PORT STANVAC OFFSHORE SANDS INVESTIGATION

Vibrocore Land Based Operations & Core Logs

Report to:

Department of Environment & Water (DEW) S.A.
Climate Change, Coast and Marine Branch
Environment, Heritage & Sustainability Division

By:

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Abbreviations & Acronyms

AB	Aquatic Biosecurity Pty Ltd
ADP	Adelaide Desalination Plant
AI	Acoustic Imaging Pty Ltd
BD	Bulk Density
BOC	Bottom of Core
c	coarse (sands)
cc/c	core catcher/cutter (1 unit)
CPB	Coast Protection Branch of SA Dept of Environment & Planning (1989)
CST	Central Standard Time Zone (Adelaide)
CDST	Central Daylight Savings Time Zone (daylight savings – summer Adelaide)
DEW	(South Australia) Department of Environment & Water
DGPS	Differential Global Positioning System
EP	Environmental Projects Pty Ltd (Adelaide, SA)
f	fine (usually referral to sand classification)
GOH	Geo-Ocean Horizons Pty Ltd (Adelaide, SA)
GPS	Global Positioning System
gr	gravel, gravelly (sediment classification)
incl	include
MESA	Mines & Energy of South Australia (mid to late 1990's)
m	metre
m.m	metre.metre
occ	occasionally
OSBM	O'Sullivans Beach Marina
PFAS	per and polyfluoroalkyl substance
PIRSA	Primary Industries & Resources of South Australia (+2000)
PHS	Precision Hydrographic Services Pty Ltd (Adelaide, SA)
PSD	particle size distribution
PSOSI	Port Stanvac Offshore Sands Investigation
Pt Stanvac	Port Stanvac [former Mobil Petroleum Plant w/ refinery & jetty S of Adelaide]
SA	South Australia
sl	slightly
TOC	Top of core
uwv	underwater video
v	very
vc	very coarse (usually referral to sand classification)
vf	very fine (usually referral to sand classification)
vbc	vibracore
AGD66	Australia Geodetic Datum 1966 (used in SA prior to 2000)
AGD84	Australia Geodetic Datum 1984 (used in SA prior to 2000)
AHD (m)	Australian Height Datum in metres
AMG (m)	Australian Map Grid Co-ordinates (easterly & northerly based on AGD66 or AGD84)
ANS	Australian National Spheroid (different from WGS84)
GDA94	Geodetic Datum of Australia 1994 (used in SA since 2000)
MGA (m)	Map Grid of Australia (easterly & northerly grid coordinates based on GDA94, in metres)
WGS84	World Geodetic Spheroid 1984 (different than ANS)
deg.deg	referenced to latitude (S) & longitude (E) in degrees.degrees
deg min sec	referenced to latitude (S) & longitude (E) in degrees minutes seconds
deg min.min	referenced to latitude (S) & longitude (E) in degrees minutes.minutes
E	east
N	north
S	south
W	west

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EXECUTIVE SUMMARY

Geo-Ocean Horizons Pty Ltd (GOH) was contracted by the South Australian Department of Environment & Water (DEW) to assist with the land-based vibracoring operations for the Port Stanvac Offshore Sands Investigation (PSOSI) in late August – October 2020. The PSOSI was part of a larger program by DEW, to examine external sand resources for the Adelaide beach replenishment. The GOH report (report reference Rice, RL 2020) is a summary of GOH's participation in the PSOSI from land based vibracore handling and processing (cutting & geological logging) and amalgamation of the geological core data. Acoustic Imaging P/L (Sept, 2020) integrated the geological core data with the June 2020 marine geophysical program (sub-bottom profiling) and identified two offshore sand prospects within the PSOS study area. GOH was not involved in the evaluation of the suitability of the collected samples for beach replenishment.

1.0 OVERVIEW PORT STANVAC OFFSHORE SANDS INVESTIGATION: MAY TO NOVEMBER 2020

DEW investigated the potential for offshore sand resources off Port Stanvac – O'Sullivans Beach Marina area for their Adelaide beach replenishment program during May-October 2020. The study area included the recent reduction of the Port Stanvac Exclusion Zone and, areas to the north of Port Stanvac and south of Port Stanvac to O'Sullivans Beach Marina in water depths between 10-20m (Figure 1) [*Background:* in 2019-2020, the Port Stanvac Exclusion Zone was reduced in size due to the structural removal of Port Stanvac Jetty and associated infrastructure to slightly above seabed resulting from the decommissioning of Port Stanvac Petrochemical Plant].

The main PSOSI Project participants were listed below including a summary of their roles:

- DEW: project managers and logistical support
- Precision Hydrographic Services Pty Ltd (PHS) and Acoustic Imaging Pty Ltd (AI) conducted hydrographic (bathymetric), acoustic backscatter and marine geophysical (sub-bottom) surveys over the Study Area in May-June 2020. Based on acquired acoustic backscatter data, some areas of interest in the Study Area, were identified as requiring further investigation for potential sand resources for beach replenishment via coring of the seabed (Precision Hydrographic Services P/L, 2020 including Acoustic Imaging P/L Appendix 1 of PHS Report (2020).
- Acoustic Imaging Pty Ltd (AI) was responsible for the marine geophysical survey with PHS & the amalgamation of PSOSI vibracore data with the sub-bottom marine geophysical transects and identification of potential sand resources based on those data sets (Acoustic Imaging P/L Appendix 1 of PHS Report (2020) & Acoustic Imaging P/L, Sept 2020 – Technical Note Rev1.0).
- Aquatic Biosecurity Pty Ltd (AB) was contracted to obtain 42 vibracores from selected locations within the Study Area (Aquatic Biosecurity Pty Ltd, 2020, Version 3).
- Geo-Ocean Horizons Pty Ltd (GOH) was contracted to geologically log SS01-SS42 vibracores and provide the core information to DEW and other contractors (this report)
- Environmental Projects Pty Ltd (EP) was contracted to oversee the environmental & sediment sampling program for the cores, including GIS data base, and provide the information to DEW and other contractors (Environmental Projects Pty Ltd, 2020).

The PSOSI was divided into 3 phases, after the hydrographic and marine geophysical investigations in May-June 2020 were completed (Precision Hydrographic Services P/L, 2020)

- Phase 1: obtain, log, sample and summarize 32 vibracores, SS01-SS32, over targeted sites within the Study Area to ground truth the acoustic backscatter and marine geophysical (sub-bottom profiles) acquired by PHS and AI [foundation for the August-September 2020 coring program] and satisfy requirements for environmental – contaminant sampling (Environmental Projects P/L, 2020).
- Phase 2: obtain, log, sample and summarize an additional 10 vibracores, SS33-SS42, in potential sand prospects in the southern and northern areas based on refined ground truthing of the vibracore data with the sub-bottom profiling [October 2020 coring program] (Acoustic Imaging P/L, Sept 2020; Environmental Projects P/L, 2020)
- Phase 3: amalgamate and summarize the core analytical and geological log data with the marine geophysical data into common data bases for the Study Area [various data bases from AB, EP, AI & GOH which were independently submitted to DEW].

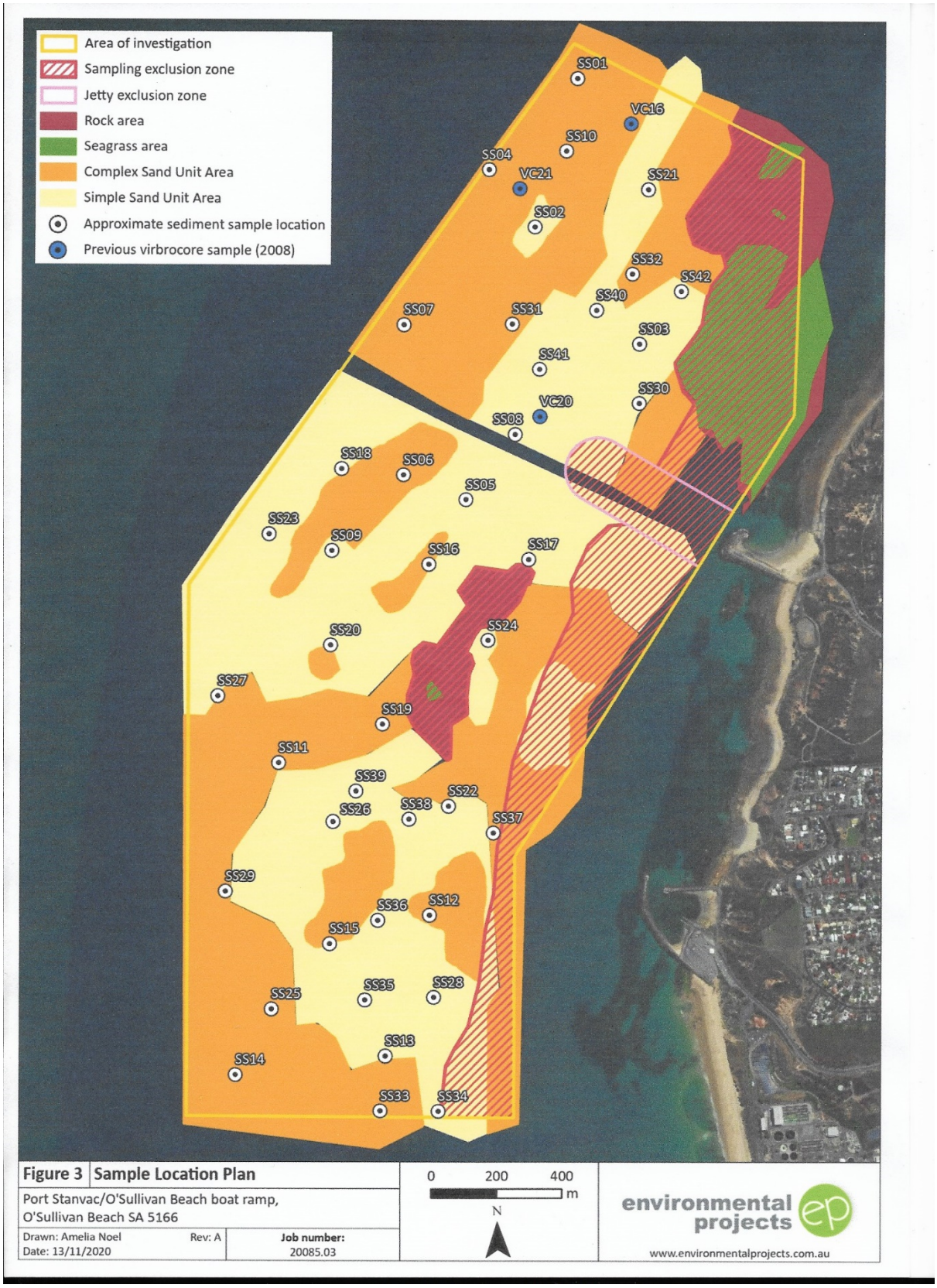

Figure 1: Port Stanvac Offshore Sands Investigation (2020) Vibracore Locations: Vibrocores SSS01 – SS42 Actual Locations (white circle). Vibracores VC16, VC20 & VC 21 (blue circle) from 2008 Adelaide Desalination Project (Rice, 2008). (Figure was re-produced from Acoustic Imagery P/L, June, 2020 &Sept 2020 reports combined with the GIS mapping data base from Environmental Projects P/L, 2020). Vibracores SS01-SS32 were obtained during August-September 2020 whilst SS33-SS42 were obtained on 13 October 2020.

2.0 VIBRACORE OPERATIONS: MARINE & LAND BASED LATE AUGUST TO MID-OCTOBER 2020

Vibracore operations were team based with co-ordination and co-operation amongst the various contractors and DEW.

- AB handled the marine based vibracore operations including transport of the uncut cores SS01-32 to O'Sullivan' Beach Marina (OSBM) and SS33-42 to GOH's facility for further land-based core logging and sub-sampling and details of the actual coring operations (weather, time/date, position, water depth per core; Aquatic Biosecurity P/L, 2020)
- EP assisted with the transport of the SS01-SS32 vibracores from OSBM dock to the temporary core cutting/logging/sampling facility at the OSBM Boat Storage Facility; oversaw and performed the required environmental sampling of each core whilst assisting GOH with logging, labelling and core photography (SS011-SS42); ensured instruments for core splitting and sampling were "de-contaminated" prior to use; delivered the core samples to the Analytical Laboratories; provided updated GIS maps on core locations etc.; provided analytical results to DEW (Environmental Projects P/L, 2020)
- GOH provided the infrastructure and marine geologist for operations directly related to core cutting/splitting/logging/photography for the late August-October 2020 field program; provided temporary storage facility for selected cores for the project; produced the geological core logs for SS01-SS42 and associated spreadsheet. GOH was not involved in the identification of the proposed vibracore sites within the Study Area nor participated in the marine based vibracore operations for obtaining the vibracores (Table 1; Appendices A & B)
- AI: provided the May-June and September – November 2020 marine geophysical data (sub-bottom profiles per core SS01-SS32) and areas of interest for further coring (SS33-SS42) and the interpretations of the acoustic backscatter and sub-bottom profiles, including super-imposing the core information with the respective sub-bottom profiles (Precision Hydrographic Services P/L, 2020, Acoustic Imaging P/L, 2020)
- PHS: conducted the hydrographic survey information May-June 2020 survey which laid the bathymetric foundation for the Aug-October 2020 vibracore survey [re: bathymetric data; Precision Hydrographic Services P/L, 2020] (Figure 1).
- DEW: project managers and support, particularly on the land based vibracore operations

2.1 Vibracore Operations

2.1.1 August-September Operations – Detailed Operations

Cores SS01-SS32 were obtained by AB using their OEM vibracore system during the 6-day period 25 August to 9 September 2020 (weather dependent; Aquatic Biosecurity Pty Ltd, 2020 Version4). Unreduced cores were transported to OSBM boat dock, usually in bundles of two (2). The cores were subsequently decanted and processed EP and GOH each day.

- EP was responsible for the environmental sampling and logging including quality control and handling of the collected samples [contaminants, PFAS, bulk density and particle size distribution (PDS)
- GOH was responsible for the operations involving core cutting, geological logging/photography and production of geological core log sheets for DEW and other contractors; selected cores were preserved by GOH in 6-month temporary storage (stratigraphic and representative cores)
- AI received GOH preliminary vibracore logs SS01-SS32 for correlation with marine geophysical data (acoustic backscatter and sub-bottom profiles)
- DEW was project manager and, also assisted with core cutting / logging operations and field operation support as required.

Cores SS33-SS42 were obtained by AB on 13 October 2020 and delivered, decanted, to GOH facility on 14 October 2020 [Note: no core was obtained for SS33 due to refusal].

- GOH geologist processed the cores on 15 October 2020 (core cutting /splitting/ logging/ photography/ preservation).
- EP sampled the cores for only bulk density (BD) and particle size distribution (PSD), where possible, on the 16 October 2020 at the GOH Facility [Note: environmental/contaminant samples were not required for these cores].
- AI received GOH preliminary vibracore logs SS33-SS42 for correlation with marine geophysical data
- One half of each of the nine (9) cores was preserved for future reference at the GOH facility (6-month temporary storage)
- DEW was project manager including the distribution of data amongst the various contractors.

2.1.2 Core Cutting to Core Logging Operations

GOH supplied the following infrastructure and documentation for the core cutting to processing at the OSBM Boat Storage Area and GOH Facility (Figure 2a):

- ❖ JHA documents for core processing (handling)
- ❖ Appropriate protective clothing for GOH personnel
- ❖ Core cutting area (Figure 2a)
  - core cutting boxes on wooden trestles (3 – 1m length boxes)
  - circular saw for core cutting (Note: supplied by AB for SS01-SS32; GOH for SS34-42)
  - support tools including chisel, hammer & knife for splitting & display
  - appropriate PPE including safety helmet with visor for core cutting personnel (DEW & GOH)
  - ear plugs and ear muffs for core cutting operations
  - safety glasses & protective gloves for core cutting
  - rags, brushes for cleaning of core barrels
  - electrical tape for core caps (colour coded)
  - additional de-contaminated core caps
  - hand wash for COVID19
  - 1st aid kit & fire extinguisher
  - Garbage bags for waste/rubbish.

GOH, EP, AB, and DEW efficiently co-ordinated the combined set up and use at the Core Processing Areas at the OSBM Boat Storage Facility (Figure 2b):

- ❖ Core Processing Area for Core Display, Sampling & Logging set up at OSBM Boat Storage Facility)
  - Digital camera & Tripod (PENTAX Optio W60 waterproof camera w/ SD card; data downloaded each day)
  - Munsell Soil Chart for core colour identification
  - core processing pallet
  - support equipment & supplies for sampling and logging of the cores
  - water proof paper for labelling cores
  - white board for core identification for photos
  - spare xylene free marking pens for labelling cores
  - tape measures for core measurements and photos
  - spare sample bags
  - spare end caps
  - small chairs
  - rinse, wash, rinse buckets, brushes, dust bins, towels, rags for cleaning sampling utensils
  - de-mineralized water
  - dilute hydrochloric acid (10%) & material data sheet
  - appropriate PPE as needed including protective gloves
  - tool kit
  - first aid kit

- rubbish bin & liners for collection of core related waste & recycling
- marque for sampling in shade (not direct sun).

EP supplied the following for the core sampling and logging tasks (Figure 2b):

- ❖ Chain of Custody sample sheets & documentation
- ❖ Various sample vials/bags & marking pens as required
- ❖ Esky for keeping samples cool
- ❖ Storage containers for samples
- ❖ Protective glasses, gloves & other PPE for core sampling and logging
- ❖ White polycarbonate half tubing for core halves (photography background & sampling)
- ❖ Decontamination material for utensils used in core sampling
- ❖ Storage container for disused core matter.

2.1.3 Labelling of Core Barrel

GOH labelled the external surface of the core barrel(s) for cutting, logging and preservation (when required) as follows:

Example: SS01 (0.00-0.31m)
<----------

Core ID: SS01 (VC08) (see Note below)
"SS01" identified the core as vibracore in the DEW & EP data bases
01: site identification number

Arrow: Points to the Top of Core (TOC; top of seabed surface) "**<**----------"

Core Section Length: SS01 = 0.00 to 0.31m
Note: cores were cut to final recovery length minus core catcher/cutter (usually 3-4cm removed)

End Cap (core cap) Tape Colour:
Green/Yellow = Top of Core (TOC) Red/Blue = Bottom of Core (BOC)

Abbreviations: TOC = top of core (surface)
BOC = bottom (end of) core (deepest into seabed)
cc/c = core catcher/cutter

core catcher/cutter (cc/c) contents, when applicable were photographed and logged with the core

Penetration Length: *external* measurement (m.m) from *external* TOC identified by barrel scour/etched/marking pen marks, to the bottom end of the cc/c [external TOC was usually different from the actual internal TOC = the actual sediment core] (Table 1)

Final Recovery Length with core catcher/cutter: *external* measurement (m.m) of internal core contents: from the TOC to the BOC after settlement and dewatering have occurred, *prior to removal* of the cc/c & prior to cutting/splitting the core open. *Note:* the cores were stored in the inclined or vertical position when possible to allow for sediment settling within the barrel, particularly if the surficial sediments were very soft or in suspended mode (Table 1)

Final Recovery Length without (w/o) core catcher/cutter: *external* measurement (m.m) of internal core contents: from the TOC to the BOC after settlement and decanting have occurred, *after removal* of the cc/c & prior to cutting/splitting the core open. (Table 1).

2.2 Core Processing Facilities: Cut-Split, Sample & Geological Logs

Once the core(s) were delivered to the OSBM Boat Storage area - temporary core processing facility - the following procedures were implemented. For cores SS01-SS32, GOH geologist with some assistance from DEW and EP, were responsible for cutting, splitting, labelling, photographing and logging of the cores. EP personnel were responsible for the environmental sampling and utensil de-contamination. All personnel co-operatively assisted in the ongoing cleanliness of the worksite and with the various tasks involved (Section 2.1.2).

GOH has temporarily retained selected cores from the SS01-SS32 series and all from the SS33-SS42 series (except for SS33) for a 6-month period, as stratigraphic and reference material. Hopefully, some of the cores will be archived at the PIRSA Core Storage Facility under the Gulf St Vincent

Series. The selected cores were: SS04, SS05, SS09, SS11, SS13, SS16, SS18, SS19, SS24, SS28, SS29, SS31, SS32, and SS34-SS42.

Figure 2a (top): Core Cutting Set-up at O'Sullivans Beach Boat Storage Facility
Figure 2b (bottom): Core Processing Set-up at O'Sullivans Beach Boat Storage Facility

2.2.1 Core Handling: Cutting - Processing Procedures

1. if cores were not processed immediately, the core(s) was placed in the upright position (TOC high side), in the shade outside. For the SS01-SS32 series, all cores were processed the same day except for SS22, which was processed the next morning (26August2020).
2. GOH geologist examined the cores prior to cutting.
    a. The core barrel externally for scouring/etching [indication of subsurface sediment types)
    b. The core penetration length with cc/c, when possible, was measured and recorded; penetration was an external core measurement – penetration of the core barrel into the seabed; penetration was difficult to define due to problems with turbidity & vibracore setup; hence the "?" on penetration results listed on Table 1.
    c. the core recovery length with cc/c was measured and recorded (internal measurement made via extension probe on inside and then laid out distance on outside of barrel; core recovery is the length of core intake inside the core barrel)
    d. the external core barrel was cleaned; additional labelling was done if required
    e. the core/barrel was cut to the final recovery length using pipe-cutters
        - the final recovery length with cc/c was measured and recorded in field notebook
    f. the cc/c section was removed using a pipe-cutters (usually 3-4cm section)
    g. the cc/c contents & cc/c were temporarily placed a side for logging but not sampling.
        - the final recovery length with cc/c was measured and recorded in field notebook
    h. sterilised end caps were placed back on the barrel ends prior to cutting (tape colour code: green/yellow for TOC & red or blue for BOC)
3. GOH and/or DEW personnel cut the core longitudinally, with a circular saw, using 3 wooden cradles mounted on trestles (Figure 2a):
    a. care was taken to only cut the barrel and not the (internal) core (minimize aluminium fillings on the core, inside)
    b. the circular saw was battery operated; hence, the associated electrical cable trip hazard was eliminated; battery lasted 1 core/battery; 3 batteries rotated whilst others were charging
4. GOH-EP-DEW personnel transferred the core to the core sampling-logging platform near the entrance to the OSBM Boat Storage Facility (under the marque) (Figure 2b):
    a. core was split open, longitudinally in half using a clean, decontaminated, stainless steel knife
    b. metal filings, if present, were removed from the split halves (minimise aluminium contamination)
    c. core halves were placed in white poly tubing halves supplied by EP
    d. core was labelled (white board ID above the halves) and measuring tape placed longitudinally, in the middle of the halves
    e. the core/section was photographed with digital camera mounted on a tripod (Appendix B = digital photographic copies were supplied to DEW as an external part of the GOH report).
5. GOH & EP personnel did the geological logging and sub-sampling, at the same time, on cores SS01-SS32.
    a. EP environmental personnel were responsible for sampling for bulk density, particle size distribution (PDS; grain size) and environmental/chemical contaminants including PFAS. They supplied the appropriate sample containers, labels etc and delivered the samples to the appropriate analytical laboratories as required. Appropriate Chain of Custody procedures were performed.
    b. GOH geologist was responsible for the photography and geological logging of the cores
        - Wentworth Classification (grain size) was used [Note: geological core logs are based on physical observation (Appendix A) not analytical analyses (PSD); all sampling results including PSD are provided in the Environmental Projects, 2020 report to DEW]
        - Munsell Soil-Colour Charts were used as reference for sediment colour
    c. DEW personnel assisted as required.

6. Upon completion of sampling and logging of the cores, the cores were either selectively preserved and transported to a designated GOH storage facility OR disposed of in an appropriate manner.
    a. GOH geologist, with the assistance of the EP/DEW personnel: selected cores for stratigraphic and reference material, were "cling wrapped" to preserve the integrity of the cores for future reference
    b. the cc/c sample was preserved with the selected cores if possible
    c. the selected cores and core barrel off-cuts were transported offsite on a daily basis, by the GOH geologist.
    d. The site was maintained as a clean, assessable site at the end of each working day.
7. The OSBM Boat Storage Facility was cleaned and vacated on the 9th September 2020 by all contracted personnel.
8. GOH geologist was responsible for the compilation of the final geological core data base and temporary preservation of selected cores (Table 1; Appendix A)
    a. the stratigraphic horizons identified the core logs **are interpretative only** (Appendix A)
    b. The MGA94 E/N grid coordinates were converted from the AB supplied "actual" core positions referenced to latitude (S) and longitude (E) geographic co-ordinates (deg.deg WGS84) by EP
    c. The uncorrected water depths with 0.7m correction for transducer were provided by AB (Aquatic Biosecurity P/L, 2020)
    d. the water depths were corrected for tides using Hydrotel [Chart Datum] by DEW
    e. the AHD elevations were calculated from the corrected tidal water depths using a 1.4m offset for Port Stanvac by DEW
    f. No corrections were made for core expansion / compaction ratio due to the uncertainty on core penetration measurements (Table 1)
    g. PSD, (BD) and environmental / contaminant information including PFAS, were provided in the Environmental Projects P/L, 2020 report to DEW.

2.2.2 Grain Size Classification Systems

The geological classification used by GOH geologist, for Cores SS01-SS42, is listed below. The geological core logs were based on observational texture (Appendix A). PSD data from EP report to DEW has not been cross-correlated with the geological logs (Environmental Projects P/L, 2020). Caution is listed because of the detailed logging performed by GOH vs the "wide distribution of sampling" represented in the EP – PSD sampling.
Note: GOH and EP logged the cores at same time and logs are quite similar.

Geological Classification:

WENTWORTH CLASSIFICATION (after Wentworth, 1922)

GRAVEL	(mm)	ϕ		SAND	(mm)	ϕ	SILT/CLAY	(mm)
Vc gravel	64 - 32	-5ϕ	vc pebble	vc sand	2.00 - 1.00	0ϕ	Silt	0.062 – 0.004 mm
C gravel	32 - 16	-4ϕ	c pebble	c sand	1.00 - 0.50	1ϕ		[62μ - 4μ] <4-8ϕ
M gravel	16 - 8	-3ϕ	m pebble	m sand	0.50 - 0.25	2ϕ		
F gravel	8 - 4	-2ϕ	f pebble	f sand	0.250-0.125	3ϕ	Clay	finer than 0.004 mm
Vf gravel	4 - 2	-1ϕ	granule	vf sand	0.125-0.062	4ϕ		[<4μ] >8 - 12ϕ

[vc = very coarse; c = coarse; m = medium; f = fine; vf = very fine; micron=μ]

3.0 VIBRACORES - GENERAL

A summary of the vibracores was provided on Table 1 and Figures 3-5 along with the detailed geological logs of Appendix A. The GOH vibracore photos were provided as an external digital attachment to DEW (Appendix B).

