

WE FISH
15/2



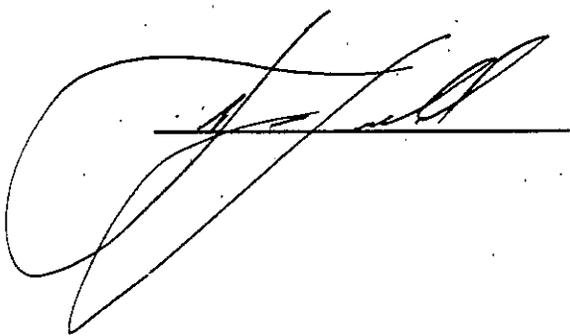
ENVIRO -TECH DIVING INC.

NPDES SURVEY
WESTWARD SEAFOODS, INC.

Tim Jewell

February 15 through March 15, 1995

DIVER TIM JEWELL



A handwritten signature in black ink, appearing to read 'Tim Jewell', is written over a horizontal line.

RECEIVED
MAY 17 1995
WASHINGTON STATE DEPARTMENT OF
ENFORCEMENT BRANCH
EPA REGION 10

METHODOLOGY

GRID CONSTRUCTION AND DIVE SPECIFICS

A series of four grids, two hundred feet by two hundred feet, were established around the Westward Seafood's outfall line located in Captains Bay (Diagram 1a). A total of 13 monuments were placed by Watson Co. on 7/21/94 using a Mini-Ranger system and referenced to state plane coordinates north of Baileys Ledge (Diagram 1b). These grids will be referenced as grids sections, one through four in this report. All of the grids as seen in Diagram 5 are interconnected. The north and south grid lines are set on an azimuth of 0° \longleftrightarrow 180° True, with the east and west grid lines set on an azimuth of 90° \longleftrightarrow 270° True. Each grid had a temporary grid reference line extended between the permanent monuments. This grid reference line had a reference mark every twenty feet. During the survey times divers extended a line reel with data marks every twenty feet between the corresponding reference marks on the grid reference line (Diagram 2).

At each data point the diver recorded depth of waste measurements and any other pertinent observations of marine life or other topographic anomalies. Water depths were taken with a US Divers M-2 dive computer. Waste depths were taken with a hollow slotted PVC probe so the diver could effectively examine the substrate and determine waste content. In areas of great topographic anomalies additional data points were taken at even closer points depending on the waste or topographic irregularity. Upon completion of each dive divers immediately and extensively debriefed on observations during the dive.

All data gathered by the divers was then used to construct a data point matrix (Diagram 3) of both the bottom topography and waste depths. This information was

DIVERS OBSERVATIONS

SECTION 1

This southeastern most section is dominated by the reef which extends throughout the majority of the south and eastern portions of this section. The subsequent topography is very shallow and rocky with the depths in the southeastern most corner being at some points only ten feet. In the shallowest portions, the bottom consists of large rock, sand and shell in this reef area. The larger rock is encrusted with kelp and sea grass as well as mussels and giant acorn barnacles. This area is also covered with numerous species of sea anemones such as Leather Anemone (*Tealia coriacea*), Giant green Anemone (*Anthopleura xanthogrammica*) and Frilled anemone (*Metridium senile*). The green sea urchins (*Strongylocentrotus droebachiensis*) are seen in this section to depths of fifty feet. The bottom in many areas of this section that is not rock is covered with numerous species of shells including Bent Nosed Macoma (*Macoma nasuta*), Pacific Littleneck Clam (*Protothaca staminea*), Rock Jingle (*Pododesmus macroschisma*), the blue Mussel (*Mytilus edulis*) and Horse Mussel (*Modiolus modiolus*). Other marine life seen in the reef area included the Kelp Greenling (*Hexagrammous decagrammus*) or Rock Greenling (*Hexagrammous lagocephalus*) as well as numerous sculpin. Sole and flounder were most evident in the southwest portion of the grid section.

Small amounts of measurable processing waste were seen in the shallow reef portion and there were trace amounts of light drifting processing waste that was observed throughout this portion of the section during processing times. There is a band of older waste along the southern boundary approximately eighty feet from monument #3 that is now covered with a fresh layer of new waste. It appears this older waste is the remains of where the outfall was previously located, this band is

DIVERS OBSERVATIONS

SECTION 2

This section is dominated by the caldera shaped waste pile (Diagram 7) just five feet east of the eastern boundary and eighty feet from the southern boundary formed by the discharge at termination of the old outfall. This caldera is forty feet long and fifteen feet wide that lays in a northwest direction. Waste at the deepest point is 12.1 feet, at a depth of sixty three feet below the surface. The sides of the caldera's waste is two to three feet deep with the deepest area at the far northwest end. The sides of the caldera on the northwest end have steeply sloping sides that sit on a steep natural slope. The center of the caldera has only small amounts of waste and in some areas are completely clear due to the high volume flow from the diffuser. Again the waste is very fine processing waste with no particles larger than .5 inches. The waste flow travels in a northwest direction and has diminished to a little more than two feet by the time the northern boundary of this section is reached (Diagram 9). Waste depths diminish rapidly as divers traveled to the west.

There were gaseous emissions when the probes were inserted into the waste during measurement periods as well as during other times on the old waste pile. Unlike the previous survey no fish mortality was observed. Numerous codfish were observed swimming in the immediate area of the main pile. Sculpin were present also in this area.

The southwest portion of this section is covered with small amounts of processing waste with only trace amounts seen in some areas. During this survey a light covering of this waste extends past the southern border approximately 100 feet

DIVERS OBSERVATIONS

SECTION 3

This section is dominated by a reef in the southeast portion of this grid. The bottom drops steeply in some areas as much as eighty feet as you travel to the north. The reef is rock covered by numerous types of anemones such as Leather Anemone (*Tealia coriacea*), Giant green Anemone (*Anthopleura xanthogrammica*) and Frilled anemone (*Metridium senile*). Encrusted along the sides of this reef are numerous types of shellfish such as Bent Nosed Macoma (*Macoma nasuta*), Pacific Littleneck Clam (*Protothaca staminea*), Rock Jingle (*Pododesmus macroschisma*), the blue Mussel (*Mytilus edulis*) and Horse Mussel (*Modiolus modiolus*). Numerous types of fin fish seen include Rock Greenling (*Hexagrammos lagocephalus*) as well Sole and Flounder. Also observed in this reef area were the previous mentioned Black Rockfish. The reef area gives way to a shell and soft mud substrate. Processing waste accumulations in the southeast portion of this section are only in small amounts. Areas along the reef are relatively free of processing waste.

The southwest portion of this section has a fairly even covering of processing waste which slowly decreased as the divers traveled to the east. Marine life is limited to Flounder except in the areas close to the reef. Waste depths are one foot or less with the exception of the very corner of this section.

The northeast and northwest portions of this section is completely free of waste except in trace amounts. The shell and mud bottom is littered with large Frilled Anemone (*Metridium senile*) attached to any solid object. The soft bottom substrate makes waste identification in this area exceeding difficult. Marine life seen was limited to the occasional sculpin.

DIVERS OBSERVATIONS

SECTION 4

This section has extensive coverage in the southeast portion of the survey area. The processing waste depths in the southeast corner reach 1.8 feet and decrease as you travel to the north. The processing waste flow appears to be in a northwest direction (Diagram 9) that follows the natural topography of this survey site. This is consistent with the flow analysis of the bottom topography (Diagram 8). Many of the waste measurements on the edge of the processing waste are very difficult to determine due to the soft substrate and waste composition. The depths along this edge range from .1 to .3 of a foot. Although waste in small amounts extended slightly past the northwest boundary divers did not survey this area due to increasing water depths. Water depths reach over 170 feet at the northwest corner with water depths at the northeast corner being 162 feet. Marine life in this area is very minimal with the exception of the occasional flat fish. It should be noted that divers observed crab in this area, either *Opolio* or small *Baradi* crab.

