Prepared by:
The Dredged Material Management Office
Seattle District, U.S. Army Corps of Engineers

MEMORANDUM FOR RECORD October 12, 2018

SUBJECT: DMMP NO-TEST DETERMINATION FOR MAINTENANCE DREDGING OF 250 CUBIC YARDS OF SAND AND GRAVEL FROM THE NAVIGATION CHANNEL CONNECTING DAVIS BAY AND DECATUR HEAD LAGOON BY THE DECATUR HEAD BEACH ASSOCIATION (NWS-2018-968).

1. Introduction. This memorandum documents the no-test determination by the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the Environmental Protection Agency) for maintenance dredging of the navigation channel connecting Davis Bay and the Decatur Head lagoon. Decatur Head is located on the east side of Decatur Island in San Juan County (Figure 1).

   The Decatur Head lagoon is used for moorage of a radar-equipped boat, which is used by Decatur Island residents for emergency purposes. The lagoon is also used by the Decatur Head Beach Association (DHBA) for winter moorage of their floating dock and boats, providing safe storage from severe weather (Attachment 1).

   Access to the lagoon is through a narrow channel (Figure 2), which was last dredged in 2005. Sediment accretion since that time has made the channel nearly impassable. The DHBA proposes land-based maintenance dredging to return the width of the channel to 16 feet (ft) at 3 ft mean lower low water (MLLW) (Figures 3 and 4). All dredged material will be placed at an upland gravel pit for later re-use (Figures 1 and 5).

2. Evaluation. The DMMP guidelines provide testing relief for small projects, depending on the rank of the project. According to the DMMP User Manual, areas that are geographically removed from potential sources of contamination but for which there are insufficient data to assign a 'low' rank are to be ranked 'low-moderate' (DMMP, 2016). In a low-moderate-ranked area, a small project is defined as one with less than 1,000 cubic yards. With only 250 cubic yards, this project qualifies as a small project. Under the DMMP guidelines, sediment sampling and testing are not required for small projects.

   As a precaution, the DMMP agencies reviewed existing contaminant data in the vicinity of the project to verify that a low-moderate rank was applicable. The Department of Ecology's Environmental Information Management (EIM) database had no data within a mile of the project, which is typically an indication that no known sources of contamination are present. Ecology's cleanup site database included only one cleanup site (Coastal Construction) on Decatur Island, but the site is more than a half-mile from both the dredge site and the gravel pit (Figure 6). In addition, samples of the sediment to be dredged were collected by Coastal Geologic Services, Inc. on July 4, 2018 and tested for grain-size, total volatile solids, total organic carbon, chemical oxygen demand, metals, diesel and heavier oils (Attachment 2). The testing results indicated that the dredged material is approximately half sand and

half gravel, with very low organic carbon content and volatile solids. Metals were either undetected or at concentrations well below levels of concern. Diesel and heavier oils were not detected. In summary, the existing data are consistent with a rank of low-moderate for this project.

3. Applicability of Small-Project Guidelines to Antidegradation Evaluations. The small-project guidelines were meant to apply to projects with proposed open-water disposal. For projects with upland disposal, the suitability of the dredged material for open-water disposal is not relevant. However, such projects are still subject to evaluation under the Department of Ecology's antidegradation standard (Ecology, 2013), which requires that the sediment to be exposed by dredging be of similar or better quality than the existing sediment surface. The DMMP agencies have agreed that the small-project guidelines apply equally to suitability determinations for open-water disposal and antidegradation evaluations.

4. No-Test Determination. This project is located in an area of low-moderate concern with regard to sediment contamination and upland disposal is proposed. The proposed dredged material volume of 250 cubic yards is less than the "no-test" volume of 1,000 CY for low-moderate-ranked areas. Based on the DMMP small-project guidelines, the DMMP agencies have determined that sampling and testing are not required for this project.

   This determination does ***not*** constitute final agency approval of the project. During the public comment period that follows a public notice, resource agencies and the public will provide input on the overall project. A final decision will be made after full consideration of public input.

5. References.

DMMP, 2016. Dredged Material Evaluation and Disposal Procedures (User Manual). Dredged Material Management Program, August 2016.

Ecology, 2013. *Sediment Management Standards – Chapter 173-204 WAC*. Washington State Department of Ecology, Revised February 2013.

6. DMMO Signature. This determination was coordinated by the undersigned with Laura Inouye (Ecology), Justine Barton (EPA) and Celia Barton (DNR).

The signed copy is on file in the Dredged Material Managment Office.

_____ _____

Date David Fox, P.E. - Seattle District Corps of Engineers

Copies Furnished:

DMMP agencies
Jordan Bunch, USACE Regulatory
DMMO File

Figure 1

DECATUR HEAD BEACH ASSOCIATION

MAINTENANCE DREDGE

SURVEY NOTES:

2017 Topographic data (inlet area and south shore) obtained by Coastal Geologic Services, inc. on 7/24/2017 using a TCR-1105 total station with direct rod measurements.

Ordinary High Water Mark (OHWM) delineated by Fairbanks Environmental and location mapped by Coastal Geologic Services, inc. on 7/24/2017.

Horizontal Datum: HPGN (HARN) Washington State Planes, North Zone, US Foot

Vertical Datum: The Vertical Datum for this survey is based upon the NOAA Tidal Datum for Thatcher Pass, Washington, as observed at 9:43 a.m. on April 2, 2015; said elevation = 3.16'. Mean Low Low Water (MLLW) = 0.0' per the 07/31/2015 Topography Survey prepared by Star Surveying, Inc.

Parcel lines shown are approximate and for reference only. No boundary survey was completed as part of this work. Boundaries obtained from the 2012 Washington State Parcel Database, and used as-is here.

MONUMENT LIST:

#	NAME	EASTING	NORTHING	ELEV.
1	MON. 1	1166345.85'	556617.68'	11.25'

MONUMENT MAP / ADJACENT PARCEL MAP / AERIAL PHOTO:

LOCATION AND VICINITY MAP:

SITE ADDRESS:

1327 Decatur Head Drive
Decatur Island, Anacortes, WA 98221

SAN JUAN COUNTY ASSESSOR PARCEL NO.:

152211001000

DRIVING DIRECTIONS:

The site is only reachable by air, and boat, with charter service out of Anacortes, WA. A public boat ramp is available.

NWS- 2018 - 968

ADJACENT PROPERTY OWNERS

PARCEL #	NAME	ADDRESS
152213005000	JOHN W RUSSELL TTEE	200 MARKET ST STE#1720 PORTLAND OR 98201-5718
152211002000	DECATUR HEAD BEACH ASSC	DECATUR ISLAND, ANACORTES, WA 98221-9402

SHEET INDEX:

#	Sheet Title
1	Cover Sheet- Vicinity Map - Notes - Index
2	Existing Conditions - Site Plan
3	Proposed Conditions - Site Plan
4	Proposed Conditions - Cross Sections
5	Dredge Disposal Site - Site Plan

GENERAL NOTES:

1. Project activities shall not occur when the work area is inundated by tidal waters.
2. Work during holidays, weekends, and outside the normal work hours requires prior arrangements and approval.
3. Contractor must obtain appropriate permissions to encroach and work within any rights-of-way.
4. The contractor shall contact utility location service 48 hours prior to starting construction at 1-800-424-5555 or 811.
5. The contractor shall restore all private and public property disturbed by the project immediately after construction.
6. Contractor shall sweep and remove all debris tracked onto existing paved roads during all phases of construction.
7. The contractor shall keep records of deviations and forward to the project designer.
8. Traffic control is to be maintained.
9. The contractor shall have on the job site a current tide chart for the duration of the project activities.
10. A copy of the approved plans must be on the job site whenever construction is in process.
11. Location of utilities was not determined prior to project design.

LEGEND (APPLIES TO ALL SHEETS):

FEATURE	EXISTING	PROPOSED
CONTOURS, MAJOR	———#———	———#———
CONTOURS, MINOR	———#———	———#———
PROPERTY LINES	— — — — —	
GRAVEL ROAD EDGE	— — — — —	
VEGETATION LINE	- - - - - - - -	
LOG LINE	— — — —	
OHWM	---OHWM---	
MHHM	— MHHW —	— MHHW —
DREDGE AREA		
SALVAGED VEGETATION		

ABBREVIATIONS:

CGS	COASTAL GEOLOGIC SERVICES
(E)/EX/EXIST.	EXISTING FEATURE
ELEV.	ELEVATION
MHHW	MEAN HIGHER HIGH WATER
MHW	MEAN HIGH WATER
MLLW	MEAN LOWER LOW WATER
MON.	MONUMENT
(N)	NEW FEATURE
OHWM	ORDINARY HIGH WATER MARK
LF	LINEAR FEET
SF	SQUARE FEET
CY	CUBIC YARDS
MIN.	MINIMUM
MAX.	MAXIMUM
TYP.	TYPICAL
LWD	LARGE WOODY DEBRIS

Proposed: Maintenance Dredge
USACE Ref. #:
In: Davis Bay County: San Juan State: WA
Application By:
Decatur Head Beach Association
Decatur Island
Anacortes, WA 98221-9402
Project Location: -
Assessors Parcel Numbers: 152211001000

COASTAL GEOLOGIC SERVICES
1711 Ellis St, Suite 103
Bellingham, WA 98225
360-647-1845 - coastalgeo.com

REVISIONS

DRAWN BY: ADT
DESIGNED BY: JWJ
CHECKED BY: JWJ
DATE SURVEYED: 7/24/17 / 7/31/15
DATE PLOTTED: 6/4/2018
CGS FILE: ADT / 3148

DECATUR HEAD MAINTENANCE DREDGE
COVER SHEET
VICINITY MAP - NOTES - INDEX
DECATUR HEAD BEACH ASSOCIATION

MLLW
ELEV. MLLW: 0.00 FT
ELEV. MHHW: 7.84 FT

SCALE: AS SHOWN
DATE: 6/4/2018
SHEET: 1
OF: 5

K:\Jobs\Jobs\Decatur\Decatur Head Dredge\17-024_Decatur_Dredge_PlanSet-2018.dwg

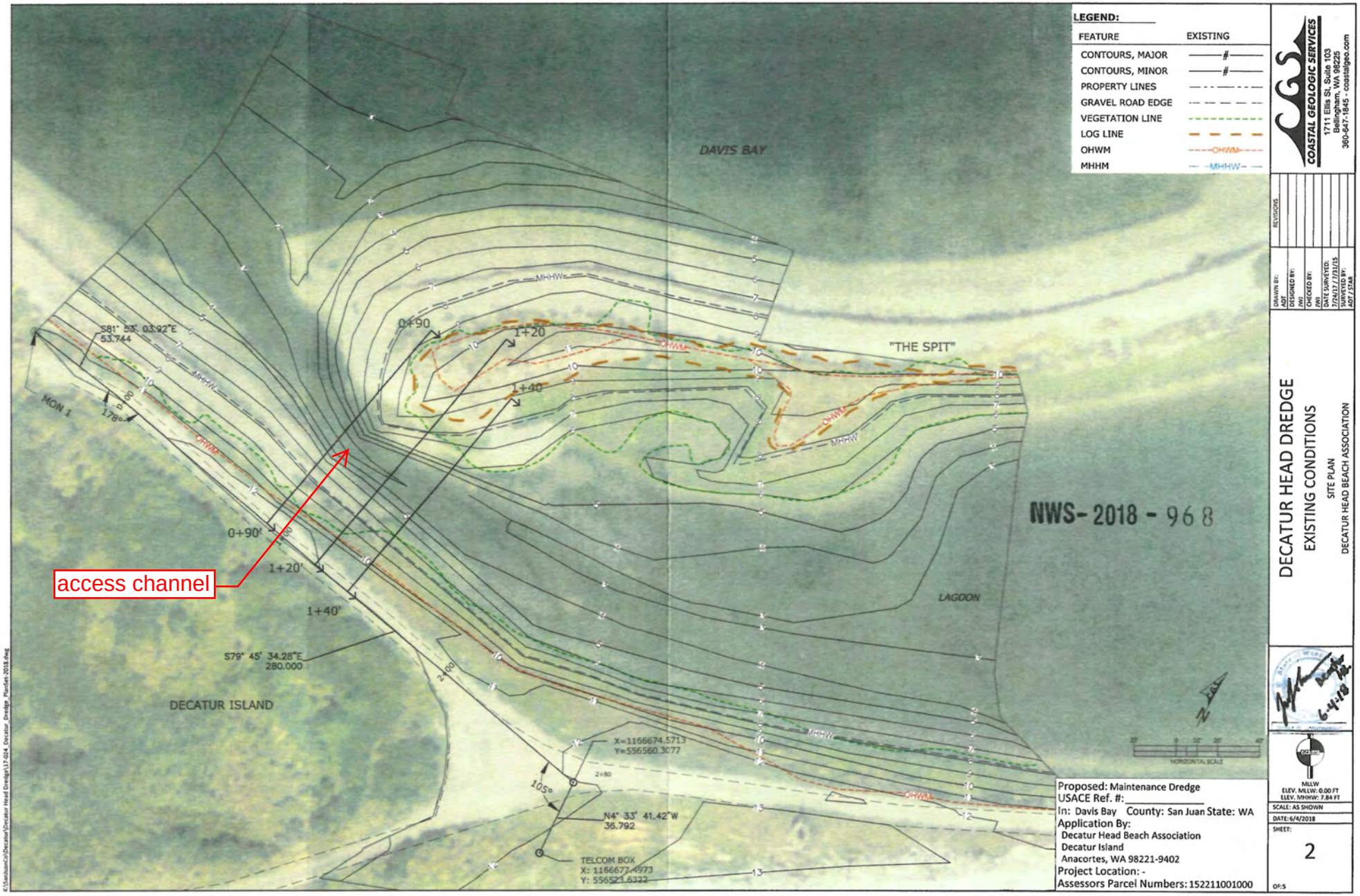
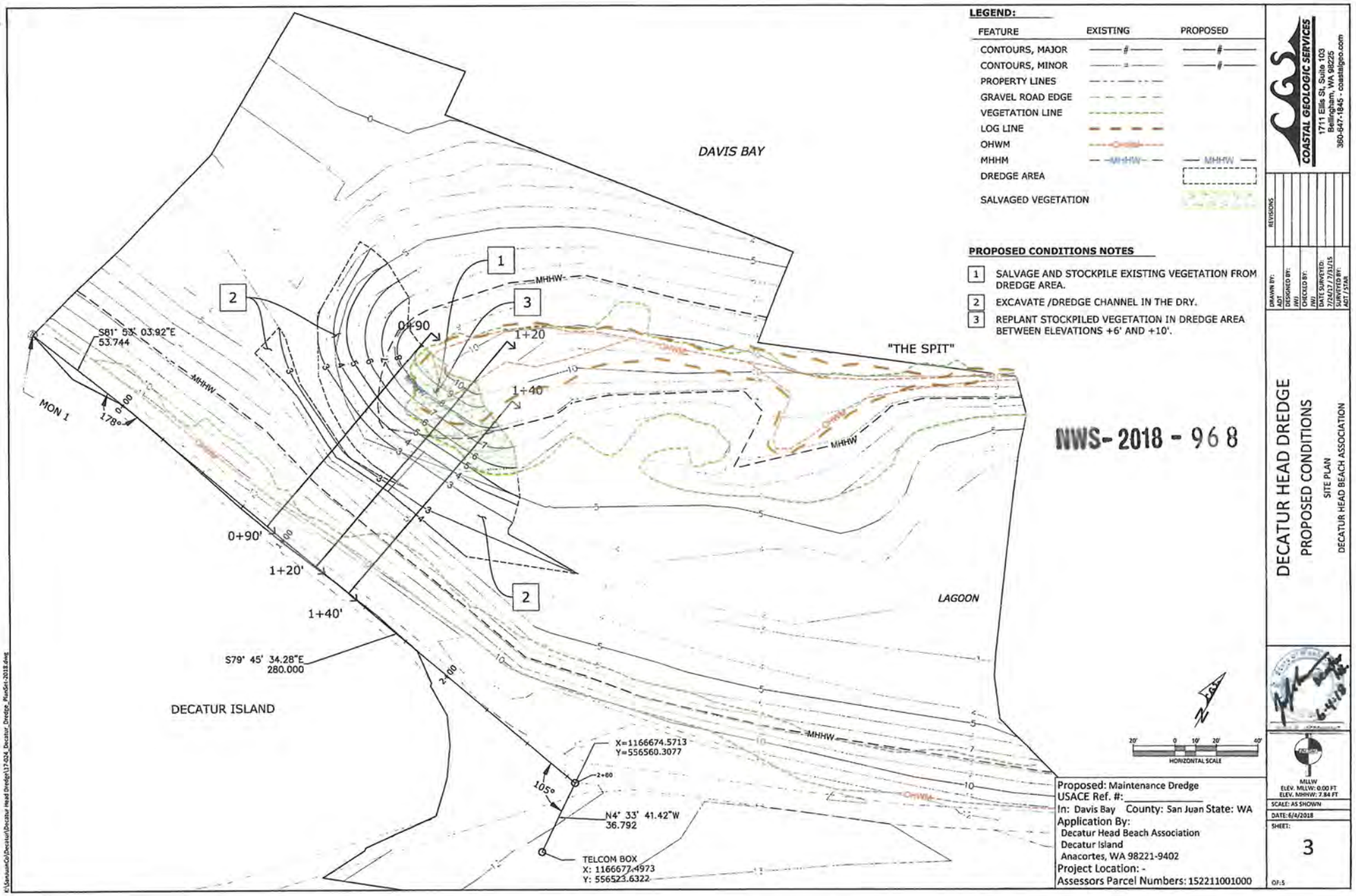
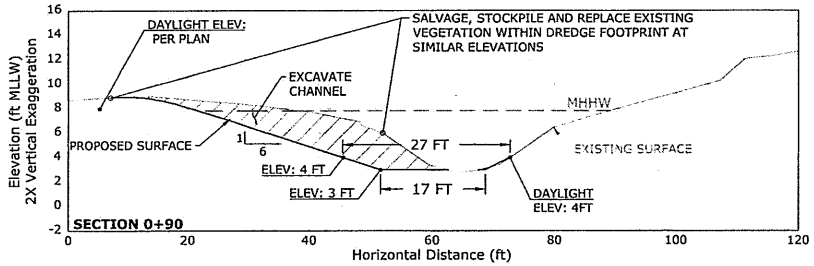
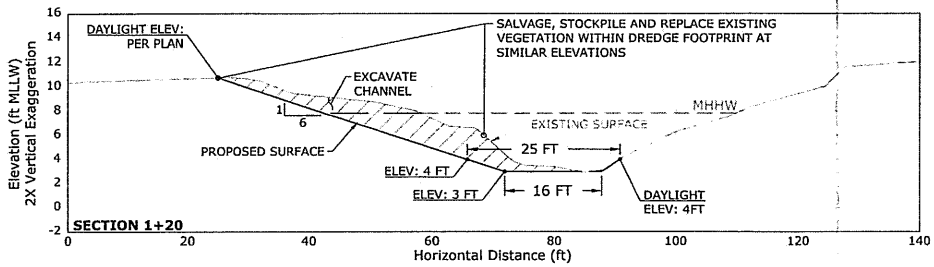