The grain size and chemical contaminant results were referenced in the report by Environmental Projects P/L, 2020 to DEW. [Note: DEW converted the AB uncorrected water depths to Chart Datum and Australian Height Datum (AHD-m) for Port Stanvac study area; EP handled the GIS positioning data including conversions for this report, Table 1 & Appendix A].

General comments on the cores are listed below.

- From discussions with AB, the penetration (m) of most of the vibracores SS01-SS42 was to "refusal" rather than the maximum barrel length (Table 1, Appendix A, Figure 3).
    - Most "refusals" (resistance) were between 0.25 – 2.0m below the seabed surface and were due to the core barrel encountering some sort of hard and/or resistance material (substrate-surface-interface). These materials consisted of firm – stiff - hard clays, calcrete (which occasionally was penetrated), a calcareous gravel/shell horizon(s), a semi-cemented clay/sand/shell layer(s) or silty very fine to fine sands. (Table 1; Appendix A).
    - Penetration was difficult to define whilst coring due to the turbidity during the coring operations. AB initiated marking the barrels with permanent marking pen – the erasing of the texture during coring provided an estimate of penetration. A "?" has been placed on penetration as a result (Table 1)
- Some core barrels had mud to sandy/shelly mud smudges and/or pit marks along sections or the entire length of the seabed penetrated barrel. These were due to the presence of either sub-surface firm to stiff clays to sandy clays, and very coarse sand/gravel/pebble and/or shell layers, respectively.
- One barrel was slightly bent (banana bend) = SS02. The vibracorer was extracted from the seabed slightly off centre from vertical pull-out. No correction was made for the mild bend.

The majority of the cores had the penetration length greater than the final recovery length with SS19 & SS23 having recovery greater than penetration (Table 1, Figures 3 & 4). The assumption was that there was some sort of loss of core during the recovery phase of vibracore operations (loss of core catcher/cutter sample &/or loss of sediment from above the core catcher/cutter) or uncertainty on the penetration markers)

A mild hydrogen sulphide odour (H_2S) was identified, when cores were split and opened for SS04, S13, SS19, SS27, SS29, SS32 and SS38.

Core refusals occurred at SS20, SS25 and SS33 (no return or a few gravel/shell bits). SS33 was refused on first attempt and then core was acquired on second attempt.

The cored surficial sediments in the Study Area were quite variable both on the surface and downcore (Figure 5). From the shallow water cores (water depths 14-17m), there appears to be a surficial silty, very fine to fine sand to silt layer in the southern and northern sand prospect areas identified by Acoustic Imaging P/L (Sept 2020, p4).

Note: Acoustic Imaging P/L (Sept 2020) merged the vibracore geological logs of SS01-SS32 cores, where possible, with the marine geophysical sub-bottom profiles acquired in June 2020 (Precision Hydrographic Services P/L 2020; Acoustic Imaging P/L, 2020). In addition, AI generated maps of the near-surface clay layers as well as different sub-surface sediment types (re: non sand or types of sands etc) to produce preliminary maps of potential sand prospects in the southern and northern areas of the Study Area (Acoustic Imaging P/L, Sept2020, p4-7). These maps provided the foundation for the locations of vibracores SS33-SS42 (fill-in cores), which were concentrated in both the prospects.

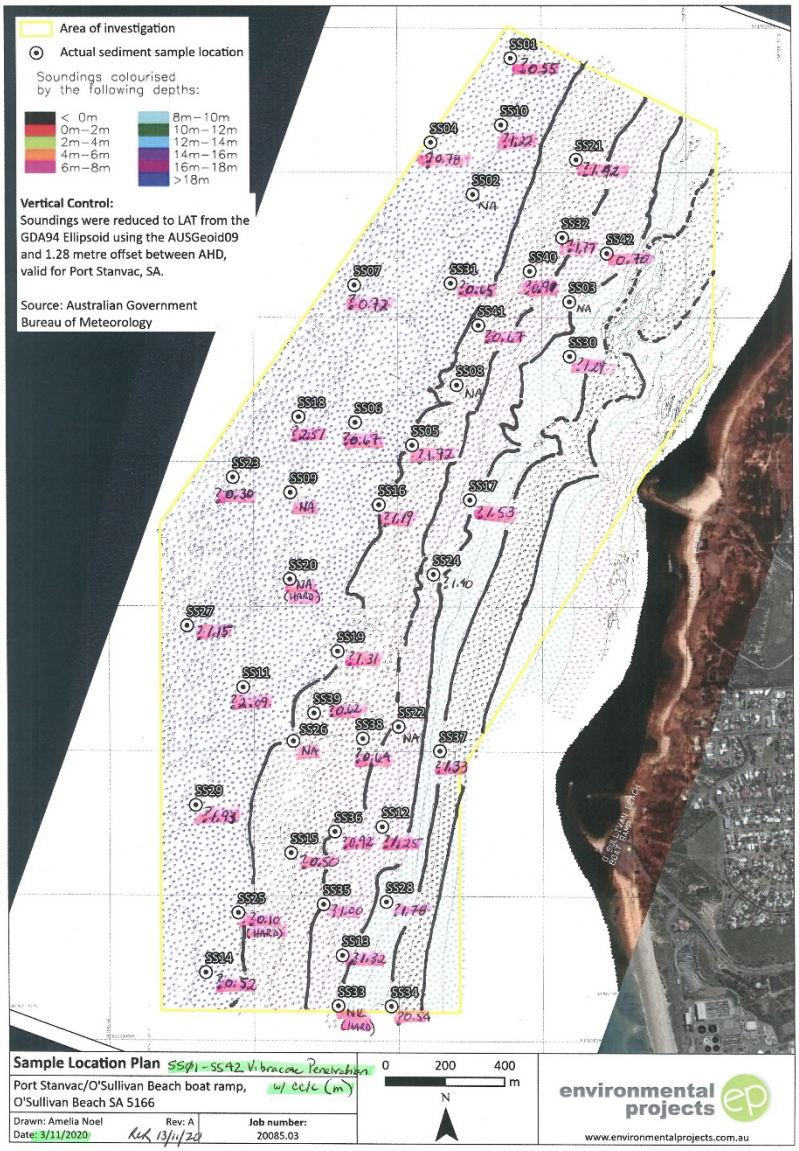

Figure 3: Bathymetric Map of Vibracores SS01 – SS42 Penetration
[estimated length of core barrel including core catcher that penetrated into the seabed in metre.metre; measured on external part of core barrel].

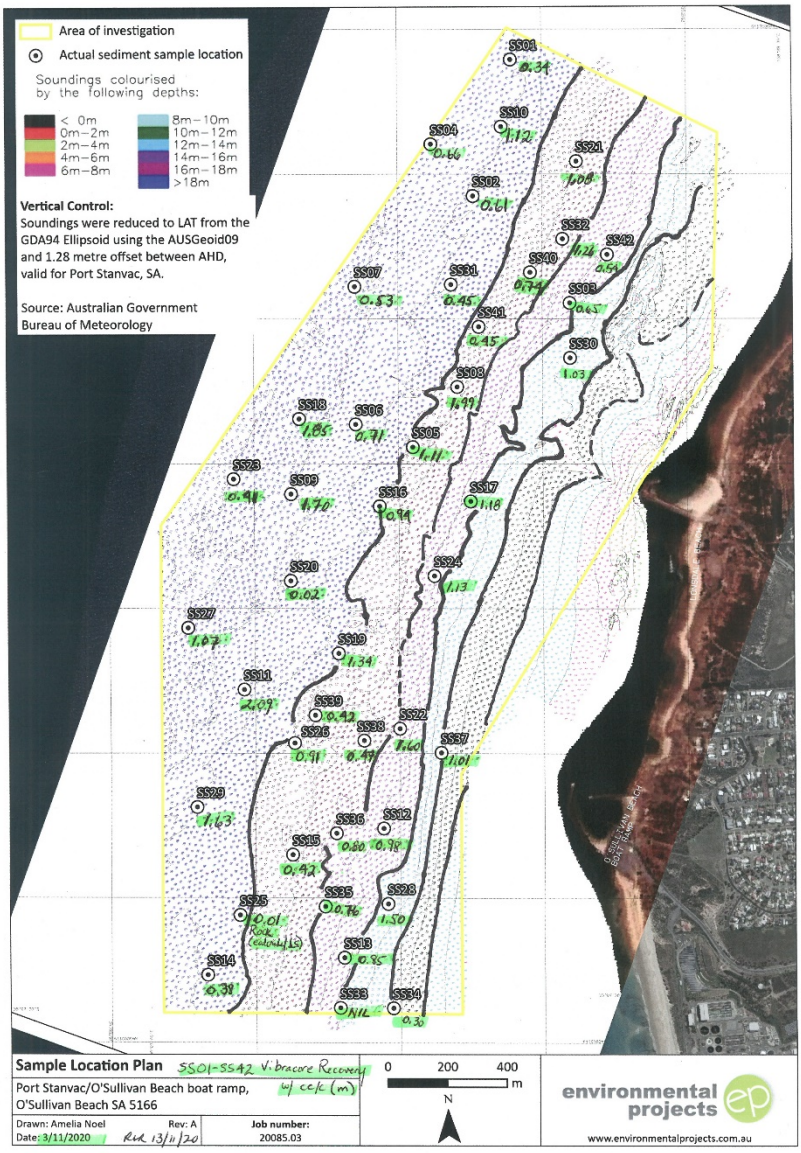

Figure 4: Bathymetric Map of Vibracores SS01 – SS42 Recovery
[length of actual core recovered including core catcher in metre.metre; measured on internal content recovered].

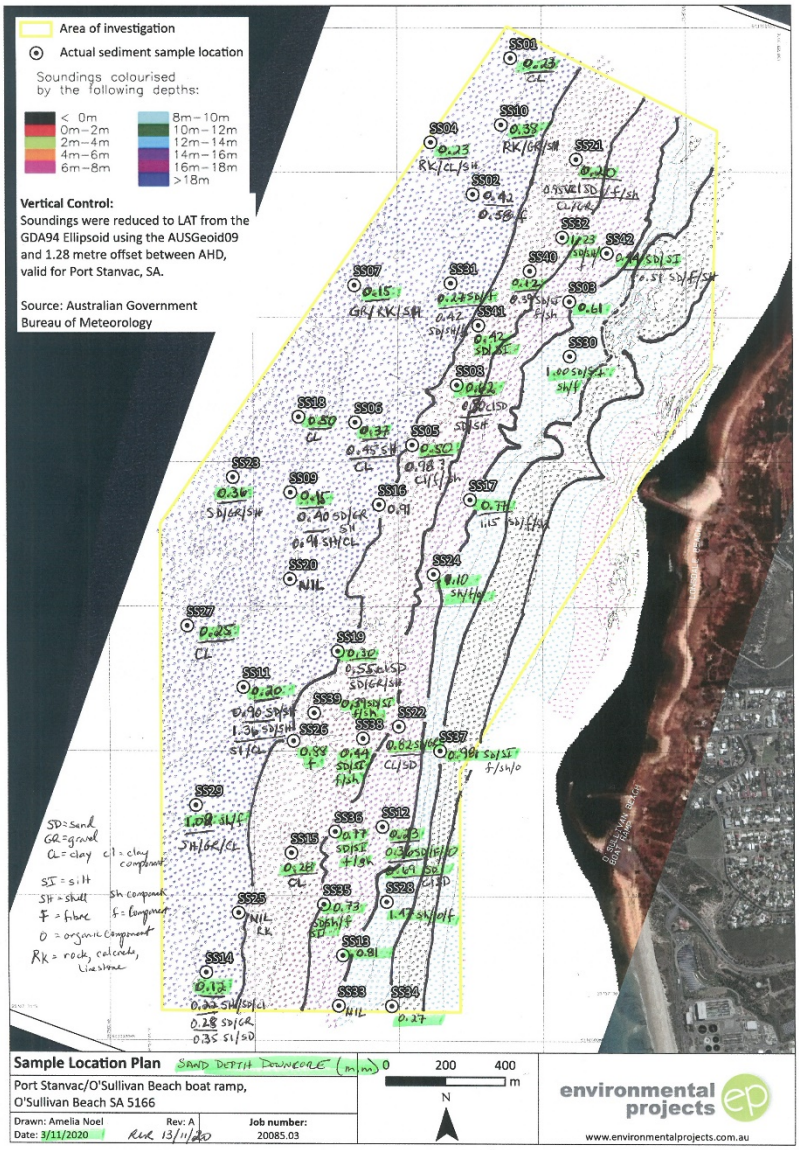

Figure 5: Bathymetric map of SS01 – SS42 with surficial sand thickness (green) and other types of sediment and their thickness recorded as depth of thickness downcore. Refer to Appendix A for geological logs and also Acoustic Imaging P/L (Sept 2020) for sediment type overlay on the near-by sub-bottom profiles.

4.0 MARINE SEDIMENT STRATIGRAPHY – REGIONAL

Belperio *et al* (1990), in their discussion on the offshore sand resources, summarized the shallow seabed stratigraphy along the southern Adelaide coast which included the marine study area of the ADP and the Port Stanvac – O'Sullivans Beach Marina area (also refer to Ludbrook, 1984, Cann et al, 1993, Hudson & Rice, 1997, Rice & Hudson, 1998, Rice, 2008 for regional overview). The theoretical stratigraphic sequence based on a combination of shallow water seismic profiles and shallow dive cores and vibracores obtained within the study area were summarized below.

St Kilda Formation (Qhk):	Holocene marine unit (sands, coastal lagoon & estuarine clays)
Pooraka Formation (Qpp):	Holocene to late Pleistocene alluvial unit (clays, sands, sandy/silt clays)
Glanville Formation (Qpg):	Late Pleistocene marine unit (occasion calcrete cap (Qca); semi-cemented sands to clayey sands to clays; occasion shell layers (sometimes semi-cemented; occ. foram rich)
Hindmarsh Clay Fm (Qph):	Pleistocene composite alluvial unit (usually clays)
Tertiary Undifferentiated (T):	Various marine and fluvial units such as Port Willunga Fm, North & South Maslin Sands
Pre-Cambrian	Undifferentiated (P∈): Quartzites.

4.1.1 Marine Sediment Stratigraphy – Generalized for Port Stanvac Area

The following generalization of the shallow (sub-surface) marine stratigraphy for the marine area of the Port Stanvac area, is based on a combination of old/recent (Acoustic Imaging PL, Sept 2020) shallow water seismic profiles and old/new vibracores obtained within the study area was summarized below (Tucker & Thomas (1985), Belperio *et al* 1989 & 1990; Rice & Hudson 1998; Rice, 2008). The primary shallow stratigraphic units were from the Quaternary (Holocene and Late Pleistocene).

- a thin (less than 2m) cover of Holocene-recent marine sands and muddy (clayey to silty) sands to clays over *possibly* older alluvium sediments consisting of silty to gravelly clays to clayey sands of the late Pleistocene Pooraka Fm *and/or* over shallow marine to peritidal (coastal lagoonal sediments consisting of shelly clays and cemented skeletal calcarenites of the late Pleistocene Glanville Formation. There may be some "interstadial" sea level changes of early Holocene- late Pleistocene (above Glanville Fm) that have also been "captured" (Cann et al, 1993). The Pleistocene Pooraka Fm may be intermittently present and not be continuously preserved throughout the area.
- Tertiary and Pre-Cambrian sediments/rocks may be present within a few metres of the sea bed based on interpretative shallow seismic (boomer) profiles (Hails *et al* 1982; Belperio *et al* 1989, 1990; Rice & Hudson, 1998). Refer to Acoustic Imagery PL (2020 & Sept2020) results for interpretative results as the marine geophysics was not part of GOH brief.

With the additional vibracores VC16, VC19, VC20 & VC21, from the Adelaide Desalinization Plant (ADP; Rice, 2008) and the PSOSI "SS" 2020 vibracores, possibly lower sea-level still stands between the period of the late Pleistocene (Glanville Fm) and the present Holocene may have also been sampled (Cann et al, 1993).

Usually, the stratigraphic units of the core(s) can be differentiated by a visual examination. However, identification of the stratigraphic units may be impaired when two marine stratigraphic units with similar still stand elevations and colours-textures occur together (e.g. Holocene over Late Pleistocene Glanville Fm). It can be quite difficult to safely apply the appropriate stratigraphic unit(s) without appropriate age dating of the sediments and/or shells within the sediments. Even then, there may be some uncertainties (reworking etc). Unfortunately, this was the case with the cores taken for the ADP and the present PSOSI shallow sub-surface marine environment. *What is pertinent, is the seabed-subsurface sediment texture rather than the sediment stratigraphy.* The interpretative sediment stratigraphy can be finalized at a later time.

From examination of the vibracores combined with previous core information the following generalization was made for the shallow (sub-surface) sediments in the marine study area of the Port Stanvac Area (Section 3.0; Appendices A; refer to Acoustic Imaging P/L, Sept 2020 for vibracore - sub-bottom geophysical correlations).

- a thin layer (undefined depth in core) of surficial sands – silty very fine to fine sands in the southern area
  (SS13, SS35, SS23, SS36, SS12, SS26, SS22, SS37) (identified in Acoustic Imaging P/L, Sept 2020 as the tentative southern prospect)
- a thin layer (undefined depth in core) of surficial sands – silty very fine to coarse sands with shell in the inner area north of Port Stanvac Jetty (SS32, SS40, SS42?, SS03, SS30) (identified in Acoustic Imaging P/L, Sept 2020 as the tentative northern prospect)
- in some areas with the surficial sands, there were sections of the core that contained seagrass fibre (identified as just fibre) and/or organic bits in various concentrations
- some sort of near-surface clay layer (SS01, SS04, SS05, SS09, SS15, SS18, SS27); usually in water depths >16-18m (Figure 5)
- some sort of near-surface gravel and/or shell layer(s) below the surficial sands (SS07, SS09, SS14, SS19, SS25, SS29) (Figure 5)
- below the above clay, gravel or shell layer either
  - firm to stiff clays OR
  - thin calcrete or calcareous nodule layer (less than 0.10m to 0.30m thick)
- below the above-mentioned clay or calcrete layers, the sediment texture was quite variable and consisted generally of
  - clay, sometimes with shell: usually firm to stiff to hard, sometimes desiccated in appearance
  - sandy or silty clay, sometimes with shell
  - clayey sand, sometimes with shell
  - sand, particularly shell sands
- in the longer cores (SS05, SS09, SS11, SS14, SS18, SS29), with increased depth down core, there were layers of
  - semi-cemented sands and/or clays
  - calcareous nodules and/or limestone chunks (sand-gravel-pebble size)
  - shell hash - shell sands – shell layers
  - matrix of clay or sand in the gravel and shell hash.

Without an age date on the shells and correlation of the core data with more detailed shallow seismic profiling, the environmental setting and age for deposition cannot be confirmed. As identified earlier, what are important to the program are the sediment texture and contaminant issues.

Below the surficial sands, was a very distinctive sediment and possibly color contact consisting of either gravel, shell hash, gravel - shell hash or clay. The presence of the gravel and/or shell hash was usually considered to be the base of the Holocene (Qhk). The clays were discussed below.

Firm to stiff to hard clays were found within 0.50m of the seabed surface, usually below the surficial sands-gravel-shell layers mentioned above, and generally in the shallow and northern part of the study area. Because of the presence of these types of clay close to the surface, the penetration and recovery lengths of the vibracores were usually less than 1m (refusal). Without more detailed analyses (re age dating, shell identification etc.), the stratigraphy of these clays was sometimes difficult to discern – whether they belong to the marine and/or coastal lagoonal Holocene Qhk unit or a part of the alluvial clays of the Pleistocene Pooraka Fm and/or aeolian exposed marine – estuarine – coastal lagoonal clays of the either interstadial of early Holocene -late Pleistocene or the late Pleistocene Glanville Fm. Clays lying below the calcrete or calcareous nodule layer were classified as belonging to the Glanville Fm, and were quite variable in texture.

The calcrete layer tended to be present intermittently in the Study Area. The calcrete was quite variable in texture and thickness: consisting of a uniformly hard or an alternate hard/soft, friable calcrete layer, and/or calcareous nodules (gravels) sometimes with cemented shell and/or a sand/clay

matrix. The calcrete layer (Qca) was identified as the top of the Glanville Fm, consistent with the stratigraphic discussions in Belperio *et al* (1990).

The type of sediment below the calcrete was quite variable and was considered part of the Glanville Fm. If stiff to hard clays were present, penetration was low. If soft to firm clays, shell sands and/or semi-cemented but somewhat friable sands/clay layers were present, penetration was good (Figure 3).

5.0 CONCLUSION

Two offshore sand prospects for Adelaide beach replenishment were identified in the Study Area off Port Stanvac from the amalgamation of a variety of sediment data produced from the vibracore and marine geophysical programs conducted during the period June to October 2020. Further work will be required to verify the prospect is a definite resource.

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Table 1: Port Stanvac Offshore Sands Investigation: Summary of Vibracore Operations: 25 August – 13 October 20202, SS01 – SS42

Submitted as attachment due to size.
File Name: Table1 PtStanvacCoreDataSpreadSheet.xls
Table1 PtStanvacCoreDataSpreadSheet.pdf

Table 1: **Port Stanvac Offshore Sands Investigation: Summary of Vibracore Operations: 25 August - 13 October 2020, SS01 - SS42**

Aquatic Biosecurity P/L owned RV ORCA

Water Depth: Aquatic Biosecurity P/L SIMRAD depth sounder w/ high power transponder & time recorded (0.7m correction for transducer)

Geographic Coordinates: **Latitude (S) / Longitude (E) in WGS84**

Abbreviations: f = fine (sand); vf = very fine (sand); TOC = top of core; m = medium (sand); v = very; sl = slightly; BOC = bottom of core; c-vc = coarse to very coarse (sand); w/ = with; occ = occasionally; cc/c = core catcher/cutter; LS = limestone; vbc = vibracorer

Aquatic Biosecurity P/L owned OEM vibrating corer w/ 3.665m aluminium barrels (decontaminated SS01-SS32) & 1.8m barrels (SS33-42)

Water Depth in uncorrected metres (m)

Height Datum: water depth corrected to Chart Datum & AHD in metres (m) by DEW surveyors

CST = Central Standard Time (SS01-SS32)

CDST = Central Daylight Savings Time (SS33-S42)

