



# Sewage Handling

Document Number: <b>LMS0049A</b>	<b>Standard</b>	Applies To: <b>Suncor Energy Upstream</b>
Revision Date: <b>2016/01/05</b> Revision: <b>1</b> Review Cycle: <b>3 years</b>	Document Owner (Title): <b>Manager, Industrial Hygiene</b>	

## Summary of Changes

Rev No.	Section Changed	Revision Made
1		New Document

**Scope** This standard applies to all Suncor Energy Inc. Upstream employees, contractors, vendors and visitors and is part of the Upstream EHS management system.

**Purpose** This standard is intended to protect workers and minimize environmental impacts during handling and disposal of domestic sewage on Suncor Energy Inc.'s facilities in the Wood Buffalo region.

**Compliance** This standard will ensure compliance with the following: Alberta Occupational Health and Safety Act, Regulation and Code, July, 2009; Alberta Environmental Protection and Enhancement Act, Regulations 119/1993 and 120/1993; and Suncor Energy Inc. Environmental Operating Approval.

**Roles and Responsibilities** **The following individuals and groups have the following roles and responsibilities:**

- Document Owner**
  - Ensures this document is reviewed according to the required revision cycle.
  - Ensures the document is updated to accommodate changes to Suncor, provincial, and federal regulation.
  - Ensures the document is updated to mitigate risks found as the result of an incident.
- Document Approver**
  - Ensures this standard is necessary and that it aligns with management and company direction.

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| <b>Upstream Line Management</b>                                | <ul style="list-style-type: none"> <li>• Ensures implementation and adherence to this standard.</li> <li>• Ensures all concerned parties are aware of the requirements for handling and disposal of domestic sewage.</li> </ul>  |
| <b>Environmental Affairs and Industrial Hygiene Department</b> | <ul style="list-style-type: none"> <li>• Responsible for interpretation of relevant regulations regarding sewage handling and disposal.</li> <li>• Responsible for an annual audit of sewage handling and disposal operations.</li> </ul>  |
| <b>Environmental Compliance Manager</b>                        | <ul style="list-style-type: none"> <li>• Completes and submits monthly and annual sewage reports to Alberta Environment.</li> </ul>  |
| <b>Supervisor Cranes, Mine Services (Oil Sands)</b>            | <ul style="list-style-type: none"> <li>• Maintains an up-to-date list of locations requiring sewage removal and disposal services.</li> <li>• Requests guidance from Environmental Affairs for atypical sewage handling or disposal situation.</li> <li>• Reviews the Sewage Handling and Disposal log sheet to ensure the information required on all sewage disposal jobs is logged and that log sheets are maintained in an active file for ten years.</li> </ul> |

**References**

- [ECS0101A](#) Environmental Spill Reporting
- [PMP0179A](#) Remove/Overhaul Gorman Rupp Sewage Lift Pumps
- [ENP0001A](#) Environmental Incident Reporting

**Terms, Definitions and Acronyms**

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

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|------------|--|
| <b>TSS</b> | Total Suspended Solids - the amount of undissolved solids in sewage. Excess TSS can block sufficient sunlight from reaching underwater plant life preventing normal growth and productivity.   |
| <b>BOD</b> | Biochemical Oxygen Demand - the amount of oxygen used in five days by micro-organisms breaking down organic matter found in an effluent sample. A high BOD means there is excess TSS in the effluent and indicates inadequate treatment. |

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**Standard****1. General****Item****Description**

- 1.1 All tasks or activities involving domestic sewage will undergo the industrial hygiene process of recognition, evaluation and control to mitigate potential detrimental effects associated with raw sewage.

**2. Recognition****Item****Description**

- 2.1 Pathogenic organisms may be transmitted in dried, aerosolized or liquid form, and can enter the body through inhalation, injection, or ingestion.
- Note:** The potential for illness from contact with pathogenic bacterial, viral, or parasitic microorganisms in sewage in most developed countries is relatively limited.
- 2.2 Release of untreated domestic sewage into the environment can result in destruction of aquatic habitat and cause both acute and chronic toxicity in aquatic organisms.

**3. Evaluation****Item****Description**

- 3.1 Measurement of worker exposure to contaminants in raw sewage is generally not required. Evaluation of the effectiveness of sewage treatment on site shall be determined by measurement of Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD).

