

**SPRINGWOOD DEVELOPMENTS INC.**  
**10150 121 STREET**  
**EDMONTON, ALBERTA**  
**T5N 1K4**

**PHONE: (780) 488-2044**  
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January 19<sup>th</sup>, 2010

Regulatory Approvals Centre  
Alberta Environment  
Main Floor, Oxbridge Place  
9820 - 106 Street  
EDMONTON, Alberta T5K 2J6

Dear Sir or Madame:

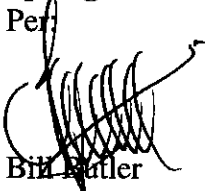
**Re: Application to Renew Approval 9727-01-00 as amended**

Accompanying this letter, please find Springwood Development Inc.'s Application to Renew Approval 9727-01-00 (as amended) which deals with the former Cochrane wood preserving facility. We trust that this application and accompanying Amended Remedial Action Plan address the information requirements of the Guide to Content for Industrial Approval Applications and the Approval Procedure Regulation of the Environmental Protection and Enhancement Act.

If you have any questions or further information requirements, please contact the undersigned. Thank you for your consideration.

Yours truly,  
**Springwood Developments Inc.**

Per:



Bill Butler  
gj/WKB

Enclosure

**Application to Renew Approval 9727-01-00 (as amended)**

**(a) The name and address of the applicant;**

**1. General**

- 1.1 *Corporately Registered Company Name*
- 1.2 *Mailing Address of Head Office (in Alberta)*
- 1.3 *Mailing Address of Applicable Plant or Regional Office*
- 1.4 *Phone and Telecopier(Fax) Numbers, including e-mail, if available*
- 1.5 *Date*
- 1.6 *Name(s) of contact(s) for this application*
- 1.7 *Signature of Owner/Operator*

Application submitted by:

Bill Butler - President

Springwood Developments Inc.


10150, 121<sup>st</sup> Street

Edmonton, Alberta, T5N 1K4

Phone: (780) 488 2044

Fax: (780) 488 1191

\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title of Applicant

**(b) The location, capacity and size of the activity to which the application relates**

**2. Location**

2.1 *Legal Land Description (LLD) - based on Land Status Automated System (LSAS) (i.e. Meridian - Range - Township - Section - Legal Subdivision)*

2.2 *Relation to nearest town, city, or village*

2.3 *Geographical description (topographic map) including relation to nearby watercourses*

The Site is located in the southwest quarter of Section 2, Township 26, Range 4, west of the 5<sup>th</sup> Meridian. Its legal land description within the quarter section is Block F Plan 1325 JK.

The former wood treatment facility is located at 304 Griffin Road West (the Site) in the Town of Cochrane approximately 30 km northwest of Calgary (Figure 1 of the Amended Remedial Action Plan (ARAP)). Domtar Inc. (Domtar) operated the facility from 1964 to 1988. The wood treatment facility was used for the pressure impregnation of rail ties and large dimensional wood products with coal tar and a coal tar/creosote mixture, which consists of predominately semi-volatile polycyclic aromatic hydrocarbons (PAHs), and pentachlorophenol (PCP). The PAHs and PCP are widespread across the property but generally are limited to the upper 1.5 metres (m) of soil, except for a south central area of the Site, designated a Special Management Area (SMA), where the contaminants extend into groundwater. In 1999, Domtar sold the property to Cochrane Properties Ltd. (CPL). In February 2000, Alberta Environment (AENV) approved a Remedial Action Plan (RAP), prepared on behalf of CPL by Conor Pacific Environmental Technologies Inc. (Conor Pacific 1999). This RAP formed the basis for the subsequent remediation of the south-western portion of the Site in 2000. Since that time, these remediated lands have been redeveloped. Figure 2 of the ARAP provides a plan view of the former Domtar facility, illustrating the lands that have been remediated and redeveloped as well as the remaining lands. This Application and the associated ARAP are intended to apply only to the remaining, undeveloped lands that have not yet been remediated.