DEW = SA Dept of Environment & Water

Core ID	Date (dd/mm/ 2020)	Time (CST SS01-32) CDST (SS33-42)	Uncorr Water Depth (m)	Tide Level (Hyrdotel) (m)	Seafloor Depth (Chart Datum - m)	AHD (m) (approx 1.4m Pt Stanvac)	Pene-tration (m)	Final Recover w/ cc/c (m)	Final Recover w/o cc/c (m)	Sum of Core Descriptions refer to individual core logs for more detail (downcore in m.m)	Core Photo ID	Environ Samples	Easting (m) MGA 94	Northing (m) MGA94	Actual Longitude (E) (deg.deg) WGS84	Actual Latitude (S) (deg.deg) WGS84	Actual Longitude (E) (deg min.min) WGS84	Actual_ Latitude (S) (deg min.min) WGS84	Actual Longitude (E) (deg min sec) WGS84	Actual Latitude (S) (deg min sec) WGS84	Wind Direction & Speed (knots)	Swell (m)	Waves (m)
SS01	2.6E+07	925	20.30	1.848	18.452	-19.852	?0.55	0.34	0.31	0.00-0.23 silty f-m SAND w/ shell & some fibre 0.23-0.31 CLAY to gritty CLAY w/ shell	SS01 IMGP004 - 006	Combined, PFAS, BD, PSD	268877.961	6113336.175	138.46451	-35.09630	138° 27.8706' E	35° 05.7780' S	138° 27' 52.236" E	35° 05' 46.680" S	N 10	<0.5	<0.5
SS02	2.6E+07	1229	19.20	1.042	18.158	-19.558	NA	0.61	0.58	0.00-0.42 silty vf-f SAND grading downcore to slightly silty f-vc SAND/GRAVEL 0.42-0.58 v sl clayey, silty vf-f SAND w/ fibre	SS02 IMGP009 - 010	Combined, PFAS, BD, PSD	268749.994	6112880.007	138.46298	-35.10038	138° 27.7788' E	35° 06.0228' S	138° 27' 46.728" E	35° 06' 01.368" S	N 5kts	<0.5	<0.5
SS03	2.6E+07	1128	15.00	1.298	13.702	-15.102	NA	0.65	0.62	0.00-0.61 Combination of f-m SAND w/ silty vf-f SAND & some shell	SS03 IMGP007 - 008	Combined, PFAS, BD, PSD	269072.024	6112521.884	138.46641	-35.10368	138° 27.9846' E	35° 06.2208' S	138° 27' 59.076" E	35° 06' 13.248" S	N 5	<0.5	0.5
SS04	9092020	728	21.00	2.160	18.840	-20.240	?0.78	0.66	0.62	0.00-0.23 silty f-c SAND 0.23-0.34 LS & reef rock GRAVEL CHUNKS w/ matrix clayey sand 0.34-0.58 gritty CLAY w/ small shell 0.58-0.62 SHELLHASH w/ matrix clay/sand	SS04 IMGP0111 - 0113	Combined, PFAS, BD, PSD	268609.625	6113054.042	138.46149	-35.09878	138° 27.6894' E	35° 05.9268' S	138° 27' 41.364" E	35° 05' 55.608" S	SE 5-10	0.5	<0.5
SS05	9092020	1248	18.20	0.782	17.418	-18.818	?1.71	1.11	1.08	0.00-0.97 Gradual Coarsening downcore 0.00-0.50 silty vf-f SAND to m-c SAND 0.50-0.90 vsl clayey, silty vf--m SAND w/ scattered fibre & occ shell 0.90-0.98 vsl clayey silty vf-m SAND w/ fibre & coarse shell 0.8-1.08: SHELLS/SHELLHASH intermixed w/ vl clayey silty SAND & some fibre	SS05 IMGP0124 - 0128	Combined, PFAS, BD, PSD	268543.288	6112042.183	138.46048	-35.10788	138° 27.6288' E	35° 06.4728' S	138° 27' 37.728" E	35° 06' 28.368" S	E 5-10	0.5	0.5
SS06	5092020	1306	19.50	0.789	18.711	-20.111	?0.67	0.71	0.68	0.00-0.37 silty vf-f SAND w/ scattered shell 0.37-0.45 SHELL/SAND layer 0.45-0.68 firm-stiff CLAY w/ occ shell	SS06 IMGP0099 - 0102	Combined, PFAS, BD, PSD	268352.515	6112118.350	138.45841	-35.10715	138° 27.5046' E	35° 06.4290' S	138° 27' 30.276" E	35° 06' 25.740" S	NW <5	1	0.5
SS07	5092020	1406	20.10	1.106	18.994	-20.394	?0.72	0.53	0.49	0.00-0.15 silty vf-m SAND 0.15-0.18 GRAVEL/ROCK CHUNKS 0.18-0.43 SAND & GRAVEL CHUNKS 0.43-0.49 CALCRETE & Ls CHUNKS intermixed w/ SHELLHASH	SS07 IMGP0095 - 0098	Combined, PFAS, BD, PSD	268351.732	6112577.902	138.45853	-35.10301	138° 27.5118' E	35° 06.1806' S	138° 27' 30.708" E	35° 06' 10.836" S	NW <5	1	0.5
SS08	2.6E+07	1339	17.60	0.893	16.707	-18.107	NA	1.99	1.96	0.00-0.80 vsl clayey silty vf-c SAND w/ shell 0.80 -1.87 Alternate Layers of sl clayey f-c SAND w/ shell & shellhash 1.87-1.96 SAND & SHELL/SHELLHASH	SS08 IMGP0011 - 0018	Combined, PFAS, BD, PSD	268693.259	6112242.490	138.46218	-35.10611	138° 27.7308' E	35° 06.3666' S	138° 27' 43.848" E	35° 06' 21.996" S	N 5	0.5	0.5
SS09	2.6E+07	1436	20.20	0.896	19.304	-20.704	NA	1.70	1.67	0.00-0.15 silty vf-f SAND 0.15-0.40 f-m SAND w/ shell intermixed w/ CALCAREOUS NODULES 0.40-0.91 sl clayey f-m SAND 0.91-1.40 SHELL LAYERS w/ matrix f-c sand 1.40-1.47 sl clayey silty vf-f SAND & SHELL 1.47-1.67 sandy clay	SS09 IMGP0019-0023	Combined (2), PFAS, BD, PSD	268134.065	6111885.205	138.45595	-35.10920	138° 27.3570' E	35° 06.5520' S	138° 27' 21.420" E	35° 06' 33.120" S	N 5	<0.5	<0.5
SS10	9092020	823	20.40	2.040	18.360	-19.760	?1.22	1.12	1.08	0.00-0.38 silty f-vc SAND w/ occ shell 0.38-0.60 LS & REEF ROCK CHUNKS 0.60-0.99 vsl clayey silty f-vc SAND / GRAVEL 0.99-1.08 SHELLHASH intermixed w/ f-vc SAND/SHELL	SS10 IMGP0103-0110	Combined, PFAS, BD, PSD	268845.346	6113112.221	138.46409	-35.09831	138° 27.8454' E	35° 05.8986' S	138° 27' 50.724" E	35° 05' 53.916" S	SE 5-10	0.5	<0.5
SS11	5092020	927	19.90	1.154	18.746	-20.146	?2.09	2.09	2.06	0.00-0.90 sl clayey silty vf-vc SAND & SHELL 0.90-1.33 sl clayey SAND & SHELL 1.33-1.36 semi cemented SHELL SAND 1.36-2.06 SAND-SILT-CLAY	SS11 IMGP0074-0081	Combined, PFAS, BD, PSD	267973.782	6111232.820	138.45401	-35.11504	138° 27.2406' E	35° 06.9024' S	138° 27' 14.436" E	35° 06' 54.144" S	NW <5	1	1
SS12	3.1E+07	1031	15.70	1.131	14.569	-15.969	?1.25	0.98	0.95	0.00-0.23 silty vf-f SAND; H2S odor 0.23-0.28 sl clayey, silty vf-m SAND intermixed w/ fibre & organics 0.28-0.35 v sl silty c-vc SAND 0.35-0.69 silty vf-f SAND w/ scattered shell 069-0.94 v sl clayey, silty vf-f SAND	SS12 IMGP0050-0053	Combined (2), PFAS, BD (2), PSD	268437.174	6110767.327	138.45896	-35.11934	138° 27.5376' E	35° 07.1604' S	138° 27' 32.256" E	35° 07' 09.624" S	S 5	1 - 1.2	0.5 - 1

Core ID	Date (dd/mm/ 2020)	Time (CST SS01-32) CDST (SS33-42)	Uncorr Water Depth (m)	Tide Level (Hyrdotel) (m)	Seafloor Depth (Chart Datum - m)	AHD (m) (approx 1.4m Pt Stanvac)	Pene-tration (m)	Final Recover w/ cc/c (m)	Final Recover w/o cc/c (m)	Sum of Core Descriptions refer to individual core logs for more detail (downcore in m.m)	Core Photo ID	Environ Samples	Easting (m) MGA 94	Northing (m) MGA94	Actual Longitude (E) (deg.deg) WGS84	Actual Latitude (S) (deg.deg) WGS84	Actual Longitude (E) (deg min.min) WGS84	Actual_ Latitude (S) (deg min.min) WGS84	Actual Longitude (E) (deg min sec) WGS84	Actual Latitude (S) (deg min sec) WGS84	Wind Direction & Speed (knots)	Swell (m)	Waves (m)
SS13	3.1E+07	1153	15.20	1.356	13.844	-15.244	?1.32	0.85	0.81	0.00-0.81 silty vf-f SAND w/ rare pockets of fibre & shell	SS13 IMGP0057-0060	Combined (2), PFAS (2), BD, PSD	268303.158	6110336.523	138.45737	-35.12319	138° 27.4422' E	35° 07.3914' S	138° 27' 26.532" E	35° 07' 23.484" S	S 5	<0.5	<0.5
SS14	3.1E+07	1229	19.40	1.437	17.963	-19.363	?0.52	0.38	0.35	0.00-0.05 c-vc SAND - vf GRAVEL intermixed w/ silty vf-f SAND (disturbed section; red algae on surface) 0.05-0.12 sillty vf-f SAND w/ rare fibre 0.12-0.18 SHELL intermixed w/ fibre & sl silty c-vc SAND 0.18-0.22 vsl clayey, silt vf-f SAND to SILT 0.22-0.28 c-vc SAND to f GRAVEL 0.28-0.35 sl clayey SILT to vf-f SAND	SS14 IMGP0061-0062	Combined, PFAS, BD, PSD	267844.950	6110279.292	138.45233	-35.12360	138° 27.1398' E	35° 07.4160' S	138° 27' 08.388" E	35° 07' 24.960" S	S 5	<0.5	<0.5
SS15	3.1E+07	750	17.70	1.365	16.335	-17.735	?0.50	0.42	0.39	0.00-0.05 v sl clayey, silty vf-f SAND 0.05-0.23 m-c SAND 0.23-0.28 sl clayey, silty vf-f SAND 0.28-0.39 sandy CLAY to CLAY	SS15 IMGP0048-0049	Combined, PFAS, PSD	268132.042	6110679.606	138.45559	-35.12006	138° 27.3354' E	35° 07.2036'S	138° 27' 20.124" E	35° 07' 12.216" S	S 5-10	1 - 1.2	0.50 - 1
SS16	5092020	1221	17.80	0.643	17.157	-18.557	?1.19	0.94	0.91	0.00-0.91 silty vf-f SAND 0.38-0.91 rare fibre & shell	SS16 IMGP0088-0094	Combined (2), PFAS (2), BD, PSD	268430.672	6111843.936	138.45919	-35.10964	138° 27.5514' E	35° 06.5784' S	138° 27' 33.084" E	35° 06' 34.704" S	NW <5	1	1
SS17	2.8E+07	1007	15.70	1.810	13.890	-15.290	?1.53	1.18	1.15	0.00-0.26 f-vc SAND 0.26-0.77 Alternate Layers m-vc SAND w/ rare shell & silty vf-f SAND w/ rare shell 0.77-1.15 silty vf-f SAND w/ occ fibre & shell	SS17 IMGP0036-0041	Combined (2), PFAS (2), BD, PSD	268735.861	6111859.490	138.46254	-35.10957	138° 27.7524' E	35° 06.5742' S	138° 27' 45.144" E	35° 06' 34.452" S	N<5	0.5	<0.5
SS18	2.8E+07	1213	21.10	1.520	19.580	-20.980	?2.51	1.85	1.82	0.00-0.26 f-m SAND w/occ shell & calc nodules 0.26-0.50 vsl silty sandy CLAY intermixed w/ f-c SAND w/ scattered fibre 0.50-0.73 CLAY 0.73-1.35 clayey f-m SAND w/ shell 1.35-1.82 CLAY to v sl silty sandy CLAY w/ occ shell & gravel	SS18 IMGP0029-0035	Combined (2), PFAS, BD, PSD	268163.212	6112136.827	138.45634	-35.10694	138° 27.3804' E	35° 06.4164' S	138° 27' 22.824" E	35° 06' 24.984" S	N<5	0.5	<0.5
SS19	5092020	1043	17.80	0.746	17.054	-18.454	?1.91	1.34	1.31	0.00-0.30 silty vf-c SAND w/ scattered shell 0.30-0.55 sl clayey,silty, f-vc SAND w/ scattered shell 0.55-0.91 v sl silty c-vc SAND to GRAVEL w/ some shell 0.91-1.31 silty vf-f SAND & SHELL sand/gravel/shellhash	SS19 IMGP0082-0087	Combined, PFAS, PSD	268290.872	6111353.043	138.45752	-35.11403	138° 27.4512' E	35° 06.8418' S	138° 27' 27.072" E	35° 06' 50.508" S	NW<5	1	1
SS20	2.8E+07	1436	20.20	1.285	18.915	-20.315	NA	0.02	0.02	Bounced on hard surface; black bivalve shell bits	No photos	No Samples Taken	268131.437	6111595.407	138.45584	-35.11181	138° 27.3504' E	35° 06.7086' S	138° 27' 21.024" E	35° 06' 42.516" S	N<5	<0.5	<0.5
SS21	2.8E+07	800	18.10	1.870	16.230	-17.630	?1.42	1.08	1.05	0.00-0.20 silty vf-f SAND 0.20-0.30 v sl clayey, silty f-m SAND 0.30-0.95 v sl clayey silty vf-f SAND w/ fibre 0.95-1.05 CLAY intermixed w/ f-c SAND & pea GRAVEL CHUNKS (calcrete/Ls)	SS21 IMGP0024	Combined (2), PFAS (2), BD, PSD	269096.468	6112995.395	138.46681	-35.09942	138° 28.0086' E	35° 05.9652' S	138° 28' 00.516" E	35° 05' 57.912" S	N <5	0.5	<0.5
SS22	2.5E+07	1550	16.10	0.951	15.149	-16.549	NA	1.60	1.57	0.00-0.82 sl silty vf-f SAND grading downcore to c-vc SAND / fine GRAVEL 0.82-1.57 Alternate Layers f shelly sandy CLAY & vc SAND w/ shell	SS22 IMGP001 - 003	Combined, PFAS, BD, PSD	268493.397	6111101.785	138.45967	-35.11634	138° 27.5802' E	35° 06.9804' S	138° 27' 34.812" E	35° 06' 58.824" S	ght Winds (	<0.5	<0.5
SS23	2.8E+07	1334	21.30	1.379	19.921	-21.321	?0.30	0.41	0.38	0.00-0.03 Verneer of CLAY to silty vf-f SAND 0.03-0.36 Coarsening downcore silty vf-f SAND w/ some fibre & shell 0.36-0.41 SAND/GRAVEL intermixed w/ SHELLHASH	SS23 IMGP0042 - 0043	Combined, PFAS, PSD	267942.120	6111935.802	138.45386	-35.10870	138° 27.2316' E	35° 06.5220' S	138° 27' 13.896" E	35° 06' 31.320" S	N 5	0.5	<0.5
SS24	3.1E+07	952	15.50	1.076	14.424	-15.824	?1.40	1.13	1.10	0.00-1.10 silty vf-f SAND w/ occ scattered shell & fibre	SS24 IMGP0054 - 0056	Combined (2), PFAS (2), BD, PSD	268612.666	6111611.023	138.46112	-35.11178	138° 27.6672' E	35° 06.7068' S	138° 27' 40.032" E	35° 06' 42.408" S	S 5-10	1 - 1.2	0.50 - 1
SS25	3.1E+07	1344	19.20	1.774	17.426	-18.826	?0.10	0.01	0.01	Bounced on hard surface; 2 angular CALCRETE / LS CHUNKS recovered	No photos	No Samples Taken	267954.769	6110478.587	138.45359	-35.12183	138° 27.2154' E	35° 07.3098' S	138° 27' 12.924" E	35° 07' 18.588" S	S 5	<0.5	<0.5
SS26	2.5E+07	1508	17.71	0.828	16.882	-18.282	NA	0.91	0.88	0.00-0.81 mix of silty vf-vc SAND / fine GRAVEL w/ some fibre	No photos	Combined, PFAS, BD, PSD	268140.716	6111053.925	138.45579	-35.11669	138° 27.3474' E	35° 07.0014' S	138° 27' 20.844" E	35° 07' 00.084" S	ght Winds (	<0.5	<0.5

Core ID	Date (dd/mm/ 2020)	Time (CST SS01-32) CDST (SS33-42)	Uncorr Water Depth (m)	Tide Level (Hyrdotel) (m)	Seafloor Depth (Chart Datum - m)	AHD (m) (approx 1.4m Pt Stanvac)	Pene-tration (m)	Final Recover w/ cc/c (m)	Final Recover w/o cc/c (m)	Sum of Core Descriptions refer to individual core logs for more detail (downcore in m.m)	Core Photo ID	Environ Samples	Easting (m) MGA 94	Northing (m) MGA94	Actual Longitude (E) (deg.deg) WGS84	Actual Latitude (S) (deg.deg) WGS84	Actual Longitude (E) (deg min.min) WGS84	Actual_ Latitude (S) (deg min.min) WGS84	Actual Longitude (E) (deg min sec) WGS84	Actual Latitude (S) (deg min sec) WGS84	Wind Direction & Speed (knots)	Swell (m)	Waves (m)
SS27	5092020	757	21.40	1.746	19.654	-21.054	?1.15	1.07	1.04	0.00-0.25 silty vf-f SAND 0.25-1.04 mix of CLAY to sandy clay to clayey sand w/ pockets organics/ fibre/ shell	SS27 IMGP0067 - 0073	Combined, PFAS, BD, PSD	267786.990	6111438.956	138.45202	-35.11314	138° 27.1212' E	35° 06.7884' S	138° 27' 07.272" E	35° 06' 47.304" S	W <5	2	1
SS28	3.1E+07	853	14.30	1.173	13.127	-14.527	?1.78	1.50	1.47	0.00-1.47 silty vf-f SAND w/ scattered shell; minor organics fibre downcore	SS28 IMGP0044 - 0047	Combined (2), PFAS (2), BD, PSD	268450.896	6110515.689	138.45904	-35.12161	138° 27.5424' E	35° 07.2966' S	138° 27' 32.544" E	35° 07' 17.796" S	S 5 - 10	1-1.2	0.5-1
SS29	3.1E+07	1446	19.70	1.998	17.702	-19.102	?1.98	1.63	1.60	0.00-1.02 mix of silty vf-vc SAND w/ occ shell & fibre 1.02-1.42 SHELLS intermixed w/ SAND / GRAVEL; H2S odor 1.42-1.60 CLAY intermixed w/ clayey SAND & SHELL	SS29 IMGP0063 - 0066	Combined (2), PFAS (2), BD, PSD	267812.379	6110839.051	138.45213	-35.11855	138° 27.1278' E	35° 07.1130' S	138° 27' 07.668" E	35° 07' 06.780" S	S 5	0.5	<0.5
SS30	2.8E+07	916	14.20	1.909	12.291	-13.691	?1.29	1.03	1.00	0.00- 1.00 silty vf-c sand w/ pockets of shells & organics	SS30 IMGP0025 - 0028	Combined (2), PFAS (2), BD, PSD	269072.123	6112338.725	138.46636	-35.10533	138° 27.9816' E	35° 06.3198' S	138° 27' 58.896" E	35° 06' 19.188" S	N <5	0.5	<0.5
SS31	9092020	944	20.00	1.665	18.335	-19.735	?0.65	0.45	0.42	0.00-0.27 silty vf-f sand grading downcore to c-vc sand w/ fibre 0.27-0.42 SHELL intermixed w/ FIBRE & silty vf-f SAND	SS31 IMGP0120 - 0123	Combined, PFAS, PSD	268674.522	6112583.915	138.46207	-35.10303	138° 27.7242' E	35° 06.1818' S	138° 27' 43.452" E	35° 06' 10.908" S	E 10-15	0.5	0.5
SS32	9092020	1047	17.10	1.266	15.834	-17.234	?1.77	1.26	1.23	0.00-0.70 silty vf-c SAND downcore shell increase downcore 0.70-1.23 sl silty f-c SAND & m-vc bioclastic SHELL SAND; some fibre pockets	SS32 IMGP0114 - 0119	Combined (2), PFAS (2), BD, PSD	269049.254	6112735.548	138.46622	-35.10175	138° 27.9732' E	35° 06.1050' S	138° 27' 58.392" E	35° 06' 06.300" S	E 10-15	0.5	0.5
SS33	1.3E+07	830	14.60	1.246	13.354	-14.754	0	0.00	0.00	Bounced on hard surface; 2 attempts - no recovery	No photos	No Samples Taken	268288.298	6110168.521	138.45716	-35.12470	138° 27.4296' E	35° 07.4820' S	138° 27' 25.776" E	35° 07' 28.920" S	E <5	<0.5m	<0.5m
SS34	1.3E+07	917	12.60	1.166	11.434	-12.834	?0.54	0.30	0.27	0.00-0.27 silty vf-f SAND w/ occ shell	SS34 IMGP0129 - 0134	BD, PSD	268466.169	6110167.514	138.45911	-35.12475	138° 27.5466' E	35° 07.4850' S	138° 27' 32.796" E	35° 07' 29.100" S	E <5	<0.5m	<0.5m
SS35	1.3E+07	946	16.30	1.176	15.124	-16.524	?1.00	0.76	0.73	0.00-0.16 silty vf-f SAND; rare organics 0.16-0.32 silty vf-f SAND w/ occ organics/ fibre & shell 0.32-0.73 v sl clayey, silty vf-f SAND to SILT w/ occ shell & fibre	SS35 IMGP0135 - 0136	BD, PSD	268240.431	6110506.983	138.45673	-35.12164	138° 27.4038' E	35° 07.2984' S	138° 27' 24.228" E	35° 07' 17.904" S	E <5	<0.5m	<0.5m
SS36	1.3E+07	1017	16.30	1.200	15.100	-16.500	?0.92	0.80	0.77	0.00-0.17 silty vf-f SAND to SILT 0.17-0.77 silty vf-f SAND to SILT w/ scattered fibrE & pockets of shell	SS36 IMGP0137 - 0138	BD, PSD	268278.886	6110751.073	138.45722	-35.11945	138° 27.4332' E	35° 07.1670' S	138° 27' 25.992" E	35° 07' 10.020" S	E <5	<0.5m	<0.5m
SS37	1.3E+07	1110	13.30	1.261	12.039	-13.439	?1.33	1.01	0.98	0.00-0.16 silty vf-f SAND to SILT 0.16-0.96 silty vf-f SAND to SILT w/ scattered fibre & shell	SS37 IMGP0139 - 0145	BD, PSD	268631.365	6111020.939	138.46116	-35.11710	138° 27.6696' E	35° 07.0260' S	138° 27' 40.176" E	35° 07' 01.560" S	E 10	<0.5m	<0.5m
SS38	1.3E+07	1134	17.20	1.292	15.908	-17.308	?0.64	0.47	0.44	0.00-0.12 silty vf-f SAND to SILT w/ rare fibre 0.12-0.44 silty vf-f SAND to SILT w/ sl increase shell & fibre downcore	SS38 IMGP0146 - 0148	BD, PSD	268373.098	6111062.082	138.45834	-35.11667	138° 27.5004' E	35° 07.0002' S	138° 27' 30.024" E	35° 07' 00.012" S	E 10	<0.5m	<0.5m
SS39	1.3E+07	1205	17.10	1.399	15.701	-17.101	?0.62	0.42	0.39	0.00-0.24 silty vf-f SAND to SILT w/ rare fibre 0.24-0.39 silty vf-f SAND to SILT; v sl clayey? 0.32 pocket of organics & shell	SS39 IMGP0149 - 0150	BD, PSD	268210.402	6111146.732	138.45658	-35.11587	138° 27.3948' E	35° 06.9522' S	138° 27' 23.688" E	35° 06' 57.132" S	E 10	<0.5m	<0.5m
SS40	1.3E+07	1253	17.50	1.552	15.948	-17.348	?0.91	0.74	0.71	0.00-0.12 silty vf-f SAND w/ rare shell 0.12-0.39 silty vf-f SAND to SILT w/ rare shell & fibre 0.39-0.49 sl silty c-vc SAND & SHELL 0.49-0.71 silty vf-f SAND w/ scattered shell & fibre; some clay lenses	SS40 IMGP0151 - 0152	BD, PSD	268939.884	6112623.977	138.46499	-35.10273	138° 27.8994' E	35° 06.1638' S	138° 27' 53.964" E	35° 06' 09.828" S	E 5	<0.5m	<0.5m
SS41	1.3E+07	1330	18.30	1.647	16.653	-18.053	?0.67	0.45	0.42	0.00-0.38 silty vf-f SAND to SILT w/ occ shell & fibre downcore 0.38-0.42 silty vf-f SAND w/ occ shell & fibre	SS41 IMGP0153 - 0155 Note misID IMGP0153	BD, PSD	268766.601	6112443.062	138.46304	-35.10432	138° 27.7824' E	35° 06.2592' S	138° 27' 46.944" E	35° 06' 15.552" S	E 5	<0.5m	<0.5m
SS42	1.3E+07	1400	15.50	1.692	13.808	-15.208	?0.70	0.54	0.51	0.00-0.06 silty vf-f SAND 0.06-0.44 silty vf-f SAND to SILT w/ rare fibre 0.44-0.51 silty vf-f SAND intermixed w/ fibre & shell	SS42 IMGP0156 - 0157	BD, PSD	269198.386	6112682.728	138.46784	-35.10226	138° 28.0704' E	35° 06.1356' S	138° 28' 04.224" E	35° 06' 08.136" S	E 5	<0.5m	<0.5m

Appendix A

Detailed Geological Logs

for Vibracores SS01 – SS42 and

VC16, VC19, VC20 & VC21

[also provided also as external attachment

filenames:
30Nov20PortStanvacOffshoreSandsInvestigationReportAppendixA.doc

30Nov20PortStanvacOffshoreSandsInvestigationReportAppendixA.pdf

Vibrocore ID: SS01 **Date (dmy): 26/08/2020** **Time (CST): 0915**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268877.961 **MGA-N: 6113336.175**
Location: (deg.deg) (WGS84): Latitude (S): 35.0963 **Longitude (E): 138.46451**
(deg min.min) 35 05.778' 138 27.8706'
(deg min sec) 35 05' 46.6800" 138 27' 52.2360"
Water Depth uncorr(m): 20.3 Seafloor Depth (Chart Datum)(m): 18.452 AHD (approx. 1.4m Pt Stanvac)(m): -19.952
Penetration w/ cc/c (m): ?0.55 **Final Recov w/ cc/c (m): 0.34** **Final Recov w/o cc/c (m): 0.30**
Photo ID: SS01 IMGP004-006
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NW corner of Study area – NW of Port Stanvac; SS04, SSS10 & SS21 to SE
Core catcher/cutter inverted;
Weather: Swell <0.5m; Waves <1m; Wind Northerly 10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.05	Detrital/bioclastic, slightly shelly coarse to very coarse SANDS w/ large, relict/modern bivalve shell fragments
	Brown
	Bivalve shells incl scallops
0.05 – 0.23	Detrital/bioclasic, slightly silty, fine to medium SANDDS
	Olive gray
	Moderately well sorted
	Occasional pockets of brown coarse sands
	Occasional seagrass fibres
0.15-0.17	large bivalve shell lense
0.17-0.23	predominantly olive gray
0.23	**Distinct Color & Sediment Change**
0.23 – 0.31	CLAY to gritty CLAY w/ large shells
	Stiff, dense, cohesive
	Green gray to blue gray
	Shells: predominantly whole gastropods

Interval (m)	
0.00 – 0.23	Holocene (Qh)
0.23 – 0.31	early Holocene to late Pleistocene marine unit (coastal lagoon / estuarine - indurated?)

