

Work Practice

Department:	UPGRADING OPERATIONS	Number:	POW0037A
Subject:	Sewage Treatment System Sampling	Reference:	
FLOC:	UPG		

1. Purpose:

To minimize the risk to personnel taking sewage treatment system quality control samples.

2. Prerequisites:

2.1 Personnel must be familiar with [LMS0049A](#) Sewage Handling Standard.

3. Precautions:

3.1 Do not step onto the inner slope of any pond dyke.

3.2 Do not step onto any ice formed on the top of any ponds.

3.3 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.

3.4 Any persons with potential for contact with sewage should use appropriate PPE to minimize the risk of contact with a biological hazard (sewage), either at the sewage lagoons or at any sewage lift stations (i.e.: lift station south-west of Plant 6). Medical latex gloves should be worn during the sampling procedure (under work gloves). If contact with splashing fluid is likely, monogoggles or a face shield should be worn and wearing rain gear should be considered.

3.5 If immersion in sewage occurs, the worker should shower immediately and report to First Aid. Any significant, accidental exposures to sewage should be reported to First Aid (i.e. splash in eyes).

4. Work Practice:

4.1 **Obtain** clean sample bottles from the lab, alternately, there is usually an inventory of bottles kept in the Sewage Blower building. Use a 1ltr plastic sample bottle.

4.2 **Proceed** to the sewage treatment area sampling locations.

Note: 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 NE corner of the blower building.

Additional samples may be requested from the aerated sewage ponds and lagoons.

4.3 **Use** sample bucket or a long handled sample scoop to obtain a sample at the sampling locations. Ensure the sample bucket has been cleaned and/or sterilized prior to use at EACH sampling location. Triple rinse the sample bucket with the water that is to be sampled.

4.4 **Tag** all samples with required information prior to sample collection.

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- 4.5 **Ensure** a representative sample is obtained:
- **Triple** rinse plastic sample bottles with sample water.
 - **Catch** the water in the sample bucket as it flows out of the line and sample within the centre of the flow channel.
 - **Do not** scrape bucket or sample container on bottom or sides of manhole which may result in a contaminated sample.
 - **Do not** sample stagnant water, such as water pooled along sides of Ponds.
 - **Avoid** sampling at the water surface in Ponds, which may result in collection of floating scum that may contaminate sample, submerge collection container at least 30 cm below surface
 - Avoid collection of any sludge that has settled at the bottom in Ponds; avoid disturbing settled sludge at the bottom of the sampling location.
 - **Fill and cap** sample bottle. Ensure there are no air spaces in bottle. Visually check samples for signs of contamination (e.g. algae) prior to delivery to lab and resample as required.
- 4.6 **Avoid** allowing samples to freeze in cold weather; do not allow samples to warm significantly in hot weather.
- 4.6 **Deliver** collected samples to the lab immediately. Samples are to be accompanied by appropriate Chain of Custody (COC) documentation. Retain a copy of the COC following relinquishment of samples to the external lab.
- 4.6 The outlet sample is taken twice weekly on Wednesday and Friday mornings. It will be analyzed for Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) by an outside lab.
- 4.7 The inlet sample is taken twice weekly on Wednesday and Friday mornings. It will be analyzed for BOD and TSS by an outside lab.
- 4.8 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.

5. Implementation:

The Upgrading Operations Shift Supervisors shall ensure implementation of this work practice.

6. Interpretation and Updating:

The Upgrading Operations Area Manager Offplots shall ensure interpretation and updating of this work practice.

7. Approved By:

**Donald Austin,
General Manager,
Upgrading Operations.**

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APPENDIX I

OIL SANDS



Inter-Office Memo

Subject	Rationale Document - Sewage	Date (Y-M-D)	July 30, 1999
From	Yvonne Gazzard Jim Walbridge	File	5410
To	File	Cc	Tim Gondek OHNs

This is an update of the March 19, 1998 Rationale Document - Sewage, which should now be discarded. 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 and the changes to the program since the last update.

Rationale:

The potential for illness from contact with bacterial, parasitic, or viral micro-organisms in sewage does exist, but in most developed countries is relatively limited. Biohazardous agents (bacteria, virus, parasite) may be transmitted in dried, aerosolized or liquid form, through inhalation, injection, ingestion, or absorption through the skin.