DIVERS OBSERVATIONS

OUTFALL LINE

This area outfall line was inspected from the termination to the initial entrance to the bay. The line is in good condition and anchored at regular intervals with square two piece concrete anchors. The outfall line has one small bridge that is suspended for approximately 40 feet where the line encounters Baileys Ledge. The line has one coupling approximately 300 feet from shore that shows no sign of leakage. The new reducer installed is in good condition and show no sign of leakage. There is a small area of coverage that occurred when the outfall line was damaged. This area of coverage is approximately 40 feet on each side of the outfall line and extends to the north along the line for approximately 80 feet. The depth of this coverage varies but are seldom over .2 of a foot. The outfall line has already acquired a significant amount of marine growth including anemones, sponges, chitons as well as two crab species. Juvenile King Crab were observed living in the marine growth attached to the outfall line.

VOLUME AND AREA MEASUREMENTS

OVERALL SURVEY SITE

The overall coverage and pattern of processing waste has changed since the last survey period. The weather conditions (North, Northeast and Northwest winds and storms) during the times preceding the survey as well as during the survey seems to be partially responsible for this change. The new deflector plate installed on the end of the outfall may also effect this change. There was a significant coverage of area to the south of the survey area although much of the coverage was less than 10 cm. To assist in understanding this dispersion pattern, the overall volume and coverage is separated into three distinct different measurements :

- **Volume and area inside the monumented survey area**
- **Volume and area over total extent measured**
- **Volume and area over entire area at 10 cm measurement**

VOLUME MEASUREMENTS MONUMENTED SURVEY AREA

TOTAL WASTE COVERAGE 116,000 SQ. FEET
2.66 ACRES

AVERAGE DEPTHS

IN AREAS OF WASTE COVERAGE .80 FEET
WASTE GREATEST DEPTH 12.1 FEET

VOLUME MEASUREMENTS ENTIRE EXTENT AREA

TOTAL WASTE COVERAGE 157,931 SQ. FEET
3.63 ACRES

AVERAGE DEPTHS

IN AREAS OF WASTE COVERAGE .72 FEET
WASTE GREATEST DEPTH 12.1 FEET

VOLUME MEASUREMENTS ENTIRE EXTENT AREA 10 cm

TOTAL WASTE COVERAGE 108,824 SQ. FEET
2.50 ACRES

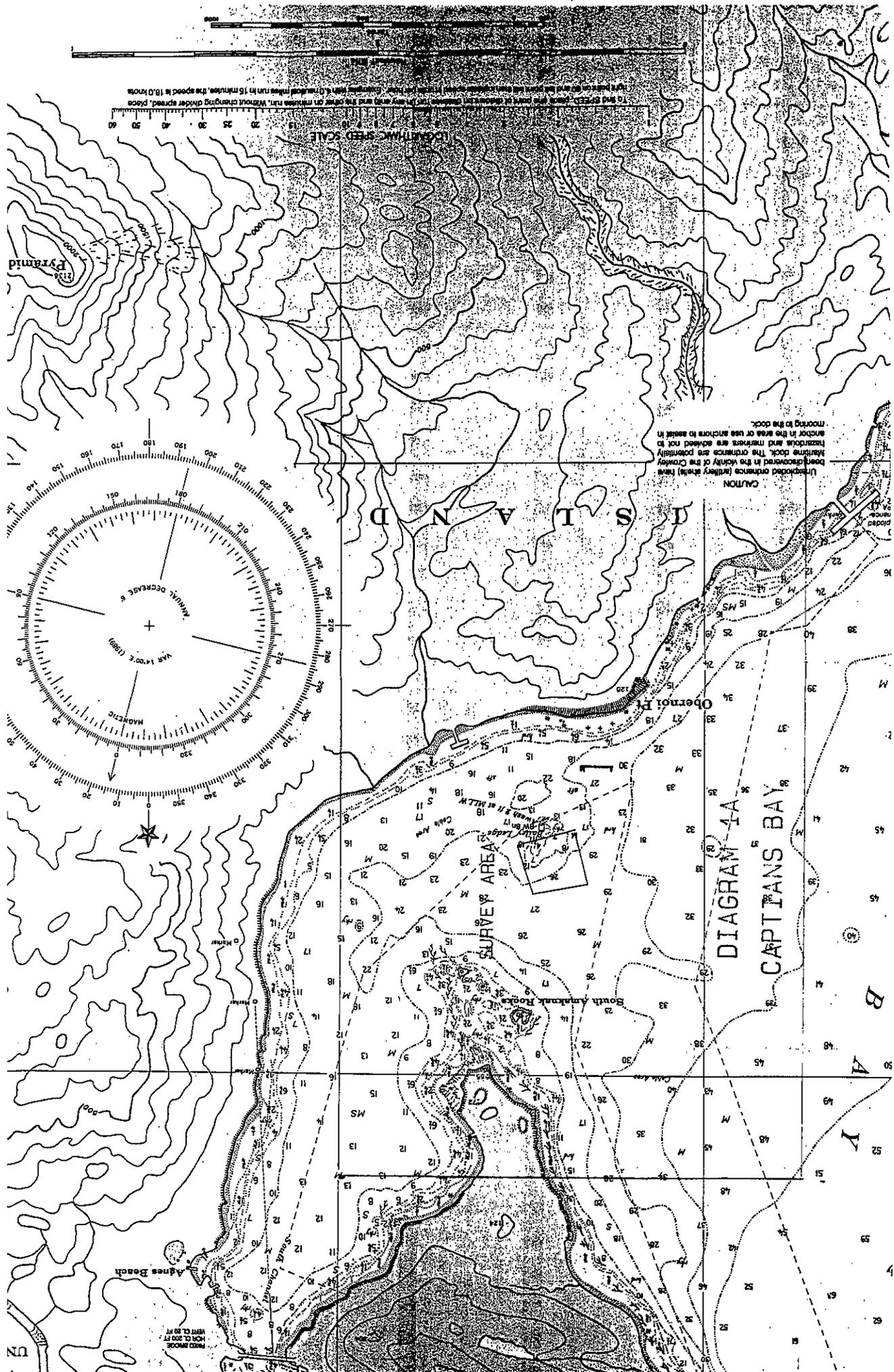
AVERAGE DEPTHS

IN AREAS OF WASTE COVERAGE
WASTE GREATEST DEPTH 12.1 FEET

DIAGRAMS

DIAGRAMS FOR TEXT

DIAGRAM 1a, b	<i>OVERVIEW OF SURVEY SITE</i>
DIAGRAM 2	<i>LINE REELS</i>
DIAGRAM 3	<i>DATA POINT MATRIX OF SURVEY SITE</i>
DIAGRAM 4	<i>OUTFALL DIFFUSER HEAD</i>
DIAGRAM 5	<i>MONUMENT MARKER</i>
DIAGRAM 6	<i>REPOSITIONED MARKERS & MISSING MARKERS</i>
DIAGRAM 7	<i>OLD WASTE PILE</i>
DIAGRAM 8	<i>FLOW ANALYSIS OF BOTTOM TOPOGRAPHY</i>
DIAGRAM 9	<i>WASTE EXTENT IN MONUMENTED SURVEY AREA</i>
DIAGRAM 10	<i>WASTE EXTENT 10 cm COVERAGE</i>
DIAGRAM 11	<i>WASTE EXTENT ENTIRE AREA</i>
DIAGRAM 12	<i>WASTE EXTENT ENTIRE AREA 10 cm COVERAGE</i>



TO FIND SPEED, READ THE POINT OF INDICATED NUMBER ON THE SCALE AND DRAW A LINE TO THE POINT ON THE SCALE. WITHOUT CHANGING OTHER SPEED, PLACE THE POINT ON THE SCALE AND READ THE SPEED ON THE SCALE. (Example: If the point is 10 on the scale and the speed is 10.0 knots, the speed is 10.0 knots.)

