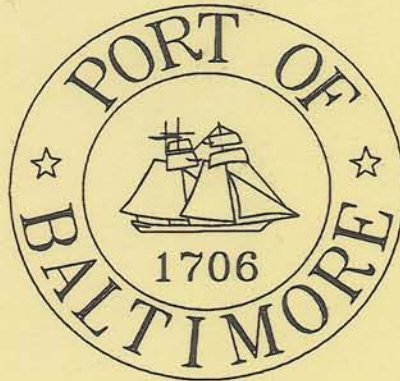


DRAFT

**MARYLAND DEPARTMENT OF TRANSPORTATION  
MARYLAND PORT ADMINISTRATION**



**C&D CANAL AND BALTIMORE CONNECTING  
CHANNELS DEEPENING PROJECT**

**COST ANALYSIS SUPPLEMENT**

**37 FT CHANNEL**

**Prepared for:**

**Maryland Port Administration  
Office of Harbor Development  
2310 Broening Highway  
Baltimore, MD 21224**

**Prepared by:**

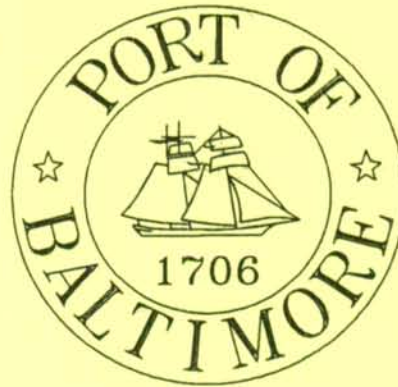
**Gahagan & Bryant Associates, Inc.  
9008-0 Yellow Brick Road  
Baltimore, MD 21237**

**May 26, 1998**

**ITEM # 1005222 05/98 SHELF #3**  
C&D Canal & Baltimore Connecting Channels  
Deepening Project Cost Analysis Supplement 37 Ft.  
Channel

DRAFT

**MARYLAND DEPARTMENT OF TRANSPORTATION  
MARYLAND PORT ADMINISTRATION**



**C&D CANAL AND BALTIMORE CONNECTING  
CHANNELS DEEPENING PROJECT**

**COST ANALYSIS SUPPLEMENT**

**37 FT CHANNEL**

**Prepared for:**

**Maryland Port Administration  
Office of Harbor Development  
2310 Broening Highway  
Baltimore, MD 21224**

**Prepared by:**

**Gahagan & Bryant Associates, Inc.  
9008-0 Yellow Brick Road  
Baltimore, MD 21237**

**May 26, 1998**

# **EXECUTIVE COMMITTEE**

## **CHESAPEAKE AND DELAWARE CANAL-BALTIMORE HARBOR CONNECTING CHANNELS (DEEPENING), DE AND MD PRECONSTRUCTION ENGINEERING AND DESIGN**

**U.S. Army Corps of Engineers, Philadelphia District  
Wanamaker Building, 100 Penn Square East  
Philadelphia, Pennsylvania**

**May 28, 1998**

**U.S. Army Corps of Engineers, Philadelphia  
Maryland Department of Transportation  
Maryland Port Administration**



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE HARBOR  
CONNECTING CHANNELS PRECONSTRUCTION ENGINEERING AND DESIGN**

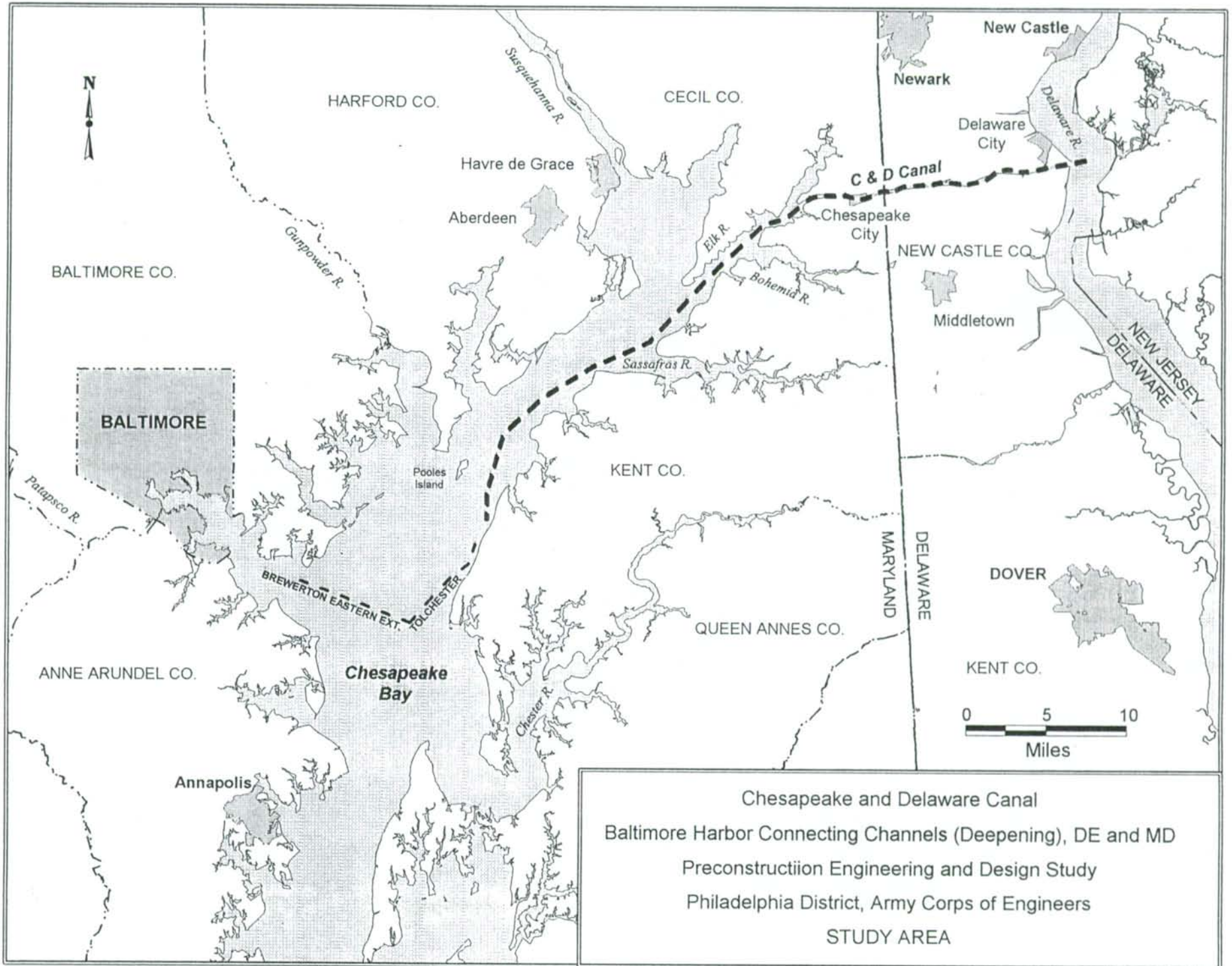
**EXECUTIVE COMMITTEE MEETING  
MAY 28, 1998**

