IMPACT ASSESSMENT ACT - SIGNIFICANCE OF ENVIRONMENTAL EFFECTS DETERMINATION (SEED) FORM
NON-BASIC PROJECT

The purpose of this form is to summarize and document the significant adverse environmental effects of a project as per s.82 of the *Impact Assessment Act* (IAA). Consult the Basic/Non-Basic Project Requirements (s 3.6 of Departmental Procedure) for details and follow the SEED Guidelines (Entry Instructions & Linkages to PATH Record Keeping and IAA Registry). All completed and signed SEED documents shall be uploaded to PATH and the SCHED drive.

GENERAL INFORMATION

1. Project Title: Dredge Material Management Site, Sandy Cove, Digby County, Nova Scotia	
2. Proponent: Fisheries and Oceans Canada – Small Craft Harbours (DFO-SCH)	
3. Other Contacts: Public Services and Procurement Canada (PSPC) Scott Burley, Environmental Services 1713 Bedford Row, Halifax, NS B3J 3C9 (902) 237-5392 scott.burley@pwgsc-tpsgc.gc.ca	**4. Role of each contact:** ODG Consultant
5. Source (Contact): Steve Deveau – Senior Project Engineer, DFO-SCH	
6. Received Date: January 25, 2022	
7. PATH No(s).: NA	**8. DFO File No:** NA
9. EKME File No.: NA	**10. Canadian Impact Assessment Registry Reference No.:** 83276

PROJECT DESCRIPTION AND JUSTIFICATION

11. Project Location:

The proposed project is sited on 2 parcels of federally owned properties (PID 30269542 and the recently purchased PID 30163331). The properties are located to the northeast of Sandy Cove, Nova Scotia (NS), along the shore of St. Mary's Bay. The project site, Fisheries and Oceans Canada – Small Craft Harbours (DFO-SCH) Property No. 27952 under the Directory of Federal Real Property (DFRP), has a combined property size of 14.41 hectares (ha), which is accessible via a gravel road known as Old Post Road; also known as Old Route 217 Loop. Coordinates listed for DFRP 27952 are 44.492200, -66.068600 (Treasury Board of Canada Secretariat, 2022). The property lies within close proximity to four DFO-SCHs on the Digby Neck: 12 kilometers (km) from Centreville SCH; 13 km from East Ferry SCH; 9 km from Little River SCH; and 1.5 km from Sandy Cove East SCH (**Figure 1** and **Figure 2 in Appendix A)**.

12. Project Summary:

DFO-SCH proposes to undertake the development of a dredge material management site (DMMS) intended for use as a long-term storage of sediment dredged primarily from the Centreville SCH (Harbour Code 1051). Options for reuse of this dredge material will be explored such that a portion of the material may be stored onsite temporarily; however, it is anticipated that the majority of the material will be managed onsite over the long-term. Being in close proximity to other SCHs on the Digby Neck, the DMMS may provide an option for the storage and management of sediments from dredging projects at the following locations as well: Sandy Cove East SCH, Little River SCH and East Ferry SCH.

Site works within the project site boundaries will include the construction of an access road that will facilitate the transportation of dredge material from the harbours to the selected location designed to store the material **(Figure 3, Appendix A**). Dredge material will be managed within the containment area constructed on site. A treed buffer will be retained around the containment area, as well as along the adjacent property boundaries, that will minimize the view from nearby properties, as well as from Old Post Road, and will aid in the control of surface water run-off.

Soil at the DMMS will be reworked to create berms and ditches that will contain the dredge material and control surface water run-off. The materials brought to the site will primarily be managed and stored there permanently. However, options for repurposing of materials (e.g., construction material, septic beds) will be explored and implemented, if chemically acceptable and when deemed as a viable option. A site management and monitoring program will be developed to incorporate appropriate mitigation measures that will address potential impacts to the surrounding environment and provide

details on the proper handling and storage of the dredge material to avoid adverse off-site impacts. A sampling plan will be undertaken to validate the predictions of this Impact Assessment and ensure that mitigations are functioning as intended to avoid adverse off-Site impacts.

13. Review of Alternatives:

Several alternative disposal options were assessed based on environmental, technical, and economical factors when determining the preferred alternative for managing dredged sediment resulting from maintenance dredging at SCHs located on Digby Neck. These included:

- Disposal on private property - Historically, dredged sediment from Centreville and other local harbours has been transported and disposed on various private properties located in close proximity to the harbours. In NS, DFO is subject to provincial regulations and standards established in 2013 / 2014 with regards to disposal of dredge materials from harbour basins and channels that no longer permits disposal on private lands. As such, this option is no longer available as it does not adhere to provincial legislation.
- Disposal at sea - Disposal at sea (DAS) is regulated by Environment and Climate Change Canada (ECCC) under Schedule 6 of the *Canadian Environmental Protection Act* (CEPA), 1999. To be suitable for DAS and in adherence with permit conditions, the material must meet specific criteria with regards to physical and chemical properties, which is verified through periodic sampling and analytical testing. Sample results have indicated that the physical and chemical composition of sediment may not meet permit criteria, and costs associated with obtaining the required permits are prohibitive given the relatively small dredge volumes. Therefore, disposal at sea is not a viable option for the material resulting from maintenance dredging at the nearby SCH.
- Alternative properties were considered during selection of the proposed dredge material management site. The site in Sandy Cove, however, was selected for its centralized location within Digby Neck, availability for purchase, location along the coast, and being topographically downgradient from residential properties.

Establishing a dredge material management site on the property located in Sandy Cove, Digby County, NS was determined to be the most preferred option to manage dredged sediment resulting from maintenance dredging at SCH located on Digby Neck. This option would result in relatively shorter trucking distances providing environmental benefits related to reduced greenhouse gas, reduced noise and dust emissions as well as economic benefits of reduced trucking costs. The site will also provide flexibility in terms of providing a management option of dredge material to accommodate dredging in time sensitive periods (e.g., following a storm) where access to the harbours may be impeded by accumulated sediment and would require immediate dredging.

PROJECT REVIEW

14. Rationale for the Application of Section 82 of IAA:

Project is on federal land and;

☒ DFO-CCG is proposing the project, as the proponent

☐ DFO-CCG is proposing to issue *Fisheries Act* Authorization, *Species at Risk Act* Permit, or other regulatory approval

☐ DFO-CCG is proposing to provide financial assistance to another party to enable the project to proceed

☐ DFO-CCG is proposing to grant a license or interest in federal land to enable the project to proceed

☐ Other

15. Primary Authority and Rationale for Involvement:

DFO-SCH is the proponent.

16. Other Authorities and Rationale for Involvement:

Not applicable

17. Other Contacts and Nature of Response:

Nova Scotia Department of Environment - Project notification sent via email on February 22, 2022.

- No response has been received to date.

Nova Scotia Department of Lands and Forestry - Project notification sent via email on February 22, 2022.

- No response has been received to date.

ECCC - Project notification sent via email on February 22, 2022.

- Received a response via email from Maryam Fazeli on March 16, 2022, providing information and recommended mitigation measures to ensure the project meets applicable Acts and regulations under ECCC mandate. Information provided by ECCC has been considered and incorporated in this assessment and applicable mitigation measures have been included in Section 25 below.

18. Nature of Project:

☐ Building and Property Development
☐ Mines and Minerals
☒ Ports and Harbours
☐ Oil and Gas
☐ Highways and Roads
☐ Water Management
☐ Recreation and Tourism
☐ Remediation and conservation
☐ Maintenance Activities (fences, walls)
☐ Nuclear Energy
☐ Bridges
☐ Waste Management
☐ Agriculture
☐ Forestry
☐ Airport and Airfields
☐ Dams and Reservoirs
☐ Railways
☐ Hydroelectric Energy
☐ Alternative Energy
☐ Other, not otherwise specified

19. Scope of Project and the Assessment (details of the project subject to review):

Project Description

DFO-SCH proposes to develop a DMMS intended to receive, store, and manage sediment material resulting from maintenance dredging activities conducted at Centreville SCH, and potentially other nearby SCH properties located along the Digby Neck, NS. The proposed project will involve the construction of a dredge material containment area on a portion of property owned by DFO-SCH, located on Old Post Road (Route 217) in Sandy Cove, Digby County, NS. This property, PID 30269542, has a total area of 11.47 ha bordering St. Mary's Bay. An adjacent property has recently been purchased, PID 30163331, to add another 2.94 ha to the current DFO-SCH DFRP No. 27952 for a combined property size of 14.41 ha on which to site the proposed project (**Figure 3, Appendix A**).

Transportation of Materials and Equipment

The project will require the transportation of materials, workers, and equipment to the federal property at Sandy Cove during the construction and operation of the DMMS. This will be accomplished using a variety of vehicles, such as haul trucks of various sizes; heavy equipment, such as excavators; and light vehicles such as pick-up trucks and cars travelling along Highways 1, 101, 217, 303 and 340. Trucking of dredged material at the DMMS property will be of a relatively low frequency (once every 2 to 3 years) therefore the majority of the time the site will be inactive with traffic increasing only during brief times of activity. On average, dredging activities would require approximately 80 truckloads over a 2 to 3 week period at an anticipated frequency of every 2 to 3 years. During larger dredge projects, this time frame may increase to 4 to 6 weeks, depending on the actual quantity.

DMMS Construction

Site works will involve the following three phases:

1) Site Clearing: Vegetation clearing will be conducted within the DMMS construction footprint and along the access road using chain saws, harvesting equipment and a bulldozer. The total cleared area will be approximately 18,555 m^2. Merchantable timber will be removed from the site and remaining woody material will be chipped and spread on the ground. Clearing will be conducted during the fall and winter, to avoid impacts on breeding birds. Grubbing of smaller woody material will take place in portions of the containment area and along the access road to prepare the ground for earthworks. Topsoil will be stockpiled separately for reuse in site restoration. Should disturbed ground be left for an extended period before construction, the area will be covered with mulch to reduce erosion risk. The site manager will monitor site runoff and identify any potential sources of sediment laden runoff leaving the site. These could include any road ditching or along the toe of any stockpiles or disturbed areas. Appropriate temporary sedimentation controls will be used as needed (e.g., silt fence). All machinery will be kept in good working order and appropriate spill response equipment will be present onsite during activity. Waste containers (e.g., oil jugs) and other trash generated by the work crews will be collected and removed from site for appropriate disposal.

2) Construction of Access Road: A new access road will be constructed within the property from Old Post Road to the dredge material containment area. Improvements to Old Post Road will also be completed to facilitate transportation of the material to the proposed site, including brush removal to widen site lines, grading and hardening of the road surface, as needed, and may require upgrading of cross-drain culverts to accommodate heavier vehicles. The total footprint of the new access road, including the drainage ditch is approximately 3,120 m^2 (16 m wide by 196 m long). The road will have a top surface 4 m wide and will be composed of competent material imported to site. A turning area will be constructed at the end of the access road located within the containment area from which the trucks will end dump the material. A drainage ditch will be installed on the upgradient side of the road to intercept slope run-off and direct clean site drainage downgradient to a vegetated area. The drainage ditch will include erosion/sedimentation control measures as needed, such as check-dams located at the recommended interval based on slope steepness. The road will have posted signage during operation and a gate to control access and prevent illegal dumping. Excess topsoil and overburden will be stockpiled separately for reuse elsewhere during site construction. All excess topsoil that will remain after construction will be conserved for use in site restoration.

3) Construction of Containment Area: The containment area constructed to manage the material that goes to the site will be a total of 12,495 m^2 in size, with a total length of $\pm$ 147 m and width of $\pm$ 85 m (including access road). Minor earthworks will be undertaken to create berms and ditches that will contain the dredge material and control surface water runoff. The containment area will be divided into two parts, with the north area having a low permeability geosynthetic liner installed underneath the containment area and earthen embankments along the west, east, and north sides. The southern portion of the containment area will be situated on natural soil to the south of the northern containment area with an earthen containment embankment extending along the west side. The access road is designed for delivery to both areas simultaneously. Containment berms will be approximately 2 m wide, composed of local overburden and possibly supplemented with imported material as needed. The embankment crest elevation will vary with topography around the containment area perimeter.

The north containment area (No.1) will be used to store fine material such as sands, silts and clays. This cell will be lined with a low permeability geosynthetic liner, approximately 610 mm thick. The dimensions of the lined containment area are approximately 2,197 m^2 (approximate length ± 56 m and width ± 40 m). Construction will involve excavating to remove the overburden material down to bedrock (typically about 0.5 m depth at this site), using the excavated material to construct the containment berms located along the east, west and north sides of the cell. Additional material may be trucked in as required to achieve desired berm height. The bottom of the cell will be prepped and a drainage blanket (i.e. permeable layer of rock/gravel) will be installed at the base of the berm in the northeast corner of the lined cell to allow water to drain from the cell into the ditching system along the access road. A culvert will be installed under the access road along the east side of the lined section of the cell to allow water to flow into vegetated areas downgradient.

The south containment area (No. 2) will be used to store larger rock material. Vegetation in this area will be cleared but not grubbed to aid in reducing sedimentation in any runoff. No impermeable liner is required for this material, and only a single containment berm is needed along the west side of the cell. Sediment control measures such as silt fencing will be utilized around the perimeter of this area to further control site runoff.

An additional cleared area along the east edge of the site about 20 m wide will be used for temporary laydown and stockpile management. Only DFO staff and authorized workers will be permitted to access the site.

Operation / Maintenance

The proposed property is intended for use as long-term storage of sediment primarily originating from the Centreville SCH located in Trout Cove. The site may, however, receive material from other surrounding SCHs such as Sandy Cove East, Little River and East Ferry based on site-specific dredging requirements. The materials brought to the site will primarily be managed and stored there permanently. However, options for repurposing of materials (e.g., construction material, septic beds) will be explored and implemented, if chemically acceptable and when deemed as a viable option.

The Centreville SCH is typically dredged every 5 - 10 years and a small quantity is dredged from Little River SCH every 2 - 3 years. The Sandy Cove DMMS will therefore be inactive most of the time. Sandy Cove East and East Ferry are dredged on an as-needed basis at longer intervals. The number of trucks per dredge event from Centreville and Little River would range, depending on the actual dredge quantities and the size of the haul trucks. On average approximately 500 - 600 cubic metres (m^3) of material are dredged per event, which would typically require approximately 80 truckloads over a 2 - 3 week period at an anticipated frequency of every 2 - 3 years. During larger dredge projects, this time frame may increase to 4 - 6 weeks, depending on the actual quantity. These events, however, would occur at a much lower frequency (on average every 10 years or more).

The site will be designed to receive material from multiple dredging events while the harbours in the area remain in operation. Transportation of material to the site will use existing highways and roads leading from the harbours to the proposed site including Route 217, Sandy Cove Road, and Old Post Road (a gravel extension of Route 217). During this time, heavy equipment, such as excavators and haul trucks, will be used to move material on the site to allow room for more material to be added to the containment cell during subsequent dredge cycles.

Prior to the operation of the DMMS, a site management and monitoring plan will be developed to identify appropriate mitigation measures that will address potential impacts to the surrounding environment and provide details on the proper handling and storage of the dredge material to avoid adverse off-site impacts. Part of this program will include collecting groundwater samples for chemical analysis from 8 recently-installed monitoring wells located downgradient from the DMMS to the west, north, and east (locations identified on the attached Conceptual Design Plan figure).

Abandonment / Decommissioning

There is currently no plan to decommission or abandon the Sandy Cove DMMS. The very nature of the proposed project is intended to ensure the viability and safety of the nearby SCHs, primarily for commercial fisheries and navigation.

If for any reason the site must be decommissioned, at the time of decommissioning, DFO-SCH will develop a site-specific re-use or reclamation plan that will be appropriate for the applicable environmental legislation and DFO policies. The decommissioning of facilities would undergo separate impact assessment and legislative reviews as a future stand-alone project.

Environmental effects resulting from the abandonment or decommissioning of the proposed physical works are not considered further in this assessment.

Accidents and Malfunctions

Accidents and malfunctions have the potential to occur when undertaking a physical activity. Potential environmental effects resulting from accidents and malfunctions over the course of the proposed project are, therefore, considered in this assessment.

Schedule

Site clearing and construction of the cell and access road is planned to commence in late fall 2023/early winter 2024 with the goal of having the site operational for the spring dredging cycle 2024. This schedule is dependent upon DFO-SCH program funding. The scope of the assessment is based on the works being completed within five years (i.e., March 31, 2028).

