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Updated June 24, 2015



## 1.0 INTRODUCTION

### 1.1 Plan Background

Operating and maintaining the water and sewer system is a responsibility that involves consideration for routine functions, planning and responding to emergency situations. The purpose of this plan is to assist the District of Stewart in preparing for and responding to emergency situations within their water and sewer systems. For the purposes of this plan, an emergency is defined as *“the occurrence of any event that causes the water or sewer to pose a threat to public health and safety or to the environment”*.

The District of Stewart Emergency Response and Recovery Plan is a separate document that has been developed to address emergencies that impact the District beyond the water and sewer systems. In situations when the District of Stewart Emergency Plan is activated, the Water and Sewer Emergency Plan may serve as a resource to the District; however, the official Emergency Plan will take precedence. This document contains contacts, procedures, system maps and other information required to effectively respond to a set of pre-identified emergencies. The contacts have been grouped into common categories. All questions or comments regarding this plan should be directed to the Director of Public Works.

Emergency procedures have been prepared for potential water and potential sewer situations. These situations cover most emergencies that will be encountered. In situations where other emergencies arise, the general approach and principles illustrated here within should be adapted to address the situation.

As with any other emergency document, this plan’s effectiveness can only be measured in an emergency response. Therefore, each procedure should be reviewed and, if possible, tested annually and revisions made as necessary.

### 1.2 Water System Background

The District of Stewart water system is shown in maps (Appendix 1). The District’s primary water system is currently comprised of the following components:

- 3 operating groundwater wells that deliver water to the distribution system
- Approximately 8 km of water-main.



At present there is no treatment or disinfection provided to the water utility other than chlorine disinfection during water main flushing, which takes place in May each year.

### **1.3 Sewer System Background**

The District of Stewart sewer system is shown in Map Appendix #1. The District's primary sewer system is comprised of the following components:

- 3 lift stations
- 1 aerated lagoon
- Approximately 8km. of sewer main

Lift station locations:

- 5<sup>th</sup> and Victoria Lift Station #1
- Brightwell and 5<sup>th</sup> Lift Station #2
- 5<sup>th</sup> and Railway Lift station #3

### **1.4 Emergency Stages**

There are several basic stages during the initial discovery and assessment of an emergency; warning, detection, assessment, emergency response and clean-up or repair. The following are steps that every Public Works employee should be aware of, given that anyone may be the first to be notified or come upon the emergency situation. Being familiar with an organized approach may save precious time.

#### **1.4.1 Warnings**

Warnings may come in a number of ways. The two most likely are phone calls from concerned citizens or during routine maintenance checks. Water and sewer issues can be reported by calling 250-636-2251.

#### **1.4.2 Detection**

Once a warning sign has become apparent, the actual cause must be detected. Each employee should be trained to recognize warning signs and investigate to determine the cause and possible consequences. A short list of some problems to look for is given in Table 1 (page 6) for water utility emergencies and Table 2 (page 21) for sewer utility emergencies. Procedures or tests (beyond visual observations) undertaken to determine if a problem exists will generally be the responsibility of the Director of Public Works or other works staff.



### **1.4.3 Assessment**

The person who detects a potential emergency should make a primary assessment of the situation. The assessment is not to determine a remedy, rather to determine the magnitude of the problem. A decision can then be made as to whether an emergency response or routine maintenance is required.

### **1.4.4 Emergency Response**

Once an emergency has been detected and assessed, the emergency plan for the specific situation should be implemented. Although all personnel should be familiar with their responsibilities and required actions during an emergency, one of the first steps, should an event occur, is to re-affirm the roles and establish clear lines of communication.

### **1.4.5 Clean Up/Repair**

Following control of the emergency, the clean up or repair may begin. Because the possible causes and thus remedies of an emergency are numerous, it is beyond the scope of the manual to describe specific repair procedures. It is likely that most repair procedures required of District Staff will be within the scope of their regular training. Depending on the cause and extent of the emergency, advice and direction from appropriately qualified specialists should be obtained.



**Table 1: Indicators and Possible Corresponding Causes of Water Utility Emergencies**

EMERGENCY	WARNING SIGNS	POSSIBLE CAUSES
<b>BACTERIOLOGICAL CONTAMINATION OF WELLS</b>	<ul style="list-style-type: none"> <li>• Positive Coliform Test</li> <li>• Odor / Discoloration</li> <li>• Bad taste / Floating objects</li> <li>• Illness</li> </ul>	<ul style="list-style-type: none"> <li>• Linkage from surface water to groundwater</li> <li>• Natural deterioration of aquifer</li> <li>• Build-up of bacteria on well screens</li> </ul>
<b>CHEMICAL CONTAMINATION OF WELLS</b>	<ul style="list-style-type: none"> <li>• Odor / Discoloration</li> <li>• Bad taste / Floating objects</li> <li>• Illness</li> </ul>	<ul style="list-style-type: none"> <li>• Vandalism</li> <li>• Chemical spill in groundwater recharge area</li> </ul>
<b>RESERVOIR CONTAMINATION</b>	<ul style="list-style-type: none"> <li>• Positive Coliform Test</li> <li>• Odor / Discoloration</li> <li>• Bad taste / Floating objects</li> <li>• Illness</li> <li>• Signs of vandalism</li> <li>• Flooding / Wet spots</li> <li>• Erosion</li> <li>• Shortage of water</li> </ul>	<ul style="list-style-type: none"> <li>• Well contamination</li> <li>• Vandalism</li> <li>• Distribution system contamination</li> </ul>
<b>DISTRIBUTION SYSTEM CONTAMINATION</b>	<ul style="list-style-type: none"> <li>• Positive Coliform Test</li> <li>• Odor / Discoloration</li> <li>• Bad taste / Floating objects</li> <li>• Illness</li> <li>• Shortage of water</li> <li>• Very low pressures</li> <li>• Sudden pressure fluctuations</li> <li>• Flooding / Wet spots</li> <li>• Erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Well contamination</li> <li>• Vandalism</li> <li>• Reservoir contamination</li> <li>• Backflow from:               <ul style="list-style-type: none"> <li>➢ Industrial plants or equipment</li> <li>➢ Irrigation system</li> <li>➢ Fire flow conditions</li> <li>➢ Mainline break</li> </ul> </li> </ul>
<b>EXTENSIVE PUMP FAILURE</b>	<ul style="list-style-type: none"> <li>• Low level reservoir alarm</li> </ul>	<ul style="list-style-type: none"> <li>• Power failure</li> <li>• Mechanical breakdown</li> </ul>