1. **INTRODUCTIONS** - Tay Yoshitani, LTC Robert Keyser
  - Meeting Objectives
2. **CORPS OVERVIEW** - Frank Master
  - **Design Tasks**
    - Quantities (O&M and Initial) - Gahagan & Bryant Associates
    - Preliminary Cost Estimates - Gahagan & Bryant Associates
    - Erosion and Bank Stabilization Analyses
    - Subsurface Investigations
    - Channel Test Pits
  - **Economic Tasks** - Louis Berger, Inc.
    - Shipping Line Questionnaires
    - Commodity Projections
    - Fleet Projections
    - Diversion Percentages
    - Queuing and Delay
    - Benefit Analysis
  - **Environmental Tasks**
    - Three-Dimensional Hydrodynamic Modeling
    - Chemical Testing
    - Environmental Upland Assessment
    - USF&W Studies
    - Groundwater Evaluations
  - **Formulation Tasks**
    - Project Optimization
3. **SCHEDULE** - All
4. **PUBLIC INVOLVEMENT** - Frank Master, Frank Hamons
  - Working Group
  - Customer Satisfaction
5. **DISCUSSION** - All



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE  
HARBOR CONNECTING CHANNELS  
(DEEPENING), DE AND MD  
PRECONSTRUCTION ENGINEERING AND DESIGN**

**STUDY AREA**



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE  
HARBOR CONNECTING CHANNELS  
(DEEPENING), DE AND MD  
PRECONSTRUCTION ENGINEERING AND DESIGN**

**BENEFIT ANALYSIS**



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE  
HARBOR CONNECTING CHANNELS  
(DEEPENING), DE AND MD  
PRECONSTRUCTION ENGINEERING AND DESIGN**