The Site is located in a transition zone between plains topography to the east and the moderate relief associated with the Rocky Mountain Foothills to the west. The property is located in the Bow River valley on an upper alluvial terrace on the north side of the river. The land surface gently slopes down to the southeast from approximately 1148 metres above sea level (masl) on the former Domtar Site to approximately 1145 masl in the vicinity of Griffin Road West and 2<sup>nd</sup> Avenue East. South of Griffin Road West a series of alluvial terraces descend towards the Bow River at an elevation of approximately 1136 masl. There are no surface water bodies located within or directly adjacent to the study area. Big Hill Creek is located more than 400 m west-southwest of the Site and the Bow River is located over 600 m southwest.

**3. Capacity (stated design, nominal)**

3.1 *Raw material processing capacity, by-product processing capacity, finished product capacity*

3.2 *Other appropriate capacity measurements*

There are no longer industrial activities occurring on the Site; hence, there are no industrial capacities that are applicable to this section of the Application. A water treatment system is in

operation to mitigate potential off-Site impacts associated with contaminated groundwater that is present beneath the Site. The capacity of this groundwater treatment system is approximately 230 litres per minute.

**4. Size**

*4.1 Size of the affected area, leased area, and/or plant site (e.g. hectares)*

*4.2 Physical dimensions of the plant site including a plant site map (i.e. plot plan)*

*4.3 Number of employees working at the facility*

The area of the lands that are subject to this Application is approximately 46 acres (approximately 19 hectares). Figure 2 of the ARAP illustrates the location and boundaries of the Site. There are no employees working on the Site as the Site is currently idle and is essentially vacant. Workers are required on a part-time basis to operate the Groundwater Treatment Facility. Significant employment and activity will be generated by approval of this Application and associated implementation of the ARAP.

**(c) The nature of the activity, the change to the activity or the amendment, addition or deletion, as the case may be**

**5. New Plants**

Not used.

**6. Renewal Application**

**6.1 Provide classification of this facility under the Environmental Protection and Enhancement Act Activities Designation Regulation 211/96.**

The former Cochrane wood preserving facility is considered a wood treatment facility under Section www of Division 2, Schedule 1 of the Activities Designation Regulation.

**6.2 Describe the general purpose, raw materials, products, by-products (e.g. chemical manufacturing plant, brine pond, waste storage facility, etc.). Include quantities used/produced per unit time.**

No raw materials are consumed, or products or by-products generated by the activities on the Site.

**6.3 Describe the major unit operations (e.g. cooling towers, steam boilers, compression, sulphur prilling, etc.).**

There are no major unit operations on the Site. A detailed description of the remediation activities is provided in Section 6 of the ARAP. A general introduction to the proposed remedial program is provided below.

Options analyses for remediation planning have been conducted since remediation of the former Domtar facility was first contemplated. The following remedial strategy has been developed to allow safe, effective, and efficient remediation and redevelopment of the remaining land. The following bullets summarize the tasks involved in the overall program.

- All buildings and subsurface features (pipelines and wells) that are no longer of interest for remediation or development activities will be demolished, and waste materials either recycled or legally disposed.
- Soil, both inside and outside of the SMA, and soil stockpiles that are currently present on the Site will be remediated as follows:
  - Soil will be excavated as needed, and processed to achieve volume reduction.
  - Highly contaminated soil from the former wood-treatment plant area within the SMA will be bio-stabilized.
- Processed soil will be beneficially reused to establish development grades inside and outside of the SMA, consistent with tested contaminant characteristics. Contaminated soil that exceeds the Site's remediation criteria, exclusive of the dioxins and furans criterion, will be consolidated within the SMA.
- Excess soil or other material that cannot or will not be reused to meet development grades will be legally disposed off Site. This includes debris, hazardous waste, and soil that does not meet geotechnical requirements for Site redevelopment, and salvaged crushed rock.

