



Industrial Sewer, Wastewater Treatment and Cooling Water Systems

Document Number: ECS0103A	Standard – Administrative	Applies To: Oil Sands
Revision Date: 2018/01/29 Revision: 2 Review Cycle: 3	Document Owner (Title): Director, EH&S Environment/IH Oil Sands	

Summary of Changes

Rev No.	Section Changed	Revision Made
1	ALL	<ul style="list-style-type: none"> Added Revision number as 1 as no previous revision numbers were assigned. Reformat to current template. Added hyperlinks to referenced documents. Complete rewrite of content. Request previous revision for comparison.
	1.3	Added “or it can be recycled to the Cooling Water Pond for re-use.”
	2.1	Changed Pond C Outfall weir to “the combined Pond C and E outfall.
	2.2	Step deleted “The release of water from the Pond E Outfall Weir to the Athabasca River shall not contain more than 5 mg/L of Oil and Grease. Pond E release limits are specified in Table 4.2-C, in an Amending Approval 94-02-02.”
	2.5	Step deleted “Please note that new amendments to Tables 4.2-A, and 4.2-D will come into effect once the Pond B/C Wastewater Treatment Plant is operational. This standard will be updated to reflect those conditions prior to the plant coming online.”
	Table 1	Complete rewrite. Please request previous version for comparison.
	Table 2	Deleted
	3.2	Changed Pond C to “the combined Pond C/Pond E”
	3.3	Changed Pond C to “The combined Pond C/Pond E”
	3.4	Step deleted “The industrial wastewater entering and leaving Pond E shall be monitored as specified in TABLE 4.2-D.”
	Table 3	Renumbered to Table 2 – Complete rewrite. Please request previous version for comparison.
2	2.2	Changed table number.
	Table 1	Consolidated Table 1; Removed BFWTP Reject) and Pond C Effluents from Table 1
	4.2	Changed table 2.1 to Table 1 and 2
	4.4	Specified table number (Table 2) which was missing.

Purpose To set minimum environmental operating requirements for the Industrial Sewer System, the Upgrading Industrial and Storm Water and Wastewater Systems.

Compliance This standard applies to Suncor Oil Sands Upgrading and Energy & Utilities.

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Approved By: Sheila Chernys, Director, EH&S Environment/IH Oil Sands

Roles and Responsibilities

The following individuals and groups have the following roles and responsibilities:

- | | |
|--|---|
| Document Owner | <ul style="list-style-type: none">• Ensures this standard is reviewed according to the required revision cycle.• Ensures the standard is updated to accommodate changes to Suncor, provincial, and federal regulation.• Ensures the standard is updated to mitigate risks found as the result of an incident. |
| Document Approver | <ul style="list-style-type: none">• Ensures this standard is necessary and that it aligns with management and company direction. |
| Department Management and Directors | <ul style="list-style-type: none">• Ensures adherence to this standard within their jurisdiction. |

References

- [ECS0101A](#) Spill Reporting
- [ENP0001A](#) Environmental Incident Reporting
- [RHP00009](#) Special Liquid Waste Disposal into Tailings Ponds
- [POP3272A](#) Water License for Waste Water System
- [POW0019A](#) Wastewater Outfall Monitoring Operations Requirements

Terms, Definitions and Acronyms

The following terms, definitions and acronyms are used in this standard:

- | | |
|------------------------------|--|
| Composite Sample | A composite of samples which is typically collected at 15-minute intervals over one day, and which is representative of the stream being sampled. |
| Day | Any sampling period of 24 consecutive hours unless otherwise specified. |
| Grab Sample | An individual sample collected in less than 30 minutes and which is representative of the substance sampled. |
| Industrial Wastewater | The composite of liquid wastes and water-carried wastes, any portion of which results from any industrial process or pit dewatering carried on at the plant. |

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Terms, Definitions & Acronyms *Continued*

Monitoring System	All equipment used for sampling, conditioning, analyzing of recording data in respect to any parameter listed or referred to in the Approval including, equipment used for continuous monitoring.
Plant	The Suncor Energy Inc. Oil Sands Processing Plant and associated Mines, and all associated infrastructure and equipment, including but not limited to, all buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, roadways, pipelines, tailings ponds, mature fine tailings drying (MFTD) operations, Dedicated Disposal Areas (DDA's) and other installations, and includes the land located on Township 90, Range 8 and 9, Township 91, Range 8, 9, and 10, Township 92, Range 8, 9, and 10, and Township 93, Range 10, all west of the Fourth Meridian, that is being used, has been used, or held for or in connection with the Suncor Energy Inc. Oil Sands Processing Plant and associated mines.
Plant Developed Area	The areas of the plant used for the storage, treatment, processing, transport, or handling of raw materials, intermediate product, by-product, finished product, process chemicals, or waste material.
Recorder	A device which continuously records a measurement including, a strip chart, circular chart, or electronic data logger.

