP7 Contractor conducted weekly environmental site inspections and made repairs to environmental controls which have been damaged by winter weather conditions in February 2012.

Repairs were made to wind damaged silt fence along main Phase II channel stem on February 3, 2012. Heavy rainfall on February 11, 2012 exposed snow/wind damaged sections of silt fencing along the west side of the receiving pit and the east side of the main channel (see Photo 4-1). The TP7 Contractor made repairs to the damaged sections of silt fencing and added hay bales to reinforce broken or loose steaks on February 15, 2012 (see Photo 4-2). On February 16 and 24, 2012 the TP7 Contractor made repairs to

berms which had been damaged during the heavy rainfall which fell on February 11, 2012. Additional repairs were made to snow damaged silt fencing on February 23 and 27, 2012.



**Photo 4-1: Example of TP7 Environmental Controls Damaged by Winter Weather**



**Photo 4-2: Hay Bales Installed during Repair Efforts**

## 5. TP6C – FERRY STREET BRIDGE

The scope of the TP6C contract is to construct the new Ferry Street Bridge and road approaches.

No TP6C construction activities took place in February 2012 as the Contractor was on a winter shutdown.

## 6. CONCLUSION

The TP6A Contractor assembled pipe manifolds at the Narrows pump pad, connected pump discharge lines to manifolds, transported pipe sections along the Phase II east access road, fused 48” pipe along the Phase II east access road, fused 24” pipe at the Narrows pump pad, transported pumps and pipe fittings from Coke Oven Brook and Wash Brook to the Narrows, installed a second temporary support and working platform at Battery Point, and fabricated a waler frame for cut-off wall #2 at Battery Point. Silt curtains, silt fencing, and debris nets were continually monitored throughout February 2012 and were replaced or repaired as necessary. One (1) relatively minor turbidity monitoring exceedance and two (2) noise exceedances were reported in February 2012. The DE did not issue any environmental RFAs or NCRs to the TP6A Contractor during February 2012.

No TP7 construction activities took place in February 2012 as the Contractor was on a winter break. However, the TP7 Contractor conducted weekly environmental site inspections and made repairs to environmental controls which have been damaged by winter weather conditions in February 2012. Repairs were made to wind damaged silt fence along the main Phase II channel stem on February 3, 2012. Heavy rainfall on February 11, 2012 exposed snow/wind damaged sections of silt fencing along the west side of the receiving pit and the east side of the main channel. The TP7 Contractor made repairs to the damaged sections of silt fencing and added hay bales to reinforce broken or loose steaks on February 15, 2012. On February 16 and 24, 2012 the TP7 Contractor made repairs to berms which had been damaged during the heavy rainfall which fell on February 11, 2012. Additional repairs were made to snow damaged silt fencing on February 23 and 27, 2012.

No TP6B or TP6C construction activities took place in February 2012 as these Contractor’s were on a winter break.

MBJV’s EMs performed routine inspections of the Sites using the EIL to ensure that remedial work activities did not cause any environmental concerns. Ongoing environmental concerns are addressed to the Contractors both verbally on site and through written NCR or RFAs. At TP6A, TP6B, TP7 and TP6C AECOM personnel sign and review the EILs on a daily basis to ensure field conditions match the reporting by the EM. A summary table of pending and recently closed NCRs, RFAs and SIs are highlighted below in Table 6-1.

**Table 6-1: Overview of Environmental Disciplinary Reports (RFAs, NCRs)**

Report No.	Description	Issued	Cause	Action	Responded To	Long Term Action	Closed Date
RFA-TP6B-064	Groundwater Intrusion at the Narrows	Nov. 3, 2011	<p>On October 28, 2011 groundwater was observed flowing through previously treated cells at the Narrows structure into the channel. While groundwater flowed through the cells it also flowed through untreated sediments that were up gradient of the one row of S/S along the newly constructed channel (see attached plan). This flow generated impacted water and transported sediments into the channel (see attached photo).</p> <p>The TP6B Contractor is required to prevent further contamination of the newly constructed channel by:</p>	Pending	Pending	Pending	Pending

Report No.	Description	Issued	Cause	Action	Responded To	Long Term Action	Closed Date
			<ol style="list-style-type: none"> <li>1. Controlling groundwater flow at the Narrows and;</li> <li>2. Removing the transported materials that are currently in the channel to be treated.</li> </ol>				

## Environmental Inspection Log

### Appendix A

### Remediation of the Sydney Tar Ponds and Coke Ovens Sites Environmental Inspection Log (EIL)

Design Element: \_\_\_\_\_  
 Date: (D/M/Y): \_\_\_\_\_  
 Time (24 hrs): \_\_\_\_\_