**4. Control Measures****Item****Description****Elimination /  
Engineering  
Controls**

- 4.1 There is limited opportunity to eliminate or engineer out exposures to raw domestic sewage based upon the type of tasks where workers come into contact with the material.

**Administrative  
Controls**

- 4.2 The most effective method to prevent exposure to microorganisms found in raw sewage is to maintain a high degree of personal hygiene since hand to mouth contact is the primary route of exposure. Effective measures include:
- Showering daily.
  - Avoid touching nose, mouth eyes or ears with contaminated hands.
  - Cleaning cuts, abrasions or rashes and covering them at work.
  - Washing hands before eating, smoking or drinking.

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	<b>Item</b>	<b>Description</b>
<b>Personal Protective Equipment</b>	4.3	Workers who are immersed in domestic sewage should shower immediately and then report to First Aid.
	4.4	The PPE required will be dependent upon the specific task and location of the work being performed. As a minimum, workers must wear tight-fitting latex or neoprene gloves (e.g. N-Dex or Conform) when handling or sampling sewage. If contact with splashing fluid is likely, rain gear and monogoggles or faceshields must be worn.
	4.5	Respiratory protection is generally not required when handling sewage but may be advisable in specific situations. <ul style="list-style-type: none"> <li>• Self-contained breathing apparatus must be worn when pumping sewage containing hydrogen sulfide.</li> <li>• Air purifying respirator with P100 filters must be worn if splashing hazard is likely.</li> <li>• Organic vapour cartridges must be used if sewage is contaminated with hydrocarbon material.</li> </ul>
	4.6	Protective clothing must be removed at the end of shift and cleaned before re-use or discarded, if disposable.

**5. Medical Surveillance**

<b>Item</b>	<b>Description</b>
5.1	Vaccination for tetanus or Hepatitis A is not required for employees who are considered exposed or who may be exposed to sewage.  <b>Note:</b> Workers who feel they are at risk can be vaccinated through Alberta Health Services (Northern Lights Regional Health Centre).
5.2	If workers are submersed in domestic sewage, Suncor Energy will work with medical professionals at the Northern Lights Regional Health facility to determine if post-exposure vaccination should be administered.

**6. Environmental Requirements**

<b>Item</b>	<b>Description</b>
6.1	Ensure domestic sewage is only discharged per provisions of site specific Environmental Operating Approvals.
6.2	Sewage that has been accidentally mixed with other substances, such as oil, can only be dumped into the sewage system if the following conditions are met: <ul style="list-style-type: none"> <li>• Mixed sewage is non-toxic as determined by the microtox test method</li> <li>• Business Unit receiving mixed sewage agrees to accept material</li> <li>• Alberta Environment has been notified and does not object.</li> </ul>

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<b>Item</b>	<b>Description</b>
6.3	All spills of domestic sewage must be reported to Environmental Affairs and Industrial Hygiene department as per the requirements of ENP0001A Environmental Incident Reporting.

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**End of Standard**

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## Appendix 1 – Sewage Rationale Document

OIL SANDS



## Inter-Office Memo

Subject	Sewage Rationale Document	Date (Y-M-D)	2015-11-17
From	Industrial Hygiene	Department	Industrial Hygiene
To	Health and Wellness Centre	Cc	Sheila Chernys ;Jean Myers

As a part of the ongoing commitment to employee health, Suncor has developed a risk based health surveillance system. This memo documents the rationale for Suncor's Sewage Handling Guidelines. This is an update of the April, 6th, 2006, Sewage Rationale Document, which should now be archived.

**Rationale:**

The potential for illness from contact with pathogenic bacterial, viral, or parasitic micro-organisms in sewage does exist but in most developed countries is relatively limited. Pathogenic organisms may be transmitted in dried, aerosolized or liquid form, and can enter the body through inhalation, injection, or ingestion.