## 2.0 WATER SYSTEM EMERGENCY SITUATIONS

### 2.1 Water Supply

**Emergency Event:** 2.1.1 Reduction of Water Supply

**Risks:** Fire Flow Supply / Public Inconvenience

**Emergency Triggers:**

- Loss of system pressure.

**Actions Required:**

- Advise Fire Department of reduced water supply area.
- Notify affected users.
- Contact Director of Public Works to determine appropriate course of action to implement measures to conserve water use.

**Mandatory Contacts:**

- Director of Public Works
- Fire Department
- Chief Administrative Officer
- Residential and Commercial Users
- Affected Users

**Optional Contacts:**

- 

**Follow Up Actions Required:**

- Monitor situation



**Emergency Event:**      *2.1.2 Broken Water Main*

**Risks:**                      Contamination / Health / Fire Flow Supply / Public Inconvenience / Property Damage

**Emergency Trigger:**

- Any water main break.

**Actions Required:**

- Isolate break.
- Contain water discharge.
- Contact Director of Public Works and Fire Department.
- Notify affected users of service interruption.
- Make necessary repairs.
- Arrange alternate source of water if necessary: temporary connections, bottled water, etc.

**Mandatory Contacts:**

- Director of Public Works
- Fire Department
- Chief Administrative Officer
- Residential and Commercial Users
- Affected Users

**Optional Contacts:**

- 

**Follow Up Actions Required:**

- Flush repaired main until flow runs clear (minimum 3 water changes).
- Take water sample downstream of break after repairs are completed. Test for fecal/non-fecal coliforms, and heterotrophic plate count. If fecal/non-fecal or heterotrophic plate counts exceed allowable limits then follow the Failed Water Test procedure. Also test for other chemicals (as advised) if chemical spill suspected at site of break.
- Update maintenance records with details of the water main break (sample Water Main Break Record form contained in Appendix 4)
- Written report (Internal to District)
- Written report to external agencies, if necessary.
- Disinfecting the repaired main.





**Emergency Event:**     **2.1.3 Major Fire Flow Conditions**

**Risks:**                     Fire Flow Supply / Public Inconvenience

**Emergency Trigger:**

- Loss of system pressure.
- Low reservoir alarm.
- Communications from Fire Department.

**Actions Required:**

- Contact the Director of Public Works to determine appropriate course of action.
- Contact Fire Department regarding estimated usage and expected duration.
- 

**Mandatory Contacts:**

- Director of Public Works
- Fire Department
- Chief Administrative Officer
- Residential and Commercial Users
- Affected Users

**Follow Up Actions Required:**

- Written report (internal to District)



**Emergency Event: 2.1.4 Flooded Pump house**

**Risks:** Contamination / Health / Public Inconvenience / Property Damage

**Emergency Trigger:**

- Flooded pump house.

**Actions Required:**

- Sandbag around pump house before flood.
- Turn off all power to pump house.
- Block off all openings so floodwater does not enter well.
- Advise Fire Dept. of well shut down.
- After flood – test well for contamination.
- If contaminated – chlorinate and flush well and continue sampling until well is useable again.

**Mandatory Contacts:**

- Director of Public Works
- Fire Department
- Chief Administrative Officer
- Residential and Commercial Users
- Affected Users

**Optional Contacts:**

- Health Officer

**Follow Up Actions Required:**

- After clean sample, return pump to normal operation cycle.
- Written report (internal to District).



## 2.2 Water Quality

<b>Emergency Event:</b> <b>2.2.1 Failed Water Test</b>
<b>Risks:</b> Contamination / Health
<b>Emergency Triggers:</b> <ul style="list-style-type: none"><li>• Water quality tests exceed limits for chemical, physical or bacteriological parameters.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Contact Director of Public Works and Chief Administrative Officer.</li><li>• Through discussions with Health Authorities and Director of Public Works determine if Boil Watch Notice should be issued or if other public notification required.</li><li>• If advised then follow Boil Watch Notice Procedure (see Appendix 2).</li><li>• Re-sample water to ensure accurate result.</li><li>• Flush suspected mains. Isolate mains to ensure directional flush.</li><li>• Re-sample after flushing.</li><li>• Chlorinate affected areas as directed by the Director of Public Works and Health Officer.</li></ul>
<b>Mandatory Contacts:</b> <b>IMMEDIATE:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Chief Administrative Officer</li><li>• Northern Health Authority</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Increased water testing in area if needed.</li><li>• Written report (internal to District)</li><li>• Written report to external agencies (Health Authorities)</li></ul>



**Emergency Event: 2.2.2 Suspected Contaminated Water**

**Risks:** Contamination / Health

**Emergency Triggers:**

- Any system component failure that gives suspicion of possible water system contamination.
- Vandalism or unauthorized access into reservoir.
- Water main break where surrounding substances may have entered into the water system.