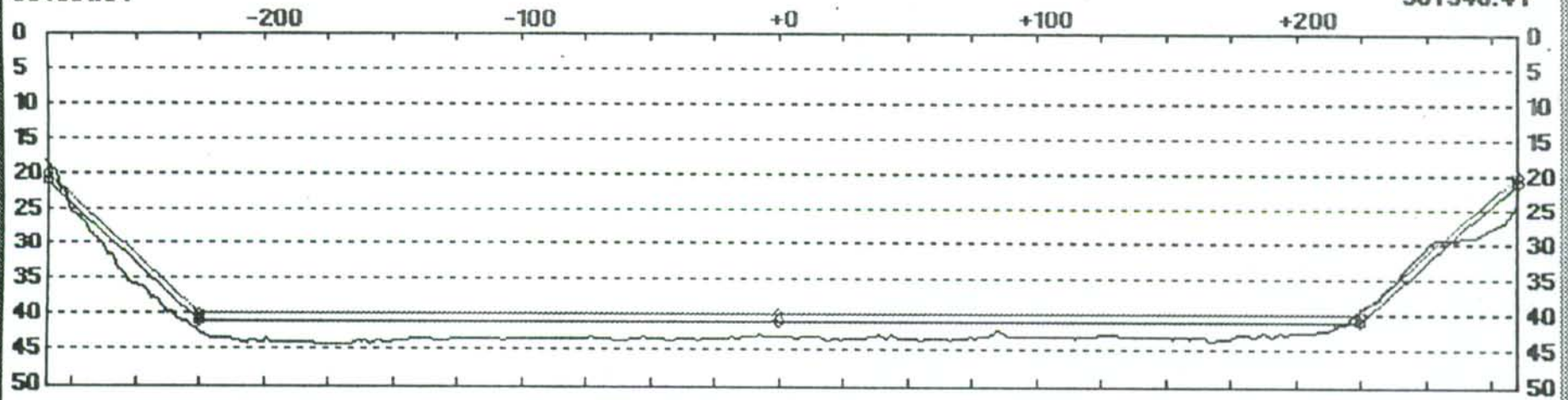
**SAMPLE CROSS SECTIONS**



Volume Cross Sections

596595.6X  
564651.0Y

597308.5X  
567348.4Y



Line 10 of 23, Sounding File: 22p600.edt, Template File: ex4000.tmp, Subgrade: 1

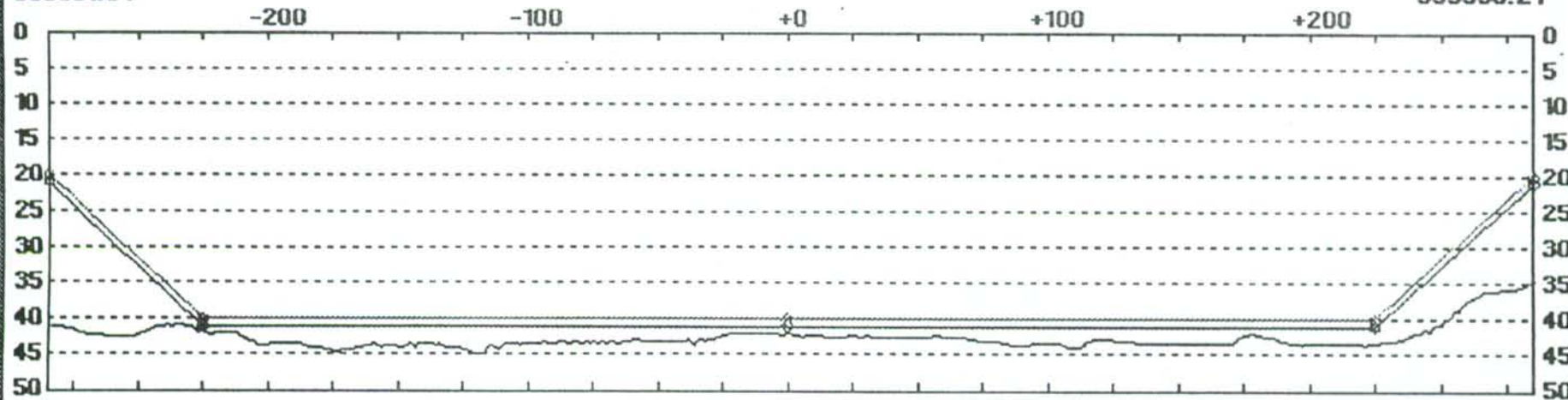
Near Biddle's Pt DA



Volume Cross Sections

554265.5X  
559001.3Y

554312.4X  
559990.2Y



Line 2 of 3, Sounding File: 66800.edt, Template File: ex4000.tmp, Subgrade: 1

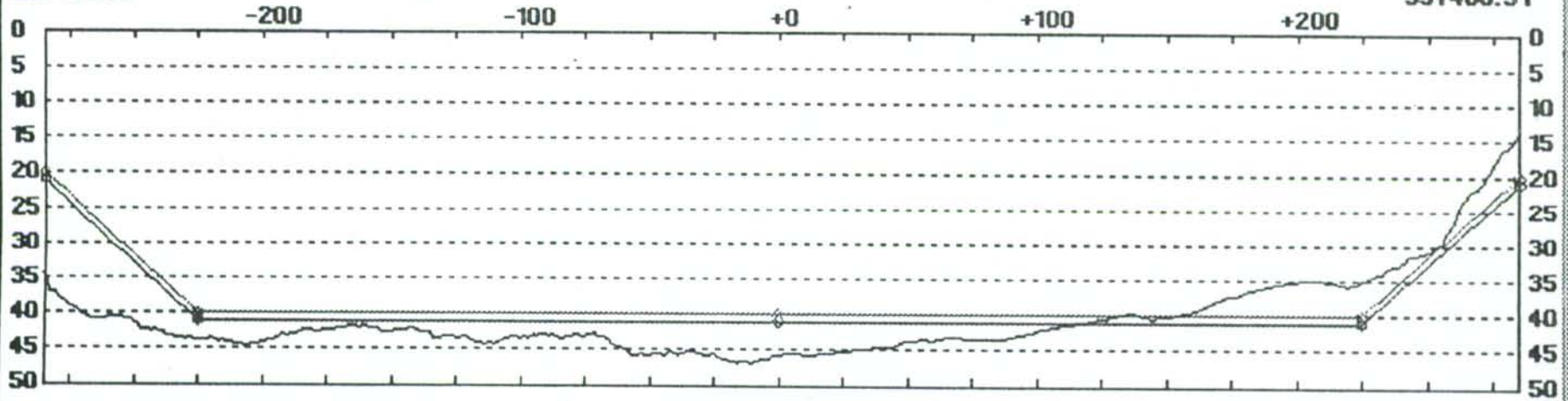
Near DE/MD State Line



Volume Cross Sections

545387.5X  
556478.6Y

545455.2X  
557466.3Y



Line 12 of 12, Sounding File: 76200.edt, Template File: ex4000.tmp, Subgrade: 1

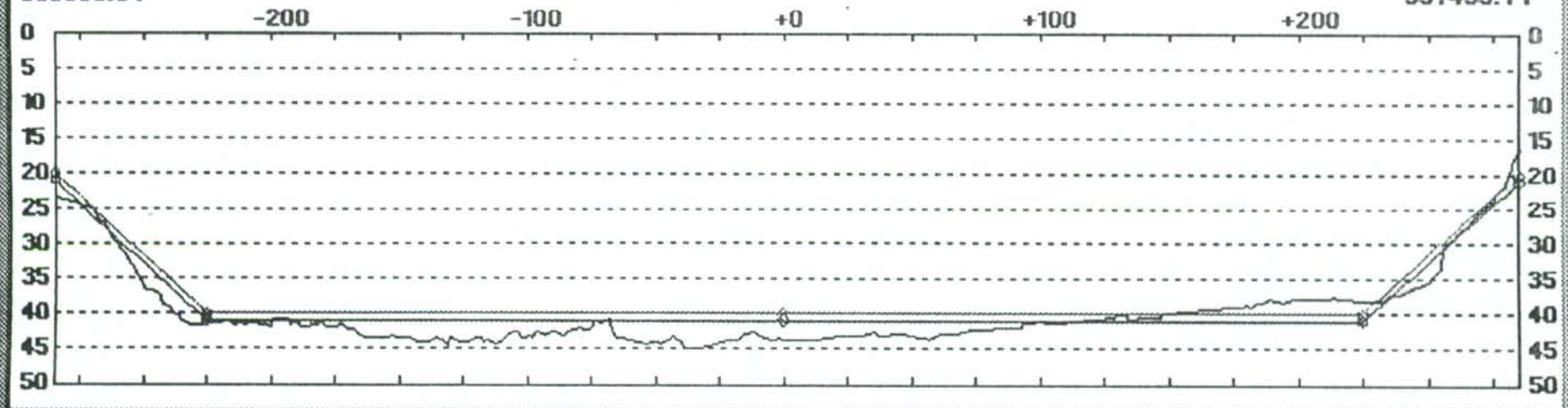
Chesapeake City, MD  
At opening to the basin