The primary bacterial threat to a sewage handler is tetanus. Tetanus is a rare disease characterized by muscle rigidity and muscle spasms. The tetanus bacteria are capable of forming spores. The tetanus spores are resistant to harsh environmental conditions therefore they can survive in most environments to reproduce more tetanus bacteria. The resistance of the spores is the reason that tetanus is considered so hazardous. Contamination of a puncture wound, cut or abrasion is the most common method of transmission. In industry some unusual modes of tetanus infection have occurred through inhalation and dermal contact.

Occupationally associated bacterial gastro-enteritis (Giardiasis) from exposure to sewage is uncommon amongst sewage handlers if appropriate personal hygiene measures are used.

Parasitic infections are extremely uncommon in developed countries particularly if normal hygienic procedures are practised.

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The most serious potential viral infection is Hepatitis A. Although very uncommon in Canada, Hepatitis A may lead to serious liver inflammation, and in rare cases, may be fatal. Symptoms range from those associated with a mild flu (fever, loss of appetite, fatigue) to more severe symptoms like prolonged nausea, vomiting, abdominal pain and jaundice (yellowing of the skin and whites of the eyes). Hepatitis A is transmitted via human or animal feces and must be ingested to contract the disease.

Changes have been made to the previous Sewage Handling Standard:

The Biological Monitoring requirement has been deleted. Based on current literature, preliminary blood tests and stool analysis serve no functional purpose so are now reserved for acute exposure to sewage if deemed necessary by the company physician.

Hepatitis B and Polio vaccinations are no longer recommended. (Canadian Immunization Guide)

Vaccination for Hepatitis A will continue to be recommended for those who handle sewage as a regular part of their job, but is not a specific requirement for those who are not regularly handling sewage.

Classification of exposure groups has not changed from the March 1998 update. The highest risk exposure group is classified as Level One and the lower risk exposure group is classified as Level Two.

The population to be included in the two exposure levels is still consistent with the most recent review of the work groups (March 1998) by Industrial Hygiene.

Exposure Levels

Two exposure levels to sewage have been identified. Level One applies to occupations that WILL have exposure to sewage as part of their routine work. It is recommended that these occupations receive Hepatitis A, Tetanus, and Diphtheria vaccinations (TD).

Level Two applies to those occupations that MAY have exposure to sewage in the course of their work. Regular vaccination of TD is recommended. This is recommended for everyone, even non-sewage workers. Hepatitis A is not recommended nor required but is offered to those employees who wish to receive it.

POPULATION

Suncor and long-term contractor employees included in these Exposure Groups are as follows:

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Level One:

1. Mine Operations, Mine Services - Support Equipment Vacuum Truck Drivers

These individuals are called to handle sewage wherever there is a spill, leak or overflow on site. The vacuum hoses and pumping equipment become covered with sewage giving opportunity for exposure. The Vacuum truck drivers fall within Exposure level one.

2. Energy Services Maintenance Services Plumbers/Pipefitters

These individuals work on sewage systems, pumps, pipes and septic tanks. They should be included in Exposure level one.

3. Upgrading Outfall Operators

This group collects sewage samples. The outfall operators should be included in Exposure level one.

4. Camp Maintenance Pipefitters

These individuals are required to work underneath the camp trailers. There is a strong potential for them to have to lie in dry sewage since the sewage pipes under the trailer can leak. They must be included in Exposure level one.

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Level Two:

1. CMS Millwrights and Pipefitters

This group may be exposed to sewage about twice a year from repairing the sewage pumps located west of the plant 7 compressor building. Possible exposure twice a year would not be sufficient to warrant including this group in Exposure level 1.

2. Upgrading Electronics

Upgrading Electronics employees may work on sewage pumps by exception. They may have nothing to do with sewage handling for three months then have three occasions in one month. They tend to work on motors that drive sewage pumps. This would not directly expose them to sewage but may give them a secondary exposure.

3. Industrial Hygienists

This group may be required to respond to a sewage problem to evaluate the situation. Their exposure will be by exceptions, not routine.

4. Upgrading Projects

Some of this group will be involved with the building & excavation of the sewage lagoons and therefore could come in contact with sewage depending on how much direction the contractors require.