1. Bacterial pathogens in sewage can include the organisms listed in the table below.

<b>2. Bacterial Pathogen</b>	<b>Related Disease</b>
<i>Salmonella</i>	Salmonellosis
<i>S. typhimurium</i>	Typhoid fever
<i>Shigella</i>	Shigellosis
Enterococcus (Fecal Streptococci)	Diarrhea
E. coli ( Fecal Coliform)	Diarrhea
<i>Vibro cholerae</i>	Cholera
<i>Campylobacter jejuni</i>	Gastroenteritis
<i>Clostridium tetani</i>	Tetanus

The primary bacterial threat to a sewage handler is tetanus. Tetanus is a rare disease characterized by muscle rigidity and muscle spasms. Contamination of a puncture wound, cut or abrasion is the most common method of transmission. There are licensed Tetanus vaccinations available that can provide long-lasting protection against infection. These vaccines are administered as part of routine public health immunizations in association with Diphtheria vaccine, commonly referred to as Td vaccine.

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Suncor Energy Inc. does not require its employees considered to be exposed or potentially exposed to sewage to get a vaccination for tetanus. Vaccinations are a medically invasive procedure that workers cannot be required to submit themselves to. Workers should ensure that their routine public health immunizations are current. If workers are concerned that their Tetanus vaccination is not current, they can contact the Family Health Unit at the Northern Lights Regional Health Center to arrange vaccination.

Development of a disease associated with other bacterial pathogens present in sewage is uncommon amongst sewage handlers if appropriate personal hygiene measures are used.

3. Viral Pathogens in sewage can include the organisms listed in the table below.

<b>Viral Pathogen</b>	<b>Related Disease</b>
Hepatitis A	Hepatitis
Norwalk-like agents	Gastroenteritis
Virus-like 27 nanometer particles	Gastroenteritis
Rotavirus	Gastroenteritis and polio

Hepatitis A is a food and water-borne agent primarily transmitted by the fecal-oral route. The prevalence of Hepatitis A is most strongly associated with low socio-economic status and is more likely to be found in developing and third world countries. There are licensed Hepatitis A vaccinations available that can provide long-lasting protection against infection. These vaccines can be administered pre-exposure or for post-exposure prophylaxis. Pre-exposure administration of the vaccine is generally recommended for those groups that are at higher risk of being exposed to the virus. Current literature indicates that occupational exposure to Hepatitis A in sewage handling workers is highly unlikely in North America so this occupational group is generally not required to have systematic vaccinations.

Suncor Energy Inc. does not require its employees considered to be exposed or potentially exposed to sewage to get a vaccination for Hepatitis A. Vaccinations are a medically invasive procedure that workers cannot be required to submit themselves to. Should workers feel that they are at risk and wish to get the vaccination, they can contact the Family Health Unit at the Northern Lights Regional Health Center to arrange vaccination. Should there be an incident where workers are submersed in domestic sewage, post-exposure prophylactic vaccination would be considered but would not be required. Suncor Energy Inc. would work with medical professionals at the Northern Lights Regional Health facility to determine if post-exposure vaccination should be administered.

Development of a disease associated with other viral pathogens present in sewage is uncommon amongst sewage handlers if appropriate personal hygiene measures are used. Vaccinations are not available for the other viral pathogens.

4. Parasitic Pathogens sewage can include the organisms listed in the table below.

<b>Parasitic Pathogen</b>	<b>Related Disease</b>
Cryptosporidium parvum	cryptosporidiosis
Giardia lamblia	giardiasis
Entamoeba histolytica	amoebic dysentery

Parasitic infections are extremely uncommon in developed countries particularly if appropriate personal hygiene measures are used.

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**Exposed Workers:**

Workers that will have exposure to sewage as part of their routine work activities include the following: Upgrading Offplots Operators, Mine Services Support Equipment Vacuum Truck Drivers, Plumbers/Pipe fitters in Site Wide Services and MEM Building Maintenance.

Workers that will have exposure to sewage as part of their non-routine or infrequent activities will include the following: Upgrading Electrical and Instrumentation, Jacob's Catalytic Plumbers/Pipefitters in Upgrading 2, Site Wide Services Light Vehicle Shop Mechanics.

**References:**

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2. Alberta Human Resources and Employment, Medical Monitoring of Workers Exposed to Sewage, Workplace Health and Safety Medical Guideline MG012, July 2000
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## Appendix 2 - Upgrading Sewage Guidance

Under the provisions of Suncor Energy's Environmental Operating Approval, domestic sewage can only be discharged into the U2 sewage lagoons or the Steepbank sewage treatment plant. Domestic sewage is not to be dumped into the Upgrading wastewater industrial treatment system, drainage systems in the mine, tailings ponds, or process streams.

