

Marinus Verhagen Enterprises Limited

Asbestos Waste Management Site

Class 1 Environmental Assessment Report

Date: February 2013
Ref. N°: 15852

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Marinus Verhagen Enterprises Limited

Asbestos Waste Management Site McLellans Brook, NS

Class 1 Environmental Assessment Report

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REVISION AND PUBLICATION REGISTER		
Revision N°	Date	Modification And/Or Publication Details
0	2012-12-12	Draft Review Submittal to NSE
1	2013-02-18	Submit to Nova Scotia Environment

1 INTRODUCTION

Marinus Verhagen Enterprises Limited (Verhagen Enterprises) of New Glasgow, Nova Scotia (the Proponent) is proposing to construct an Asbestos Waste Management Site adjacent to its current Construction and Demolition (C&D) Waste Disposal Site located in McLellans Brook, Nova Scotia. To proceed with this Project, a Class 1 Environmental Assessment (EA) is required, pursuant to the *Environment Act* as identified in Schedule A of the *Environmental Assessment Regulations*, Section E (Waste Management) (1), “A facility for storing, processing, treating or disposing of waste dangerous goods that were not produced at the facility, other than facilities operated by, or on behalf of, a municipality or Provincial agency for waste dangerous goods collected only from residential premises.” Asbestos is considered a waste dangerous good as described in the *Asbestos Waste Management Regulations*.

This Project will serve Verhagen Enterprises with additional capabilities to manage waste from its C&D operations by providing an asbestos waste management site adjacent to its current waste management facility.

1.1 Name of Undertaking

Marinus Verhagen Enterprises Limited proposes to construct and operate an Asbestos Waste Management Site adjacent to their existing Construction and Demolition Debris disposal facility. This Project is referred to as the Asbestos Waste Management Site.

1.2 Location of Undertaking

The Project is located on Old Mill Road (also locally known as Thomsen Road), approximately 2.5 km from the intersection with Civic No. 941 McLellans Brook Road, as shown on Figure 1. The proposed site is located on PID No. 00874651 adjacent to the current C&D waste disposal facility operated by Verhagen Enterprises.

The site is bound by the existing C&D waste disposal site and the Trans Canada Highway (TCH – Highway 104) to the north, undeveloped forest covered land to the east and south, and agricultural land to the west (Figure 1).

The nearest residential dwelling is located approximately 600 m to the southwest on Douglas Crescent. The nearest local business to the Project site is also located on Douglas Crescent. Two farming operations are the next closest operations to the Project site. One farm is located approximately 600 m north of the site on Thompson Road on the north side of the TCH, and the second farm is located approximately 900 m west of the site off McLellans Brook Road.

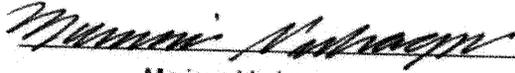
1.3 Land Ownership and Project Funding

The 2.02 hectare (ha) property is leased by the Proponent and will become part of the overall C&D operations. The Project will be privately funded by the Proponent that will not include any funding from either provincial or federal agencies.

1.4 Proponent Information

Name of Undertaking:	Asbestos Waste Management Site
Proponent:	Marinus Verhagen Enterprises Limited
Proponent Contact:	Marinus Verhagen President
Location of Undertaking:	Old Mill Road McLellans Brook, Nova Scotia
Proponent Mailing Address:	6408 Linacy Road New Glasgow, NS B2H 5C4
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Signature of Proponent Signing Officer:



Marinus Verhagen
President
Marinus Verhagen Enterprises Limited

Feb. 19, 2013.

Date

Signature of EA Preparer:

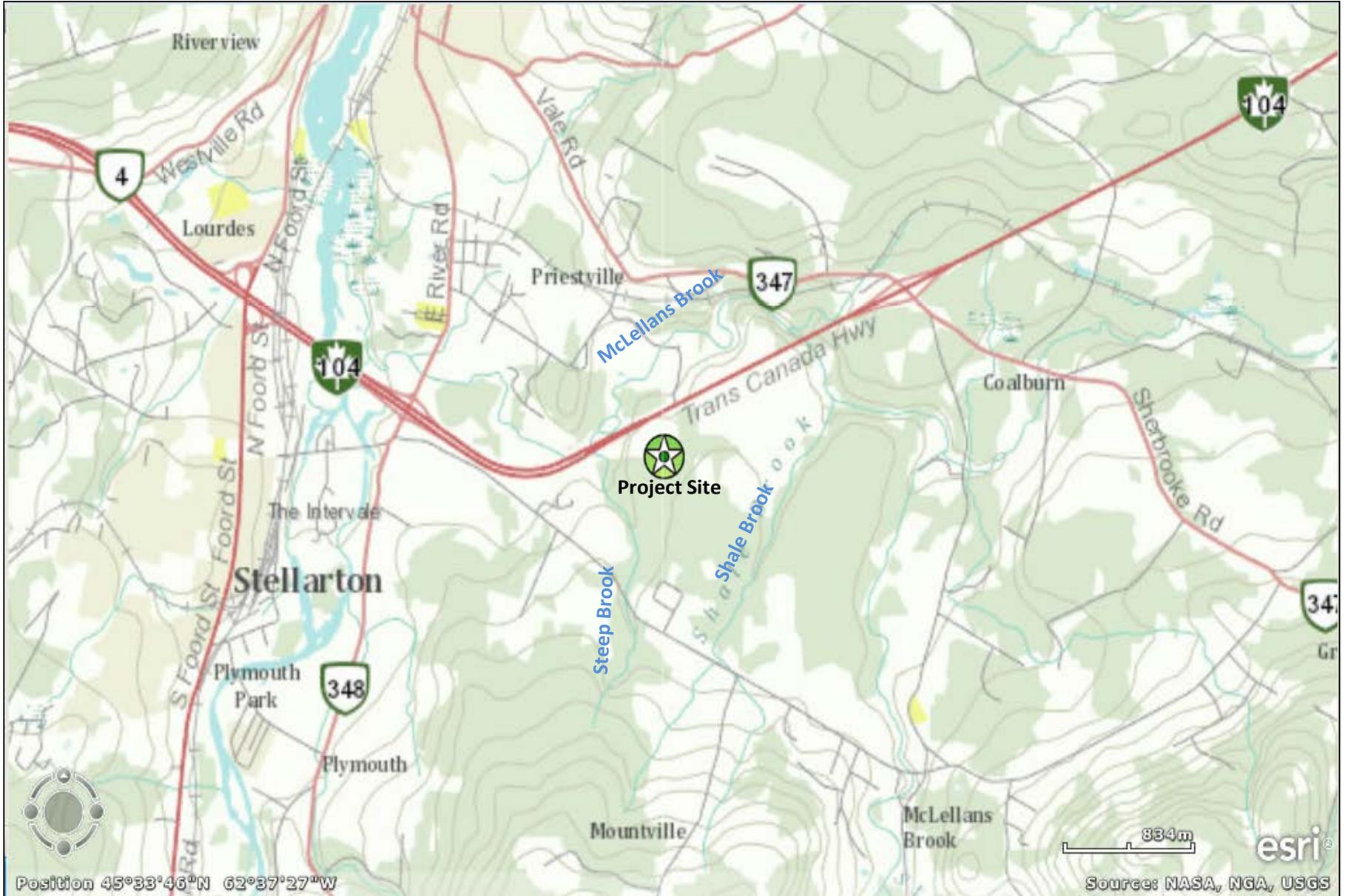


Andrew McIntosh,
Project Manager
LVM Maritime Testing

Feb. 19, 2013

Date

Figure 1. Site location and surrounding surface water.



2 INTRODUCTION

2.1 Need for Undertaking

Verhagen Enterprises plans to construct and operate the Asbestos Waste Management Site to expand their current construction and demolition activities and disposal of such waste. The Project site will only handle asbestos waste that is delivered to the site in accordance with the NSE's *Asbestos Waste Management Regulations*.