ENVIRONMENTAL SETTING

20. Environment Description:

Physical Environment

The property is bordered to the south and southeast by the St. Mary's Bay (Atlantic Ocean), approximately 220 m from the DMMS. Most surrounding properties, including those opposite Old Post Road, are vacant forested resource properties, with the exception of PID 30365076 which has a residential structure present, approximately 200 m north of the DMMS. Based on observations made during site visits, a drilled well and possibly a dug well may be present at the residential structure.

The local topography in the area is characteristic of the Digby Neck peninsula, having hilly landforms with steep sloping embankments or cliffs along the coasts. Onsite topography generally slopes upward from Old Post Road to a peak in the southern portion of the property, then drops quickly toward the Atlantic Ocean. Surface water is anticipated to flow northwest, with the exception of the coastal boundary where surface water would drain east toward St. Mary's Bay. The inland portion of the study area is hilly and is highest at the southern end of the property sloping towards the north and towards St. Mary's Bay to the east. The slope to St. Mary's Bay is very steep and approximately 30% of the property would be too steep to develop.

A field survey and analysis of historical air photos (Stantec, 2022a) indicated that the site has been heavily disturbed in the past by a combination of agriculture and forest harvesting. Historical air photos indicate that the site was subject to several patch cuts since 1945. During the field survey, stone walls were found at the eastern end of the project area indicating that agriculture (probably livestock grazing) was conducted there. The 1945 air photos show no evidence of agricultural activity on the site although small pastures are present just outside of the site to the north and south. The evidence would suggest that agricultural use of the site had ceased at least several decades before 1945.

NS bedrock geology maps for the project area (White & Horne, 2012) and vicinity (Kontak & Webster, 2010) indicate that the site is on the East Ferry Member (lower flow unit) of the North Mountain Formation of the Fundy Group, characterized by grey-green, fine- to medium-grained, massive basalt with microcrysts of plagioclase and pyroxene, with gabbroic pegmatite common. The unit may also contain large (tens of metres wide) circular features, referred to as rootless cones. Fractures cutting the unit are lined with zeolites or silica, or more rarely sedimentary dykes consisting of fine-grained, silica-rich, red-brown material.

The NS surficial geology map (Stea, Conley, & Brown, 1992) indicates that site surficial geology consists of ground moraine and streamlined drift: stony till plain and drumlins. This is described as till; stony, sandy matrix, with material derived from local bedrock sources; and drumlin facies: siltier till due to erosion and incorporation of older till units by glaciers. Topography is described as flat to rolling, with many surface boulders. The Sandy Cove area specifically has a thickness of 46 m, consisting of flat-lying silt and clay beds; steeply-dipping, gravelly-sand fore-set beds; and flat-lying, open-work, gravel topset beds.

Environmentally significant factors of the surficial geology are described as having moderate limitations to crop use from stoniness; rapid drainage and erodibility; factors affecting construction use from shallowness, stoniness, and high water table; and poor buffering capacity for acid rain (Stea, Conley, & Brown, 1992).

The groundwater region's map (Kennedy & Drage, 2008) indicates that the site is within a volcanic groundwater region; glaciofluvial and alluvial deposits (i.e., deposits generally considered to have higher potential for groundwater supply development) have not been identified in the project area. The potential surficial aquifers map for the western region of NS (Kennedy, 2014) does not identify potential areas for surficial aquifer groundwater supply development or actual municipal groundwater supply wells in the project area.

The Ecological Land Classification (Neily et al., 2017) has five levels, providing a scientific description of the variety of terrestrial ecosystems across NS at ecologically relevant scales. The broadest scale division of ecosystem geography recognized in the Ecological Land Classification is the Ecozone, which is further subdivided into finer scaled Ecoregions, Ecodistricts, Ecosections and Ecosites (Neily et al., 2017).

The site is located in the Fundy Shore Ecoregion and the North Mountain Ecodistrict. The North Mountain Ecodistrict consists of a narrow ridge that is almost entirely underlain by basalt that runs parallel to the southern shore of the Bay of Fundy. The ridge reaches elevations as high as 240 m above sea level (ASL) and is typically steeper on the south side than on the north.

Surficial deposits are dominated by glacial till that has a high basalt content. These till deposits are often shallow to bedrock on upper slopes. Colluvium deposits are common on middle and lower slopes. Soils are derived from gravelly sandy loam to loam till high in basalt (Rossway/Roxville soils); cobbly sandy loam to loam till / colluvium high in basalt (Glenmont soils); and gravelly clay loam till / colluvium containing basalt (Middleton soils).

Freshwater in lakes and rivers comprise only 0.4% of the Ecodistrict, owing to the steep terrain and well drained soils. Agricultural land currently occupies 9.6% of the North Mountain Ecodistrict, while 81% of the Ecodistrict is occupied by forest.

Biological Environment

Sandy Cove is located within the North Mountain Ecodistrict. The forested lands of the Ecodistrict are varied and include white spruce (*Picea glauca*), black spruce (*Picea mariana*), mountain ash (*Sorbus spp.*), and stunted paper birch (*Betula papyrifera*), sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), red spruce (*Picea rube*ns), and eastern hemlock (*Tsuga canadensis*). Much of the North Mountain Ecodistrict where the site is located has been harvested or cleared.

The habitat on-site (PIDs 30269542 and 30163331) was characterized during a site visit conducted by Stantec on October 25, 2021. Habitat on the site consists of forest (five plant communities), tall shrub thickets (one plant community) and wetland (two plant communities) (**see Figure 5 in Appendix A**).

The plant communities that make up the forest habitat type include mature coniferous forest, mature hardwood forest, mature mixed forest, immature softwood forest, and immature mixed forest. The oldest forest stands onsite are found on the steep slopes near the St. Mary's Bay. These areas are very difficult to harvest and have remained relatively undisturbed while the inland portion of the site has been repeatedly harvested and used for agriculture.

Mature hardwood forest is one of the plant communities found on the steep slopes. The described stand is located near the top of the slope at the northern end of the site. It was estimated to be 60 years old and is dominated by a mixture of white ash (*Fraxinus americana*) and yellow birch along with small amounts of white spruce and American mountain ash (*Sorbus americana*). The shrub understory is relatively sparse and composed largely of chokecherry (*Prunus virginiana*), immature balsam fir and white spruce. The ground vegetation consists of a carpet of electrified cat's-tail moss (*Rhytidiadelphus triquetrus*), punctuated by small patches of rough-stemmed goldenrod (*Solidago rugosa*) and evergreen wood fern (*Dryopteris intermedia*).

Most of the steep slope is occupied by mature mixed forest estimated to be approximately 100 years old. This plant community has a tree canopy that is composed mostly of a mixture of white spruce and yellow birch as well as small amounts of white ash, red maple (*Acer rubrum*), and balsam fir. White ash is the most abundant species of the shrub layer. The herb layer was dominated by whorled wood aster (*Oclemena acuminata*) and an unidentified moss. Other species commonly found in the herb layer of this community include three-lobed whipwort (*Bazzania trilobata*), rough-stemmed goldenrod and common speedwell (*Veronica officinalis*).

Patches of mature softwood forest 40 to 60 years old are present on the inland portion of the site. These stands are composed mainly of white spruce with lesser amounts of balsam fir and paper birch. The shrub understory varied in composition depending on the amount of tree canopy cover. In open stands, a moderately dense shrub understory composed of speckled alder (*Alnus incana*), green alder (*Alnus alnobetula*) and chokecherry was present; while in stands with dense canopy cover the shrub understory consists of a few saplings of balsam fir and yellow birch. The herb layer species composition also varies depending on the amount of canopy closure. In open stands, the herb layer is well developed and composed of a variety of species, the most abundant of which were electrified cat's-tail moss, rough-stemmed goldenrod, New York fern (*Thelypteris noveboracensis*), and interrupted fern (*Claytosunda claytoniana*). In the stands with heavy canopy cover, the herb layer is poorly developed and composed mostly of mosses including knight's plume moss (*Ptilium crista-castrensis*), white pincushion moss *(Leucobryum glaucum*), and broom moss (*Dicranum sp.*).

Small patches of immature softwood forest are present near the site access road where forest harvesting had been conducted approximately 15 years ago. The canopy is composed mostly of balsam fir along with lesser amounts of white

spruce, red maple, American mountain ash and green alder. Bunchberry (*Cornus canadensis*), electrified cat's-tail moss, Alleghaney blackberry (*Rubus allegheniensis*) and rough goldenrod is the most abundant species in the herb layer.

Large patches of immature mixed forest are also present along the site access road and appeared to have developed following timber harvesting conducted approximately 15 years ago. These stands are dominated by a mixture of trees and tall shrubs. The most abundant species in the canopy were green alder, balsam fir, gray birch (*Betula populifolia*), chokecherry, and mountain holly (*Ilex mucronata*). The herb layer supported a variety of species, the most abundant of which are hairy flat-top white aster (*Doellingeria umbellata*), bunchberry, bristly dewberry (*Rubus hispidus*), and rough-stemmed goldenrod. Other common herbs included knight's plume moss, broom moss, red raspberry (*Rubus idaeus*), and Alleghaney blackberry.

Wetland

Three wetlands were encountered on the site, all of which are small, tall shrub dominated swamps (**see Figure 5 in Appendix A**). The two wetlands located at the southern end of the site (Wetlands 1 and 2) are tall shrub dominated slope swamps which support similar plant communities. These wetlands are characterized by a sparse tree canopy composed of white spruce and red maple as well as a moderately dense shrub layer composed of a variety of small trees, tall shrubs and low shrubs. The most abundant species of the shrub layer were mountain holly, balsam fir, Virginia rose (*Rosa virginiana*), paper birch, green alder, northern wild raisin (*Viburnum nudum*), and common winterberry. The herb layer is dense and supported a diverse array of species. The most abundant species of the herb layer are peat mosses (*Sphagnum spp.*), dwarf red raspberry (*Rubus pubescens*), hairy flat-top white aster, smooth blackberry (*Rubus canadensis*), cinnamon fern (*Osmundastrum cinnamomeum*), whorled wood aster, bluejoint reed grass (*Calamagrostis canadensis*), rough-stemmed goldenrod, and grass-leaved goldenrod (*Euthamia graminifolia*).

Wetland 3, located at the northern end of the site, is a tall shrub-dominated basin swamp which supported a different plant community. This wetland has a dense shrub canopy composed mostly of speckled alder along with small amounts of chokecherry, mountain holly, young balsam fir and white spruce. Tree cover consisted of a few white spruce. The herb layer is composed of a variety of species including electrified cat's-tail moss, dwarf red raspberry, three-seeded sedge (*Carex trisperma*), fowl manna grass (*Glyceria striata*), rough-stemmed goldenrod, and tall meadow-rue (*Thalictrum pubescens*).

The proposed location of the containment areas within the DMMS will avoid direct impacts on identified wetland habitat within the site (Stantec, 2022a). Appropriate mitigation measures will be used to address potential indirect/direct impacts on wetland habitat during construction and operation (see Table 3 in Section 26).

Species at Risk

The baseline study (Stantec, 2022a)included a review of Species at Risk that may occur at or near the site. Species at Risk were identified using Atlantic Canada Conservation Data Centre (AC CDC) data provided by PSPC. The AC CDC maintains linked databases that document which species occur in each Atlantic Canadian province and the locations at which federally and provincially rare species are known. PSPC provided a spreadsheet dated January 15, 2021, with AC CDC data for a radius of 5 km around the site. Species included in the AC CDC data provided by PSPC that are listed under Schedule 1 of the federal *Species at Risk Act* (SARA), Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and/or the provincial NS *Endangered Species Act* (NSESA) are listed below and compared against field findings (Stantec, 2022a).

- Blue felt lichen (*Pectenia plumbea*): Blue felt lichen is a cyanolichen that grows on large deciduous trees. In Nova Scotia, most records of blue felt lichen are from mixed forests containing red maple that are in wet depressions or adjacent to streams, rivers or lakes (COSEWIC, 2010). Moist areas on the Site are associated with the three wetlands. These wetlands contain few trees and the forest surrounding them contain few red maple. The red maple that are present are small or are growing on dry slopes. The project site does not appear to provide suitable habitat for blue felt lichen.
- Goldencrest (*Lophiola aurea*): the three wetlands onsite do not contain peat deposits, so it is unlikely that goldencrest is present.
- Barn Swallow *(Hirundo rustica*): There are no natural features or anthropogenic structures onsite that would provide suitable nesting habitat for barn swallows. As such, it is unlikely that barn swallows would be present onsite.
- Bank Swallow (*Riparia riparia*): There is some potential that the eastern side of the site could provide nesting habitat for bank swallows, having coastal cliffs. These cliffs consist of exposed bedrock capped with soil. The junction of the soil slope and the bedrock cliffs may provide areas with near vertical exposures of eroding soil

that could provide suitable nesting sites. Table 3 in Section 26 outlines the mitigation measures that will be taken to avoid negative impacts to bank swallows in the area.

- Wood Thrush (*Hylocichla mustelina*): Results of the field survey suggest that suitable, albeit marginal, nesting habitat for wood thrush may be present onsite. Table 3 in Section 26 outlines the mitigation measures that will be taken to avoid negative impacts to Wood Thrush in the area.
- Harlequin Duck (*Histrionicus histrionicus*): The site is located along the shore of St. Mary's Bay which is relatively sheltered and would not be expected to provide good wintering habitat for harlequin ducks.
- Evening Grosbeak (*Coccothraustes vespertinus*): There is some potential for evening grosbeak to nest onsite, although the mature mixed forest located on the steep slopes on the eastern margin of the site are unlikely to be adversely affected by the proposed storage of dredge spoils.
- Bat species and hibernaculum: The geology of the site (basalt) is not conducive to the formation of solution caves and there was no evidence to indicate that underground mine workings are present onsite. As such, it is unlikely that the site provides potential hibernacula for bats. The site is almost entirely forested. The mature mixed forest stands that occur on the steep slopes along the eastern side of the site could potentially be suitable for maternity colonies. The flatter areas to the west are largely occupied by young dense forest stands and tall shrub thickets that would not provide good maternity colony sites. An acoustic study was conducted over a 15 night period in June and July, 2022, which identified the presence of Northern Myotis in the area (Stantec, 2022a) and as such it is possible that bats could utilize the site for various life functions (feeding, roosting, migration, etc.) Table 3 in Section 26 outlines the mitigation measures that will be taken to avoid project related impacts to bats potentially present in the area.

Breeding Birds

To assess potential bird species presence in the Site, data from the Maritimes Breeding Bird Atlas (MBBA) were obtained for the 10 x 10 km square in which the Site is located (Square ID 19GK33) (MBBA, 2022). According to the MBBA, a total of 53 species are or may be breeding in square 19GK33 based on observed breeding evidence (MBBA, 2022). Those observations include:

- 13 confirmed species;
- 9 probable species, including barn swallow as identified in the AC CDC report (listed as Special Concern under SARA and COSEWIC, and Vulnerable under NSESA); and
- 31 possible species, including evening grosbeak as identified in the AC CDC report (listed as Special Concern under SARA and COSEWIC and Vulnerable under NSESA).

A complete list of species reported by the MBBA is presented in **Appendix B**.

Human Environment

The site is described by Service Nova Scotia (SNS) and Internal Services' Property Online as PID 30269542, owned by Her Majesty the Queen in Right of Canada DFO. The PID includes a recent acquisition of the former 30163331, sold to DFO by Grant Thornton Limited and the DFRP property number 27952 has been retained for the total project site. The Site is vacant and partially covered with woodland, grass, and various vegetation, accessible via a gravel road extension of Route 217 (Old Post Road) northwest of the property boundary; St. Mary's Bay (Atlantic Ocean) borders the property on the east.

Surrounding properties are also vacant and partially covered with woodlands and other vegetation with the exception of the residential property located on the opposite side of Old Post Road that contains a dwelling, approximately 200 meters from the site. The area is primarily used for recreation by seasonal and permanent residents, as there are a number of hiking trails and beaches that are popular for walking and recreational use in the area. These include the TR Falls hiking trail which is located approximately 500 meters northeast of the site and is a popular hiking trail for local residents and tourists. Due to the location, the area is also used as a local hub for commercial fisheries out of Sandy Cove East Small Craft Harbour. The community of Sandy Cove has a population of 65 residents consisting of a mix of permanent and seasonal residences and is roughly 32 kilometres from the town of Digby which has a larger population of 2,001.