Volume Cross Sections

544988.4X  
556506.0Y

545056.1X  
557493.7Y

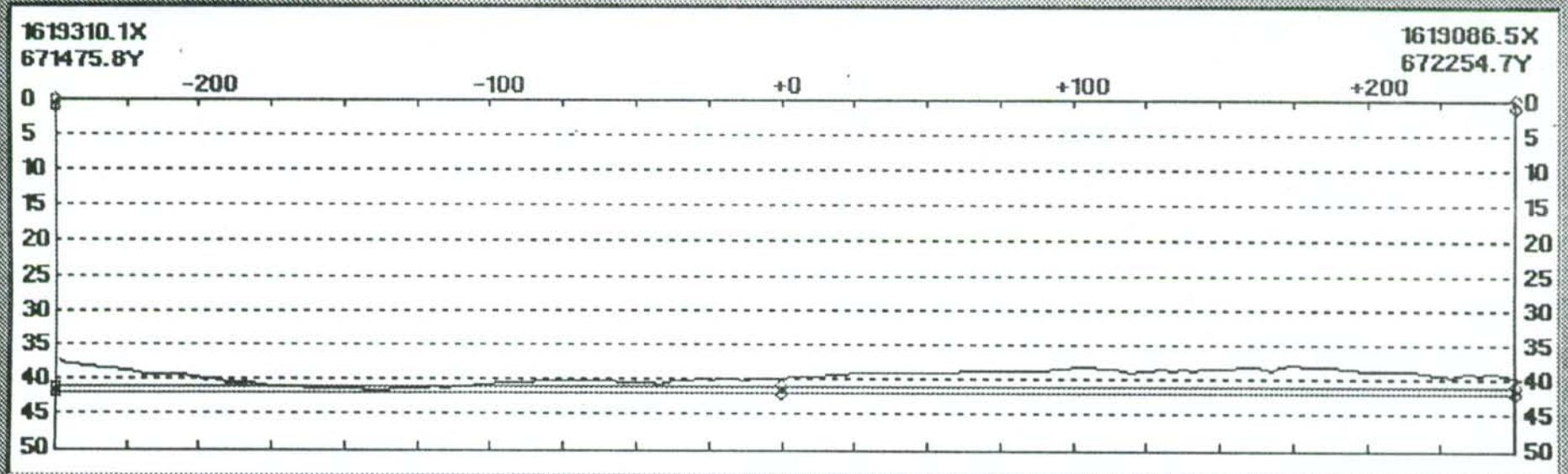


Line 13 of 13, Sounding File: 76600.edt, Template File: ex4000.tmp, Subgrade: 1

Chesapeake City, MD  
Just east of Bridge



Volume Cross Sections

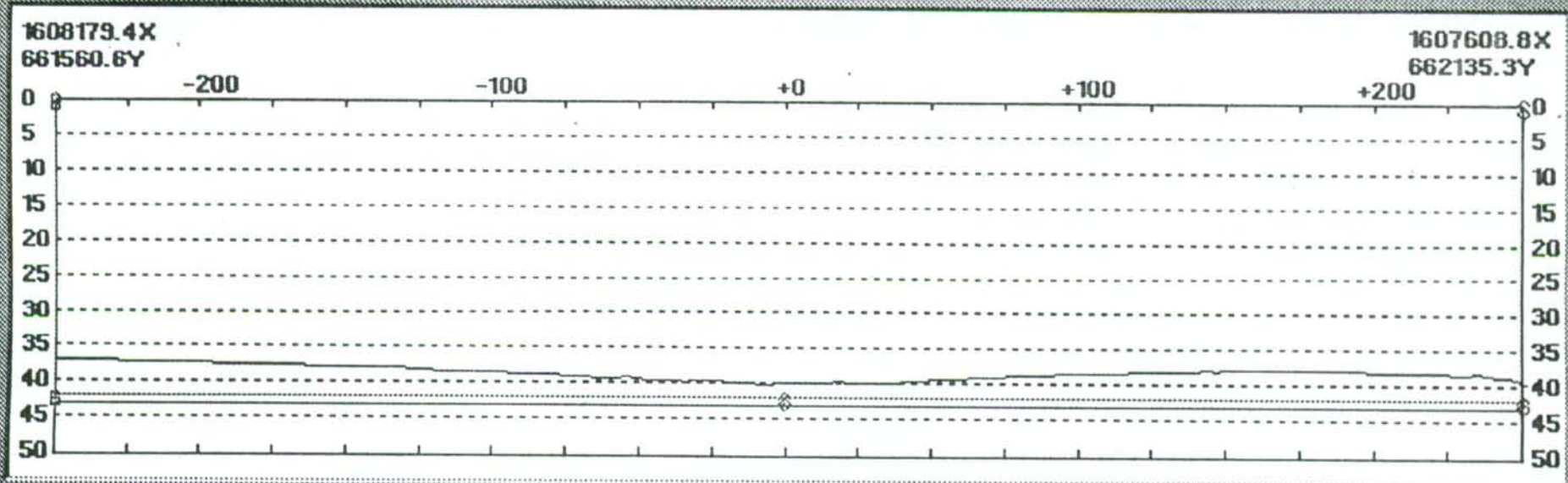


Line 1 of 151, Sounding File: 108200r.edt, Template File: jg401.tmp, Subgrade: 1

Near Town Pt Bend