LEGEND:
FEATURE
EXISTING
CONTOURS, MAJOR
CONTOURS, MINOR
PROPERTY LINES
GRAVEL ROAD EDGE
VEGETATION LINE
LOG LINE
OHWM
MHHW
DAVIS BAY
"THE SPIT"
LAGOON
DECATUR ISLAND
MON 1
S81° 53' 03.92"E
53.744
0+90
1+20
1+40
0+90'
1+20'
1+40'
access channel
S79° 45' 34.28"E
280.000
X=1166674.5713
Y=556560.3077
N4° 33' 41.42"W
36.792
TELCOM BOX
X: 1166677.4973
Y: 556521.6322
NWS- 2018 - 968
Proposed: Maintenance Dredge
USACE Ref. #:
In: Davis Bay County: San Juan State: WA
Application By:
Decatur Head Beach Association
Decatur Island
Anacortes, WA 98221-9402
Project Location: -
Assessors Parcel Numbers: 152211001000
COASTAL GEOLOGIC SERVICES
1711 Ellis St. Suite 103
Bellingham, WA 98225
360-647-1845 - coastalgeo.com
DECATUR HEAD DREDGE
EXISTING CONDITIONS
SITE PLAN
DECATUR HEAD BEACH ASSOCIATION
MLLW
ELEV. MLLW: 0.00 FT
ELEV. MHHW: 7.84 FT
SCALE: AS SHOWN
DATE: 6/4/2018
SHEET:
2
OF:5

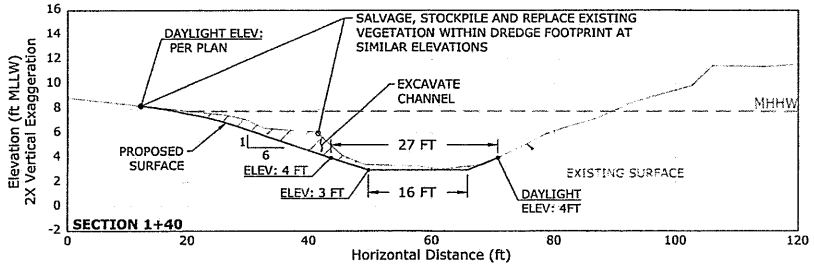
Figure 2

Figure 3


LEGEND:
FEATURE
EXISTING
PROPOSED
CONTOURS, MAJOR
CONTOURS, MINOR
PROPERTY LINES
GRAVEL ROAD EDGE
VEGETATION LINE
LOG LINE
OHWM
MHHW
DREDGE AREA
SALVAGED VEGETATION
PROPOSED CONDITIONS NOTES
1 SALVAGE AND STOCKPILE EXISTING VEGETATION FROM DREDGE AREA.
2 EXCAVATE /DREDGE CHANNEL IN THE DRY.
3 REPLANT STOCKPILED VEGETATION IN DREDGE AREA BETWEEN ELEVATIONS +6' AND +10'.
DAVIS BAY
"THE SPIT"
LAGOON
DECATUR ISLAND
MON 1
S81° 53' 03.92"E
53.744
178°
0+90
1+20
1+40
S79° 45' 34.28"E
280.000
105°
X=1166674.5713
Y=556560.3077
N4° 33' 41.42"W
36.792
TELCOM BOX
X: 1166677.4973
Y: 556523.6322
NWS-2018-968
HORIZONTAL SCALE
Proposed: Maintenance Dredge
USACE Ref. #:
In: Davis Bay County: San Juan State: WA
Application By:
Decatur Head Beach Association
Decatur Island
Anacortes, WA 98221-9402
Project Location: -
Assessors Parcel Numbers: 152211001000
COASTAL GEOLOGIC SERVICES
1711 Ellis St, Suite 103
Bellingham, WA 98225
360-647-1845 - coastalgeo.com
REVISIONS
DRAWN BY: AGT
DESIGNED BY: JWJ
CHECKED BY: JWJ
DATE SURVEYED: 7/24/17 / 7/31/15
SURVEYED BY: AGT / STAR
DECATUR HEAD DREDGE
PROPOSED CONDITIONS
SITE PLAN
DECATUR HEAD BEACH ASSOCIATION
MLLW
ELEV. MLLW: 0.00 FT
ELEV. MHHW: 7.84 FT
SCALE: AS SHOWN
DATE: 6/4/2018
SHEET:
3
OF: 5







NWS- 2018 - 968

Proposed: Maintenance Dredge
USACE Ref. #: _____
In: Davis Bay County: San Juan State: WA
Application By:
Decatur Head Beach Association
Decatur Island
Anacortes, WA 98221-9402
Project Location: -
Assessors Parcel Numbers: 152211001000

COASTAL GEOLOGIC SERVICES
1711 Ellis St, Suite 103
Bellingham, WA 98225
360-647-1845 - coastalgeo.com

REVISIONS

DRAWN BY: ADT
DESIGNED BY: JWJ
CHECKED BY: AW
DATE SURVEYED: 7/24/17 / 7/31/15
SURVEYED BY: ADT / SPAR

DECATUR HEAD DREDGE
PROPOSED CONDITIONS
CROSS SECTIONS
DECATUR HEAD BEACH ASSOCIATION

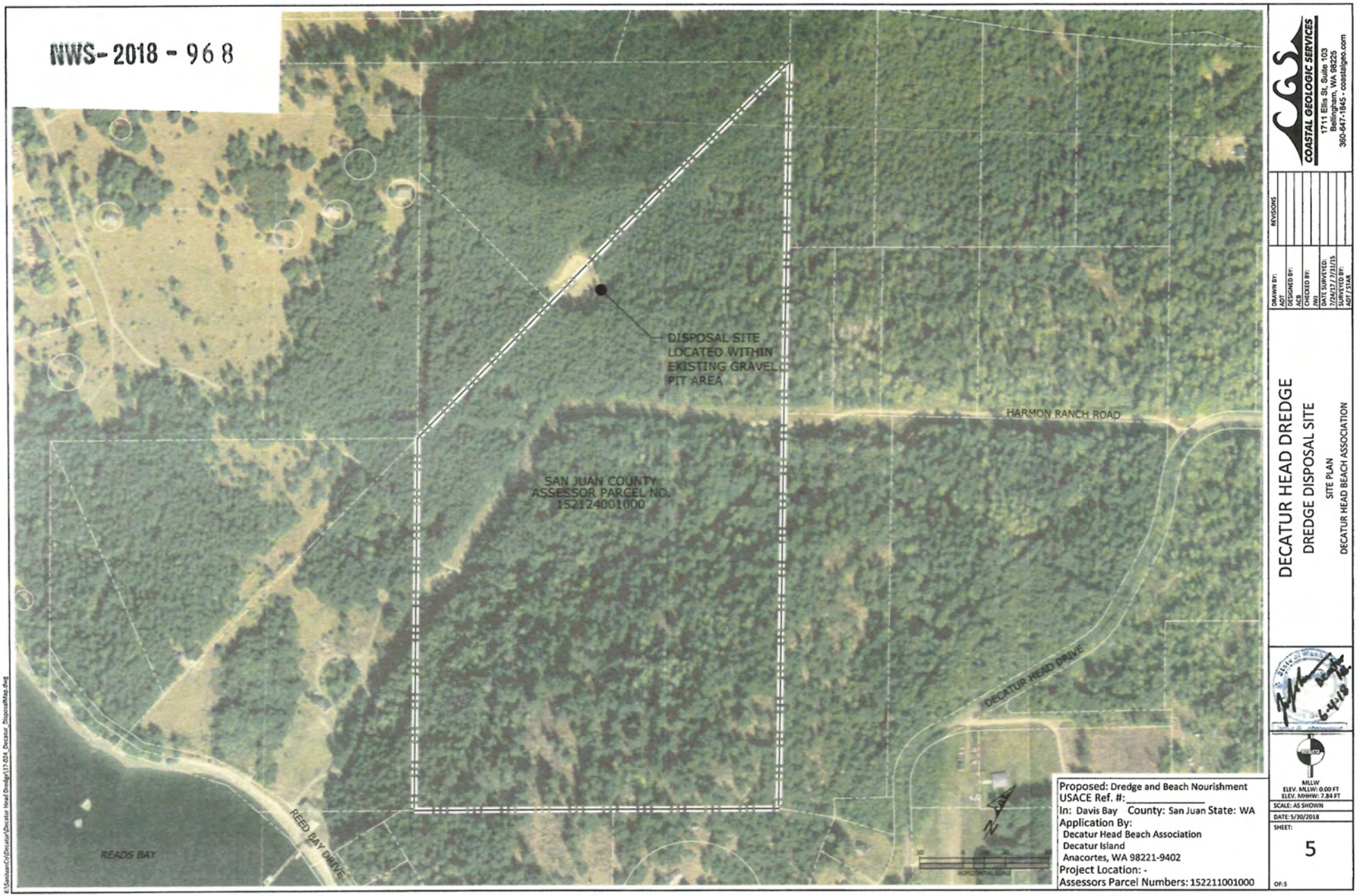
MLLW
ELEV. MLLW: 0.00 FT
ELEV. MHHW: 7.84 FT

SCALE: AS SHOWN
DATE: 6/4/2018
SHEET: 4
OF: 5

K:\SanJuanCo\Decatur\Decatur Head Dredge\17-024_Decatur_Dredge_PlanSet-2018.dwg

Figure 4

Figure 5


NWS-2018-968
DISPOSAL SITE LOCATED WITHIN EXISTING GRAVEL PIT AREA
HARMON RANCH ROAD
SAN JUAN COUNTY ASSESSOR PARCEL NO. 152124001000
DECATUR HEAD DRIVE
REED BAY DRIVE
READS BAY
N
Proposed: Dredge and Beach Nourishment
USACE Ref. #:
In: Davis Bay County: San Juan State: WA
Application By:
Decatur Head Beach Association
Decatur Island
Anacortes, WA 98221-9402
Project Location: -
Assessors Parcel Numbers: 152211001000
COASTAL GEOLOGIC SERVICES
1711 Ellis St, Suite 103
Bellingham, WA 98225
360-647-1845 - coastalgeo.com
REVISIONS
DRAWN BY: ADT
DESIGNED BY: ACB
CHECKED BY: JWJ
DATE SURVEYED: 2017-11-15
SURVEYED BY: ADT / STAB
DECATUR HEAD DREDGE
DREDGE DISPOSAL SITE
SITE PLAN
DECATUR HEAD BEACH ASSOCIATION
MLLW
ELEV. MLLW: 0.00 FT
ELEV. MHHW: 7.84 FT
SCALE: AS SHOWN
DATE: 5/30/2018
SHEET:
5
OF:5


Search Google Maps
See travel times, traffic and nearby places
Sign in
Sidney, BC - Anacortes, WA
Sidney, BC - Anacortes, WA
Anacortes - Orc
Figure 6
dredged material disposal site (gravel pit)
dredge site
Decatur Island
Coastal Construction cleanup site
Decatur
Center Island
3D

Attachment 1

WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) Form[1,2]

US Army Corps of Engineers
Seattle District

USE BLACK OR BLUE INK TO ENTER ANSWERS IN THE WHITE SPACES BELOW.

AGENCY USE ONLY

Date received: RECEIVED SEP 26 2018 REGULATORY

Agency reference #:

Tax Parcel #(s):

Part 1–Project Identification

1. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development)
Decatur Head Beach Association Maintenance Dredge

Part 2–Applicant

The person and/or organization responsible for the project.

2a. Name (Last, First, Middle)			
Coulter, Tim			
2b. Organization (If applicable)			
Decatur Head Beach Association			
2c. Mailing Address (Street or PO Box)			
Decatur Island			
2d. City, State, Zip			
Anacortes, WA 98221-9402			
2e. Phone (1)	**2f.** Phone (2)	**2g.** Fax	**2h.** E-mail
(425) 512-4774	NA	NA	timcoulter@gmail.com

[1]Additional forms may be required for the following permits:

- If your project may qualify for Department of the Army authorization through a Regional General Permit (RGP), contact the U.S. Army Corps of Engineers for application information (206) 764-3495.
- If your project might affect species listed under the Endangered Species Act, you will need to fill out a Specific Project Information Form (SPIF) or prepare a Biological Evaluation. Forms can be found at http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx.
- Not all cities and counties accept the JARPA for their local Shoreline permits. If you need a Shoreline permit, contact the appropriate city or county government to make sure they accept the JARPA.

[2]To access an online JARPA form with [help] screens, go to http://www.epermitting.wa.gov/site/alias__resourcecenter/jarpa_jarpa_form/9984/jarpa_form.aspx.

For other help, contact the Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.

Part 3–Authorized Agent or Contact

Person authorized to represent the applicant about the project. (Note: Authorized agent(s) must sign 11b of this application.)

3a. Name (Last, First, Middle)			
Shaw, Francine Marie			
3b. Organization (If applicable)			
Planning and Permit Services, LLC			
3c. Mailing Address (Street or PO Box)			
PO Box 868			
3d. City, State, Zip			
Friday Harbor, WA 98250			
3e. Phone (1)	**3f.** Phone (2)	**3g.** Fax	**3h.** E-mail
(360) 298-4449	NA	NA	francine@rockisland.com

Part 4–Property Owner(s)

Contact information for people or organizations owning the property(ies) where the project will occur. Consider both **upland and aquatic** ownership because the upland owners may not own the adjacent aquatic land.

☒ Same as applicant. (Skip to Part 5.)

☐ Repair or maintenance activities on existing rights-of-way or easements. (Skip to Part 5.)

☐ There are multiple upland property owners. Complete the section below and fill out JARPA Attachment A for each additional property owner.

☒ Your project is on Department of Natural Resources (DNR)-managed aquatic lands. If you don't know, contact the DNR at (360) 902-1100 to determine aquatic land ownership. If yes, complete JARPA Attachment E to apply for the Aquatic Use Authorization.

4a. Name (Last, First, Middle)			
4b. Organization (If applicable)			
4c. Mailing Address (Street or PO Box)			
4d. City, State, Zip			
4e. Phone (1)	**4f.** Phone (2)	**4g.** Fax	**4h.** E-mail

Part 5–Project Location(s)

Identifying information about the property or properties where the project will occur.

☐ There are multiple project locations (e.g. linear projects). Complete the section below and use JARPA Attachment B for each additional project location.

5a. Indicate the type of ownership of the property. (Check all that apply.)

☒ Private
☐ Federal
☐ Publicly owned (state, county, city, special districts like schools, ports, etc.)
☐ Tribal
☒ Department of Natural Resources (DNR) – managed aquatic lands (Complete JARPA Attachment E)

5b. Street Address (Cannot be a PO Box. If there is no address, provide other location information in 5p.)

NA

5c. City, State, Zip (If the project is not in a city or town, provide the name of the nearest city or town.)

Decatur Head on Decatur Island

5d. County

San Juan

5e. Provide the section, township, and range for the project location.

¼ Section	Section	Township	Range
NE	22	35N	1W

5f. Provide the latitude and longitude of the project location.

- Example: 47.03922 N lat. / -122.89142 W long. (Use decimal degrees - NAD 83)

48.509535 N lat. / -122.788673 W long.

5g. List the tax parcel number(s) for the project location.

- The local county assessor's office can provide this information.

TPN 152211001000

5h. Contact information for all adjoining property owners. (If you need more space, use JARPA Attachment C.)

Name	Mailing Address	Tax Parcel # (if known)
John W. Russel TTEE	200 Market Street; Suite1720 Portland, OR 98201-5718	152213005
William and Miriam P. Beck	4313 90th SE Mercer Island, WA 98040-4026	152213003
Robert and Francis Nightingale	Decatur Island Anacortes, WA 98221-9401	152213002
C. Texas, Dorothy East, Jana Rippee and Chris Johnson	481 Ridgefield Road Wilton, CT 06897-1925	152213001

5i. List all wetlands on or adjacent to the project location.

There is one wetland on the south side of the lagoon.

5j. List all waterbodies (other than wetlands) on or adjacent to the project location.

Davis Bay and the Decatur Head Lagoon

5k. Is any part of the project area within a 100-year floodplain

☒ Yes ☐ No ☐ Don't know

5l. Briefly describe the vegetation and habitat conditions on the property.

The shoreline surrounding the project site consists of gravel and sand beaches with beach grasses and salt marsh vegetation (pickleweed).

5m. Describe how the property is currently used.

The property is a common area used by the Decatur Head Beach Association.

5n. Describe how the adjacent properties are currently used.

Adjacent properties are used for single-family residential development, mostly for vacation purposes.

5o. Describe the structures (above and below ground) on the property, including their purpose(s) and current condition.

The land is occupied by the community dock.

5p. Provide driving directions from the closest highway to the project location, and attach a map.

There are no roads or highways accessing Decatur Island. It is a non-ferry served island. The property can only be accessed by private boat or plane. See attached vicinity map.

Part 6–Project Description

6a. Briefly summarize the overall project. You can provide more detail in 6b.

Decatur Head Beach Association is proposing a maintenance dredge of the navigation channel connecting Davis Bay with the Decatur Head lagoon every two to three years as it fills in over a ten year period. Decatur Head lagoon is used for moorage of the only year around radar equipped boat on the island which is used for emergency purposes. It is also used by Association members for winter moorage of their floating dock and their boats for safe storage from severe weather. The Association wishes to maintain the present use of the lagoon as moorage which is now being threatened by the accretion of sediment at the entrance channel.

Access to the lagoon is through a narrow channel located southwest of the lagoon. The lagoon was dredged in 2005 under approved permits but has slowly shoaled over the past 13 years. The opening to the lagoon has now become too shallow and narrow to enter except at the highest tides. The channel needs to be dredged again. Returning the width of the channel to that permitted in 2001 will ensure that the spit will not choke the lagoon off from the sea.

The proposal includes a maintenance land-based dredge to widen and return the bottom of the channel to a width of 16 feet at 3 ft. MLLW. (The prior approved dredge widened the channel to 26 feet at 3 ft. MLLW.) Excavation equipment will access the proposed dredge site from the landward side immediately adjacent to the dredge site. No in water work will occur when tidal waters are flooding the immediate work area. Work will be conducted in the dry.

Approximately 250 cubic yards of sand are proposed to be excavated from the navigation channel (150 cubic yards will be removed below MHHW and 100 cubic yards will be removed above MHHW) resulting in 6:1 side slopes (horizontal:vertical) to enhance navigation. Approximately 6,498 sq. ft. of dredge area will be below MHHW (mean higher high water) and 1,811 sq. ft. will be above MHHW for a total dredge area of 8,309 sq. ft./0.2 acres.

All dredged material will be disposed on the uplands, within the interior of Decatur Island (TPN 152124001).This parcel is owned by local resident, George Lamb. Spoils will be hauled by a dump truck directly to the site, using existing roads, where it will be disposed in an existing gravel pit for re-use later.

The proposal also includes the removal of 2,000 SF of salt marsh vegetation, primarily pickleweed, from the south end of the spit. This salt marsh vegetation will be salvaged, stockpiled and maintained in such a way to ensure successful replanting once excavation is complete. Stockpiled salt marsh vegetation will be kept moist with seawater until replanted. It will be replanted to the proposed intertidal surface at appropriate elevations to assure it continues growing (between +6.5 MLLW and +9 MLLW). Coastal Geological Services has successfully conducted similar replants of pickleweed for other projects because this type of vegetation transplants well.

6b. Describe the purpose of the project and why you want or need to perform it.