Provincial traffic data is collected by the province of Nova Scotia and available as Open Source data on an annual basis. Daily average volumes on route 217 were reported to be between 1,170 vehicles per day and 907 vehicles per day. There is an observed average of 1,170 vehicles per day between Waterford East Line to Lake Midway Provincial Park Entrance, 940 vehicles per day between Lake Midway Provincial Park Entrance to Little River Road, and 907 vehicles per day between Little River Road and Tiverton Ferry Terminal. For comparison, traffic volumes in Digby County average 2,514 vehicles per

day. Given the estimate of 80 truckloads over a 2-3 week disposal activity period, this equates to 5-8 additional vehicles per day which does not represent a significant increase in traffic volumes.

According to the recent Phase I Environmental Site Assessment (ESA) conducted for the site located on PID 30269542 (GHD, 2021), no sources of potential environmental contamination were identified on the project site or on adjacent properties (including PID 30163331) – all of which have been vacant and largely unchanging in aerial photographs captured from 1945 – 2013. Searches of the NS Environmental Registry and federal / provincial / private environmental databases did not identify any issues that may be applicable to the project site. A site visit found that there was no evidence of operations onsite. There was no evidence observed of past uses that involve, or have involved, such activities as the use, treatment, storage, disposal, and generation of hazardous materials, landfilling, or the storage of wastewater in impoundments. There was no evidence observed of these activities on the adjoining properties either. Several plastic storage totes and drums, which appeared to be empty, were observed north of the project property on the opposite side of Old Post Road. The 2021 Phase I ESA concluded that there were no known environmental impairment issues or evidence of potential environmental contamination associated with the project property, based on historic and current land use.

A comprehensive Qualitative Risk Assessment (QRA) was conducted for the site located on PIDs 30269542 and 30163331 (Stantec, 2022a). An objective of the QRA was to screen newly and previously obtained sediment data from Centreville SCH, Sandy Cove East SCH and Little River SCH against human health and ecological, pathway-specific guidelines in order that a qualitative review and discussion of risk could be completed. The sediment sampling programs provide temporally useful data and spatial coverage of the chemical and physical characteristics of sediment within each Harbour. In addition, baseline soil and groundwater data collected from the site were screened against human health and ecological, pathway-specific guidelines. The screening was then used to determine the potential risks to human and ecological receptors associated with exposure to the land-based disposal of dredged sediment. The QRA included an assessment of user exposure (such as DFO workers, trespassers / visitors, and recreational users) to the disposed sediment through direct contact (incidental ingestion, dermal contact, particulate inhalation), inhalation of vapours (indoor/outdoor air), potable water exposure, and runoff/leaching to groundwater and discharge to surface water. The sediment analytical results were screened to human health specific guidelines to identify the contaminants of potential concern (COPCs) that could potentially be a human health concern.

Baseline soil and groundwater sampling was conducted by Stantec (Stantec 2022a) on PID 30269542 in January 2022 with a second round of sampling conducted in July 2022 on PID 30269542 and 30163331. Based on the January, 2022 groundwater elevations, the inferred groundwater flow of the site is to the east toward the Atlantic Ocean. Baseline groundwater sample results showed concentrations of several metals including aluminum, beryllium, cadmium, cobalt, copper, iron, manganese, nickel, vanadium and zinc exceeded applicable guidelines for groundwater concentrations. It should be of note that many of these parameters can naturally occur in elevated concentrations in Nova Scotia.

Results of the soil sampling conducted on the two properties showed concentrations of several metals including aluminum, chromium, iron, manganese, selenium, and/or vanadium exceeded applicable Soil Quality Guidelines (SQG) . It should be noted that aluminum, manganese and selenium results were all less than the NS background soil concentrations. Similarly, iron results from all but one sample location were less than the NS background soil concentrations.

The human health screening component of the QRA determined that there is a potential that the concentrations of some metals (arsenic, lead, manganese, selenium, and vanadium) and Polycyclic Aromatic Hydrocarbons (PAHs) could leach to underlying groundwater following sediment disposal activities and migrate laterally to impact offsite potable supply wells, in the absence of sediment disposal management that would include control of leachate and migration. Mitigation measures, including leachate control measures, will be incorporated to minimize potential impacts to groundwater associated with placement of material on the site as outlined in Table 3, Section 26 below.

Based on the Nova Scotia Department of Fisheries and Aquaculture site mapping tool, the closest aquaculture site is an Atlantic salmon lease near Long Beach Pond (Nova Scotia Department of Fisheries & Aquaculture, n.d.), approximately 12.5 km southwest of the project site. The lease holder (1012) is Long Beach Farms Limited. The mapping also indicates a proposed Atlantic salmon lease near Mink Cove, approximately 4.5 km southeast of the site. The proposed lease holder is Canadian Salmon Limited.

There is little known historical information related to the project property and there have been a limited number of archaeological assessments completed previously on Digby Neck. An archaeological impact assessment (ARIA) of the project area was conducted by Stantec in October, 2022 (Stantec 2022b). Due to the uneven terrain, lack of access to water and coastal resources, the DMMS site (PID 30269542) appears to have low potential for pre-contact archaeological resources. Based on the historical research completed for the ARIA and the findings of the walkover survey, the western

property appears to have been developed and in use from the late 18th century into the early 20th century as a wood lot and pasture for farming, but otherwise appears to contain little potential for significant archaeological resources (Stantec, 2022b).

Similarly, due to lack of access to water and coastal resources, the eastern property, PID 30163331, also appears to have low potential for pre-contact archaeological resources. The eastern property, however, contains several rock walls associated with past farming activity, into which considerable effort was made to construct these walls. It is possible that additional heritage resources may be present in this property as a result of other activities by the Euro-Canadian settlers. For this reason, the eastern property should be avoided during development of the DMMS. If avoidance is not possible, then a trained archaeologist should be consulted to conduct additional investigation and assessment of this property in order to avoid potential impacts on archaeological resources.

OTHER CONSIDERATIONS

21. Adverse Impact on the rights of Indigenous People of Canada:

PSPC, on behalf of DFO-SCH, carried out an Indigenous Assessment at the proposed Sandy Cove property in accordance with DFO-SCH's Preliminary Duty to Consult Assessment Guide. This Guide is intended to provide basic information to DFO-SCH in the Maritimes and Gulf Regions and to assist its Program Managers in making informed, prudent decisions that take into account statutory and other legal obligations, as well as policy objectives, related to Indigenous and treaty rights. The Supreme Court of Canada has held that the Crown has a duty to consult and, where appropriate, accommodate when the Crown contemplates conduct that might adversely impact potential or established Indigenous or treaty rights. While there may be other reasons to undertake consultations (e.g., good governance, policy-based, etc.), three elements are required for a legal duty to consult to arise:

1. There is contemplated or proposed Crown conduct.
2. The Crown has knowledge of potential or established Indigenous or treaty rights.
3. The potential or established Indigenous or treaty rights may be adversely impacted by the Crown.

The recent archaeological impact assessment (ARIA) of the project area conducted by Stantec in October, 2022 (Stantec 2022b) indicated that the property contained little potential for significant archaeological resources (Stantec, 2022b). However, other than this survey, there is little known historical information related to the property proposed for DMMS development and there have been a limited number of archaeological assessments completed previously on Digby Neck. Based on this, the Duty to Consult assessment determined that the potential use of the land by Indigenous people is considered unknown, and as the project will result in removal of vegetation and restricted access to the site, Indigenous consultation was initiated. The closest Indigenous community to the DMMS is Bear River First Nation, located approximately 48 km northeast of the project site. An offer to consult was sent via email to the Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO) and the eleven First Nations represented by the KMKNO on December 2, 2021. Separate letters were also sent via email to the Millbrook First Nation and Sipekne'katik First Nation on December 2, 2021. A project notification letter was also sent to the Native Council of NS informing them of the project.

PSPC received a response letter from KMKNO on February 22, 2022, indicating that the KMKNO wishes to consult on the project and requested copies of the Archaeological Impact Assessment (AIA) and SEED. PSPC provided copies of the requested documents via email on June 7, 2023. On June 7, 2023 PSPC provided the draft SEED report and ARIA for review and input. On July 18, 2023, PSPC sent a follow-up email requesting a brief meeting to discuss the project, the draft SEED report and ARIA. An update on the environmental processes was also provided and a potential construction date of Fall 2023 communicated. The project was discussed during a SCH – KMKNO meeting on August 18, 2023 and that KMKNO were to action a response on this project; no response has been received to-date. Another follow-up email was sent by PSPC on Sept 5, 2023 requesting a meeting. An additional follow-up was sent by PSPC on Sept 20, 2023 providing an update on the project schedule the need to move forward with the project by end of Week Sept 25-29. PSPC left a voicemail with KMKNO (M'isel Abram) on Sept 26, 2023 reiterating PSPC's request for a response and indicating that a written response would follow; no responses have been received to-date. PSPC sent a follow-up letter on September 28, 2023 indicating that since there has been no further communication received from KMKNO, DFO-SCH and PSPC intend to move forward with finalizing the environmental permitting such that the project can go to tender in time to meet project funding timelines.

Follow-up letters were also sent by PSPC via email to Millbrook First Nation (March 30, 2022) and Sipekne'katik First Nation (March 30, 2022 following their recently established consultation protocol and May 24, 2022) providing an update

on the project and indicating that the project is proceeding. To date, PSPC / DFO-SCH have not received a response from Millbrook First Nation with regards to this project.

On June 9, 2022, Sipekne'katik responded to the follow-up letter, indicating that they wish to consult on the project and initiated Phase 2 of their consultation protocol. The requested documents were provided to Sipekne'katik by PSPC via email on February 23, 2023 (SEED and completed Scope of Consultation form) and June 7, 2023 (ARIA). PSPC, DFO-SCH and Sipekne'katik met virtually to discuss the project on July 5, 2023. During this meeting Sipekne'katik indicated that all of their concerns raised to date have been addressed and they are in agreement with the project moving forward while they complete their internal review of the project.

22. Indigenous knowledge provided in respect of the project:

The use of available Indigenous Knowledge (IK) collected during the assessment in addition with information from available sources was incorporated in this assessment, however an IK study was not completed as part of this assessment.

23. Community knowledge provided in respect of the project:

On March 1, 2022, as a follow-up to initial community feedback received, a public meeting was held at the Sandy Cove Fire Hall (6635 Hwy 217, Digby Neck, NS). The meeting was also accessible virtually. Additional project details were presented and provided an opportunity for members of the public to discuss the proposed activities with the project team. The following is a summary of public comments received during the public review period and public meeting that are considered part of the assessment process under the *Canadian Impact Assessment Act*.

- Increased truck traffic and impacts on local roads;
- Soil / surface water / groundwater / well contamination;
- Impacts on recreation and tourism;
- Concerns with consultation process and timing;
- Proximity to community, public areas, residential properties;
- Alternative options;
- Aesthetic impacts;
- Impacts on property values;
- Other materials being brought to the site; and
- Increased noise, odour and emissions.

The public comments, along with how they were addressed in the SEED, are further outlined in **Appendix C.**

24. Summary of public notification:

The following Public Registries were completed for the proposed works:

☒ Canadian Impact Assessment Registry

a) CIAA registry number: 83276
b) Dates posted:
   a. Notice of Intent: 2022-01-25
   b. Notice of Determination: See Section 33 below.

Comments received: See Section 23 above.

Under section 82 of the IAA, DFO-SCH must determine whether the proposed DMMS, located in Sandy Cove, NS (DFRP 27952), is likely to cause significant adverse environmental effects. To help inform this decision, the following consultations were completed:

- On January 25, 2022, the project was posted online on the Canadian Impact Assessment Registry (Registry Project #83276) in both official languages for a public review/comment period that took place between January 25, 2022, and April 4, 2022.
- Also on January 25, 2022, notification letters, prepared in both official languages, were mailed to 25 property owners located along Sandy Cove Road and Old Post Road. These letters provided details regarding the project and outlined how to provide public comments / questions, as well as the link to the Canadian Impact Assessment Registry and contact information for the department representative.
- On February 25, 2022, notifications were published in the Chronicle Herald and Le Courier de la Nouvelle-Écosse, informing the public of the project as well as a link to the Canadian Impact Assessment Registry.
- On March 1, 2022, as a follow-up to initial community feedback received, a public meeting was held at the Sandy Cove Fire Hall (6635 Hwy 217, Digby Neck, Nova Scotia). The meeting was also accessible virtually. Additional project details were presented and provided an opportunity for members of the public to discuss the proposed activities with the project team.

Appendix C provides a summary of all public comments received during the public review period and public meeting sessions (listed by subject/item of concern). It is important to note that all public comments received in relation to the proposed project have been considered during the assessment of significant environmental effects in accordance with the IAA.

ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

25. Evaluation of Environmental Effects and Determination of Significance:

Methodology

The environmental effects evaluation methodology used in this form focuses the evaluation of those environmental components of greatest concern. The Valued Components (VCs) most likely to be affected by the project as described are indicated in *Table 1: Potential Project / Environment Interactions Matrix*. VCs were selected based on ecological importance to the existing environment, the relative sensitivity of environmental components to project influences, and their relative social, cultural, or economic importance. The potential impacts resulting from the interactions are also identified in Table 1 as positive or negative in nature.

Gender-based Analysis Plus (GBA+) provides a framework to describe the full scope of potential positive and negative effects under the IAA. The application of GBA+ to impact assessment seeks to understand, describe and, where possible, mitigate adverse impacts on diverse populations. GBA+ is an analytical tool that will be utilized during the undertaking of this assessment as per the guidance provided by the IAA on *Gender-based Analysis Plus in Impact Assessment*. As such, the intention is to ensure that, as applicable, multiple community-relevant, diverse subgroups have been considered and proposed mitigation, where relevant, clearly addresses any issues identified.

The VC interactions identified in Table 1 must be supplemented with a determination of significance for each resulting effect to assign adequate measures to mitigate a negative effect if negative and, if possible, enhance a positive effect. The significance of project-related impacts is determined in consideration of the impact's frequency, duration, and geographical extent as well as magnitude relative to natural or background levels, and whether they are reversible in nature. These criteria are described in *Table 2: Assessment Criteria for Determination of Significance*.

A description of each potential effect, its projected significance, and assigned mitigation measures are detailed in Table 3 of Section 25.

The evaluation of effects, the determination of significance of the environmental effects, and assignment of mitigation measures are all based on the following:

- information provided by the proponent;
- a review of project related activities;
- an appraisal of the environmental setting, and identification of resources at risk;
- the identification of potential impacts within the temporal and spatial bounds;
- available community/indigenous knowledge;
- professional judgement of the assessor;
- specialist advice/knowledge from experts.

Scoping

This environmental effects evaluation considers the full range of project / environment interactions and the environmental factors that could be affected by the project as defined above and their significance. The proposed project is anticipated to commence within the aforementioned timeframe as outlined in the schedule above (Section 19); however, this timeline is subject to approvals and funding. As such, the temporal scope for the proposed project covers a 5-year period from the time of this assessment to account for this uncertainty. This assessment should, therefore, be considered accurate until March 2028 unless a review of the information presented in this assessment prior to the end of the 5-year period prompts a re-assessment to ensure accuracy (e.g., legislative changes, changes in physical, biological, socio-economic features, input from ongoing Indigenous consultations, etc.).

As previously noted, physical activities such as replacement or decommissioning of the proposed physical works are subject to their own stand-alone assessment at the time of need, therefore, are not considered further in this assessment.

Table 1: Potential Project / Environment Interactions Matrix

Valued Components (VCs)	*Section 7(1)(a) (Environmental Legislation)*			*Section 7(1)(c) and (d) (Indigenous Interests)*				*Other Impacts & Due Diligence*											
Project Phase / Physical Work/Activity	*Fish (Fisheries Act)*	*SARA*	*Birds (MBCA)*	*Physical and Cultural Heritage*	*Land and Resource Use for Traditional Purposes*	*Structure, Site, or Thing of HAPA Significance*	*Health, Social or Economic Conditions*	*Physical and Cultural Heritage*	*Structure, Site, or Thing of HAPA Significance*	*Health, Social or Economic Conditions*	*Water (marine, ground, surface, drainage, water levels, flow etc.)*	*Wetlands*	*Terrestrial Species and Habitat*	*Aquatic Species and Habitat*	*Terrestrial Soils*	*Marine Sediments*	*Air Quality*	*Sensory Disturbance (air/water, noise, and vibration)*	*Others (i.e., land/landscapes)*
Dredge Material Management Site Project, Sandy Cove, Nova Scotia																			
Transportation of Materials and Equipment		-	-				-			-			-				-	-	
Site Clearing		-	-	-			-	-		-	-	-	-		-		-	-	-
Construction of Access Road		-	-	-			-	-		-	-	-	-		-		-	-	-
Construction of Containment Cells/Areas		-	-	-			-	-		-	-	-	-		-		-	-	-
DMMS Operation (trucking, placement, material storage and management)		-	-				-			+/-	-	-	-	-	-		-	-	-
Accidents / Malfunctions		-	-				-			-	-	-	-	-	-		-	-	

HAPA = Historical, Archaeological, Paleontological or Architectural
N/A = Not Applicable
"+" = potential positive interaction; "-" = potential negative interaction; "+/-"= potential positive and negative interactions.