Volume Cross Sections



Line 41 of 151, Sounding File: 123400.edt, Template File: jg402.tmp, Subgrade: 1

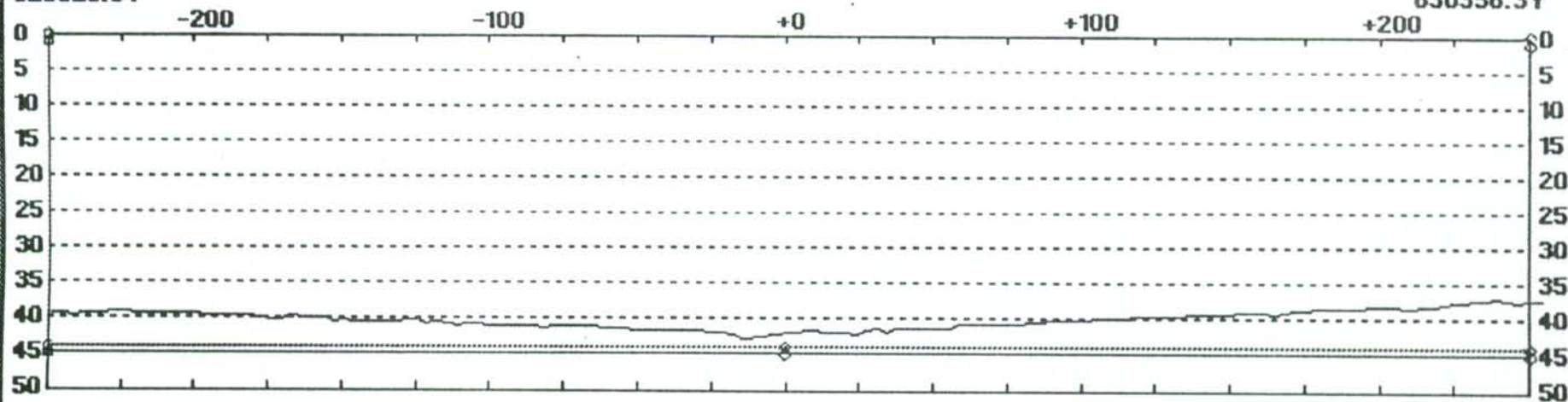
Near confluence  
with Bohemia River



Volume Cross Sections

1576511.9X  
629620.9Y

1576172.3X  
630356.3Y



Line 8 of 192, Sounding File: 168600.edt, Template File: jg404.tmp, Subgrade: 1

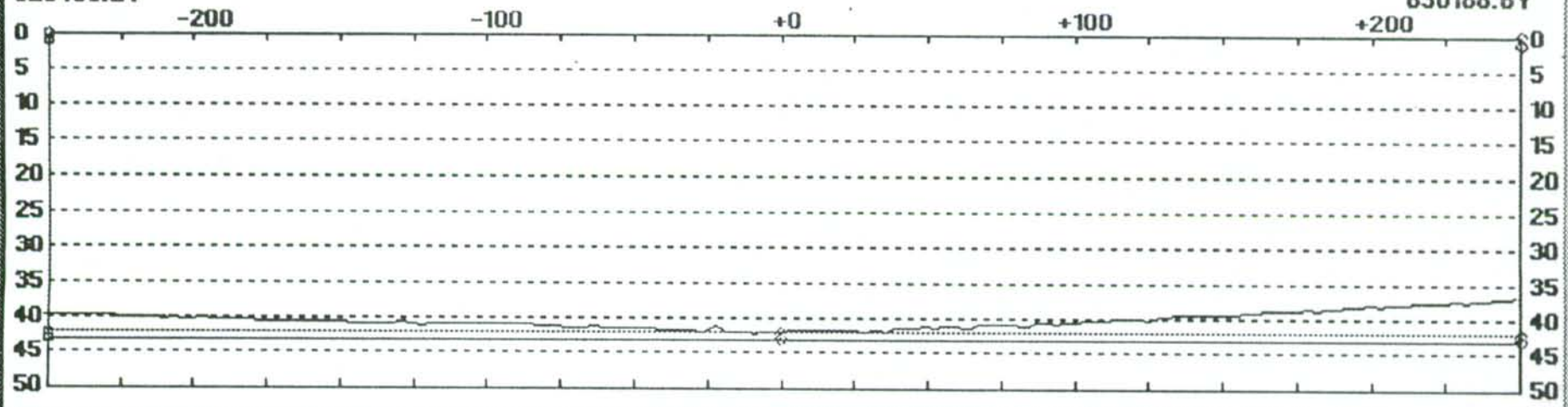
Near confluence with  
Sassaparilla River