The purpose of the maintenance dredge is to remove sediments that have filled in the navigation channel over the past 13 years since the last maintenance dredge was conducted in 2005. The sediments have reduced the depth of the navigation channel to the point that access to the lagoon is becoming difficult, if not impossible. The Beach Association uses the lagoon for boat moorage throughout the year and especially in the winter months when their floating dock is moved into the lagoon for safe storage from severe weather.

6c. Indicate the project category. (Check all that apply)

☐ Commercial ☒ Residential ☐ Institutional ☒ Transportation ☐ Recreational

☐ Maintenance ☐ Environmental Enhancement

6d. Indicate the major elements of your project. (Check all that apply)

☐ Aquaculture	☐ Culvert	☐ Float	☐ Retaining Wall (upland)
☐ Bank Stabilization	☐ Dam / Weir	☐ Floating Home	☐ Road
☐ Boat House	☐ Dike / Levee / Jetty	☐ Geotechnical Survey	☐ Scientific Measurement Device
☐ Boat Launch	☐ Ditch	☐ Land Clearing	☐ Stairs
☐ Boat Lift	☐ Dock / Pier	☐ Marina / Moorage	☐ Stormwater facility
☐ Bridge	☒ Dredging	☐ Mining	☐ Swimming Pool
☐ Bulkhead	☐ Fence	☐ Outfall Structure	☐ Utility Line
☐ Buoy	☐ Ferry Terminal	☐ Piling/Dolphin	
☒ Channel Modification	☐ Fishway	☐ Raft	

☐ Other:

6e. Describe how you plan to construct each project element checked in 6d. Include specific construction methods and equipment to be used.

- Identify where each element will occur in relation to the nearest waterbody.
- Indicate which activities are within the 100-year floodplain.

The construction project is being phased to the extent practicable in order to prevent soil erosion and transport of sediment from the site during implementation.

The following is the assumed construction schedule:

- Prepare site access. Equipment access during project actions can all be accomplished from the uplands with equipment mobilization arriving by road from on island.

- Mobilize construction equipment to the project site.

- Install the following Best Management Practices for temporary erosion and sediment control

  Preserve Vegetation and Mark Clearing Limit: To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Sensitive areas to be preserved and their buffers shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. Prior to construction, clearing limits shall be staked and be clearly flagged along the length of the clearing limits.

  Establish Construction Access: Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads. Street sweeping or street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. Access to the site will be from the existing gravel access road and dock. Existing access and roads shall be maintained throughout the construction project and cleaned to prevent track out. Vehicles shall stay on roads to the extent possible.

  Control Flow Rates: There will be no increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site as a result of the proposed dredging.

  Stabilize Soils and Protect Slopes: Exposed and unworked soils will be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. Additional BMP materials will be kept on site at all times for use during emergency situations. BMP materials will include: one roll of at least 100 SF of clear plastic, 10 filled sandbags, 100 FT of rope, and 100 LF of silt fencing. The project site is located west of the Cascade Mountain Crest. As such, no soils may remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) or for more than 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils will be stabilized at the end of the shift before a non-working holiday or weekend if needed based on weather forecasts. All stockpiled soils will be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels. All cut and fill slopes will be designed, constructed, and protected in a manner than minimizes erosion.

  Protect Drain Inlets: There are no known storm drain inlets located in the vicinity of the project. If any are found, the contractor will protect all drain inlets to prevent unfiltered or untreated water from entering the drainage conveyance system. Storm drain inlet protection will be implemented for all drainage inlets on and near the project site that could potentially be impacted by sediment-laden runoff.

  Control Pollutants: All pollutants, including waste materials and demolition debris, that are generated on site will be handled and disposed of in a manner that does not cause

contamination of stormwater. Good work site management and preventative measures will be maintained to ensure that the site will be kept clean, well-organized, and free of debris. If required, BMPs to control specific sources of pollutants will be implemented as discussed below.

The contractor will maintain a fully stocked spill kit on site at all times.

Vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills. Stationary equipment (e.g., generators, light stands) containing any amount of fuels shall be equipped with secondary containment. On-site fueling tanks and petroleum product storage containers will include secondary containment. Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.

In order to perform emergency repairs on site, temporary plastic sheeting will be placed beneath and, if raining, over the vehicle.

Contaminated surfaces shall be cleaned immediately following any discharge or spill incident. Other BMPs shall be administered, as necessary, to address any additional pollutant sources on site.

Control Dewatering: There is no dewatering required for the project other than ensuring the dredge sediment is mostly drained before transferring to the upland disposal site located within the interior of Decatur Island (TPN 152124001000). Saturated dredge sediment will be temporarily stockpiled immediately adjacent to the upper beach to allow draining before hauling to the disposal site. If there is any ponded water present at the time of construction, the water shall be pumped to vegetated areas.

Maintain BMPs: All temporary and permanent erosion and sediment control BMPs will be maintained and repaired as needed to assure continued performance of their intended function. Visual monitoring of the BMPs will be conducted at least once every calendar week and within 24 hours of any stormwater or nonstormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency will be reduced to once every month.

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections shall be conducted

- Move and stockpile logs within dredge area.
- Remove and stockpile salt marsh vegetation within dredge area.
- Haul and place dredge sediments on an upland disposal site.
- Replace onsite logs.
- Transplant salt marsh vegetation within dredge area.
- Demobilize construction equipment and final cleanup.

6f. What are the anticipated start and end dates for project construction? (Month/Year)

- If the project will be constructed in phases or stages, use JARPA Attachment D to list the start and end dates of each phase or stage.

Start Date: September 1, 2019 End Date: March 1, 2020 ☐ See JARPA Attachment D

6g. Fair market value of the project, including materials, labor, machine rentals, etc.

6h. Will any portion of the project receive federal funding? • **If yes**, list each agency providing funds.
☐ Yes ☒ No ☐ Don't know

Part 7–Wetlands: Impacts and Mitigation

☒ Check here if there are wetlands or wetland buffers on or adjacent to the project area.
(If there are none, skip to Part 8.)

7a. Describe how the project has been designed to avoid and minimize adverse impacts to wetlands
☐ Not applicable
The dredging activity will occur on the opposite side of the navigation channel from the wetland.
7b. Will the project impact wetlands?
☐ Yes ☒ No ☐ Don't know
7c. Will the project impact wetland buffers?
☐ Yes ☒ No ☐ Don't know
7d. Has a wetland delineation report been prepared? • **If Yes**, submit the report, including data sheets, with the JARPA package.
☐ Yes ☒ No
7e. Have the wetlands been rated using the Western Washington or Eastern Washington Wetland Rating System? • **If Yes**, submit the wetland rating forms and figures with the JARPA package.
☐ Yes ☐ No ☒ Don't know
7f. Have you prepared a mitigation plan to compensate for any adverse impacts to wetlands • **If Yes**, submit the plan with the JARPA package and answer 7g. • **If No, or Not applicable**, explain below why a mitigation plan should not be required.
☐ Yes ☒ No ☐ Don't know
The dredge area lies below the elevation of the wetland within marine waters associated with Davis Bay.
7g. Summarize what the mitigation plan is meant to accomplish, and describe how a watershed approach was

used to design the plan.

NA – no mitigation is proposed.

7h. Use the table below to list the type and rating of each wetland impacted, the extent and duration of the impact, and the type and amount of mitigation proposed. Or if you are submitting a mitigation plan with a similar table, you can state (below) where we can find this information in the plan.

Activity (fill, drain, excavate, flood, etc.)	Wetland Name[1]	Wetland type and rating category[2]	Impact area (sq. ft. or Acres)	Duration of impact[3]	Proposed mitigation type[4]	Wetland mitigation area (sq. ft. or acres)

[1] If no official name for the wetland exists, create a unique name (such as "Wetland 1"). The name should be consistent with other project documents, such as a wetland delineation report.
[2] Ecology wetland category based on current Western Washington or Eastern Washington Wetland Rating System. Provide the wetland rating forms with the JARPA package.
[3] Indicate the days, months or years the wetland will be measurably impacted by the activity. Enter "permanent" if applicable.
[4] Creation (C), Re-establishment/Rehabilitation (R), Enhancement (E), Preservation (P), Mitigation Bank/In-lieu fee (B)

Page number(s) for similar information in the mitigation plan, if available: _____

7i. For all filling activities identified in 7h, describe the source and nature of the fill material, the amount in cubic yards that will be used, and how and where it will be placed into the wetland.

There will be no fill placed in the wetland or wetland buffer.

7j. For all excavating activities identified in 7h, describe the excavation method, type and amount of material in cubic yards you will remove, and where the material will be disposed.

There will be no excavation (dredge activity) in the wetland or wetland buffer.

Part 8–Waterbodies (other than wetlands): Impacts and Mitigation

In Part 8, "waterbodies" refers to non-wetland waterbodies. (See Part 7 for information related to wetlands.)

☒ Check here if there are waterbodies on or adjacent to the project area. (If there are none, skip to Part 9.)

8a. Describe how the project is designed to avoid and minimize adverse impacts to the aquatic environment.
☐ Not applicable
See response to 6.e above.
8b. Will your project impact a waterbody or the area around a waterbody?
☒ Yes ☐ No

8c. Have you prepared a mitigation plan to compensate for the project's adverse impacts to non-wetland waterbodies?

- **If Yes**, submit the plan with the JARPA package and answer 8d.
- **If No, or Not applicable,** explain below why a mitigation plan should not be required.

☒ Yes ☐ No ☐ Don't know

8d. Summarize what the mitigation plan is meant to accomplish. Describe how a watershed approach was used to design the plan.

- If you already completed 7g you do not need to restate your answer here.

The dredge area is dynamic, wave action continuously moves the sand and gravel and organisms must be robust to withstand the grinding action. Ten individual snails, one juvenile purple mahogany-clam, seven acorn barnacles, and three worms were observed in three sediment samples. These species are ubiquitous throughout the Salish Sea and dredging 250 cubic yards of sediment will have minimal impact to the populations of these species in the project area.

Organisms associated with the saltmarsh vegetation will be temporarily disturbed when the saltmarsh vegetation is removed and stock piled. The stockpiled saltmarsh vegetation will be kept wet with seawater until it is returned to the dredge site and replanted at the appropriate elevations after the dredge activity is complete. Pre-project conditions will be reestablished within one or two growing seasons.

The proposed dredging activity will result in no net-loss of ecological functions. (Please see the attached biological assessment prepared by Fairbanks Environmental Services dated August 2, 2018.)

8e. Summarize impact(s) to each waterbody in the table below.

Activity (clear, dredge, fill, pile drive, etc.)	Waterbody name[1]	Impact location[2]	Duration of impact[3]	Amount of material (cubic yards) to be placed in or removed from waterbody	Area (sq. ft. or linear ft.) of waterbody directly affected
Dredge	Davis Bay	In	Permanent	250 cubic yards	8,309 sq. ft.

[1] If no official name for the waterbody exists, create a unique name (such as "Stream 1") The name should be consistent with other documents provided.
[2] Indicate whether the impact will occur in or adjacent to the waterbody. If adjacent, provide the distance between the impact and the waterbody and indicate whether the impact will occur within the 100-year flood plain.
[3] Indicate the days, months or years the waterbody will be measurably impacted by the work. Enter "permanent" if applicable.

8f. For all activities identified in 8e, describe the source and nature of the fill material, amount (in cubic yards) you will use, and how and where it will be placed into the waterbody. [

No fill is proposed to be placed in or near Davis Bay. The dredged sediments will be transported to an upland disposal site gravel pit) within the interior of Decatur Island for reuse as fill.

8g. For all excavating or dredging activities identified in 8e, describe the method for excavating or dredging, type and amount of material you will remove, and where the material will be disposed.

A backhoe operating from the beach will be used to dredge approximately 250 cubic yards of sediment from the navigation channel. The sediments will then be transported via dump truck on existing roads to the upland disposal site (TPN 152124001000).

Part 9–Additional Information

Any additional information you can provide helps the reviewer(s) understand your project. Complete as much of this section as you can. It is ok if you cannot answer a question.

9a. If you have already worked with any government agencies on this project, list them below.

Agency Name	Contact Name	Phone	Most Recent Date of Contact
San Juan County	Linda Kuller	(360) 370-7572	February 2018

9b. Are any of the wetlands or waterbodies identified in Part 7 or Part 8 of this JARPA on the Washington Department of Ecology's 303(d) List

- **If Yes,** list the parameter(s) below.
- If you don't know, use Washington Department of Ecology's Water Quality Assessment tools at: https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d.

☐ Yes ☒ No

9c. What U.S. Geological Survey Hydrological Unit Code (HUC) is the project in?

- Go to http://cfpub.epa.gov/surf/locate/index.cfm to help identify the HUC.

17110004

9d. What Water Resource Inventory Area Number (WRIA #) is the project in?

- Go to https://ecology.wa.gov/Water-Shorelines/Water-supply/Water-availability/Watershed-look-up to find the WRIA #.

WRIA #2

9e. Will the in-water construction work comply with the State of Washington water quality standards for turbidity?

- Go to https://ecology.wa.gov/Water-Shorelines/Water-quality/Freshwater/Surface-water-quality-standards/Criteria for the standards.

☒ Yes ☐ No ☐ Not applicable

9f. If the project is within the jurisdiction of the Shoreline Management Act, what is the local shoreline environment designation?

- If you don't know, contact the local planning department.
- For more information, go to: https://ecology.wa.gov/Water-Shorelines/Shoreline-coastal-management/Shoreline-coastal-planning/Shoreline-laws-rules-and-cases.

☐ Urban ☐ Natural ☒ Aquatic ☒ Conservancy ☐ Other: _____

9g. What is the Washington Department of Natural Resources Water Type?

- Go to http://www.dnr.wa.gov/forest-practices-water-typing for the Forest Practices Water Typing System.

☒ Shoreline ☐ Fish ☐ Non-Fish Perennial ☐ Non-Fish Seasonal

9h. Will this project be designed to meet the Washington Department of Ecology's most current stormwater manual?

- **If No**, provide the name of the manual your project is designed to meet.

☒ Yes ☐ No

Name of manual: Stormwater Management Manual for Western Washington.

9i. Does the project site have known contaminated sediment?

- **If Yes**, please describe below.

☐ Yes ☒ No

See the chemical analysis conducted for the dredge spoils on Page 4 of the Coastal Geological Services Memorandum titled "*Decatur Head Maintenance Dredge Project Description and Impact Avoidance*" dated August 2, 2018.

9j. If you know what the property was used for in the past, describe below.

The navigation channel and lagoon has always been used by the residents and visitors of Decatur Island for access, moorage and recreational activities.

9k. Has a cultural resource (archaeological) survey been performed on the project area?

- **If Yes**, attach it to your JARPA package.

☐ Yes ☒ No

9l. Name each species listed under the federal Endangered Species Act that occurs in the vicinity of the project area or might be affected by the proposed work.

Juvenile Chinook salmon, juvenile Chum salmon, juvenile Pink salmon, juvenile Pacific herring, juvenile surf smelt, and juvenile Pacific sand lance

9m. Name each species or habitat on the Washington Department of Fish and Wildlife's Priority Habitats and Species List that might be affected by the proposed work.

Townsend's Big Eared Bat, Pandalid Shrimp, Freshwater/Forested/Shrub Wetland, Estuarine and Marine Wetland, and Pinto abalone may be found in the area surrounding the project site.

Part 10–SEPA Compliance and Permits

Use the resources and checklist below to identify the permits you are applying for.

- Online Project Questionnaire at http://apps.oria.wa.gov/opas/.
- Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.
- For a list of addresses to send your JARPA to, click on agency addresses for completed JARPA.

10a. Compliance with the State Environmental Policy Act (SEPA). (Check all that apply.)

- For more information about SEPA, go to https://ecology.wa.gov/regulations-permits/SEPA-environmental-review.

☐ A copy of the SEPA determination or letter of exemption is included with this application.

☒ A SEPA determination is pending with San Juan County (lead agency). The expected decision date is November 2018.

☐ I am applying for a Fish Habitat Enhancement Exemption. (Check the box below in 10b.)

☐ This project is exempt (choose type of exemption below).

☐ Categorical Exemption. Under what section of the SEPA administrative code (WAC) is it exempt? _____

☐ Other: _____

☐ SEPA is pre-empted by federal law.

10b. Indicate the permits you are applying for. (Check all that apply.)

LOCAL GOVERNMENT

Local Government Shoreline permits:

☐ Substantial Development ☐ Conditional Use ☐ Variance

☒ Shoreline Exemption Type (explain): Maintenance and Repair

Other City/County permits:

☐ Floodplain Development Permit ☐ Critical Areas Ordinance

STATE GOVERNMENT

Washington Department of Fish and Wildlife:

☒ Hydraulic Project Approval (HPA) ☐ Fish Habitat Enhancement Exemption – Attach Exemption Form

Washington Department of Natural Resources:

☐ Aquatic Use Authorization

Complete JARPA Attachment E and submit a check for $25 payable to the Washington Department of Natural Resources. **Do not send cash.**

Washington Department of Ecology:

☒ Section 401 Water Quality Certification

FEDERAL GOVERNMENT

United States Department of the Army permits (U.S. Army Corps of Engineers):

☐ Section 404 (discharges into waters of the U.S.) ☒ Section 10 (work in navigable waters)

United States Coast Guard permits:

☐ General Bridge Act Permit ☐ Private Aids to Navigation (for non-bridge projects)

Part 11–Authorizing Signatures

Signatures are required before submitting the JARPA package. The JARPA package includes the JARPA form, project plans, photos, etc.]

11a. Applicant Signature (required)

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work only after I have received all necessary permits.

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. _____ (initial)

By initialing here, I state that I have the authority to grant access to the property. I also give my consent to the permitting agencies entering the property where the project is located to inspect the project site or any work related to the project. _____ (initial)

Tim Coulter, Treasurer Decatur Head Beach Association Applicant Printed Name	Applicant Signature	Date

11b. Authorized Agent Signature

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work only after all necessary permits have been issued.

Francine Shaw Authorized Agent Printed Name	Authorized Agent Signature	Date

11c. Property Owner Signature (if not applicant)

Not required if project is on existing rights-of-way or easements (provide copy of easement with JARPA).

I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.

Tim Coulter, Treasurer Decatur Head Beach Association Property Owner Printed Name	Property Owner Signature	Date

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years or both.

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341.
ORIA publication number: ORIA-16-011 rev. 07/2017

Part 11–Authorizing Signatures

Signatures are required before submitting the JARPA package. The JARPA package includes the JARPA form, project plans, photos, etc.]

11a. Applicant Signature (required)

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work only after I have received all necessary permits.

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. _____ (initial)

By initialing here, I state that I have the authority to grant access to the property. I also give my consent to the permitting agencies entering the property where the project is located to inspect the project site or any work related to the project. _____ (initial)

Tim Coulter, Treasurer Decatur Head Beach Association Applicant Printed Name	Applicant Signature	9/19/18 Date

11b. Authorized Agent Signature

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work only after all necessary permits have been issued.

Francine Shaw Authorized Agent Printed Name	Francine Shaw Authorized Agent Signature	9-21-18 Date

11c. Property Owner Signature (if not applicant)

Not required if project is on existing rights-of-way or easements (provide copy of easement with JARPA).

I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.

Tim Coulter, Treasurer Decatur Head Beach Association Property Owner Printed Name	Property Owner Signature	9/19/18 Date

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years or both.