Table 2: Assessment Criteria for Determination of Significance

Magnitude	Magnitude, in general terms, may vary among issues, but is a factor that accounts for size, intensity, concentration, importance, volume and social or monetary value. It is rated as compared with background conditions, protective standards, or normal variability.	
	Small	Relative to natural or background levels
	Moderate	Relative to natural or background levels
	Large	Relative to natural or background levels
Reversibility	Reversible	Effects can be reversed
	Irreversible	Effects are permanent
Geographic Extent	Immediate	Confined to project site
	Local	Effects beyond immediate project site but not regional in scale
	Regional	Effects on a wide scale
Duration	Short-term	Between 0 and 6 months in duration
	Medium-term	Between 6 months and 2 years
	Long-term	Beyond 2 years
Frequency	Once	Occurs only once
	Intermittent	Occurs occasionally at irregular intervals
	Continuous	Occurs on a regular basis and regular intervals

26. Potential Environmental Effects and Mitigation Measures for the Project:

Table 3: Description and Significance of Potential Environmental Effects and Recommended Mitigation Measures

Potential Environmental Effects	Mitigation Measures
Valued Component: Species at Risk	
Transportation of Materials and Equipment: • Potential indirect disturbance to species at risk (e.g. Bats, Bank Swallows, Wood Thrush) resulting from increased traffic to the site. Significance: *small , reversible, local, short-term, once*. ***Site Clearing:*** • Potential direct mortality of species at risk during clearing activities. Significance: *small, irreversible, immediate, short-term, once.* • Removal of vegetation may cause reduction of habitat for nesting species at risk such as Bats (Myotis sp.), Bank Swallows, Wood Thrush. Significance: *small, reversible, immediate, long-term, once.* ***Access Road Construction:*** • Potential direct mortality of species at risk during road construction. Significance: *small, irreversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:*** • Potential direct mortality of species at risk during DMMS construction. Significance: *small, irreversible, immediate, short-term, once.* • Activities may expose species at risk to construction-related debris or toxic materials they may have direct contact with and/or ingest. Significance: *small, reversible, immediate, short-term, intermittent.* • Construction of berms/stockpiles may attract nesting bank swallows, that would be threatened by site activities. Significance*: small, reversible, immediate, short-term, once.* ***DMMS Operation:*** • The use of heavy equipment may temporarily disturb terrestrial wildlife species. Significance: *small, reversible, immediate, short-term, intermittent.* • Placement of dredged material may create appropriate nesting habitat for bank swallows. Significance: *small, reversible, immediate, short-term, intermittent.* ***Accidents/Malfunctions:*** • Release of hazardous materials from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, short-term, once.*	• Train site personnel to comply with the Species at Risk Act (SARA) regarding the protection of species at risk on-Site and in the vicinity (i.e. myotis sp.). • Minimize project footprint to the extent possible and schedule work within the shortest timeframe. • All activities, vehicles, and materials will be restricted to the designated work area. • Prior to starting on-site work activities (daily), a check for wildlife will be done by conducting a thorough visual inspection of the work area and immediate surroundings. • To reduce potential for direct bat mortality, tree/vegetation clearing during the maternity / summer roosting period (May to August) and fall mating season (September to October) will be avoided. • Any necessary removal of the wooded areas and any site operations (e.g., disposal of sediment, site maintenance, and removal of material) will occur outside of the migratory bird breeding and nesting season. If removal of trees or natural areas needs to occur during breeding and nesting season, appropriate surveys clearing the activity areas will be completed by qualified staff as close to the starting of activities as possible. • Field/cleared areas that are planned to be used for any component of the DMMS will be inspected during the nesting season to ensure that ground-nesting birds are not present. • Should nests of bird species at risk (e.g. Wood Thrush, Bank Swallows) be encountered during work, immediately notify the PSPC Project Manager for directives to be followed. Establish a setback around the nest site and neighbouring vegetation and minimize loud noise and vibration near the site until nesting is completed. The proponent shall ensure that if a nest is detected within the project area, Environment and Climate Change Canada - Canadian Wildlife Service (ECCC-CWS) shall be consulted and their recommendations shall be followed to protect these areas. • Bank swallows generally dig their burrows in near-vertical banks (slopes of at least 70 degrees) that are more than 2 m high (ECCC, 2016). Berms of the containment cells will be constructed and mounds of dredged material will be shaped to discourage bank swallows from establishing nests in the berms and mounds (i.e., with a slope of less than 70 degrees). • Dispose of food and other types of waste that may attract scavenging species in an appropriate location off-site. Temporary waste storage onsite will be covered. • During nighttime work (if any), lights are to be shielded or pointed downwards. They are to be positioned in the opposite direction of any nearby bird nesting habitat. • All machinery must be well muffled and maintained in proper working order and must be regularly checked for leakage of lubricants or fuel. • Ensure that machinery arrives on-site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds. • Waste or any miscellaneous unused materials must be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown into the terrestrial environment.

	• Equipment must be maintained in proper running order to prevent leaking or spilling of hazardous or toxic products, including hydraulic fluid, diesel, gasoline, and other petroleum products. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site. • Observations of wildlife use of the site will be noted during site inspections as part of the long term monitoring and operation of the site, and additional mitigation measures may be implemented to address potential negative impacts as required. •
Valued Component: Birds (protected under the Migratory Birds Convention Act) and Habitat	
Transportation of Materials and Equipment: • Potential disturbance to migratory birds resulting from increased traffic to the site. Significance: *small, reversible, immediate, short-term, intermittent*. ***Site Clearing:*** • Potential direct mortality of migratory birds during clearing activities. Significance: *small, reversible, immediate, short-term, once.* • Removal of vegetation may cause reduction of habitat for migratory birds. Significance: *small area, reversible, immediate, long-term, once.* ***Access Road Construction:*** • Potential direct mortality of migratory birds (ground nesters) during road construction. Significance: *small, reversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:*** • Potential direct mortality of migratory birds (ground nesters) during DMMS construction. Significance: *small, reversible, immediate, short-term, once.* • Activities may expose migratory birds to construction-related debris or toxic materials they may have direct contact with and/or ingest. Significance: *small, reversible, immediate, short-term, intermittent.* ***DMMS Operation:*** • The use of heavy equipment may temporarily disturb migratory bird species. Significance: *small, reversible, immediate, short-term, intermittent.* ***Accidents/Malfunctions:*** • Release of hazardous materials from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, short-term, once.*	• Train site personnel to comply with the *Migratory Birds Convention Act* (MBCA) regarding the protection of migratory birds, their eggs, nests, and their young encountered on-site and in the vicinity. No one shall disturb, move, or destroy migratory bird nests. • Minimize project footprint to the extent possible and schedule work within the shortest timeframe. • A site management and monitoring plan will be developed, which will outline mitigation measures to minimize negative interactions with birds during construction and operation. • Any necessary removal of the wooded areas and any site operations (e.g., disposal of sediment, site maintenance, and removal of material) will occur outside of the breeding and nesting season. If removal of trees or natural areas needs to occur during breeding and nesting season, appropriate surveys clearing the activity areas will be completed by qualified staff as close to the starting of activities as possible. • Field/cleared areas that are planned to be used for any component of the DMMS will be inspected during the nesting season to ensure that ground-nesting birds are not present. • Should nests of migratory birds be encountered during work, immediately notify the PSPC Project Manager for directives to be followed. Establish a setback around the nest site and neighbouring vegetation and minimize loud noise and vibration near the site until nesting is completed. The proponent shall ensure that if a nest is detected within the project area, Environment and Climate Change Canada - Canadian Wildlife Service (ECCC-CWS) shall be consulted and their recommendations shall be followed to protect these areas. • All machinery must be well muffled. If necessary, trucks may be required to avoid the use of "hammer" braking along specific sections of the route. • During nighttime work (if any), lights are to be shielded or pointed downwards. They are to be positioned in the opposite direction of any nearby bird nesting habitat. • Contractors must ensure that food scraps and garbage are not left at the work site. All construction waste material will be disposed of in a provincially approved manner. • All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline, and other petroleum products. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site.
Valued Component: Physical and Cultural Heritage (Indigenous Interests)	

Transportation of Materials and Equipment: • None ***Site Clearing:*** • Unearthing of historically/culturally significant materials during clearing. Significance: *small, reversible/irreversible, immediate, short-term, once.* ***Access Road Construction:*** • Unearthing of historically/culturally significant materials during road construction. Significance: *small, reversible/irreversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:*** • Unearthing of historically/culturally significant materials during DMMS construction. Significance: *small, reversible/irreversible, immediate, short-term, once.* ***DMMS Operation:*** • None ***Accidents/Malfunctions:*** • None	• Provide awareness training to site personnel on the sensitivity of Indigenous Peoples to potential impacts on archaeological/heritage resources, potential for presence of unknown buried heritage features, and examples of possible artifacts and structures. All construction personnel will be responsible for reporting any unusual materials unearthed during construction activities to the Construction Supervisor. • In those situations where the find is believed to be an archaeological resource, the Construction Supervisor will immediately stop work near the find and notify the PSPC Project Manager. • If an archaeological and/or historically significant item is discovered during the work activities, work in the area will be stopped immediately and the PSPC Project Manager will be contacted as well as the provincial Archaeological Services unit: Nova Scotia Department of Communities, Culture and Heritage, Special Places Program - telephone: (902) 424-6475 • If discovered features are potentially related to Indigenous Communities, The KMKNO and Office of L'nu Affairs will be informed. • Work can only resume near the find when authorized by the PSPC Project Manager and Construction Supervisor, after approval has been granted by the Nova Scotia Department of Communities, Culture and Heritage. • In the event of the discovery of human remains or evidence of burials, the work will immediately cease, and the nearest law enforcement agency will be contacted immediately by the PSPC Project Manager and/or the Construction Supervisor. • Avoid ground disturbance on eastern property (PID#30163331). Should ground disturbance be required, a qualified archaeologist will be engaged to identify additional mitigation measures (e.g., monitoring) to avoid potential impacts on archaeological resources.
Valued Component: Health, Social or Economic Conditions (Indigenous Interests)	
Transportation of Materials and Equipment: • Safety hazards during transportation of equipment and materials. *Small, reversible, immediate, medium-term, once*. • Increased truck traffic on local roads and highway. Significance: *small, reversible, immediate, short-term, intermittent*. ***Site Clearing:*** • Safety hazards during clearing. *Small, reversible, immediate, short-term, once.* ***Access Road Construction:*** • Safety hazards during road construction. *Small, reversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:*** • Safety hazards during DMMS construction. *Small, reversible, immediate, short-term, once.* ***DMMS Operation:*** • Safety hazards during operation. Significance: *small, reversible, immediate, long-term, intermittent*. • Provide feasible option to manage dredged sediment to support local fishing industry. Significance: *long-term, regional, continuous; other criteria not applicable.*	• Site access must be restricted to authorized workers only. • All personnel involved with activities and contact with hazardous material must be adequately trained and utilize appropriate personal protective equipment. • Proper safety procedures must be followed for the duration of the project as per municipal, provincial, and federal regulations. • Employees will be trained in health and safety protocols (e.g., work safe practices, emergency response). • Measures outlined in the site management and monitoring plan will be established to minimize the off-site impacts of the proposed DMMS during the operational phase. This will include design details to minimize the impacts to soil, surface water, and groundwater quality over the lifetime of the site. • Installation of a lockable gate at the access road off Old Post Road. • Site construction and operations (e.g., disposal of sediment, site maintenance, etc.) will be conducted outside of tourist season as much as reasonably possible. • "No Trespassing", "No Dumping", and "No Hunting" signs will be installed at the gate and along the site boundary. All signage will adhere to Government of Canada standards and requirements. • Revegetation of exposed soil/sediment will reduce negative visual impacts, dust generation, and erosion. If hydroseeding is applied, a mixture of native seed types will be used. • Regular inspections will be completed to ensure the access gate(s), fencing, and signs are in good condition and that unauthorized disposal of garbage, construction waste, or other debris is not occurring at the site.

• Potential impacts to recreational use, tourism, and human health resulting from off-site impacts. Significance: *moderate, reversible, local, long-term, intermittent*. ***Accidents/Malfunctions:*** • Equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, medium-term, once.*	• When material is being transported to the site from the SCH during dredging activities, signage will be placed at appropriate locations on Highway 217, Sandy Cove Road, and Old Post Road to warn motorists of trucks entering the highway and slow-moving vehicles. • All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline, and other petroleum products. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site.
Valued Component: Physical and Cultural Heritage	
Transportation of Materials and Equipment: • None ***Site Clearing:*** • Unearthing of historically/culturally significant materials during clearing. Significance: *small, reversible/irreversible, immediate, short-term, once.* ***Access Road Construction:*** • Unearthing of historically/culturally significant materials during road construction. Significance: *small, reversible/irreversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:*** • Unearthing of historically/culturally significant materials during DMMS construction. Significance: *small, reversible/irreversible, immediate, short-term, once.* ***DMMS Operation:*** • None ***Accidents/Malfunctions:*** • None	• Provide awareness training to site personnel on the potential for presence of unknown buried heritage features, and examples of possible artifacts and structures. All construction personnel will be responsible for reporting any unusual materials unearthed during construction activities to the Construction Supervisor. • In those situations where the find is believed to be an archaeological resource, the Construction Supervisor will immediately stop work near the find and notify the PSPC Project Manager. • If an archaeological and/or historically significant item is discovered during the work activities, work in the area will be stopped immediately and the PSPC Project Manager will be contacted as well as the provincial Archaeological Services unit: Nova Scotia Department of Communities, Culture and Heritage, Special Places Program - telephone: (902) 424-6475 • Work can only resume near the find when authorized by the PSPC Project Manager and Construction Supervisor, after approval has been granted by the Nova Scotia Department of Communities, Culture and Heritage. • In the event of the discovery of human remains or evidence of burials, the work will immediately cease, and the nearest law enforcement agency will be contacted immediately by the PSPC Project Manager and/or the Construction Supervisor. • Avoid ground disturbance on eastern property (PID#30163331). Should ground disturbance be required, a qualified archaeologist will be engaged to identify additional mitigation measures (e.g., monitoring) to avoid potential impacts on archaeological resources.
Valued Component: Health, Social or Economic Conditions	
Transportation of Materials and Equipment: • Safety hazards during transportation of equipment and materials. *Small, reversible, immediate, medium-term, once*. • Increased truck traffic on local roads and highway. Significance: *small, reversible, immediate, short-term, intermittent*. • Added wear on Old Post Road from project related traffic. Significance: *small, reversible, immediate, short-term, intermittent*. ***Site Clearing:*** • Safety hazards during clearing. *Small, reversible, immediate, short-term, once.* ***Access Road Construction:*** • Safety hazards during road construction. *Small, reversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:***	• All project drivers will obey recommended speed limits and reduce speed when road conditions are sub-optimal (e.g., slippery, low light, congested traffic, pedestrians present). • Excessive wear or rutting of Old Post Road by project vehicles will be repaired as soon as possible following heavy usage. • Site access must be restricted to authorized workers only. • All personnel involved with activities and contact with hazardous material must be adequately trained and utilize appropriate personal protective equipment. • Proper safety procedures must be followed for the duration of the project as per municipal, provincial, and federal regulations. • Employees will be trained in health and safety protocols (e.g., work safe practices, emergency response). • Measures outlined in the site management and monitoring plan will be established to minimize the off-site impacts of the proposed DMMS during the operational phase. This will include design details to minimize the impacts to soil, surface water, and groundwater quality over the lifetime of the site.