- Storm water runoff will be controlled during remediation to prevent its contamination. If needed, accumulations will be removed from contaminated areas and treated prior to release.
- The existing groundwater remediation system will continue to be operated, both to recover NAPL and dissolved phased contamination present in the groundwater, and to mitigate further off Site migration of contaminated groundwater. Groundwater monitoring activities will also continue.

An environmental project manager will be on Site during soil remediation to provide quality control and oversight of all activities.

- 6.4 *Describe the duration of the project, construction commencement date, completion date and commissioning dates of unit(s), production facilities and environmental protection and control systems/procedures. Include an estimated project cost as well as costs of environmental protection and control systems.*

Springwood desires to redevelop the remaining 46 acres of the former Domtar facility in two phases. The first phase involves the remediation and grading of the southern 30 acres of the Site by late 2011, followed by its redevelopment. Remediation of the northern 16 acres will be completed concurrent with the southern 30 acres, but its redevelopment is anticipated to commence two years after the completion of the first phase. These dates are considered reasonable and achievable but are subject to remedial progress and market conditions related to development and use of the lands.

- 6.5 *Provide scale diagrams of the plant, plant site and the surrounding area, including:*
- topography of the area;*
  - property boundaries and land use of the area;*
  - the location of the plant site;*
  - location and types of all buildings;*
  - exact location and name of all equipment used in manufacturing, processing or storage and other units;*
  - liquid effluent outfall and air emission point sources and sampling/monitoring equipment (see ATTACHMENT D) [provide separate sections on air, wastewater, etc.];*
  - exact location and name of all equipment used in control, treatment and disposal of wastes (see ATTACHMENTS B and C; for landfills see ATTACHMENT E);*
  - location of all sewer lines;*
  - the industrial runoff drainage information specified in ATTACHMENT B;*
  - location of all air emissions discharge points; and*
  - location of all topsoil stockpiles.*

The location of the Site, site boundaries, relevant structures and stockpiles on the Site are illustrated in Figures 1 to 4 of the ARAP. The referenced Attachments of the Guide to Content of

Industrial Approval Applications are not considered to be relevant to this Application as there are no active industrial activities occurring on the Site.

- 6.6 *Provide a flow diagram of the manufacturing process(es) or operation(s) involved, the industrial wastewater, air and waste treatment facilities, and a general narrative description, including equipment and unit capacities.*

Two primary processes will occur or are occurring on the Site; soil treatment and remediation will occur as described in Section 6.4 of the ARAP, and groundwater remediation is occurring as described in Section 6.11 of the ARAP. Schematic illustrations of the soil treatment processes are presented in Figures 13 to 15 of the ARAP. Schematic illustrations of the groundwater treatment processes are presented in Figures 17 and 18 of the ARAP. The capacity of the groundwater remediation system is approximately 230 lpm.

- 6.7 *Provide a list of unit products resulting from the processing or activity operations, specifying the production unit, typical and maximum design capacities. Include a material balance flow sheet (block diagram) for the entire plant operation.*

There are no products generated by the remediation activities. Clean gravel may be separated from the Site soils and transferred off-Site for beneficial use to achieve the desired lines and grades of the final development. Gravel is generated by materials management and grading activities rather than as a product of an industrial process.

- 6.8 *For industrial wastewater discharges and air emission streams identify:*

- (a) the release substance volume(s) generated per unit time;*
- (b) concentration of substance(s), and physical or biological characteristics of substance(s);*
- (c) discharge rate per unit time as well as per unit of production, and*
- (d) whether the discharge or emission is continuous or intermittent, and the frequency (if intermittent).*

The groundwater treatment system on Site is described in Section 6.11 of the ARAP and is illustrated schematically in Figures 18 and 19 of the ARAP. The monitoring program for the treatment system is outlined in Section 7.6 of the ARAP. The groundwater treatment plant was installed in 2005 to replace the previous treatment plant, which was at a different location. The current treatment plant process consists of the following:

- NAPL separation system with coalescing plates;
- bag filters for suspended particulate;
- transfer pump; and
- activated carbon vessels.