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341
ORIA publication number: ORIA-16-011 rev. 07/2017

Attachment 2

COASTAL GEOLOGIC SERVICES

memorandum

Date: August 21, 2018

To: Tim Coulter, Decatur Head Beach Association

From: Jim Johannessen, LEG, MS and Adam Tullis, Coastal Geologic Services, Inc.

Re: **Decatur Head Maintenance Dredge Project Description and Impact Avoidance**

Introduction and Purpose

The purpose of this memo is to present a design for a maintenance excavation/dredge project on the eastern extent of Decatur Island in San Juan County, WA at Decatur Head Beach and lagoon entrance near Decatur Head Drive. The lagoon is a low-energy area exhibiting no appreciable net-shore drift, and the lagoon's entrance is situated between two converging net shore-drift cells. The shore regions extending approximately 1,200 FT to either side of the lagoon entrance were mapped as *accretion shoreforms* – areas of current or historical marine sediment deposition (MacLennan et al. 2010).

The findings herein were based on selected measurements, topographic mapping, and observations collected at a field visit conducted by Adam Tullis of Coastal Geologic Services (CGS) and Chris Fairbanks of Fairbanks Environmental Services on July 24, 2017, and by Jim Johannessen of CGS on several occasions in recent decades, along with additional research of geology and coastal processes in the vicinity. Past work by CGS includes completing an assessment of a similar dredge proposal in 2002.

New topographic mapping conducted by CGS and Fairbanks was used to update the Star survey data from July 2015. New mapping extents include the dredge excavation area between the spit terminus and beach along Decatur Head Beach Dr. N on Davis Bay, and the southeast beach that faces Rosario Strait. Additionally, the July 2017 topographic mapping included mapping current log and vegetation extents.

Dredge designs and reports from the previous 2002 permitted channel dredge were reviewed and used as a basis for the preparation of the current proposed project, with the current proposal a maintenance dredging (technically simply intertidal excavation from the uplands and not marine based dredging) that will remove the same volume of material as was done in 2002.

Project Purpose

The primary purposes of this project are to enable mid tide navigation from Davis Bay into the lagoon between Davis Bay and Rosario Strait on the eastern shore of Decatur Island by conducting land-based excavation (sometimes referred to as dredging by agencies). The actions described in the design section will provide:

- Enhanced mid tide and high tide navigation for low draft vessels
- Enhanced lagoon flushing

Design Project Description

Alternatives Evaluated

At its narrowest, the existing inlet at the 3 FT mean lower low water (MLLW) elevation contour has a width of approximately 7 FT near the southwest terminus of the spit and does not have connectivity between the lagoon and Davis Bay at 3 FT MLLW. The design proposes a channel bottom width of 17 FT at elevation 3 FT MLLW to allow for enhanced navigation with allowable overdredge of 1 FT within the channel and 0.5 FT along the tie in slope.

A narrower and an also wider dredge area were considered for the shallower portion of the lagoon inlet, but were ultimately dropped in favor of the proposed design. The narrower width of 10 FT at the channel bottom was determined to be inadequate for safe navigation of the inlet, as it left no margin for error in navigating, where a small current is sometimes present. The wider depth of 20 FT at the inlet bottom was also evaluated and determined to be more than is necessary for small boat navigation, but at greater impact and cost. This width would have been a good option, bulkhead the volume that needed to be excavated would exceed the permit threshold, so was therefore dropped from consideration.

Project Description

This design proposes to dredge approximately 250 cubic yards (CY) of sediment volume from south tip of the spit, resulting in a channel bottom width of 16 FT at 3 FT MLLW elevation with 6:1 (horizontal:vertical) side slopes (see Sheets 3-4). Approximately 6,498 square feet (SF) of dredge area is below MHHW and 1,811 SF is above mean higher high water (MHHW). The excavation/dredge design calls for approximately 150 CY of sediment volume removed below MHHW and 100 CY above MHHW.

All dredge sediment shall be disposed of on the uplands of the island. This parcel is owned by local resident George Lamb, and is parcel number 152124001000. Spoils would be hauled by singe dump truck directly to the disposal site using existing island roads. Francine Shaw of Planning and Permit Services LLC spoke with San Juan County in May, 2018 and the County stated that the planned disposal site (initially termed disposal site #2) is clearly a developed area in a small, old gravel pit (see Photo page 2). The County stated that this site is exempt from wetland regulations due to the past disturbance and development. The dredge spoils would be placed in the south-southwest portion of this parcel against the existing steep cut bank that faces southwest (see Sheet 5). Spoils would be placed with a finished grade no steep than 3:1 (horizontal:vertical) to maintain a generally stable configuration.

The design includes approximately 2,000 SF of salt marsh vegetation removal and salvage from the south end of the spit. Salt marsh vegetation, primarily pickleweed (*Salicornia virginica*), currently within the dredge area shall be removed and stockpiled in such a way to ensure successful transplant. Stockpiled salt marsh vegetation shall be kept moist with seawater until replanted. The salvaged salt marsh vegetation shall be placed atop the newly exposed and lowered spit tip at the appropriate elevations; between +6.5 FT MLLW and +9 FT MLLW.

Impact Avoidance and Mitigation

Per San Juan County Code Section 18.50.440.A(1) Regulations for dredging and dredge material disposal, dredging and dredge material disposal must be done in a manner that avoids or minimizes adverse ecological impacts. Unavoidable impacts must be mitigated in conformance with SJCC 18.50.140, 18.50.150 and 18.50.160. Aspects of this code will be addressed below:

Minimizing ecological impacts - Overall, impacts to the ecological function of the lagoon and inlet area was accomplished by minimizing the disturbance area of the dredge activities. The dredge area is quite small (approximately 8,300 SF or 0.2 acres), and was kept no larger than required. The dredge has only been proposed when needed, and not in advance of shoaling. To mitigate the impact to the shoreline vegetation, salt marsh vegetation (primarily pickleweed; *Salicornia virginica*) currently within the dredge area, shall be removed and stockpiled in such a way to ensure successful transplant. Stockpiled salt marsh vegetation shall be kept moist with seawater until replanted. Fairbanks Environmental has outlined other methods in which the ecological impacts were minimized.

iii Frequency and volume of anticipated maintenance excavation - The frequency and volume of anticipated maintenance excavation/dredging in the future is based on the history in the past few decades. The site was last dredged in 2005 with a volume of 250 CY. The design was developed in 2017 for this same volume, therefore it is estimated that the site requires approximately 250 CY of dredging every 12 years, equivalent to 21 CY/ YR. It is similarly concluded that the site will required approximately 250 CY of dredging again in 2024.

iv. Method of dredging, including facilities for settlement and movement of materials – Dredging will occur form land by heavy equipment, anticipated to be with an excavator working for the existing road edge. The excavator will load directly into a dump truck which will leave the shoreline area on existing roads and driven to the old gravel pit that shall be used as a disposal area, since beneficial reuse of this beach quality sediment is apparently prohibited by current San Juan County code.

v. Project timeline – The project will start as soon as permits are acquired and a fish window is open. The excavation/dredge will likely take on the order of 3—5 days to complete, depending on tidal windows.

vi. A plan for disposal of maintenance spoils for the life of the project or a period of 25 years, whichever is shorter – The plan for the next 25 years is to repeat the current maintenance excavation/dredge approach using the same methods and the sane disposal area.

Coastal Process

Coastal Geomorphology (Coastal Geologic Services, 2000) – Decatur Head is an isolated outcrop of bedrock that reaches elevation 129 ft (NGVD). The Decatur Head uplands landward the level of the beach cabins is sloped at 25-35 degrees. There is very little soil atop bedrock on this slope. The Head is attached to the main part of Decatur Island by an approximately 1,600-ft long barrier beach on the Rosario Strait side of the area. The barrier beach originally formed as a spit through littoral sediment transport. The landform is technically now a "tombolo", since the spit has joined Decatur Head to Decatur Island. The tombolo likely began forming 4,000 to 5,000 years ago when global sea level stopped rising significantly to become relatively stable near the present sea level. The tombolo has likely extended to Decatur Head for more than five hundred, and possibly several thousand, years.

The process that delivered sediment for the formation of the tombolo is littoral drift, and the long-term effect (that creates landforms) of this is termed net shore-drift. Net shore-drift in this area transports bluff derived sediment from the White Cliff area on ESE Decatur Island to Decatur Head (drift cell DE-2, Figures 2 and 3). Sediment transport in this area is driven by prevailing (most frequent) and predominant (highest velocity) southerly quadrant winds. Net shore-drift was mapped in "Net Shore-drift of San Juan County and Parts of Jefferson, Island, and Snohomish counties, Washington"

(Johannessen, 1992). That project was completed 1991-92 for the WA Department of Ecology and involved mapping drift cells in all of San Juan County. Mapping involved extensive countywide fieldwork surveying coastal geomorphic trends. The project was undertaken to correct the numerous errors in the Coastal Drift section of the Coastal Zone Atlas of Washington (WDOE, 1979), which is no longer considered valid.

After the tombolo was formed, net shore-drift could build up a beach platform around the perimeter of Decatur Head. The soils in the entire cabin area are comprised of beach gravel and sand, along with minor organic material. The results of the laboratory analysis of the sediment sampled at the project site are consistent with this soil makeup and are discussed in detail later in this report. This extension of the sediment transport corridor allowed for the formation of the spit south and SW of the Beach Association cabins. This spit also comprises the west boundary of the lagoon (Figure 1). Winds from the north quadrant occur as infrequent high velocity winter northeaster windstorms and more common summer fair weather winds. Once net shore-drift sediment reached the north side of Decatur Head, north and NE winds create southerly and southwesterly net shore-drift along the cabin area and down the length of the spit to the lagoon channel.

The bay west of Decatur Head is officially unnamed, but is referred to by some as Decatur Bay, which will be used here. The beach on the south side of Decatur Bay is the terminus of a different net shore-drift cell (cell DE-1). This cell originates SW of Fauntleroy Point in western Decatur Bay and extends for approximately 1.2 miles to the broad depositional beach the fronts the houses and wetland located SW of the lagoon channel (Johannessen, 1992; Figure 3). This cell has a relatively low volume of sediment transport, with deposition spread over the near-linear beach in southern Decatur Bay. Net shore-drift in this cell is driven by north and NE winds. This barrier beach, along with the tombolo east of the lagoon, formed the large freshwater wetland (with cattails) located south of the lagoon channel.**Net Shore-drift Cell Description** – The following is an excerpt from the above-mentioned Department of Ecology report (Johannessen, 1992) that defined the drift cell that includes the spit at the proposed project site. This brief description is included here to provide published background material for the above discussion of coastal processes. The maps from the net shore-drift report are included as Figures 2 and 3.

> **Net Shore-drift Cell DE-2 (Blakely Island and Lopez Pass quadrangles)**
>
> At 2.5 km in length, this is the longest drift cell along Decatur Island. Cell DE-2 originates at a zone of drift divergence along White Cliff, a 30- to 40-m-high, eroding bluff comprised of glacial till (Lopez Pass quadrangle). Several bluff failures have occurred recently along this shore, providing additional sediment to the shore drift system. Net shore-drift is to the northeast extending around Decatur Head and depositing sediment in a spit prograding southwestward on the west side of Decatur Head (Blakely Island quadrangle). A narrow beach fronts White Cliff, consisting of pebbles, cobbles and boulders. Lag deposits consisting of boulders up to 2 m in diameter are present in the nearshore area here. Sediment size decreases and beach width increases to the northeast to the tombolo that has prograded to Decatur Head, indicating northeastward net shore-drift.
>
> As net shore-drift continues to the north around rocky Decatur Head, the beach becomes temporarily narrower. This is because of increased wave attack and tidal current velocity here, as well as a lack of additional sediment input. As net shore-drift material transits counter-clockwise around Decatur Head, it accumulates along the beach on the northwest and west side of Decatur Head, and in the spit that extends to the southwest from Decatur Head. This prograding spit constitutes the terminus of the drift cell.

iii. Analysis of the stability of bedlands adjacent to the proposed dredging site – The bedlands in the inlet are dynamically stable, but have shown a narrowing of the lagoon inlet with a gradual shifting of contours on the south end of the spit to the south. This shoaling from the north that has caused the channel to gradually narrow and shoal, and subsequently has caused the need to excavate ("dredge") sediment. The bedlands farther from the inlet have appeared to be very stable over the decades with record.

iv. Tidal fluctuation, currents speed and direction (Coastal Geologic Services, 2000) – The area is subjected to semi-diurnal tides, with two uneven high tides and low tides on most days. Flood tide is when the tide is rising, which produced tidal currents running northward in Rosario Strait, and generally westward in Davis Bay but at very low velocities. Ebb (falling) tides run in the opposite direction.

The inner potion of Decatur Bay is fairly shallow, with the majority of the bay less than 60 FT deep, relative to MLLW (10 fathoms; see NOS chart excerpt, Figure 4). The area NNW of Decatur Head is generally less than 18 ft deep. This area has been observed to have very minimal tidal currents. In contrast, the small pass between Decatur Head and James Island has considerable tidal current velocity, often exceeding 2 or 3 knots. This is due to the fact that Decatur Head and James Island forms a constriction in Rosario Strait. It must be understood that tidal currents do not drive net shore-drift (or littoral drift), instead net shore-drift is controlled by wind waves as stated above.

The inlet to eth lagoon has more rapid tidal currents during the mid-tidal cycles when the water is shallow in the channel. Flood tided run east in the inlet and ebb tides run west, with velocities often between 1 and 3 knots, with an estimated peak of approximately 4 knots.

Shoreline Change (Coastal Geologic Services, 2000) – Historical maps and aerial photos were obtained and examine to characterize the dynamics of the spit and the lagoon channel. The oldest information found was an 1889 T-sheet map (Figure 5) prepared by the National Ocean Service (NOS). High-quality vertical aerial photos (1:12,000 scale) were purchased from the WA DNR. Scaled measurements of shoreline change were made directly from aerial photos. Photos were individually scaled using distances between cabin locations measured from the project base map. Additional scaling and checking was performed using distances between road corners on a 1:25,000 scale NOS chart (no. 18430, Rosario Strait, Northern Part). Scale measurements were made on the portion of the photos that was used for data collection to accurately correct for scale variations and lens and other distortions. Only the photos that were best centered on the lagoon were used to minimize radial lens distortion and parallax. Measurements of control points and beach features were made directly on original prints using a caliper with one-thousandth of an inch precision. The scale of the photos and the absence of surveyed control points limit the accuracy of measurements (discussed below) but this is the best record of historical shoreline position available.

Historical shoreline change at the tip of the spit and at 2 transects that could be accurately located on the aerial photos near the proposed disposal area was measured. Photos spanned the period 1969 to 1995 (200% enlargements of the 1969 and 1995 photos are attached as Figures 6 and 7). Aerial oblique photos taken by the WA Department of Ecology were also obtained and examined for qualitative information. These photos were taken in 1977 and 1995 and offer more detail. The 1995 photos are at a far better scale (see Figure 8). The beach feature that showed up best on the vertical photos was the

outer edge of vegetation. This was the feature used for shoreline position measurements. Transects were located on photos by using cabins as consistent fixed features.

The estimated worst-case margin of error associated with point measurements from all vertical photos, is within 20 feet of the actual shoreline position. The use of the less-detailed 1889 map has an estimated worst-case margin of error within 30-40 feet of the actual shoreline. However, the actual error of the results is expected to be far less than the worst-case scenario since measurements were made by the same person in a consistent fashion. In addition, error is introduced randomly; it does not cause the data to be biased (Stafford and Langfelder, 1971). This is equal to the best possible accuracy for historical shoreline mapping using remotely-sensed images (Morton, 1991; Stafford and Langfelder, 1971). Although error is unavoidable with use of aerial photos, trends identified "make sense" and were often verified by examination of the oblique photos or field evidence.

Changes in the location of the spit measured between 1889 and 1995 are summarized in Table 1. The spit appears to have actively prograding (extending) since 1889. The spit also seems to have become wider through accretion at the base of the spit. The irregular western shoreline mapped in 1889 (Figure 5) just south of the caretaker's cabin had filled in by 1969 (Figure 6). The spit is (correctly) mapped as "accreting beach" in the Coastal Zone Atlas of Washington (WDOE, 1979).

Since 1889, the beach east of the lagoon on Rosario Strait appeared to have accreted, indicating that there is still ample sediment supply in this net shore-drift cell. The Rosario Strait beach was mapped as "eroding beach" in the Coastal Zone Atlas (WDOE, 1979). This seems incorrect, as there is historic evidence of accretion there that was verified by field assessment.

Geomorphic evidence to verify the lengthening of the spit (Table 1) shows up in the photos in shape of upper beach bars and the presence or absence of vegetation. The area near the tip of the spit appears as if it had recently become stabilized in 1969. Several overwash fans show up on the 1969 (Figure 6) and later photos located along the spit, the largest of which is approximately 150 ft from the lagoon channel, showing the origin of the lagoon-side bulges in the spit. The area at the tip of the spit has gradually become more vegetated since 1969 as a "bulb" has accreted there through littoral drift wrapping around the tip of the upper intertidal beach (during higher tide periods; Figure 7).

Table 1. Approximate historic spit position and channel width measured from historical map and aerial photos. Recent channel width was from 1999 Starr and Associates survey.

Year	Length of Spit (ft)	Distance to Approx. MHW to SE; on Rosario Strait (ft)	Width Lagoon Channel to MHW (ft)
1889	610	165	~35
1969	630	295	~35
1995	655	285	~20

Changes at Lagoon Channel Entrance – The bulb that was forming on the end of the spit in 1969 must have gradually constrained the entrance channel to a similar width to what it presently has. The 1978 photo seems to show evidence of dredging of the channel in the few years prior to 1978. The recollection of the Beach Association members is that the channel was dredged several times with the spoils simply pushed out into Decatur Bay. The bulb appeared to have been removed, and upper beach

sediment was starting to form a new one in 1978. The accretion of a new bulb continued through 1987 and 1991. Field observations revealed that the tidal current flow in the lagoon channel has high velocities during ebb tide as the lagoon water rushes out at the same time as the tidal level in Decatur Bay is dropping the most rapidly (at mid-tide). Observed velocity was just high enough to cause sediment transport in the throat of the lagoon. This tidal current has caused the beach on the south side of the channel to be considerably steeper in 1999, and apparently since at least the mid-1980's.

Mr. Ed Kolling, who was the caretaker in 2000 and for any years stated that the Beach Association members gave the lagoon channel dredging history as "dredged every 5-6 years". The aerial photo record shows that between 1987 and 1991 the tip of the spit has lengthened to cause the tidal current flow to be pushed against the beach on the south side of the channel, causing some erosion. The channel appears as if it may have been dredged soon after 1991, but the changes in the tip of the spit were not great and the scale and quality of the photos make this uncertain. The aerial photo record and the known dredging history is far from complete, but it would seem that the changes in the channel caused by dredging were filled in again within 5-10 years.

Dredge Sediment Analysis

i. Physical analysis of material to be dredged (material composition and amount, grain size, organic materials present, source of material, etc.; and

ii. Chemical analysis of material to be dredged (volatile solids, chemical oxygen demand, grease and oil content, mercury, lead and zinc content, etc.)