Vibrocore ID: SS02 **Date (dmy): 26/08/2020** **Time (CST): 1229**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268749.9941 **MGA-N: 6112880.007**
Location: (deg.deg) (WGS84): Latitude (S): 35.10038 **Longitude (E): 138.46298**
(deg min.min) 35 06.0228' 138 27.7788'
(deg min sec) 35 06' 01.3680" 138 27' 46.7280"
Water Depth uncorr (m): 19.2 Seafloor Depth (Chart Datum)(m): 18.158 AHD (approx 1.4m Pt Stanvac)(m): -19.558
Penetration w/ cc/c (m): NA Final Recov w/ cc/c (m): 0.61 Final Recov w/o cc/c (m): 0.58
Photo ID: SS02 IMGP009-010
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NW corner of study area – NW of Port Stanvac; SS04, SS10 & SS01 to N-NW; SS32-SS40-SS42 to SE
Core catcher/cutter full; slow, hard penetration – vbc bounced on hard surface; barrel slightly bent.
Weather: Swell <0.5m; waves <0.5m; Wind Northerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.07	silty, very fine to fine SAND w/ rare bivalve shell fragments Mottled brown to gray Well sorted Occasional fibre
0.0 – 0.11	silty very fine to fine SAND w/ occ shell fragments Gray Moderately well sorted
0.11 - 0.42	slightly silty, fine to very coarse SAND to fine GRAVEL (granule) w/ occ shell fragments Gray to olive gray Occ calcareous (S) nodules Rare fibre
0.42 – 0.58	very slightly clayey, silty, very fine to fine SANDS with fibre Olive gray Moderately sorted Occ bivalve shell fragments & some small gastropod shells
CC:	As above, somewhat gritty, occ gastropod & bivalve shell fragments Occ fibre Crab pincher fragment

Interval (m)	
0.00 – 0.58	Holocene (Qh)

Vibrocore ID: SS03 **Date (dmy): 26/08/2020** **Time (CST): 1128**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 269072.024 **MGA-N: 6112521.884**
Location: (deg.deg) (WGS84): Latitude (S): 35.10368 **Longitude (E): 138.46641**
(deg min.min) 35 06.2208' **138 27.9846'**
(deg min sec) 35 06' 13.2480" **138 27' 59.0760"**
Water Depth uncorr (m): 15.0 Seafloor Depth (Chart Datum)(m): 13.702 AHD (approx 1.4m Pt Stanvac)(m): -15.102
Penetration w/ cc/c (m): NA Final Recov w/ cc/c (m): 0.65 inal Recov w/o cc/c (m): 0.62
Photo ID: SS03 IMGP007-008
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NW of Port Stanvac Jetty area – shallow side of study area; SS40-SS32-SS42 to NW-N; SS41-SS30 to SW-SE
Core catcher/cutter full; slow, hard penetration
Weather: swell <0.5m; waves 0.5m; wind northerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.07 fine to medium SANDS
Brown
Well sorted, uniform, clean, quartz?
0.07 – 0.61 Detrital/bioclastic, silty, very fine to fine, quartz(?) SAND w/ rare shell fragments
Gray
Well sorted, uniform, clean
More compact towards bottom
Detrital component >>> bioclastic
0.59-0.61 occasional shells/fragments

Interval (m)
0.00 – 0.61 Holocene (Qh)

Vibrocore ID: SS04 **Date (dmy): 09/09/2020** **Time (CST): 0728**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268609.6251 **MGA-N: 6113054.042**
Location: (deg.deg) (WGS84): Latitude (S): 35.09878 **Longitude (E): 138.46149**
(deg min.min) 35 05.9268' **138 27.6894'**
(deg min sec) 35 05' 155.6080" **138 27' 41.3640"**
Water Depth uncorr (m): 21.0 Seafloor Depth (Chart Datum)(m): 18.84 AHD (approx 1.4m Pt Stanvac) (m): -20.24
Penetration w/ cc/c (m): ?0.78 Final Recov w/ cc/c (m): 0.66 Final Recov w/o cc/c (m): 0.62
Photo ID: SS04 IMGP0111-0113
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size
Comments: NW of study area – outer boundary; S of SS01, N-S of SS10 & SS02 respectively
Core catcher/cutter dented, slightly dented; slight H2S odor
Weather: swell 0.5m; waves<0.5m; wind southeasterly 5-10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.12 Detrital/bioclastic, slightly silty fine to medium SAND [pred detrital]
Moderately well sorted, uniform
0.00-0.05 slightly disturbed; gray to olive gray, very slightly clayey, slightly silty, fine to coarse sand
0.05-0.12 brown to grayish brown
Occ shell
0.12 – 0.23 Detrital/bioclastic, medium to coarse SAND [pred detrital]
Gray to dark gray
Occ pockets of olive gray clay (soft, cohesive)

0.23 **Distinct Color & Sediment Change**
0.23-0.34 Limestone & Reef Rock GRAVEL CHUNKS w/ MATRIX OF CLAYEY SAND
Olive gray to brownish gray
Sub-rounded
1-5cm long pieces
Slightly cohesive, friable (crumbly)

0.34 – 0.58 gritty CLAY w/ minute gastropod shells
Pale olive to olive
Somewhat dry & friable *crumbly)
Cohesive
Grit = sand to fine granule size
0.52-0.56 medium to very coarse sand / shell lense

0.58 – 0.62 Bivalve SHELLHASH w/ matrix of CLAY/SAND
Beige to lt greenish gray (?)
Loose
Bivalves: uniform size range of 2-8mm

Interval (m)	
0.00 – 0.23	Holocene (Qh)
0.23 – 0.58	Reworked Holocene
0.58 – 0.62	early Holocene ? (coastal lagoon - indurated?)

Vibrocore ID: SS05 **Date (dmy): 09/09/2020** **Time (CST): 1248**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268543.29 **MGA-N: 6112042.18**
Location: (deg.deg) (WGS84): Latitude (S): 35.10788 **Longitude (E): 138.46048**
(deg min.min) 35 06.4728' **138 27.6288'**
(deg min sec) 35 06' 28.3680" **138 27' 37.7280"**
Water Depth uncorr (m):18.20 Seafloor Depth (Chart Datum)(m): 17.418 AHD (approx 1.4m Pt Stanvac)(m): -18.818
Penetration w/ cc/c (m): ?1.72 **Final Recov w/ cc/c (m): 1.11** **Final Recov w/o cc/c (m): 1.08**
Photo ID: SS05 IMGP0124-0128
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: W of Port Stanvac Jetty area; E of SS06-SS18, W of SS17, N of SS16
Core catcher/cutter mangled & inverted -shellhash & sand above
Weather: swell 0.5m; waves 0.5m; wind easterly 5-10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.97 gradual coarsening downcore in sections; somewhat uniform
0.00 – 0.38 gray, firm, friable SANDS
0.00-0.04 Detrital/bioclastic, *disturbed,* brown to gray silty very fine to fine SAND [pred detrital]
0.04-0.38 Detrital/bioclastic silty, very fine to fine SAND [pred detrital]
Dark gray
Uniform, clean(?), moderately well sorted
Quartz?
Very rare scattered shell fragments
0.38 – 0.50 Detrital/bioclastic, slightly silty, medium – coarse SAND [pred detrital]
Dark gray
Uniform – moderately sorted
0.50 – 0.90 Detrtial/bioclastic, very slightly clayey, silty, very fine to medium SAND w/ scattered fibre & occ small shell fragments [pred detrital]
Dark gray
Moderately sorted
loose
0.71-0.74 shell fragments & seagrass fibre
0.77-0.80 shell fragments & seagrass fibre (silty very fine to fine sand lense)
0.90 – 0.98 Detrital/bioclastic, very slightly clayey, silty, very fine to medium SAND w/ fibre & coarse shell fragments
Dark gray
Loose to firm

0.98 **Distinct Change in Sediment**
0.98 – 1.08 SHELLS/SHELLHASH intermixed with very slightly clayey, silty SANDS & some fibre
Light gray to beige
Shells: gastropods & bivalves; granular – small gravel size
Loose, friable

Interval (m)
0.00 – 0.98 Holocene (Qh)
0.98 – 1.08 early Holocene? coastal lagoon - indurated)

Vibrocore ID: SS06 Date (dmy): 05/09/2020 Time (CST): 1306
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268352.5152 MGA-N: 6112118.35
Location: (deg. deg) (WGS84): Latitude (S): 35.10715 Longitude (E): 138.45841
(deg min.min) 35 06.4290' 138 27.5046'
(deg min sec) 35 06' 25.7400" 138 27' 30.2760"
Water Depth uncorr (m): 19.5 Seafloor Depth (Chart Datum)(m): 18.711 AHD (approx 1.4m Pt Stanvac)(m): -20.111
Penetration w/ cc/c (m): ?0.67 Final Recov w/ cc/c (m): 0.71 Final Recov w/o cc/c (m): 0.68
Photo ID: SS06 IMGP0099-0102
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: W of Port Stanvac Jetty area; E of SS18, W of SS05 & SS17, N of SS09
Core catcher/cutter full; bottom of barrell had clay adhered to sides
Weather: swell 1m; waves 0.5m; wind northwesterly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.37 Detrital/bioclastic SANDS
Slightly silty, very fine to fine SANDS w/ scattered shell fragments (pred bivalve)
Mottled brown to gray to olive gray
Moderately well sorted

0.37 **Distinct Sediment Change**
0.37 – 0.45 SHELL/SAND LAYER
Large bivalve shell on top (both halves) w/ gray fine to coarse sands & shell fragments (pred bivalves) in between w/ 2 full bivalve shell halves on bottom

0.45 **Distinct Sediment Change**
0.45 – 0.68 CLAY w/ occ shells/fragments, occ grit
Fim to stiff
Cohesive, plastic
Grayish brown to olive
Grit = occ dry bits
Pockets of sand & scattered shell

Interval (m)	
0.00 – 0.37	Holocene (Qh)
0.37– 0.45	early Holocene & Pleistocene Pooraka Fm (Qpp)
0.45 – 0.68	late Pleistocene marine unit ? – indunated

Vibrocore ID: SS07 **Date (dmy): 05/09/2020** **Time (CST): 1406**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268351.7315 **MGA-N: 6112577.902**
Location: (deg.deg) (WGS84): Latitude (S): 35.10301 **Longitude (E): 138.45853**
(deg min.min) 35 06.1806' **138 27.5118'**
(deg min sec) 35 06' 10.836" **138 27' 30.708"**
Water Depth uncorr (m): 20.10 Seafloor Depth (Chart Datum)(m): 18.994 AHD (approx 1.4m Pt Stanvac)(m): -20.394
Penetration w/ cc/c (m): ?0.72 **Final Recov w/ cc/c (m): 0.53** **Final Recov w/o cc/c (m): 0.49**
Photo ID: SS07 IMGP0095-0098
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: Western boundary of Study Area – slightly NW of Port Stanvac Jetty; SS31-SS41-SS08 to NE-W-SE respectively
Core catcher/cutter half full; calcrete/limestone chunks & shellhash w/ gray green sand
Weather: swell 1m; waves 0.5m; wind northwesterly <5knts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.06 Detrital/bioclastic SANDS
Silty to very fine to fine sands
Brown to grayish brown
Moderately well sorted
Biota attachment on top of core

0.06 – 0.15 Detrital/bioclastic SANDS
Slightly silty, fine to medium sand
Dark gray to black

0.15 **Distinct Sediment Change**

0.15 – 0.18 GRAVEL – ROCK CHUNKS [calcrete crust]
Broken, angular to sub-rounded
Hard

0.18 – 0.43 Detrital/bioclastic SANDS & GRAVEL [d>b]
very slightly clayey, slightly silty, fine to very coarse SAND to fine GRAVEL (grit) with scattered fibre & scattered shell/fragments (pred gastropods)
gray to olive

0.43 – 0.49 CALCRETE / LIMESTONE GRAVEL CHUNKS intermixed w/ SHELLHASH
Loose
Light gray to beige
Coarse to very coarse shell sands

Interval (m)	
0.00 – 0.15	Holocene (Qh)
0.15 – 0.18	Reworked Holocene
0.18 – 0.43	early Holocene or late Pleistocene & reworked
0.43 – 0.49	Qca Calcrete & Bedrock

Vibrocore ID: SS08 Date (dmy): 26/08/2020 Time (CST): 1339
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268693.2592 MGA-N: 6112242.49
Location: (deg.deg) (WGS84): Latitude (S): 35.10611 Longitude (E): 138.46218
(deg min.min) 35 06.3666' 138 27.7308'
(deg min sec) 35 06' 21.9960" 138 27' 43.8480"
Water Depth uncorr (m): 17.60 Seafloor Depth (Chart Datum)(m): 16.707 AHD (approx 1.4m Pt Stanvac)(m): -18.107
Penetration w/ cc/c (m): NA Final Recov w/ cc/c (m): 1.99 Final Recov w/o cc/c (m): 1.96
Photo ID: SS08 IMGP0011-0018
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: W of Port Stanvac Jetty; SS07-SS41-SS30 to NW-N-NE respectively**;** SS05 to S
Core catcher/cutter full, inverted, slightly dented: shell intermixed with beige clayey silty sand
Weather: swell 0.5m; waves 0.5m; wind north 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.10 Detrital/bioclastic fine to very coarse SAND to fine GRAVEL w/ occ shell fragments
Brown
Moderately poorly sorted

0.10 - 0.23 Detrital/bioclastic fine to coarse SAND w/ occ shell fragments (pred bivalve)
Gray
Moderately sorted
0.23 large bivalve shell fragment

0.23 - 0.62 Detrital/bioclastic silty very fine to fine SAND w/ occ shell fragments [d>b]
Gray to olive gray
Moderately well sorted, uniform (except for shell lenses)
0.46-0.50 very large gastropod & bivalve shell lense
(gastropod = *triformis*)
0.58-0.61 shell lense (bivalve shell fragments & seagrass fibre)

0.62 – 0.80 Detrital/bioclastic, very slightly clayey, very fine to medium SAND w/ gravel size bivalve shell fragments
Olive gray
Compact, moderately poorly sorted

0.80 **Distinct Sediment Change**
0.80 – 1.87 Alternate layers of brown/gray slightly clayey, fine to coarse SAND w/ larger shell fragments AND
Brown/gray SHELLHASH (predominantly horizontally laid in core, bivalves)
Moist, "loose" – crumbly (friable), not "compact/dense"
1.48-1.70 occasional calcareous nodules
1.76-1.85 beige, clayey fine to medium sand layer w/ occ shell fragments

1.87 - 1.96 SAND intermixed w/ numerous gastropod shells up to 1cm in length
Greenish gray

CC SHELLHASH (pred bivalves)
loose

Interval (m)

0.00 – 0.80	Holocene (Qh)
0.80 – 1.87	early Holocene ? to late Pleistocene
1.87 – 1.96	late Pleistocene coastal lagoon - indurated?

Vibrocore ID: SS09 **Date (dmy): 26/08/2020** **Time (CST): 1436**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268134.0651 **MGA-N: 6111885.205**
Location: (deg.deg) (WGS84): Latitude (S): 35.10920 **Longitude (E): 138.45595**
(deg min.min) 35 06.5520' **138 27.3570'**
(deg min sec) 35 06' 33.1200" **138 27' 21.4200"**
Water Depth uncorr (m): 20.20 Seafloor Depth (Chart Datum)(m): 19.304 AHD (approx 1.4m Pt Stanvac)(m): -20.704
Penetration w/ cc/c (m): NA **Final Recov w/ cc/c (m): 1.70** **Final Recov w/o cc/c (m): 1.67**
Photo ID: SS09 IMGP0019-0023
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: SW of Port Stanvac Jetty outer area; SS23 to W, SS18-SS06-SS05 to NW-N-NE respectively; SS16 to E, SS20 to S
Core catcher/cutter empty; calcrete nodules above
Weather: swell <0.5m; waves 0.50m; wind northerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.15 Predominantly detrital slightly silty, very fine to fine SAND
Brown
Well sorted, uniform

0.15 **Distinct Sediment Change**
0.15 – 0.40 fine to medium SANDs w/ relict shell fragments INTERMIXED w/ large (gravel size) CALCAREOUS NODULES/Limestone Chunks
Dirty, olive gray
Poorly sorted, loose

0.40 **Distinct Sediment Change**
0.40 – 0.91 slightly clayey, fine to medium SAND
Olive gray to greenish gray
Moderately poorly sorted
Intermittent small bivalve shell fragments (whole/broken)

0.91 **Distinct Sediment Change**
0.91 – 1.40 Bivalve SHELL LAYERS with matrix of bioclastic/detrital fine to coarse SAND
Graying transitioning to beige to greenish gray/brown downcores
Crumbly – loose
Shells – layered horizontally in core
1.40 – 1.47 slightly clayey, silty very fine to medium SAND intermixed w/ small SHELLS (whole/broken)
Brown
Poorly sorted

1.47 **Distinct Sediment Change**
1.47 – 1.57 slightly sandy CLAY
Mottle brown to light greenish gray
Slightly cohesive, plastic

1.57 – 1.67 slightly sandy CLAY w/ occasional calacareous (calcrete?) nodules towards bottom
Greenish gray
Cohesive, plastic

Interval (m)	
0.00 – 0.40	Holocene (Qhk)
0.40 – 1.47	early Holocene, lagoonal? (6-9000yr?)
1.47 – 1.57	paleosoil
1.57 – 1.67	late Pleistocene marine unit

Vibrocore ID: SS10 Date (dmy): 09/09/2020 Time (CST): 0823
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268845.35 MGA-N: 6113112.22
Location: (deg.deg) (WGS84): Latitude (S): 35.09831 Longitude (E): 138.46409
(deg min.min) 35 05.8986' 138 27.8454'
(deg min sec) 35 05' 53.9160" 138 27' 50.7240"
Water Depth uncorr (m): 20.40 Seafloor Depth (Chart Datum)(m): 18.36 AHD (approx 1.4m Pt Stanvac) (m): -19.76
Penetration w/ cc/c (m): ?1.22 Final Recov w/ cc/c (m): 1.12 Final Recov w/o cc/c (m): 1.08
Photo ID: SS10 IMGP0103-0110
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NW corner of Study Area; SS01 to NW; SS21 to E, SS04-SS02 to S
Core catcher/cutter empty, slightly inverted, slightly dented/abraided; clay adhered to bottom of barrel; barrel slightly bent.
Bagged: 0.38-0.60m section
Weather: swell 0.5m; waves <0.5m; wind south easterly 5-10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.16 Detrital/bioclastic, very slightly silty, fine to medium SAND [pred detrital]
0.00-0.16 dk dray to olive gray; top slightly disturbed
0.08-0.16 black very fine to fine sand w/ organics (mottled)
0.16 – 0.38 Gradual coarsening downcore
Fine to medium SAND to very coarse SAND w/ occ large shell fragments
0.29-0.31, 0.33 black bivalve shell fragments

0.38 **Distinct Color & Sediment Change – Reworked Zone**
0.38 – 0.60 Large Limestone – Reef Rock CHUNKS
Chunks: 5-6m long, sub-rounded to rounded
Some bivalve shell fragments (matrix)
Preserved = bagged this section.
0.60 – 0.81 Alternating Color Banks = very slightly clayey, slightly silty, slightly gravelly (granule) medium to very coarse SAND Detrital/bioclastic sediment, w/ occ shell fragments
Light to dark gray
Moderately to poorly sorted
Somewhat uniform lenses (1-2m thick)
0.81 – 0.99 Detrital/bioclastic, slightly clayey, fine to medium detrital SAND & coarse to very coarse bioclastic SAND to fine GRAVEL (granule size)
Light gray to light greenish gray
Slightly cohesive, loose
Somewhat dry & friable (desicatted clay bits)

0.99 **Distinct Sediment & Color Change**
0.99 – 1.08 SHELLHASH intermixed with (matrix?) of fine to very coarse detrital SAND & very coarse to fine gravel bioclastic SAND
Grayish brown
Compact, friable (crumbly)
Shellhash = loose

Interval (m)	
0.00 – 0.38	Holocene (Qhk)
0.38 – 0.60	Reworked Holocene & late Pleistocene?
0.60 – 0.99	? Reworked Holocene &/OR late Pleistoncene [older marine unit?]
0.99 – 1.08	late Pleistocene (coastal lagoon - indurated?)

Vibrocore ID: SS11 Date (dmy): 05/09/2020 Time (CST): 0927
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 267973.7824 MGA-N: 6111232.82
Location: (deg.deg) (WGS84): Latitude (S): 35.11504 Longitude (E): 138.45401
(deg min.min) 35 06.9024' 138 27.2406'
(deg min sec) 35 06' 54.1440" 138 27' 14.4360"
Water Depth uncorr (m): 19.90 Seafloor Depth (Chart Datum)(m): 18.746 AHD (approx 14m Pt Stanvac)(m): -20.146
Penetration w/ cc/c (m): ?2.09 Final Recov w/ cc/c (m): 2.09 Final Recov w/o cc/c: 2.06
Photo ID: SS11 IMGP0074-0081
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NW of O'Sullivans Beach Marina; SS27 to NW; SS19-SS39-SS26 to NE-E-SE
Core catcher/cutter full; olive gray, firm, cohesive, sandy clay; clay adhered to bottom of abraided barrel
Weather: swell 1qm; waves 1m; wind north westerly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.20 Detrital/bioclastic SAND
Silty, very fine to fine sand
Brown to grayish brown / brownish gray
Moderately well sorted

0.20 **Distinct Sediment Change**
0.20 – 0.30 Detrital/bioclastic SANDS intermixed w/ large SHELL FRAGMENTS (bivalves)
Gray
Moderately sorted
0.30 – 0.50 Detrital/bioclastic SAND & SHELL FRAGMENTS
Slightly clayey, silty, very fine to medium SAND intermixed with small shell/ fragments & occ fibre
Gray to olive gray

0.50 – 0.60 Detrital/bioclastic SAND
Silty very fine to fine sand w/ occ shell
0.60 – 0.90 Bioclastic/detrital SAND & Shell
Very slightly clayey, fine to very coarse sand/shell sand
Shell coarser than sands
Light greenish gray to light gray
Uniform, loose, very slightly cohesive (clay component)
0.71-0.73 GRAVEL CHUNKS (calcrete? / limestsone?)

0.90 **Distinct Sediment & Color Change**
0.90 – 1.17 slighty clayey SANDS intermixed w/ SHELLHASH
Yellowish brown to grayish brown
Shells = small gastropods
1.00-1.17 very coarse shell sand component
1.17 – 1.33 very slightly clayey, SAND intermixed w/ SHELLS /FRAGMENTS
Yellowish brown to gray
Poorly sorted
1.28-1.33 brown bioclastic/detrital sand
Coarse to very coarse sand (bioclastic coarser than detrital component)
1.33 – 1.36 semi-cemented, friable, SHELL SAND (bioclastic/detrital)
Very pale brown to light greenish brown

1.36 **Distinct Sediment Change**
1.36 – 1.63 Silty, very fine to fine SAND to sandy SILT w/ slightly larger shell fragments
Pale brown, uniform
Friable to semi-cemented chunks of calcareous sands
Occ large shell fragments

1.63 **Distinct Sediment Change**
1.63 – 2.06 Alternate Color layering of light gray to yellowish brown to dark brown, slightly sandy CLAY to CLAY
Cohesive, plastic
Pockets of shells
Somewhat dry

Interval (m)	
0.00 – 0.50	Holocene (Qh)
0.50 – 0.90	early Holocene (Qh)
0.90 – 1.17	early Holocene – lagoonal?
1.17 - 1.36	early Holocene – lagoonal
1.36 – 1.63	Sandflat
1.63 – 2.06	Older Marine Unit pedogenically altered?

Vibrocore ID: SS12 Date (dmy): 31/08/2020 Time (CST): 1031
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268437.1744 MGA-N: 6110767.37
Location: (deg.min) (WGS84): Latitude (S): 35.11934 Longitude (E): 138.45896
(deg min.min) 35 07.1604' 138 27.5376'
(deg min sec) 35 07' 09.6240" 138 27' 32.2560"
Water Depth uncorr (m): 15.7 **Seafloor Depth (Chart Datum)(m): 14.569 AHD (approx 1.4m Pt Stanvac)(m): -15.969**
Penetration w/ cc/c (m): 1.25 Final Recov w/ cc/c (m): 0.98 Final Recov w/o cc/c (m): 0.95
Photo ID: SS12 IMGP0050-0053
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: W of O'Sullivans Beach Marina, inshore core; SS36 to W, SS15-SS35-SS28 to SW-SW-S respectively
Core catcher/cutter full: dark grey to black, slightly clayey fine-medium sands w/ rare scattered shells & w/ fibre
Weather: swell 1-1.2m; waves 0.5-1m; wind southerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.23 Detrital/bioclastic, silty, very fine to fine SAND [d>>>b]
Mottled olive gray to lt brown to dk gray to black
Compact, uniform
0.00-0.05 olive gray to gray
0.05-0.13 brown
0.13-0.23 brownish gray to dk gray to black; H2S odor

0.23 **Distinct Sediment & Color Change**
0.23 – 0.28 slightly clayey, silty, very fine to medium SAND INTERMIXED W/ FIBRE & ORGANICS
Black
0.28 - 0.35 Detrital/bioclastic, very slightly silty, coarse to very coarse SAND [d>>b]
Gray to brown
0.35-0.36 bivalve shell fragments

0.35 **Distinct Color & Sediment Change**
0.35 - 0.69 Detrital/bioclastic, silty, very fine to fine SAND w/ rare – scattered shell fragments
Light to dark gray (darker downcore)
Moderately well sorted, uniform, compact
0.46-0.58 bivalve shell fragment layer
0.59-0.64 2 rounded gravel chunks (4cm long)

0.69 **Distinct Color & Sediment Change**
0.69 – 0.94 very slightly clayey, silty, very fine to fine SAND
Gray to brown
Moderately well sorted
Quartz?
0.69-0.83 dark grayish brown
0.83-0.98 very dark grayish brown
0.94 & CC slightly coarser than above; w/ fibre
Dark gray to black

Interval (m)
0.00 – 0.69 Holocene (Qh)
0.69 – 0.94 early Holocene ?

Vibrocore ID: SS13 **Date (dmy): 31/08/2020** **Time (CST): 1153**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268303.1581 **MGA-N: 6110336.523**
Location: (deg.deg) (WGS84): Latitude (S): 35.12319 **Longitude: 138.45737**
(deg min.min) 35 07.3914' 138 27.4422'
(deg min sec) 35 07' 23.4840" 138 27' 26.5320"
Water Depth uncorr (m): 15.20 Seafloor Depth (Chart Datum)(m): 13.844 AHD (approx 1.4m Pt Stanvac)(m): -15.244
Penetration w/ cc/c (m): 1.32 **Final Recov w/ cc/c (m): 0.85** **Final Recov w/o cc/c (m): 0.81**
Photo ID: SS13 IMGP0057-0060
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: S end of Study Area – SW of O'Sullivans Beach Marina; SS33-SS34 to S-SE respectively
Core catcher/cutter full, partly collapsed (inverted): contents as per listed below
H2S odor when core opened
Weather: swell <0.5m; waves <0.5m; wind southerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.81 & CC Detrital/bioclastic, silty, very fine to fine SAND w/ rare pockets of fibre & shell [d>>>b]
Gray
Moderately well sorted, uniform, clean
Quartz sands?