2.2 Description of Undertaking

The Project will entail the construction of an asbestos waste management site accepting waste meeting NSE's disposal regulations for such material. The site will have a low permeability liner meeting the NSE's design requirements. This Project will support Verhagen Enterprises current Construction and Demolition (C&D) waste management site adjacent to the proposed Project site (Figure 2).

Asbestos waste material to be deposited within the Project site will result from building demolition activities by Verhagen Enterprises and other Nova Scotia asbestos contractors. It is anticipated that approximately 500 tonnes of waste will be deposited at the facility per year. The actual amount disposed at the site will vary based on the demolition activities within the province.

The initial Project site layout of 1 hectare is planned to provide for several years of disposal of asbestos waste. The waste cell will have a liner constructed of native material that will have a minimum permeability of 1×10^{-5} cm/sec and a minimum thickness of 1 metre. The construction of a typical asbestos waste cell is shown on Figure 2. The rate of waste accepted at the site will be monitored to determine when/if a subsequent waste cell would be required.

The cell, once completed, will have a final soil cap placed over the cell with the cover being stabilized through seeding and plantings as soon as possible to keep the active areas to a minimum.

The overall site will consist of the following:

- ▶ Buffer zone;
- ▶ Low permeability liner; and
- ▶ Erosion and sediment control features.

All asbestos waste entering the site must be accompanied with a shipping document as is required in the *Transportation of Dangerous Goods Act* (Canada). The approval requires a yearly report summarizing the quantity and type of material disposed of at the site. An example of the shipping form to be used for the site is included in Appendix 1.

2.3 Project Description

The proposed Project components include:

- ▶ An access road from the existing C&D facility;
- ▶ Stormwater management system;
- ▶ Stockpile of cover (clay) material; and
- ▶ Construction of containment cell.

Construction

The general Project Construction activities will include the following:

- ▶ Implementation of a project specific Erosion and Sediment Control (ESC) Plan;
- ▶ Clearing and grubbing of the area;
- ▶ Excavation of the material and compaction of liner material;
- ▶ Installation of stormwater collection; and
- ▶ Construction of asbestos waste containment cell.

Operations and Maintenance

The operations of the facility will include vehicle traffic for staff working at the facility, from vehicles delivering the asbestos waste and site maintenance vehicles (e.g. heavy machinery including excavators, bulldozers and dump trucks). Regular activities include placement of the waste within the cells, the covering of asbestos waste material deposited at the site, and management of the stockpiled cover material.

Decommissioning

Decommissioning of the proposed Project site is not likely to occur for at least 20 years or more. With the passing of time, and depending on the amount of waste accepted by the site, additional cells are planned for the site. With an expected lifespan, and as part of their commitment to environmental stewardship, plans for decommissioning of the proposed Project have not been prepared. Once a date for decommissioning has been established, consultation with the proper regulatory authorities will help to develop an official site decommissioning plan that meets all regulatory requirements.

2.4 Site and Project Schedule

The hours of operation for the C&D Waste Site are 7 am to 6 pm, weekdays, except statutory holidays. These will be same hours of operation for the Asbestos Waste Management Site.

The construction for the Project site will begin upon the receipt of the regulatory approvals. At this time the construction is expected to begin during the first quarter of 2013.

2.5 Regulatory Framework

The development of the site requires the following regulatory approvals:

- ▶ NSE Industrial Approval to Construct and Operate (Part IV) the Project site; and
- ▶ NSE Class 1 Environmental Assessment.

The Proponent has already been in contact and obtained the requirements for the development of the site as an Asbestos Waste Management Facility with the regional NSE office in New Glasgow.

3 EXISTING ENVIRONMENT

3.1 Biophysical Environment

3.1.1 Vegetation and Habitat

The property is situated within the 52,856 ha Natural Landscape 42: Pictou River Hills, characterized by low rolling hills, mixed Acadian forest types and large river systems that drain into the Northumberland Strait. (NSDEL 2002). The actual proposed asbestos disposal site is a 1 ha section of the 60 ha property identified as PID 00874651, which is cut over woodland dominated by regenerating gray birch (*Betula populifolia*) and large areas of land cleared completely of trees and roots. The site is predominantly a young secondary forest (Figure 3), dominated by gray birch (*Betula populifolia*) and trembling aspen (*Populus tremuloides*), with a significant presence of glossy buckthorn (*Frangula alnus*). There were occasional balsam fir (*Abies balsamea*) and white spruce (*Picea glauca*) that changed the local character to that of a mixed-woods habitat (Figure 4). The site was quite homogeneous. The dominant herb was

rough goldenrod (*Solidago rugosa*). Glassy buckthorn (*Frangula alnus*), an invasive plant species, was identified on the Project site during the botanical survey (Marbicon 2012).

A complete listing of the floral species observed during the field survey is included in Appendix 1 of the botanical report (Appendix 2).



Figure 3. Typical birch thicket present on the Project site (from Marbicon 2012).

Adjacent to this property to the west is an existing landfill disposal area and to the north is the Trans Canada Highway # 104. The study area is a very busy industrial area that has been greatly disturbed by human infrastructure and activity. No significant or managed areas exist within a 5 km radius of the study site.



Figure 4. Southwest corner of the Project site as viewed from the C&D site (from Wile 2012)

The Project site is situated on gently sloped land and while two drainage systems (Shale Brook and McLellans Brook) skirt the property, no streams or wetlands appear to be located on the property near the Project site. Some very small patches of sedge a few metres square are present indicating poor drainage or a high water table in these small areas. Some deeper ruts in old logging roads exhibited wetland flora, but there were no wetlands on site that were over 100 square metres. Given the recent forest cutting and land clearing activity on the property and its proximity to industrial activity, wildlife habitats are far from pristine and natural.

3.1.2 Wildlife and Habitat

A Wildlife and Habitat field survey was undertaken by Mr. John Wile on 30 October 2012 (Appendix 3). The field survey used the information gathered in the Atlantic Canada Conservation Data Centre (ACCDC) report (Appendix 4) for directing the work. None of the species observed during the 30 October 2012 field survey were either federal (COEWIC) or provincial (NSDNR) species of conservation concern. The mammals listed in Table 1 were not observed directly but signs of their presence within the study area were found. No reptiles or amphibians were observed.

There is a lack of connectivity of the study site to other large contiguous blocks of forest normally required for wide ranging terrestrials such as the Mainland Moose (*Alces americanus*), Lynx (*Lynx canadensis*) or Black Bear (*Ursus americanus*). Smaller mammals could be present within the study area throughout the year.

Table 1 Fauna Species in the Study Area Observations on 7 October 2011 (Wile 2012).

COMMON NAME	SCIENTIFIC NAME
BIRDS	
Black-capped Chickadee	<i>Parus atricapillus</i>
American Crow	<i>Corvus brachyrhynchos</i>
MAMMALS	
Snowshoe Hare	<i>Lepus americanus</i>
White-tailed deer	<i>Odocoileus virginianus</i>

Birds that may potentially be present within the study area include the Olive-sided flycatcher (*Contopus cooperi*) (Threatened), Northern Goshawk (*Accipiter gentilis*) (Not at Risk), and Gray Catbird (*Dumetella carolinensis*) (S3B). These birds would not likely use the study area as nesting habitat due to the nearby industrial activity and developed area.

Due to the location of the Project site near a busy highway, industrial site (i.e. C&D site) and high degree of disturbance due to recent clearcutting of the forest, the study area would offer limited habitat opportunities to wildlife (Wile 2012).

3.1.3 Wetlands

There are no wetlands either on or surrounding the Project site.