Methods

Clean sediment sample jars were obtained from Edge Analytical, along with labels including basic information on the site and tests to be completed. Sample locations, date, time, and collector were recorded in field sheets and on sample jars. Sediment samples for physical analysis were collected on July 4, 2018. Samples were collected by Jim Johannessen, Licensed Engineering Geologic of Coastal Geologic Services Inc., between 3pm and 4:30pm just after low tide. The samples were collected with a clean plastic scoop and put directly in new glass sample jars provided by Edge Analytical. Four sample jars were filled from each location. Different sample jars were filled for different metals volatile organics, and grain-size.

All sampling occurred from within the proposed dredge area. Sample locations were determined by laser rangefinder measurements from established monuments and baselines along the road parallel to the inland, with backup GPS points collected.

Three samples were collected for physical analysis, each of them along one of the cross sections in the design sheets. Samples were collected from the surface down to a depth of 1.0 FT/30 cm at the following locations:

- Cross section 1+40 at +5.0 FT MLLW
- Cross section 1+2.0 at +4.0 FT MLLW
- Cross section 0+9.0 at +6.0 FT MLLW

Samples from Cross sections 1+40 and 0+9.0 were put on ice and transported to Edge Analytical for analysis within 24 hours of collection.

Results

The results of the chemical and physical analysis are detailed in the attached Appendix 1, Sediment Sample Lab Report prepared by Edge Analytical. The lab results show that there was 0% volatile solids in the samples. The results show that most heavy metals were "not detected" in the samples with the exception of Chromium, and Zinc which tested at levels which are well below the United States Army Corps of Engineers (USACE) Dredged Material Management Office (DMMO) "screening level" which is defined as is defined as the chemical concentration at or below which there is no reason to believe that dredged material disposal would result in unacceptable adverse effects. Additionally the samples contained low amounts of Barium which are well below the United States Environmental Protection Agency's Ecological Soil Screening Levels for Barium.
The samples results show that both the sample contained less than 0.2% of organic matter. The August 2018 Memo by Fairbanks Environmental contains a detailed discussion of the biological analysis of the samples. The samples results show that the samples had a chemical oxygen demand ranging from 465 mg/L 764 mg/L which appears typical for coarse grained sediment in a relatively clean environment.

The samples were also analyzed for grain size. The sample taken at cross section 1+40 was found to be 45.9% gravel, 53.8% sand, and 0.3% silt and clay. The sample taken at cross section 0+90 was found to be 50.2% gravel, 49.7% sand, and 0.1% silt and clay. These sediments were clearly beach quality and were originally intended for beneficial reuse as beach nourishment, until San Juan County informed us that was not consistent with the current SMP code.

iii. Biological analysis of material to be dredged - See August 2018 Memo by Fairbanks Environmental.

Limitations of This Report

This report was prepared for the specific conditions present at the subject property to meet the needs of specific individuals. No one other than the landowner and their agents should apply this report for any purposes other than that originally contemplated without first conferring with the professional that prepared this report. The findings and recommendations presented in this report were reached based on a brief field visit. The report does not reflect detailed examination of sub-surface conditions present at the site, or drainage system designs, which are not known to exist. The report is based on examination of surface features, bank exposures, soil characteristics, gross vegetation characteristics and beach processes. In addition, conditions may change at the site due to human influences, floods, groundwater regime changes, natural hazard or other factors. This report may not be all that is required to carry out recommended actions. More detailed design specifications may be needed for proper implementation of a habitat enhancement project.

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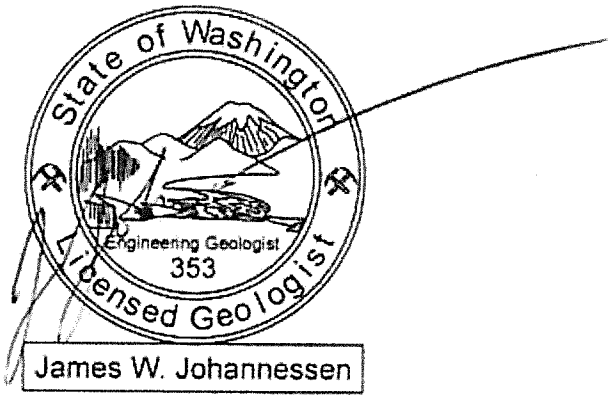
Coastal Geologic Services, Inc.



Jim Johannessen,
Licensed Engineering Geologist, MS

ATTACHMENTS:

Photo Page 1. Ground photos of the site
Figure 1. Site location map.
Figure 2. Net shore-drift of Lopez Pass quadrangle (Johannessen, 1992).
Figure 3. Net shore-drift of Blakely Island quadrangle (Johannessen, 1992).
Figure 4. Except of NOS chart no. 18430.
Figure 5. Portion of NOS T-sheet no. 1953 dated 1889.
Figure 6. 1969 WA DNR aerial photo, 200% enlargement (7/21/69).
Figure 7. 1995 WA DNR aerial photo, 200% enlargement (5/24/95).
Figure 8. 1995 WE DOE oblique aerial photo (8/24/95).
Appendix 1. Sediment Sample Lab Report
Project Plans

- **Sheet 1.** Cover Sheet- Vicinity Map - Notes - Index
- **Sheet 2.** Existing Conditions - Site Plan
- **Sheet 3.** Proposed Conditions - Site Plan
- **Sheet 4.** Proposed Conditions - Cross Sections
- **Sheet 5.** Dredge Disposal Site – Site Plan

Bid Sheet

Channel to be dredged, looking north.

Channel to be dredged, looking east.

Area of channel dredge. Looking southeast.

Beach logs, typical of logs within construction access.

Beach nourishment access, looking northeast.

Beach nourishment area along Rosario Strait, looking northeast.

Photo Page 1. Ground photographs of the project area taken July 25, 2017.

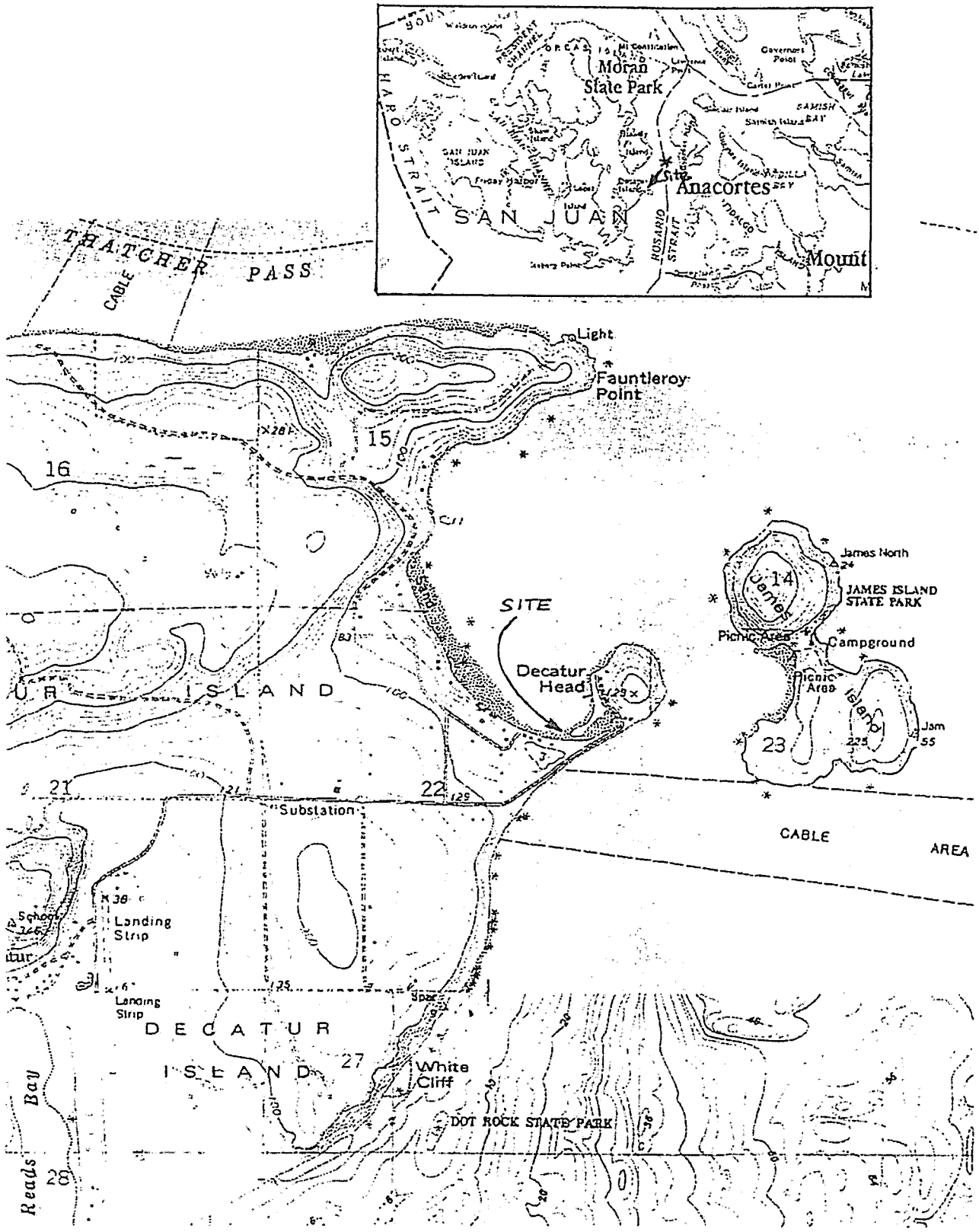


Figure 1. Site location map for Decatur Head area.

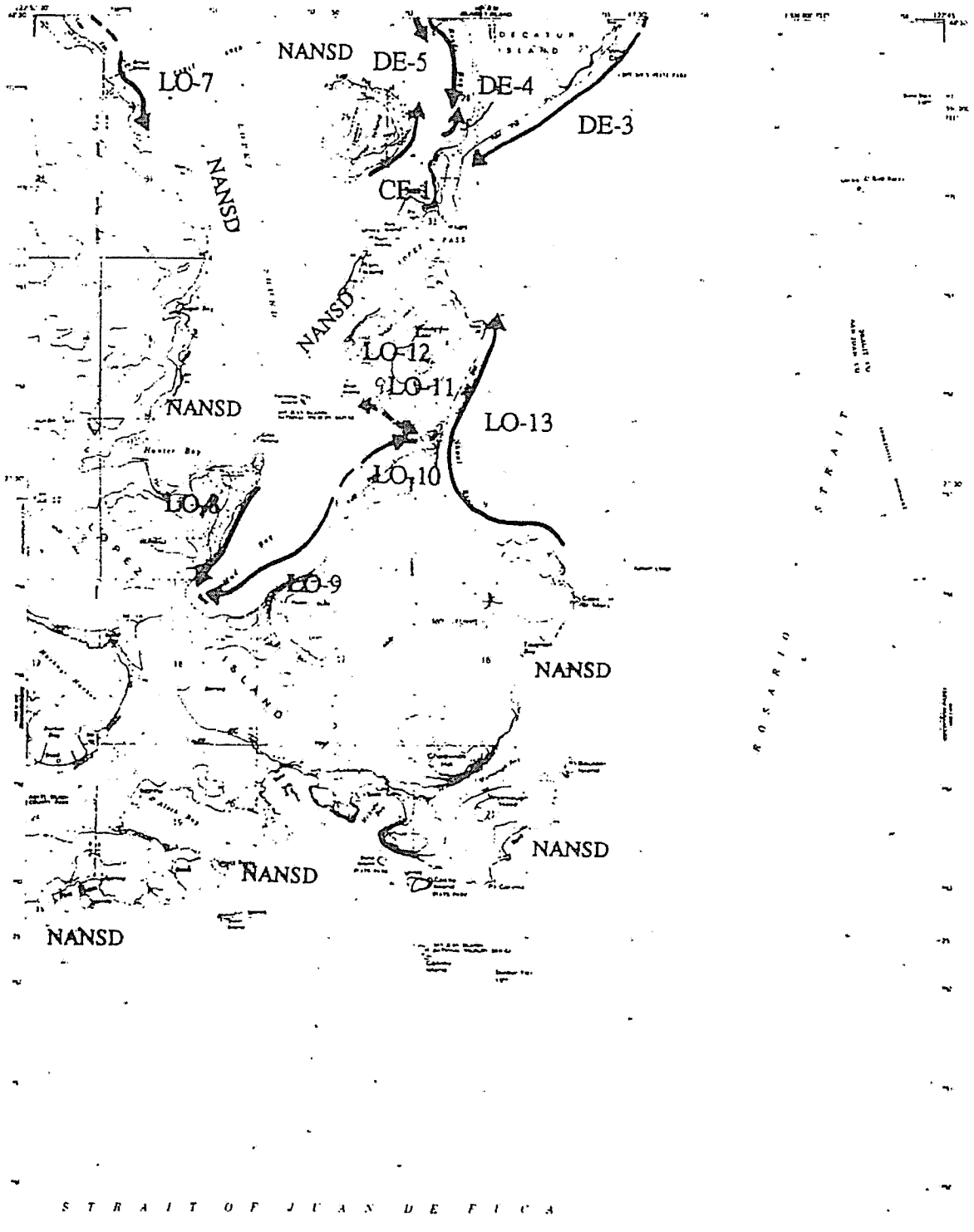


Figure 2. Net shore-drift of Lopez Pass quadrangle (Johannessen, 1992).

Figure 11. Lopez Pass quadrangle.

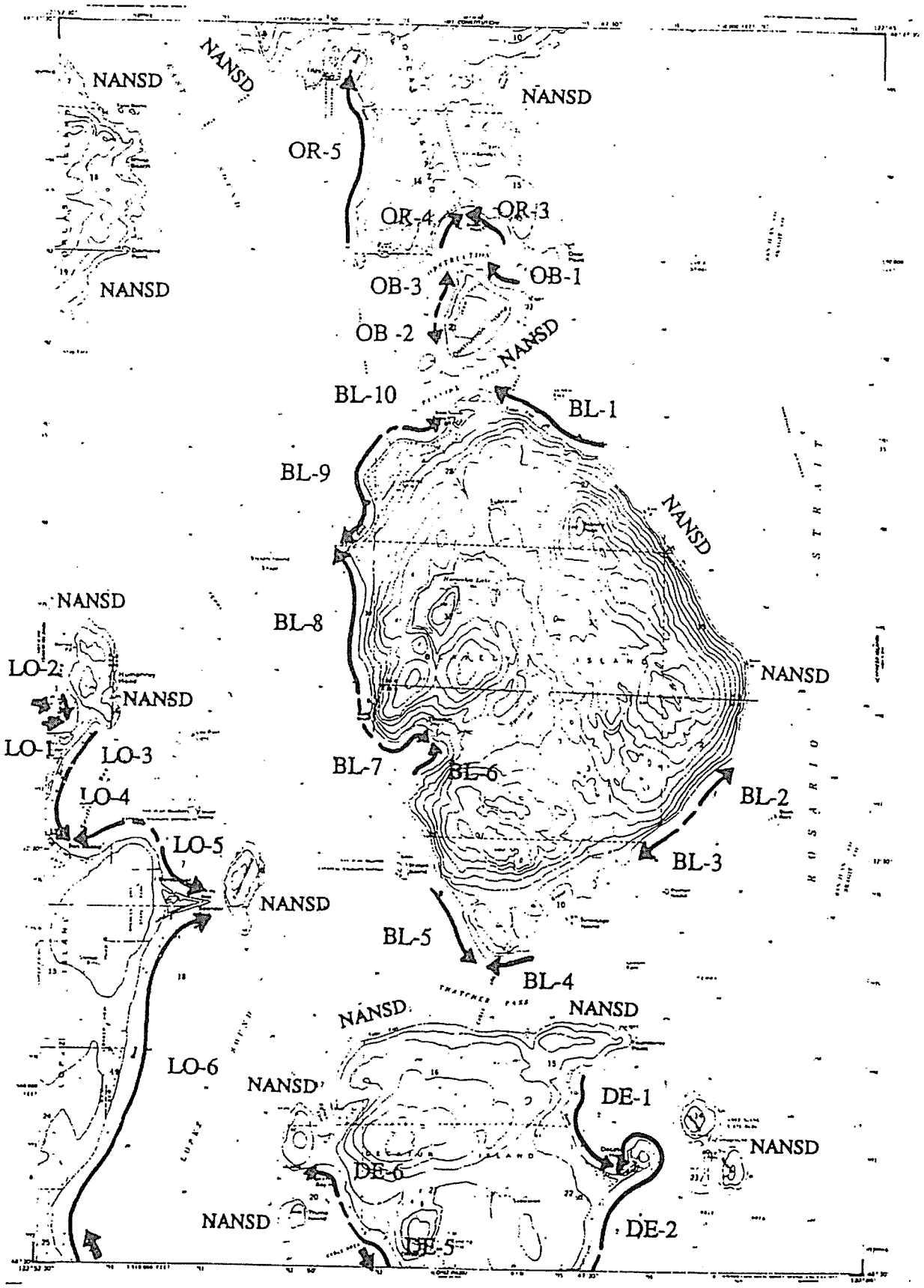


Figure 3. Net shore-drift of Blakely Island quadrangle (Johannessen, 1992).

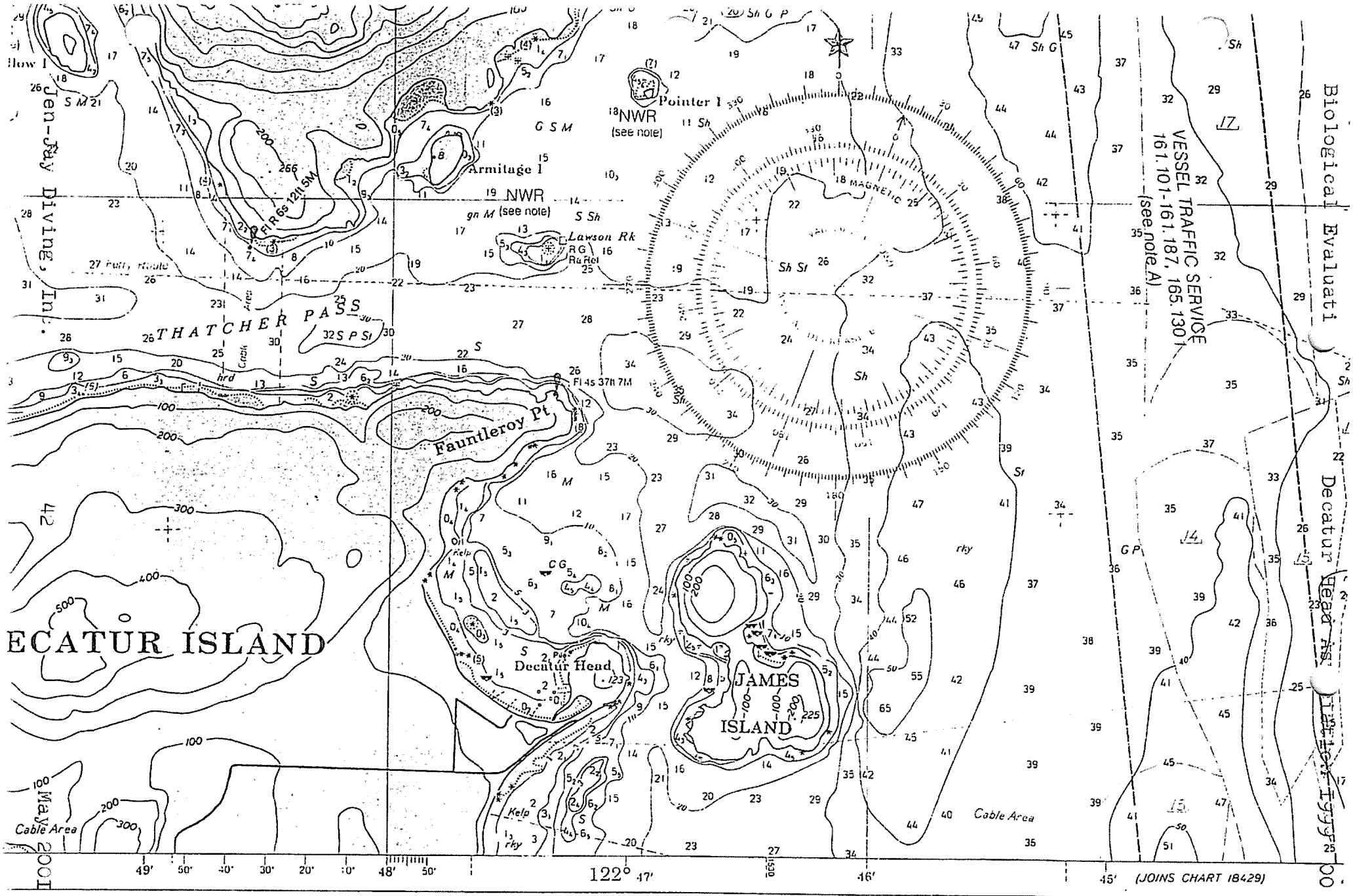


FIGURE 4.