• Safety hazards during DMMS construction. *Small, reversible, immediate, short-term, once.* ***DMMS Operation:*** • Safety hazards during operation. Significance: *small, reversible, immediate, long-term, intermittent*. • Provide feasible option to manage dredged sediment to support local fishing industry. Significance: *long-term, regional, continuous; other criteria not applicable.* • Potential impacts to local recreational land use, tourism, and human health resulting from off-site impacts. Significance: *moderate, reversible, local, long-term, intermittent*. • Local property values could be impacted by industrial land use. Significance: *moderate, reversible, local, long-term, intermittent*. ***Accidents/Malfunctions:*** • Equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, medium-term, once.*	• Installation of a lockable gate at the access road off Old Post Road. • Site construction and operations (e.g., disposal of sediment, site maintenance, etc.) will be conducted outside of tourist season as much as reasonably possible. • "No Trespassing", "No Dumping", and "No Hunting" signs will be installed at the gate and along the site boundary. All signage will adhere to Government of Canada standards and requirements. • Revegetation of exposed soil/sediment will reduce negative visual impacts, dust generation, and erosion. If hydroseeding is applied, a mixture of native seed types will be used. • Regular inspections will be completed to ensure the access gate(s), fencing, and signs are in good condition and that unauthorized disposal of garbage, construction waste, or other debris is not occurring at the site. • When material is being transported to the site from the SCH during dredging activities, signage will be placed at appropriate locations on Highway 217, Sandy Cove Road, and Old Post Road to warn motorists of trucks entering the highway and slow-moving vehicles. • Impacts on property values are minimal as the surrounding adjacent properties are currently used for selective timber harvesting. Project related impacts at distant residences along Old Post Road will only experience short term heavy traffic for a few weeks about every 3-5 years. Mitigation for transportation effects and sensory disturbance (air, noise, vibration) will address potential to impact on property values. • All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline, and other petroleum products. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site.
Valued Component: Water Quality and Characteristics (marine, ground, and/or surface)	
Transportation of Materials and Equipment: • **None** ***Site Clearing:*** • Activities resulting in exposing bare soils may result in increased erosion and sedimentation into nearby surface waters (i.e., onsite wetlands, St. Mary's Bay). Significance: *small, reversible, immediate, short-term, intermittent*. ***Access Road Construction:*** • Activities may result in construction-related debris or toxic materials (associated with construction equipment such as fuel and lubricants) affecting groundwater and/or surface water quality. Significance: *small, reversible, immediate, short-term, intermittent*. • Activities resulting in exposing bare soils may result in increased erosion and sedimentation into nearby surface waters (i.e., onsite wetlands, St. Mary's Bay). Significance: *small, reversible, immediate, short-term, intermittent*. **Construction of Containment Cells/Areas*:*** • Activities may result in construction-related debris or toxic materials (associated with construction equipment such as fuel and lubricants) affecting groundwater and/or surface water quality. Significance: *small, reversible, immediate, short-term, intermittent*.	• An erosion and sediment control plan will be developed for the site by the contractor for use during clearing, construction and operation activities that minimizes risk of sedimentation to the surrounding environment. • Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds. • No construction or infill material may be obtained from any coastal feature, namely a beach, dune, or coastal wetland. • Wash, refuel, and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering a waterbody. • Do not wash down equipment within a 30-meter buffer zone of a wetland, watercourse, or other identified environmentally sensitive area. • Any construction-related material used must be clean and non-toxic (i.e., free of fuel, oil, grease, and/or any contaminants). • Construction material and debris is not to become waterborne. • Weather conditions are to be assessed daily to determine the risk of extreme weather in the project areas. Avoid work during periods when ECCC has issued a rainfall warning for the work area. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on site. • Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, and it must be on-site. Spill equipment will include, as a minimum, at least one 250 L (i.e., 55 gallon) overpack spill kit containing items to prevent a spill from spreading; absorbent booms,

• Activities resulting in exposing bare soils may result in increased erosion and sedimentation into nearby surface waters (i.e., onsite wetlands, St. Mary's Bay). Significance: *small, reversible, immediate, short-term, intermittent*. ***DMMS Operation:*** • Release of contaminants (e.g. COPCs (See Appendix D for list) into nearby waterway(s) during rain events and surficial run-off. Significance: *moderate, reversible, local, long-term, intermittent.* • Release of contaminants from stockpiled material into groundwater. Significance: *moderate, reversible, immediate, long-term, intermittent*. ***Accidents/Malfunctions:*** • Release of hazardous materials into nearby waterway(s) and/or ground water from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *Moderate, reversible, immediate, short-term, once.*	pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633). • The existing wooded areas along portions of the site boundaries will be maintained. The wooded and vegetated areas in PID 30163331 will provide a long-term natural filter to control runoff during placement of dredged sediment as well as during rain events and spring freshets. • The containment cell will be designed, and the site management and monitoring plan will be developed to prevent off-site surface water / groundwater impacts. • The containment cell will be lined with an impermeable layer that will prevent potentially contaminated leachate from the dredged sediment from migrating to groundwater over time. A drainage blanket (i.e. permeable layer of rock/gravel) will be installed at the base of the berm along the northeast corner of the lined cell to allow water to drain from the cell into the ditching system along the access road. A culvert will be installed under the access road along the east side of the lined section of the cell to allow water to flow towards St. Mary's Bay into vegetated areas downgradient and away from potential ground water users located upgradient. Water from the containment area will be monitored as part of the long term monitoring of the site to ensure site runoff reaching St Mary's Bay meets applicable guidelines. • Ditching surrounding the access roads and containment area will be designed to direct clean surface flow around and away from the site and direct sediment laden water into vegetated areas within the property. • Avoid placing dredge material within 30 m of a watercourse or wetland including St. Mary's Bay. • A site management and monitoring plan will be developed and implemented to monitor for potential offsite impacts to surface water and groundwater quality resulting from site activities. Should monitoring indicate potential issues, an adaptive management approach (e.g., removal of material, remediation of site, etc.) will be followed, and additional mitigation measures will be implemented.
Valued Component: Wetlands	
Transportation of Materials and Equipment: • **None** ***Site Clearing:*** • Clearing activities may result in dirty site runoff or toxic materials associated with heavy equipment such as fuel and lubricants affecting groundwater and/or surface water quality, in wetlands. Significance: *small, reversible, immediate, short-term, once*. ***Access Road Construction:*** • Access road construction activities may result in dirty site runoff or toxic materials associated with heavy equipment such as fuel and lubricants affecting groundwater and/or surface water quality, in wetlands. Significance: *small, reversible, immediate, short-term, once*. **Construction of Containment Cells/Areas*:*** • DMMS construction activities may result in construction-related debris or toxic materials (associated with construction equipment such as fuel and lubricants) affecting groundwater and/or surface water quality, in wetlands. Significance: *small, reversible, immediate, short-term, once*.	• Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds. • No construction or infill material may be obtained from any coastal feature, namely a beach, dune, or coastal wetland. • Wash, refuel, and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water. • Do not wash down equipment within a 30-meter buffer zone of a wetland, watercourse, or other identified environmentally sensitive area. • Any construction-related material used must be clean and non-toxic (i.e., free of fuel, oil, grease, and/or any contaminants). • An Erosion and Sediment Control Plan will be developed for the site that minimizes risk of sedimentation to the surrounding environment. Construction material and debris is not to become waterborne. • Weather conditions are to be assessed daily to determine the risk of extreme weather in the project areas. Avoid work during periods when ECCC has issued a rainfall warning for the work area. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance. • Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, and it must be on-site. Spill equipment will include, as a minimum, at least one 250 L (i.e., 55

DMMS Operation: • Release of contaminants and/or increased sedimentation into nearby wetland(s) during rain events and surficial run-off. Significance: *small, reversible, local, long-term, intermittent.* ***Accidents/Malfunctions:*** • Release of hazardous materials into nearby wetland(s) from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, short-term, once.*	gallon) overpack spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633). • The existing wooded areas along portions of the site boundaries will be maintained. The wooded and vegetated areas in PID 30163331 will provide a long-term natural filter to prevent runoff during placement of dredged sediment as well as during rain events and spring freshets. • A minimum 30 m buffer will be implemented around the onsite wetlands. • The containment cell will be designed, and the site management and monitoring plan will be developed to prevent off-site surface water / groundwater impacts. • The containment cell will be lined with an impermeable layer that will prevent water and leachate from the dredged sediment from migrating to groundwater over time. • Ditching surrounding the access roads and containment area will be designed to direct clean surface flow around and away from the site and direct sediment laden water into vegetated areas within the property. • All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline, and other petroleum products. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site.
Valued Component: Terrestrial Species and Habitat	
Transportation of Materials and Equipment: • Potential disturbance of terrestrial wildlife resulting from increased traffic to the site. Significance: *small, reversible, immediate, short-term, intermittent*. ***Site Clearing:*** • Potential direct mortality of terrestrial wildlife during clearing activities. Significance: *small area, reversible, immediate, short-term, once.* • Removal of vegetation may cause reduction of habitat for terrestrial wildlife. Significance: *small area, reversible, immediate, long-term, once.* ***Access Road Construction:*** • Activities may result in construction-related debris or toxic materials (associated with construction equipment such as fuel and lubricants) affecting soil and/or surface water quality, which terrestrial species may have direct contact with and/or ingest. Significance: *small, reversible, immediate, short-term, intermittent.* • Potential disturbance of terrestrial wildlife during construction activities. Significance: *small, reversible, immediate, short-term, intermittent.* **Construction of Containment Cells/Areas*:*** • Activities may result in construction-related debris or toxic materials (associated with construction equipment such as fuel and lubricants) affecting soil and/or surface water quality, which terrestrial species may have direct contact with and/or ingest. Significance: *small, reversible, immediate, short-term, intermittent.*	• Minimize disturbance to all species on-site and adjacent areas during entire course of work. • Dispose of food and other types of waste that may attract scavenging species in an appropriate manner. If no appropriate disposal option exists on-site, dispose of waste in a proper location off-site. • All machinery will be well muffled and maintained in proper working order and must be regularly checked for leakage of lubricants or fuel. • Ensure that machinery arrives on-site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds. • Waste or any miscellaneous unused materials must be recovered for either disposal in a designated facility or placed in temporary storage. Under no circumstances will materials be deliberately thrown into the terrestrial environment. • A site management and monitoring plan will be developed, which will outline mitigation measures to minimize negative interactions with terrestrial wildlife. • Observations of wildlife use of the site will be noted, and additional mitigation measures may be implemented to address potential negative impacts as required. • Prior to starting on-site work activities (daily), a check for wildlife will be done by conducting a thorough visual inspection of the work area and immediate surroundings. • All activities, vehicles, and materials will be restricted to the designated work area. • To reduce potential for direct bat mortality, tree/vegetation clearing during the maternity / summer roosting period (May to August) and fall mating season (September to October) should be avoided. • All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline, and other petroleum products.

• Potential disturbance of terrestrial wildlife during construction activities. Significance: *small, reversible, immediate, short-term, intermittent.* ***DMMS Operation:*** • The use of heavy equipment may temporarily disturb terrestrial wildlife species. Significance: *small, reversible, immediate, short-term, intermittent.* ***Accidents/Malfunctions:*** • Release of hazardous materials from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, short-term, once.*	• Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site.
Valued Component: Aquatic Species and Habitat	
Transportation of Materials and Equipment: • None ***Site Clearing:*** • None ***Access Road Construction:*** • None **Construction of Containment Cells/Areas*:*** • None ***DMMS Operation:*** • Release of contaminants (See Appendix D for list) into nearby waterway(s) during rain events and surficial run-off, which aquatic species may have direct contact with and/or ingest. Significance: *moderate, reversible, local, medium-term, intermittent.* • Potential for unacceptable risks to aquatic life should sediment leachate containing contaminants e.g. COPCs (See Appendix D for list) migrate to the Atlantic Ocean. Significance: *moderate, reversible, local, short-term, intermittent.* ***Accidents/Malfunctions:*** • Release of hazardous materials into nearby waterway(s) from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, short-term, once.*	• Any construction-related material used must be clean and non-toxic (i.e., free of fuel, oil, grease, and/or any contaminants). • Construction material and debris are not to become waterborne. Do not dispose of any materials or waste into aquatic environment. • No construction or infill material may be obtained from any coastal feature, namely a beach, dune, or coastal wetland. • The containment cell will be designed, and the site management and monitoring plan will be developed to avoid off-site surface water / groundwater impacts. Perimeter ditches and silt fencing with check dams will also be constructed to control surface water flow on the site. Drainage from the ditches will flow to a sediment trap consisting of standard hay bales embedded into the ground before reaching the Ocean. Water from the containment area will be monitored as part of the long term monitoring of the site to ensure site runoff reaching St Mary's Bay meets applicable guidelines. • Weather conditions are to be assessed daily to determine the risk of extreme weather in the project areas. Avoid work during periods when ECCC has issued a rainfall warning for the work area. • An Erosion Control Plan will be developed for the site that minimizes risk of runoff to the aquatic environment. • Onsite, crews must have emergency spill clean-up equipment adequate for the activity involved, and it must be on-site. Spill equipment will include, as a minimum, at least one 250 L (i.e., 55 gallon) overpack spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633). • A site management and monitoring plan will be developed that will outline mitigation measures to minimize negative interactions with aquatic species and habitat.
Valued Component: Terrestrial Soils	
Transportation of Materials and Equipment: • None ***Site Clearing:*** • Clearing activities may result in direct impacts (i.e., compaction, topsoil loss) or release of toxic materials (associated with heavy equipment such as fuel and	• Minimize the project footprint to the extent possible and prevent vehicle movement outside the marked construction area. • Stockpile topsoil separately for reuse during site restoration. Do not mix topsoil with subsoil. • Do not bury any debris or waste materials onsite. • Any debris or waste material will be disposed of in a provincially approved manner. • Transport hazardous materials and hazardous waste in compliance with the *Transportation of Dangerous Goods Act.*

lubricants) affecting local soil. Significance: *small, reversible, immediate, short-term, once.* ***Access Road Construction:*** • Access road construction activities may result in direct impacts (i.e., compaction, topsoil loss) or release of toxic materials (associated with heavy equipment such as fuel and lubricants) affecting local soil. Significance: *small, reversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:*** • DMMS construction activities may result in direct impacts (i.e., compaction, topsoil loss) or release of toxic materials (associated with heavy equipment such as fuel and lubricants) affecting local soil. Significance: *small, reversible, immediate, short-term, intermittent.* ***DMMS Operation:*** • Activities, such as the disposal of the dredging spoils, may result in toxic materials (associated with construction equipment such as fuel and lubricants) or contaminated sediment affecting soil. Significance: *moderate, reversible, local, long-term, intermittent.* • The concentrations of hot water soluble (HWS) boron in the sediments have the potential to adversely impact terrestrial plants if released into local soils. Significance: *moderate, reversible, long-term, intermittent.* ***Accidents/Malfunctions:*** • Release of hazardous materials from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, short-term, once.*	• Eliminate free board spillage when excavating, loading, and hauling excavated material. • Trucks transporting excavated material will have watertight boxes. • Do not overload trucks when hauling excavated material. • Maintain trucks clean and free of mud, dirt, and other foreign matter. • Secure contents against spillage. Avoid potential release of contents and of any foreign matter onto highways, roads, and access routes used for the work. Immediately clean any ground spills and soils to extent directed by authority having jurisdiction. • Ensure machinery arrives on-site clean and free of mud or plant material in order to prevent introduction of alien invasive species. • Do not dump petroleum products or any other deleterious substances on the ground. • Be diligent and take all necessary precautions to avoid spills and contamination of the soil (both surface and subsurface) when handling petroleum products on-site and during fueling and servicing of vehicles and equipment. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site consisting of at least one 250-litre overpack spill kit for containment and cleanup of spills. • In the event of a petroleum spill, immediately notify the PSPC Project Manager. Perform cleanup in accordance with all regulations and procedures stipulated by authority having jurisdiction. • Measures outlined in the site management and monitoring plan will be established to minimize the impacts of the proposed DMMS during the operational phase. This will include design details and maintenance to minimize the impacts to soil and terrestrial habitat over the lifetime of the site, such as installation and maintenance of appropriate disposal cell liner and berms. • The containment cell will be designed, and the site management and monitoring plan will be developed to avoid off-site soil impacts. Should monitoring indicate potential issues, an adaptive management approach will be followed, and additional mitigation measures will be implemented (e.g., removal of material, remediation of site, etc.).
Valued Component: Air Quality	
Transportation of Materials and Equipment: • Use of heavy machinery may cause short-term, elevated dust and emissions, including greenhouse gasses, during transportation of material and equipment. Significance: *small*, *reversible, immediate, short-term, intermittent*. ***Site Clearing:*** • Use of heavy machinery may cause short-term, elevated dust and emissions at the site. Significance: *small*, *reversible, immediate, short-term, once*. ***Access Road Construction:*** • Use of heavy machinery may cause short-term, elevated dust and emissions, including greenhouse gasses, at the site. Significance: *small*, *reversible, immediate, short-term, once*. **Construction of Containment Cells/Areas*:*** • Use of heavy machinery may cause short-term, elevated dust and emissions, including greenhouse gasses, at the site. Significance: *small*, *reversible, immediate, short-term, once*.	• Project vehicles and machinery will be maintained in good working order with appropriate mufflers and emissions abatement equipment, such as catalytic converters. • Reduce emissions of air contaminants and greenhouse gases using a vehicle anti-idling policy. • Where possible dredged sediment will be placed at the site prior to periods of higher nearby land use by full and part-time residents and tourists to the area. • A site management and monitoring plan will be developed to minimize emissions. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site consisting of at least one 250-litre overpack spill kit for containment and cleanup of spills. • Excessive dust will be managed using application of water. Monitoring of dust levels will be conducted by the onsite construction manager, with special attention to dry days with high winds when significant earthworks are in progress. Temporary earth stockpiles may be covered if they are a significant source of dust. Waste oil must not to be used for dust control under any circumstances. • Reduce vehicle speeds onsite and along the unpaved Old Post Road to minimize dust generation. • Implement a complaints resolution protocol to record third party concerns of dust impacts and how the concern was addressed. Complaints received by any project personnel will be communicated immediately to the PSPC project manager and will be addressed as soon as reasonably possible.