CONTINUING SPEED SCALE

CAUTION
Unspiked ordnance (artillery shells) have been discovered in the vicinity of the Crownley. Hazardous and markers are advised not to anchor in the area or use anchors to assist in mooring to the dock.

DIAGRAM 1A
CAPTAINS BAY

SURVEY AREA

Agnes Beach

FIXED PROBE
HEIGHT 200 FT
DEPTH 20 FT

UN

- PERMANENT MARKERS
- 40 DATA POINTS
- 40 GRID LINE WITH REFERENCE MARKS

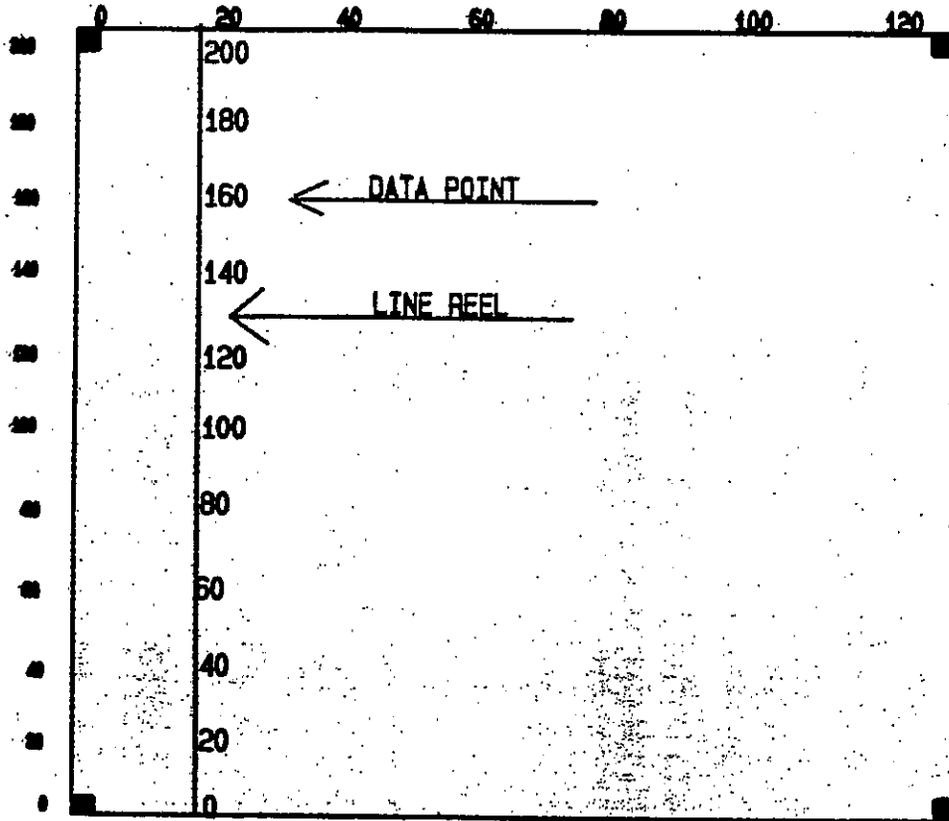
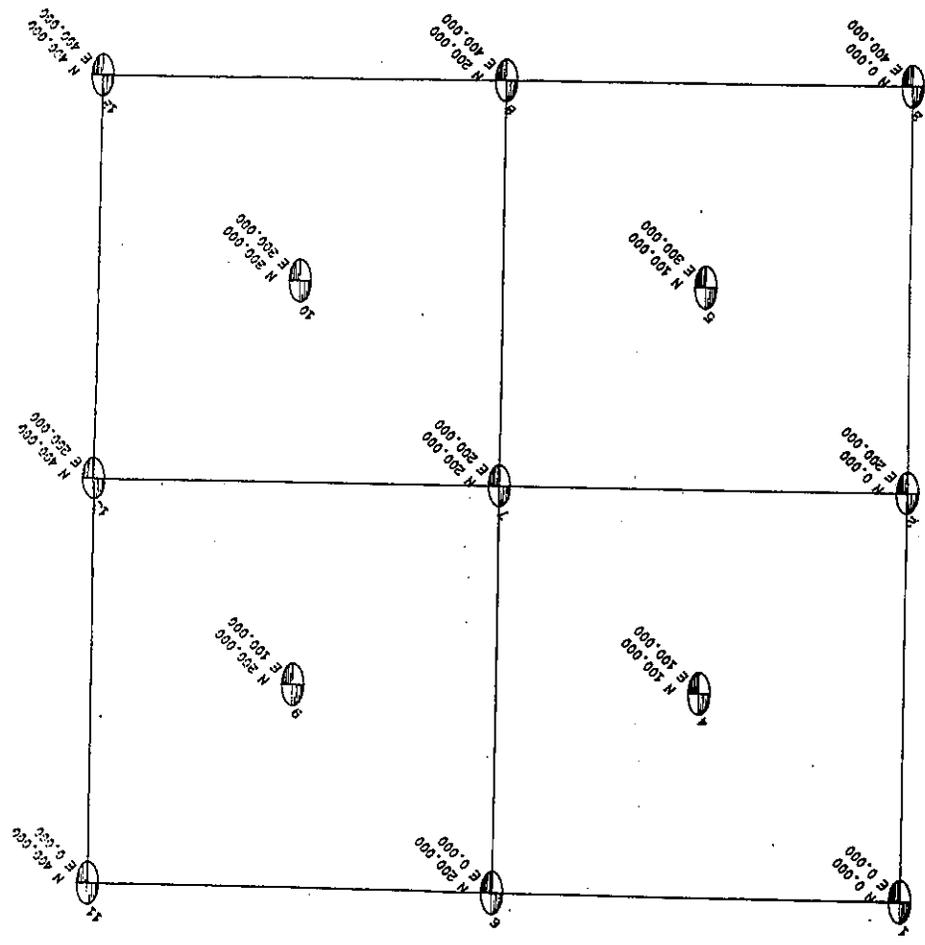