Standard**1. Operating Requirements**

Item	Description
1.1	All operations must comply with Environmental operating requirements.
1.2	Any release of industrial wastewater to the Athabasca River is prohibited except where authorized under the Alberta Environment Operating Approval 94-02-00 as amended.
1.3	The Industrial Sewer System is designed to transport industrial run-off and wash water to Pond A which is then connected in sequence to Ponds D, B, and then C. (Configuration altered in 2011 to facilitate longer water treatment times). The water is transferred to Cooling water pond through plant 34 (dissolved air flotation water treatment plant) which is designed for reducing O&G and TSS. The cooling pond water is designed for the FGD process which is directed to the Athabasca River. Excess pond C water is sent to the Extraction hot water tank (82D-7) for process use.

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- | Item | Description |
|------|---|
| 1.4 | <p>Approved streams entering the Upgrading Industrial Wastewater System from Upgrading and Extraction include:</p> <ul style="list-style-type: none"> a) Area precipitation run-off waters b) Wash water c) Oily wastewater d) Cooling tower blowdown water. <p>Note: Floor cleaners must be approved by Environmental Affairs.</p> |
| 1.5 | <p>Approved streams entering the Industrial Sewer System from Energy and Utilities include:</p> <ul style="list-style-type: none"> a) Area precipitation run-off waters b) Wash water c) Boiler blowdown water d) Sludge pit overflow e) Condensate return f) Ion-exchanger regeneration backwash and rinse water g) Clarifier blowdown water. <p>Note 1: MMF backwash water is sent to cooling water pond and eventually end up in waste water system</p> <p>Note 2: RO reject is sent to waste water system</p> <p>Note 3: ZeeWeed reject is sent to waste water system</p> |
| 1.6 | <p>Wastewater from exchanger bundle washes and other equipment chemical cleanings is NOT permitted for discharge to the Industrial Sewer System. Refer to RHP00009 Special Liquid Waste Disposal into Tailings for handling of these liquid waste streams. Requests for discharge of chemical cleanings must be by special agreement and approved by Environmental Affairs.</p> |
| 1.7 | <p>No liquid or solid wastes which would impact the normal operation of the wastewater system are to be disposed of through the Industrial Sewer System. Refer to POP3272A Water Licence for Waste Water System. Streams that are not listed as Approved in Section 1.5 or 1.6 must be authorized by Environmental Affairs prior to discharge.</p> |

2. Limits and Standards

- | Item | Description |
|------|--|
| 2.1 | <p>Releases of industrial wastewater from the Pond E outfall shall not exceed the limits specified in TABLE 1.</p> |
| 2.2 | <p>Any releases that exceed the limits specified in Table 1 must be reported following ENP0001A Environmental Incident Reporting.</p> |
| 2.3 | <p>Any spills of hazardous materials to the Industrial Sewer or to the Industrial Wastewater Treatment system must be reported as per ECS0101A Environmental Spill Reporting Standard.</p> |

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TABLE 1: INDUSTRIAL WASTEWATER LIMITS

PARAMETER	LIMITS	
Acute lethality test using rainbow trout (<i>Oncorhynchus mykiss</i>)	50% or greater survival in 100% industrial wastewater sample	
pH	≥ 6.0 and ≤ 9.5 pH units	
Flows from Pond E (FGD)	Must not exceed the maximum flow objectives set in the proposed Pond C/Pond E flow management plan as described in the SIR response of March 18, 2011 of the Application 059-94, unless otherwise authorized by the Director	
	Maximum Monthly Average Mass Loadings (kg/day)	Maximum Daily Average Mass Loadings (kg/day)
Chemical Oxygen Demand	3000	4500
Phenols	2.0	7.5
Sulphide	3.8	7.0
Ammonia-Nitrogen	25	70
Total Phosphorus	10	20
Total Nitrogen	680	1300
Total Chloride	20000	37000
Oil and Grease	150	350
Total Suspended Solids	1250	2000

3. Monitoring Requirements

Item	Description
3.1	All monitoring must comply with requirements detailed in POW0019A .
3.2	The continuous pH and flow measurement devices on the combined Pond C/Pond E outfall weir must operate at least for ninety percent of the time during periods when the outfall is being used.