DMMS Operation: • Use of heavy machinery may cause short-term, elevated dust and emissions, including greenhouse gasses, at the site. Significance: *small*, *reversible, immediate, short-term, intermittent*. ***Accidents/Malfunctions:*** • Release of hazardous (volatile) materials from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *small, reversible, immediate, short-term, once.*	• Site operations will not be conducted on days with high winds if dust issues are identified.
Valued Component: Sensory Disturbance (air/water, noise, odours and/or vibration)	
Transportation of Materials and Equipment: • Use of haul trucks for sediment transport and porting of large equipment will generate some added noise and vibration for local residents along the haul routes. Significance: *small*, *reversible, immediate, short-term, intermittent*. ***Site Clearing:*** • Use of heavy machinery may cause short-term, elevated noise levels at the site. Significance: *small*, *reversible, immediate, short-term, intermittent*. ***Access Road Construction:*** • Use of heavy machinery may cause short-term, elevated noise levels at the site. Significance: *small*, *reversible, immediate, short-term, intermittent*. • Noise and dust may be generated by construction activities. Significance: *small*, *reversible, immediate, short-term, intermittent*. **Construction of Containment Cells/Areas*:*** • Use of heavy machinery may cause short-term, elevated noise levels at the site. Significance: *small*, *reversible, immediate, short-term, intermittent*. • Noise and dust generated because of the construction activities. Significance: *small*, *reversible, immediate, short-term, intermittent*. ***DMMS Operation:*** • Short-term visible dust generated from dried sediment in the containment cell. Significance: *small*, *reversible, immediate, short-term, intermittent*. • Short-term locally detectible odours generated from organic content in the wet dredged sediment in the containment cell. Significance: *small*, *reversible, immediate, short-term, intermittent*. • Use of heavy machinery may cause short-term, elevated noise levels at the site. Significance: *small*, *reversible, immediate, short-term, intermittent*. ***Accidents/Malfunctions:*** • Release of hazardous materials from equipment malfunction, accidental spills, or unplanned serious events, such as collisions. Significance: *moderate, reversible, immediate, short-term, once.*	• To the extent possible, construction and operation activities (sediment placement) will be scheduled to avoid the peak tourism season, prior to periods of higher nearby land use by full and part-time residents and tourists to the area. • A site management and monitoring plan will be developed to minimize noise, odour, and dust. • Construction and operation activities must be carried out during hours agreed upon with the project manager and times acceptable to local authorities to mitigate disturbance to residents. o Based on Nova Scotia Environment and Labour (2005) guidelines, operations at the site should be completed between 7 am and 7 pm. • The dredged sediment will be allowed to vegetate naturally or hydroseeded, depending on the success of natural revegetation. The presence of vegetation on the material will prevent long-term windblown dust generation. • A Complaints Resolution Protocol will be available if odours persist, i.e., contact SCH Area Office in Yarmouth. Additional mitigation methods will be established to address lingering off-site odour (e.g., cover material, hydroseeding, etc.). • During site operations, maintaining a lower speed on the site and along Old Post Road will reduce dust produced by vehicles. Lower speeds will also reduce the need for use of “air-breaks” on trucks. • Develop a response plan that is to be implemented immediately in the event of a spill of a deleterious substance and keep an emergency spill kit on-site consisting of at least one 250-litre overpack spill kit for containment and cleanup of spills. • Dust suppression by the application of water will be employed when required. The project authority shall determine locations where water is to be applied, the amount of water to be applied, and the times at which it shall be applied. Waste oil must not to be used for dust control under any circumstances. • Site operations will not be conducted on days with high winds if dust issues are identified.
Valued Component: Landscape	

Transportation of Materials and Equipment: • None ***Site Clearing:*** • Preparation of the site will change the appearance of the property. Significance: *moderate, reversible, immediate, short-term, once.* ***Access Road Construction:*** • Preparation of the site will change the appearance of the property. Significance: *moderate, reversible, immediate, short-term, once.* **Construction of Containment Cells/Areas*:*** • Preparation of the site will change the appearance of the property. Significance: *moderate, reversible, immediate, short-term, once.* ***DMMS Operation:*** • Operation of the site will change the appearance of the property. Significance: *moderate, reversible, immediate, long-term, continuous.* ***Accidents/Malfunctions:*** • None	• The primary mitigation for potential impacts on the visual landscape is maintenance of existing wooded areas within the property along the site boundaries to reduce visibility of the containment facility from adjacent properties and along Old Post Road. It is anticipated that the number of vantage points from which project activities will be visible are few to none, as there is higher intervening ground screening the site from areas to the south and west, where most nearby residences are located. • Vegetated berms will be created to contain the dredged sediment. These berms will be allowed to revegetate which will reduce the visual contrast of the containment facility within the existing landscape. • Stockpiled dredged sediment will also be allowed to revegetate between applications, which may provide some visual continuity with the surrounding area. • Construction related exposed soil will be allowed to revegetate naturally; however, hydroseeding may be conducted in areas of high visibility or areas of high potential for erosion and sedimentation to minimize the time soil is exposed. • Control of site access by security fence and locked gate will prevent illegal dumping at the site.

27. Description of any Significant Adverse Environmental Effects of the project (after considering the application of mitigation measures):

Although the potential exists for short-term and/or medium-term residual environmental effects during the project, with the implementation of recommended mitigation measures, no significant adverse effects are anticipated. Residual effects will include minor increases in heavy truck traffic for a period of 2-3 weeks about once every 3-5 years. When harbour operational constraints allow, this activity will be scheduled outside the peak tourist season. During operation, the containment facility will temporarily displace a small area of terrestrial habitat and will be allowed to revegetate following site decommissioning. No impacts on local groundwater are anticipated but a proactive monitoring program is planned to confirm this prediction. The primary purpose of the project will be successfully realized in the continuing support of the regional fishing economy through maintenance of SCH via dredging.

28. Cumulative Effects:

Individual projects and/or project components may produce residual environmental effects that are not significant, but when combined with the effects of other project components or other projects and activities, these effects may become a concern, as they may cause a cumulative adverse effect. The Impact Assessment Registry lists the dredging and wharf replacement at the Centreville SCH as being in progress (82994) as another project proposed by DFO-SCH. The DMMS proposed in this document would allow the delivery and management of that material to a property in close proximity to the wharf.

Both properties that comprise DFRP No. 27952 are vacant. Observations during the QRA noted that one residential structure exists nearby on the opposite side of Old Post Road where there is a drilled domestic drinking water well and possibly an additional dug well. The QRA also reported exceedances of metals, toluene, and TPH in soils and groundwater already existing onsite.

In the past, projects completed at Sandy Cove East, Centreville SCH, as well as surrounding SCH properties that share the Digby Neck, have primarily involved general operation and maintenance of an active commercial fishing harbour and maintenance dredging of the channel and basin to maintain/improve the harbour in serving the commercial fishing industry.

Environmental effects resulting from maintenance dredging projects include:

- Alteration of fish habitat;
- Potential death of sessile fish species;
- Temporary disturbance to pelagic fish species;
- Temporary disturbance to terrestrial wildlife and birds;
- Potential degradation of marine water quality;
- Potential impacts on marine sediment/soils;
- Potential disturbance/destruction of culturally significant artifacts;
- Temporary reduction in air quality (dust and noise) and increased emissions from construction equipment, vehicle traffic and fishing vessels.

With proper implementation of mitigation measures, significant environmental effects resulting from these past projects were avoided.

All potential environmental impacts resulting from any future projects will be assessed separately under the *IAA*. It is anticipated that future SCH dredging activities that are connected to disposal at the Sandy Cove DMMS will be conducted in separate years or sequentially within the same year such that there is no overlap between direct effects. The accumulated sediments at the DMMS have been anticipated in the design and are accounted for.

The project under assessment is not projected to have a significant cumulative adverse effect considering past and potential future projects. There are no other predicted effects that may result from the proposed construction activities. With appropriate planning and implementation of effective mitigation measures, such negative impacts can be avoided.

29. Climate Change/Sustainability:

Considering and addressing climate change aspects early on during the initial planning and design phases of the project will work to address potential impacts during the DMMS construction and operation.

Impacts of climate change to this project could potentially result from increased frequency and intensity of storm events that could affect the construction schedule, potentially damage construction equipment, and increase potential for runoff and

erosion. Significance of these effects is expected to be small to moderate, reversible, local, short-term, intermittent. Proper planning and monitoring of weather warnings issued by ECCC and following erosion control measures that will be included in the site management and monitoring plan will help mitigate these potential impacts.

The project also has the potential to contribute to climate change such as reduction in carbon storage (i.e., removal of woody material), increase in air emissions and green house gasses (GHGs) through various activities such as material procurement, dust generation and combustion of fossil fuels. Mitigation measures identified in Section 26 above will act to reduce potential impacts resulting from the project with regards to contributing to climate change.

30. *Fisheries Act*, *Species at Risk Act and/or Migratory Birds Convention Act* permits or authorizations*)* and general follow-up of the Mitigation Measures*:*

A site management and monitoring plan will be developed and implemented to ensure mitigation measures developed for this project are effective and the predictions of this assessment are accurate. Adaptive management will be implemented if monitoring data indicates exceedances of predicted effects.

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CONCLUSION

32. Conclusion on Significance of Adverse Environmental Effects (Sections 82-83):
DFO-SCH has evaluated the project in accordance with Section 82 of the IAA, 2019. Based on this evaluation, the department has determined that the project is not likely to cause significant adverse environmental effects with mitigation and therefore can proceed using mitigation measures as outlined.

Prepared by: _____ **Date:** 21-Nov-2023

Name: Garrett Bell, CET

Title: Senior Environmental Technologist, WSP E&I Canada Ltd.

Reviewed by: Burley, Scott Digitally signed by: Burley, Scott DN: CN = Burley, Scott C = CA O = GC OU = PWGSC-TPSGC Date: 2023.11.22 10:36:47 -04'00' **Date:**

Name: Scott Burley, M.Sc.

Title: Senior Environmental Specialist, PSPC

Approved by: Deveau, Steven Digitally signed by Deveau, Steven Date: 2023.11.28 12:20:35 -04'00' **Date:** _____

Name: Steven Deveau, P.Eng.

Title: Senior Project Engineer, DFO-SCH

DECISION

33. Fisheries and Oceans Canada – Small Craft Harbours

☒ **The project is not likely to cause significant adverse environmental effects, and DFO-SCH may exercise its power, duty, or function.**

☐ **The project is likely to cause significant adverse environmental effects, and DFO-SCH has decided not to exercise its power, duty, or function.**

☐ **The project is likely to cause significant adverse environmental effects, and DFO-SCH will refer the project to the Governor in Council to determine if the significant adverse environmental effects are justified in the circumstances**

Approved by: Deveau, Steven Digitally signed by Deveau, Steven Date: 2023.11.28 12:20:59 -04'00' **Date:** _____

Name: Steven Deveau, P.Eng.

Title: Senior Project Engineer, DFO-SCH

APPENDIX A
Figures

LEGEND:

217 NOVA SCOTIA HIGHWAY ROUTE

PROPOSED HAUL ROUTE(S)

SOURCES: BASEMAP(S) MODIFIED AFTER GEOGRATIS NTDB,MAPS 021A05, 021A12, 021B08, 021B09, 2013.
INSET IMAGERY: BING IMAGERY; © 2022 MICROSOFT CORPORATION © 2022 MAXAR © CNES (2022) DISTRIBUTION AIRBUS DS.

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CLIENT:
Public Services and Procurement Canada / Services Publics et Approvisionnement Canada

wsp

PROJECT:
PROPOSED DREDGE MATERIAL MANAGEMENT SITE (DMMS) SANDY COVE, DIGBY COUNTY, NS

TITLE:
HAUL ROUTE FROM CENTREVILLE TO DMMS

DWN BY:	DSGN'D BY:	CHK'D BY:	CHK'D (LEAD):
DM	DM	JK	CT

DATUM:	SCALE:
NAD83	AS SHOWN

PROJECTION: UTM ZONE 19 NORTH

PROJECT NO:	REV. NO:
TE221207	1

REV. DATE:	FIGURE NO:
2023/09/11	1

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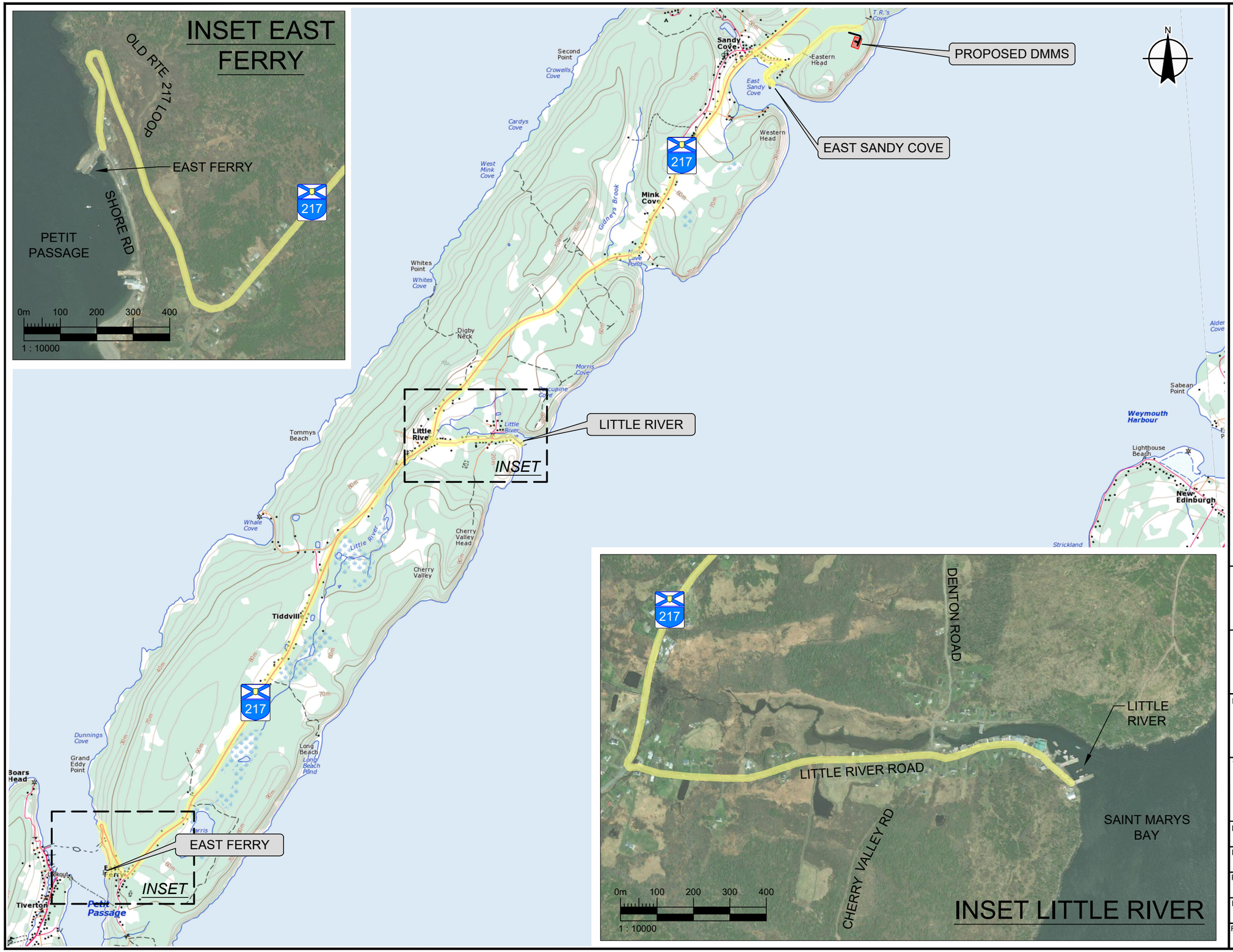

LEGEND:

217 NOVA SCOTIA HIGHWAY ROUTE

PROPOSED HAUL ROUTE(S)

SOURCES: BASEMAP(S) MODIFIED AFTER GEOGRATIS NTDB,MAPS 021A05, 021A12, 021B08, 021B09, 2013.
INSET IMAGERY: BING IMAGERY; © 2022 MICROSOFT CORPORATION © 2022 MAXAR © CNES (2022) DISTRIBUTION AIRBUS DS.