5. Energy Services HVAC Technician

The HVAC Technician may be required to work on sewage pipes. Their exposure will be infrequent and therefore only warrants inclusion in Level Two.

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6. Fort McKay Labourer (Camp)

These individuals may be required to clean up sewage spills in camp. Their exposure will be infrequent.

7. Camp Maintenance Carpenter

These individuals may be required to work on the camp trailers or work on the washrooms in camp. There is the potential for exposure to sewage but it will be infrequent.

8. Upgrading Relief Outfall Operators

This group includes operators who have previously been trained to do the outfall job and could be asked to perform the job in the event of an emergency or to fill in while another operator is on holiday. Their exposure would be by exception rather than routine.

Some other groups were suggested for evaluation but upon evaluation were not included in the protocol.

1. Emergency Services

They do not handle sewage and in case of emergency contact, already have shots required under the Emergency Services Protocol for other aspects of their job.

2. Laboratory Technicians

This may change in the future if they are ever required to do analysis on sewage. This possibility is not yet in effect. Their only current potential exposure occurs when they pack samples that other people have taken. The bottles are plastic and not likely to break. There is no planned direct contact with sewage.

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3. CMS Instrumentation

It was thought that this group might do repair work on some valves. Apparently this has not been done for at least two years and in case it is ever required in future, there is a procedure that includes soaking the valve in bleach to kill any bacteria. At least two of the employees in this group have had the required vaccinations and would be assigned to this work if it were ever required.

4. Geotechnical Services Monitors

This may change in the future should application of municipal waste water sludge to reclamation areas occur. They would be required to check their monitoring equipment on the reclaimed area approximately once per month and would require inclusion in level 1.

5. Reclamation Employees

These employees would only become exposed should application of municipal waste water sludge to reclamation areas occur. The environmental employees who need to be on the reclaimed area to monitor growth and performance of new trees should be included in the level 1 designation when this occurs.

Yvonne Gazzard
Occupational Health Nurse

Jim Walbridge
Industrial Hygienist

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APPENDIX II

CLIENT FACT SHEET

1. Why are sewage guidelines in place and are there health effects I should be concerned with?

Sewage handling guidelines are in place to educate the worker regarding hazards associated with sewage handling and to assist him/her to reduce these risks. The hazards to personnel handling sewage typically fall into two categories: chemical and biological.

Chemical

Sanitary sewers or any other similar confined space can sometimes be deficient in respirable oxygen due to the presence of carbon dioxide, methane and hydrogen sulfide gases generated as a result of bacterial activity. A reduction in respirable oxygen can cause asphyxiation.

Airborne gases such as methane are hazardous because of their potentially explosive nature. Other gases such as hydrogen sulfide can produce both acute and chronic health effects. Acute high doses of hydrogen sulfide can cause paralysis and death in some instances. Acute low dose exposure can cause dizziness, weakness, nausea, headache, burning eyes, respiratory irritation and loss of consciousness occasionally. Some sources report that chronic low level exposure may produce effects such as eye irritation, fatigue, changes in personality, respiratory irritation, and gastrointestinal disorders.

Biological

The potential for illness from contact with viral, bacterial or parasitic microorganisms in sewage does exist, but in most developed countries is relatively limited. Biohazardous agents (bacteria, virus, parasite) may be transmitted in dried, aerosolized or liquid form, through inhalation, injection, ingestion, or absorption through the skin.

The primary bacterial threat to a sewage handler is tetanus. Tetanus is a rare disease characterized by muscle rigidity and muscle spasms. The tetanus bacteria are capable of forming spores. The tetanus spores are resistant to harsh environmental conditions therefore they can survive in most environments to reproduce more tetanus bacteria. The resistance of the spores is the reason that tetanus is considered so hazardous. Contamination of a puncture wound, cut or abrasion is the most common method of transmission. In industry some unusual modes of tetanus infection have occurred through inhalation and dermal contact.

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Parasitic infections are extremely uncommon in developed countries particularly if normal hygienic procedures are practised.