0.00-0.17	grayish brown to gray to dark gray
0.17-0.81	gray to olive gray
0.41	pocket of brown fibre
0.60	large gastropod shell

Interval (m)
0.00 – 0.81 Holocene (Qh)

Vibrocore ID: SS14 **Date (dmy): 31/08/2020** **Time (CST): 1229**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 267844.9501 **MGA-N: 6110279.292**
Location: (deg.deg) (WGS84): Latitude (S): 35.12360 **Longitude (E): 138.45233**
(deg min.min) 35 07.4160' **138 27.1398'**
(deg min sec) 35 07' 24.9600" **138 27' 08.3880"**
Water Depth uncorr (m): 19.40 Seafloor Depth (Chart Datum)(m): 17.963 AHD (approx 1.4m Pt Stanvac)(m): -19.363
Penetration w/ cc/c (m): ?0.52 **Final Recov w/ cc/c (m): 0.38** **Final Recov w/o cc/c (m): 0.35**
Photo ID: SS14 IMGP0061-0062
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: SW corner of Study Area – furthest offshore; SS25 to NE
Core catcher/cutter half full: dark grey to black, well sorted, uniform, silt very fine to fine sand
Weather: swell <0.5m; waves <0.5m; wind 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.05 Detrital/bioclastic, coarse to very coarse SAND to very fine GRAVEL INTERMIXED W/ silty very fine to fine SAND
Disturbed section
Brown to grayish brown
Branched red algae (live) attached to shell fragment

0.05 – 0.12 Detrital/bioclastic, silty, very fine to fine SAND w/ rare fibre [d>>>b]
Dark gray
Moderately well sorted, uniform

0.12 – 0.18 SHELLS INTERMIXED w/ fibre AND slightly silty coarse to very coarse SAND
Dark gray

0.18 – 0.22 very slightly clayey, silty, very fine to fine SAND to SILT

0.22 **Gradual Sediment Change**

0.22 – 0.28 Detrital/bioclastic coarse to very coarse SAND to fine GRAVEL
Gray to brown
Shells coarser than detrital component
Quartz sands?
Very minor fibre

0.28 **Gradual Sediment Change**

0.28 - 0.35 slightly clayey, SILT to very fine to fine SAND
Mottled olive brown to olive
Slightly cohesive

Interval (m)	
0.00 – 0.28	Holocene (Qh)
0.28 – 0.35	early Holocene (Qh)

Vibrocore ID: SS15 Date (dmy): 31/08//2020 Time (CST): 0750
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268132.0424 MGA-N: 6110679.606
Location: (deg.deg) (WGS84): Latitude (S): 35.12006 Longitude (E): 138.45559
(deg min.min) 35 07.2036' 138 27.3354'
(deg min sec) 35 07' 12.2160" 138 27' 20.1240"
Water Depth uncorr (m): 17.70 Seafloor Depth (Chart Datum)(m):16.335 AHD (approx 1.4m Pt Stanvac)(m): -17.735
Penetration w/ cc/c (m): ?0.50 Final Recov w/ cc/c (m): 0.42 Final Recov w/o cc/c (m): 0.39
Photo ID: SS15 IMGP0048-0049
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: W of O'Sullivans Beach Marina; SS35 to SE, SS36-SS12 to NE
Core catcher/cutter full, mangled
Weather: swell 1-1.2m; waves 0.5-1m; wind southerly 5-10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.05 Detrital/bioclastic, very slightly clayey, slilty, very fine to fine SAND [d>>>b]
Dark gray
Moderately sorted, uniform
0.05 – 0.13 Detrital/bioclastic, medium to coarse SAND [d>>>b]
Brown
Moderately well sorted, uniform

0.13 **Distinct Color Change**
0.13 – 0.23 Detrital/bioclastic, medium to coarse SAND [d>>>b]
Gray
Well sorted, uniform
0.23 – 0.28 Gradual transition to finer sediment
Slightly clayey, silty, very fine to fine SAND
Gray

0.28 **Distinct Color & Sediment Change**
0.28 – 0.33 sandy CLAY
Mottled olive to olive brown
Stiff, cohesive, plastic
Occ dark brown organic bits
0.33 – 0.39 & CC CLAY w/ occ hard bits
Olive
Firm to stiff, cohesive, plastic
Hard bits: desicatted (dry, crumbly)

Interval (m)
0.00 – 0.28 Holocene (Qh)
0.28 – 0.39 early Holocene or late Pleistocene

Vibrocore ID: SS16 Date (dmy): 05/09/2020 Time (CST): 1221
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268430.6721 MGA-N: 6111843.936
Location: (deg.deg) (WGS84): Latitude (S): 35.10964 Longitude (E): 138.45919
(deg min.min) 35 06.5784' 138 27.5514'
(deg min sec) 35 06' 34.7040" 138 27' 33.0840"
Water Depth uncorr (m): 17.80 Seafloor Depth (Chart Datum)(m): 17.157 AHD (approx 1.4m Pt Stanvac)(m): -18.557
Penetration w/ cc/c (m): ?1.19 Final Recov w/ cc/c (m): 0.94 Final Recov w/o cc/c (m): 0.91
Photo ID: SS16 IMGP0088-0094
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: SW of Port Stanvac Jetty; SS09 to W; SS06-SS05-SS17 to NW-N-NE respectively
Core catcher/cutter empty, undamaged
Weather: swell 1m; waves 1m; wind northwesterly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.05 Detrital/bioclastic, silty, very fine to fine SAND [d>>b]
Pale brown
Well sorted, uniform
0.05 – 0.08 Detrital/bioclastic, silty, very fine to fine SAND [d>>b]
Mottled gray to brown
Moderately well sorted, uniform
0.08 – 0.91 Detrital/bioclastic, silty, very fine to fine SAND [d>>b]
Gray
Well sorted, uniform, compact
Quartz?
Occ rare slightly larger shell bits & scattered fibre
0.38-0.44 large bivalve shell fragment w/ gray medium to coarse sand lense
0.51-0.52 fibre
0.67-0.75 fibre

Interval (m)
0.00 – 0.91 Holocene (Qh)

Vibrocore ID: SS17 **Date (dmy): 28/08/2020** **Time (CST): 1007**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268735.8612 **MGA-N: 6111859.49**
Location: (deg.deg) (WGS84): Latitude (S): 35.10957 **Longitude (E): 138.46254**
(deg min.min) 35 06.5742' 138 27.7524'
(deg min sec) 35 06' 34.4520" 138 27' 45.1440"
Water Depth uncorr (m): 15.70 Seafloor Depth (Chart Datum)(m): 13.89 AHD (approx 1.4m Pt Stanvac)(m): -15.29
Penetration w/ cc/c (m): ?1.53 Final Recov w/ cc/c (m): 1.18 Final Recov w/o cc/c (m): 1.15
Photo ID: SS17 IMGP0036-0041
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: W of Port Stanvac Jetty, inshore area; SS24 to S; SS16-SS05 to W-NW respectively
Core catcher/cutter full
Weather: swell 0.5m; waves <0.5m; wind northerly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.10 Detrital/bioclastic, medium to very coarse SAND [d>>>b]
Brown
Moderately sorted, uniform, clean

0.10 – 0.26 Detrital/bioclastic, fine to medium quartz (?) SAND [d>>>b]
Dark gray
Moderately well sorted, uniform, clean

0.26 **Distnct Color and Sediment Change**

0.26 – 0.77 Alternate layers of gray to light gray, moderately sorted, medium – very coarse SAND w/ rare shell fragments AND olive gray, moderately well sorted, silty very fine to fine SAND w/ rare shell fragments

0.26-0.36	sand
0.33	large relict bivalve shell half
0.36-0.47	silty sand
0.47-0.62	coarse sand w/ occ pockets of organics/fibre or small shell fragments
0.62-0.77	olive silty very fine to fine sand w/ fibre and occ shell fragments

0.77 – 1.15 Detrital/bioclastic silty, very fine to fine SAND w/ occ fibre & occ shell fragments [d>b]
Olive gray
Well sorted, uniform, compact
Shells: bivalves, whole/broken

Interval (m)
0.00 – 1.15 Holocene (Qh)

Vibrocore ID: SS18 Date (dmy): 28/08/2020 Time (CST): 1213
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268163.21 MGA-N: 6112136.83
Location: (deg.deg) (WGS84): Latitude (S): 35.10694 Longitude (E): 138.45634
(deg min.min) 35 06.4164' 138 27.3804'
(deg min sec) 35 06' 24.9840" 138 27' 22.8240"
Water Depth uncorr (m): 21.10 Seafloor Depth (Chart Datum)(m): 19.58 AHD (approx 1.4m Pt Stanvac)(m): -20.98
Penetration w/ cc/c (m): ?2.51 Final Recov w/ cc/c (m): 1.85 Final Recov w/o cc/c (m): 1.82
Photo ID: SS18 IMGP0029-0035
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: W of Port Stanvac Jetty, furtherest offshore; SS06 to SE, SS23-SS09 to SW-S respectively
Core catcher/cutter empty
Weather: swell 0.5m; waves <0.5m; wind northerly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.11 Detrital/bioclastic fine to medium SAND w/ occ shell fragments [d>>>b]
Brown
Moderately sorted

0.11 – 0.26 Detrital/bioclastic fine to medium SAND w/ scattered grey calcalreous nodules [d>>>b]
Brown to gray
Moderately sorted

0.26 – 0.50 Detrital/bioclastic very slightly silty, sandy CLAY INTERMIXED fine to coarse SAND w/ scattered fibre
Light gray to light olive gray clays vs dk gray sands
Somewhat layered

0.50 **Distinct Color & Sediment Change**

0.50 – 0.73 CLAY w/ lenses of gray sand/gritty clay
Rare shells
Occ cemented clayey sand bits (granule size)
Olive
Cohesive, plastic

0.73 – 1.35 clayey fine to medium SAND w/ increased shell lenses downcore
Olive gray to gray
Shells: bivalves & gastropods

1.35 – 1.37 **Distinct Sediment Change**

1.35 -1.73 very slightly silty, sandy CLAY to CLAY w/ occ shells/fragments
Light grayish green (7/1 10Y)
Cohesive
Occ semi-cemented (dry/friable) sand bits
Occ pockets of brown shells

1.73 – 1.82 sandy CLAY w/ large cemented sand/granule bits & occ gravel
Greenish gray
Cohesive
Gravel – up to 2cm, sub-angular

Interval (m)	
0.00 – 0.50	Holocene (Qhk)
0.50 – 1.35	Holocene (<10,000yr?) muddy lagoonal or paleosol
1.35 – 1.82	weathered Pleistocene

Vibrocore ID SS19 Date (dmy): 05/09/2020 Time (CST): 1043
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268290.8725 MGA-N: 6111353.043
Location: (deg.deg) (WGS84): Latitude (S): 35.11403 Longitude (E): 138.45752
(deg min.min) 35 06.8418' 138 27.4512'
(deg min sec) 35 06' 50.5080" 138 27' 27.0720"
Water Depth uncorr (m): 17.80 Seafloor Depth (Chart Datum)(m): 17.054 AHD (approx 1.4m Pt Stanvac)(m): -18.454
Penetration w/ cc/c (m): ?1.31 Final Recov w/ cc/c (m): 1.34 Final Recov w/o cc/c (m): 1.31
Photo ID: SS19 IMGP0082-0087
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NW of O'Sullivans Beach Marina; SS11-SS39-SS38-SS22 to SW-S-SE respectively
Core catcher/cutter empty, closed
Strong odor of H2S
Weather: swell 1m; waves 1m; wind northwesterly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.05 Detrital/bioclastic SAND [d>>b]
Silty very fine to fine sand (disturbed, watery)
Brown to grayish brown
Moderately well sorted,
0.05 – 0.16 Detrital/bioclastic SAND [d>>b]
Slightly silty, medium to very coarse sand
Grayish brown
Moderately sorted
0.16 – 0.30 Detrital/bioclastic SAND
Slightly silty, medium to very coarse sand w/ scattered shell/fragments (pred bivalves)
Very dark gray
0.20-0.21 large bivalve shell

0.30 **Slight Sediment & Color Change**
0.30 – 0.55 slightly clayey, silty, fine to very coarse SAND w/ scattered shell fragments
Olive brown
Moderate to moderately poorly sorted
Slightly cohesive
0.43-0.46 bivalve shell lense
0.54-0.55 black organic pocket

0.55 – 0.91 **Gradual coarsening downcore of bioclastic component (shells – sand to gravel size)**
Bioclastic/detrital SANDS/GRAVEL
Very slightly silty, coarse to very coarse SAND grading to fine GRAVEL
Light olive brown to olive brown
Shells: mix of small gastropods & bivalves
0.66 – 0.91 Shell content increase [b>d]
0.82-0.84 gravel chunks – rounded

0.91 – 1.20 Alternate layers of light olive brown silty very fine to fine SAND & brown SHELL SAND/GRAVEL
1.08-1.10 rounded gravel chunks
1.20 rounded gravel chunks

1.20 – 1.31 Bioclastic SANDS/GRAVEL – SHELLHASH
Coarsening downcore
Shells: bivalves & gastropods
brown

Interval (m)	
0.00 – 0.30	Holocene (Qh)
0.30 – 1.20	early Holocene lagoonal? (7-9000yrs?)
1.20 – 1.31	early Holocene lagoonal?

Vibrocore ID: SS20 **Date (dmy): 28/08/2020** **Time (CST): 1436**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268131.437 **MGA-N: 6111595.4107**
Location: (deg.min) (WGS84): Latitude (S): 35.11181 **Longitude (E): 138.45584**
(deg min.min) 35 06.7086' **138 27.3504'**
(deg min sec) 35 06' 42.5160" **138 27' 21.0240"**
Water Depth uncorr (m): 20.20 Seafloor Depth (Chart Datum)(m): 18.915 AHD (approx 1.4m Pt Stanvac)(m): -20.315
Penetration w/ cc/c (m): NA **Final Recov w/ cc/c (m): 0.02** **Final Recov w/o cc/c (m): 0.02**
Photo ID: No Photos
Analyses Done: Environmental Sampling: None
Comments: NW of O'Sullivans Beach Marina; SS09-SS16 to NW -N respectively; SS27-SS19 to SW – SE respectively
Core catcher/cutter empty, dented
vbc bounced on hard surface
Weather: swell <0.5m; waves <0.5m; wind northerly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.02 A few bits of black bivalve shell fragments

Interval (m)

0.00 – 0.02 Reef surface

Vibrocore ID: SS21 **Date (dmy): 28/08/2020** **Time (CST): 0800**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 269096.4681 **MGA-N: 6112995.395**
Location: (deg.deg) (WGS84): Latitude (S): 35.09942 **Longitude (E): 138.466681**
(deg min.min) 35 05.9652' 138 28.0086'
(deg min sec) 35 05' 57.9120" 138 28' 00.5160"
Water Depth uncorr (m): 18.10 Seafloor Depth (Chart Datum)(m): 16.23 AHD (approx 1.4m Pt Stanvac)(m): -17.63
Penetration w/ cc/c (m): ?1.42 **Final Recov w/ cc/c (m): 1.08** **Final Recov w/o cc/c (m): 1.05**
Photo ID: SS21 IMGP0024
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: Northern part of Study Area – mid depth; SS10 to W; SS02-SS32-SS42 to SW-S-SE respectively
Core catcher/cutter inverted, half full; olive gray, soft clay to sand w/ fibre & calcrete nodules, shells
Weather: swell <0.5m; waves <0.5m; wind northerly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.09	Detrital/bioclastic silty, very fine to fine SAND [d>>>b]
	Grayish brown
	Well sorted, uniform, clean
0.09 – 0.20	Detrital/bioclastic silty very fine to fine SAND [d>>>b]
	Gray
	Well sorted, uniform
0.09-0.11	shell lense (modern/relict whole/broken fragments)
0.20	**Slight Sediment Change**
0.20 – 0.30	very slightly clayey (?), silty fine to medium quartz(?) SAND
	Very large shell fragment in unit
0.29-0.30	seagrass fibre
0.30 – 0.95	very slightly clayey, silty, very fine to fine SAND w/ fibre
	Pockets of shells – fibre – brown organic matter
	Gray to olive gray
	Very slight increase in clay content downcore
0.38	brown matter
0.59-0.62	brown fibre
0.70	bivalve shell half
0.82-0.83	bivalve shell halves
0.94-0.98	bivalve shell
0.95	**Distinct Color & Sediment Change**
0.95 – 1.05	CLAY INTERMIXED W/ fine to coarse SAND to pea GRAVEL CHUNKS (calcrete, limestone)
	Dark gray to dk olive gray

Interval (m)	
0.00 – 0.95	Holocene (Qh)
0.95 – 1.05	QCa ?
	Late Pleistocene (coastal lagoon - indurated?)

Vibrocore ID: SS22 **Date (dmy): 25/08/2020** **Time (CST): 1550**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268493.3966 **MGA-N: 6111101.785**
Location: (deg.deg) (WGS84): Latitude (S): 35.11634 **Longitude (E): 138.45967**
(deg min.min) 35 06.9804' **138 27.5802'**
(deg min sec) 35 06' 58.8240" **138 27' 34.8120"**
Water Depth uncorr (m): 16.10 Seafloor Depth (Chart Datum)(m): 15.149 AHD (approx 1.4m Pt Stanvac)(m): -16.549
Penetration w/ cc/c (m): NA **Final Recov w/ cc/c (m): 1.60** **Final Recov w/o cc/c: 1.57**
Photo ID: SS22 IMGP001-003
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution; log/sampled on 26Aug20
Comments: NW of O'Sullivans Beach Marina inner shore area; SS37 to E; SS38 to W
Core taken on 25Aug20; logged & sampled on 26Aug20
Core catcher/cutter full; refer to below
Weather: swell <0.5m; waves <0.5m; wind light <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.40 slightly silty, very fine to fine SAND
Gray w/ pockets of brown
Moderately well sorted
Clean, uniform

0.40 – 0.82 coarse to very coarse SAND to fine GRAVEL (granule)
Gray to brown
Moderately sorted
Rare pockets of clay

0.82 **Distinct Color and Sediment Change**

0.82 – 1.57 Alteranate layers of brown or gray to olive gray shelly, (fine to very coarse) sandy CLAY to brown or gray very coarse SAND w/ shells (granule size); bioclastic/detrital sands
Poorly sorted
Clayey areas: cohesive, compact
Soft (clays), loose (shells & sand)
Shells: solitary or layered
Possibly graded bedding [top to bottom with fines to coarser sediments]

0.86-1.00 Bivalve shell layer

1.20-1.25 Bivalve shell layer

CC/C olive gray to brown, compact, slightly sitly, slightly sandy CLAY intermixed with silty, sandy SHELLS
Shells: gastropods, bivalves (lagoonal?)

Interval (m)

0.00 – 0.82 Holocene (Qhk)

0.82 – 1.57 Reworked Holocene & Pleistocene Pooraka Fm (Qpp)? or late Pleistocene marine unit (coastal lagoon - indurated?)

Vibrocore ID: SS23 Date (dmy): 28/08/2020 Time (CST): 1334
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 267942.1202 MGA-N: 6111935.802
Location: (deg.deg) (WGS84): Latitude (S): 35.10870 Longitude (E): 138.45386
(deg min.min) 35 06.5220' 138 27.2316'
(deg min sec) 35 06' 31.3200" 138 27' 13.8960"
Water Depth uncorr (m): 21.30 Seafloor Depth (Chart Datum)(m): 19.921 AHD (approx 1.4m Pt Stanvac)(m): -21.321
Penetration w/ cc/c (m): ?0.30 Final Recov w/ cc/c (m): 0.41 Final Recov w/o cc/c (m): 0.38
Photo ID: SS23 IMGP0042-0043
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: Western boundary of Study Area midway between Port Stanvac Jetty & O'Sullivans Beach Marina; SS09 to E; SS18 to NE
Core catcher/cutter empty, slightly dented full; last 10cm of barrel - abraided
Weather: swell 0.5m; waves < 0.5m; wind northerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.03 veneer of soft CLAY grading to silty very fine to fine SAND
Olive gray
Live biota (worm)

0.03 – 0.36 Gradational bedding: coarsening down core
Detrital/bioclastic SAND w/ rare fibre [d>>b]
Gray
Unifom
0.03-0.09 brown, silty very fine to fine sands – moderately sorted
0.09-0.17 brown, very slightly silty, very fine to fine sands – moderately well sorted
0.17-0.36 medium to coarase sand
0.30-0.37 large (vertical) bivalve halves

0.36 **Distinct Sediment Change**
0.36 – 0.41 SAND/GRAVEL INTERMIXED w/ SHELLHASH
1-2cm shells (bivalves) & gravel Limestone chunks

Interval (m)
0.00 – 0.36 Holocene (Qhk)
0.36 – 0.41 Reworked Holocene & Qca, older Marine Unit – late Pleistocene? & Bedrock

Vibrocore ID: SS24 **Date (dmy): 31/08/2020** **Time (CST): 0952**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268612.666 **MGA-N: 6111611.023**
Location: (deg.deg) (WGS84): Latitude (S): 35.11178 **Longitude (E): 138.46112**
(deg min.min) 35 06.7068' **138 27.6672'**
(deg min sec) 35 06' 42.4080" **138 27' 40.0320"**
Water Depth uncorr (m): 15.50 Seafloor Depth (Chart Datum)(m): 14.424 AHD (approx 1.4m Pt Stanvac)(m): -15.824
Penetration w/ cc/c (m): ?1.40 **Final Recov w/ cc/c (m): 1.13** **Final Recov w/o cc/c (m): 1.10**
Photo ID: SS24 IMGP0054-0056
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: Inshore core midway between Port Stanvac Jetty & O'Sullivans Beach Marina
Core catcher/cutter full: see below
Weather: swell 1-1.2m; waves 0.5-1m; wind southerly 5-10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 1.10	Detrital/bioclastic, silty, very fine to fine SAND w/ occ scattered shell fragments [d>>>b]
	Gray to olive gray
	Moderately well sorted, uniform, firm-compact
0.00-0.21	light gray
0.18-0.20	diagonally oriented shell fragment
0.23-0.29	dark gray, coarse to very coarse sand lense w/ bivalve shells top/bottom
0.28-0.44	brown pockets of organics/fibre (+3x pockets)
0.57-0.60	shells including 2cm gastropod
0.60	olive gray
0.60-0.90	olive gray silty, very fine to fine sand w/ pockets of brown organics/fibre & c-vc sand
0.83	black (relict) shell fragment
0.90-0.98	pockets of coarse to very coarse sand/shell/fibre
0.98-1.10	dark gray silty, very fine to fine sand: uniform, firm-compact
1.10-1.13CC	increased shell content

Interval (m)	
0.00 – 1.10	Holocene (Qh)

Vibrocore ID: SS25 **Date (dmy): 31/08/2020** **Time (CST): 1344**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 267954.7686 **MGA-N: 6110478.587**
Location: (deg.deg) (WGS84): Latitude (S): 35.12183 **Longitude (E): 138.45359**
(deg min.min) 35 07.3098' **138 27.2154'**
(deg min sec) 35 07' 18.5880" **138 27' 12.9240"**
Water Depth uncorr (m): 19.20 Seafloor Depth (Chart Datum)(m): 17.426 AHD (approx 1.4m Pt Stanvac)(m): -18.826
Penetration w/ cc/c (m): ?0.10 **Final Recov w/ cc/c (m): 0.01** **Final Recov w/o cc/c (m): 0.01**
Photo ID: No Photos
Analyses Done: Environmental Sampling: None
Comments: SW corner of Study Area; SS14 to SW, SS15-SS35-SS13 to NE-E-SE respectively
Core catcher/cutter empty/dented
vbc hit something hard & bounced
Weather: swell <0.5m; waves <0.5m; wind southerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.01 2 angular CHUNKS of CALCRETE / LIMESTONE
Brown/beige

Interval (m)
0.00 – 0.01 Qca or Bedrock

Vibrocore ID: SS26 Date (dmy): 25/08/2020 Time (CST): 1508
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268140.7158 MGA-N: 6111053.925
Location: (deg.deg) (WGS84): Latitude (S): 35.11669 Longitude (E): 138.45579
(deg min.min) 35 07.0014' 138 27.3474'
(deg min sec) 35 07' 00.0840" 138 27' 20.8440"
Water Depth uncorr (m): 17.71 Seafloor Depth (Chart Datum)(m): 16.882 AHD (approx 1.4m Pt Stanvac)(m): -18.282
Penetration w/ cc/c (m): NA Final Recov w/ cc/c (m): 0.91 Final Recov w/o cc/c (m): 0.88
Photo ID: SS26 20200825 173924
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size
Comments: W of O'Sullivans Beach Marina; SS39 to N; SS38 to E
Core catcher/cutter full/damaged; slow, hard penetration – vbc bounced on hard surface; barrel slightly bent.
Weather: swell <0.5m; waves <05m; wind light <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.19 slightly silty very fine – fine – medium SAND
Gray
moderately sorted
uniform
0.19 - 0.22 SAND/GRAVEL Lense

0.22 **Distinct Color Change**

0.22 – 0.48 slightly silty, very fine – fine – medium SAND
Mottled brown / gray
Pockets of black organic matter
048 – 0.54 coarse SANDS to fine GRAVEL (GRANULES) w/ shells
Dark gray, moderately sorted
0.54 – 0.61 coarse to very coarse SAND w/ minor slightly silty, very fine – fine sand component
Dark gray
Poorly sorted
0.61 – 0.88 silty, very fine to fine SAND w/ fbre
Mottled gray
CC/C slightly silty, very fine – fine – medium SAND w/ fibre

Interval (m)
0.00 – 0.88 Holocene (Qh)