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1 : 50000

CLIENT:

Public Services and Procurement Canada / Services Publics et Approvisionnement Canada

wsp

PROJECT:
PROPOSED DREDGE MATERIAL MANAGEMENT SITE (DMMS) SANDY COVE, DIGBY COUNTY, NS

TITLE:
HAUL ROUTES FROM EAST FERRYAND LITTLE RIVER TO DMMS

DWN BY:	DSGN'D BY:	CHK'D BY:	CHK'D (LEAD):
DM	DM	JK	CD

DATUM:	SCALE:
NAD83	AS SHOWN

PROJECTION: UTM ZONE 19 NORTH

PROJECT NO:	REV. NO:
TE221207	1

REV. DATE:	FIGURE NO:
2023/09/11	2

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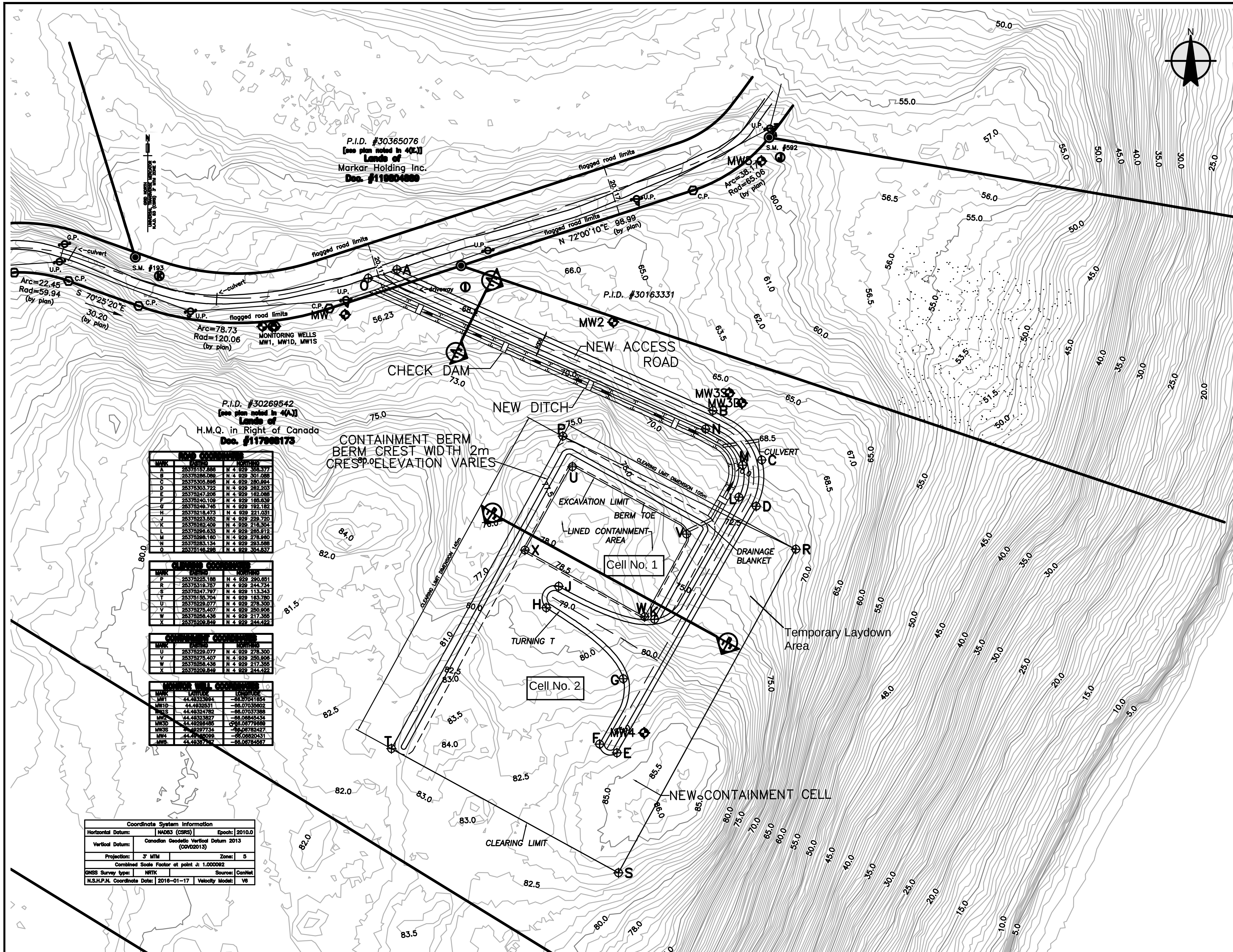

ROAD COORDINATES		
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B	25375286.089	N 4 929 301.088
C	25375305.898	N 4 929 280.994
D	25375303.722	N 4 929 262.203
E	25375247.206	N 4 929 162.088
F	25375240.109	N 4 929 165.639
G	25375249.745	N 4 929 192.182
H	25375218.473	N 4 929 221.031
J	25375223.552	N 4 929 229.720
K	25375262.409	N 4 929 216.304
L	25375296.633	N 4 929 265.912
M	25375298.160	N 4 929 278.960
N	25375283.134	N 4 929 293.588
O	25375146.298	N 4 929 354.837

CLEARING COORDINATES		
MARK	EASTING	NORTHING
P	25375225.188	N 4 929 290.651
R	25375319.757	N 4 929 244.734
S	25375247.797	N 4 929 113.343
T	25375155.704	N 4 929 163.780
U	25375229.077	N 4 929 278.300
V	25375275.407	N 4 929 250.906
W	25375258.436	N 4 929 217.355
X	25375209.849	N 4 929 244.422

CONTAINMENT COORDINATES		
MARK	EASTING	NORTHING
U	25375229.077	N 4 929 278.300
V	25375275.407	N 4 929 250.906
W	25375258.436	N 4 929 217.355
X	25375209.849	N 4 929 244.422

MONITOR WELL COORDINATES		
MARK	LATITUDE	LONGITUDE
MW1	44.49323994	-66.07041654
MW1D	44.4932531	-66.07035602
MW1S	44.49324782	-66.07037388
MW2	44.49323827	-66.06845434
MW3D	44.49296485	-66.06779689
MW3S	44.49297734	-66.06782427
MW4	44.49[illegible]8099	-66.06820431
MW5	44.49387[illegible]7	-66.06784567

Coordinate System Information			
Horizontal Datum:	NAD83 (CSRS)	Epoch:	2010.0
Vertical Datum:	Canadian Geodetic Vertical Datum 2013 (CGVD2013)		
Projection:	3° MTM	Zone:	5
Combined Scale Factor at point J: 1.000092			
GNSS Survey type:	NRTK	Source:	CanNet
N.S.H.P.N. Coordinate Date:	2016-01-17	Velocity Model:	V6

LEGEND:

CLIENT:

Public Services and Procurement Canada / Services Publics et Approvisionnement Canada

wsp

PROJECT:
PROPOSED DREDGE MATERIAL MANAGEMENT SITE (DMMS)
SANDY COVE, DIGBY COUNTY, NS

TITLE:
CONCEPTUAL DESIGN PLAN

DWN BY:	DSGN'D BY:	CHK'D BY:	CHK'D (LEAD):
DM	DM	JK	CT

DATUM: NAD83 (CSRS)
SCALE: 1:1500
PROJECTION: MTM ZONE 5
PROJECT NO: TE221207
REV. NO: 1
REV. DATE: 2023/09/11
FIGURE NO: 3

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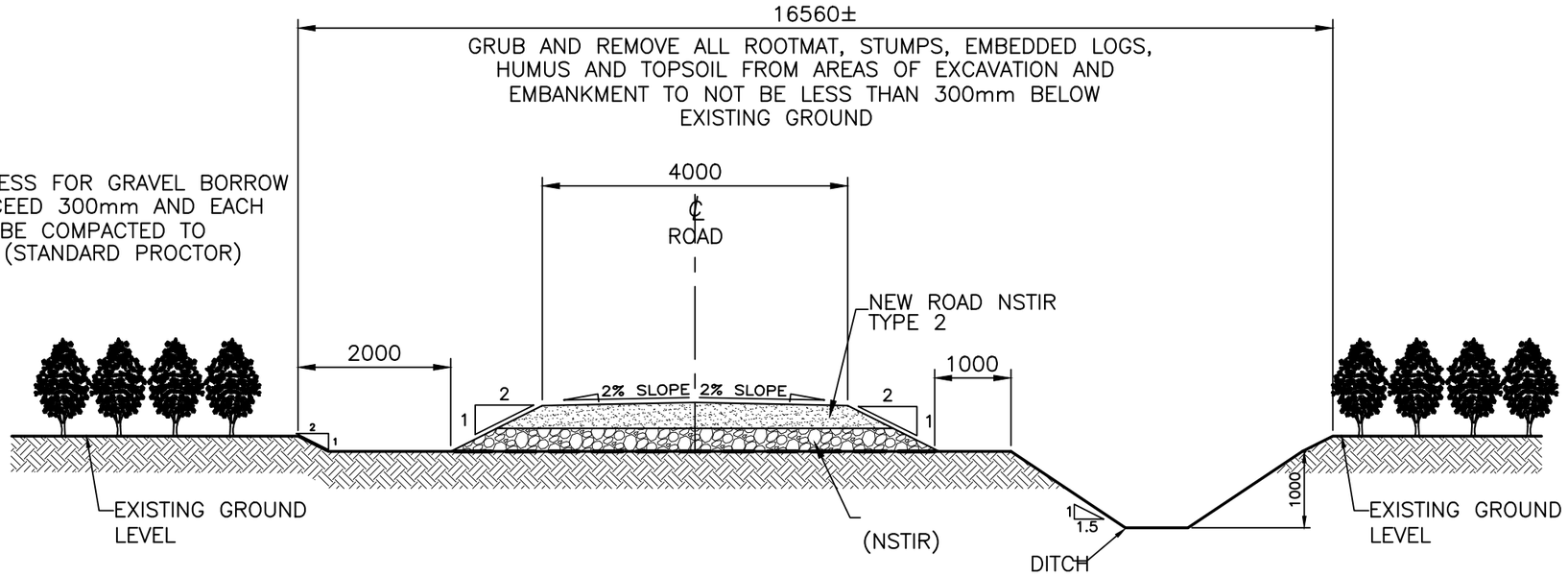
NOTE:

LIFT THICKNESS FOR GRAVEL BORROW NOT TO EXCEED 300mm AND EACH LIFT SHALL BE COMPACTED TO ASTM D698 (STANDARD PROCTOR)



ROAD CLEARING AND GRUBBING A 1 1

0m 0.5 1.0 1.5 2.0 2.5 3.0

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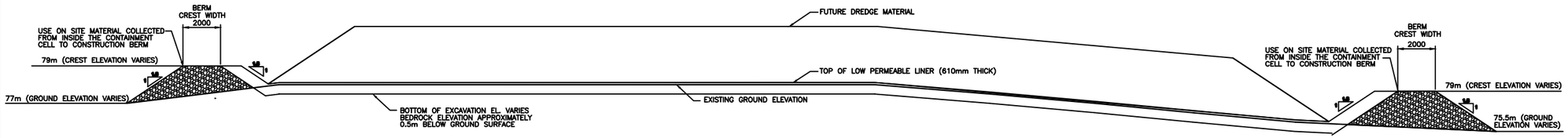

CONTAINMENT CELL B 1 2

0m 2 4 6 8 10

1 : 250

LEGEND:

CLIENT:

Public Services and Procurement Canada / Services Publics et Approvisionnement Canada

PROJECT:

PROPOSED DREDGE MATERIAL MANAGEMENT SITE (DMMS)
SANDY COVE, DIGBY COUNTY, NS

TITLE:

CONCEPTUAL SECTION AND DETAILS

DWN BY:	DSGN'D BY:	CHK'D BY:	CHK'D (LEAD):
DM	DM	JK	CT

DATUM:	SCALE:
NAD83 (CSRS)	AS SHOWN

PROJECTION: MTM ZONE 5

PROJECT NO:	REV. NO:
TE221207	1

REV. DATE:	FIGURE NO:
2023/09/11	4

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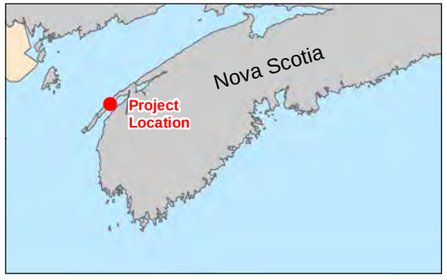

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 20N
2. Data Sources:
3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Project Location
- Top of Steep Embankment
- Wetland Buffer (15m)

Habitat Type

- Mature Hardwood Forest
- Mature Mixed Forest
- Mature Softwood Forest
- Immature Softwood Forest
- Tall Shrub Thicket / Immature Mixed Forest
- Tall Shrub Dominated Slope Swamp
- Tall Shrub Dominated Basin Swamp

- Roads
- Watercourse
- Wetlands (NSDNR)
- Property Boundary

0 50 100 metres
(At original document size of 11x17)
1:3,000

N

Stantec

Project Location
Sandy Cove, Digby
Nova Scotia

Client/Project 121417310-001
Public Works & Government Services Canada
Qualitative Risk Assessment,
Sandy Cove DMMS

Figure No.
5

Title
Site Habitat

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APPENDIX B
Maritimes Breeding Bird Atlas Data Summaries

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Species list for square 19gk33 (number of entries returned: 53)

Region	Square	Species	Breeding Evidence				Point Counts			
			Max BE	Categ	#Sq	Atlasser Name	#PC	%PC	Abun	#Sq
16	19GK33	Wood Duck	H	POSS	1	Eric L. Mills				
16	19GK33	Green-winged Teal	FY	CONF	1	Eric L. Mills				
16	19GK33	Common Loon	P	PROB	1	Eric L. Mills				
16	19GK33	Double-crested Cormorant	H	POSS	1	Eric L. Mills				
16	19GK33	Turkey Vulture	T	PROB	1	Dwayne Sabine				
16	19GK33	Broad-winged Hawk	H	POSS	1	Olivier Barden				
16	19GK33	Herring Gull	H	POSS	1	Olivier Barden				
16	19GK33	Mourning Dove	S	POSS	1	Olivier Barden				
16	19GK33	Downy Woodpecker	H	POSS	1	Becky S. Ellis				
16	19GK33	Northern Flicker	H	POSS	1	Eric L. Mills				
16	19GK33	Alder Flycatcher	T	PROB	1	Eric L. Mills				
16	19GK33	Eastern Kingbird	H	POSS	1	Olivier Barden				
16	19GK33	Blue-headed Vireo	A	PROB	1	Eric L. Mills				
16	19GK33	Red-eyed Vireo	S	POSS	1	Eric L. Mills				
16	19GK33	Blue Jay	FY	CONF	1	Dwayne Sabine				
16	19GK33	American Crow	FY	CONF	1	Olivier Barden				
16	19GK33	Common Raven	H	POSS	1	Olivier Barden				
16	19GK33	Tree Swallow	H	POSS	1	Olivier Barden				
16	19GK33	Barn Swallow	V	PROB	1	Eric L. Mills				
16	19GK33	Black-capped Chickadee	H	POSS	1	3 participants				
16	19GK33	Golden-crowned Kinglet	H	POSS	1	Eric L. Mills				
16	19GK33	Ruby-crowned Kinglet	H	POSS	1	Becky S. Ellis				
16	19GK33	Eastern Bluebird	P	PROB	1	Olivier Barden				
16	19GK33	Veery	H	POSS	1	2 participants				
16	19GK33	Swainson's Thrush	H	POSS	1	3 participants				
16	19GK33	Hermit Thrush	H	POSS	1	2 participants				
16	19GK33	American Robin	CF	CONF	1	Olivier Barden				
16	19GK33	Gray Catbird	S	POSS	1	Olivier Barden				