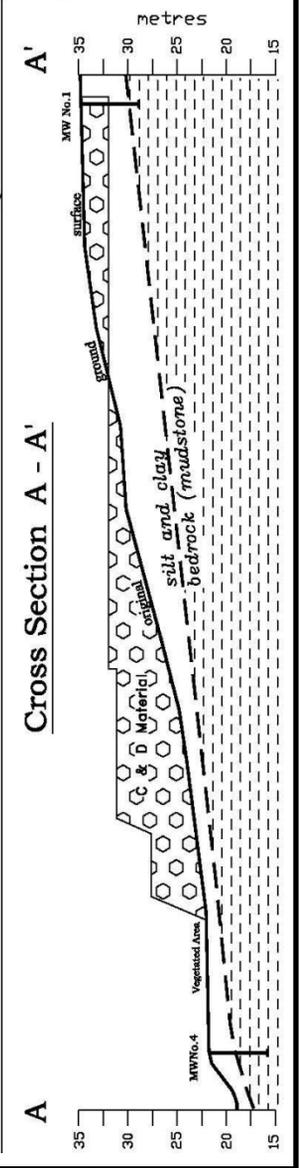
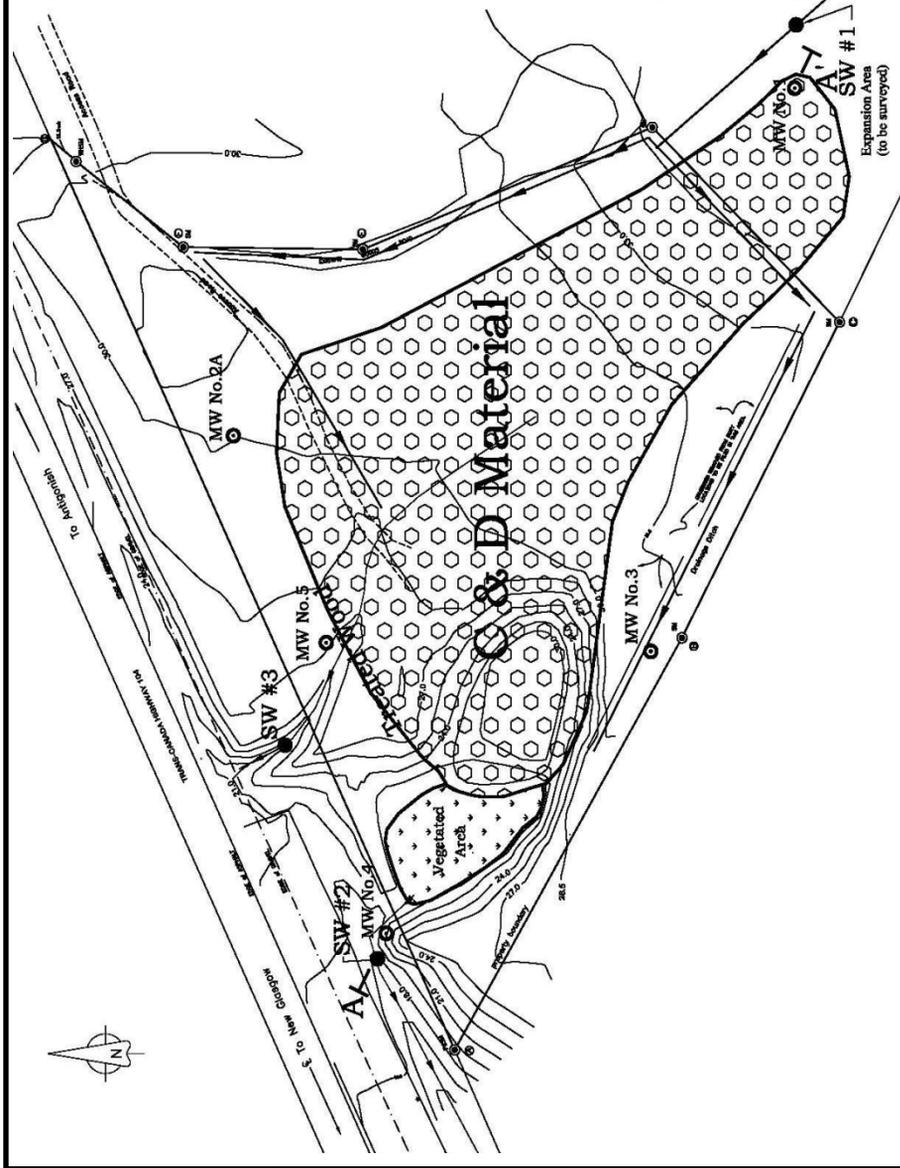
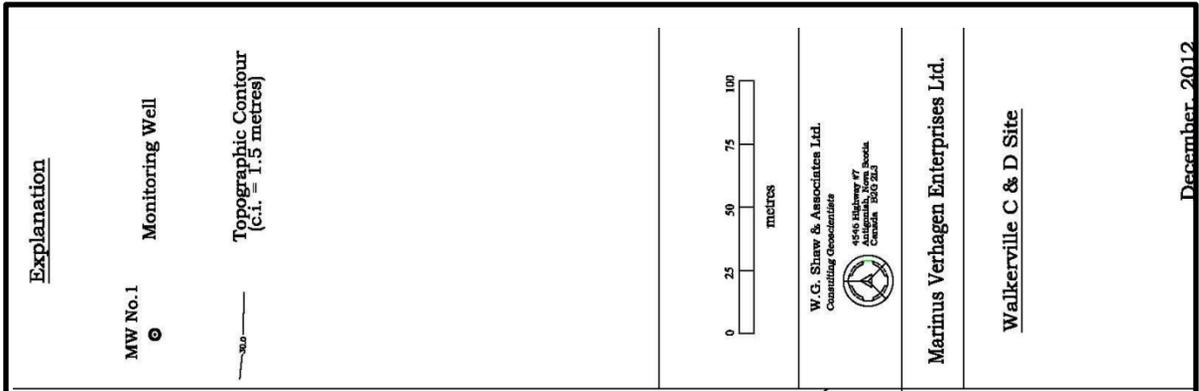
3.1.4 Surface Water

No watercourses travel through or adjacent to the Project site. The nearest upgradient watercourse is Shale Brook, approximately 600 m southeast of the Project site and flows into MacLellan’s Brook. Steep Brook is the nearest downgradient watercourse located approximately 450 m west of the Project site and empties into MacLellan’s Brook. MacLellan’s Brook travels from the east to the north of the Project site and is closest to the site approximately 500 m north of Project site and on the north side of the TCH. MacLellan’s Brook ultimately empties into Pictou Harbour (Figure 1).

Surface water on the C&D facility flows through ditches along the periphery of the site (Figure 6). All water ultimately travels to the northwest corner of the site through an existing fen that serves as a settling pond. The water then travels to the southwest through the existing Highway 104 drainage ditch discharging into Steep Brook which empties into MacLellan’s Brook. The Project site’s surface drainage will be connected to the C&D facility’s stormwater drainage at the southeast corner of the C&D site (Figure 5)

The C&D site has three surface water sampling locations around the site; one background and two downgradient (Figure 5). The water quality of the site is typical for fresh water. Since the

site monitoring plan has been in place, the water quality has had slight sporadic guideline exceedences of aluminum, iron, copper, zinc and nitrite+nitrate. Elevated concentration levels for both calcium and sulphate have been identified as either a result of baseflow or water that has come into contact with the C&D material (e.g. drywall and concrete) (Appendix 5). To date there have not been any concerns noted by the NSE regarding the discharge of stormwater from the C&D site.



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Existing Site Monitoring Locations
Verhagen Enterprises
Construction and Demolition Site
McLellan's Brook, Nova Scotia
(Source: Shaw 2012)

Figure 5

3.1.5 Groundwater

Local area drinking water is supplied by groundwater. The nearest groundwater wells are approximately 500 m west upgradient of the Project site servicing residents on Douglas Crescent off McLellans Road. Groundwater flows northwest across the existing C&D site (Figure 6) and it is expected that the groundwater flows in a similar path for the Project site due to the site topography. The municipalities of New Glasgow and Stellarton are both serviced by municipal water systems utilizing surface water. There are no anticipated impacts related to groundwater from the Project as the waste cells will be lined with native clay material. The asbestos waste management site was selected for its proposed site due to the availability for its low permeable native soil that will minimize any potential impacts to the surrounding environment.

The current C&D site has five groundwater monitoring wells surrounding it. The closest monitoring well to the Project site is MW No.1. All five of the monitoring wells are located downgradient of the Project site and surround the C&D site (Figure 5).