**Actions Required:**

- Advise the Director of Public Works of the situation and proposed response.
- Contact Health Authorities and the Chief Administrative Officer to determine if public notification should be given. Notify District administration and provide an overview of the situation.
- If location of Suspected Contaminated Water is within the District distribution system:
  - Isolate reservoir.
  - Flush suspected main and/or service connection. Isolate main to ensure directional flush;
  - Take water samples at nearest downstream sampling station and at closest cold water service. Ensure that when water is sampled from the service the tap has run long enough to ensure sampling of water within the main. Test for residual chlorine, fecal/non-fecal coliforms. Also, test for any suspected chemicals that may have entered the water supply;
  - If water tests fail bacteriological tests then follow Failed Water Test procedure (Pg. 11);
- If location of Suspected Contaminated Water is within the wells:
  - isolate reservoir
  - Take one sample at the well discharge and distribution system. Send to a laboratory for analysis of the suspected contaminate; and
  - Shut the well down and contact the Director of Public Works to determine if the well is safe to operate given suspected contamination.



- If location of Suspected Contaminated Water is within the reservoir then:
  - Take a sample from the reservoir and at least two within the distribution system. Send off for laboratory analysis for the suspected parameters;
  - If water tests fail bacteriological tests then follow Failed Water Test procedure (Pg. 11).
- Through discussions with Director of Public Works and Health Authorities, determine if Boil Watch Notice should be issued. If advised, then follow Boil Watch Notice Procedure (see Appendix 2).

**Mandatory Contacts:**

**IMMEDIATE:**

- Fire Department
- Director of Public Works
- Chief Administrative Officer

**Optional Contacts:**

- 

**Follow Up Actions Required:**

- Written report (internal to District)
- Written report to external agencies (Health Authorities)



**Emergency Event: 2.2.3 Vandalism of Water System**

**Risks:** Contamination / Health

**Emergency Trigger:**

- Any vandalism to any component of the water system.

**Actions Required:**

- Determine if vandalism may have contaminated water system.
- If potential contamination, follow Suspected Contaminated Water procedure (Pg. 12).

**Mandatory Contacts:**

- Director of Public Works
- Chief Administrative Officer
- Northern Health
- RCMP

**Optional Contacts:**

- 

**Follow Up Actions Required:**

- Written report (internal to District)
- Written report to external agencies (Health Authorities)



<b>Emergency Event:</b> <b>2.2.4   Hazardous Waste Spill</b>
<b>Risks:</b> Contamination / Health

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Any waste spill in the vicinity of any portion of the water system.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Immediately notify Director of Public Works.</li><li>• Determine if spill may have contaminated water system.</li><li>• If potential contamination, follow Suspected Contaminated Water procedure (Pg. 12).</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Chief Administrative Officer</li><li>• Northern Health</li><li>• District Staff</li><li>• RCMP - if vandalism is apparent</li><li>• Residential and Commercial Users</li><li>• Affected Users</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>• Department of Fisheries and Oceans</li><li>• Emergency Program Coordinator</li><li>• Northern Health</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District)</li><li>• Written report to external agencies (Health Authorities)</li></ul>



## 2.3 Equipment Failure

**Emergency Event:** 2.3.1 *Water Well Equipment Failure*

**Risks:** Reservoir Supply / Fire Flow Supply / Public Inconvenience

**Emergency Trigger:**

- Low supply pressure.
- Failure of water well equipment.
- Low level alarm reservoir.

**Actions Required:**

- Investigate failure and determine cause.
- If failure is related to a pump, then arrange for necessary pump repair work.
- If failure is related to well casing or yield then contact Director of Public Works and Chief Administrative Officer to determine appropriate course of action.

**Mandatory Contacts:**

- Director of Public Works

**Optional Contacts:**

- 

**Follow Up Actions Required:**

- Written report (internal to District)





<b>Emergency Event:</b>	<b>2.3.2 Water Reservoir Structural Failure</b>
<b>Risks:</b>	Environmental / Property Damage / Public Inconvenience

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Low level alarm on the water reservoir.</li><li>• Visible evidence of leaking water or structural damage.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Investigate failure and determine cause.</li><li>• Contact Director of Public Works to obtain confirmation on next steps.</li><li>• If structural damage has occurred and draining the reservoir is required then:<ul style="list-style-type: none"><li>➢ Shut down related supply well.</li><li>➢ Drain the reservoir through the drain line and discharge as per specific operating procedures.</li></ul></li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Chief Administrative Officer</li><li>• District Administration</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District)</li></ul>



<b>Emergency Event:</b>	<b>2.3.4 Backflow Preventer Failure</b>
<b>Risks:</b>	Contamination / Health

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Observed or suspected failure of backflow preventer.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Isolate area from usable water system.</li><li>• Take water sample in close proximity to backflow preventer (distribution system side).</li><li>• Analyze fecal/non-fecal coliforms and heterotrophic plate count.</li><li>• If there is any potential that contamination of the main could have occurred then follow the Suspected Contaminated Water procedure (Pg. 12).</li><li>• Repair backflow preventer.</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Chief Administrative Officer</li><li>• Affected Users</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District)</li><li>• Written report to external agencies (Health Authority) if required.</li></ul>