The groundwater treatment plant is designed to accommodate a flow rate of approximately 230 L/min.

- 6.9 *Identify any component streams which contribute to those streams identified in 8 above.*

The average contribution from the different pumping systems has been estimated as follows:

- 5 L/min for the West and South Trenches;
- 5 L/min for the Griffin Road Trench;
- 40 L/min for the Hydraulic Barrier at the Spray Lakes property; and
- 35 L/min for the on Site East Hydraulic Barrier.

6.10 *Describe any cooling system to be used [e.g. once-through; air (closed-loop); circulating, etc.]. Include flow rates, intake and discharge temperatures (EC), blowdown rate, dissipation rate in receiving water (kilojoules/hour).*

- Identify any additives (i.e. corrosion inhibitors, biocides), the frequency of application.*
- and calculate concentration in the final discharge effluent stream.*

There are no cooling systems present on the Site and none are associated with the proposed remediation program.

6.11 *Describe all raw water treatment processes, chemicals used, amounts and quality of wastes to be disposed and the frequency of disposal.*

The groundwater remediation processes are described in Section 6.8 and 6.9 of this Application and in Section 6.11 of the ARAP. Spent activated carbon, bag filters and recovered NAPL are generated by this process. Approximately 4.5 cubic metres of spent carbon and product is generated annually and is legally disposed by HAZCO Environmental Services Ltd. at Newalta's Calgary facility. Approximately 300 kg of spent bag filters is legally disposed by HAZCO Environmental Services Ltd. at the Clean Harbours facility.

6.12 *For sanitary wastes, describe the facilities treatment system (if any), and disposal method. Include:*

- number of people on the system(s);*
- volume discharged per unit time;*
- whether or not approval was required or obtained from the Plumbing Inspections Branch of Alberta Labour; and*
- final disposal of sludge (if any) and location.*

There are no sanitary wastes generated by Site activities. Portable sanitary facilities will be used during remediation of the Site. Once the Site is redeveloped, sanitary wastewater will be directed to the Town of Cochrane sanitary sewer system. Domestic wastes will be collected and disposed by an approved commercial waste management company or by the Town of Cochrane.

6.13 *Describe major environmental control operations including size and location of any ponds, pond contents, pond liners, landfills or other waste management facilities (i.e. sludge ponds), air or water pollution control or treatment facilities, discharge details, engineering drawings for these structures (e.g. industrial runoff control, deepwell disposal). (See ATTACHMENT C.) As-built plans and liner details for ponds, landfills, and other waste management facilities will also be required.*

All environmental control operations are described in the ARAP. The primary environmental control operations are the remediation measures that are described in Section 6 of the ARAP. Monitoring and mitigation programs are described in Section 7 of the ARAP.

6.14 For all underground and aboveground tanks, specify:

- (a) tank locations;
- (b) type of service (e.g. Produced water);
- (c) capacity (in m<sup>3</sup>);
- (d) material type;
- (e) type of corrosion protection;
- (f) type of secondary containment;
- (g) method of leak detection.

*Note: Tabular presentation of data would be appropriate.*

There are no tanks existing on the Site other than small tanks associated with the groundwater treatment process that is described in Section 6.11 of the ARAP. No tanks are contemplated as part of implementation of the ARAP.

6.15 For underground storage tanks, please specify:

- (a) Measures incorporated to prevent overfilling of tanks (e.g. Automatic shut-off devices, high level dams).
- (b) Summarize results of integrity testing and inspections. See ATTACHMENT D-A4.

Not applicable.

6.16 Describe the source and amount of potable water, how it will be used, and any water treatment system used (i.e. chlorination, filtration, softening, etc.). Refer to Potable Water Regulation 122/93 with amendments up to and including Alberta Regulation 214/96.

No potable water systems are present on the Site and none are contemplated as part of implementation of the ARAP. Municipal water supply will be used to support any subsequent Site redevelopments.