DIAGRAM 2
WESTWARD SEAFOODS

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DIAGRAM 4
DIFFUSER HEAD



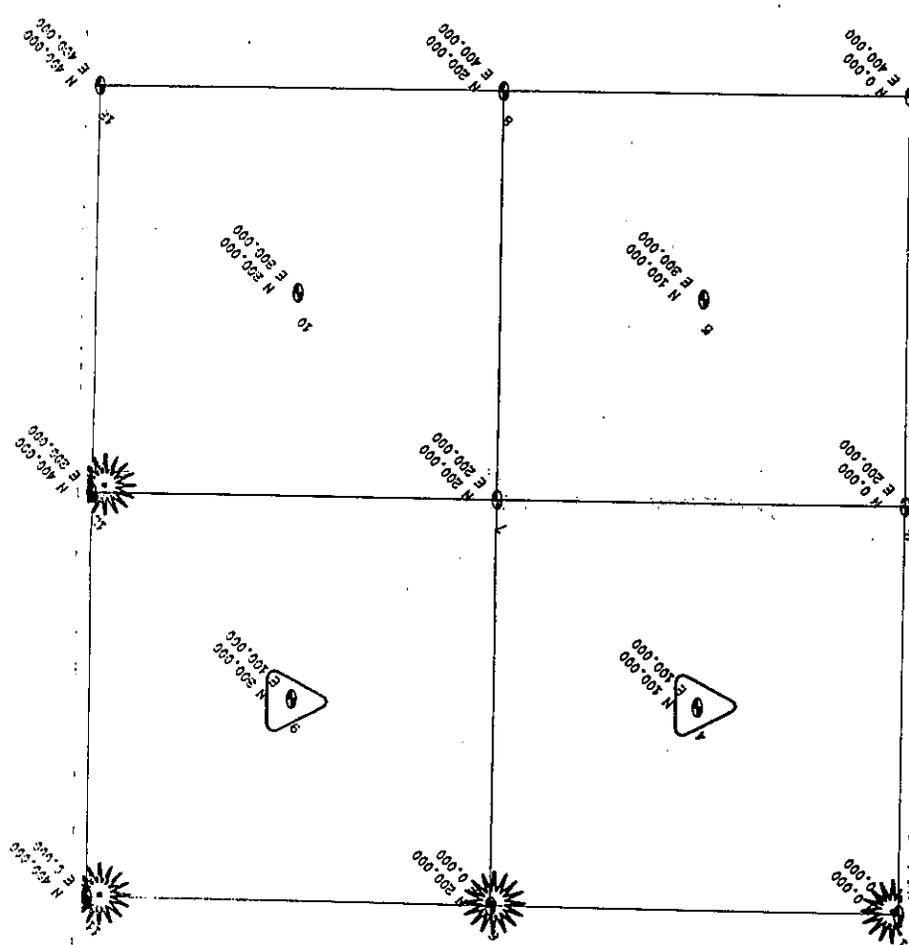
BOTTOM



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DUTCH HARBOR, ALASKA

MARCH 1995

DIAGRAM 5
LOCATION OF MONUMENTS



 REPOSITIONED MONUMENTS
 MISSING MONUMENTS

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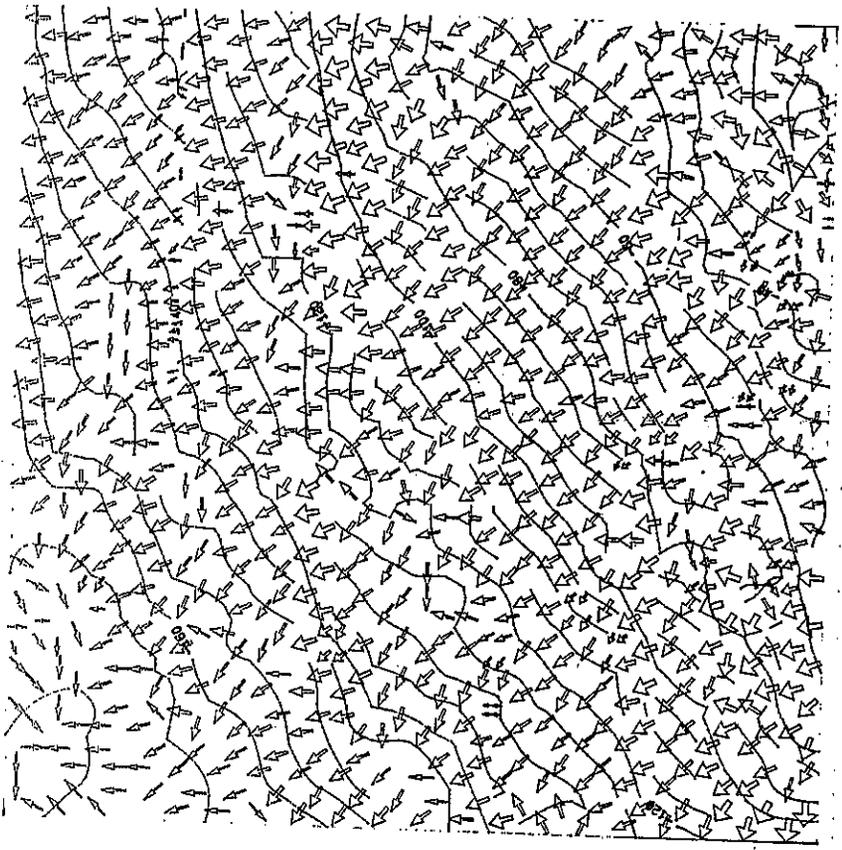
THE ENVIRONMENTAL SURVEY PEOPLE

DUTCH HARBOR, ALASKA

DIAGRAM 6

DISTURBED MONUMENTS

MARCH, 1995



WESTWARD SEAFOODS
ENVIRO-TECH DIVING, INC.

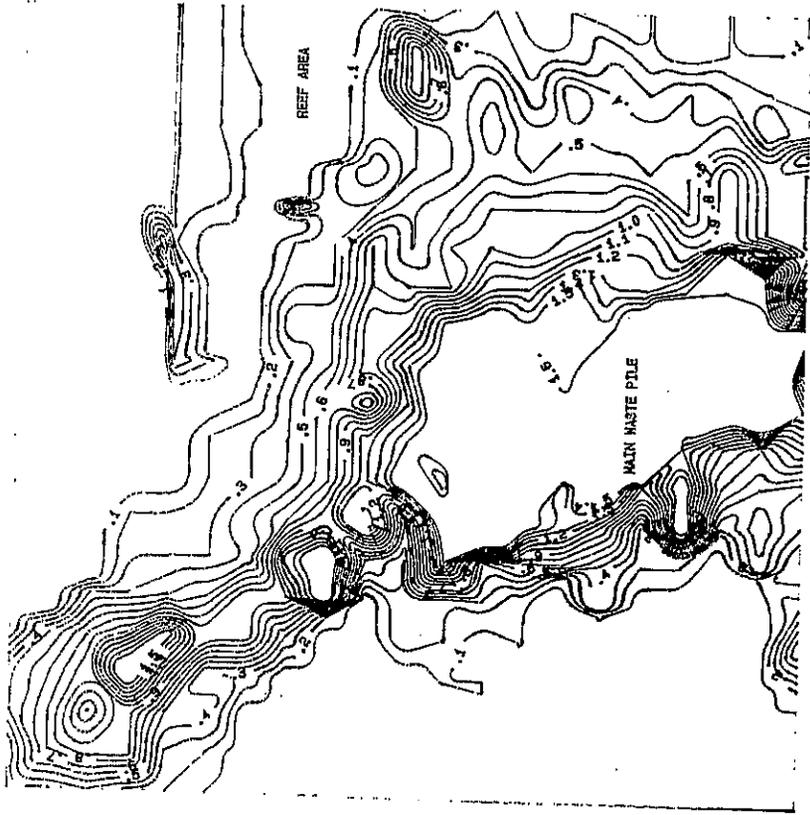
THE ENVIRONMENTAL SURVEY PEOPLE
DUTCH HARBOR, ALASKA

DIAGRAM 8

FLOW ANALYSIS W/ TOPOGRAPHIC

MARCH 1995

MINOR CONTOUR 5 FEET
MAJOR CONTOUR 20 FEET



WESTWARD SEAFOODS

ENVIRO-TECH DIVING, INC.