<b>Emergency Event:</b>	<b>2.3.5 System Power Failure</b>
<b>Risks:</b>	Fire Flow Supply / Public Inconvenience

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Utility alarms (monitored systems)</li><li>• Notification from BC Hydro</li><li>• Public Complaint</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• “Called out” employee / pump station operator assesses situation and determines magnitude of interruption.</li><li>• Director of Public Works</li><li>• Contact BC Hydro</li><li>• In the event of power failure (as indicated by BC Hydro),</li><li>• Affected users notified.</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Chief Administrative Officer</li><li>• BC Hydro</li><li>• Fire Department</li><li>• Affected Users</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District)</li></ul>



### 3.0 SEWER EMERGENCY SITUATIONS

#### 3.1 Hazardous Incidents

<b>Emergency Event:</b>	<b>3.1.1 Vandalism of Sewer System</b>
<b>Risks:</b>	Environmental Contamination / Health / Public Inconvenience / Property Damage

Emergency Trigger: <ul style="list-style-type: none"><li>• Any vandalism to any component of the sewer system.</li></ul>
Actions Required: <ul style="list-style-type: none"><li>• Determine if vandalism may have contaminated, blocked or broken sewer main.</li><li>• If potential contamination, follow Suspected Contaminated Sewer procedure (pg. 27). If potential blockage – see pg. 24. If potential break – see pg. 31.</li></ul>
Mandatory Contacts: <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• RCMP</li></ul>
Optional Contacts: <ul style="list-style-type: none"><li>•</li></ul>
Follow Up Actions Required: <ul style="list-style-type: none"><li>• Written report (internal to District)</li><li>• Written report to external agencies if necessary</li></ul>



**Table 2: Indicators and Possible Corresponding Causes of Sewer Utility Emergencies**

EMERGENCY	WARNING SIGNS	POSSIBLE CAUSES
<b>VANDALISM OF SEWER SYSTEM</b>	<ul style="list-style-type: none"> <li>• Contamination of Sewer System, indicated by bad sample or smell in system.</li> <li>• Blockage of Sewer System by vandals.</li> <li>• Pump stopped.</li> </ul>	<ul style="list-style-type: none"> <li>• Vandals contaminating system with foreign substance.</li> <li>• Dropping of large objects (rocks etc.) in manhole to block main line.</li> <li>• Shut down of power supply or pump jammed.</li> </ul>
<b>HAZARDOUS WASTE SPILL</b>	<ul style="list-style-type: none"> <li>• Odor / Discoloration</li> <li>• Signs of vandalism</li> <li>• Bad samples</li> </ul>	<ul style="list-style-type: none"> <li>• Vandals contaminating sewer system with foreign substances.</li> <li>• Unauthorized persons or vandals having access to Sewer System.</li> </ul>
<b>SEWER SERVICE BLOCKAGE</b>	<ul style="list-style-type: none"> <li>• Back-up of sewage into buildings, houses, streets or environmentally sensitive areas</li> </ul>	<ul style="list-style-type: none"> <li>• Main line blocked by objects.</li> </ul>
<b>FAILED SEWER TEST</b>	<ul style="list-style-type: none"> <li>• Sewer test exceeds limits for chemical, physical or bacteriological parameters</li> </ul>	<ul style="list-style-type: none"> <li>• Spill of foreign substance into sewer system.</li> <li>• Vandals or unauthorized persons having access to Sewer System.</li> </ul>
<b>SEWER PUMP FAILURE</b>	<ul style="list-style-type: none"> <li>• High level alarm (contacted by Auto Dialer)</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of power.</li> <li>• Pump blockage.</li> </ul>
<b>BLOCKAGE OF FLOW</b>	<ul style="list-style-type: none"> <li>• High level alarm (contacted by Auto Dialer)</li> <li>• Back-up of sewage into buildings or onto streets or environmentally sensitive areas</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of sewer pump</li> <li>• Grease or other debris blocking line.</li> <li>• Vandalism</li> <li>• Deterioration of pipe causing pipe breakage.</li> </ul>
<b>SUSPECTED CONTAMINATION OF SEWER</b>	<ul style="list-style-type: none"> <li>• Bad sewer samples</li> <li>• Smell of toxic substance in sewer</li> </ul>	<ul style="list-style-type: none"> <li>• Vandalism or unauthorized access to sewer main connection.</li> <li>• Dumping of illegal materials into sewer system.</li> <li>• Sewer main break where surrounding substances may have entered into the system.</li> <li>• Any system component failure that gives suspicion of possible sewer system contamination.</li> </ul>
<b>LAGOON BERM STRUCTURAL FAILURE</b>	<ul style="list-style-type: none"> <li>• Visible evidence of leaking water or structural damage.</li> </ul>	<ul style="list-style-type: none"> <li>• Erosion of banks.</li> <li>• Vandalism</li> </ul>



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<b>SEWER LIFT STATION EQUIPMENT FAILURE</b>	<ul style="list-style-type: none"><li>• Auto Dialer call due to high level</li><li>• Lift station overflow</li><li>• Sewage backed up into sewer mains and services</li></ul>	<ul style="list-style-type: none"><li>• Power outage</li><li>• Pump failure or jam</li><li>• Vandalism</li></ul>
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<b>Emergency Event</b>	<b>3.1.2 Hazardous Waste Spill</b>
<b>Risks:</b>	Contamination / Health