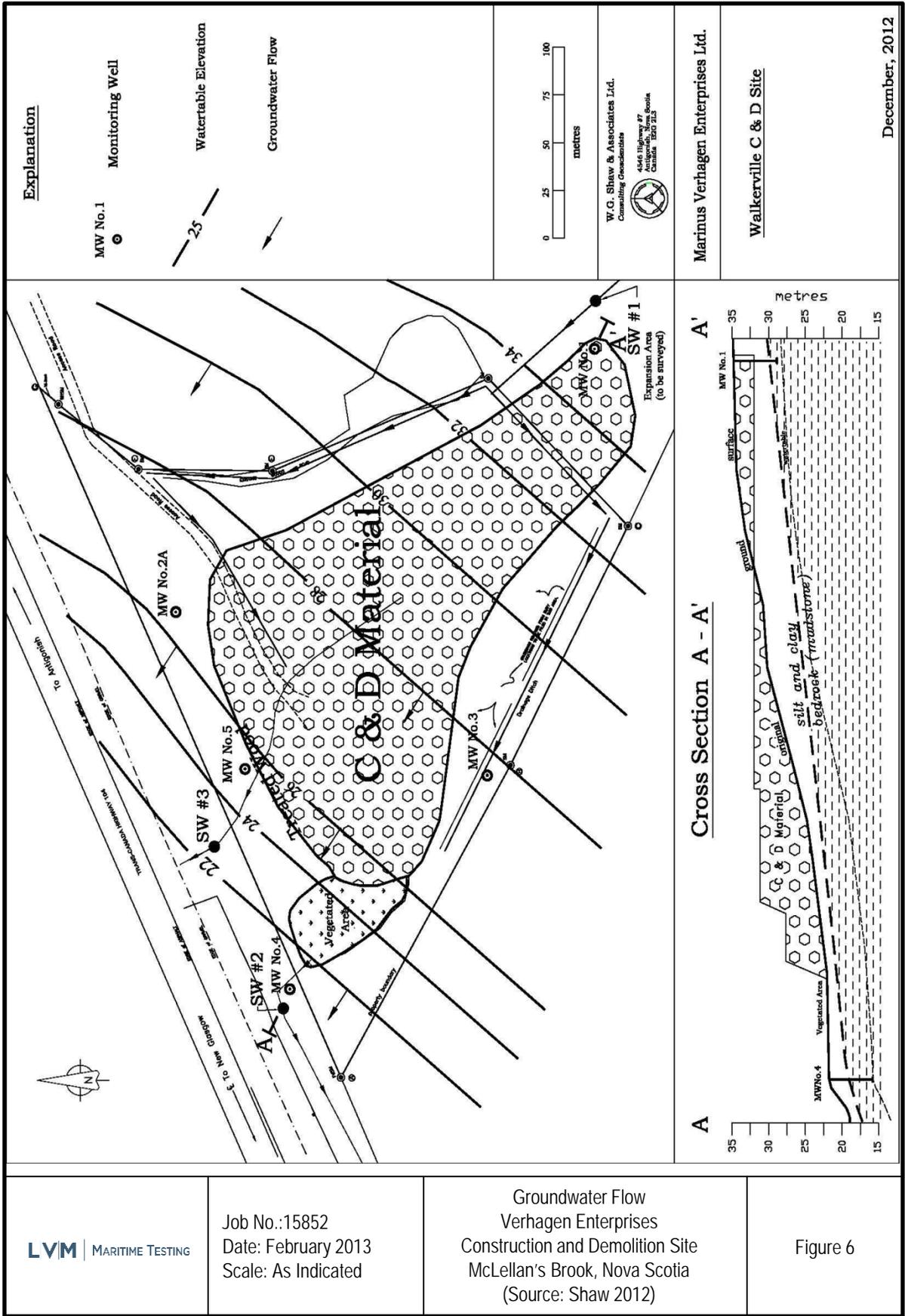
The background water quality sample locations for the C&D site, which are located downgradient of the Project site, is moderately hard (350-514 mg/L as CaCO₃) and slightly basic (pH ranges between 7.3 to 8.1). The water samples for these monitoring locations have slight exceedences for total dissolved solids (TDS), turbidity, colour and manganese guideline concentrations (Appendix 5)

3.1.6 Geology and Hydrology

The bedrock within the study area consists of the Cumberland Group - Stellarton Formation. The site is located within the Stellarton Formation and consists of lacustrine-alluvial shale, sandstone, conglomerate, oil shale and coal. The Pictou coalfield is a late Carboniferous area that underlies approximately an area of 5 km by 16 km underneath the communities of New Glasgow, Stellarton and Trenton.

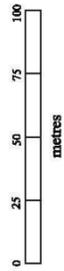
The surficial geology mapping of the area classifies the area as clay till. This was confirmed during LVM Maritime Testing's geotechnical investigation of the Project site (Appendix 6). There were nine (9) test pits excavated over the proposed Project site. Conditions throughout the site were generally similar in nature. The soil encountered was undisturbed natural fine grained glacial till that varied from silty sand, some gravel with trace to some clay to silty clay, some sand with trace gravel. Occasional cobbles were also present in the test pits. The test pits were terminated approximately 2 to 3 metres below the anticipated bottom of the asbestos waste cells. Bedrock and groundwater were not encountered during the test pit investigations.

Permeability testing of the soil for suitability as a liner material was undertaken. The coefficient of permeability for the soil ranged between 3.6×10^{-8} to 3.0×10^{-8} cm/sec, which is less than



Explanation

- MW No.1
- Monitoring Well
- Water Table Elevation
- Groundwater Flow



W.G. Shaw & Associates Ltd.
 Consulting Geoscientists
 4545 Highway #7
 Antigonish, Nova Scotia
 Canada B9B 2L3

Marinus Verhagen Enterprises Ltd.

Walkerville C & D Site

December, 2012

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 Scale: As Indicated

Groundwater Flow
 Verhagen Enterprises
 Construction and Demolition Site
 McLellan's Brook, Nova Scotia
 (Source: Shaw 2012)

Figure 6

the NSE requirement of 1.0×10^{-5} cm/sec. It is anticipated that the *in situ* permeability will be less than that required by the NSE (Appendix 6).

There has been historical coal mining operations near the area of the Project. During the background review two former mining operations were identified using the NSDNR Geology and Maps Database. The Steep Brook (Blue Acres: STE-4-121) site is a former pit operation located approximately 600 m to the west of the Project site. The other site is a former coal mine shaft located approximately 450 m south (upgradient) of the project site and identified as McLellans Brook (THO-2-064). Neither of these former coal mines are anticipated to either impact or be impacted by the current Project. The initial test pit investigation of the Project site did not indicate bedrock at the site and the test pits extended approximately 2 to 3 metres below the grade anticipated for the bottom elevation of the asbestos waste cell.

3.1.7 Species at Risk

The Atlantic Canada Conservation Data Centre's (ACCDC) 100 km radius search of the Project site revealed 4,934 records of 104 vertebrate species and 1,314 records of 264 vascular plants and 98 records of 20 non-vascular plants. The search of ACCDC data base targeted the less common species either with COSEWIC or Provincial listings or with a provincial "S" rank of 3 or less and so does not include many of the more common vertebrate species that could be present on the property.

Fauna

The 100 km search included many natural landscapes dissimilar to this including marine and coastal habitats associated with the Atlantic Ocean, the Upper Bay of Fundy and remote inland forested wilderness areas. There were 33 vertebrate species having various levels of COSEWIC status rankings: Endangered 6, Threatened 11, Species of Concern 7, Data Deficient 1 (Eastern Cougar), Not at Risk 8. COSEWIC listings deal with the national status of species and can often differ from the status applied at the provincial level.

Provincially six species are ranked as Endangered, one as Threatened and one as Vulnerable. There were 12 vertebrate species having a Provincial rarity rank of S1.

There were no Species at Risk, either flora or fauna, identified during the wildlife and botanical field surveys. During the review of the ACCDC records, there was a recorded sighting of a Wood Turtle as close as 5 km from the study area. However, due to the fact that the Project site does not have a watercourse, the preferred habitat of Wood Turtles, it is unlikely to find them within the study area (Wile 2012).