Weather Conditions: \_\_\_\_\_

Daily Construction Activities: \_\_\_\_\_

EIL Completed by (printed name and signature): \_\_\_\_\_ EM Name \_\_\_\_\_ EM Signature \_\_\_\_\_

EIL Reviewed by (DE name, signature, date, time): \_\_\_\_\_ DE Name \_\_\_\_\_ DE Signature \_\_\_\_\_ DD/MM/YYYY, 24:00 \_\_\_\_\_

DAILY CHECKLIST ITEM:	DESCRIPTION	ACCEPTABLE	NOT ACCEPTABLE <sup>1</sup>	NOT APPLICABLE	Comment # (See P.2)
1. Sediment Control Structures:					
	Hay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Silt Fences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Dissipation Measures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Silt Curtains	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Oil Absorbent Boom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Stabilization Areas					
3. Noise Control Measures					
4. Dust Control Measures					
5. Air Emission Control Measures					
6. Materials, Product & Equip. Storage					
7. Fueling and Maintenance Area					
8. Waste Disposal/Debris					
9. Access Roads					
10. Dewatering					
	Hoses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Connections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
11. Decontamination Areas (ONCE DAILY)					
	Workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Equipment/Vehicles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
12. Barriers for Disposal, Storage & Work Areas (ONCE DAILY)					
13. Other Specific EM Activities:					
	Type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
	Type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
14. Field Sampling:					
	Type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

<sup>1</sup>Criteria for Acceptable and Not Acceptable for each checklist item is given on Pages 3 to 6.

- Where a checklist item is not acceptable, comments must be provided below detailing: the nature of the concern; the extent of any environmental impacts; the remediation measures undertaken; the requirement for any further remediation measures; if notification of a regulatory body was required, and if so, the response; any recommendations for improvements/follow-up; and any other relevant information.



## Criteria to determine if Mitigation Effectiveness is Acceptable or Non-acceptable

### 1. Sediment Control Structures:

- a. Acceptable: If instantaneous turbidity readings are within 8 Nephelometric Turbidity Units (NTU) above background (upstream sample location) if background concentrations are less than 80NTU. If background is greater than 80 NTU, and samples are within 10% of background levels on downstream side of the structure, the structure is deemed to be functioning as intended. During visual inspection, if the sediment control structures are intact, with no gaps, tears, slumping or weathering of the materials and no noticeable impact in the receiving water “downstream” of the sediment control structures.
- b. Not Acceptable: If instantaneous turbidity readings are greater than 8NTU if background is less than 80NTU, or if readings are greater than 10% of background levels on downstream side of the structure, the structure is deemed to be not functioning as intended. During visual inspection, if the sediment control structures are not intact, with gaps, tears, slumping or weathering of the materials and noticeable impact in the receiving water “downstream” of the sediment control structures.

### 2. Stabilization Areas:

- a. Acceptable: During visual inspection, if there is no apparent sloughing banks or erosional processes occurring in an area of disturbance created by the Project.
- b. Not Acceptable: During visual inspection, if there is sloughing banks or erosional processes occurring in an area of disturbance created by the Project.

### 3. Noise Control Measures:

- a. Acceptable: If noise measurements (based on two hour averages) are within the following limits:
  - $L_{eq,2hr} \leq 65$  dBA between 0700 to 1900 hours (Days)
  - $L_{eq,2hr} \leq 60$  dBA between 1900 to 2300 hours (Evenings)
  - $L_{eq,2hr} \leq 55$  dBA between 2300-0700 hours (Nights)
- b. Not Acceptable: If noise measurements (based on two hour averages) are not within the above limits.

### 4. Dust Control Measures:

- a. Acceptable: During visual inspection, dust is controlled during grading, excavation and construction activities. The exposed surfaces, stock piles or stored materials are covered with water, foam or tarps, as required. The vehicles used for excavation or transportation of materials are completely enclosed or with retractable load covers, the haul unit seals are in good working order, hoses and connections on equipment are free of leaks or drips.
- b. Not Acceptable: During visual inspection, dust is not controlled during grading, excavation and construction activities. The exposed surfaces, stock piles or stored materials are not covered with water, foam or tarps. The vehicles used for excavation or transportation of materials are not completely enclosed or with retractable load covers, the haul unit seals are not in good working order, hoses and connections on equipment have leaks or drips.