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Responsibility	Step	Action	Initial/Date
	3.3	The release of industrial wastewater from the Pond E Outfall Weir must be monitored as specified in Table 1 & 2.	

TABLE 2: INDUSTRIAL WASTEWATER AND INDUSTRIAL RUNOFF AND REPORTING

Release from Industrial Wastewater (Pond E)		
PARAMETERS	FREQUENCY	SAMPLE TYPE
Flow (m ³ /d)	Daily, during release	Totalizer
Temperature	Daily, during release	Continuous
pH	Daily, during release	Continuous
Total Suspended Solids	Daily, during release	Composite
Chemical Oxygen Demand	Daily, during release	Composite
Oil and Grease	Daily, during release	Composite
Phenols	Daily, during release	Composite
Sulphide	Daily, during release	Composite
Ammonia Nitrogen (NH ₃ -N)	Daily, during release	Composite
Total Phosphorus (TP)	Weekly, during release	Composite
Total Nitrogen (TN)	Weekly, during release	Composite
Chloride	Weekly, during release	Composite
Naphthenic Acids	Weekly, during release	Composite
CCME F1, F2, F3 hydrocarbons (characterize alkyl and parent PAHs if detected in F1-F3)	Weekly, during release	Composite
Metals and other parameters listed in Appendix I	Weekly, during release	Composite
96-hour Multiple Concentration Acute Lethality Test Using Rainbow Trout	Every two months, during release	Grab
Chronic Toxicity Test using Ceriodaphnia and fathead minnows (including Microtox IC Metric)	Every two months, during release	Grab

3.4 Releases from the Pond E shall be limited to cooling water, Boiler Feed Water Treatment Plant (BFWTP) wastewater, and FGD wastewater from Pond 4G/4G2.

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Item	Description
3.5	Energy & Utilities shall monitor the flow rate from Pond 4G/4G2 discharge water to a limit of 6.82 m3 per minute.
3.6	If the outfalls are monitored more frequently than required in this standard, the extra analytical results shall be provided to Environmental Affairs in order to comply with Alberta Environment's reporting rules.

4. Routine Reporting Requirements

Item	Description
4.1	Upgrading Operations must ensure compliance with all wastewater system reporting requirements.
4.2	Upgrading Operations shall provide Environmental Compliance with information for the monthly report, within 15 days of the end of each month, including: <ul style="list-style-type: none">a) the monitoring results collected in accordance with Tables 1 & 2 including an assessment of data relative to limits specified in Table 1 & 2.c) the daily minimum and maximum of pH recorded for the release of industrial wastewater to the Athabasca River from Pond E and the duration of any deviation from the range of 6.0 to 9.5 pH units.d) the daily average temperatures from Pond E
4.3	Upgrading Maintenance (E/I) must provide Environmental Affairs with information for the monthly water report, within 15 days of the end of each month, including the following details: <ul style="list-style-type: none">a) type of monitoring equipment installedb) calibration data and proceduresc) inspection schedulesd) repair dates and nature of repairs undertakene) names of equipment installer, calibrator, inspector and repair person in respect of the above, andf) any other information required by Environmental Affairs.
4.4	Energy Services shall provide Environmental Affairs with information for the monthly report, within 15 days of the end of each month, including all monitoring results collected in accordance with Table 2.

End of Standard

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Appendix 1 – Metals and Other Parameters

Total Recoverable and Dissolved Metals and Elements	
Aluminum	Manganese
Antimony	Mercury (at DL <0.1 ng/L)
Arsenic	Molybdenum
Barium	Nickel
Beryllium	Potassium
Bismuth	Selenium
Boron	Silver
Cadmium	Sodium
Calcium	Strontium
Chromium	Thallium
Chromium (hexavalent)	Thorium
Cobalt	Tin
Copper	Titanium
Iron	Uranium
Lead	Vanadium
Lithium	Zinc
Other parameters	
Specific conductivity	Nitrate plus Nitrite as Nitrogen
Alkalinity	Total Kjeldahl Nitrogen (TKN)
Hardness	Dissolved Phosphorus
Total dissolved solids (TDS)	Dissolved Inorganic Carbon (DIC)
Cyanides	Dissolved Organic Carbon (DOC)
Sulphate	

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The following individuals have approved and signed this document.

UserName: Sheila Chernys (schernys)

Title: Dir OS Enviro & Reg

Date: Wednesday, 31 January 2018, 02:36 PM Mountain Time

Meaning: Approver 1 Signed

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