6.17 Provide details on any reciprocating or turbine engines (a table may be used to list all the information if there are several engines):

- (a) make and model number;
- (b) rated power (kilowatts);
- (c) exhaust stack diameter (metres);
- (d) exhaust stack height above grade (metres);
- (e) exhaust gas temperature (°C);
- (f) exhaust gas velocity (m/s);
- (g) emission rate of the oxides of nitrogen (grams of NO<sub>x</sub>)/(kW\*hr); and
- (h) does the engine meet the low NO<sub>x</sub> emission requirement and by what method.

Not applicable.

6.18 *Provide a copy of the plot plan showing any stack and exhaust stack locations and distance between each stack.*

Not applicable.

6.19 *Provide the peak height of the compressor building in metres.*

Not applicable.

6.20 *Provide details on all natural gas fired heaters (including space heaters), treaters and boilers (a table may be used to list all the information):*

*(a) rated power (kilowatts);*

*(b) exhaust stack height (metres); and*

*(c) exhaust stack diameter (metres); and*

*(d) does the heater, boiler, or steam generator meet the low NO<sub>x</sub> emission requirement.*

Not applicable. The shed for the groundwater treatment system is heated electrically.

6.21 *Provide details on any auxiliary or standby process equipment or other sources of emissions to air, soils or water.*

There is no auxiliary or standby process equipment on-Site and none is contemplated are part of implementation of the ARAP or subsequent redevelopment of the Site.

6.22 *Provide details on flare stacks:*

*(a) height (metres);*

*(b) diameter (metres);*

*(c) net heating value of the gas to be combusted in the flare under normal and emergency conditions;*

*(d) exit velocity of the flare, under normal and emergency conditions;*

*(e) method used to control combustion e.g., assisted by air, steam or nonassisted;*

*(f) flare tip design, and*

*(g) type of igniter, pilots.*

Not applicable.

6.23 *Provide details on any active flare pit on site:*

*(a) under what condition is it used;*

*(b) type and/or present condition of liner;*

*(c) how often it is used and what goes into the pit, and*

*(d) type of flare design, e.g., igniter, pilot, etc.*

Not applicable.

6.24 *Details on any inactive or former flare pits on site including:*

- (a) size of flare pit;*
- (b) description of previous or planned remediation activities; and*
- (c) confirmatory groundwater and soil sample results (if applicable).*

Not applicable.

6.25 *Describe emergency flaring scenarios: provide rates and composition of flared streams (i.e. inlet stream, acid gas before sulphur recovery unit, acid gas after sulphur recovery unit, etc.) and to provide a dispersion modelling run to show the maximum ground level concentration.*

Not applicable.

6.26 *Describe any on site incineration of solid waste and any approvals received for the disposal practice.*

No incineration of waste is occurring on the Site and none is contemplated as part of implementation of the ARAP.

6.27 *Determine the maximum ground level concentration of SO<sub>2</sub>, NO<sub>2</sub>, or any air contaminant that is significant. Provide a computer output for NO<sub>2</sub> and SO<sub>2</sub> dispersion modelling. Background ambient concentrations must be taken into account, as well as nearby sources up to 5 km.*

There are no point source emissions on the Site and none are contemplated as part of implementation of the ARAP. Hence this section is not applicable.

## **7. Applications for Activity Change or an Amendment**

Not used.

**(d) Where the application requires an approval from the Alberta Energy and Utilities Board or the Natural Resources Conservation Board in relation to the activity, the date of the written decision in respect of the application**

**8. *New/Renewal/Change***

*Provide:*

*8.1 Date of Alberta Energy and Resources Conservation Board (EUB) Approval (if applicable);*

*8.2 ERCB Approval Number (if applicable);*

*8.3 Comments on any environmental related terms and conditions of the approval.*

The former Cochrane wood preserving facility did not require an ERCB approval.