16	19GK33	European Starling	AE	CONF	1	Olivier Barden				
16	19GK33	Cedar Waxwing	H	POSS	1	2 participants				
16	19GK33	Black-and-white Warbler	S	POSS	1	Eric L. Mills				
16	19GK33	Common Yellowthroat	FY	CONF	1	Eric L. Mills				
16	19GK33	American Redstart	FY	CONF	1	Dwayne Sabine				
16	19GK33	Northern Parula	S	POSS	1	Eric L. Mills				
16	19GK33	Magnolia Warbler	S	POSS	1	Olivier Barden				
16	19GK33	Yellow Warbler	S	POSS	1	3 participants				
16	19GK33	Chestnut-sided Warbler	S	POSS	1	Eric L. Mills				
16	19GK33	Black-throated Blue Warbler	S	POSS	1	Eric L. Mills				
16	19GK33	Yellow-rumped Warbler	S	POSS	1	Eric L. Mills				
16	19GK33	Black-throated Green Warbler	FY	CONF	1	2 participants				
16	19GK33	Chipping Sparrow	CF	CONF	1	Dwayne Sabine				
16	19GK33	Savannah Sparrow	S	POSS	1	Olivier Barden				
16	19GK33	Song Sparrow	FY	CONF	1	Eric L. Mills				
16	19GK33	Swamp Sparrow	A	PROB	1	Eric L. Mills				
16	19GK33	White-throated Sparrow	A	PROB	1	Eric L. Mills				
16	19GK33	Dark-eyed Junco	S	POSS	1	2 participants				
16	19GK33	Northern Cardinal	FY	CONF	1	Dwayne Sabine				
16	19GK33	Indigo Bunting	FY	CONF	1	Dwayne Sabine				
16	19GK33	Red-winged Blackbird	FS	CONF	1	Eric L. Mills				
16	19GK33	Common Grackle	H	POSS	1	2 participants				
16	19GK33	Purple Finch	H	POSS	1	3 participants				
16	19GK33	American Goldfinch	P	PROB	1	2 participants				
16	19GK33	Evening Grosbeak	H	POSS	1	Olivier Barden				

APPENDIX C
Summary of Public Comments

Public Consultation Summary

Project Title: Proposed Dredge Material Management Site, Sandy Cove, Digby, Nova Scotia
Proponent: Fisheries and Oceans Canada – Small Craft Harbours

The following (**Table 1**) provides a summary of comments received during the public consultation period (listed by subject/item of concern). It is important to note that all public comments received in relation to the proposed project have been considered during the assessment of significant environmental effects in accordance with the *Canadian Impact Assessment Act*.

Table 1: Summary of Public Concerns with Regards to the Proposed Dredge Material Management Site at Sandy Cove, Digby County, Nova Scotia

Issue/Concern	Number of Comments Received	Comments Addressed in SEED
Potential aesthetic impacts/ and concerns related to site design such as: • What will the site look like? • Concerns that the site will effect the natural beauty of the area • Concerns that there will be Impacts on current views of the water and landscape	9	• A surrounding buffer of existing trees will be left to minimize visual aesthetics from surrounding properties and Old Post Road. Further, vegetated berms will be created to contain the dredged sediment. These berms will be designed to reduce the visual impacts of the site within the existing landscape. • Dredged sediment will be placed at the site prior to periods of higher nearby land use by full and part-time residents and tourists to the area, when possible. • A site management and monitoring plan will be developed to include measures to minimize noise, odour, and dust. • The site management and monitoring plan will incorporate design criteria to further reduce visual impacts of the site, such as establishing optimal berm height and design, re-vegetation measures and site access measures.
Concerns related to proximity to community /public areas/residential areas: • Potential health risks to adjacent residences and community of Sandy Cove • Impacts on quality of life of adjacent residences and tourists visiting area	10	• A surrounding buffer of existing trees will be left to minimize visual aesthetics from surrounding properties and the Old Post Road. Further, vegetated berms will be created to contain the dredged sediment. These berms will be designed to reduce the visual impacts of the site within the existing landscape.

		• Site activity at the DMMS property will be of a relatively low frequency (once every 2-3 years) as such the majority of the time the site will be inactive. • Dredged sediment will be placed at the site prior to periods of higher nearby land use by full and part-time residents and tourists to the area, when possible. • Measures outlined in the site management and monitoring plan will be established to minimize the off-site impacts of the proposed dredge material management site. This will include design procedures to minimize the impacts to soil, surface water, and groundwater quality over the lifetime of the site as well as mitigation to address potential air quality impacts associated with odour, noise, dust, and emissions resulting from site activities. • A groundwater monitoring plan will be implemented to confirm and monitor possible variations over time in the groundwater quality conditions at the site following sediment disposal activities. Should monitoring indicate potential issues, an adaptive management approach (e.g., removal of material, remediation of site, soil treatment) will be followed, and additional mitigation measures will be implemented.
Concerns related to increased truck traffic and condition of roads such as: • Concerns related to impacts of truck traffic through village of Sandy Cove • Damage to the already poorly maintained road • Potential to create a mess on roads during wet material transport • Speed vehicles travel on narrow road pose safety concerns • Concerns related to long term maintenance/management of Old Post Road • Safety concerns with regards to pedestrians and children present on the local roads • Safety concerns with truck traffic conflicting with public use of Old Post Road as a hiking trail	21	• Site activity at the DMMS property will be of a relatively low frequency (once every 2-3 years) as such the majority of the time the site will be inactive. • On average dredging activities would require approximately 80 truckloads over a 2 - 3 week period at an anticipated frequency of every 2 - 3 years. During larger dredge projects, this time frame may increase to 4 - 6 weeks, depending on the actual quantity. These events, however, would occur at a much lower frequency (on average every 10 years or more). • During transportation of the material to the site, signage will be placed at appropriate locations on Highway 217, Sandy Cove Road and Old Post Road to warn motorists and pedestrians of trucks entering the highway and slow-moving vehicles. • Proper handling procedures will be in place (e.g., use water tight boxes, do not overfill loads, etc.) during dredging and

		transport to the site to minimize spills of material onto the local roads.
Potential soil/surface water/groundwater/well contamination: • What measures are in place to ensure surrounding wells will not be contaminated/impacted • How will the groundwater be monitored • Concerns with material spilling out of trucks into fresh water and wells • Concerns of the potential contaminates present in material	13	• The containment cell will be constructed, and the site management and monitoring plan will be developed to avoid off-site surface water / groundwater impacts. As a component of the site management and monitoring plan, a long-term monitoring program will be developed to assess the effectiveness of mitigation measures and ensure off-site impacts are avoided. • The containment cell berms will be lined with an impermeable layer that will prevent water and leachate from the dredged sediment from migrating to groundwater over time. Ditching surrounding the access road and containment cell/areas will manage water flow to direct surface flow away from adjacent properties. • The groundwater monitoring plan will be implemented to confirm and monitor possible variations in groundwater quality over time following sediment disposal activities. Should monitoring indicate potential issues, an adaptive management approach (e.g., removal of material, remediation of site, etc.) will be followed, and additional mitigation measures will be implemented. • Best management practices and mitigation measures will be implemented to prevent releases of contaminated material and spills (e.g., proper maintenance and use of equipment on-site), and response measures will be developed in the event of an accident/malfunction.
Concerns related to the timing and extent of consultation • Concerns with the timing of public consultation • Concerns with scope of public consultation (i.e. concerns with who received letters and who did not) • Requests to extend the public comment period • Concerns with why public consultation was not initiated prior to purchasing property	11	Under section 82 of the IAA, DFO-SCH must determine whether the proposed DMMS is likely to cause significant adverse environmental effects. To help inform this decision, the following consultations were completed. • Project posted to Canadian Impact Assessment Registry on January 25, 2022 for public comment. • Notification letters (prepared in both official languages) were mailed to 25 property owners located along Sandy Cove Road and Old Post Road on January 25, 2022. • Notifications were published in the Chronicle Herald and Le Courier de la Nouvelle-Écosse, informing the public of the project on February 25, 2022.

		• As a follow-up to initial community feedback received, a public meeting was held at the North Shore & District Fire Hall on March 1, 2022. The meeting was also accessible virtually.
Concerns related to odour, noise and air emissions: • Concerns related to how odours will be managed • How long will odours persist • Concerns related to noise and dust from truck traffic and site operations	3	• Where possible dredged sediment will be placed at the site prior to periods of higher nearby land use by full and part-time residents and tourists to the area. • A site management and monitoring plan will be developed to minimize noise, odour, and dust. • Site activity at the DMMS property will be of a relatively low frequency (once every 2-3 years) as such the majority of the time the site will be inactive. • On average dredging activities would require approximately 80 truckloads over a 2 - 3 week period at an anticipated frequency of every 2 - 3 years. During larger dredge projects, this time frame may increase to 4 - 6 weeks, depending on the actual quantity. These events, however, would occur at a much lower frequency (on average every 10 years or more). • Heavy equipment on-site will be limited to the time necessary to spread the material. • Construction activities will be carried out during hours agreed upon with the project manager and times acceptable to local authorities to mitigate disturbance to residents. • Dust suppression by the application of water will be employed when required. Waste oil must not be used for dust control under any circumstances. • It is anticipated that due to the organic content of the material, odours are expected to occur during placement of dredged material at the site and immediately after which may persist for a short period of time following completion of placement. If odours persist, methods will be established to address odour, dust, and noise from site activities (i.e., contact SCH Area Office in Yarmouth). Additional mitigation measures may be utilized (e.g., cover material, hydroseeding, etc.).
Potential negative impacts on property values in the area	4	• A surrounding buffer of existing trees will be left to minimize visual aesthetics from surrounding properties and Old Post

		Road. Further, vegetated berms will be created to contain the dredged sediment. These berms will be designed to reduce the visual impacts of the site within the existing landscape. • Potential impacts to socio-economic factors such as tourism, recreation, and impacts on surrounding residential properties were assessed during the impact assessment process in the context of how potential off-site effects to the environment resulting from the project may impact these factors (tourism, recreation, etc.). • Site activity at the DMMS property will be of a relatively low frequency (once every 2-3 years) as such the majority of the time the site will be inactive. • Site mitigation measures developed during the impact assessment as well as the associated site management and monitoring plan will also address potential off-site impacts that could impact surrounding property values.
Concerns related to alternative options considered: • Questions with regards to why the proposed site was selected • Questions with regards to what other options were considered • Questions with regards to why disposal at sea is not an option for this material	9	Several alternative disposal options were assessed based on environmental, technical and economical factors when determining the preferred option for managing dredged sediment resulting from maintenance dredging at harbours on Digby Neck: • Disposal on private property - Historically, dredged sediment from Centreville and other local harbours has been transported and disposed on various private properties located in close proximity to the harbour. In NS, DFO is subject to provincial regulations and standards established in 2013 / 2014 with regards to disposal of dredge materials from harbour basins and channels that no longer permits disposal on private lands. As such, this option is no longer available as it does not adhere to provincial legislation. • Disposal at sea - Disposal at sea (DAS) is regulated by Environment and Climate Change Canada (ECCC) under Schedule 6 of the Canadian Environmental Protection Act (CEPA), 1999. To be suitable for DAS and in adherence with permit conditions, the material must meet specific criteria with regards to physical and chemical properties, which is verified through periodic sampling and analytical testing. Sample results have indicated that the physical and chemical composition of sediment may not meet permit

		criteria, and costs associated with obtaining the required permits are prohibitive given the relatively small dredge volumes. Therefore, disposal at sea is not a viable option for the material resulting from maintenance dredging at the nearby SCHs. • Alternative properties were considered during selection of the proposed dredge material management site. The site in Sandy Cove, however, was selected for its centralized location within Digby Neck, availability for purchase, location along the coast, and being topographically downgradient from residential properties. • Establishing a dredge material management site on the property located in Sandy Cove, Digby County, NS was determined to be the most feasible option to manage dredged sediment resulting from maintenance dredging at SCH located on Digby Neck. This option would result in relatively shorter trucking distances providing environmental benefits related to reduced greenhouse gas, noise, and dust emissions as well as economic benefits of reduced trucking costs. The site will also provide flexibility in terms of providing a management option of dredge material to accommodate dredging in time sensitive periods (e.g., following a storm) where access to the harbour may be impeded by accumulated sediment and would require immediate dredging.
Concerns related to impacts on socioeconomic, tourism and recreation: • There are many seasonal residents that may be negatively impacted by the project • Area is a popular tourist location • Old Post Road is a popular hiking and walking trail and is used to access TR Falls hiking trail. • Concerns related to potential impacts to TR Falls from site operations	12	• A surrounding buffer of existing trees will be left to minimize visual aesthetics from surrounding properties and the Old Post Road. Further, vegetated berms will be created to contain the dredged sediment. These berms will be designed to reduce the visual impacts of the site within the existing landscape. • Site activity at the DMMS property will be of a relatively low frequency (once every 2-3 years) as such the majority of the time the site will be inactive. • Where possible dredged sediment will be placed at the site outside periods of higher nearby land use by full and part-time residents and tourists visiting the area. • Measures outlined in the site management and monitoring plan will be established to minimize the off-site impacts of the proposed dredge material management site. This will

		include design procedures to minimize the impacts to soil, surface water, and groundwater quality over the lifetime of the site as well as mitigation to address potential air quality impacts associated with odour, noise, dust, and emissions resulting from site activities.
Concerns of municipal and construction waste and other hazardous materials disposed of at the site: • Concerns with other material potentially brought to the site (e.g. garbage, construction waste, etc.)	4	• The purpose of the proposed dredge material management site is to receive and manage sediment originating from maintenance dredging activities conducted at Small Craft Harbour located on Digby Neck and is not intended to receive waste material from other sources. • The site management and monitoring plan will include measures to deter and prevent the unauthorized disposal of material within the site which will be achieved through measures such as erecting signage, restricting site access, monitoring for unauthorized material disposal, etc.

APPENDIX D
Chemicals of Potential Concern

Chemicals of Potential Concern

Bulk Sediment	Sediment Leachate
Benzene	*Anthracene*
Petroleum Hydrocarbon Fraction F3	*Benzo(a)anthracene*
PAH Index of Additive Cancer Risk (IACR)	*Flouranthene*
Benzo(a)anthracene	*Phenanthrene*
Benzo(a)pyrene	*Pyrene*
Benzo(b+j+k)fluoranthene	*Aluminum*
Dibenzo(a,h)anthracene	*Arsenic*
Indeno(1,2,3-cd)pyrene	*Barium*
Naphthalene	*Boron*
Phenanthrene	*Chromium*
Aluminum	*Cobalt*
Arsenic	*Copper*
Copper	*Iron*
Iron	*Lead*
Lead	*Manganese*
Molybdenum	*Selenium*
Selenium	*Vanadium*
Tin	*Zinc*
Vanadium	
Zinc	
Hot water-soluble boron	
Sodium Absorption Ration (SAR	
Electrical Conductivity	

Note: Italicized COPCs exceed for aquatic life guidelines

Groundwater
Toluene
Modified TPH
Aluminum
Beryllium
Cadmium
Cobalt
Copper
Iron
Manganese
Nickel
Vanadium
Zinc

Note: Italicized COPCs exceed for aquatic life guidelines

Source: Stantec Consulting Limited. 2022a. Draft – Qualitative Risk Assessment – Dredge Material Management Site Sandy Cove, Digby County, Nova Scotia PID 30269542 and 30163331. March 31, 2022. Dartmouth, NS, File# 121417310.