Volume Cross Sections

1576148.8X  
629453.2Y

1575809.2X  
630188.6Y



Line 9 of 192, Sounding File: 169000.edt, Template File: jg402.tmp, Subgrade: 1

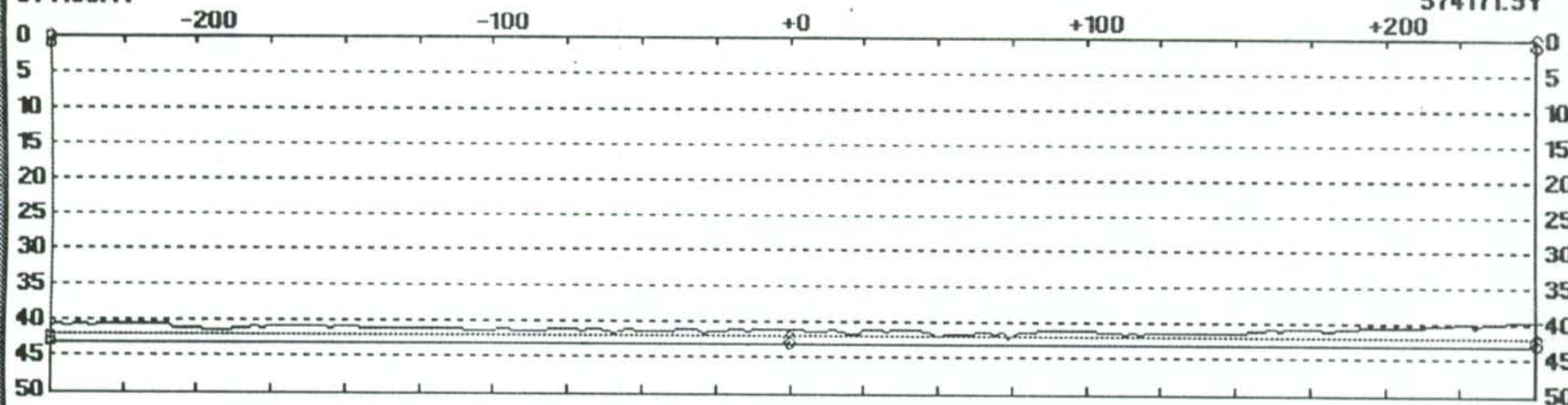
Near Confluence with  
Sassaparilla River