Flora

The ACCDC desktop survey resulted in nine (9) floral species having various levels of COSEWIC status rankings : Endangered 3, Threatened 1, Species of Concern 3, and Not at

Risk 2. Provincially two species are ranked as Endangered, and three as Vulnerable. There were 78 floral species having a Provincial rarity ranking of S1.

A Blood Milkwort (*Polygala sanguinea*) was recorded in 1922 on an un-forested vacant lot approximately 4 km from the Project site. The species was not found during the field survey.

The Blue vervain (*Verbena hastata*) is a NSDNR Green status species that was recorded at a gravelly shore in 2003. This habitat is not found on the Project site and this species was not identified on the Project site during the survey.

3.2 Socio-Economic Environment

3.2.1 Archaeological, Heritage and Aboriginal Resources

Davis MacIntyre and Associates Limited conducted an archaeological resource impact assessment of the Project site and surrounding area in 2012. A copy of the complete Davis report is included in Appendix 6.

The report noted that there is no indication of historic period settlement within the study area. Also, based on the findings of the study, the study area appears to not be suitable for First Nations resource exploitation or settlement as there was little that would have attracted them for either seasonal or short-term activity or encampment (Davis 2012).

4 SCOPE OF THE ASSESSMENT

4.1 Impact Assessment Methodology

The environmental impact assessment is a planning tool used in which the environmental effects of a proposed undertaking are predicted and evaluated and are given consideration prior to the undertaking. The environmental impact assessment includes identifying and describing those components of the proposed setting within the area of the study boundaries that will or could be affected by the Project. The process for an environmental impact assessment is a step-wise and transparent process. The steps in the process include:

- Determining the VECs ;
- Determining the Project activities that may interact with the VECs;
- Determining the mitigation measure that can be used or implemented to reduce the impact;
- Determining and characterizing the residual environmental effects and their significance; and
- Developing monitoring measures.

4.2 Determination of Valued Environmental Components (VECs)

A list of potential VECs was determined using a standard environmental assessment methodology. Potential VECs were assessed to determine if they may be present within the study area. Based on this information a determination was made as to which of the VECs would be included in the assessment of this Project.

The identification of the Project activities that may interact with the VECs is completed by identifying the various Project components that may have a potential effect pathway to the receiving environment or component. The components are categorized to whether they occur during construction, operation or decommissioning phases of the Project. Project activities are compared to the list of VECs and the potential interactions are identified for further consideration in the impact assessment process.

Once the Project and VEC interaction have been identified, potential impacts can be identified. Information about the VECs and the knowledge of the Project activities are combined to determine and review potential adverse effects of the Project.

Mitigation measures, which can be used to reduce the potential impacts of the Project on the VECs, are identified. Mitigation measures can include both Project design, construction

practices or Project specific measures and are implemented by the Proponent to reduce the identified impacts.

4.2.1 Residual Environmental Effects Determination and Characterization

Residual environmental effects are those effects that remain following the application of mitigation measures. They can be characterized based on their geographic extent, duration, frequency, reversibility and magnitude as outlined in Table 2.

Table 2 Residual Impacts Rating Criteria

CRITERIA	RATING TERM	DEFINITION
Magnitude	Negligible	No measurable impacts.
	Small	Impact likely to result in less than 1% change in regional resource.
	Medium	Impact likely to result in 1% to 10 % change in regional resource.
	Large	Impact likely to result in more than 10% change in regional resource.
Geographic Extent	Local	Effect is limited to the footprint of the Project site and immediate surrounding area.
	Regional	Effect is limited to the Regional Study Area of the VEC.
Frequency	Rarely	Less than once per year.
	Intermittent	Less than once per week.
	Daily	Greater than once a day.
Duration	Short-Term	Effects only occur during construction, decommissioning, or as an isolated event during the operation and maintenance phase.
	Medium-Term	Effect lasts for the duration of the Project, or during operation.
	Long-Term	Effect occurs for an undetermined time beyond Project decommissioning.
Reversibility	Reversible	Effect is reversed after the activity ceases.
	Partially-Reversible	Effect is partially reversed after the activity ceases.
	Non-Reversible	Effect will not be reversed when activity ceases.

4.2.2 Significance of Residual Environmental Effects

Assigning residual impact significance is required to determine if a project has the potential to result in an adverse impact after implementing mitigation measures. A clear determination is made regarding whether or not the residual environmental effect is significant.

A rating system for describing the significance of adverse environmental effects was chosen, as presented in Table 3.

Table 3 Rating System for the Significance of Identified Adverse Environmental Effects

RATING TERM	DEFINITION
High	Potential impact could threaten sustainability of the resources and should be considered a management concern. Research, monitoring and / or recovery initiative should be considered.
Medium	Potential impact could result in a decline in resource to lower-than-baseline, but stable levels in a study area after Project closure and into the foreseeable future. Regional management actions such as research, monitoring, monitoring and/or recovery initiatives may be required.
Low	Potential impact may result in slight decline in resource in study area during the life of the Project. Research, monitoring and /or recovery initiatives would not normally be required.
Minimal	Potential impact may result in slight decline in resource in study are during the construction and decommissioning phase, but the resource should return to baseline levels.

4.3 PROJECT-ENVIRONMENT INTERACTIONS AND VALUED ENVIRONMENTAL COMPONENTS (VECS)

Project pathways are determined by the assessor, based on experience and a firm understanding of the proposed Project. Understanding the pathways allows identification of possible impacts on environmental receptors (VECs). Interactions are described in the following sections for pathways which occur in the construction and operations phases.

Construction Phase

The construction phase can potentially affect a broad range of VECs. While the construction phase of the Project is generally short term in duration, impacts to VECs can be long term. The potential Project – VEC interactions are shown in Table 4.

Operations Phase

Once the construction phase of the Project is complete, the operations and maintenance phase will begin. Impacts in this phase are typically longer in duration than in the construction phase. The potential Project – VEC interactions are shown in Table 4.

Table 4 Summary of Valued Ecosystem Components and Interactions

PROJECT ACTIVITIES	VECS									
	BIO-PHYSICAL							SOCIO-ECONOMIC		
	AIR QUALITY	NOISE	VEGETATION, BIRDS AND OTHER WILDLIFE	SPECIES AT RISK	SURFACE WATER	GROUNWATER	SPECIES AT RISK	HERITAGE & ABORIGINAL RESOURCES	LAND USE	HUMAN HEALTH AND SAFETY
Construction Phase										
Site Preparation	X	X	X	X	X	X	X	X		X
Site Infrastructure	X	X	X		X	X		X		X
Accidents			X		X	X				X
Operations and Maintenance Phase										
Vehicle Transport		X		X			X			X
Site Maintenance										X
Accidents			X		X	X				X

5 POTENTIAL IMPACTS, MITIGATION AND MONITORING

5.1 Bio-Physical VECs

5.1.1 Air Quality

Potential Construction Impacts

There exists potential for negative air quality impacts due to emissions from construction equipment operating on-site during construction activities. Vehicle and equipment exhaust emissions are anticipated to result in a potentially minor decrease in air quality on the site and a negligible decrease in air quality off the site. The site is in a rural location and approximately 600 m to the nearest human receptor and is small in size. Therefore the impacts to human receptors are expected to be minimal. These negative impacts will be of short term duration, potentially occurring on a continuous basis during working hours of the construction period on a local scale.

Potential impacts to air quality may be caused due to airborne dust and particulates during construction activities from vehicle movement along site roads and from earthworks activities. Dust has the potential to negatively impact air quality with subsequent potential impacts to human health and flora (dust deposition). As the disturbed area will be kept to a minimum as much as possible with the construction occurring in stages, impacts to air quality due to airborne dust and particulates will be negative, negligible in magnitude, occurring intermittently over the short term on a local scale.