Vibrocore ID: SS27 **Date (dmy): 05/09/2020** **Time (CST): 0757**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 267786.9898 **MGA-N: 6111438.956**
Location: (deg.deg) (WGS84): Latitude (S): 35.11314 **Longitude (E): 138.45202**
(deg min.min) 35 06.7884' **138 27.1212'**
(deg min sec) 35 06' 47.3040" **138 27' 07.2720"**
Water Depth uncorr (m): 21.40 Seafloor Depth (Chart Datum)(m): 19.654 AHD (approx 1.4m Pt Stanvac)(m): -21.054
Penetration w/ cc/c (m): ?1.15 **Final Recov w/ cc/c (m): 1.07** **Final Recov w/o cc/c (m): 1.04**
Photo ID: SS27 IMGP0067-0073
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: western boundary - NW of O'Sullivans Beach Marina; SS11 to SE & SS20 to NE
Core catcher/cutter party invertedl; bent barrel w/ cohesive clays on bottom of barrel; camera failure on photos
H2S odor
Weather: swell 2m; waves 1-2m; wind westerly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.25	Detrital/bioclastic, silty, fine to medium SAND
	Brown grading to brownish gray downcorer
	Compact
	Rare shell fragments
	Disturbed top 5cm
0.25	**Distinct Sediment Contact**
	Large bivalve shell fragments at 0.25m
0.25 – 0.45	sandy, gritty CLAY to clayey SAND w/ occ large bivalve shell fragments
	Olive gray
	Soft, somewhat cohesive
0.45 – 0.59	slightly sandy CLAY
	Olive
	Moist
	Very soft to soft
	Slightly cohesive
0.59 – 0.87	slightly clayey, fine to very coarse SAND w/ pockets of organics & fibre
	Olive gray to gray
	Slightly cohesive
	Moderate poorly sorted
0.87 – 0.95	slightly sandy, CLAY
	Gray to light olive gray
	Soft
	Cohesive, plastic
0.95 – 1.04	slightly sandy CLAY w/ occ shell fragments
	Olive
	Firm to stiff
	Compact, dry – somewhat friable (crumbly)

Interval (m)	
0.00 – 0.25	Holocene (Qh)
0.25 – 0.87	Reworked Holocene & ?late Pleistocene (Qp)
0.87 – 1.04	Late Pleistocene

Vibrocore ID: SS28 Date (dmy): 31/08/2020 Time (CST): 0853
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268450.8955 MGA-N: 6110515.689
Location: (deg.min) (WGS84): Latitude (S): 35.12161 Longitude (E): 138.45904
(deg min.min) 35 07.2966' 138 27.5424'
(deg min sec) 35 07' 17.7960" 138 27' 32.5440"
Water Depth uncorr (m): 14.30 Seafloor Depth (Chart Datum)(m): 13.127 AHD (approx 1.4m Pt Stanvac)(m): -14.527
Penetration w/ cc/c (m): ?1.78 Final Recov w/ cc/c (m): 1.50 Final Recov w/o cc/c (m): 1.47
Photo ID: SS28 IMGP0044-0047
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: SE of O'Sullivans Beach Marina inshore area; SS35 to W, SS13 to SSW; SS12 to N
Core catcher/cutter full: uniform, olie grey silty very fine to fine sands
Weather: swell 1-1.2m; waves 0.5-1m; wind southerly 5-10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.16	Detrital/bioclastic silty very fine to fine SAND [d>>>b]
	Mottled grayish brown to brownish gray
	Moderately well sorted, uniform
0.16 – 1.47	Detrital/bioclastic silty very fine to fine SAND w/ occ scattered shell fragments [d>>>b]
& CC	Gray
	Occ pockets of brown organics
	Moderately well sorted, uniform, compact/dense
0.17	fine to medium sand lense
0.26	dark gray to black fine to medium sand lense w/ organics?
0.70	bivalve shell fragment
0.72-0.90	brownish, slightly clayey, very fine to fine sand w/ pockets of fibre & organics
0.96-1.03	AA
1.10-1.18	AA
1.39-1.40	large bivalve shell fragment

Interval (m)	
0.00 – 1.47	Holocene (Qh)

Vibrocore ID: SS29 Date (dmy): 31/08/2020 Time (CST): 1446
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 267812.37 MGA-N: 6110839.051
Location: (deg.min) (WGS84): Latitude (S): 35.11855 Longitude (E): 138.45213
(deg min.min) 35 07.1130 138 27.1278'
(deg min sec) 35 07' 06.7800" 138 27' 07.6680"
Water Depth uncorr (m): 19.70 Seafloor Depth (Chart Datum)(m): 17.702 AHD (approx 1.4m Pt Stanvac)(m): -19.102
Penetration w/ cc/c (m): ?1.93 Final Recov w/ cc/c (m): 1.63 Final Recov w/o cc/c (m): 1.60
Photo ID: SS29 IMGP0063-0066
Core Box No.: Temporary storage of core for 6mth period
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution Environmental Sampling Intervals: grain size & contaminants:
Comments: Western Boundary of Study Area W of O'Sullivans Beach Marina
Core catcher/cutter full; H_2S Odor downcore
Weather: swell 0.5m; waves <0.5m; wind southerly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.34 Detrital/bioclastic, slightly silty, very fine to fine SAND w/ occ lenses of shell fragments [d>b]
Mottled olive gray to gray
0.18-0.19 bivalve shell halves
0.30-0.34 light brown

0.34 – 0.69 Detrital/bioclastic, silt very fine to fine SAND [d>>b]
Grayish brown to brownish gray
Occ fibre & scattered shell lenses
Bivalve shell fragments

0.69 – 1.02 **Gradual change in Sediment Texture**
Detrital/bioclastic, silty very fine to fine SAND grading downcore to silty very coarse SAND
Gray to olive gray
Occ fibre
Shell lenses
0.98-1.02 lots of shells = both bivalves & gastropods

1.02 – 1.08 **Distinct Color & Sediment Change**
Brown SHELLS intermixed w/ very coarse SAND/GRAVEL
Poorly sorted
1.08 – 1.24 Alternate layers of dark gray to gray poorly sorted SHELL GRAVEL and brown medium to very coarse SAND / fine GRAVEL
Gravel = sub rounded
Loose

1.24 **Distinct Color & Sediment Change**
1.24 – 1.42 GRAVEL w/ some shells
Black
Loose, sub-rounded
Black shells: whole/broken, pred bivalves
H2S odor

1.42 **Distinct Color & Sediment Change**
1.42 – 1.47 gray to dark gray CLAY INTERMIXED w/ beige to light gray clayey, SAND & SHELL
Clay: cohesive, plastic
1.47 – 1.60 light gray to pale yellow, semi-cemented, friable SHELLS & matrix of clayey, silty SANDS
Shells: predominantly gravel size, some gastropods

Interval (m)	
0.00 – 1.02	modern Holocene (Qh)
1.02 – 1.24	transitional Holocene (Qh)
1.24 – 1.42	Reworked Holocene
1.42 – 1.60	Older Marine Unit

Vibrocore ID: SS30 **Date (dmy): 28/08/2020** **Time (CST): 0916**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 269072.1234 **MGA-N: 6112338.725**
Location: (deg.deg) (WGS84): Latitude (S): 35.10533 **Longitude (E): 138.46636**
(deg min.min) 35 06.3198' 138 27.9816'
(deg min sec) 35 06' 19.1880" 138 27' 58.8960"
Water Depth uncorr (m): 14.20 Seafloor Depth (Chart Datum)(m): 12.291 AHD (approx 1.4m Pt Stanvac)(m): -13.691
Penetration w/ cc/c (m): ?1.29 **Final Recov w/ cc/c (m): 1.03** **Final Recov w/o cc/c (m): 1.00**
Photo ID: SS30 IMGP0025-0028
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NNW of Port Stanvac Jetty, inshore area; SS03 to N; SS41 way to the W
Core catcher/cutter empty
Weather: swell 0.5m; waves <0.5m; wind northerly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.10	Detrital/bioclastic, silty, very fine to fine (quartz?) SAND [d>>>b]
	Gray
	Well sorted, uniform, clean
0.10 – 0.23	Detrital/bioclastic, sl silty, medium SAND [d>>>b]
	Brown
	Well sorted, uniform, clean
0.23 – 0.29	Detrital/bioclastic, silty very fine to fine SAND
	Gray to dark gray
	Well sorted, uniform, quartz?
0.29 – 0.40	Detrital/bioclastic, medium to coarse SAND w/ minor shell component
	Gray
	Moderately well sorted
0.40 – 1.00	SILT to silty very fine to fine SAND w/ rare pockets of shells & brown organics
	Olive gray
	Moderately well sorted, fairly uniform, compact
0.79-0.81	medium to very coarse sand lense
0.95-1.00	silty very fine to fine sand w/ rare gravel (rounded quartz?)

Interval (m)	
0.00 – 1.00	Holocene (Qh)

Vibrocore ID: SS31 **Date (dmy): 09/09/2020** **Time (CST): 0944**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268674.5218 **MGA-N: 6112583.915**
Location: (deg.deg) (WGS84): Latitude (S): 35.10303 **Longitude (E): 138.46207**
(deg min.min) 35 06.1818' 138 27.7242'
(deg min sec) 35 06' 10.9080" 138 27' 43.4520"
Water Depth uncorr (m): 20.00 Seafloor Depth (Chart Datum)(m): 18.335 AHD (approx 1.4m Pt Stanvac) (m): -19.735
Penetration w/ cc/c (m): ?0.65 **Final Recov w/ cc/c (m): 0.45** **Final Recov w/o cc/c (m): 0.42**
Photo ID: SS31 IMGP0120-0123
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: NW of Port Stanvac Jetty; SS41 to SE; SS40 to NE; SS07 to W
Core catcher/cutter empty with busted fingers (2x at TOC); relict black scallop shell fragments above CC
Weather: swell 0.5m; waves 0.5m; wind easterly 10-15kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.20 Detrital/bioclastic, silty, very fine to fine SAND [pred detrital]
- 0.00-0.04 Distrubed; mottled brown
- 0.04-0.20 dark gray
- 0.02-0.08 2 metal fingers from core catcher (broken off from CC)
- 0.06 live biota (worm)
- 0.17-0.20 seagrass fibre lense

0.20 – 0.27 Detrital/bioclastic, very slightly silty, coarse to very coarse SAND w/ fibre [pred detrital]
- Gray
- Moderately sorted

0.27 – 0.42 Large bivalve SHELL FRAGMENTS intermixed w/ FIBRE & silty, very fine to medium SAND
- Sand: light gray; possibly matrix inbetween the shell fragments?
- Dirty
- Poorly sorted

Interval (m)	
0.00 – 0.27	Holocene (Qh)
0.27 – 0.42	Reworked Holocene & Late Pleistonce (Qp) - (coastal lagoon / estuarine - indurated?)

Vibrocore ID: SS32 Date (dmy): 09/09/2020 Time (CST): 1047
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 269049.254 MGA-N: 6112735.548
Location: (deg.deg) (WGS84): Latitude (S): 35.10175 Longitude (E): 138.46622
(deg min.min) 35 06.1050' 138 27.9732'
(deg min sec) 35 06' 06.3000" 138 27' 58.3920"
Water Depth uncorr (m): 17.10 Seafloor Depth (Chart Datum)(m): 15.834 AHD (approx 1.4m Pt Stanvac)(m): -17.234
Penetration w/ cc/c (m): ?1.77 Final Recov w/ cc/c(m): 1.26 Final Recov w/o cc/c (m): 1.23
Photo ID: SS32 IMGP0114-0119
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: combined, PFAS, bulk density, particle size distribution
Comments: Northern area of Study Area – SS42 to E, SS40 to SW, SS03 to S, SS21 way to the N
Core catcher/cutter inverted & full;
H2S odor
Weather: swell 0.5m; waves 0.5m; wind easterly 10-15kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.0 – 0.10 Detrital/bioclastic, silty, very fine to fine SAND [pred detrital]
Mottled brown & gray; top 0.4cm disturbed
Uniform, soft
0.10 – 0.41 Detrital/bioclastic, silty, very fine to fine SAND w/ rare shell
Dark gray
Moderately well sorted,
0.41 – 0.70 Detrital/bioclastic slightly silty, fine to med SAND grading downcore to
Very slightly gravelly, slightly silty, medium to coarse SAND w/
Rare scattered shell fragments (pred bivalve shells/halves)
Dark gray to grayish brown
Moderately to moderately poorly sorted, loose
0.55-0.57 bivalve shells
0.56 – 0.63 rounded gravel bits (1-2cm)
0.62-0.64 bivavle shells
0.70 – 1.23 Detrital/bioclastic, slightly silty fine to coarse (detrital) SAND w/ medium to very coarse bioclastic SHELL SAND component
Dark gray to olive
Scattered large shell fragments
Rare gravel bits
Uniform – moderately sorted
0.75-0.76 seagrass fibre; brown to dark brown
0.84-0.88 seagrass fibre; brown to dark brown
0.90-0.96 slightly clayey
1.03-1.10-1.13 seagrass fibre; brown to dark brown
1.20-1.23 olive gray, silty very fine to fine sand w/ some fibre
CC Bivalve SHELLS intermixed w/ SAND & GRAVEL

Interval (m)	
0.00 – 1.23	Holocene (Qh)
CC	early Holocene (coastal lagoon?)

Vibrocore ID: SS33 Date (dmy): 13/10/2020 Time (CDST): 0830
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268288.2978 MGA-N: 6110168.521
Location: (deg.deg) (WGS84): Latitude (S): 35.1247 Longitude (E): 138.45716
(deg min.min) 35 07.4820' 138 27.4296'
(deg min sec) 35 07' 28.9200" 138 27' 25.7760"
Water Depth uncorr (m):14.60 Seafloor Depth (Chart Datum)(m): 13.354 AHD (approx 1.4m Pt Stanvac)(m): -14.754
Penetration w/ cc/c (m): 0.00 Final Recov w/ cc/c (m): 0.00 Final Recov w/o cc/c (m): 0.00
Photo ID: No photos
Analyses Done: No Environmental Sampling performed
Comments: S end of Study Area; SS34 to E, SS13 to N
2 attempts at location – no cores = refusal on hard surface
Weather: swell <0.5m; waves <0.5m; wind easterly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)	
0.0	No Core recovered

Vibrocore ID: SS34 **Date (dmy): 13/10/2020** **Time (CDST): 0917**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268459.875 MGA-N: 6110179.5
Location: (deg.deg) (WGS84): Latitude (S): 35.12475 Longitude (E): 138.45911
(deg min.min) 35 07.4850' 138 27.5466'
(deg min sec) 35 07' 29.1000" 138 27' 32.7960"
Water Depth uncorr (m): 12.60 Seafloor Depth (Chart Datum)(m): 11.434 AHD (approx 1.4m Pt Stanvac)(m): -12.834
Penetration w/ cc/c (m): ?0.54 Final Recov w/ cc/c (m): 0.30 Final Recov w/o cc/c (m): 0.27
Photo ID: SS34 IMGP0129-0134
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: SW of O'Sullivan's Beach Marina; SE of SS13, E of SS33
Core catcher/cutter empty, closed
Weather: swell <0.5m; waves <0.5m; wind easterly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)	
0.0– 0.08	Detrital/bioclastic, silty, very fine to fine SAND [pred detrital]
	brown
	well sorted, uniform, clean
0.08 – 0.27	Detrital/bioclastic, silty, very fine to fine SAND [pred detrital]
	Light to dark gray
	well sorted, uniform
0.18	small shell fragment
0.26-0.27	broken shell fragments & fibre

Interval (m)	
0.00 – 0.27	Holocene (Qh)

Vibrocore ID: SS35 Date (dmy): 13/10/2020 Time (CDST): 0940
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268240.431 MGA-N: 6110506.983
Location: (deg.deg) (WGS84): Latitude (S): 35.12164 Longitude (E): 138.45673
(deg min.min) 35 07.2984' 138 27.4038'
(deg min sec) 35 07' 117.9040" 138 27' 24.2280"
Water Depth uncorr (m):16.30 Seafloor Depth (Chart Datum)(m): 15.124 AHD (approx 14m Pt Stanvac)(m): -16.524
Penetration w/ cc/c (m): ?1.00 Final Recov w/ cc/c (m): 0.76 Final Recov w/o cc/c (m): 0.73
Photo ID: SS35 IMGP0135-0136
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: WSW of O'Sullivan's Beach Marina; W of SS28 & slightly NE of SS25, N of SS13, S of SS15-SS36, SW of SS112
Core catcher/cutter empty, closed, 2 fingers slightly damaged
Weather: swell <0.5m; waves <0.5m; wind easterly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)	
0.0– 0.06	Detrital/bioclastic, silty, very fine to fine SAND [pred detrital] Light brown well sorted, uniform, clean
0.06 – 0.16	Detrital/bioclastic, silty, very fine to fine SAND [pred detrital] Mottled light brown to gray well sorted, uniform, clean
0.08-0.09	black specks (organics?)
0.12-0.16	black specks (organics?)
0.16 – 0.32	Detrital/bioclastic, silty, very fine to fine SAND w/ occ fibre [pred detrital] Dark brown w/ occ black organic & minute shell pockets Moderate well sorted, uniform
0.23-0.27	dk brown to black organic & fibre pocket w/ minute shell fragments
0.28-0.29	black horizontal lense (organics?)
0.29-0.30	black horizontal lense (organics?)
0.32- 0.64	Detrital/bioclastic, very slightly clayey, silty, very fine to fine SAND to SILT w/ occ shell fragments & fibre [pred detrital] Gray to greenish gray Moderately well sorted, uniform
064 – 0.73	Detrital/bioclastic, silty, very fine to fine SAND w/ occ fibre Gray to greenish gray Moderately well sorted, uniform
0.64-0.68	bivalve shell fragments (whole/broken halves)
0.69-0.70	pocket of dark brown to gray w/ fibre/organics/shell & fine-medium sand

Interval (m)	
0.00 – 0.73	Holocene (Qh)

Vibrocore ID: SS36 Date (dmy): 13/10/2020 Time (CDST): 1030
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268278.886 MGA-N: 6110751.073
Location: (deg.deg) (WGS84): Latitude (S): 35.11945 Longitude (E): 138.45722
(deg min.min) 35 07.1670' 138 27.4332'
(deg min sec) 35 07' 10.0200" 138 27' 25.9920"
Water Depth uncorr (m): 16.30 Seafloor Depth (Chart Datum)(m): 15.10 AHD (approx 1.4m Pt Stanvac)(m): -16.50
Penetration w/ cc/c (m): ?0.92 Final Recov w/ cc/c (m): 0.80 Final Recov w/o cc/c (m): 0.77
Photo ID: SS36 IMGP0137-0138
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: W of O'Sullivan's Beach Marina; W of SS12 & slightly NE of SS15, N of SS35, NW of SS28, S of SS26-38-22-37
Core catcher/cutter empty, closed; H2S odor
Note: 1st core attempted = refusal, no return
Weather: swell <0.5m; waves <0.5m; wind easterly <5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)

0.0– 0.05	Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
	Brown to grayish brown, slightly mottled
	well sorted, uniform, clean
0.05 – 0.17	Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
	Mottled gray to dark gray
	well sorted, uniform, clean
0.05-0.07	dk gray lense
0.17 – 0.77	Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ scattered fibre & occ pockets of small shells [pred detrital]
	Very slightly clayey?
	Mottled gray to olive gray
	Moderately well sorted, uniform
0.26-0.27	pocket of small shells/fragments
0.37	pocket of small shells/fragments
0.58	pocket of dark brown organics
0.72-0.77	pocket of shells/fragments
0.76-0.77	bivalve shell half

Interval (m)

0.00 – 0.77	Holocene (Qh)

Vibrocore ID: SS37 **Date (dmy): 13/10/2020** **Time (CDST): 1110**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268631.3648 MGA-N: 6110020.939
Location: (deg.deg) (WGS84): Latitude (S): 35.1171 Longitude (E): 138.46116
(deg min.min) 35 07.0260' 138 27.6696'
(deg min sec) 35 07' 01.5600" 138 27' 40.1760"
Water Depth uncorr (m): 13.30 Seafloor Depth (Chart Datum)(m): 12.039 AHD (approx 1.4m Pt Stanvac)(m): -13.439
Penetration w/ cc/c (m): 1.33 Final Recov w/ cc/c (m): 1.01 Final Recov w/o cc/c (m): 0.98
Photo ID: SS37 IMGP0139-0145
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: W of O'Sullivan's Beach Marina entrance; W of SS12 & slightly NE of SS15, N of SS35, NW of SS28, E of SS26-39-38-22,
Core catcher/cutter empty, closed
Weather: swell <0.5m; waves <0.5m; wind easterly 10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)

0.0– 0.09 Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
Pale brown
well sorted, uniform, clean

0.09 – 0.16 Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
Speckled brown to gray
well sorted, uniform, clean

0.16 – 0.44 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ scattered fibre & occ pockets of small shells [pred detrital]
Mottled gray to light brownish gray
Moderately well sorted, uniform
- 0.26-0.28 pocket of small shells/fragments
- 0.36-0.40 pocket of gray fine-medium sand (speckled) incl shell?
- 0.44 pocket of dark brown organics

0.44 – 0.98 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ rare fibre & shells [pred detrital]
Gray to greenish gray
Well sorted, uniform
- 0.55-0.59 pocket of medium sand/organics
- 0.72 pocket of medium sand/organics
- 0.91 pocket of medium sand/organics
- 0.96 large shell fragment (gastropod?) with small one inside

Note: similarities with SS36 at these intervals

Interval (m)

0.00 – 0.98 Holocene (Qh)

Vibrocore ID: SS38 **Date (dmy): 13/10/2020** **Time (CDST): 1134**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268373.0981 MGA-N: 6111062.082
Location: (deg.deg) (WGS84): Latitude (S): 35.11667 Longitude (E): 138.45834
(deg min.min) 35 07.0002' 138 27.5004'
(deg min sec) 35 07' 00.0120" 138 27' 30.0240"
Water Depth uncorr (m): 17.20 Seafloor Depth (Chart Datum)(m): 15.908 AHD (approx 14m Pt Stanvac)(m): -17.308
Penetration w/ cc/c (m): ?0.64 Final Recov w/ cc/c (m): 0.47 Final Recov w/o cc/c (m): 0.44
Photo ID: SS38 IMGP0146-0148
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: W of O'Sullivan's Beach Marina entrance; W of SS22 & SS37 & E of SS26 & SS39, N of SS36 & SS12
Core catcher/cutter empty, closed; H2S odor
Weather: swell <0.5m; waves <0.5m; wind easterly 10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)

0.0– 0.04 Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
Brown to gray
well sorted, uniform, clean

0.04 – 0.12 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ rare fibre [pred detrital]
Very slightly clayey?
Banded dark gray to black w/ some brown mottles
well sorted, uniform

0.12 – 0.38 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ scattered fibre & shell fragments [pred detrital]
Very slightly clayey?
Occ pockets of black organic bits
Gray to greenish gray
Moderately well sorted, uniform
0.12-0.26 scattered fibre
0.24-0.25 large bivalve shell frgment
0.34 black lense of very slightly clayey, silt to very fine sand

0.38 – 0.44 Detrital/bioclastic, silty, very fine to fine SAND w/ large shell fragments & scattered fibre
Gray to greenish gray
Pockets of coarse to very coarse sand

Note: similarities with SS36-SS37 at these intervals

Interval (m)

0.00 – 0.44 Holocene (Qh)

Vibrocore ID: SS39 **Date (dmy): 13/10/2020** **Time (CDST): 1205**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268210.4019 MGA-N: 6111146.732
Location: (deg.deg) (WGS84): Latitude (S): 35.11587 Longitude (E): 138.45658
(deg min.min) 35 06.9522' 138 27.3948'
(deg min sec) 35 06' 57.1320" 138 27' 23.6880"
Water Depth uncorr (m): 17.10 Seafloor Depth (Chart Datum)(m): 15.701 AHD (approx 14m Pt Stanvac)(m): -17.101
Penetration w/ cc/c (m): ?0.62 Final Recov w/ cc/c (m): 0.42 Final Recov w/o cc/c (m): 0.39
Photo ID: SS39 IMGP0149-0150
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size
Comments: W of O'Sullivan's Beach Marina entrance; W of SS22, SS38 & SS37 &, N of SS26
Core catcher/cutter empty, closed
Weather: swell <0.5m; waves <0.5m; wind easterly 10kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)
0.0– 0.04 Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
Brown
well sorted, uniform, clean

0.04 – 0.08 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ rare fibre [pred detrital]
Mottled gray to brown
well sorted, uniform

0.08 – 0.24 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ scattered fibre [pred detrital]
Very slightly clayey?
Gray to greenish gray
Moderately well sorted, uniform
0.09-0.13 slightly clayey

0.24 – 0.39 Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
Very slightly clayey?
Gray to greenish gray
Well sorted, uniform, clean
0.25-0.27 band of black organic silt
0.32 pocket of gray/black organics & shell fragments

Note: similarities with SS36-SS37-SS38 at these intervals

Interval (m)
0.00 – 0.39 Holocene (Qh)

Vibrocore ID: **SS40** **Date (dmy):** **13/10/2020** **Time (CDST):** **1253**
Location: GDA94/MGA94 Zone 54 (m): **MGA-E:** **268939.8839** **MGA-N:** **6112623.977**
Location: (deg.deg) (WGS84): **Latitude (S):** **35.10273** **Longitude (E):** **138.46499**
(deg min.min) **35 06.1638'** **138 27.8994'**
(deg min sec) **35 06' 09.8280"** **138 27' 53.9640"**
Water Depth uncorr (m):17.50 Seafloor Depth (Chart Datum)(m): 15.948 AHD (approx 14m Pt Stanvac)(m): -17.348
Penetration w/ cc/c (m): ?0.91 **Final Recov w/ cc/c (m): 0.74** **Final Recov w/o cc/c (m): 0.71**
Photo ID: SS40 IMGP0151-0152
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: NNW of demobilized Port Stanvac Jetty; N of SS08, SS41 & VC20, NE of SS31, W of SS03, NW of SS30
Core catcher/cutter empty, closed w/ slightly dented finger
Weather: swell <0.5m; waves <0.5m; wind easterly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)

0.0– 0.05 Detrital/bioclastic, silty, very fine to fine SAND [pred detrital]
Brown
well sorted, uniform, clean

0.05 – 0.12 Detrital/bioclastic, silty, very fine to fine SAND w/ rare shell fragments [pred detrital]
Mottled gray to brown
well sorted, uniform
0.10-0.11 bivalve shell half

0.12 – 0.39 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ rare fibre & sand size shell fragments [pred detrital]
Gray
Moderately well sorted, uniform
0.16-0.21 pocket of very coarse sand size shell fragments
0.33-0.34 pocket of very coarse sand size shell fragments

0.39 – 0.49 Detrital/bioclastic, slightly silty, coarse to very coarse SAND & SHELL [pred detrital]
Gray
Quartz?