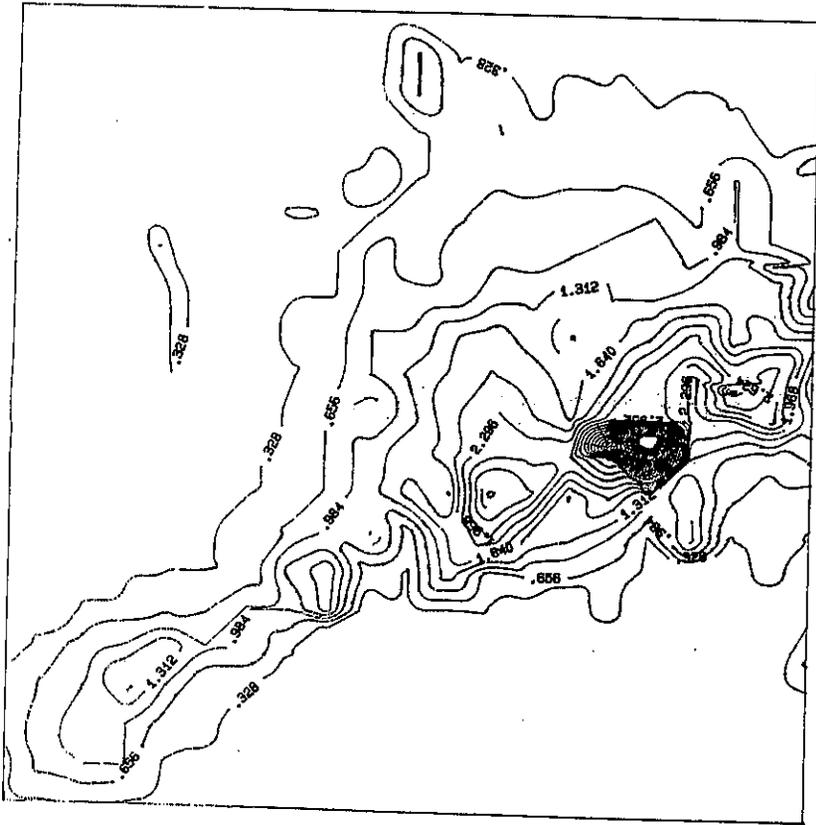
THE ENVIRONMENTAL SURVEY PEOPLE

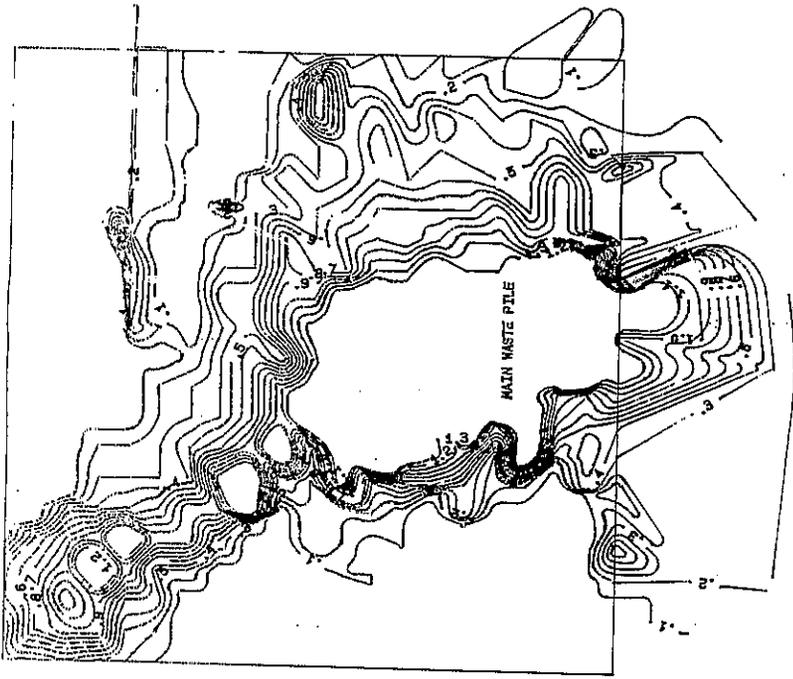
DUTCH HARBOR, ALASKA

DIAGRAM 9

WASTE EXTENT

MARCH 1995





WESTWARD SEAFOODS

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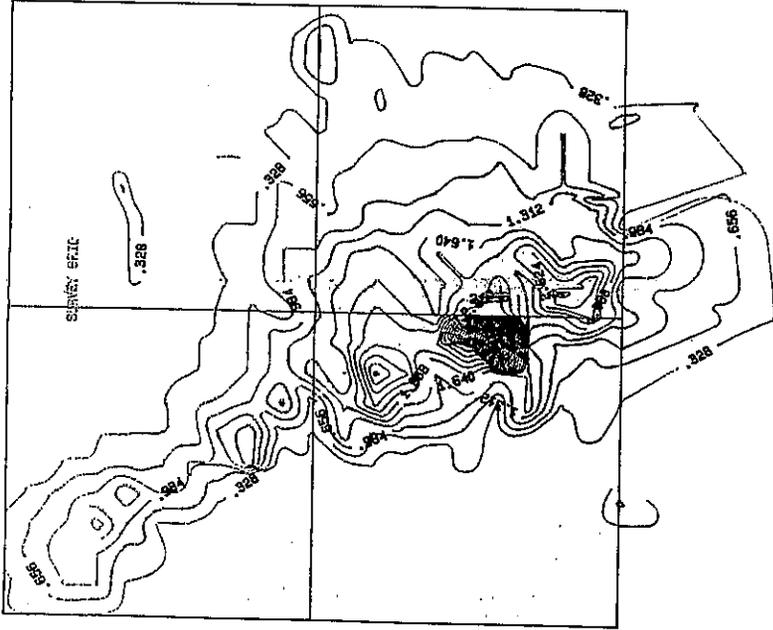
DUTCH HARBOR, ALASKA

DIAGRAM 11

WASTE EXTENT ENTIRE AREA

MARCH 1995

CONTOUR 0.1 FEET



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DIAGRAM 12

WASTE EXTENT ENTIRE AREA

MARCH 1995

CONTOUR 10 CM

MAPS AND DATA POINT INFORMATION.

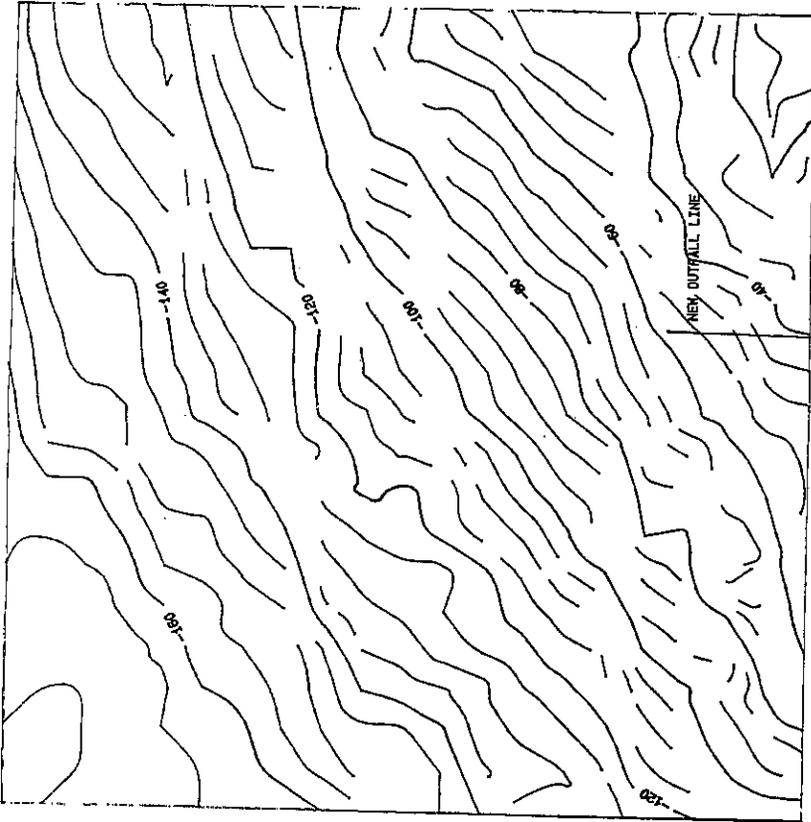
BOTTOM ONLY - MAPS AND DATA

BOTTOM TOPOGRAPHIC MAP

BOTTOM THREE DIMENSIONAL MAP

BOTTOM THREE DIMENSIONAL WITH TOPOGRAPHIC OVERLAY

DATA POINT INFORMATION



WESTWARD SEAFOODS

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THE ENVIRONMENTAL SURVEY PEOPLE