Published at Washington, D.C.
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

FATHOMS	1	2	3	4	5	6	7	8	9	10
FEET	6	12	18	24	30	36	42	48	54	60	66

1889

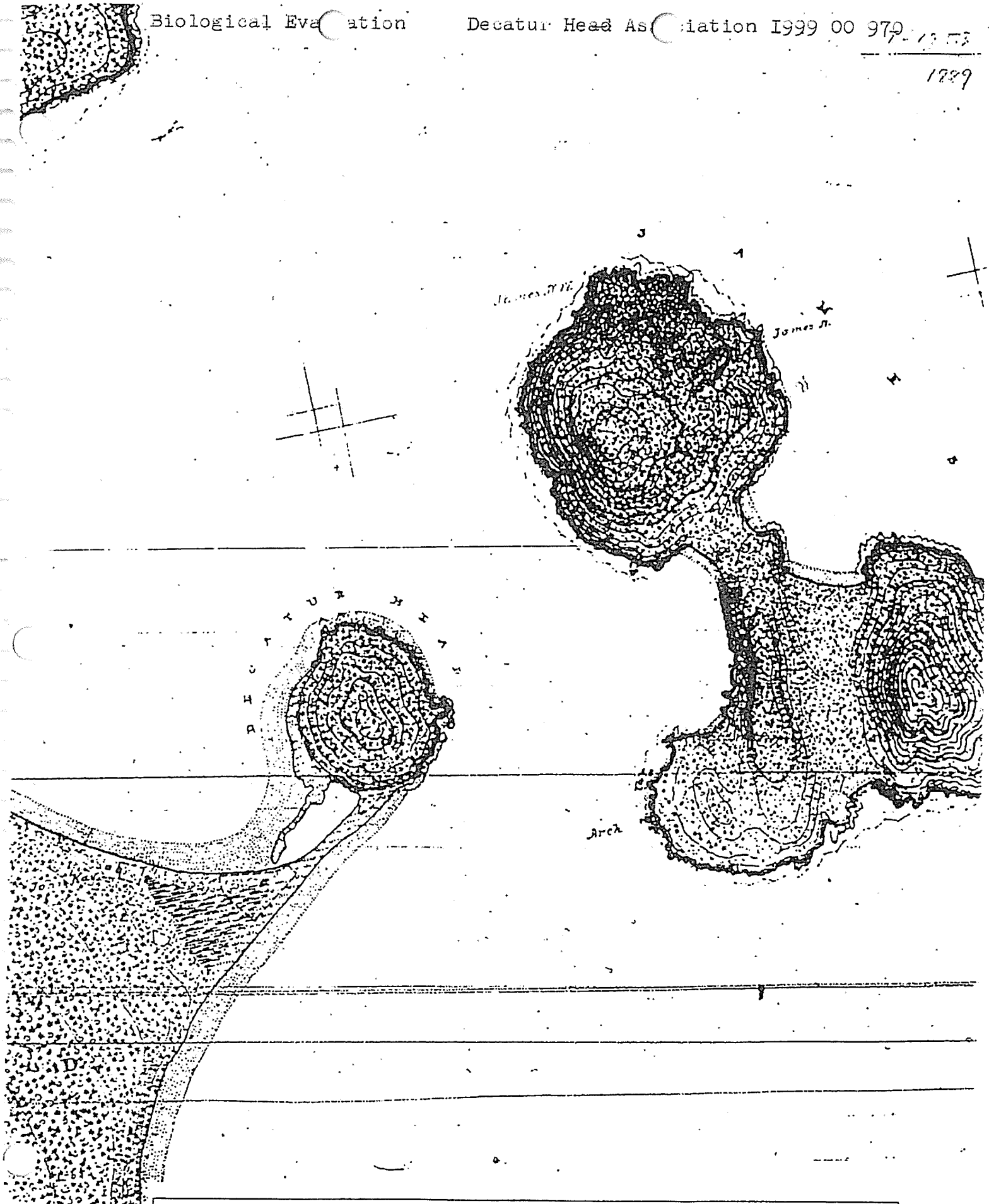


Figure 5. Portion of NOS T-sheet no. 1953 dated 1889.

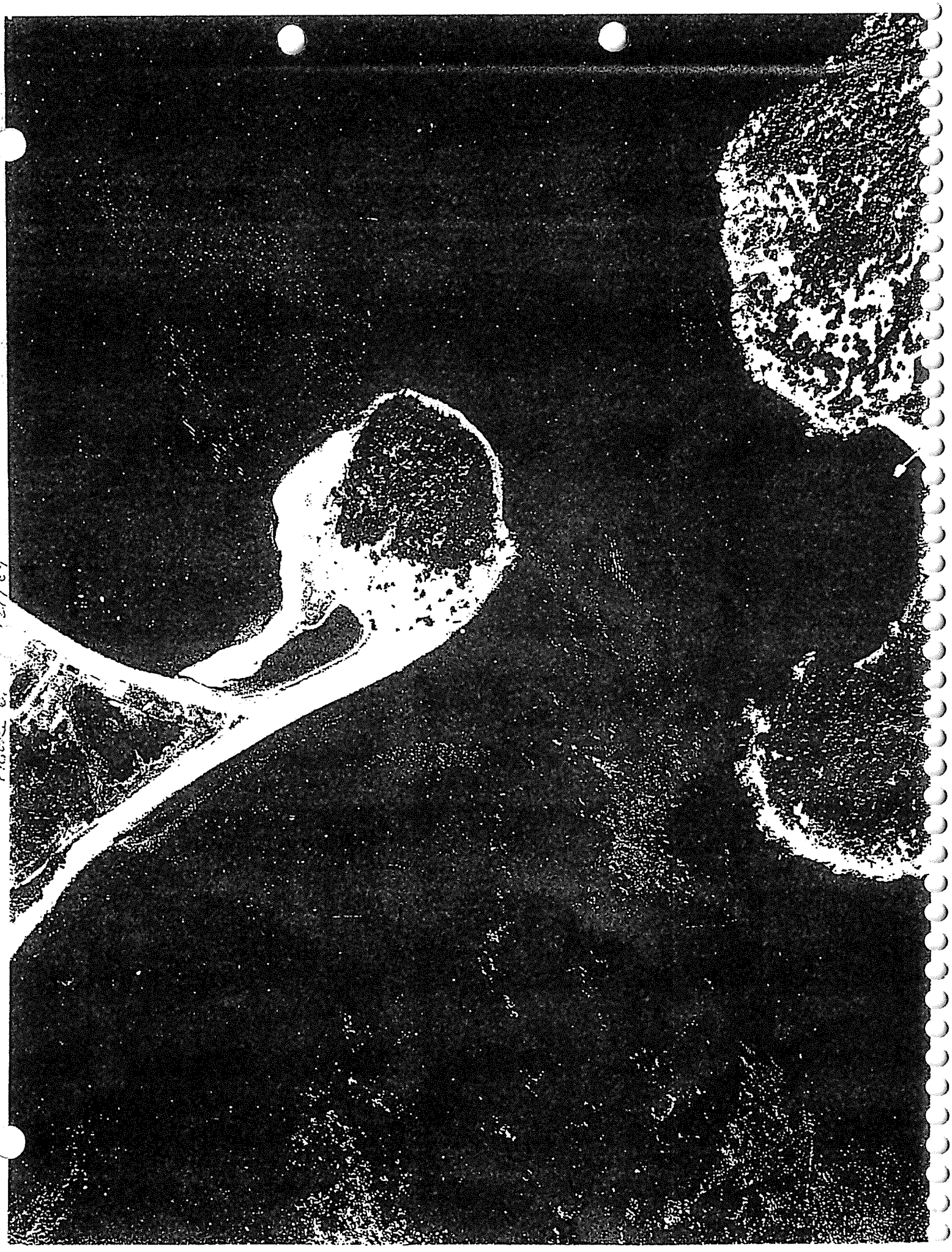
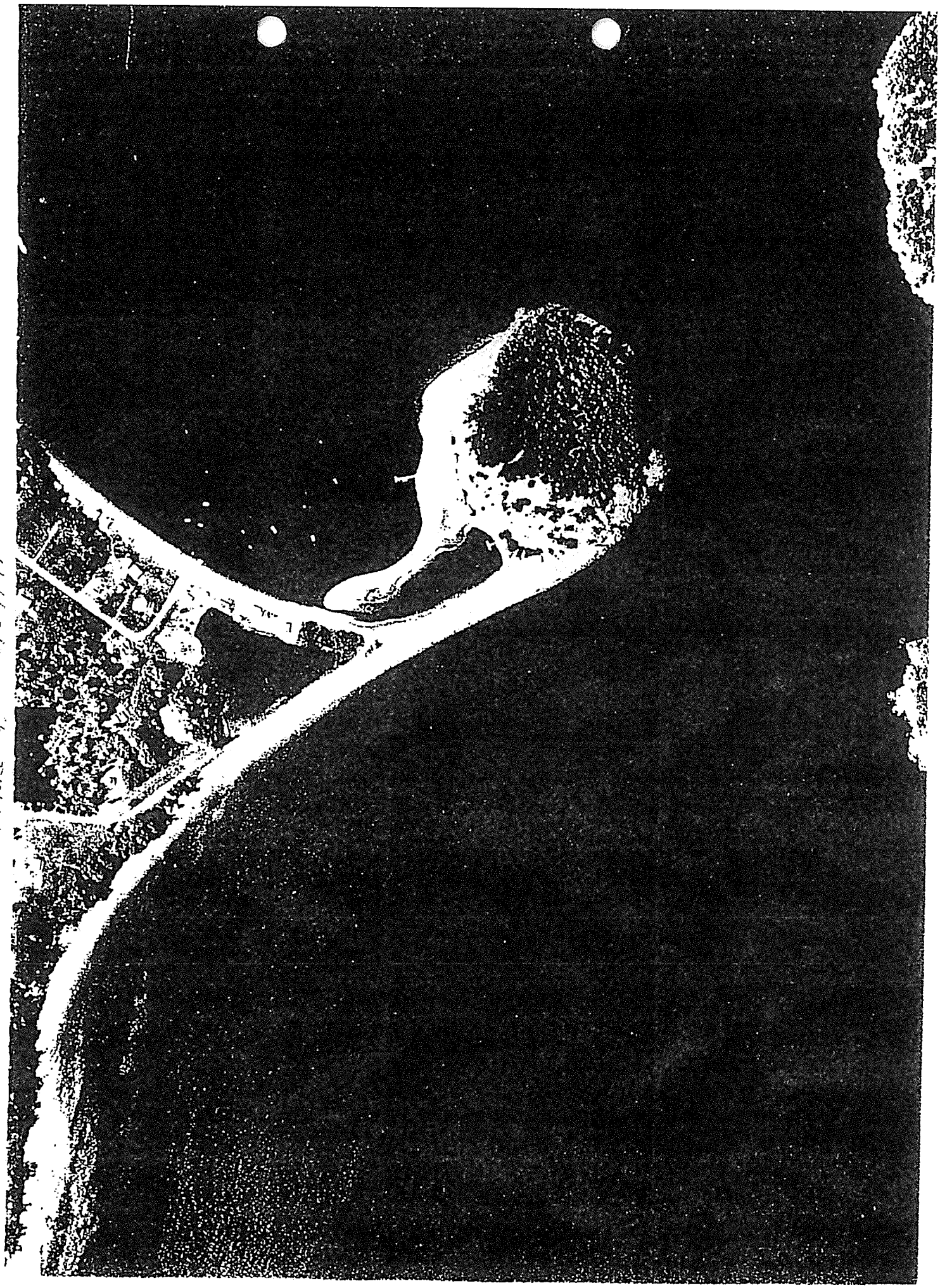


Figure 6 - 1/31/69



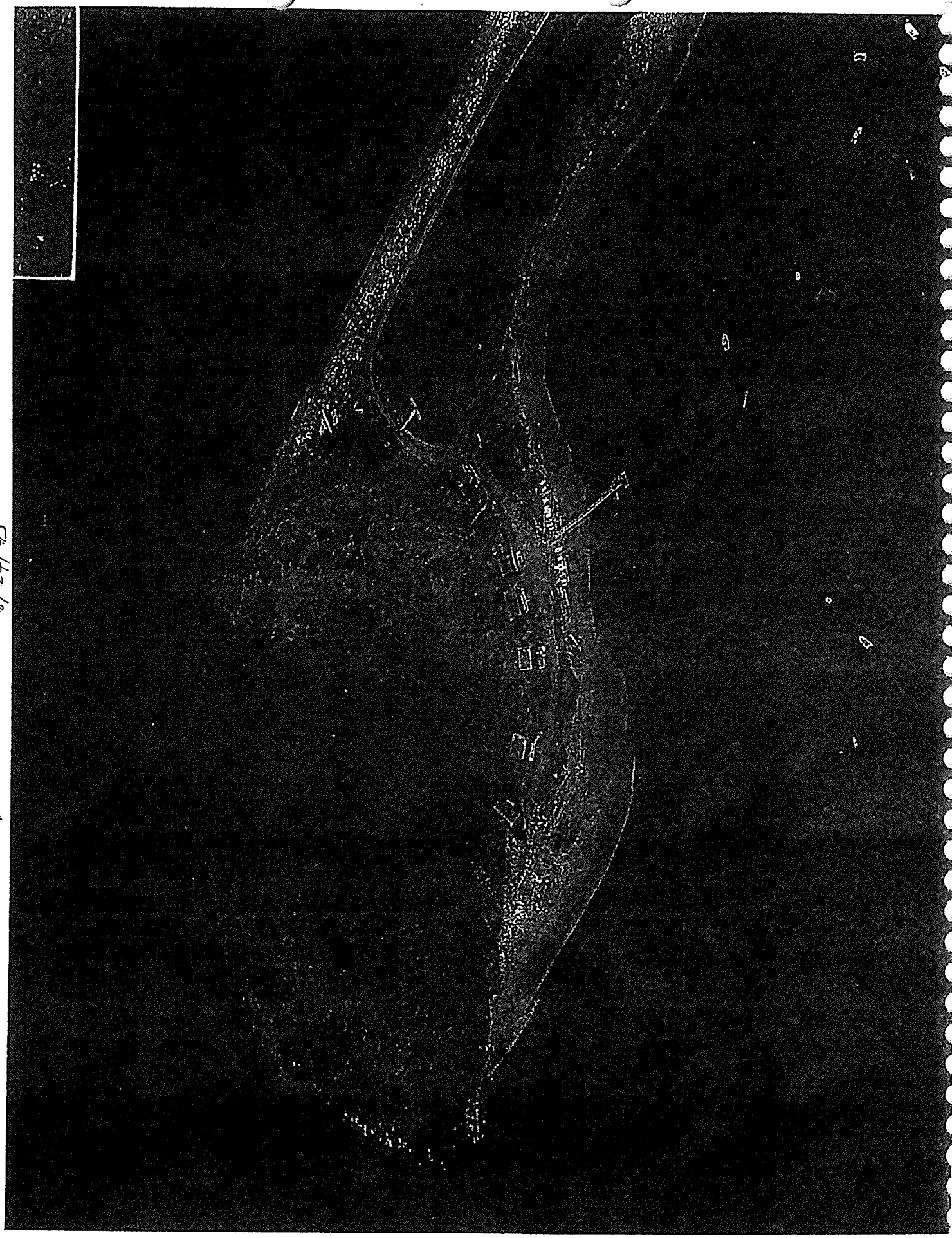


Fig 44, SB

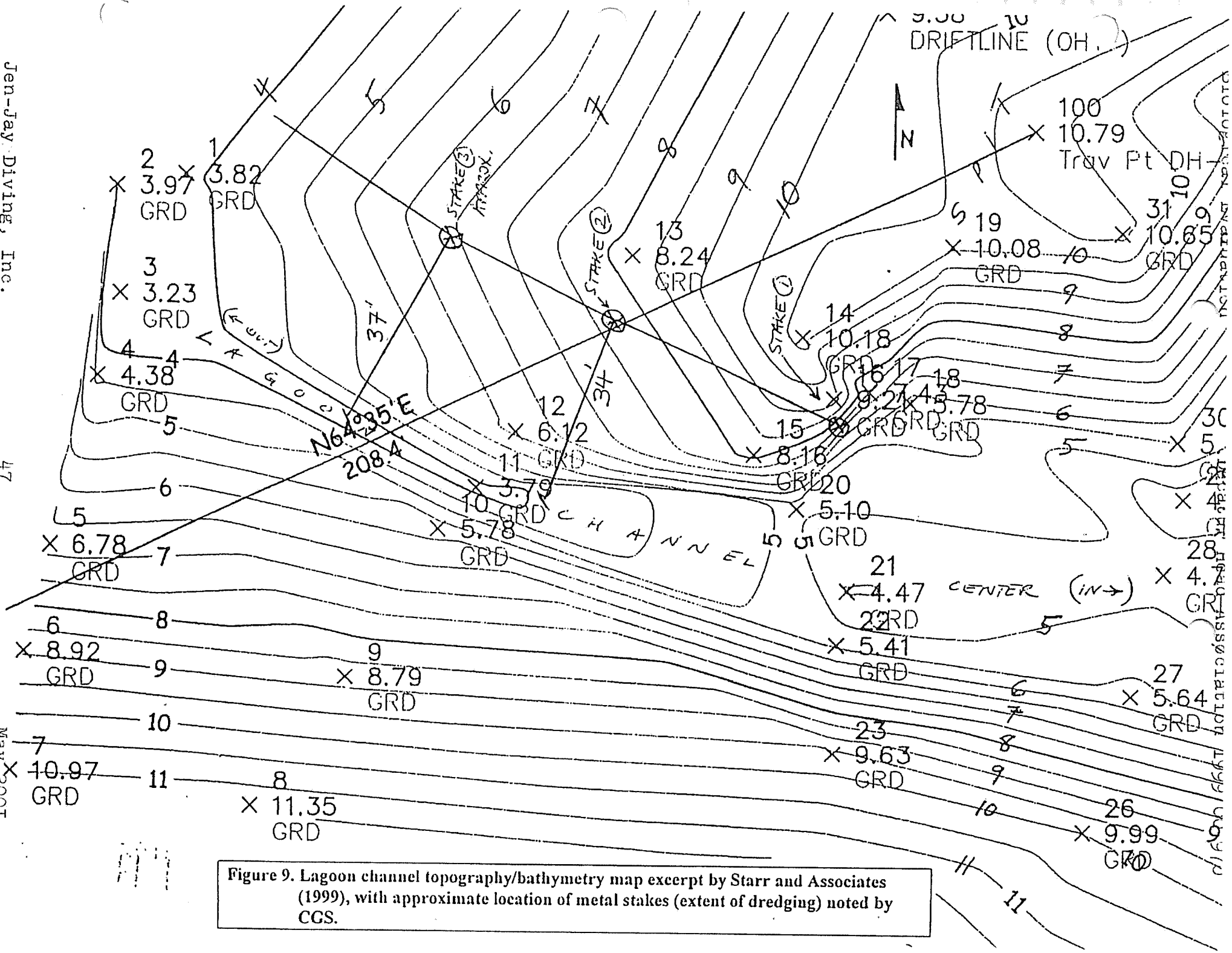


Figure 9. Lagoon channel topography/bathymetry map excerpt by Starr and Associates (1999), with approximate location of metal stakes (extent of dredging) noted by CGS.