0.49 – 0.71 Detrital/bioclastic, silty, very fine to fine SAND w/ scattered fibre & shell
Occ dark brown clay lenses
Gray
0.49-0.52 fibre lense
0.53-0.58 blackened scallop shell half w/ fibre & small shell fragments underneath
0.60-0.61 clay lense
0.62-0.63 clay lense w/ gravel bit
0.63-0.67 diagonal fibre lense
0.64-0.65 gravel bit
0.68 clay lense
0.69-0.71 shell fragment & some fibre

Interval (m)

0.00 – 0.71 Holocene (Qh)

Vibrocore ID: SS41 **Date (dmy): 13/10/2020** **Time (CDST): 1330**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 268766.6007 MGA-N: 6112443.062
Location: (deg.deg) (WGS84): Latitude (S): 35.10432 Longitude (E): 138.46304
(deg min.min) 35 06.2592' 138 27.7824'
(deg min sec) 35 06' 15.5520" 138 27' 46.9440"
Water Depth uncorr (m): 18.30 Seafloor Depth (Chart Datum)(m): 16.653 AHD (approx 14m Pt Stanvac)(m): -18.053
Penetration w/ cc/c (m): ?0.67 Final Recov w/ cc/c (m): 0.45 Final Recov w/o cc/c (m): 0.42
Photo ID: IMGP0153-0155 [NOTE: mis-identified core as SS40 in some of the photos]
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: NW of demobilized Port Stanvac Jetty; N of SS08 & VC20, W of SS30, SW of SS03, S of SS40, SE of SS31
Core catcher/cutter empty, closed
Weather: swell <0.5m; waves <0.5m; wind easterly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)

0.0– 0.09 Detrital/bioclastic, silty, very fine to fine SAND to SILT [pred detrital]
Mottled brown & gray
well sorted, uniform, clean

0.09 – 0.38 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ occ shell fragments [pred detrital]
Very slightly clayey?
gray
well sorted, uniform
0.12-0.15 shelly
0.25-0.29 occ fibre
0.33-0.36 bivalve shell half & small shell fragment

0.39 - 0.42 Detrital/bioclastic, silty very fine to fine SAND w/ occ shell fragments & fibre
Very slightly clayey?
Gray
0.39-0.40 large bivalve shell half & organics

Interval (m)

0.00 – 0.42 Holocene (Qh)

Vibrocore ID: SS42 **Date (dmy): 13/10/2020** **Time (CDST): 1400**
Location: GDA94/MGA94 Zone 54 (m): MGA-E: 269198.3865 MGA-N: 6112682.728
Location: (deg.deg) (WGS84): Latitude (S): 35.10226 Longitude (E): 138.46784
(deg min.min) 35 06.1356' 138 28.0704'
(deg min sec) 35 06' 08.1360" 138 28 04.2240"
Water Depth uncorr (m): 15.50 Seafloor Depth (Chart Datum)(m): 13.808 AHD (approx 1.4m Pt Stanvac)(m): -15.208
Penetration w/ cc/c (m): ?0.70 Final Recov w/ cc/c (m): 0.54 Final Recov w/o cc/c (m): 0.51
Photo ID: IMGP0156-0157
Core Box No.: Temporary storage of core for 6mths
Analyses Done: Environmental Sampling: bulk density, particle size distribution
Comments: NNW of demobilized Port Stanvac Jetty; E of SS32, NE of SS40, N of SS03 & SS30
Core catcher/cutter empty, closed
Weather: swell <0.5m; waves <0.5m; wind easterly 5kts

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

Interval (m)
0.0– 0.06 Detrital/bioclastic, silty, very fine to fine SAND [pred detrital]
brown
well sorted, uniform, clean
0.05-0.06 mottling

0.06 – 0.15 Detrital/bioclastic, silty, very fine to fine SAND to SILT w/ rare fibre [pred detrital]
Dark gray to gray
Well sorted, uniform, clean

0.15 – 0.44 Detrital/bioclastic, silty very fine to fine SAND to SILT w/ rare fibre [pred detrital]
Gray to dark greenish gray
Well sorted, uniform, clean
Occ black specks (organics?)

0.44 **Slight Change in Sediment**
0.44 – 0.51 Detrital/bioclastic, silty very fine to fine SAND INTERMIXED W/ FIBRE & SHELL
Dark gray to dark greenish gray
Moderately sorted
0.47-0.48 dark greenish gray clay lense
0.50-0.51 large shell fragment

Interval (m)
0.00 – 0.51 Holocene (Qh)

Vibrocore ID: **SV312 (VC12)** **Date (dmy):**24/09/2008 **Time (CST):**13:42
Location: GDA94/MGA94 Zone 54 (m): **MGA-E:** 268901.6 **MGA-N:** 6113447.8
Location: (deg min.min) (WGS84): **Latitude:** 35 5.718 S **Longitude:** 138 27.888 E
Water Depth (m): 20.5m **Tide Correction Depth:** **AHD (m):** -20.67
Penetration w/ cc/c (m): 0.80m **Init.&Final Recov w/ cc/c:** 1.51 &1.40m **Final Recov w/o cc/c:** 1.35m
Compaction Ratio (P/R): 0.57 **Video DVD (min:sec):** 02:13 to 3:16 **Photo ID:** NA
Core Box No.: 6 of 14 on Port Stanvac Desal Plant vibracore pallet 1: SV312/1 (0.00-0.02m bagged), SV312/2 (0.02-0.14m), SV312/3 (0.14-1.00m) SV312/4 (1.00-1.35m) + cc/c bagged + Grab Sample SV312 bagged
Surface Grab Sample Available (Y/N): Y SV312 Grab Samples (2 bags)
Analyses Done: **Environmental Sampling Intervals:** grain size & contaminants: 0.02-0.30m, 1.20-1.35m
Comments: midway- east side of area "in between" proposed northern & southern pipeline corridors, north of Port Stanvac Refinery jetty. Slightly south of seismic transects PSN08, near fixes #224-225, slightly south of Transect 6A (midway fixes 61-62); in vicinity of Grab Samples SAOS010, GS115 & GS124; in vicinity of vibracores SV307,& SV311 & core 56/84
Core catcher/cutter: empty, dented; penetration: slow & hard/crunching. Final recovery after dewatering = 1.40m w/ cc/c
Van Veen Style Grab Sample SV312: thin film of brown to gray silty fine sand over detrital/bioclastic sands consisting of mod-poorly sorted very coarse sand to fine gravel w/ large bivalve incl scallop shell fragments (sd/gravel size), 3 pebbles of calcrete/calcareous nodules w/ red algae growth, red algae nodules, occ fibre.
Archived at Primary Industries & Resources SA Drill Core Storage Facility (Glenside): Gulf St Vincent Series: Port Stanvac Desalinization Marine Investigation for Connell Wagner P/L – SA Water.

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.02 silty, fine quartz SAND to very slightly clayey, sandy (fine) SILT
[-20.67 - -20.69] gray (5Y5/1)
occ fibre
contents bagged
0.02 – 0.77 Gradational Bedding: coarsening down core, increase shell content down core
[-20.69 - -21.44]
0.02 – 0.13 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-20.69 - -20.80] silty fine quartz sand w/ component of fine-med shell sand
olive gray (5Y5/2), uniform
occ fibre
0.13 - 0.27 Detrital / Bioclastic SANDS (detrital > = bioclastic)
[-20.80 - -20.94] slightly silty, fine sand w/ component of med shell sand grading to
very slightly silty, fine-med quartz sand intermixed w/ med shell sand
(shell content increase down core)
olive gray (5Y4/1)
occ fibre
0.27 – 0.33 Detrital / Bioclastic SANDS (detrital = bioclastic)
[-20.97 - -21.00] very slightly silty, fine-med quartz sand intermixed w/ med – very coarse shell sand
brown to gray
occ minute whole gastropod shells
0.33 – 0.77 Detrital / Bioclastic SANDS (detrital slightly > bioclastic)
[-21.00 - -21.44] very slightly silty, coarse to very coarse quartz/lithic sand intermixed w/ med- very coarse shell sand – fine gravel
brown to gray
occ calcareous nodules & whole gastropod shells

0.77 *[-21.44]* DISTINCT COLOR & SEDIMENT CONTACT
0.77 – 0.90 CLAY to sandy CLAY w/ hard clay bits
[-21.44 - -21.57] wedge of mottled greenish gray to olive gray to gray (5G6/1 – 5Y5/1-5/2)
occ minute gastropod shells
firm - stiff, cohesive, somewhat dry & friable

0.90 – 1.18 poss double cored (0.5m swell whilst coring) or reworked material SANDS-SHELL SANDS w/ matrix
[-21.57 - - 21.85] brown to gray gradational bedding: coarsening down core
fine grading to very coarse quartz/lithic sands w/ shell component & minor clay matrix
occ whole gastropod shells, broken reworked bivalve shells/fragments
1.01 – 1.18 clay content increase down core
[21.68 - -21.85]

1.18 *[-21.85]* DISTINCT COLOR & SEDIMENT CONTACT
1.18 – 1.35 SHELL HASH w/ matrix of gray clay to fine – very coarse sand
& CC/C to 1.40 lt gray to gray (57/1-6/1)
[-21.85 - -22.07] semi-cemented but friable, compact
whole/broken bivalves/gastropod shells, some reworked; incl *Brachiodontes erosus(?)*
scattered calcareous nodules

Interval (m)	Uncorrected AHD	P/R Compaction Ratio (0.57)	Corrected AHD	SV312
0.00 – 0.77	[-20.67 to -21.44m AHD]	0.00 – 0.44	[-20.67 to -21.11m AHD]	Holocene (Qhk)
0.77 – 0.90	[-21.44 to -21.57m AHD]	0.44 – 0.51	[-21.11 to -21.18m AHD]	possibly Holocene coastal lagoon / estuarine facies &/OR Reworked Pleistocene Glanville Fm (Qpg)
0.90 – 1.18	[-21.57 to -21.85m AHD]	0.51 – 0.67	[-21.18 to -21.34m AHD]	Reworked Pleistocene Glanville Fm (Qpg)
1.18 – 1.40	[-21.85 to -22.07m AHD]	0.67 – 0.80	[-21.34 to -21.47m AHD]	Pleistocene Glanville Fm (Qpg)

Vibrocore ID: **SV316 (VC16)** **Date (dmy):** 29/09/2008 **Time (CST):** 07:10
Location: GDA94/MGA94 Zone 54 (m): **MGA-E:** 269043.2 **MGA-N:** 6113199.8
Location: (deg min.min) (WGS84): **Latitude:** 35 5.854 S **Longitude:** 138 27.977 E
Water Depth (m): 19.4m **Tide Correction Depth:** **AHD (m):** -19.45
Penetration w/ cc/c (m): 1.50m **Init.&Final Recov w/ cc/c:** 2.96 & 2.25m **Final Recov w/o cc/c:** 2.15m
Compaction Ratio (P/R): 0.66 **Video DVD (min:sec):** 27:21 to 29:37 **Photo ID:** SV316 p1 to p14
Note: both video & photo measurements are offset by 0.10m (add 0.10m to reading)
Core Box No.: 10 of 14 on Port Stanvac Desal Plant vibracore pallet 1: SV316/1 (0.00-0.10m), SV316/2 (0.10-1.12m), SV316/3 (1.12-2.15m) + cc/c bagged + Grab Sample SV316 bagged
Surface Grab Sample Available (Y/N): Y SV316 Grab Samples (3 bags)
Analyses Done: **Environmental Sampling Intervals:** grain size & contaminants: 0.05-0.50m, 1.0-1.5m
Comments: near trial inlet/outlet pipes of trial desal plant: eastern central end of "in between" area of proposed northern & southern pipeline corridors, north of Port Stanvac Refinery jetty. Slightly north of seismic transects PSN#12 (near fixes #349-351; in vicinity of Grab Samples SAOS007, GS102, GS125 & GS130 & in vicinity of vibracores SV312 & SV321
Core catcher/cutter empty; penetration: slow-firm & hard; barrel brazen, slightly bent when pulled out of seabed due to strong tidal currents. Final recovery after dewatering & settlement: 2.25m
Van Veen Style Grab Sample SV316: moderately sorted, orange brown vc sand to sandy fine detrital gravel w/ occ shell fragments; poss thin film of brown f-m quartz sand on top; gravel: quartz, calcrete/calcareous nodules, sandstone/limestone.
Archived at Primary Industries & Resources SA Drill Core Storage Facility (Glenside): Gulf St Vincent Series: Port Stanvac Desalinization Marine Investigation for Connell Wagner P/L – SA Water.

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.78 Gradational Change from pred detrital sands to pred bioclastic sands/gravels & coarser sediments down core
[-19.45 - -20.23]
0.00 – 0.12 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-19.45 - -19.57] slightly clayey, fine-med quartz sand w/ component of med-coarse shell sand
olive gray (5Y5/2)
occ fibre
Disturbed section: poss thin film of gray clay over sand

0.12 – 0.30 Detrital / Bioclastic SANDS (detrital = bioclastic)
[-19.57 - -19.75] slightly silty, slightly gravelly, fine-med quartz sand intermixed w/ med – very coarse shell sand / gravel
poorly sorted, olive gray (5Y5/2),
occ large shell fragments
occ fibre

0.30 – 0.50 Detrital / Bioclastic SANDS (detrital = bioclastic)
[-19.75 - -19.95] coarse to very coarse sand – fine gravel intermixed w/ shells/shell hash w/ matrix of slightly silty, fine quartz sand
poorly sorted, gray to orange brown
occ large bivalves incl reworked scallop shells
detrital gravel: quartz, calcrete, calcareous nodules, limestone
0.43-0.49 large black chunk of either limestone w/ cemented shells OR slag
[-19.88 - -19.94]

0.50 – 0.60 Detrital / Bioclastic SANDS (detrital < bioclastic)
[-19.95 - -20.05] coarse to very coarse sand & shell sand w/ matrix of slightly silty fine quartz sand
whole/broken shells incl bivalves
poorly sorted, olive gray (5Y5/2)
0.57-0.60 bivalve shell half (*Circe weeding*) & calcareous nodules/limestone chunks
[-20.02 - -20.05]

0.60 -0.78 Detrital / Bioclastic SANDS – SHELL HASH
[-20.05 - -20.23] SHELLS-SHELL HASH w/ matrix of clayey, silty, slightly gravelly med-coarse quartz sand
olive gray (5Y4/2),
occ fibre
shells: gastropods, bivalves
0.73-0.78 increased content of minute gastropods
[-20.18 - -20.23]

0.78 *[-20.23]* DISTINCT COLOR & SEDIMENT CONTACT

0.78 – 1.10 calcareous CLAY to slightly gravelly CLAY w/ occ minute gastropods
[-20.23 - -20.55] mottled dk greenish gray to greenish gray to olive (5G4/1 – 6/1 to 5Y3/4)
grit: occ sand size shell bits (gastropods etc)
soft-firm, cohesive, pliable, friable in parts (desiccated appearance) [PP: 170-270kPa]
banded section: 0.78-0.88, 0.78-0.95, 0.95-1.05, 1.05-1.10m

Vibracore log SV316 continued

1.10 – 1.43 ALTERNATING LAYERS OF CLAY – SILT – FINE SAND - SHELL
[-20.55 - -20.88] similar to SV3108, SV311, SV313 & SV314

1.10-1.19 CLAY to silty CLAY grading to clayey fine-med SAND – SHELL SAND w/ embedded minute gastropods
[-20.55 - -20.64] mottled greenish gray (5G6/1)
soft, cohesive, watery to very moist
1.19-1.28 CLAY to slightly (fine) sandy CLAY to (fine) sandy SILT intermixed w/ SHELL SAND
[-20.64 - -20.73] mottled greenish gray to pale olive (5G6/1 to 5Y6/3)
firm, cohesive, somewhat friable & dry in parts (desiccated appearance) [PP: 40-140kPa]
1.28–1.35 fine sandy CLAY to clayey, fine SAND intermixed w/ med SHELL SAND
[-20.73 - -20.80] mottled greenish gray to pale olive
soft, cohesive & moist; similar to section 1.10-1.19m
1.35-1.41 CLAY to slightly sandy CLAY & SHELL SAND w/ minute gastropod shells
[-20.80 - -20.86] mottled dk greenish gray to greenish gray
soft – firm, cohesive; similar to section 1.19-1.28m
1.41 – 1.53 Detrital / Bioclastic SANDS (detrital << bioclastic) clayey SHELL SAND
[-20.86 - -20.98] clayey, med-coarse SHELL SAND w/ minor component of fine-med quartz sand
greenish gray to olive (5Y4/3-4/4),
soft, loose-friable
gastropod rich?
Somewhat similar to 1.10-1.19 & 1.28-1.35 except coarser

1.53 – 2.15 SHELL SAND - GRAVEL w/ matrix of clay to fine detrital/shell sand
& CC/C to 2.25 shells: coarsen down core: whole/broken bivalves & gastropods, sand-gravel size, some filled in
[-20.98 - -21.70] bivalve > gastropod down core minute gastropod becomes part of matrix
compact yet somewhat friable

Interval (m)	**Uncorrected AHD**	**P/R Compaction Ratio (0.66)**	**Corrected AHD**	**SV316**
0.00 – 0.60	[-19.45 to -20.05m AHD]	0.00 – 0.40	[-19.45 to -19.85m AHD]	Holocene (Qhk)
0.60 – 0.78	[-20.05 to -20.23m AHD]	0.40 – 0.51	[-19.85 to -19.96m AHD]	Holocene reworked &/OR Reworked Pleistocene Glanville Fm (Qpg)?
0.78 – 1.10	[-20.23 to -20.55m AHD]	0.51 – 0.73	[-19.96 to -20.18m AHD]	possible Holocene coastal lagoon / estuarine facies OR Pleistocene Glanville Fm (Qpg)
1.10 – 1.41	[-20.55 to -20.86m AHD]	0.73 – 0.93	[-20.18 to -20.38m AHD]	? Holocene coastal lagoon facies / estuarine facies &/OR Reworked Pleistocene Glanville Fm (Qpg)
1.41 – 2.15	[-20.86 to -21.60m AHD]	0.93 – 1.42	[-20.38 to -20.87m AHD]	Pleistocene Glanville Fm (Qpg) (shell layer)

Vibrocore ID: **SV319 (VC19)** **Date (dmy):** 24/09/2008 **Time (CST):** 10:59
Location: GDA94/MGA94 Zone 54 (m): **MGA-E:** 268371.9 **MGA-N:** 6112753.4
Location: (deg min.min) (WGS84): **Latitude:** 35 6.086 S **Longitude:** 138 27.528 E
Water Depth (m): 21.6m **Tide Correction Depth:** **AHD (m):** -21.59
Penetration w/ cc/c (m): 0.46m **Init.&Final Recov w/ cc/c:** 0.53 & 0.48m **Final Recov w/o cc/c:** 0.37m
Compaction Ratio (P/R): 0.96 **Video DVD (min:sec):** 00:48 to 01:23 **Photo ID:** NA
Core Box No.: 12 of 14 on Port Stanvac Desal Plant vibracore pallet 1: SV319 (0.00-0.37m) + cc/c bagged + Grab Sample SV319 bagged (2 bags)
Surface Grab Sample Available (Y/N): Y SV319 Grab Samples (2 bags)
Analyses Done: **Environmental Sampling Intervals:** grain size & contaminants: 0.05-0.30m
Comments: midway & slightly north of proposed southern pipeline corridor, north of Port Stanvac Refinery jetty. In between seismic transects PSN#09 & PSN#10 (fixes 237-238 & 251-251 respectively), midway along Transect 6b; near Grab Samples SAOS001 & GS112; in vicinity of vibracore SV321 & core 55/84
Core catcher/cutter empty; penetration: slow & hard – crunchy; barrel brazen, slightly dented. Final recovery after dewatering & settlement = 0.48m w/ cc/c
Van Veen Style Grab Sample SV319: orange brown, slightly silty, fine-med sand intermixed w/ med – very coarse shell sand to sandy gravel, occ large shell fragments incl scallop, occ fibre; occ gravel of quartz, sandstone, calcrete, limestone
Archived at Primary Industries & Resources SA Drill Core Storage Facility (Glenside): Gulf St Vincent Series: Port Stanvac Desalinization Marine Investigation for Connell Wagner P/L – SA Water.

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.37 Gradational Bedding down core: coarsen down core & slight increase in shell content down core
[-21.59 - -21.96]

0.00 – 0.12 Detrital SAND
[-21.59 - -21.71] slightly silty fine quartz sand
grayish brown to brown (10YR5/2 – 5/3)

0.12 – 0.22 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-21.71 - -21.81] very slightly silty med – coarse detrital sand w/ component of coarse shell sand
grayish brown to brown to yellowish brown (10YR5/2 – 5/3 to 5/6-5/8)

0.22 – 0.30 Detrital / Bioclastic SANDS (detrital = bioclastic)
[-21.81 - -21.89] coarse – very coarse quartz/detrital sand intermixed w/ very coarse to granule shell sand /gravel
occ large shell fragments
grayish brown to brown to yellowish brown (10YR5/2 – 5/3 to 5/6-5/8)

0.30 – 0.37 Detrital / Bioclastic SANDS / Fine GRAVELS (detrital = bioclastic)
[-21.89 - -21.96] very coarse sand to fine detrital gravel intermixed w/ shell hash (shell gravel)
grayish brown to brown to (dominant) yellowish brown (10YR5/2 – 5/3 to 5/6-5/8)
occ pea gravel subrounded (quartz, lithic)
occ large shell fragments, some cemented
0.36-0.37 large bivalve shells (*Cardita ruderalis*)

0.37 – 0.48 empty CC/C: As above w/ pea gravel & shell above the CC/C fingers
[-21.96 - -22.07]

Interval (m)	Uncorrected AHD	P/R Compaction Ratio (0.96)	Corrected AHD	SV319
0.00 – 0.37	[-21.59 to -21.96m AHD]	0.00 – 0.36	[-21.59 to -21.95m AHD]	Holocene (Qhk)

Vibrocore ID: **SV320 (VC20)** **Date (dmy):** 29/09/2008 **Time (CST):** 08:34
Location: GDA94/MGA94 Zone 54 (m): **MGA-E:** 268769.7 **MGA-N:** 6112299.2
Location: (deg min.min) (WGS84): **Latitude:** 35 6.337 S **Longitude:** 138 27.782 E
Water Depth (m): 17.0m **Tide Correction Depth:** **AHD (m):** -17.95
Penetration w/ cc/c (m): 1.10m **Init.&Final Recov w/ cc/c:** 1.56 &1.47m **Final Recov w/o cc/c:** 1.38m
Compaction Ratio (P/R): 0.75 **Video DVD (min:sec):** 30:51 to 32:00 **Photo ID:** SV320 p1 to p9
Core Box No.: 12 of 14 on Port Stanvac Desal Plant vibracore pallet 1: SV320/1 (0.00-1.00m), SV320/2 (1.00-1.38m) + cc/c bagged + Grab Sample SV320 bagged (3 bags)
Surface Grab Sample Available (Y/N): Y SV320 Grab Samples (3 bags)
Analyses Done: **Environmental Sampling Intervals:** grain size & contaminants: 0.05-0.50m, 1.00-1.50m
Comments: eastern end of proposed southern pipeline corridor, slightly north of Port Stanvac Refinery jetty. Slightly south of seismic transect PSN#10 (fix 254); near Grab Samples GS111.
Core catcher/cutter empty; penetration: slow & hard – crunchy; barrel brazen, slightly dented. Final Recovery after dewatering & settlement = 1.47m w/ cc/c
Van Veen Style Grab Sample SV320: well sorted, clean-uniform, brown to gray, silty fine quartz sand w/ occ bivalve shell fragments
Archived at Primary Industries & Resources SA Drill Core Storage Facility (Glenside): Gulf St Vincent Series: Port Stanvac Desalinization Marine Investigation for Connell Wagner P/L – SA Water.

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.95 Gradational Bedding down core: coarsen down core w/ minor increased shell content
[-17.95 - -18.90]

0.00 – 0.08 Detrital SAND: silty, fine quartz SAND w/ minor component of med – coarse shell sand
[-17.95 - -18.03] olive gray (5Y5/2), clean, uniform
occ fibre

0.08 – 0.65 Detrital SAND: silty fine quartz SAND grading down core to fine-med quartz SAND
[-18.03 - -18.60] pale brown to gray (10YR6/2 – 5Y5/1), clean-uniform
occ scattered shell sand
occ fibre
well sorted, clean, uniform
0.46-0.51 lense of olive gray silty fine quartz sand & coarse to very coarse quartz sand w/
[-18.41 - -18.46] component of very coarse shell sand
0.51-0.65 gray to olive gray (5Y6/1-5/2), silty fine-med quartz sand w/
[-18.46 - -18.60] component of very coarse shell sand & occ small bivalve shells/fragments
shell: increased content compared to above
compact

0.65 – 0.83 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-18.60 - -18.78] coarse to very coarse quartz SAND w/ minor component of shell sand-gravel & minor matrix of silty fine sand
gray to dk gray to olive gray (5Y5/1-4/1 to 5/3), uniform
occ fibre

0.83 – 0.95 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-18.78 - -18.90] coarse to very coarse quartz SAND w/ component of shell sand-gravel & minor matrix of silty fine sand
gray to dk gray to olive gray (5Y5/1-4/1 to 5/3), uniform
slightly more shell than above
occ large shell fragments (gravel size)

0.95 – 1.25 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-18.90 – 19.20] very slightly clayey, silty fine quartz SAND w/ scattered shell fragments
light gray to olive gray (5Y5/1 – 5/2)
uniform, compact
occ fibre
shell: sand/gravel size

1.25 *[-19.20]* DISTINCT COLOR & SEDIMENT CONTACT
1.25 – 1.32 CALCAREOUS NODULES – CALCRETE & LIMESTONE CHUNKS w/ minor matrix of gray clay/sand/shell sand
[-19.20 - -19.27] beige to black
cemented – fractured, hard
1.32 – 1.38 CALCAREOUS NODULES-CALCRETE intermixed w/ fine-med quartz/detrital sands
[-19.27 - -19.33] beige to brown to gray
occ large shell fragments
occ fibre
1.38 - 1.47 CALCRETE-LIIMESTONE CHUNKS intermixed w/ SHELL SAND – GRAVEL
incl CC/C matrix of slightly clayey, sand
[-19.33 - -19.42] beige to gray

Interval (m)	**Uncorrected AHD**	**P/R Compaction Ratio (0.75) Corrected AHD**	**SV320**
0.00 – 1.25	[-17.95 to -19.20m AHD]	0.00 – 0.94 [-17.95 to -18.89m AHD]	Holocene (Qhk)
1.25 – 1.32	[-19.20 to -19.27m AHD	0.94 – 0.99 [-18.89 to -18.94m AHD]	Calcrete (Qca)
1.32 – 1.47	[-19.27 to -19.42m AHD]	0.99 – 1.10 [-18.94 to -19.05m AHD]	Pleistocene Glanville Fm, possibly reworked

Vibrocore ID: **SV321 (VC21)** **Date (dmy):** 24/09/2008 **Time (CST):** 12:21
Location: GDA94/MGA94 Zone 54 (m): **MGA-E:** 268704.7 **MGA-N:** 6112998.7
Location: (deg min.min) (WGS84): **Latitude:** 35 5.958 S **Longitude:** 138 27.751 E
Water Depth (m): 20.7m **Tide Correction Depth:** **AHD (m):** -20.90
Penetration w/ cc/c (m): 0.30m **Init.&Final Recov w/ cc/c:** 0.82m **Final Recov w/o cc/c:** 0.72m
Compaction Ratio (P/R): 0.37 **Video DVD (min:sec):** **Photo ID:**
Core Box No.: 12 of 14 on Port Stanvac Desal Plant vibracore pallet 1: SV321/1 (0.00-0.02 bagged), SV321/2 (0.02-0.74m) + cc/c bagged + Grab Sample SV321 bagged (2 bags)
Surface Grab Sample Available (Y/N): Y SV321 Grab Samples (2 bags)
Analyses Done: **Environmental Sampling Intervals:** grain size & contaminants: 0.05-0.50m, 1.00-1.50m
Comments: southwest of trial inlet/outlet pipes of trial desal plant: eastern southern end of "in between" area of proposed northern & southern pipeline corridors, north of Port Stanvac Refinery jetty. Slightly north of seismic transects PSN#09 (near fixes #236-237); in vicinity of Grab Samples SAOS007 & in vicinity of vibracores SV316 & SV319.
Core catcher/cutter empty & damaged – badly dented; penetration: slow & hard – corer bounced; barrel brazen & dented
Van Veen Style Grab Sample SV321: mod-well sorted, orange brown, very slightly gravelly, coarse to very coarse quartz/lithic sand w/ occ bivalve shells/fragments (some cemented/in-filled), rare fibre.
Archived at Primary Industries & Resources SA Drill Core Storage Facility (Glenside): Gulf St Vincent Series: Port Stanvac Desalinization Marine Investigation for Connell Wagner P/L – SA Water.