The most serious potential viral infection is Hepatitis A. Although very uncommon in Canada, Hepatitis A may lead to serious liver inflammation, and in rare cases, may cause death (0.1%). Symptoms range from those associated with a mild flu (fever, loss of appetite, fatigue) to more severe symptoms like prolonged nausea, vomiting, abdominal pain and jaundice (yellowing of the skin and whites of the eyes). Hepatitis A is transmitted via human or animal feces and must be ingested to contract the disease.

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2. **What personal protective equipment or other measures can I take to decrease the risk of both chemical and biological exposure?**

Follow area specific procedures during tasks where exposure to the chemical or biological hazards is likely. Education about personal hygiene practices is very important in the prevention of illness.

CHEMICAL HAZARDS

Smoking is prohibited while work is in progress as there may be highly combustible gases present such as methane. Workers shall wear appropriate respiratory equipment when working around sewage. For example, SCBA is to be worn when pumping sour sewage or an air-purifying respirator is to be worn in the presence of other organic vapours.

BIOLOGICAL HAZARDS

All scratches or abrasions should be thoroughly cleansed and kept covered while at work. All injuries especially cuts or penetrating wounds should be assessed immediately at the health centre.

Good personal hygiene is essential to prevent the development of any health effects associated with exposure to sewage.

- Avoid rubbing the eyes with contaminated hands or other contaminated objects
- Wash hands prior to eating or smoking
- Avoid nail biting, cigarette smoking or eating because of the possibility for hand to mouth transmission of contaminants
- Shower daily
- Wear latex or neoprene gloves (impervious to water), and neoprene rain gear if required
- Mono-goggles or a face shield should be worn if splashing liquid is likely
- Remove protective clothing at the end of the shift and have all such clothing cleaned prior to reuse

In addition to the above precautions, personnel should be aware of potential gaseous and other chemical hazards associated with the occupation.

Workers who accidentally fall into sewage or experience a significant exposure to sewage should shower and cleanse themselves and immediately report to Emergency Services.

Meticulous personal hygiene is your best defence against most biological hazards. An up-to-date immunization status is also important to minimize potential safety hazards from parasitic, viral or bacterial contact.

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Immunizations

Workers handling sewage should receive immunizations for Tetanus and Hepatitis A. Although Diphtheria immunization is not recommended for sewage handlers, it is most often given in conjunction with Tetanus.

Tetanus and diphtheria: Ensure primary immunization (three doses) has been completed; booster every 10 years.

Hepatitis A: Primary immunization consists of 2 doses (at 0 and 6 months). It is essential that both doses are received - no booster is required after this primary series.

3. What is the Occupational Health Centre's role regarding the Sewage Handling Guidelines and immunization?

The Occupational Health Nurse provides education on the risks associated with sewage handling and will provide a prescription for the Hepatitis A vaccine if the employee in an exposure group requests it.

Two levels of exposure have been identified:

Level 1: Employees categorized within this risk group are those jobs that **will have exposure to sewage** as part of their work. Although workers are considered low risk for exposure to the identified biological hazards, maintenance of immunizations as above is recommended. Job categories assessed at this level include regular Upgrading Outfall Operators, FMS Vacuum Truck Operators, FMS Plumbers, and Camp Maintenance Pipefitter.

Level 2: Applies to those employees that **may have exposure to sewage** as part of their work. Workers in this category are considered at extremely low risk for the identified hazards. Maintenance of regular immunization of Tetanus is recommended. Immunization for Hepatitis A is not recommended but is offered to those employees requesting it. Job categories assessed at this level include CMS Millwrights and Pipefitters, Upgrading Electronics employees, relief Outfall Operators in Upgrading Operations, Energy Services HVAC Technician, Fort McKay Labourer (camp), Camp Maintenance Carpenter.

It is the employee's responsibility to ensure that appropriate immunizations are up to date and that the status is provided to the Occupational Health Centre for inclusion on the employee's medical file.

4. Additional Information

Any of the Occupational Health and Hygiene Staff would be happy to answer any questions you may have with respect to health effects, significance of health surveillance tests, exposure data or chemical composition of any product.

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The following individuals have approved and signed this document.

UserName: Donald Austin (daustin)

Title: GM Upgrading Operations

Date: Tuesday, 06 January 2015, 12:45 PM Mountain Time

Meaning: Approver 1 Signed

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