EDGE ANALYTICAL

Burlington, WA	Corporate Laboratory (a)	1620 S Walnut St	Burlington, WA 98233	800.755.9295 • 360.757.1400
Bellingham, WA	Microbiology (b)	805 Orchard Dr Ste 4	Bellingham, WA 98225	360.715.1212
Portland, OR	Microbiology/Chemistry (c)	9150 SW Pioneer Ct Ste W	Wilsonville, OR 97070	503.682.7802
Corvallis, OR	Microbiology (d)	540 SW Third Street	Corvallis, OR 97333	541.753.4946

August 10, 2018

Coastal Geological Services, Inc
1711 Ellis St #103
Bellingham, WA 98225

RE: 18-24746 - Decatur Head

Dear Project Manager,

Your project: Decatur Head, was received on Thursday July 05, 2018.

The following comments are reported for your project:
See report for results

0.5g of sample was weighed into a COD reaction vial. 2mL of blank DI water was added to ensure a reaction with the reagents. Blank, muffled lab sand was used for a MB and had a COD value of 145 mg/L.
7/23/2018 ANP
If you have questions phone us at 800 755-9295.

Respectfully

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

Enclosures: Data Report

EDGE ANALYTICAL

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Revised - 8-13-18

Data Report

Client Name: Coastal Geological Services, Inc
1711 Ellis St #103
Bellingham, WA 98225

Reference Number: **18-24746**
Project: Decatur Head

Report Date: 8/13/18

Date Received: 7/5/18
Approved by: anp,bj,dst,fm,lrs
Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

Sample Description: A1,A2,A3,A4 1+40' , +5'
Lab Number: 50130 Sample Comment:
Sample Date: 7/4/18 3:05 pm
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
7439-97-6	MERCURY	ND	0.00851		mg/kg	1.0	7471A	a	7/19/18	HKL	7471A_180719	
NA	GRAIN SIZE	*	0		mg/L	1.0	NA	a	8/2/18	CM	MT_180802	See MTC report for results
NA	ORGANIC MATTER	0.2	0.1	0.1	%	1.0	S-9.10		7/20/18	KEB	SOIL_180720	
E-10151	VOLATILE SOLIDS	0.0			%	1.0	SM2540 G	a	7/11/18	HKL	VS_180711	
E-10117	CHEMICAL OXYGEN DEMAND	465	20	9	mg/L	1.0	SM5220 D	a	7/23/18	ANP	COD_180723	
7440-38-2	ARSENIC	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-39-3	BARIUM	28.5	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-43-9	CADMIUM	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-47-3	CHROMIUM	37.3	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7439-92-1	LEAD	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7782-49-2	SELENIUM	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-22-4	SILVER	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-66-6	ZINC	23.1	0.88		mg/Kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716a	

Sample Description: C1,C2,C3,C4 0+90 +6'
Lab Number: 50131 Sample Comment:
Sample Date: 7/4/18 4:10 pm
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
7439-97-6	MERCURY	ND	0.00819		mg/kg	1.0	7471A	a	7/19/18	HKL	7471A_180719	
NA	GRAIN SIZE	*	0		mg/L	1.0	NA	a	8/2/18	CM	MT_180802_0662	See MTC report for results
NA	ORGANIC MATTER	0.1	0.1	0.1	%	1.0	S-9.10		7/20/18	KEB	SOIL_180720	
E-10151	VOLATILE SOLIDS	0.0			%	1.0	SM2540 G	a	7/11/18	HKL	VS_180711	
E-10117	CHEMICAL OXYGEN DEMAND	764	20	9	mg/L	1.0	SM5220 D	a	7/23/18	ANP	COD_180723	
7440-38-2	ARSENIC	ND	0.96		mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A	
7440-39-3	BARIUM	24.4	0.96		mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A	
7440-43-9	CADMIUM	ND	0.96		mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A	

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

ANALYTICAL

Reference Number: **18-24746**
Report Date: 8/13/18

Data Report

7440-47-3	**CHROMIUM**	12.6	0.96	mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A
7439-92-1	**LEAD**	ND	0.96	mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A
7782-49-2	**SELENIUM**	ND	0.96	mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A
7440-22-4	**SILVER**	ND	0.96	mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A
7440-66-6	**ZINC**	22.8	0.96	mg/Kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180719a

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

EDGE ANALYTICAL

Burlington, WA *Corporate Laboratory (a)*
1620 S Walnut St - Burlington, WA 98233 - **800.755.9295** - 360.757.1400

Bellingham, WA *Microbiology (b)*
805 Orchard Dr Ste 4 - Bellingham, WA 98225 - 360.715.1212

Portland, OR *Microbiology/Chemistry (c)*
9150 SW Pioneer Ct Ste W - Wilsonville, OR 97070 - 503.682.7802

Corvallis, OR *Microbiology/Chemistry (d)*
540 SW Third Street - Corvallis, OR 97333 - 541.753.4946

Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541.639.8425

Data Report

Client Name: Coastal Geological Services, Inc
1711 Ellis St #103
Bellingham, WA 98225

Reference Number: **18-24746**
Project: Decatur Head

Report Date: 8/10/18

Date Received: 7/5/18
Approved by: anp,bj,dst,fm,lrs
Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

Sample Description: A1,A2,A3,A4 1+40' , +5'
Lab Number: 50130 Sample Comment:
Sample Date: 7/4/18 3:05 pm
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
7439-97-6	MERCURY	ND	0.00851		mg/kg	1.0	7471A	a	7/19/18	HKL	7471A_180719	
NA	GRAIN SIZE	*	0		mg/L	1.0	NA	a	8/2/18	CM	MT_180802	See MTC report for results
NA	ORGANIC MATTER	0.2	0.1	0.1	%	1.0	S-9.10		7/20/18	KEB	SOIL_180720	
E-10151	VOLATILE SOLIDS	0.0			%	1.0	SM2540 G	a	7/11/18	HKL	VS_180711	
E-10117	CHEMICAL OXYGEN DEMAND	465	20	9	mg/L	1.0	SM5220 D	a	7/23/18	ANP	COD_180723	
7440-38-2	ARSENIC	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-39-3	BARIUM	28.5	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-43-9	CADMIUM	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-47-3	CHROMIUM	37.3	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7439-92-1	LEAD	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7782-49-2	SELENIUM	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	
7440-22-4	SILVER	ND	0.88		mg/kg	1.0	6010B/3051	a	7/16/18	ANP	6010B_180716A	

Sample Description: C1,C2,C3,C4 0+90 +6'
Lab Number: 50131 Sample Comment:
Sample Date: 7/4/18 4:10 pm
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Lab	Analyzed	Analyst	Batch	Comment
7439-97-6	MERCURY	ND	0.00819		mg/kg	1.0	7471A	a	7/19/18	HKL	7471A_180719	
NA	GRAIN SIZE	*	0		mg/L	1.0	NA	a	8/2/18	CM	MT_180802_0662	See MTC report for results
NA	ORGANIC MATTER	0.1	0.1	0.1	%	1.0	S-9.10		7/20/18	KEB	SOIL_180720	
E-10151	VOLATILE SOLIDS	0.0			%	1.0	SM2540 G	a	7/11/18	HKL	VS_180711	
E-10117	CHEMICAL OXYGEN DEMAND	764	20	9	mg/L	1.0	SM5220 D	a	7/23/18	ANP	COD_180723	
7440-38-2	ARSENIC	ND	0.96		mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A	
7440-39-3	BARIUM	24.4	0.96		mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A	
7440-43-9	CADMIUM	ND	0.96		mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A	
7440-47-3	CHROMIUM	12.6	0.96		mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A	

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

ANALYTICAL

Reference Number: **18-24746**
Report Date: 8/10/18

Data Report

7439-92-1	**LEAD**	ND	0.96	mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A
7782-49-2	**SELENIUM**	ND	0.96	mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A
7440-22-4	**SILVER**	ND	0.96	mg/kg	1.0	6010B/3051	a	7/19/18	ANP	6010B_180719A

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

EDGE ANALYTICAL

Burlington, WA *Corporate Laboratory (a)*
1620 S Walnut St - Burlington, WA 98233 - **800.755.9295** • 360 757 1400

Bellingham, WA *Microbiology (b)*
805 Orchard Dr Ste 4 - Bellingham, WA 98225 - 360 715 1212

Portland, OR *Microbiology/Chemistry (c)*
9150 SW Pioneer Ct Ste W - Wilsonville, OR 97070 - 503 682 7802

Corvallis, OR *Microbiology/Chemistry (d)*
540 SW Third Street - Corvallis, OR 97333 - 541 753 4946

Bend, OR *Microbiology (e)*
20332 Empire Blvd Ste 4 - Bend, OR 97701 - 541 639 8425

Hydrocarbon Data Report

Client Name: Coastal Geological Services, Inc
1711 Ellis St #103
Bellingham, WA 98225

Reference Number: **18-24746**
Project: Decatur Head
Report Date: 8/10/18
Date Received: 7/5/18
Approved By: hy
Authorized by:

Lawrence J Henderson, PhD
Director of Laboratories, Vice President

Sample Description: A1,A2,A3,A4 - 1+40' , +5'
Lab Number: 50130
Date Analyzed: 7/13/18

Sample Date: 7/4/18 15:05
Collected By:
Analyzed By: ELW

Parameter	Result	Flag	DF	Cleanup Level	PQL	MDL	Units	Method	Lab	Batch	Comment
NWTPH-Dx											
DIESEL (C12 - C24)	ND		1	2000	50		mg/Kg	NWTPH-Dx/3550B	a	DXS_180712	DUP: ND
HEAVIER OILS (>C24)	ND		1	2000	50		mg/Kg	NWTPH-Dx/3550B	a	DXS_180712	DUP: ND

Sample Description: C1,C2,C3,C4 - 0+90 +6'
Lab Number: 50131
Date Analyzed: 7/13/18

Sample Date: 7/4/18 16:10
Collected By:
Analyzed By: ELW

Parameter	Result	Flag	DF	Cleanup Level	PQL	MDL	Units	Method	Lab	Batch	Comment
NWTPH-Dx											
DIESEL (C12 - C24)	ND		1	2000	50		mg/Kg	NWTPH-Dx/3550B	a	DXS_180712	
HEAVIER OILS (>C24)	ND		1	2000	50		mg/Kg	NWTPH-Dx/3550B	a	DXS_180712	

Notation:
ND - A result of "ND" indicates that the compound was not detected above the Lab's Method Reporting Limit - MRL.
PQL = Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor
Cleanup Level - The regulatory limit for Method A Cleanup Levels (MTCA, Chapter173-340 WAC) contaminants in the specified matrix. Amended Feb 12, 2001
The Cleanup level for Gasoline Range Organics (GRO) is 100 mg/Kg for gas mixtures without benzene and when the total ethylbenzene, toluene and xylenes are less than 1% of the gasoline concentration. The Cleanup level for GRO is 30 mg/Kg for all other mixtures.

If you have any questions concerning this report contact us at the above phone number.
Form: cHCID.rpt

ANALYTICAL

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Calibration Check

Reference Number: **18-24746**
Report Date: 08/10/18

Batch		Analyte	Result	True Value	Units	Method	% Recovery	Limits*	QC Qualifier	QC Type	Comment
6010B_180716A	2	ARSENIC	0.95	1	mg/L	6010B	95	90-110		CAL	
	2	BARIUM	0.97	1	mg/L	6010B	97	90-110		CAL	
	2	CADMIUM	1	1	mg/L	6010B	100	90-110		CAL	
	2	CHROMIUM	0.99	1	mg/L	6010B	99	90-110		CAL	
	2	LEAD	0.97	1	mg/L	6010B	97	90-110		CAL	
	2	SELENIUM	0.98	1	mg/L	6010B	98	90-110		CAL	
	2	SILVER	0.51	0.5	mg/L	6010B	102	90-110		CAL	
6010B_180719A	2	ARSENIC	0.96	1	mg/L	6010B	96	90-110		CAL	
	2	BARIUM	0.96	1	mg/L	6010B	96	90-110		CAL	
	2	CADMIUM	0.97	1	mg/L	6010B	97	90-110		CAL	
	2	CHROMIUM	0.96	1	mg/L	6010B	96	90-110		CAL	
	2	LEAD	0.98	1	mg/L	6010B	98	90-110		CAL	
	2	SELENIUM	0.97	1	mg/L	6010B	97	90-110		CAL	
	2	SILVER	0.48	0.5	mg/L	6010B	96	90-110		CAL	
7471A_180719	0	MERCURY	0.00205	0.002	mg/L	7471A	103	85-115		CAL	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

ANALYTICAL

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: **18-24746**
Report Date: 08/10/18

Batch		Analyte	Result	True Value	Units	Method	% Recovery	Limits*	QC Qualifier	QC Type	Comment
6010B_180716A	0	ARSENIC	0.97	1	mg/L	6010B	97	85-115		LFB	
	0	BARIUM	0.96	1	mg/L	6010B	96	85-115		LFB	
	0	CADMIUM	0.98	1	mg/L	6010B	98	85-115		LFB	
	0	CHROMIUM	1.02	1	mg/L	6010B	102	85-115		LFB	
	0	LEAD	0.99	1	mg/L	6010B	99	85-115		LFB	
	0	SELENIUM	0.97	1	mg/L	6010B	97	85-115		LFB	
	0	SILVER	0.46	0.5	mg/L	6010B	92	85-115		LFB	
6010B_180719A	0	ARSENIC	0.93	1	mg/L	6010B	93	85-115		LFB	
	0	BARIUM	0.92	1	mg/L	6010B	92	85-115		LFB	
	0	CADMIUM	0.94	1	mg/L	6010B	94	85-115		LFB	
	0	CHROMIUM	0.98	1	mg/L	6010B	98	85-115		LFB	
	0	LEAD	0.94	1	mg/L	6010B	94	85-115		LFB	
	0	SELENIUM	0.88	1	mg/L	6010B	88	85-115		LFB	
	0	SILVER	0.49	0.5	mg/L	6010B	98	85-115		LFB	
7471A_180719	0	MERCURY	0.00212	0.002	mg/L	7471A	106	85-115		LFB	
COD_180723	0	CHEMICAL OXYGEN DEMAND	45	50	mg/L	SM5220 D	90	90-110		LFB	
DXS_180712	0	DIESEL (C12 - C24)	95	125	mg/Kg	NWTPH-Dx	76	70-130		LFB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

ANALYTICAL

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Reagent Blank

Reference Number: **18-24746**
Report Date: 08/10/18

Batch		Analyte	Result	True Value	Units	Method	% Recovery	Limits*	QC Qualifier	QC Type	Comment
6010B_180716A	0	ARSENIC	ND		mg/L	6010B		0-0		LRB	
	0	BARIUM	ND		mg/L	6010B		0-0		LRB	
	0	CADMIUM	ND		mg/L	6010B		0-0		LRB	
	0	CHROMIUM	ND		mg/L	6010B		0-0		LRB	
	0	LEAD	ND		mg/L	6010B		0-0		LRB	
	0	SELENIUM	ND		mg/L	6010B		0-0		LRB	
	0	SILVER	ND		mg/L	6010B		0-0		LRB	
6010B_180719A	0	ARSENIC	ND		mg/L	6010B		0-0		LRB	
	0	BARIUM	ND		mg/L	6010B		0-0		LRB	
	0	CADMIUM	ND		mg/L	6010B		0-0		LRB	
	0	CHROMIUM	ND		mg/L	6010B		0-0		LRB	
	0	LEAD	ND		mg/L	6010B		0-0		LRB	
	0	SELENIUM	ND		mg/L	6010B		0-0		LRB	
	0	SILVER	ND		mg/L	6010B		0-0		LRB	
7471A_180719	0	MERCURY	ND	ND	mg/L	7471A		0-0		LRB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

ANALYTICAL

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: **18-24746**
Report Date: 08/10/18

Batch		Analyte	Result	True Value	Units	Method	% Recovery	QC Limits*	QC Qualifier	QC Type	Comment
6010B_180716A	0	ARSENIC	ND		mg/L	6010B		0-0		MB	
	0	BARIUM	ND		mg/L	6010B		0-0		MB	
	0	CADMIUM	ND		mg/L	6010B		0-0		MB	
	0	CHROMIUM	ND		mg/L	6010B		0-0		MB	
	0	LEAD	ND		mg/L	6010B		0-0		MB	
	0	SELENIUM	ND		mg/L	6010B		0-0		MB	
	0	SILVER	ND		mg/L	6010B		0-0		MB	
6010B_180719A	0	ARSENIC	ND		mg/L	6010B		0-0		MB	
	0	BARIUM	ND		mg/L	6010B		0-0		MB	
	0	CADMIUM	ND		mg/L	6010B		0-0		MB	
	0	CHROMIUM	ND		mg/L	6010B		0-0		MB	
	0	LEAD	ND		mg/L	6010B		0-0		MB	
	0	SELENIUM	ND		mg/L	6010B		0-0		MB	
	0	SILVER	ND		mg/L	6010B		0-0		MB	
COD_180723	0	CHEMICAL OXYGEN DEMAND	145		mg/L	SM5220 D		0-3		MB	Blank sand
	0	CHEMICAL OXYGEN DEMAND	ND		mg/L	SM5220 D		0-3		MB	
DXS_180712	0	DIESEL (C12 - C24)	ND		mg/Kg	NWTPH-Dx		0-0		MB	
	0	HEAVIER OILS (>C24)	ND		mg/Kg	NWTPH-Dx		0-0		MB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

ANALYTICAL

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: **18-24746**
Report Date: 08/10/18