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Any waste spill in the vicinity of any portion of the sewer system.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Immediately notify Chief Utilities Operator and Director of Operational Services.</li><li>• Determine if spill may have contaminated sewer main.</li><li>• If potential contamination, follow Suspected Contaminated Sewer procedure (pg. 27).</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Environmental Protection Officer</li><li>• Director of Public Works</li><li>• RCMP</li><li>• Department of Fisheries and Oceans</li><li>• Provincial Emergency Program</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District)</li><li>• Written report to external agencies (Health Authorities)</li></ul>



### 3.2 SEWER SYSTEM & QUALITY

<b>Emergency Event:</b>	<b>3.2.1 Blockage of Flow – Sewer Main</b>
<b>Risks:</b>	Environmental Contamination / Health / Public Inconvenience / Property Damage

<b>Emergency Triggers:</b> <ul style="list-style-type: none"><li>• Back-up of sewage into house, onto streets or environmentally sensitive areas.</li><li>• Any sewer main blockage.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Clear blockage to reinstate flow.</li><li>• If potential contaminated sewer – see pg. 27.</li><li>• If potential sewer spill – see pg. 32 for a minor spill and pg. 33 for a major spill.</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Immediate – affected users.</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Action Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to the District)</li></ul>





**Emergency Event: 3.2.2 Blockage of Flow – Sewer Service**

**Risks:** Environmental Contamination / Health /  
Public Inconvenience / Property Damage

**Emergency Triggers:**

- Back-up of sewage into house, onto streets or environmentally sensitive areas.
- Any sewer service blockage.

**Actions Required:**

- Clear blockage to reinstate flow.
- See page 24.

**Mandatory Contacts:**

- Immediate – affected users.

**Optional Contacts:**

- 

**Follow Up Action Required:**

- Written report (internal to the District)



<b>Emergency Event:</b> 3.2.3 <i>Failed Sewer Test</i>
<b>Risks:</b> Contamination / Health

<b>Emergency Triggers:</b> <ul style="list-style-type: none"><li>• Sewer water quality tests exceed limits for chemical, physical, or bacteriological parameters.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Re-sample sewer water to ensure accurate results.</li><li>• Look into possible cause of contamination.</li></ul>
<b>Mandatory Contacts: Immediate</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Environmental Protection Officer</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Increase water quality testing if needed.</li><li>• Written report (internal to District)</li><li>• Written report to external agencies (Northern Health)</li></ul>



**Emergency Event: 3.2.4 Suspected Contaminated Sewer**

**Risks:** Contamination / Health

**Emergency Triggers:**

- Any system component failure that gives suspicion of possible sewer system contamination.
- Vandalism or unauthorized access to sewer main.
- Dumping of illegal material into sewer system
- Sewer main break where surrounding substances may have entered into the sewer system.

**Actions Required:**

- Advise Director of Public Works of the situation and proposed response.
- Contact Health Authorities and Director of Public Works to determine if public notification should be given.
- If location of suspected contaminated sewer is within the District collection system:
  - Flush suspected main and/or service connection. Isolate main to ensure directional flush.
  - Take sewer samples at nearest downstream sampling station. Test for any suspected chemicals that may have entered the sewer system.
  - If sewer tests fail, then follow Failed Sewer Test procedure (pg. 26).
- If location of suspected contaminated sewer is within the lagoons:
  - Isolate lagoon
  - Take one sample at the lagoon discharge. Send to a laboratory for analysis of the suspected contaminate; and
  - Shut the lagoon down and contact the Director of Public Works to determine if the lagoon is safe to operate given suspected contamination.



### 3.3 EQUIPMENT FAILURE

<b>Emergency Event:</b>	<b>3.3.1 Lagoon Berm Structural Failure</b>
<b>Risks:</b>	Environmental / Property Damage / Public Inconvenience

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Visible evidence of leaking water or structural damage.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Investigate failure and determine cause.</li><li>• Contact the Director of Public Works and obtain confirmation on next steps.</li><li>• If structural damage has occurred and draining the lagoon is required then:<ul style="list-style-type: none"><li>➢ Drain the lagoon through the drain line and discharge as per specific operating procedures.</li><li>➢ Repair leak.</li></ul></li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Environmental Protection Officer</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District).</li><li>• Written report to external agencies if necessary.</li></ul>



<b>Emergency Event:</b>	<b>3.3.2 Sewer Lift Station Equipment Failure</b>
<b>Risks:</b>	Environmental / Property Damage / Public Inconvenience

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Failure of well equipment.</li><li>• High level alarm at lift station.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Investigate failure and determine cause.</li><li>• If failure is related to a pump then arrange for necessary pump repair work.</li><li>• If failure is related to well casing or yield then contact Director of Public Works to determine appropriate course of action.</li><li>• In the event of a serious equipment failure, dispatch a vacuum truck to vacuum lift-station.</li><li>• If failure causes overflow of sewer into environmentally sensitive area, follow Sewer Spill Procedures (pgs. 32 and 33).</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District).</li></ul>



<b>Emergency Event:</b>	<b>3.3.3 Treatment Plant and Lift Stations Power Failure</b>
<b>Risks:</b>	Public Inconvenience

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Utility alarms via Auto Dialers</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Called-out employee / Lift Station Operator assess situation and determines magnitude of interruption.</li><li>• Contact Chief Utilities Operator.</li><li>• In the event of serious power failure (as indicated by BC Hydro), dispatch vacuum truck to vacuum lift stations.</li><li>• Affected users notified.</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li><li>• Affected users</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>•</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District) if necessary.</li></ul>



<b>Emergency Event:</b>	<b>3.3.4 Broken Sewer Main</b>
<b>Risks:</b>	Contamination / Health / Public Inconvenience / Property Damage / Environmentally Sensitive Areas