Mitigation Measures

To minimize the impacts to surface water from being impacted from construction activities, the following mitigation measures will be implemented:

- ▶ Use of water to reduce dust levels during dry and/or windy weather conditions;
- ▶ Maintain the equipment in good working condition;
- ▶ Idling of equipment and vehicles will be kept to a minimum;
- ▶ Restricting work during periods of high wind conditions;
- ▶ Controlling vehicle speed on the Project site to control dust;
- ▶ Re-vegetate exposed areas as soon as practical; and
- ▶ Cover stockpiled material or use dust suppression.

Potential Operational Impacts

During the operational phase of the Project there is potential for exhaust emissions from vehicles travelling around the site. Due to the Project site's location next to an operating C&D disposal facility, any impact is expected to be of short duration, local in nature and reversible. Therefore, impacts from exhaust emissions are anticipated to be negligible.

5.1.2 Noise

Potential Construction Impacts

Noise will be generated during the construction by the movement of vehicles and heavy equipment used on site.

Proposed Mitigation Measures

To minimize the impact to the wildlife during construction, the construction equipment will be kept in good operating condition. The anticipated noise due to construction is not expected to be greater than that already experienced at the existing adjacent C&D facility. Construction activities at the Project site will be limited to the daylight working hours (7:00 am – 6:00 pm). With the mitigation measures the impact is anticipated to be negligible.

Potential Operation and Maintenance Impacts

Noise from the normal operations of the site will be of short duration and not in excess of the noise related to the C&D facility operations currently experienced within the local area. The noise that is produced will be of short duration and minor in nature. Therefore, the impact is anticipated to be negligible during the operation phase.

5.1.3 Vegetation, Birds and Other Wildlife

Potential Construction Impacts

The clearing of vegetation along with the associated habitat removal required for the construction of the waste disposal cell is an example of an effect related to the construction activities. The elimination of forest vegetation may also create new forest edges that expose the remaining vegetation to increased noise, and dust.

Additionally, the invasive plant species Glassy buchthorn was identified on the site. The spread of this plant species should be prevented, especially to the surrounding agricultural land. The construction of the facility may include the following adverse impacts:

- ▶ Modification of wildlife habitat – the quality of the habitat could be reduced and the existing habitat could be fragmented due to construction activities. This may be the result of the removal of vegetation that may provide nesting habitat for birds and other wildlife as well as feeding areas;

- ▶ Wildlife susceptibility/mortality – the use of heavy machinery and additional traffic related to construction activities may increase the potential for human/wildlife interactions that may result in injury to local wildlife species; and
- ▶ Accidental release of fuels or other contaminants in the surrounding environments.

Proposed Mitigation Measures

To minimize the impacts to vegetation, wildlife and their respective habitats, and to protect the adjacent vegetation and habitat features from being impacted from construction activities, the following mitigation measures will be implemented:

- ▶ Implementation of the measures outlined in the NSE's Erosion and Sediment Control: Handbook for Construction Sites;
- ▶ Develop and implement a Project specific Erosion and Sediment Control Plan;
- ▶ Areas to be cleared and grubbed should be clearly marked to minimize the extent to be impacted as well as the areas to be utilized for stockpiling materials;
- ▶ Re-vegetation plans will be developed for areas disturbed during construction activities;
- ▶ All exposed areas will be re-established and re-vegetated as soon as possible after the completion of construction activities, using native vegetation and seed mixes;
- ▶ Minimizing the extent of disturbance for Project construction;
- ▶ All construction related debris will be appropriately contained during construction and disposed of at an approved facility;
- ▶ No petroleum product storage, maintenance or refueling is permitted within 30 m of a watercourse;
- ▶ Petroleum product spill cleanup materials will be kept on site during construction activities;
- ▶ Vegetation clearing and grubbing will be scheduled outside of the bird breeding season (May 1 – July 31);
- ▶ Clean fill will be stockpiled in site for cover material, and
- ▶ To prevent the spread of Glassy buckthorn a mitigation plan will be developed prior to site clearing and grubbing activities.

Potential Operational Impacts

Potential impacts to vegetation and associated habitat and wildlife as a result of operational activities include:

- ▶ Generation of runoff contaminants; and
- ▶ General wildlife disturbance from vehicle noise.

The main operation activities that may impact the surrounding environment include noise from the movement of vehicle traffic for the delivery of waste material or placement of daily cover.

These impacts are normally predictable, temporary and limited in the extent, and therefore can be managed through the implementation of standard construction related mitigation measures. Wildlife within the local area will avoid the new Project site during the operational phase. Some of the wildlife will adapt to the new environment created from the construction of the Project structures and grounds.

5.1.4 Species at Risk

Potential Construction Impacts

There is a low potential for the presence of Species at risk on the Project site during construction. The impact to any Species at Risk relates to the clearing of the land during construction and subsequent injury due to interactions of the species with vehicles and equipment moving around the construction site.

Mitigation Measures

To minimize the impacts to Species at Risk from being impacted from construction activities, the following mitigation measures will be implemented:

- ▶ All work activities in the area shall be stopped.
- ▶ The potential area of the disturbance shall be marked to prevent any further disturbance.
- ▶ No further work will be conducted within the area until an appropriate mitigation plan has been prepared and implemented.

Potential Operational Impacts

While small, there will remain the potential for interactions between Species at Risk on the Project site during normal operations and vehicles as they move around within their normal habitat. Care will be taken by all vehicles travelling on the facility roads and parking areas to prevent vehicle collisions or destruction of Species at Risk. As no Species at Risk were noted during the field surveys and the small area to be impacted by the Project, the potential for such interactions is low, and therefore, there is not anticipated to be a significant impact.

5.1.5 Surface Water

Potential Construction Impacts

During the construction activities stormwater containing sediment or silt has the potential to travel off the site, especially during rain events. Erosion from exposed soils during clearing activities or stockpiled material may be transferred from the site and enter the drainage ditch surrounding the site. There is, however, no watercourse running through or adjacent to the

Project site. The potential for sediment to leave the site is only anticipated after significant rain events.

Spills may result in petroleum, oil and lubricants (POL) and other contaminants leaving the Project site.

Mitigation Measures

To minimize the impacts to surface water from being impacted from construction activities, the following mitigation measures will be implemented:

- ▶ Direct all clean water away from the working areas and exposed soils;
- ▶ Store all petroleum, oils and lubricants and chemicals in accordance with all provincial regulations;
- ▶ Refuel and maintain construction machinery only in designated areas and refuel more than 30 m from any watercourse drainage swales;
- ▶ Place silt fencing adjacent to slopes without sod or seed/mulch;
- ▶ Install silt fencing, rock check dams and other necessary sedimentary control measures in ditches where required in accordance with the NSE's *Erosion and Sediment Control: Handbook for Construction Sites*;
- ▶ Undertake regular maintenance of ditches and other erosion and sediment control measures to minimize sediment build-up; and
- ▶ Maintain an emergency spill kit on site during construction activities.
- ▶ Stockpiled material will be stored in an area and surrounded by silt fence to prevent any sediment containing runoff from entering the perimeter drainage channels.

Potential Operational Impacts

The surface flow patterns will change from the baseline conditions. Stormwater from the site will be collected by a site stormwater drainage system that will be connected to stormwater pond servicing the adjacent C&D facility. Minimal surface water is anticipated to leave the site during normal site operations. Details on the Project site stormwater management will be included in the final site design.

There is the potential for erosion of stockpiled cover material for the asbestos waste after each delivery event. Additionally, spills from vehicles operated on the site may result in petroleum, oil and lubricants (POL) and other contaminants at the Project site

Mitigation Measures

The daily operations will include the movement of vehicles throughout the site which may result in spills or leakage of POL or other chemicals that may enter the surrounding watercourse. Surface water will be directed and collected by a new stormwater collection system for the Project site and connected to the existing C&D facility system. Site stormwater plans will be developed during the site final design. Mitigation measures as outlined for the construction activities will also be instituted during the operational phase of the Project.

5.1.6 Groundwater

There are no impacts anticipated to groundwater resources due to construction or operational activities due to the construction methods of the asbestos waste cells and location of receptors to the site.