5. Air Emission Control Measures:
  - a. Acceptable: If measurement by AQMC at halfway between fenceline and source(s) is less than or equal to: 2ppm averaged over 15 minutes; or with the exception of benzene and naphthalene, 5 exceedences to the 15 minute averaging period over the workday averaged over 10 hours; or 2.5ppm for benzene and naphthalene (as confirmed by Draeger –Tubes or olfactory means) averaged over 1 hour.
  - b. Not Acceptable: If measurement by AQMC at halfway between fenceline and source(s) is greater than: 2ppm averaged over 15 minutes; or with the exception of benzene and naphthalene, 5 exceedences to the 15 minute averaging period over the workday averaged over 10 hours; or 2.5ppm for benzene and naphthalene (as confirmed by Draeger –Tubes or olfactory means) averaged over 1 hour.
6. Product Storage:
  - a. Acceptable: All potentially hazardous products are stored in a pre-designated, safe and secure product storage area at the work site in accordance with provincial legislation; all products shall be properly labeled according to WHMIS; any spilled products are contained and the area cleaned.
  - b. Not Acceptable: Any potentially hazardous products are not stored in a pre-designated, safe and secure product storage area at the work site in accordance with provincial legislation; or any products are not properly labeled according to WHMIS; or any spilled products are not contained; or the area has not been cleaned after a spill.
7. Fueling and Maintenance Area:
  - a. Acceptable: Area is clean, well organized. All potentially hazardous products are stored in a pre-designated, safe and secure product storage area within the construction area, in accordance with provincial legislation. All products are properly labeled according to Workplace Hazardous Materials Information System (WHMIS). Material Safety Data Sheets (MSDS) are on site with the relevant product.
  - b. Not Acceptable: Area is not clean, unorganized and any of the above noted safeguards are missing.
8. Waste Disposal/Debris:
  - a. Acceptable: Project site is free from any waste/debris whether it be benign solid waste or hazardous waste other than those waste stored in designated bins/areas.
  - b. Not Acceptable: Project site contains waste/debris whether it be benign solid waste or hazardous waste, is not destined for immediate disposal and requires appropriate disposal.
9. Dewatering:
  - a. Acceptable: Fish have been removed prior to dewatering; fish screens are installed in pumps; and the dewatered cells are maintained during construction.
  - b. Not Acceptable: Fish have not been removed prior to dewatering; fish screens are not installed; or the dewatered cells are not maintained during construction.
10. Access Roads used by the Contractor(s)
  - a. Acceptable: Upon visual inspection, the access roads used by the Contractor(s) are dust suppressed, free of debris or unnecessary materials with no spills. If applicable, silt fences appear

to be working and are being maintained along toe of slope (along banks) and drainage ditches appear to be working to direct flow away from waterways.

- b. Non Acceptable: Upon visual inspection, the access roads used by the Contractor(s) are not dust suppressed, have debris or unnecessary materials with spills. If applicable, the silt fences appear not to be working or to not be maintained along toe of slope (along banks), and drainage ditches appear not to be working to direct flow away from waterways.

#### 11. Other Environmental Monitoring:

##### *Air Quality* (Responsibility of the AQMC)

- a. Acceptable: Monitoring instruments are regularly calibrated. Data is collected and recorded hourly. During times periodically when there is a potential for increased emissions, real time monitoring shows compliance with previously established limits as identified above in numbers 5 and 6.
- b. Not Acceptable: Monitoring instruments are not regularly calibrated. Data is not collected or not recorded hourly. During times periodically when there is a potential for increased emissions, real time monitoring shows exceedances of limits as shown in numbers 5 and 6.

##### *Surface water*

- a. Acceptable: Monitoring instruments are regularly calibrated. Data is collected and recorded hourly. During times periodically when there is a potential for increased sediment loading (i.e. excavation), real time monitoring shows no exceedance of limits as described in Item 1.
- b. Non Acceptable: Monitoring instruments are not regularly calibrated, or data is not collected and recorded hourly. During times periodically when there is a potential for increased sediment loading (i.e. excavation), real time monitoring shows exceedance of limits as described in Item 1.

##### *Groundwater*

- a. Acceptable: If a contaminant of concern in groundwater does not have an upward trend after the fourth sample for three consecutive samples using the Mann-Kendall trend analysis; this approach will use the entire available time series of data (within the numerical constraints of the test).
- b. Not Acceptable: When an upward trend after the fourth sample for three consecutive samples using the Mann-Kendall trend analysis is identified; again, this approach will use the entire available time series of data (within the numerical constraints of the test).

#### 12. Field sampling:

- a. Acceptable: Field sampling instruments are regularly calibrated. Field sampling Standard Operating Procedures are followed. Chain of Custody forms are completed accurately and fully, and submitted with samples for analysis. Health and Safety plans have been prepared and reviewed prior to the start of daily field sampling work.
- b. Not Acceptable: Field sampling instruments are not regularly calibrated. Field sampling Standard Operating Procedures are not followed. Chain of Custody forms are not completed, not accurate, or are not fully filled out. Chain of Custody forms are not submitted with samples for analysis. Health and Safety plans have not been prepared and/or have not been reviewed prior to the start of daily field sampling work.