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>Any sewer main break.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>Isolate break.</li><li>Contain sewer discharge.</li><li>Advise Director of Public Works.</li><li>Notify affected users of service interruption.</li><li>Make necessary repairs.</li><li>Arrange alternate source of sewer transport.</li><li>Temporary connections if necessary.</li><li>If potential contaminated sewer – see pg. 27.</li><li>If potential sewer spill – see pg. 32 and 33.</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>Director of Public Works</li><li>Affected users.</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li></li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>Flush repaired main.</li><li>Update maintenance records (sample repair form contained in Appendix 4).</li><li>Written report (internal to District).</li><li>Written report to external agencies if necessary.</li></ul>



<b>Emergency Event</b>	<b>3.3.5 Minor Sewer Spill</b>
<b>Risks:</b>	Contamination / Health

<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>• Any minor sewer spill.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>• Immediately notify Director of Public Works.</li><li>• Contain spill immediately to prevent or minimize contamination to water system or environment.</li><li>• Determine if spill may have contaminated water of any sort.</li><li>• If potential contamination, follow Suspected Contaminated Water procedure (pg. 11).</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>• Director of Public Works</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>• Department of Fisheries and Oceans</li><li>• Provincial Emergency Program</li></ul>
<b>Follow Up Actions that may be required:</b> <ul style="list-style-type: none"><li>• Written report (internal to District)</li><li>• Written report to external agencies (Health Authorities)</li></ul>





<b>Emergency Event</b>	<b>3.3.6 Major Sewer Spill</b>
<b>Risks:</b>	Contamination / Health

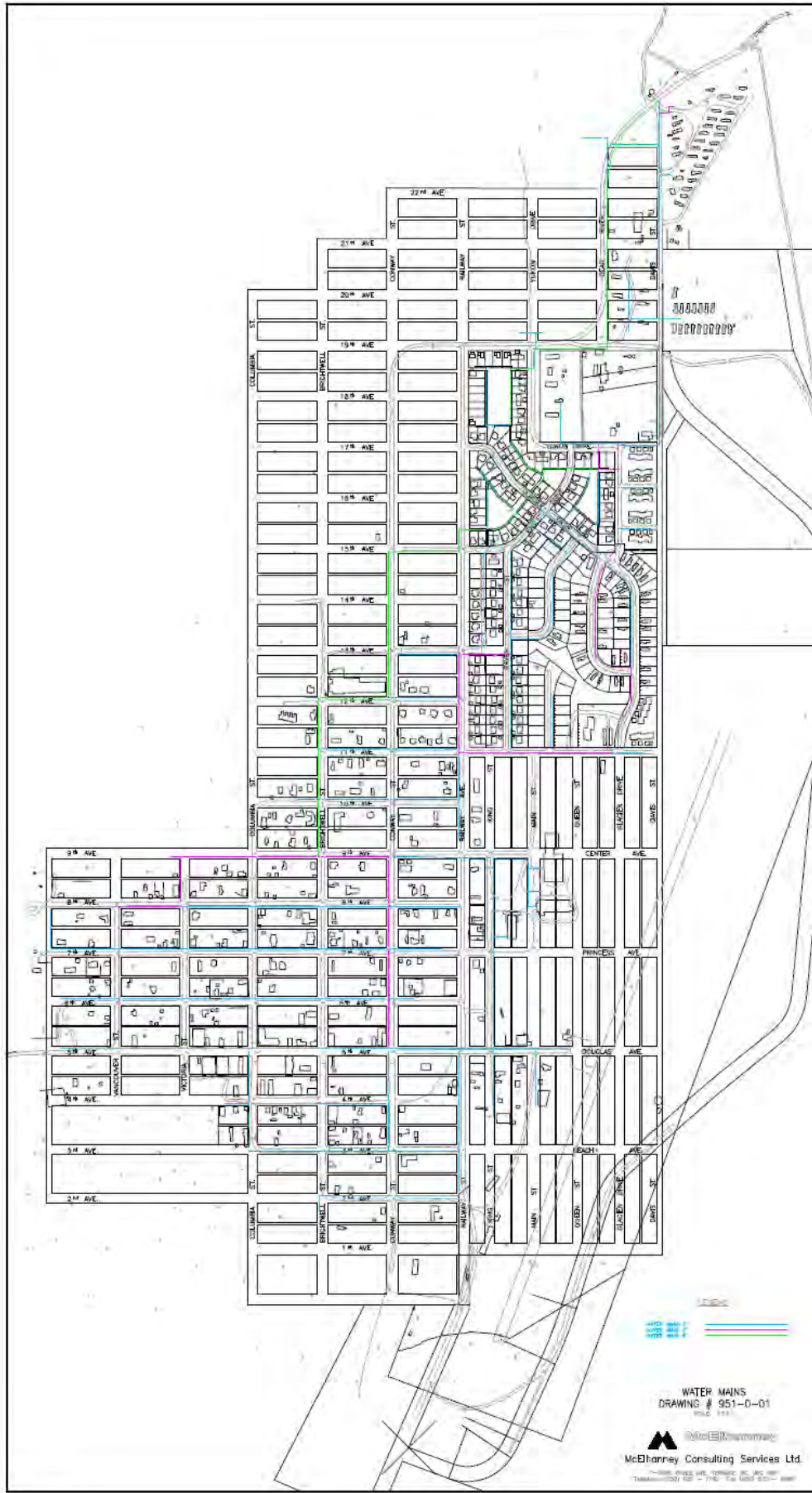
<b>Emergency Trigger:</b> <ul style="list-style-type: none"><li>Any waste spill in the vicinity of any portion of the natural or storm drain water system.</li></ul>
<b>Actions Required:</b> <ul style="list-style-type: none"><li>Immediately notify Director of Public Works.</li><li>Immediately contain spill to prevent / minimize contamination to water system or environment.</li><li>Determine if spill may have contaminated water system.</li><li>If potential contamination, follow Suspected Contaminated Water procedure (pg. 11).</li></ul>
<b>Mandatory Contacts:</b> <ul style="list-style-type: none"><li>Director of Public Works</li><li>Chief Administrative Officer</li><li>RCMP – if vandalism is apparent</li></ul>
<b>Optional Contacts:</b> <ul style="list-style-type: none"><li>Department of Fisheries and Oceans</li><li>Provincial Emergency Program</li></ul>
<b>Follow Up Actions Required:</b> <ul style="list-style-type: none"><li>Written report (internal to District)</li><li>Written report to external agencies (Health Authorities)</li></ul>