5.1.7 Land Use

The Project site is within land leased by the proponent for use as a C&D facility. As the proposed Project is an expansion of the adjacent existing C&D facility operations, no significant impacts on local land use are anticipated. Therefore there is no adverse effect anticipated from the Project on land use.

5.1.8 Heritage and Aboriginal Resources

Potential Construction Impacts

During the course of the clearing and excavation activities, artifacts and archaeological resources may be encountered. The archaeological assessment of the site indicated that there is a low potential for both archaeological and First Nations resources on the Project site. To date no First Nations or other archaeological resource has been discovered during the C&D facility operations.

Proposed Mitigation Measures

In the event that a heritage, archaeological resource or First Nations resource be uncovered during construction activities, the following mitigation measures shall be implemented:

- All work activities in the area shall be stopped;
- The potential area of the find shall be marked to prevent any further disturbance;
- Contact the Coordinator of Special Places, Ms. Laura Bennett (902-424-6475), notify of the discovery and establish a suitable mitigation method; and
- No further work at the site will be permitted until approval to proceed has been given by the Nova Scotia Museum.

Potential Operation and Maintenance Impacts

During the normal operations at the Project site, there are not anticipated to be any activities to result in disturbance to heritage, archaeological or First Nations artifacts. However, should such an artifact be discovered during the operation and maintenance activities on the Project site, the same mitigation measures used during the construction phase shall be implemented.

5.1.9 Human Health and Safety

Potential Construction Impacts

During the course of the clearing and excavation activities, dust and noise will be generated by the heavy machinery during cell construction. The site is in a rural location and approximately 600 m to the nearest human receptor and is small in size. Therefore the impacts to human receptors are expected to be minimal. These negative impacts will be of short term duration, potentially occurring on a continuous basis during working hours of the construction period on a local scale. As the disturbed area will be kept to a minimum as much as possible with the construction occurring in stages, and the operation will occur during daylight hours the potential impacts will be negative, negligible in magnitude, occurring intermittently over the short term and on a local scale.

Proposed Mitigation Measures

The proposed mitigation measures to protect human health are the same as those for both Air Quality (Section 5.1.1) and Noise (Section 5.1.2).

Potential Operational Impacts

During the operational phase of the Project there is potential for exhaust emissions and noise from vehicles travelling around the site. Due to the Project site's location next to an operating C&D disposal facility, any impact is expected to be of short duration, local in nature and reversible. Therefore, impacts from both the exhaust emissions and noise are anticipated to be negligible.

There is the potential for the breakage of containers/packaging containing asbestos waste being delivered to the site. Contingency measures to address such a situation have been included in the Operation Manual and Contingency Plan (Appendix 8).

All staff will be trained to meet the requirements of the *Asbestos Waste Management Regulations* and the NS Occupational Health and Safety regulations.

5.2 Summary of Impact Assessment and Mitigation Measures

As detailed in the previous sections, the proposed Project for the construction of the asbestos waste management site will result in some bio-physical and socio-economic impacts during

construction and during the operation of the Project site. Table 5 summarizes the potential environmental issues associated with the Project, identifies the potential impacts during construction and recommends mitigation measures to minimize these potential impacts and summarizes the significance of the impacts after mitigation.

Table 5 Summary of Impacts and Mitigation on Valued Ecosystem Components

VEC	PROJECT ACTIVITY	POTENTIAL IMPACT	MITIGATION	SIGNIFICANCE AFTER MITIGATION
Air Quality – Dust and Noise	<ul style="list-style-type: none"> - Clearing and grubbing of the site - Excavation for site services - Construction of waste cells 	<ul style="list-style-type: none"> - Generation of dust and exhaust emissions disturbing the natural environment and local residents 	<ul style="list-style-type: none"> Use of a stabilized entrance/exit with crushed rock to reduce the tracking of mud and dirt on to public roads by construction vehicles Use of water to reduce dust levels during dry and/or windy weather conditions Maintain the equipment in good working condition Idling of equipment and vehicles will be kept to a minimum Restricting work during periods of high wind conditions Controlling vehicle speed on the Project site to control dust Re-vegetate exposed areas as soon as practical Cover stockpiled material or use dust suppression Limit site work to daylight hours Maintain equipment in good working condition 	Minimum, Not Significant
Surface Water	<ul style="list-style-type: none"> - Clearing and grubbing of the site - Excavation for waste cells 	<ul style="list-style-type: none"> - Erosion and sediment from exposed soil during construction - Accidental spills into adjacent drainage ditches 	<ul style="list-style-type: none"> Direct all clean water away from the working areas and exposed soils. Store all petroleum, oils and lubricants (POL) and chemicals in accordance with all provincial regulations Refuel and maintain construction machinery only in designated areas and refuel more than 30 m from any watercourse or drainage swale Place silt fencing adjacent to slopes without sod or seed/mulch Install silt fencing, rock check dams and other necessary sedimentary control measures in ditches where required in accordance with the NSE's <i>Erosion and Sediment Control: Handbook for Construction Sites</i> Undertake regular maintenance of ditches and other erosion and sediment control measures to minimize sediment build-up Maintain an emergency spill kit on site during construction activities 	Minimal, Not Significant

VEC	PROJECT ACTIVITY	POTENTIAL IMPACT	MITIGATION	SIGNIFICANCE AFTER MITIGATION
Vegetation	<ul style="list-style-type: none"> - Modification of vegetation habitat from clearing and grubbing activities - Clearing and damage to vegetation beyond the Project site - Dust from construction activities settling on vegetation 	<ul style="list-style-type: none"> - loss of vegetation species - loss of vegetative habitat 	<p>Implementation of the measures outlined in the NSE's <i>Erosion and Sediment Control: Handbook for Construction Sites</i>;</p> <p>Develop and implement a Project specific Erosion and Sediment control plan</p> <p>Areas to be cleared and grubbed should be clearly marked to minimize the area to be impacted as well as the areas to be utilized for stockpiling materials</p> <p>Re-vegetation plans will be developed for areas disturbed during construction activities</p> <p>All exposed areas will be re-established and re-vegetated as soon as possible after the completion of construction activities, using native vegetation and seed mixes</p> <p>Minimizing the extent of disturbance for Project construction</p>	Low, Not Significant
Wildlife	<ul style="list-style-type: none"> - Modification of wildlife habitat from clearing and grubbing activities - Noise from vehicles moving around the site 	<ul style="list-style-type: none"> - modification of wildlife habitat - restriction of wildlife movement -increased potential for wildlife mortality due to movement of vehicles and equipment during construction - Disturbance of birds in the construction site 	<p>All construction related debris will be appropriately contained during construction and disposed of at an approved facility</p> <p>No petroleum product storage, maintenance or refueling is permitted within 30 m of a watercourse.</p> <p>Petroleum product spill cleanup materials will be kept on site during construction activities</p> <p>Vegetation clearing and grubbing activities will be scheduled outside of the bird breeding season (May 1 – July 31)</p> <p>If clearing is required within the breeding season, a nest survey will be conducted on the site by a trained biologist in the identification of birds and nests and eggs as well as assess and develop appropriate mitigation measures to address the presence of migratory birds during construction.</p>	Low, Not Significant
Species at Risk	<ul style="list-style-type: none"> - Modification of habitat from clearing and grubbing activities 	<ul style="list-style-type: none"> - disturbance to terrestrial species at risk and/or their habitat 	<p>All work activities in the area shall be stopped</p> <p>The potential area of the disturbance shall be marked to prevent any further disturbance</p>	Minimal, Not Significant