### 1. Collection of Sewage Samples at Sewage Treatment System in Upgrading

Item	Description
1.1	Obtain clean 1 liter plastic sample bottles from the lab.
1.2	Proceed to the sewage treatment area.
1.3	Use sample bucket to sample at the inlet and outlet from the aerobic lagoons. <b>Note:</b> Inlet sample is taken at the manhole on the outlet of the anaerobic pond. The outlet sample is taken at the manhole just outside the N.E. corner of the blower building.
1.4	Catch the water in the sample bucket as it flows out of the line, being careful not to scrape bucket or sample container on bottom or sides of manhole which may result in a contaminated sample.  Fill and cap sample bottle, ensuring there are no air spaces in bottle.  Visually check samples for signs of contamination before delivery to lab and resample as required.
1.5	Tag all samples with required information and deliver to the lab immediately. Avoid allowing samples to freeze in cold weather.
1.6	The inlet and outlet samples are taken on Wednesday and Friday mornings.
1.7	Samples must be delivered to the lab before 9:00 a.m. and must not be taken before 06:00 hours. Samples are delivered to outside lab by 09:30.

### 2 Safety Precautions for Sewage Sampling at Sewage Treatment System in Upgrading

Item	Description
2.1	Do not step onto the inner slope of pond dyke.
2.2	Do not step onto any ice formed on ponds.
2.3	Do not attempt to drive any light vehicle into the sewage treatment area if road conditions are slippery due to snow and ice or mud.

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### **Appendix 3 - Collection of Sewage from Sewage Tanks Guidance**

#### **1. Collection of Domestic Sewage from Sewage Tanks with Vacuum Truck**

<b>Item</b>	<b>Description</b>
1.1	Collect sewage from specified locations by using a vacuum truck. Operator must ensure that vacuum truck is clean and empty or, contains only sewage before vacuuming any sewage tanks.
1.2	Drive truck to sewage tank area.
1.3	Check area for obstructions before driving or backing into the location.
1.4	Exit truck and hook up hose to sewage tank. Always use handrail and steps when ascending/descending from the truck. Check area for obstructions before descending.
1.5	Open valve on the truck and start vacuuming tank.
1.6	Watch tank level gauge on truck to see if the truck is full.
1.7	When sewage tank is empty or truck is full, disconnect hose and drain the line.
1.8	Proceed to next location and repeat above steps until vacuum truck is full.
1.9	When truck is full, drive to clearly marked sewage dumping point at appropriate sewage treatment system and position truck to dump.
1.10	Check area for obstructions before driving or backing into the location.
1.11	Exit truck, bleed off air, open dump gate, raise tank and dump load into dump site.
1.12	Lower tank and shut gate.
1.13	Flush truck at end of the shift, or earlier if required for oil service.
1.14	Vacuum truck operators must complete the Sewage Handling and Disposal log sheet with the following information: <ul style="list-style-type: none"><li>• date and time when truck cleaning completed</li><li>• quantity of sewage hauled</li><li>• date and time of sewage disposal</li><li>• operator's name</li><li>• previous duty or contamination of truck</li><li>• any unusual occurrences during the job.</li></ul>

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## 2. Safety Precautions for Collection of Domestic Sewage from Sewage Tanks with Vacuum Truck

<b>Item</b>	<b>Description</b>
2.1	Vacuum truck operators must be trained.
2.2	Never vacuum sewage into a truck that contains other waste.
2.3	Sewage spills must be cleaned immediately.
2.4	Smoking is prohibited while work is in progress as combustible gases may be present (e.g. methane).
2.5	Take extra care when driving or working in poor visibility conditions. If necessary, get help to back and position the truck.

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Approved By: Shamini Samuel, Manager, Industrial Hygiene



The following individuals have approved and signed this document.

UserName: Shamini Samuel (ssamuel)

Title: Mgr Regional IH & Compliance

Date: Tuesday, 05 January 2016, 11:04 AM Mountain Time

Meaning: Approver 1 Signed

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