Volume Cross Sections

1528947.8X  
574180.TY

1527907.6X  
574171.9Y

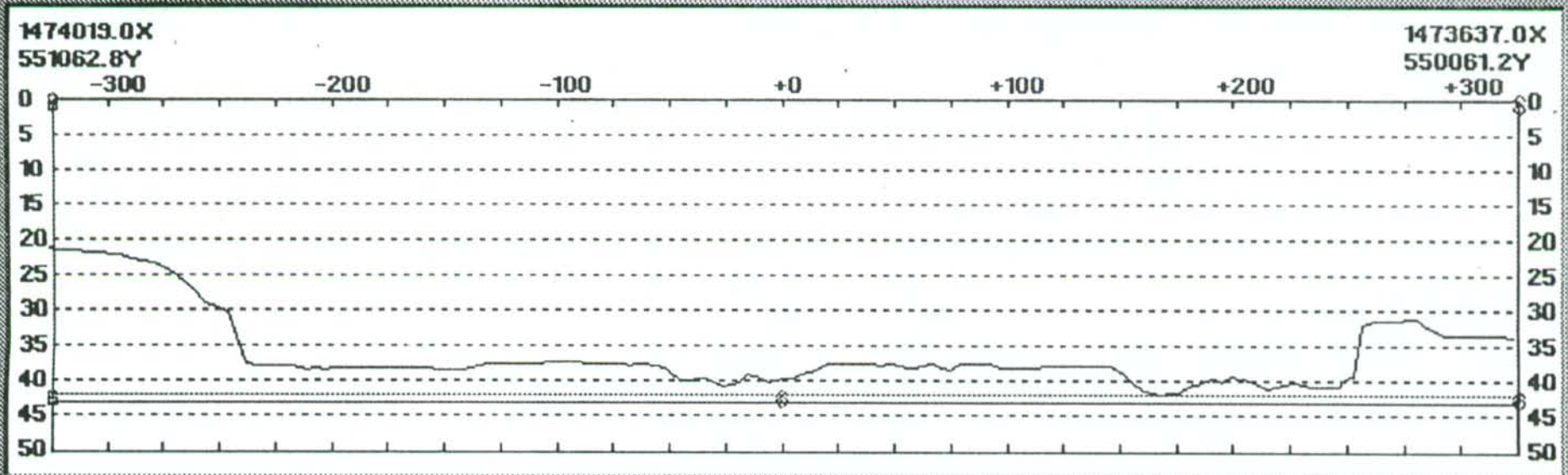


Line 25 of 27, Sounding File: 248300.edt, Template File: jg402.tmp, Subgrade: 1

Lower limit of CENAP  
channels off of Pooler Island



Volume Cross Sections

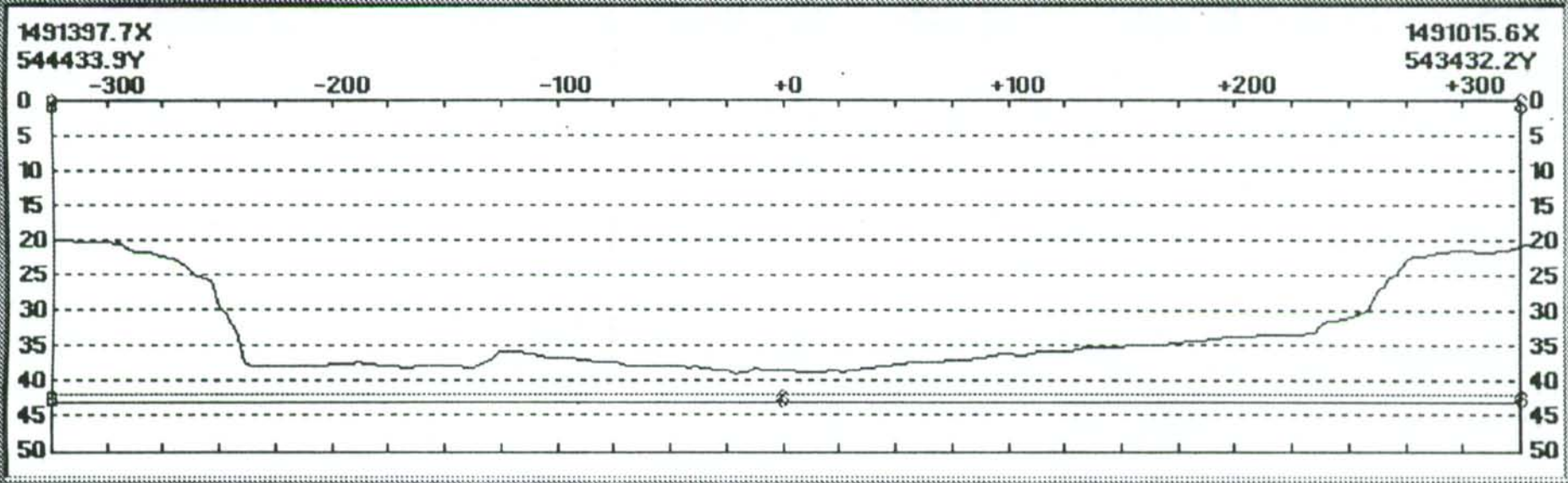


Line 12 of 192, Sounding File: 01p100z.bwx, Template File: bw14002.tmp, Subgrade: 1

Brewerton



Volume Cross Sections



Line 8 of 149, Sounding File: 19p700z.bwx, Template File: bw14002.tmp, Subgrade: 1

Brewerton



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE  
HARBOR CONNECTING CHANNELS  
(DEEPENING), DE AND MD  
PRECONSTRUCTION ENGINEERING AND DESIGN**

**INITIAL QUANTITIES  
AND  
PRELIMINARY COST ESTIMATES**



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE HARBOR  
CONNECTING CHANNELS PRECONSTRUCTION ENGINEERING AND DESIGN**

Preliminary Quantity Calculation and Cost Estimate  
36 Feet Minimum Combination Plan

36 Feet Deep Dredging			Required Dredging	Advanced Maintenance	Over Depth	Total Estimated Quantity
			( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)
Reach 1	0+000	67+205.0	35,466.5	132,490.1	287,748.4	455,705.0
Reach 2	67+205.0	108+200.0	11,411.5	63,393.1	52,155.6	126,960.2
Reach 3	108+200.0	165+800.0	0.0	0.0	0.0	0.0
Reach 4	165+800.0	239+740.0	0.0	0.0	0.0	0.0
C&D Canal			46,878.0	195,883.2	339,904.0	582,665.2
Reach 5	0+000	52+000.0	0.0	0.0	0.0	0.0
Tolchester Channel						
Reach 6	0+000	33+600.0	0.0	96,846.3	620,074.7	716,921.0
Brewerton Eastern Extension Chan.						
			46,878.0	292,729.5	959,978.7	1,299,586.2

Preliminary Cost Estimate:\$16.2 million

Preliminary Quantity Calculation and Cost Estimate  
37 Feet Minimum Combination Plan

37 Feet Deep Dredging			Required Dredging	Advanced Maintenance	Over Depth	Total Estimated Quantity
			( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)
Reach 1	0+000	67+205.0	339,441.6	177,855.5	402,250.9	919,548.0
Reach 2	67+205.0	108+200.0	48,265.3	99,359.3	92,634.1	240,258.7
Reach 3	108+200.0	165+800.0	0.0	211,580.1	374,765.7	586,345.8
Reach 4	165+800.0	239+740.0	0.0	0.0	0.0	0.0
C&D Canal			387,706.9	488,794.9	869,650.7	1,746,152.5
Reach 5	0+000	52+000.0	0.0	387,977.8	686,405.9	1,074,383.7
Tolchester Channel						
Reach 6	0+000	33+600.0	0.0	816,860.1	805,491.1	1,622,351.2
Brewerton Eastern Extension Chan.						
			387,706.9	1,693,632.8	2,361,547.7	4,442,887.4