DUTCH HARBOR, ALASKA

BOTTOM ONLY

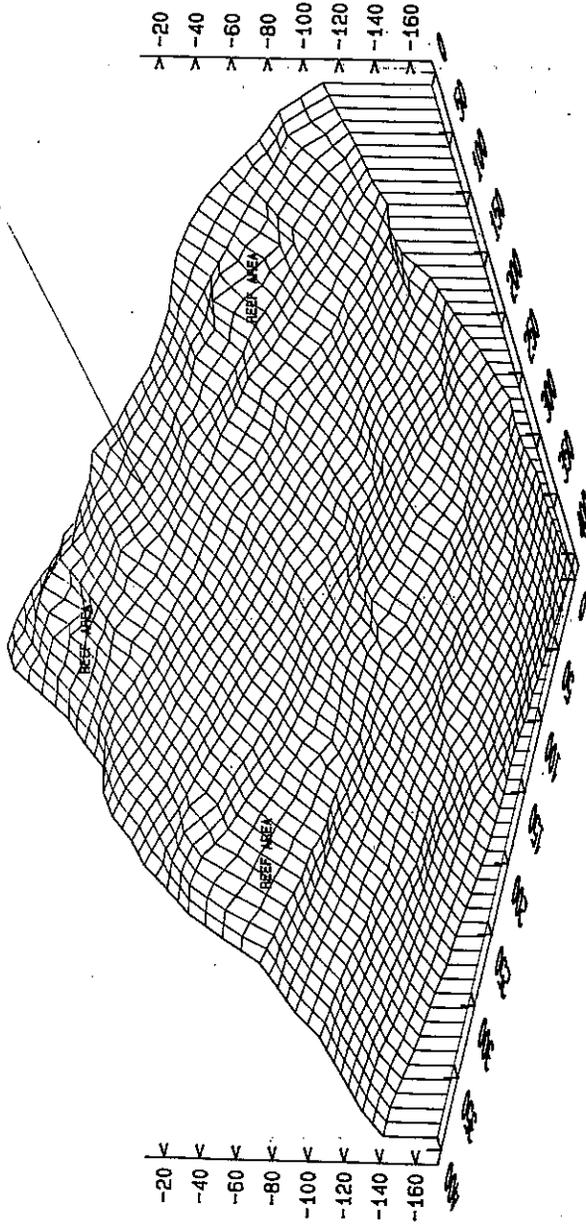
TOPOGRAPHIC MAP

MARCH 1995

MINOR CONTOUR 5 FEET

MAJOR CONTOUR 20 FEET

NEW OUTFALL LINE



WESTWARD SEAFOODS

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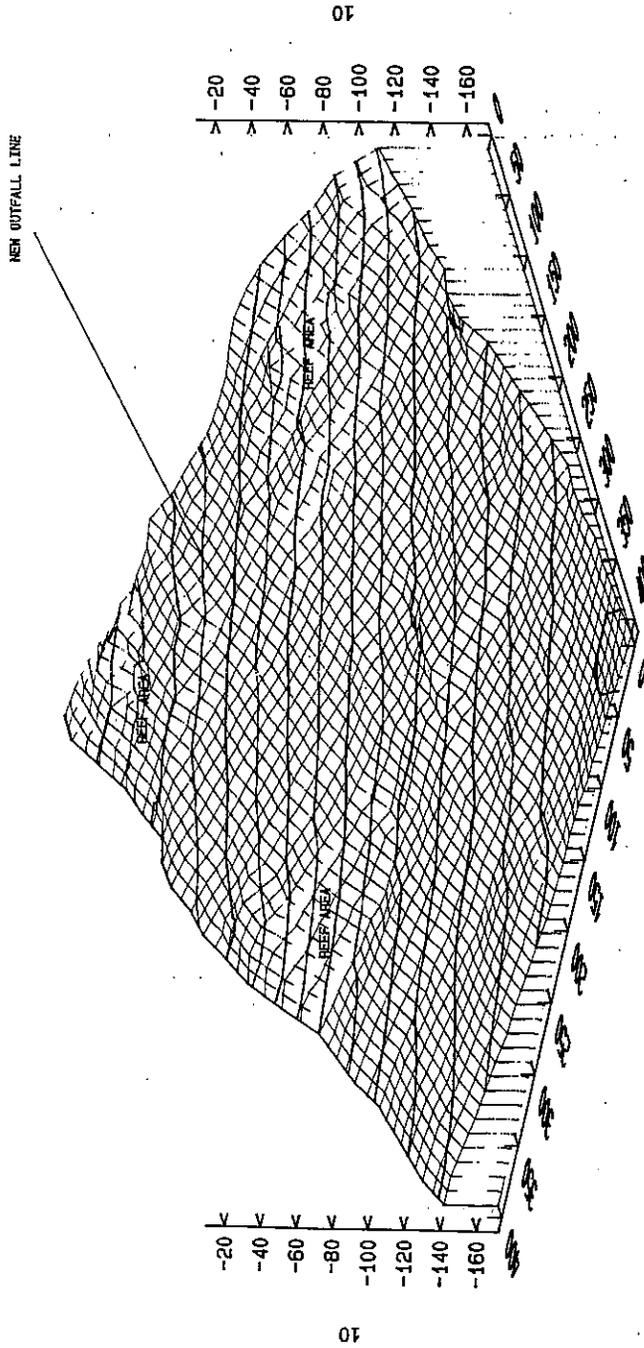
THE ENVIRONMENTAL SURVEY PEOPLE
DUTCH HARBOR, ALASKA

BOTTOM ONLY

3-DIMENSIONAL MAP

MARCH 1995

MINOR CONTOUR
MAJOR CONTOUR



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 DUTCH HARBOR, ALASKA

BOTTOM ONLY
 3-DIMENSIONAL MAP

MARCH 1995

MINOR CONTOUR
 MAJOR CONTOUR

MAPS AND DATA POINT INFORMATION

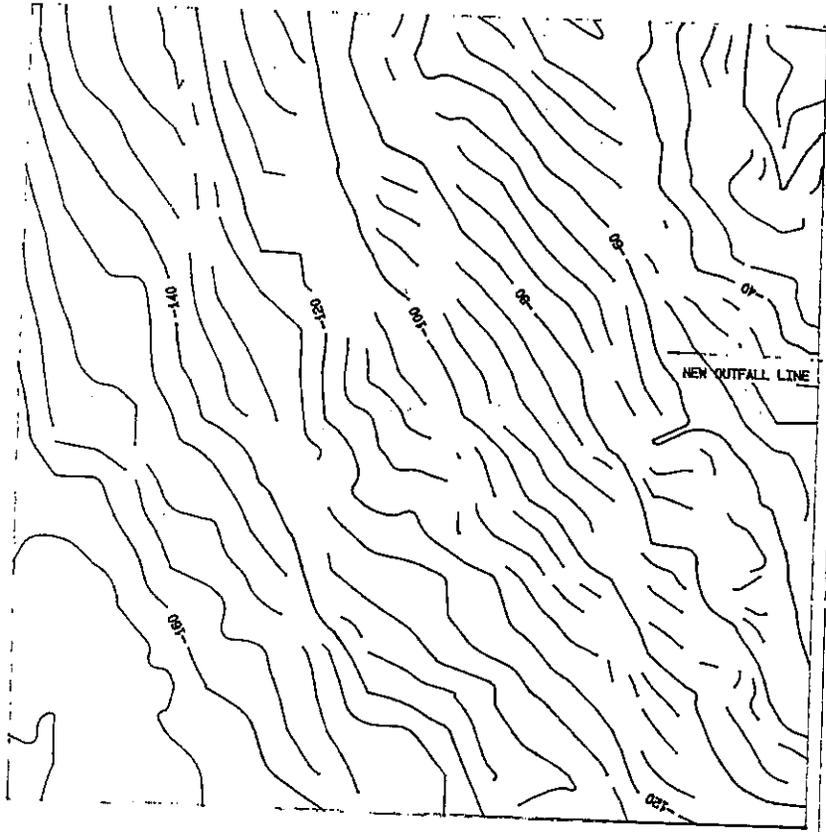
BOTTOM WITH WASTE - MAPS AND DATA

BOTTOM TOPOGRAPHIC WITH WASTE

BOTTOM THREE DIMENSIONAL WITH WASTE

BOTTOM THREE DIMENSIONAL WITH WASTE AND TOPOGRAPHIC OVERLAY

DATA POINT INFORMATION



WESTWARD SEAFOODS
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THE ENVIRONMENTAL SURVEY PEOPLE
DUTCH HARBOR, ALASKA