Batch		Analyte	Result	True Value	Units	Method	% Recovery	Limits*	QC Qualifier	QC Type	Comment
6010B_180716A	0	ARSENIC	1.96	2	mg/L	6010B	98	90-110		QCS	
	0	BARIUM	1.96	2	mg/L	6010B	98	90-110		QCS	
	0	CADMIUM	1.94	2	mg/L	6010B	97	90-110		QCS	
	0	CHROMIUM	1.95	2	mg/L	6010B	98	90-110		QCS	
	0	LEAD	1.98	2	mg/L	6010B	99	90-110		QCS	
	0	SELENIUM	1.99	2	mg/L	6010B	100	90-110		QCS	
	0	SILVER	0.48	0.5	mg/L	6010B	96	90-110		QCS	
6010B_180719A	0	ARSENIC	1.99	2	mg/L	6010B	100	90-110		QCS	
	0	BARIUM	1.98	2	mg/L	6010B	99	90-110		QCS	
	0	CADMIUM	1.96	2	mg/L	6010B	98	90-110		QCS	
	0	CHROMIUM	1.98	2	mg/L	6010B	99	90-110		QCS	
	0	LEAD	2.02	2	mg/L	6010B	101	90-110		QCS	
	0	SELENIUM	2.01	2	mg/L	6010B	101	90-110		QCS	
	0	SILVER	0.49	0.5	mg/L	6010B	98	90-110		QCS	
COD_180723	0	CHEMICAL OXYGEN DEMAND	108	111	mg/L	SM5220 D	97	90-110		QCS	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

ANALYTICAL

SAMPLE DEPENDENT
QUALITY CONTROL REPORT
Duplicate, Matrix Spike/Matrix Spike Duplicate and Confirmation Result Report

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Type	Comments
Duplicate										
6010B_180719A										
	50131	ARSENIC	ND	ND	mg/kg	NA	0-20		DUP	
	50131	BARIUM	24.4	20.1	mg/kg	19.3	0-20		DUP	
	50131	CADMIUM	ND	ND	mg/kg	NA	0-20		DUP	
	50131	CHROMIUM	12.6	14.3	mg/kg	12.6	0-20		DUP	
	50131	LEAD	ND	ND	mg/kg	NA	0-20		DUP	
	50131	SELENIUM	ND	ND	mg/kg	NA	0-20		DUP	
	50131	SILVER	ND	ND	mg/kg	NA	0-20		DUP	
7471A_180719										
	49504	MERCURY	ND	0.0128	mg/kg	NA	0-50	INH	DUP	
COD_180723										
	52622	CHEMICAL OXYGEN DEMAND	512	499	mg/L	2.6	0-20		DUP	
	53535	CHEMICAL OXYGEN DEMAND	182	185	mg/L	1.6	0-20		DUP	
DXS_180712										
	50130	DIESEL (C12 - C24)	ND	ND	mg/Kg	NA	0-30		DUP	
	50130	HEAVIER OILS (>C24)	ND	ND	mg/Kg	NA	0-30		DUP	
TS_180711										
	49504	TOTAL SOLIDS FOR CALCULATION	94.87	95.30	%	0.5	0-20		DUP	
	50131	TOTAL SOLIDS FOR CALCULATION	95.39	94.51	%	0.9	0-20		DUP	
VS_180711										
	50131	VOLATILE SOLIDS	0.001	0.001	%	0.0	0-20		DUP	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

Laboratory Fortified Matrix (MS)

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits*	%RPD	Limits*	QC Qualifier	Type	Comments
6010B_180719A															
	50131	ARSENIC	ND	92.3	105	96	mg/kg	**96**	**109**	75-125	12.9	0-20		LFM	
	50131	BARIUM	24.4	109	121	96	mg/kg	**88**	**101**	75-125	13.2	0-20		LFM	
	50131	CADMIUM	ND	83.0	95.5	96	mg/kg	**86**	**99**	75-125	14.0	0-20		LFM	
	50131	CHROMIUM	12.6	101	109	96	mg/kg	**92**	**100**	75-125	8.7	0-20		LFM	
	50131	LEAD	ND	88.1	99.3	96	mg/kg	**92**	**103**	75-125	12.0	0-20		LFM	
	50131	SELENIUM	ND	85.0	99.7	96	mg/kg	**89**	**104**	75-125	15.9	0-20		LFM	
	50131	SILVER	ND	29.4	53.1	48	mg/kg	**61**	**111**	75-125	57.5	0-20	IM	LFM	
7471A_180719															
	49504	MERCURY	ND	0.1058	0.1000	0.0823	mg/kg	**129**	**122**	70-130	5.6	0-20		LFM	
COD_180723															
	52622	CHEMICAL OXYGEN DEMAND	512	533	555	50	mg/L	**42**	**86**	70-130	68.8	0-20	IM	LFM	
	53535	CHEMICAL OXYGEN DEMAND	182	237	236	50	mg/L	**110**	**108**	70-130	1.8	0-20		LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Limits are intended for water matrices only. These criteria are for guidance only when reported with soils/solids.

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 18-24746
Report Date: 08/10/18

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
DXS_180712						
50130	O-TERPHENYL	96		%	NWTPH-Dx	
`XS_180712						
50131	O-TERPHENYL	103		%	NWTPH-Dx	

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

ANALYTICAL

Qualifier Definitions

Reference Number: 18-24746
Report Date: 08/10/18

Qualifier	Definition
IM	Matrix induced bias assumed
INH	The sample was non-homogeneous
IS	The ratio of the spike concentration to sample background was too low to meet performance criteria

Note: Some qualifier definitions found on this page may pertain to results or QC data which are not printed with this report.

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Client:	Edge Analytical	**Date:**	August 2, 2018
Address:	1620 S. Walnut Street	**Project:**	Decatur Head
	Burlington, WA 98233	**Project #:**	18B243
Attn:	H. Blunt / Edge Analytical	**Sample #:**	B18-0661
Revised on:		**Date sampled:**	July 4, 2018

As requested MTC, Inc. has performed the following test(s) on the sample referenced above. The testing was performed in accordance with current applicable AASHTO or ASTM standards as indicated below. The results obtained in our laboratory were as follows below or on the attached pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count				
	Moisture Content				
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
	Atterberg Limits				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call on us at the number below.

Respectfully Submitted,
Cheryl Meredith
WABO Supervising Laboratory Technician

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Sieve Report

Project: Decatur Head
Project #: 18B243
Client: Edge Analytical
Source: Sta 1 + 40, 5' (A3)
Sample#: B18-0661

Date Received: 1-Aug-18
Sampled By: Client
Date Tested: 2-Aug-18
Tested By: A. Eifrig

Unified Soil Classification System, ASTM-2487
SP. Poorly graded Sand with Gravel
Sample Color:
Gray

ACCREDITED
Certificate # 1366.01, 1366.02 & 1366.04

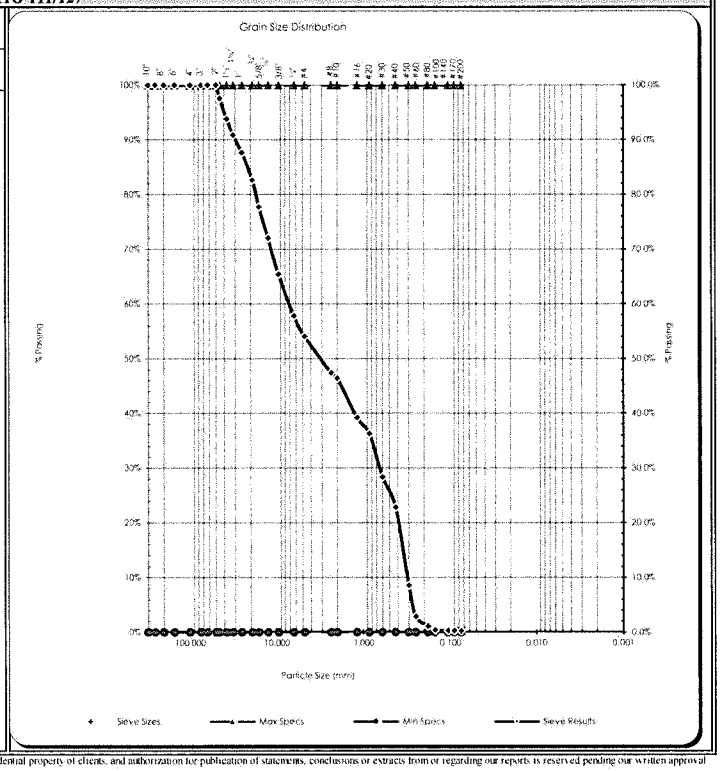
AASHTO T-176, AASHTO T-255, AASTHO T-335, AASHTO T-89, AASHTO T-90

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.269	mm	% Gravel =	45.9%	Coeff. of Curvature, C_C = 0.19
$D_{(10)}$ =	0.312	mm	% Sand =	53.8%	Coeff. of Uniformity, C_U = 23.13
$D_{(15)}$ =	0.356	mm	% Silt & Clay =	0.3%	Fineness Modulus = 4.74
$D_{(30)}$ =	0.651	mm	Liquid Limit =	n/a	Plastic Limit = n/a
$D_{(50)}$ =	3.282	mm	Plasticity Index =	n/a	Moisture %, as received = 3.1%
$D_{(60)}$ =	7.225	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	29.834	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	1/83		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

AASHTO T11/T27

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		98%	100.0%	0.0%
1.50"	37.50		94%	100.0%	0.0%
1.25"	31.50		91%	100.0%	0.0%
1.00"	25.00	88%	88%	100.0%	0.0%
3/4"	19.00	83%	83%	100.0%	0.0%
5/8"	16.00		78%	100.0%	0.0%
1/2"	12.50	72%	72%	100.0%	0.0%
3/8"	9.50	65%	65%	100.0%	0.0%
1/4"	6.30		58%	100.0%	0.0%
#4	4.75	54%	54%	100.0%	0.0%
#8	2.36		47%	100.0%	0.0%
#10	2.00	46%	46%	100.0%	0.0%
#16	1.18		39%	100.0%	0.0%
#20	0.850	36%	36%	100.0%	0.0%
#30	0.600		28%	100.0%	0.0%
#40	0.425	23%	23%	100.0%	0.0%
#50	0.300		9%	100.0%	0.0%
#60	0.250	3%	3%	100.0%	0.0%
#80	0.180		1%	100.0%	0.0%
#100	0.150	0%	0%	100.0%	0.0%
#140	0.106		0%	100.0%	0.0%
#170	0.090		0%	100.0%	0.0%
#200	0.075	0.3%	0.3%	100.0%	0.0%



Comments: Maximum nominal aggregate size is 1.00", per ASTM table C-136, the minimum sample size for a gradation with a 1.00" maximum nominal aggregate size is 10,000g. The sample provided had a total mass that was below the minimum requirement.

Reviewed by:
Cheryl Meredith

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980
Regional Offices: Olympia ~ 360.534.9777 Bellingham ~ 360.647.6111 Silverdale ~ 360.698.6787 Tukwila ~ 206.241.1974
Visit our website: www.mtc-inc.net

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Client:	Edge Analytical	**Date:**	August 2, 2018
Address:	1620 S. Walnut Street	**Project:**	Decatur Head
	Burlington, WA 98233	**Project #:**	18B243
Attn:	H. Blunt / Edge Analytical	**Sample #:**	B18-0662
Revised on:		**Date sampled:**	July 4, 2018

As requested MTC, Inc. has performed the following test(s) on the sample referenced above. The testing was performed in accordance with current applicable AASHTO or ASTM standards as indicated below. The results obtained in our laboratory were as follows below or on the attached pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count				
	Moisture Content				
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
	Atterberg Limits				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call on us at the number below.

Respectfully Submitted,
Cheryl Meredith
WABO Supervising Laboratory Technician

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Sieve Report

Project: Decatur Head	**Date Received:** 1-Aug-18	**Unified Soil Classification System, ASTM-2487**	
Project #: 18B243	**Sampled By:** Client	GP, Poorly graded Gravel with Sand	
Client: Edge Analytical	**Date Tested:** 2-Aug-18	**Sample Color:**	
Source: Sta D + 90. + 6 (C2)	**Tested By:** A. Eifrig	Gray	
Sample#: B18-0662			

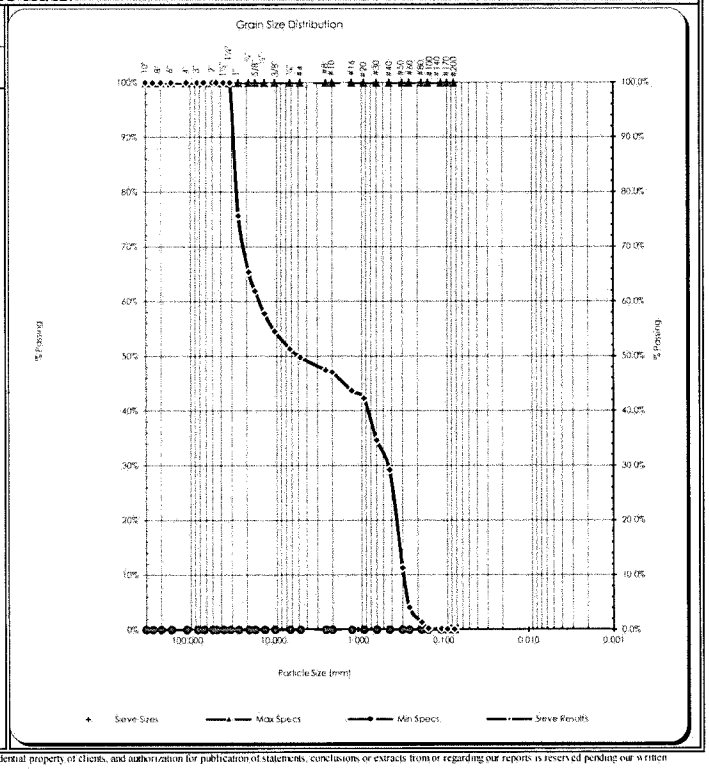
ACCREDITED

AASHTO T-176, AASHTO T-255, AASTHO T-335, AASHTO T-89, AASHTO T-90

	$D_{(95)}$ = 0.257	mm	% Gravel = 50.2%	Coeff. of Curvature, C_C = 0.05
Specifications	$D_{(10)}$ = 0.291	mm	% Sand = 49.7%	Coeff. of Uniformity, C_U = 49.39
No Specs	$D_{(15)}$ = 0.326	mm	% Silt & Clay = 0.1%	Fineness Modulus = 4.93
Sample Meets Specs ? N/A	$D_{(30)}$ = 0.450	mm	Liquid Limit = n/a	Plastic Limit = n/a
	$D_{(50)}$ = 4.946	mm	Plasticity Index = n/a	Moisture %, as received = 2.6%
	$D_{(60)}$ = 14.387	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
	$D_{(90)}$ = 28.832	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
	Dust Ratio = 0		Fracture %, 2+ Faces = n/a	Req'd Fracture %, 2+ Faces =

AASHTO T11/T27

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00		100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	76%	76%	100.0%	0.0%
3/4"	19.00	65%	65%	100.0%	0.0%
5/8"	16.00		62%	100.0%	0.0%
1/2"	12.50	58%	58%	100.0%	0.0%
3/8"	9.50	55%	55%	100.0%	0.0%
1/4"	6.30		51%	100.0%	0.0%
#4	4.75	50%	50%	100.0%	0.0%
#8	2.36		47%	100.0%	0.0%
#10	2.00	47%	47%	100.0%	0.0%
#16	1.18		44%	100.0%	0.0%
#20	0.850	42%	42%	100.0%	0.0%
#30	0.600		35%	100.0%	0.0%
#40	0.425	29%	29%	100.0%	0.0%
#50	0.300		11%	100.0%	0.0%
#60	0.250	4%	4%	100.0%	0.0%
#80	0.180		1%	100.0%	0.0%
#100	0.150	0%	0%	100.0%	0.0%
#140	0.106		0%	100.0%	0.0%
#170	0.090		0%	100.0%	0.0%
#200	0.075	0.1%	0.1%	100.0%	0.0%



Comments: Maximum nominal aggregate size is 1.00", per ASTM table C-136, the minimum sample size for a gradation with a 1.00" maximum nominal aggregate size is 10,000g. This sample provided had a total mass that was below the minimum requirement.

Reviewed by: _____
Cheryl Meredith

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Chain of Custody / Analysis Request

18-24746
50130 - 50131

Page 1 of 1

(shaded sections)

Report to:	Coastal Geological Services, Inc	Bill to:	Same		
Ship Address:	1711 Ellis St. #103	Address:			
City:	Bellingham St: WA Zip: 98225	City:		St: WA	Zip:
Attn:	Adam Tullis	Phone:		FAX:	
Phone:	360.647-1845 FAX:	P.O.#:		Attn:	
Email:	adam@costalgeo.com ← Contact 2	Visa	M/C	A/E	Expires /
Project	Deactur Head	Card#:			

adam@coastalgeo.com

For Lab Use Only
Ref #

Check Regulatory Program
- Safe Drinking Water Act
- Clean Water Act
- RCRA / CERCLA
- X Other

EDGE ANALYTICAL
Main Lab (800-755-9295)
1620 South Walnut St. Burlington, WA 98233
Microbiology (888-725-1212)
805 W. Orchard Dr. Suite 4 Bellingham, WA 98225
Wilsonville Lab (503-682-7802)
9150 SW Pioneer Ct. Suite W Wilsonville, OR 97070
Corvallis Lab (541-753-4946)
540 SW 3rd St. Corvallis, OR 97333
Bend Lab (541-639-8425)
20332 Empire Ave Ste F4, Bend, OR 97703

Instructions

1. Use one line per sample Location.
2. Be specific in analysis requests.
3. (NEW) List each metal individually (NEW)
4. Check off analyses to be performed for each sample Location.
5. Enter number of containers.

Turn Around Time Required
- X Standard
- Half-time (50% surcharge)
- Quickest (100% surcharge) Phone Call Req.
- Emergency (Phone Call Req.)

CO036555

	Field ID	Location	Grab/ Comp.	Sample Matrix*	Date	Time	COD, Metals, VS In Soil	Grain Size In Soil	NWTPH-Dx (Soil)	Organic Matter In Soil	Number of Containers
1	A1	1+40, +5'		S	7/4/18	15:05	X				
2	A2	1+40, +5'		↓	↓	↓		X			
3	A3	" "								X	
4	A4	" "							X		
5	C1	0+90 +6'		S	7/4/18	16:10	X				
6	C2	" "		↓	↓	↓		X			
7	C3	" "								X	
8	C4	" "							X		

Special Instructions
Conditions on Receipt

**Are there known hazardous or dangerous wastes in these samples? YES (NO) If YES, indicate type on reverse of this form; samples may be returned to you.

Total Containers 8

Sampled by: Jim Johannessen Phone: 360.647-1845 FAX: —— Email: jim@coastalgeo.com

Sample Receipt Request (Must include FAX or Email) X

*W - water SW - surface water WW - waste water OL - oil
DW - drinking water GW - Ground water S - soil Other:

**Relinquished by	Date	Time	Received by	Date	Time
Rebecca Cayen	7/5/18	1251	CLH	7/5/18	1258

KMS 7/5/18 1715 EDGE

	Yes	No	N/A
Custody seals intact	1.1		
Sample temp 7.0 C satisfactory	✓		
Samples received intact	✓		
Chain of custody & labels agree	✓		

FORM COC 6-27-2018