**(e) An indication of whether an environmental impact assessment (EIA) report has been required**

*9.1 Was an EIA required?*

*9.2 If required, the date of submission of the EIA report to Alberta Environment accepted by the Director.*

An Environmental Impact Assessment was not required to support initial approval and operation of the former Cochrane wood preserving facility, and was not required to support the existing Approval. Remediation, reclamation and redevelopment of a wood preserving facility is not listed as a Mandatory Activity in accordance with the Environmental Assessment (Mandatory and Exempt Activities) Regulation. Because the proposed remedial program will result in reduced impacts to the environment, an Environmental Impact Assessment is not considered to be warranted to support this renewal application.

**(f) Copies of existing approvals that were issued to the applicant in respect of the activity under this Act or a predecessor of this Act**

*10.1 Attach copies of applicable existing approvals (e.g. if this is a renewal application, please attach a copy of the previous approval that is due to expire, including any amendments).*

Approval 9727-01-00 (as amended) is provided in Appendix 1 of the ARAP.

It is noted that Approval 79072-00-00 which is held by Domtar addresses issues and activities associated with the off-Site groundwater contamination issue. Accordingly, Approval 79072-00-00 is relevant to the Site but is not subject to this Application.

**(g) The proposed or actual dates for construction commencement, construction completion, and commencement of operation**

**11 New Plants**

Not applicable.

**12. Renewal Applications**

**12.1 Provide actual date for original commencement of operation, if known.**

The remediation program is scheduled to commence in the spring of 2010, subject to approval of this Application and authorization of the ARAP.

**13 Applications for Activity Change or an Amendment**

Not applicable.

- (h) A list of substances, the sources of the substances and the amount of each substance that will be released into the environment as a result of the activity, the change to the activity or the amendment, addition or deletion, as the case may be, the method by which the substances will be released and the steps taken to reduce the amount of the substances released**

**14. New Plants**

Not applicable.

**15 For Renewal Applications**

- 15.1 *Provide a list and quantity of substances used in the production process in terms of a typical operating day.*
- 15.2 *Describe the water or air demands in terms of the sources, purpose (specific operation) and quantities.*
- 15.3 *Describe the sources of the substances to be released to the environment.*
- 15.4 *Describe the amount of the substance to be released to the environment.*
- 15.5 *Describe the methods of release.*
- 15.6 *Describe the minimization controls implemented.*
- 15.7 *For all plants, the industrial runoff volume for the plant developed area shall be determined. Refer to ATTACHMENT B for the determination of industrial runoff drainage system design.*

The primary substance released to the environment is treated groundwater generated by the groundwater remediation program. The system is designed to treat up to 230 lpm of groundwater, although the rate of treatment and release most recently has averaged approximately 85 lpm. Contaminants potentially associated with this release are NAPL, substituted phenolic compounds, poly-cyclic aromatic hydrocarbon compounds and aliphatic hydrocarbon compounds. Approved release criteria for the groundwater treatment system are summarized in Table 15.7.

Storm water run-off will be controlled during remediation to prevent its contamination by manipulating Site grade (e.g., berming or channelling) to redirect potential run-off around the areas to be remediated. Given that the Site is covered with permeable sands and gravels, little or no potentially contaminated run-off water is expected to be generated during the remediation program. Accordingly, impoundment of runoff is not expected to be required. Completion of Attachment E is not considered to be warranted.

**Table 15.7 Effluent Criteria for Treatment System**

<b>Influent/Effluent Parameters</b>	<b>Limit</b>
<b>Organic Parameters</b>	
Benzene	0.5 mg/L (City of Calgary limit)
Toluene	0.5 mg/L (City of Calgary limit)
Ethyl benzene	0.5 mg/L (City of Calgary limit)
Xylenes (total)	0.5 mg/L (City of Calgary limit)
<b>Phenolic Compounds</b>	
Phenol	1.0 mg/L (City of Calgary limit)
2,4-Dichlorophenol	0.9 mg/L (GCDWQ)
2,3,4,6-Tetrachlorophenol	0.1 mg/L (GCDWQ)
2,4,6-Trichlorophenol	0.005 mg/L (GCDWQ)
Pentachlorophenol	0.06 mg/L (GCDWQ)
<b>Polycyclic Aromatic Hydrocarbons (PAH)</b>	
Naphthalene	0.5 mg/L (USEPA)
Benzo(a)pyrene	0.01 mg/L (GCDWQ)
pH	5.5 - 10 (City of Calgary)
TSS	1,200 (City of Calgary)

Detailed description of the groundwater treatment system is provided in Section 6.11.