BOTTOM WITH WASTE
TOPOGRAPHIC MAP

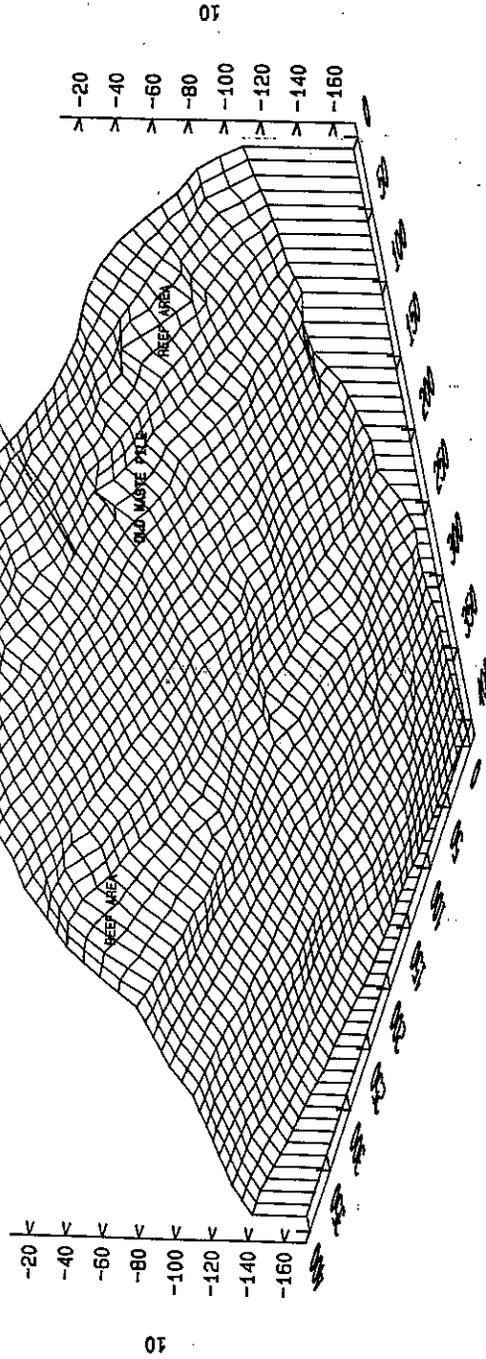
MARCH 1995

VERTICAL EXAGGERATION * 0

MINOR CONTOUR 5 FEET

MAJOR CONTOUR 20 FEET

NEW OUTFALL LINE



WESTWARD SEAFOODS

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DUTCH HARBOR, ALASKA

BOTTOM WITH WASTE

3-DIMENSIONAL MAP

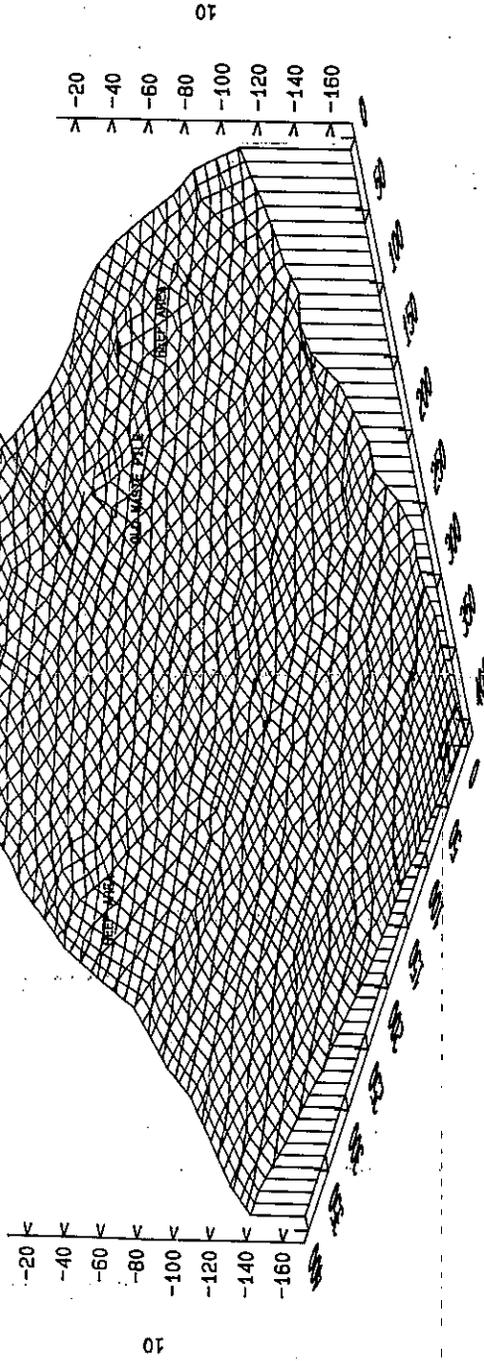
MARCH 1995

VERTICAL EXAGGERATION * 0

MINOR CONTOUR 5 FEET

MAJOR CONTOUR 20 FEET

NEK DUTFALL LINE



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DUTCH HARBOR, ALASKA

MARCH 1995
VERTICAL EXAGGERATION * 0
MINOR CONTOUR 5 FEET
MAJOR CONTOUR 20 FEET

BOTTOM WITH WASTE
3-DIMENSIONAL MAP W/ TOPOGRAPHIC

MAPS AND DATA POINT INFORMATION

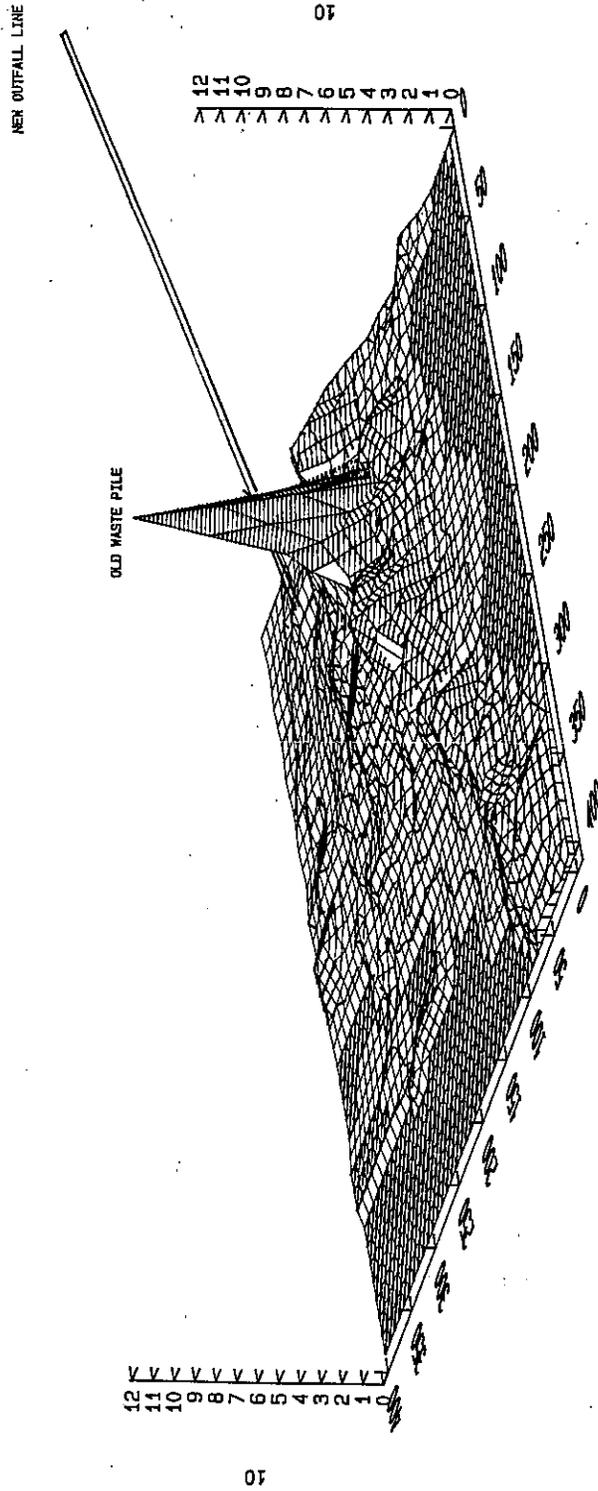
WASTE ONLY - MAPS AND DATA

WASTE TOPOGRAPHIC MAP

WASTE THREE DIMENSIONAL MAP

WASTE THREE DIMENSIONAL WITH TOPOGRAPHIC OVERLAY

DATA POINT INFORMATION