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## **APPENDIX 1**

### ***Water & Sewer System Maps***







## **APPENDIX 2**

### **Boil Watch Notice Procedure & Signs**

The following procedure outlines steps to follow once a suspected contamination of the water system has occurred.

- 1) Contact the Drinking Water Officer and explain the situation. The Drinking Water Officer will advise if a Boil Watch Notice is to be issued. If the Drinking Water Officer cannot be reached then the District should try and contact the Medical Health Officer. If neither can be contacted, the District must issue a Boil Watch Notice if public health is at risk.
- 2) When issuing a Boil Watch Notice the first step is to notify Stewart residents and commercial users by door to door and media broadcast notification, and all other affected individuals listed in the Emergency Procedure.

When notifying users and when broadcasting notification, advise the following:

**Due to \_\_\_\_\_ (reason) the District of Stewart advises the public that the water supply in certain areas is, or is suspected to have become contaminated and may not be safe for human consumption. In order to ensure safety of the water supply, all water must be boiled rapidly for at least two minutes before being used for drinking, brushing teeth, washing food etc. The areas involved are as follows:**

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**If you have any questions please contact the District of Stewart at 250-636-2251.**

**Note:** It may be necessary to give only very general locations at the beginning with more exact locations identified when more information becomes available, recognizing that it is preferable to overstate the size of area involved.

- 3) Once a Boil Watch Notice is issued there will be an increase of public calls to the District of Stewart.



Signs similar to that shown on the page 42 are to be placed on the doors of all public washrooms and above all washroom sinks and drinking fountains accessible to the public. Attached is an instruction sheet to be given to those individuals responsible for notifying users and placing of these signs.

- 4) A Boil Watch Notice is to remain in effect until advised by the Drinking Water Officer. Once the advisory has been removed, all individuals previously contacted should be notified.

The following notice can be used for the removal of the Boil Watch Notice:

*The District of Stewart advises that the Boil Watch Notice issued on \_\_\_\_\_ (date) affecting the following areas \_\_\_\_\_ has now been removed. The water in these areas has been determined to be safe for human consumption.*

*If you have any questions, please contact the District of Stewart at 250-636-2251.*



### **Procedure for Notifying Users and Placing of Boil Watch Notice Signs**

You have been assigned the task of notifying water users and for placing Boil Watch Notice signs at specific locations within a defined area of Stewart. The attached lists are to be used to track the buildings and/or houses notified of the boil order. Space is provided to indicate how notification occurred and how many signs were placed. This same form will be used to record the removal of signs when the Boil Watch Notice is complete.

Single-family residences, multi-family property managers and businesses are to be notified both verbally and with a written notice. If no one is available, a written notice should be left in a conspicuous location (i.e. the mail box or taped on the door).

Signs are to be placed at the locations listed below. For all private buildings, permission must be obtained from the property manager prior to entering the building.

#### **Multi-Family Residences, Commercial or Public Buildings, Parks**

- 1) Inside and outside of every exit or entrance door
- 2) Both sides of each door that accesses stair wells
- 3) Above the elevator call buttons on each floor
- 4) Inside each elevator
- 5) On the outside of each public bathroom door
- 6) On the mirror above the sink contained within a public washroom
- 7) Above all water fountains



Record Form for Notifying Multi-Family Residences, Commercial or Public Buildings and Parks

Building	# of Signs Placed	# of Signs Removed
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		
21.		
22.		
23.		
24.		
25.		
26.		
27.		
28.		
29.		
30.		

Placement of signs completed: \_\_\_\_\_  
Date                      Time                      Signature

Removal of signs completed: \_\_\_\_\_  
Date                      Time                      Signature





Record Form for Notifying Single-Family Residences

House Address	Verbal & Written Notification (Y/N)	Mail Box Notification (Y/N)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		
21.		
22.		
23.		
24.		
25.		
26.		
27.		
28.		
29.		
30.		