**16. For Applications for Activity Change or an Amendment**

Not applicable.

**(i) A summary of the environmental monitoring information gathered during the previous approval period**

**17. New Plants**

Not applicable.

**18. Renewal Applications**

**18.1** *Describe the requirements of the previous approval (e.g. EPEA 999-00-00) by restating the monitoring clause(s), including the parameters required, monitoring frequency and sampling requirements.*

Approval 9790-01-00 as amended does not include explicit monitoring clauses as would typically be the case for an operating plant. The need to monitor decommissioning progress and the potential release of contaminants to the environment is implicit in that portion of the approval that requires the approval holder to submit and implement a decommissioning plan and remedial action plan for the Site.

Groundwater

Groundwater monitoring has been completed over the previous approval period to accomplish the following:

- identify any groundwater contamination that may be present on and off of the Site
- delineate the extent of free-phase and dissolved phase contamination that is associated with the Special Management Area (SMA)
- monitor groundwater conditions at the edge of the SMA to evaluate potential migration of contamination over time

The nature of the groundwater investigation and monitoring programs that have been completed on the Site are summarized in Section 3.6 of the ARAP and are presented in greater detail in Appendix 8 of the ARAP.

Soil Monitoring

Soil investigations have been completed to delineate the areas of contamination associated with historical operation of the former Cochrane wood preserving facility. Soil monitoring has been completed to evaluate the effectiveness of the remedial programs, to ensure that materials removed from the Site complied with their respective use or disposal criteria, and to measure progress of soil treatment programs. Results of the soil monitoring programs as they are relevant to the current state of the Site are summarized in Section 3.8 of the ARAP and are presented in greater detail in Appendix 4 of the ARAP.

Soil Vapours

Investigations and monitoring of volatile contaminant concentrations in soil vapours has been completed to delineate the boundaries of the SMA and to verify that it is safe, from a human health perspective, to construct commercial buildings on the Site. Soil vapour monitoring programs are summarized in Section 3.8 of the ARAP and are presented in greater detail in Appendix 8 of the ARAP.

### Treated Water

Treated groundwater is monitored prior to release to the Town of Cochrane sanitary sewer system. Release of this water is regulated by a permit to release water to the sewer system. Monitoring of this water verifies compliance with the criteria summarized in Section 15.7 of this Application.

- 18.2 *Briefly describe the results of the environmental monitoring information compiled under the previous approval (e.g. statements, tables, figures, graphs, etc.) and any additional environmental monitoring that was conducted on site including groundwater remediation programs.*

### Soil

Results of the soil monitoring programs are summarized in Section 3.8 of the ARAP and are presented in greater detail in Appendix 4 of the ARAP.

In 1997, Golder conducted a comprehensive investigation of the former Domtar Site to assess the extent of wood preserving chemical impacts on soil and groundwater at the Site. Based on the results of the investigation, Golder determined that soil impacts at the Site were characterized by PAH and phenolic compound concentrations that exceeded the published criteria at that time. Golder determined the extent of soil impacts on the former Domtar Site and calculated the estimated tonnage of soil that would require remediation using the 1991 and 1997 CCME criteria. The tonnage calculations were based on the use of PCP and B(a)P as indicator parameters.