WASTE HEIGHT IS EXAGGERATED 40 TIMES TO SHOW WASTE COVERAGE OF MINOR DEPTHS IN SURVEY AREA

WESTWARD SEAFOODS

ENVIRO TECH DIVING INC

THE ENVIRONMENTAL SURVEY PEOPLE

DUTCH HARBOR, ALASKA

WASTE

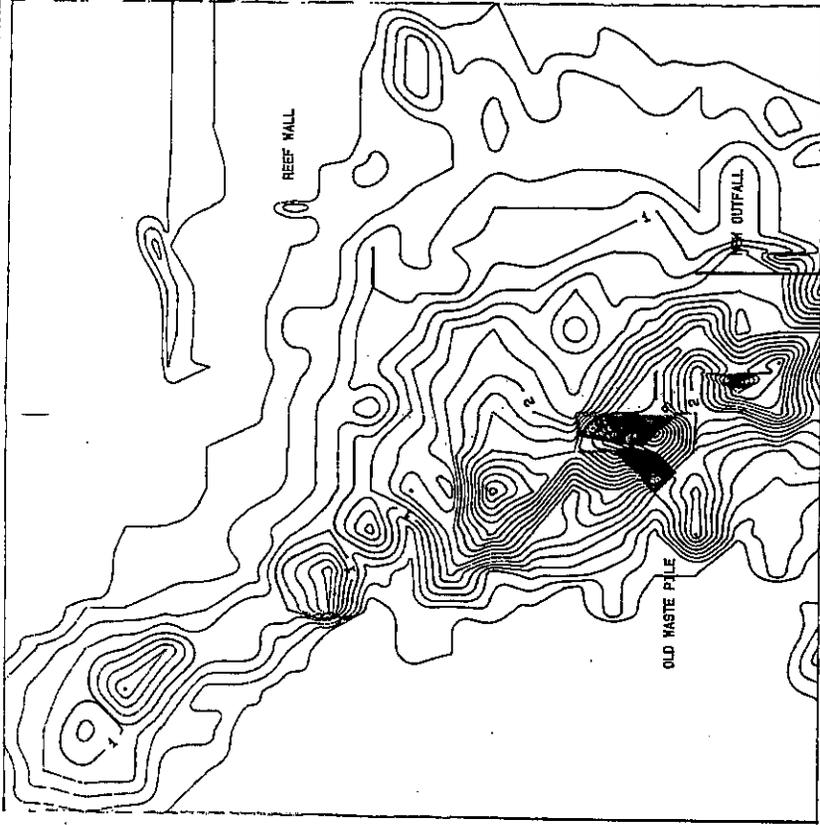
3-DIMENSIONAL MAP W/ TOPOGRAPHIC

MARCH 1995

VERTICAL EXAGGERATION * 40

MINOR CONTOUR .20 FEET

MAJOR CONTOUR 1.0 FEET



WESTWARD SEAFOODS

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DUTCH HARBOR, ALASKA

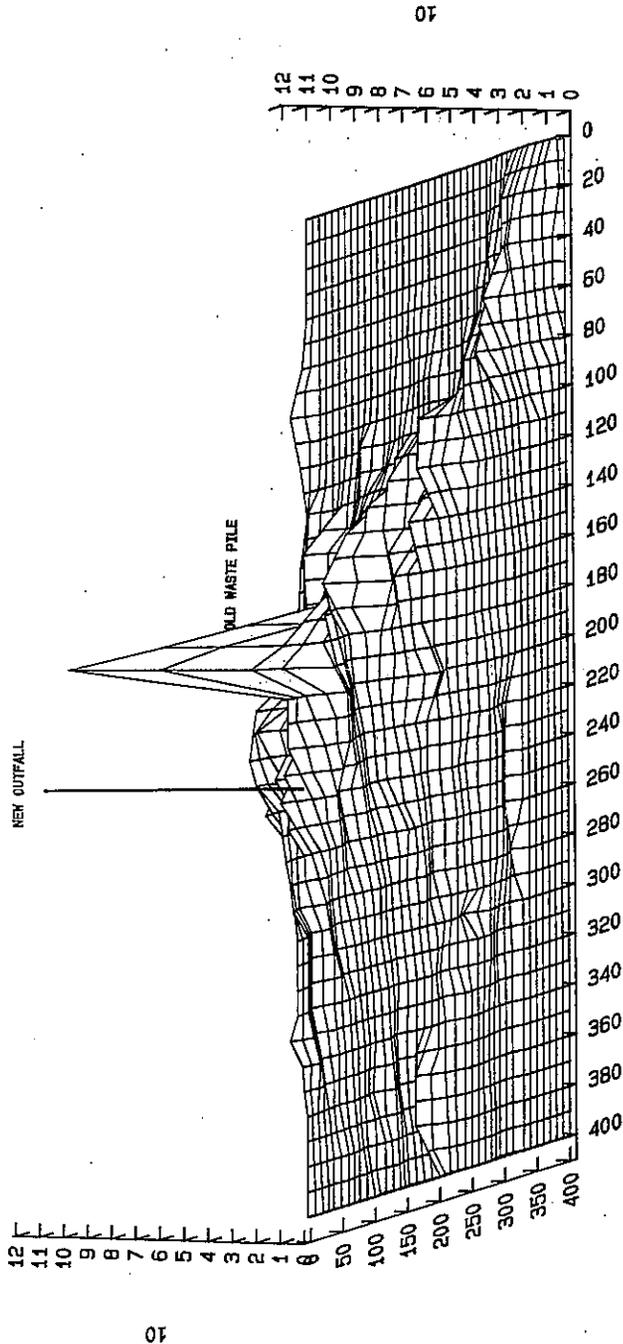
WASTE

TOPOGRAPHIC MAP

MARCH 1995

MINOR CONTOUR .20 FEET

MAJOR CONTOUR 1.0 FEET



WASTE HEIGHT IS EXAGGERATED 10 TIMES TO SHOW WASTE COVERAGE OF MINOR DEPTHS IN SURVEY AREA

WESTWARD SEAFOODS

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THE ENVIRONMENTAL SURVEY PEOPLE

DUTCH HARBOR, ALASKA

WASTE

THREE DIMENSIONAL MAP

MARCH 1995

VERTICAL EXAGGERATION * 10

MINOR CONTOUR 10 FEET

MAJOR CONTOUR 20 FEET