VEC	PROJECT ACTIVITY	POTENTIAL IMPACT	MITIGATION	SIGNIFICANCE AFTER MITIGATION
	- Noise from vehicles moving around the site		No further work at the site will be permitted until an appropriate mitigation plan has been prepared and implemented.	
Heritage Resources	- Clearing and grubbing - Excavation	- Unearth archaeological resources during construction activities	All work activities in the area shall be stopped The potential area of the find shall be marked to prevent any further disturbance Contact the Coordinator of Special Places, Ms. Laura Bennett (902-424-6475), notify of the discovery and establish a suitable mitigation method. No further work at the site will be permitted until approval to proceed has been given by the Nova Scotia Museum	Low, Not Significant
Aboriginal Resources	- Clearing and grubbing - Excavation	- Unearth aboriginal resources during construction activities	All work activities in the area shall be stopped The potential area of the find shall be marked to prevent any further disturbance Contact the Coordinator of Special Places, Ms. Laura Bennett (902-424-6475), notify of the discovery and establish a suitable mitigation method.No further work at the site will be permitted until approval to proceed has been given by the Nova Scotia Museum	Low, Not Significant
Human Health and Safety	- Clearing and grubbing of the site - Excavation for site services - Construction of waste cells	- Generation of dust and exhaust emissions disturbing the natural environment and local residents - Noise during the movement of vehicles around the site	Use of a stabilized entrance/exit with crushed rock to reduce the tracking of mud and dirt on to public roads by construction vehicles Use of water to reduce dust levels during dry and/or windy weather conditions Maintain the equipment in good working condition Idling of equipment and vehicles will be kept to a minimum Restricting work during periods of high wind conditions Controlling vehicle speed on the Project site to control dust Re-vegetate exposed areas as soon as practical Cover stockpiled material or use dust suppression Limit site work to daylight hours	Minimum, Not Significant

VEC	PROJECT ACTIVITY	POTENTIAL IMPACT	MITIGATION	SIGNIFICANCE AFTER MITIGATION
			Maintain equipment in good working condition	

6 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

The environment can have an impact during both the construction and operational phases of the Project. Heavy rain events during construction can result in the release of sediment from the site into the nearby stormwater collection system. To accommodate heavy rainfall during the operational phase, the design of the stormwater collection system will take into account the impact of climate change and the resultant increased frequency and intensity of rain events.

The increased occurrence of heavy wind or snowfall events can also impact the construction phase of the Project. Design and construction considerations for these events will be considered for the facilities.

7 ACCIDENTS AND MALFUNCTIONS

Even though there will be measures implemented at the Project site to protect the environment, there is still the potential for accidents and malfunctions to occur during the construction and operation phases of the Project. These are unplanned events that may result in a release to the environment and result in impacts to the environment.

Specific accidents and malfunctions that have a reasonable probability of occurring during the Project are summarized below. These scenarios are not a comprehensive list but address those incidents that have a reasonable probability of occurring.

The accidents and malfunctions that have been identified and assessed for both the construction and operation phases of the Project are accidental spills from the operation of heavy equipment and vehicles and interaction between vehicles with local residents and wildlife.

7.1 Spills

Petroleum, Oil and Lubricant (POL)

During the construction phase no unusual accidents or malfunctions are anticipated other than those that are typically experienced during general civil construction. However there is the potential for petroleum, oil and lubricant (POL) or other chemical spills from the heavy equipment used during construction. A spill of POLs or other chemicals into the water will generally occur from the improper handling of the materials, an accident or from heavy equipment that is not kept in proper working order. The impact of these materials during such an event is dependent on the type of material and its volume released. Minor spills will typically be cleaned up efficiently and effectively and long-term impacts are not anticipated. Major spills are not anticipated based on quantities anticipated to be on site during construction.

An Environmental Protection Plan that includes a Spill Contingency Plan for clean-up procedures for various substances anticipated to be on site during the construction and operations activities has been developed (Section 5.3.2(4) in Appendix 7). Additionally, any fuelling of heavy equipment will be conducted at a minimum distance of 30 m from any drainage swale.

Spills and leaks during the operation phase of the Project will occur from vehicles travelling around the site. Minor spills may be dealt with by the facility maintenance staff for containing any spill and preventing it from entering the stormwater collection system. Major spills will be dealt with by the local fire department in accordance with the operating procedures.

Asbestos Containing Material

The asbestos is to be transported to the site as per the NSE regulations. However, during the course of placement of the waste material within the disposal site there is the potential for asbestos containing material to be released through either a leak in the shipping container or due to a breakage of the container. The Contingency Plan prepared for the site (Appendix 7) outlines the requirements for the site and materials to be on hand in the event of a release of spill of asbestos containing material.

The personnel at the Project site will have the following available to them for the disposal and in the event of an asbestos release (Appendix 7):

- ▶ A personal respirator is required for anyone handling the asbestos or involved in repair or repackaging of any damaged asbestos containers. A personal respirator is required for anyone with in the immediate area of the asbestos transfer to the disposal site.
- ▶ Any person in the immediate area or handling asbestos containers is required to wear protective clothing, adequate to protect from any harmful effects which asbestos waste may have on human life or health.
- ▶ A supply of a wetting agent is used to reduce airborne asbestos particles. No person shall handle asbestos material, unless it is completely wetted.
- ▶ A broom and shovel to ensure that if any of the asbestos has spilled from its container that it will be completely cleaned up and properly repackaged.
- ▶ A supply of plastic bags having a thickness of not less than 6 mil, which are used to repackage any damaged asbestos containers.

7.2 Transportation

During the course of the early construction activities, there will be several pieces of heavy equipment moving material around the site as well as performing the construction activities. The potential for accidents is not anticipated to increase above that already experienced at the C&D site once the initial asbestos waste cell is constructed. The potential for such transportation incidents will decrease during the operational phase due to the reduced amount of equipment and vehicles travelling around the Project site. The delivery of asbestos waste will not be on a continuous basis but on an as needed basis based on the activities of Verhagen Enterprises at any time.

The potential for construction phase accidents will be reduced through the implementation of weekly tool box meetings for civil construction personnel and assignment of a foreman to supervise vehicle routes through the site. The potential for construction and operation phase transportation accidents will be reduced through the incorporation of road design features such as speed limits and directional signage.

7.3 Contingency Plan

Verhagen Enterprises has had an Operations Manual and Contingency Plan prepared by MEC Engineering and Construction Services of Truro, NS (Appendix 8). In Section 5.3.2 of the Contingency Plan a list of Events and Responses are listed and include the following:

- ▶ Personal Injury;
- ▶ Fire;
- ▶ Explosion;
- ▶ Oil Spills;
- ▶ Discovery of Potential Hazardous Unacceptable Waste On-Site; and
- ▶ Attempted Delivery of Unacceptable or Hazardous Waste.

Each of the events has a contingency plan outlined within the document that is to be implemented in the instance the event occurs.

8 ENVIRONMENTAL MONITORING

A monitoring program currently exists for both surface water and groundwater at the C&D facility. This program will continue to be used and form part of the overall monitoring plan for the Asbestos Waste Management Site. An additional surface water monitoring location may be included to monitor the surface water leaving the site and being discharged into the C&D facility stormwater system.

The C&D facility's surface water and groundwater monitoring program is conducted and reported on a quarterly basis. The monitoring program includes six groundwater wells and three surface water sampling locations. This will be expanded to include monitoring locations for the Asbestos Waste Management Site as part of its operating approval requirements. A copy of the annual 2012 Water Quality monitoring report is included in Appendix 5.

9 CONSULTATION

9.1 Public and Aboriginal Consultation

No public consultation has been undertaken outside of the legislated comment period during the EA process. Due to the location of the site and the findings in the Archaeological Assessment (Davis 2012), the site has a low impact to the public and potential for impact to Aboriginal Resources.

10 REFERENCES

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W.G. Shaw & Associates Ltd. 2012. Walkerville C&D Waste Management Facility, Pictou County Quarterly Report for Fall of 2012. Prepared for Marinus Verhagen Enterprises Ltd.

**Appendix 1 Asbestos Waste
Shipping
Document**

Appendix 2 Botanical Survey

**Appendix 3 Habitat and
Vertebrate
Wildlife Report**

**Appendix 4 Atlantic Canada
Conservation
Data Centre
Report**

Appendix 5 **Water Quality
Report**

**Appendix 6 Geotechnical
Investigation**

**Appendix 7 Archaeological
Resource Impact
Assessment**

**Appendix 8 Operations
 Manual &
 Contingency
 Plan**