Notification completed: \_\_\_\_\_  
Date                      Time                      Signature



# **WARNING!**

**THIS WATER IS CONTAMINATED AND UNSAFE TO  
DRINK UNLESS BOILED FOR 2 MINUTES OR  
OTHERWISE DISINFECTED**





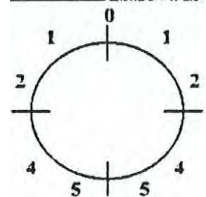
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## **APPENDIX 4**

### ***Water Main Break Record Form***



### Leak Repair Report

Folio No. _____ Map No. _____ Date: _____ <b>SIZE (in.) &amp; TYPE OF MAIN</b> _____ AC _____ PVC _____ DI _____ CI _____ Sclair (poly) _____ Steel _____ Other	Location _____ (Street) _____ / _____, Smithers, BC Ft. _____ (Street) Relates to Leak Number (from Form B2 if available) _____ <b>COMMENTS:</b> _____ _____ _____ _____ _____	<b>1. WHAT PART OF MAIN WAS DAMAGED?</b> <input type="checkbox"/> A. Pipe barrel <input type="checkbox"/> B. Joint <input type="checkbox"/> C. Valve <input type="checkbox"/> D. Flange nuts, bolts, tie rod <input type="checkbox"/> E. Service Connection <input type="checkbox"/> F. Other (explain on back) <input type="checkbox"/>	
<b>3. WHAT TYPE OF CORROSION DAMAGE?</b> <b>Internal / External / Both (circle one)</b> <input type="checkbox"/> A. No Corrosion Damage <input type="checkbox"/> B. Pitting <input type="checkbox"/> C. Gen. Corrosion <input type="checkbox"/> D. Graphitized Cast Iron (pipe looks OK but has little strength because the iron has dissolved, leaving mostly carbon)	<b>4. WHAT REPAIRS WERE MADE?</b> <input type="checkbox"/> A. Leak Repair Clamp <input type="checkbox"/> B. Welded <input type="checkbox"/> C. Replaced valve <input type="checkbox"/> D. Replaced section <input type="checkbox"/> E. Other	<b>5. SHOULD PIPE BE REPLACED?</b> <input type="checkbox"/> A. Yes <input type="checkbox"/> B. No <input type="checkbox"/> C. Not sure	<b>2. WHAT CAUSED THIS DAMAGE IN YOUR OPINION?</b> <input type="checkbox"/> A. Ground Movement <input type="checkbox"/> B. Contractors Equipment <input type="checkbox"/> C. Coating Failure <input type="checkbox"/> D. Corrosion / Electrolysis <input type="checkbox"/> E. Other _____ <input type="checkbox"/> F. See Comments <input type="checkbox"/> G. Unknown
<b>7. WHAT IS NATIVE SOIL?</b> <input type="checkbox"/> A. Clay <input type="checkbox"/> B. Loam <input type="checkbox"/> C. Sandy <input type="checkbox"/> D. Gravel / Rock	<b>8. WHAT IS BEDDING TYPE?</b> <input type="checkbox"/> A. Granular <input type="checkbox"/> B. Sand <input type="checkbox"/> C. Native Soil	<b>9. INSTALLED ANODE &amp; POLYWRAP?</b> (Omit the anode and polywrap only on non-metallic pipe) <input type="checkbox"/> A. Yes <input type="checkbox"/> B. No	<b>6. HOW BIG WAS THE LEAK?</b> <input type="checkbox"/> A. Break (Entire circumference) <input type="checkbox"/> B. Small Hole (under 1") <input type="checkbox"/> C. Large Hole <input type="checkbox"/> D. Split Leakage Rate: _____ <input type="checkbox"/> Estimated <input type="checkbox"/> Measured
<b>12. FOLLOW UP ACTIONS COMPLETED:</b> <input type="checkbox"/> A. Photographs taken of break <input type="checkbox"/> B. Main flushed until water ran clear and chlorinated <input type="checkbox"/> C. Water samples taken downstream of break		<b>10. DEPTH OF COVER IN FT.</b> Circle the closest number <b>10+ 10 9 8 7 6 5 4 3 2 1</b>	<b>11. WHERE WAS THE LEAK?</b> Circle numbers closest to leak – omit on breaks. 

**Foreman's Signature:** \_\_\_\_\_



## APPENDIX 5

### District of Stewart – Emergency Contact List

	Name	Phone	Fax
Operator's Name	District of Stewart	(250) 636-2251	(250) 636-2417
Staff Name-Office	Maureen Tarrant, CAO	(250) 636-2251	(250) 636-2417
Staff Name-Public Works	Chad McKay	(250) 636-2742	(250) 636-2145
Staff Name-Public Works	Derek Retza	(250) 636-9123	(250) 636-2145
Staff Name-Public Works	Scott Hopkins	(250) 636-9123	(250) 636-2145

### Emergency Contact Numbers

	Name	Phone	Fax
Medical Health Officer	Shane Wadden	(250) 847-6410	
Environmental Health Officer			
Public Health Engineer			
Provincial Emerg. Preparedness Program	Maurie Hurst Emergency Reporting (24hr)	(250) 615-4800 1-800-663-3456	(250) 615-4817
Police	Corporal Mario Cloutier	(250) 636-2233	(250) 636-2787
Ministry of Environment		1-800-663-9453	
Department of Fisheries	Nass Office: Smithers Office:	(250) 633-2408 (250) 847-2312	
Hospital	Stewart Health Centre	(250) 636-2614	(250) 636-2715
Fire Department	Fire Chief Daryl Coates	(250) 636-9135	
Radio Station	CJFW (Terrace) CBC Vancouver	(250) 638-0323 (604) 662-6900	
B.C. Hydro	Bob Gammer Terrace Office	(250) 961-0676 (250) 638-5648	
Environmental Protection Service			
Pump Manufacturer			
Newspaper	Terrace Standard Northern Connector	(250) 638-7283 (250) 632-6144	
T.V. Station	CFTK TV – John Clark Global BC TV	Cell: (250) 615-8571 (604) 422-6494	EMERGENCY ONLY (604) 422-6416
Bottled Water Supplier			
Ministry of Municipal Affairs			