As part of characterization activities in 1998, Conor Pacific conducted additional characterization, including limited testing for dioxins and furans in soil samples from the central wood treatment plant area. The testing indicated that the remedial criteria for dioxins and furans at that time (0.001 and 0.01 milligrams Toxic Equivalent Quotient [TEQ] per kilogram [mg TEQ/kg], respectively) would only be exceeded in areas having PCP concentrations greater than 200 mg/kg (i.e., essentially those soils in the wood treatment area within the SMA).

The current AENV soil quality guideline for dioxins and furans, which is 4 nanograms TEQ per kilogram (ng TEQ/kg; AENV 2009a), is adopted directly from CCME (2002) without change, and is based on national background concentrations and related minimal health risk. As a consequence of the significantly reduced remedial criterion, Biogenie conducted a dioxin and furan investigation in 2009 (Appendix 4 of the ARAP). Background concentrations in Cochrane and the impacts on Site remediation were assessed. The investigation confirmed that the local background concentrations were not higher than the national average concentration. It also established a strong correlation between PCP concentrations and dioxin and furan concentrations at the Site that allows PCP concentrations to be used to estimate dioxin and furan concentrations. The data show that dioxin and furan concentrations exceed the applicable remediation criterion at depths greater than depths at which PAHs and PCP concentrations exceed their criteria, and that dioxin and furan contamination extends significantly beyond that of PAHs and PCP. Because the current guideline is so low, the incremental costs associated with applying this guideline across the Site makes the Site's redevelopment economically infeasible. Thus the conclusion was reached that for commercial redevelopment of the Site to proceed, risk management will be needed to control exposure to residual concentrations (after remediation to PAHs and PCP guidelines) in areas planned for commercial development. For residential development, the remedial guideline will be met and risk management for dioxins and furans will not be needed.

The estimated extent of soil contamination associated with these criteria is presented on Figures 11 and 12 of the ARAP and soil quality data is provided in Appendix 4 of the ARAP. The estimated volume of impacted soil that would require remediation is provided in Table 18.2.

**Table 18.2 Estimated Volume of Soil to be Remediated**

<b>Development Phase</b>	<b>Contaminated Soil Volume (m<sup>3</sup>)</b>
Stockpiles	25,900
Remaining Lands outside of the SMA	48,200
SMA	40,300
<b>Total Volume</b>	<b>114,400</b>

### Soil Vapours

Soil vapour sampling was conducted at the Site by Golder in 1997 and by Komex in 2003, 2004, 2006 and 2007. Golder monitored three vapour wells located within the centre of the NAPL plume. The Komex investigations monitored newly installed vapour wells within and around the SMA.

Soil vapour monitoring results indicated the presence of PAHs, phenolic compounds and hydrocarbons. PAH detections were limited to naphthalene and phenolic detections were limited to phenol. Hydrocarbons detected included benzene. It should be noted that the concentrations of phenol detected during the 2003 sampling event compared to concentrations of phenol detected in the field blank (ambient air sample) from the same sampling event.

All vapour monitoring results are well below the AENV ambient air quality objectives for hydrocarbons, PCP, and phenols (AENV 2009a) and the Ontario Ministry of the Environment 24-hour average ambient air quality criteria (OMOE 2008) for naphthalene, PCP and phenol.

### *18.3 Describe hydrogeologic characteristics and groundwater monitoring data (information requirements outlined in Attachment G).*

#### Groundwater

The results of the groundwater investigation and monitoring programs that have been completed on the Site are summarized in Section 3.6 of the ARAP and are presented in greater detail in Appendix 8 of the ARAP. The groundwater conditions, characteristics and flow directions are complex. Hence, the reader is directed to the ARAP to obtain a full understanding of these conditions. The following points regarding the hydrogeology of the Site are most relevant to this Application:

- the worst of the groundwater contamination is contained within the SMA which is designed to contain all significant non-aqueous phase liquids (NAPL) as well as contaminant concentrations which present a risk to indoor air quality
- the potential for migration of groundwater contamination out of the SMA is mitigated by the operation of a groundwater remediation system which is already in place