Core Log (m): [*core depth uncorrected for compaction factor relative to (m) AHD*]

0.00 – 0.02 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-20.90 - -20.92] slightly clayey SILT to fine SAND w/ component of med-coarse shell sand
light olive gray (5Y6/2),
soft, loose
occ fibre

0.02 – 0.56 Gradational Bedding: coarsen down core & increase shell content down core
[-20.92 - -21.46] Color throughout: reddish yellow to strong brown to light olive gray (7.5YR 6/6-6/8 to 5/6-5/8 to 5Y6/2)

0.02 – 0.08 Detrital / Bioclastic SANDS (detrital >> bioclastic)
[-20.92 - -20.98] fine-med-coarse quartz sand w/ minor component of med-coarse shell sand
uniform, loose

0.08 – 0.56 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-20.98 - -21.46] coarse to very coarse quartz sand w/ component of coarse to very coarse shell sand
occ calcareous nodules &/or limestone chunks
occ lenses of shell fragments
loose, compact
0.30, 0.34-0.36 calcareous nodules or limestone chunks, subrounded
0.44 – 0.47 calcareous nodules or limestone chunks, subrounded

0.56 – 0.67 Detrital / Bioclastic SANDS (detrital > bioclastic)
[-21.46 - -21.57] slightly clayey/silty med to very coarse quartz sand w/ component of very coarse shell sand
Color as above: reddish yellow to strong brown to light olive gray (7.5YR 6/6-6/8 to 5/6-5/8 to 5Y6/2)

0.67 *[-21.57]* DISTINCT SEDIMENT CONTACT

0.67 – 0.74 CALCAREOUS NODULES – LIMESTONE CHUNKS (Pebble/Rubble)
[-21.57 - -21.64] pebble/ruble: subrounded
white – beige – brown - gray

0.74 empty CC/C CALCAREOUS NODULES – shelly LIMESTONE CHUNKS – SHELL
white – beige – brown – gray
shells: incl broken *Brachiodontes* shell fragments

Interval (m)	**Uncorrected AHD**	**P/R Compaction Ratio (0.37)**	**Corrected AHD**	**SV321**
0.00 – 0.67	[-20.90 to -21.57m AHD]	0.00 – 0.25	[-20.90 to -21.15m AHD]	Holocene (Qhk)
0.67 – 0.74	[-21.57 to -21.64m AHD]	0.25 – 0.27	[-21.15 to -21.17m AHD]	Calcrete (Qca)
0.74	[-21.64m]	0.27	[-21.17m AHD]	Pleistocene Glanville Fm (Qpg)

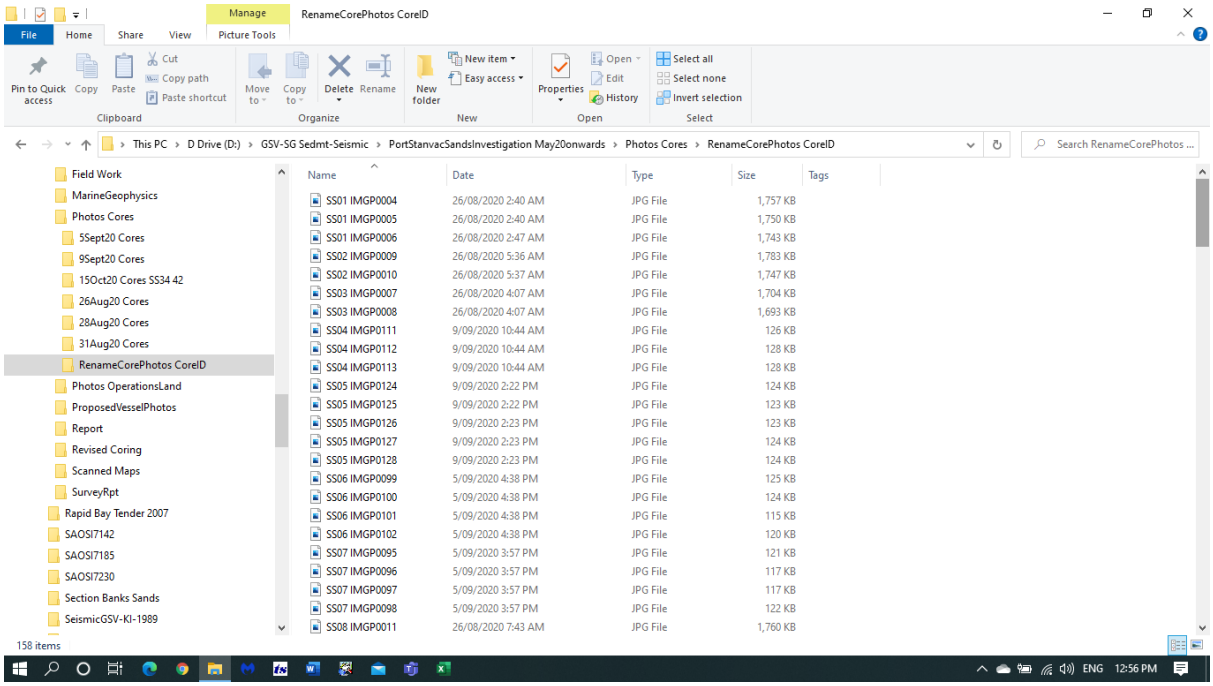
Appendix B:

Digital Photographs for

Vibracores SS01 – SS42 when appropriate

Provided as External Attachment due to size of folder/files

[Folder & filename directory provided on next few pages]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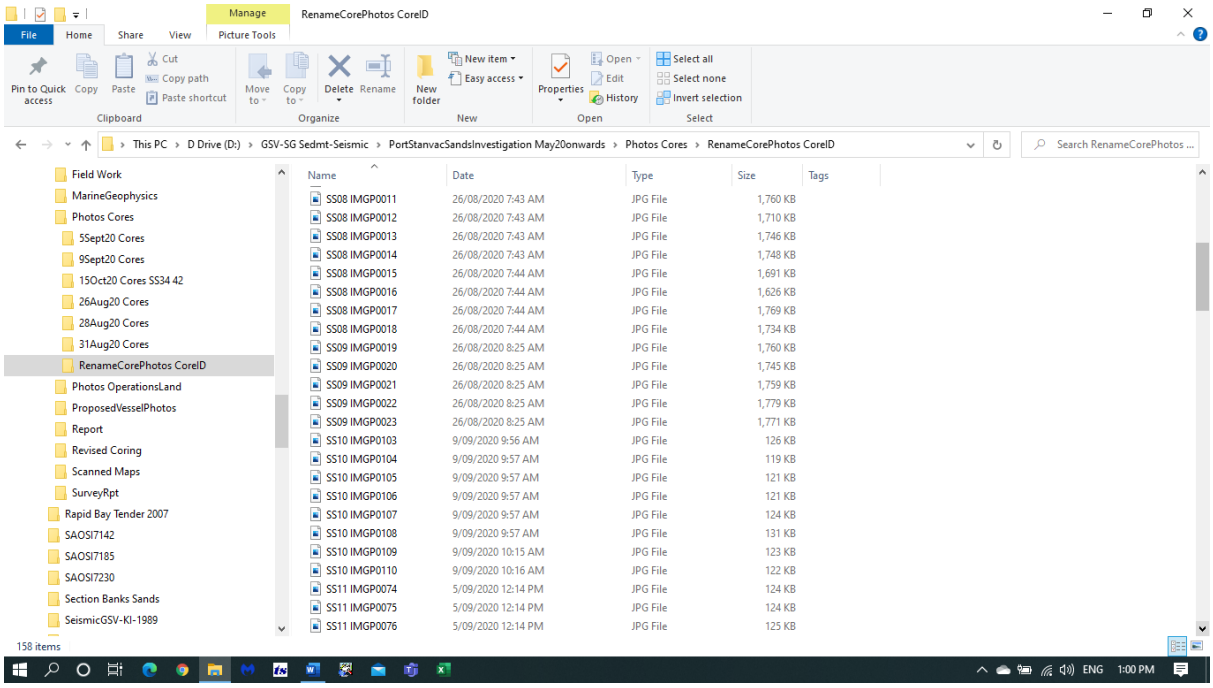
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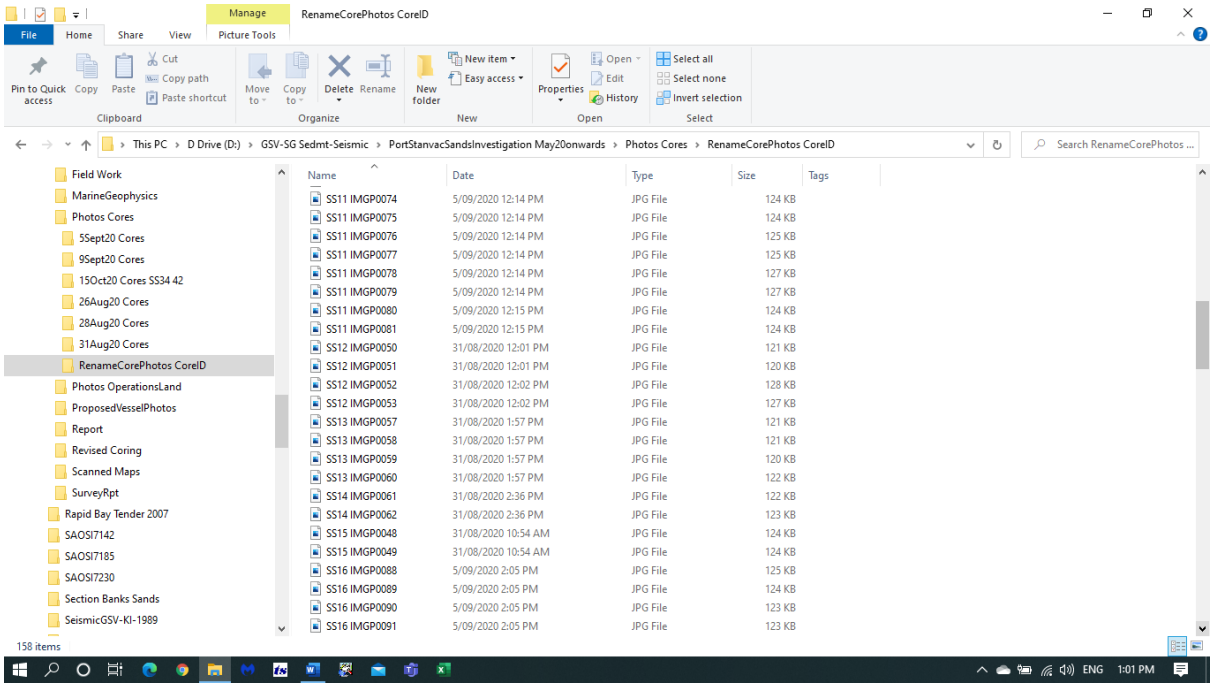
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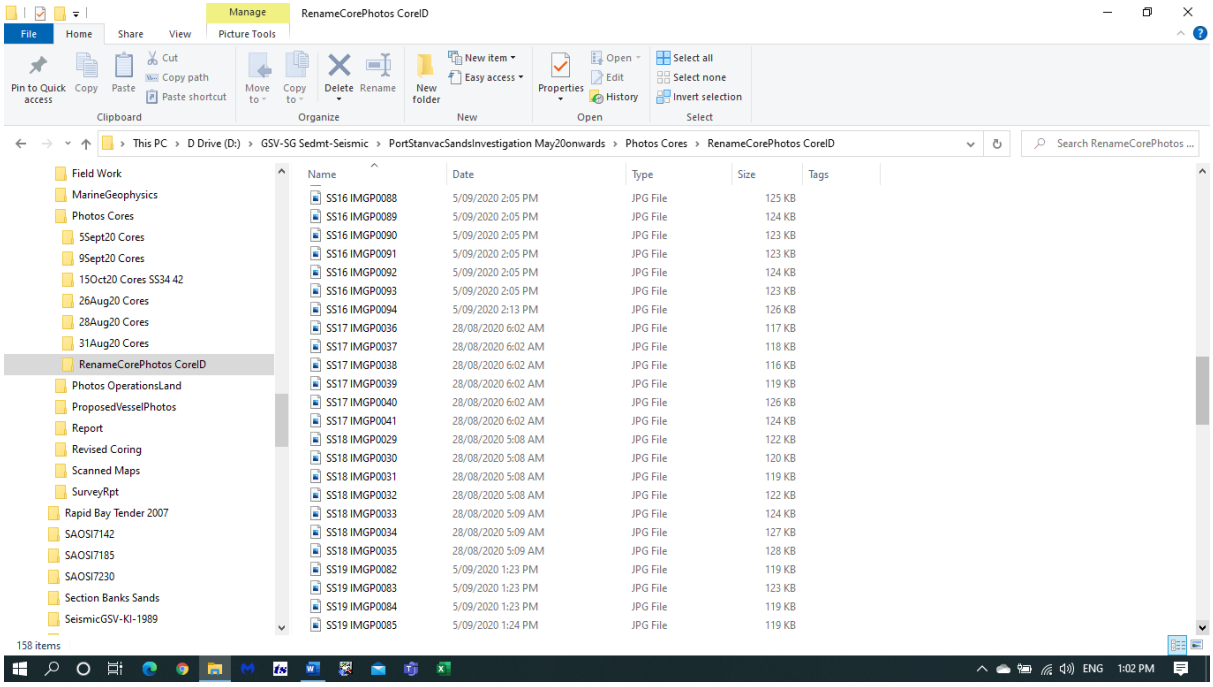
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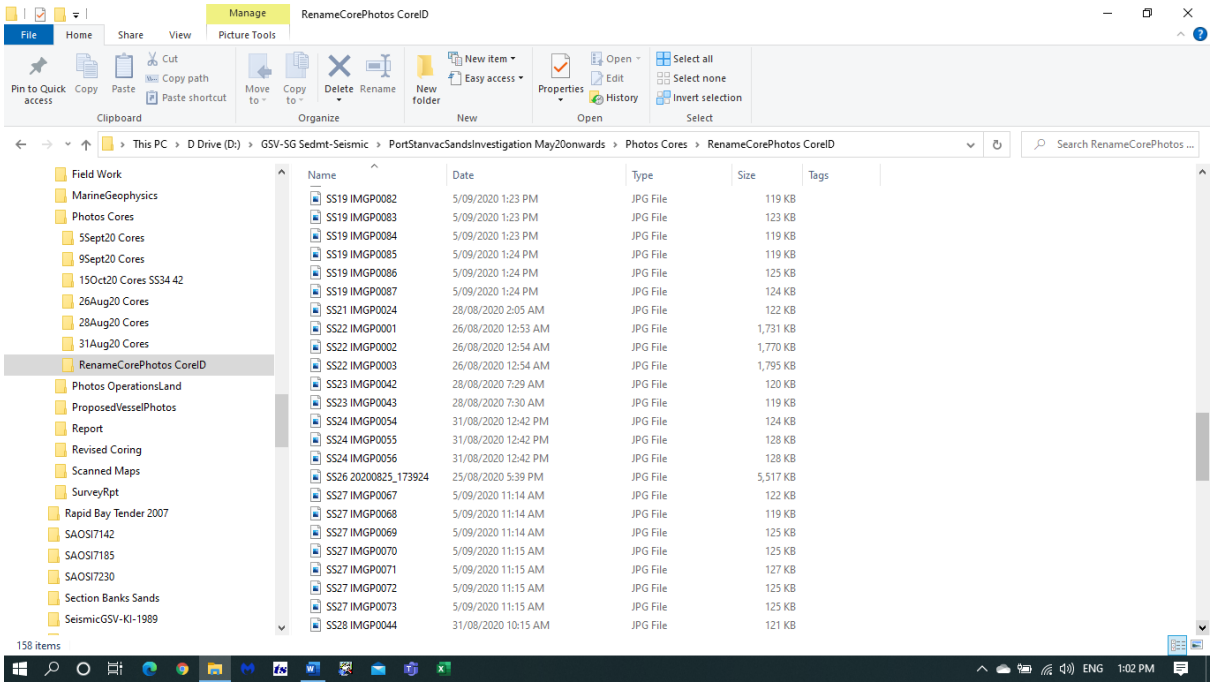
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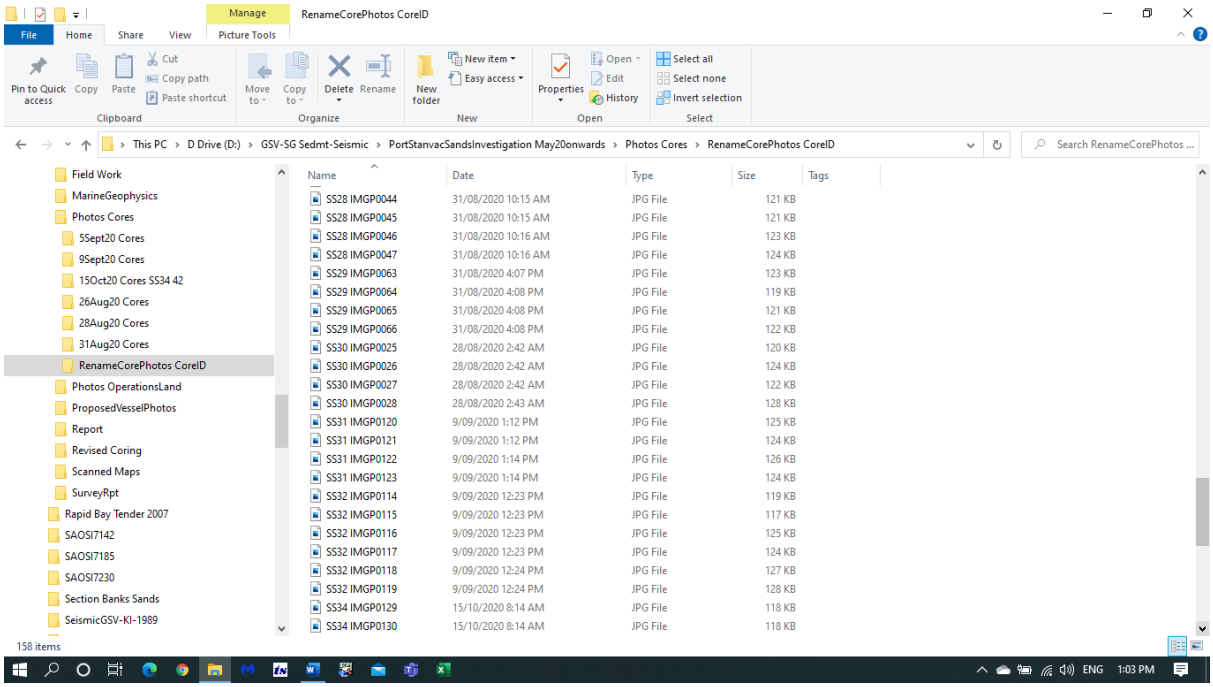
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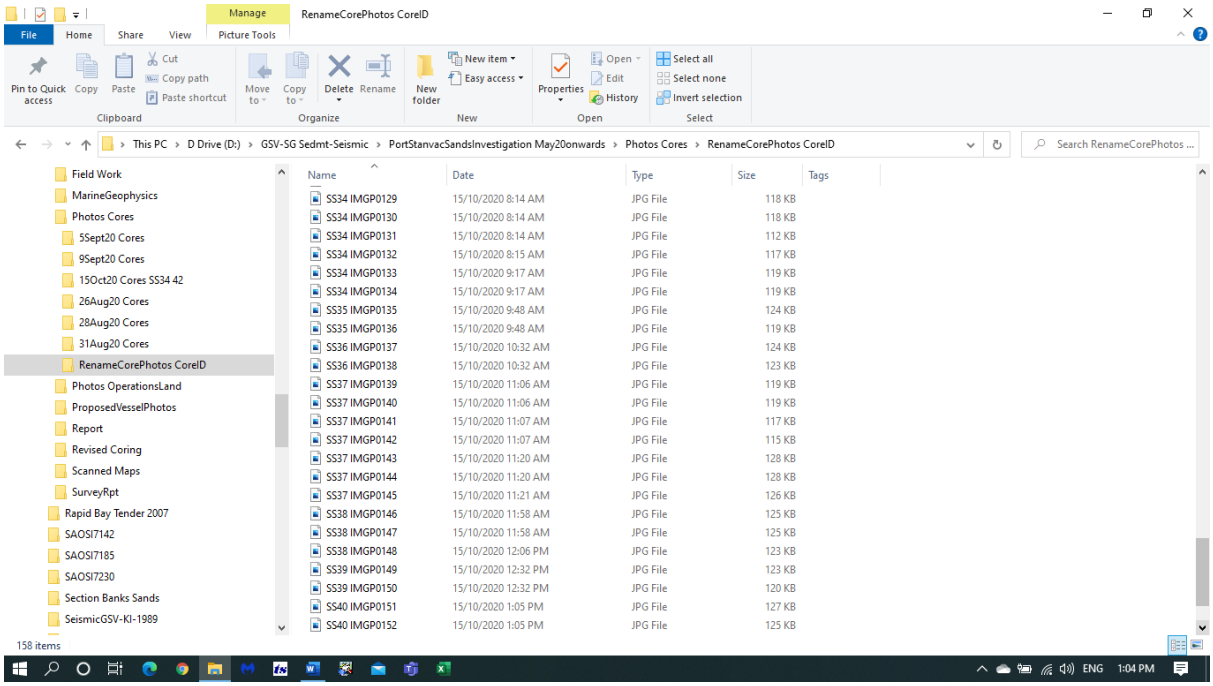
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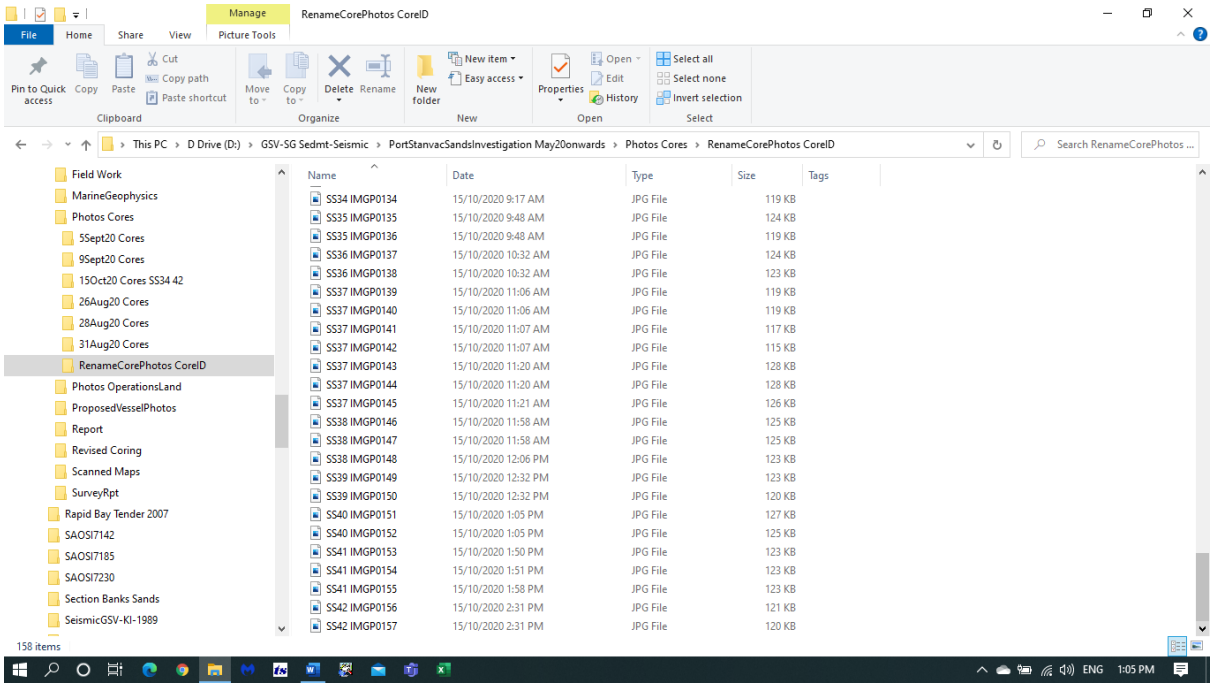
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