Preliminary Cost Estimate:\$33.8 million



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE HARBOR  
CONNECTING CHANNELS PRECONSTRUCTION ENGINEERING AND DESIGN**

Preliminary Quantity Calculation and Cost Estimate  
38 Feet Minimum Combination Plan

38 Feet Deep Dredging			Required Dredging	Advanced Maintenance	Over Depth	Total Estimated Quantity
			( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)
Reach 1	0+000	67+205.0	767,570.3	224,806.1	532,238.5	1,524,614.9
Reach 2	67+205.0	108+200.0	102,922.6	167,883.9	150,681.9	421,488.4
Reach 3	108+200.0	165+800.0	0.0	676,198.2	558,166.9	1,234,365.1
Reach 4	165+800.0	239+740.0	0.0	242,033.1	738,706.8	980,739.9
C&D Canal			870,492.9	1,310,921.3	1,979,794.1	4,161,208.3
Reach 5	0+000	52+000.0	0.0	1,074,383.7	875,162.1	1,949,545.8
Tolchester Channel						
Reach 6	0+000	33+600.0	96,846.3	1,572,050.5	852,211.4	2,521,108.2
Brewerton Eastern Extension Chan.						
			967,339.2	3,957,355.5	3,707,167.6	8,631,862.3

Preliminary Cost Estimate:\$52.3 million

Preliminary Quantity Calculation and Cost Estimate  
39 Feet Minimum Combination Plan

39 Feet Deep Dredging			Required Dredging	Advanced Maintenance	Over Depth	Total Estimated Quantity
			( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)	( Cu. Yd.)
Reach 1	0+000	67+205.0	1,328,137.9	272,976.7	660,668.5	2,261,783.1
Reach 2	67+205.0	108+200.0	205,096.1	268,823.9	247,338.8	721,258.8
Reach 3	108+200.0	165+800.0	50,374.0	1,241,863.6	735,962.0	2,028,199.6
Reach 4	165+800.0	239+740.0	0.0	1,089,307.1	968,544.6	2,057,851.7
C&D Canal			1,583,608.0	2,872,971.3	2,612,513.9	7,069,093.2
Reach 5	0+000	52+000.0	387,977.8	1,561,568.0	1,000,028.7	2,949,574.5
Tolchester Channel						
Reach 6	0+000	33+600.0	816,860.1	1,709,339.3	859,719.4	3,385,918.8
Brewerton Eastern Extension Chan.						
			2,788,445.9	6,143,878.6	4,472,262.0	13,404,586.5

Preliminary Cost Estimate:\$65.9 million



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE HARBOR  
CONNECTING CHANNELS PRECONSTRUCTION ENGINEERING AND DESIGN**

Preliminary Quantity Calculation and Cost Estimate  
40 Feet Minimum Combination Plan

40 Feet Deep Dredging			Required Dredging ( Cu. Yd.)	Advanced Maintenance ( Cu. Yd.)	Over Depth ( Cu. Yd.)	Total Estimated Quantity ( Cu. Yd.)
Reach 1	0+000	67+205.0	2,024,481.1	317,994.2	784,671.0	3,127,146.3
Reach 2	67+205.0	108+200.0	421,473.2	353,144.3	338,385.8	1,113,003.3
Reach 3	108+200.0	165+800.0	485,758.9	1,660,609.6	875,419.6	3,021,788.1
Reach 4	165+800.0	239+740.0	0.0	2,244,622.7	1,332,924.8	3,577,547.5
C&D Canal			2,931,713.2	4,576,370.8	3,331,401.2	10,839,485.2
Reach 5	0+000	52+000.0	1,074,383.7	1,875,190.8	1,089,200.2	4,038,774.7
Tolchester Channel						
Reach 6	0+000	33+600.0	1,668,896.8	1,717,581.5	860,630.5	4,247,108.8
Brewerton Eastern Extension Chan.						
			5,674,993.7	8,169,143.1	5,281,231.9	19,125,368.7

Preliminary Cost Estimate:\$78.6 million

Preliminary Quantity Calculation and Cost Estimate  
41 Feet Minimum Combination Plan

41 Feet Deep Dredging			Required Dredging ( Cu. Yd.)	Advanced Maintenance ( Cu. Yd.)	Over Depth ( Cu. Yd.)	Total Estimated Quantity ( Cu. Yd.)
Reach 1	0+000	67+205.0	2,870,564.3	352,266.9	938,939.3	4,161,770.5
Reach 2	67+205.0	108+200.0	774,353.9	413,069.4	460,059.1	1,647,482.4
Reach 3	108+200.0	165+800.0	1,183,549.4	1,873,440.9	944,553.0	4,001,543.3
Reach 4	165+800.0	239+740.0	120,568.0	3,399,019.4	1,467,380.3	4,986,967.7
C&D Canal			4,949,035.6	6,037,796.6	3,810,931.7	14,797,763.9
Reach 5	0+000	52+000.0	1,949,545.8	2,089,228.9	1,161,103.2	5,199,877.9
Tolchester Channel						
Reach 6	0+000	33+600.0	2,526,199.4	1,720,989.3	860,775.0	5,107,963.7
Brewerton Eastern Extension Chan.						
			9,424,780.8	9,848,014.8	5,832,809.9	25,105,605.5

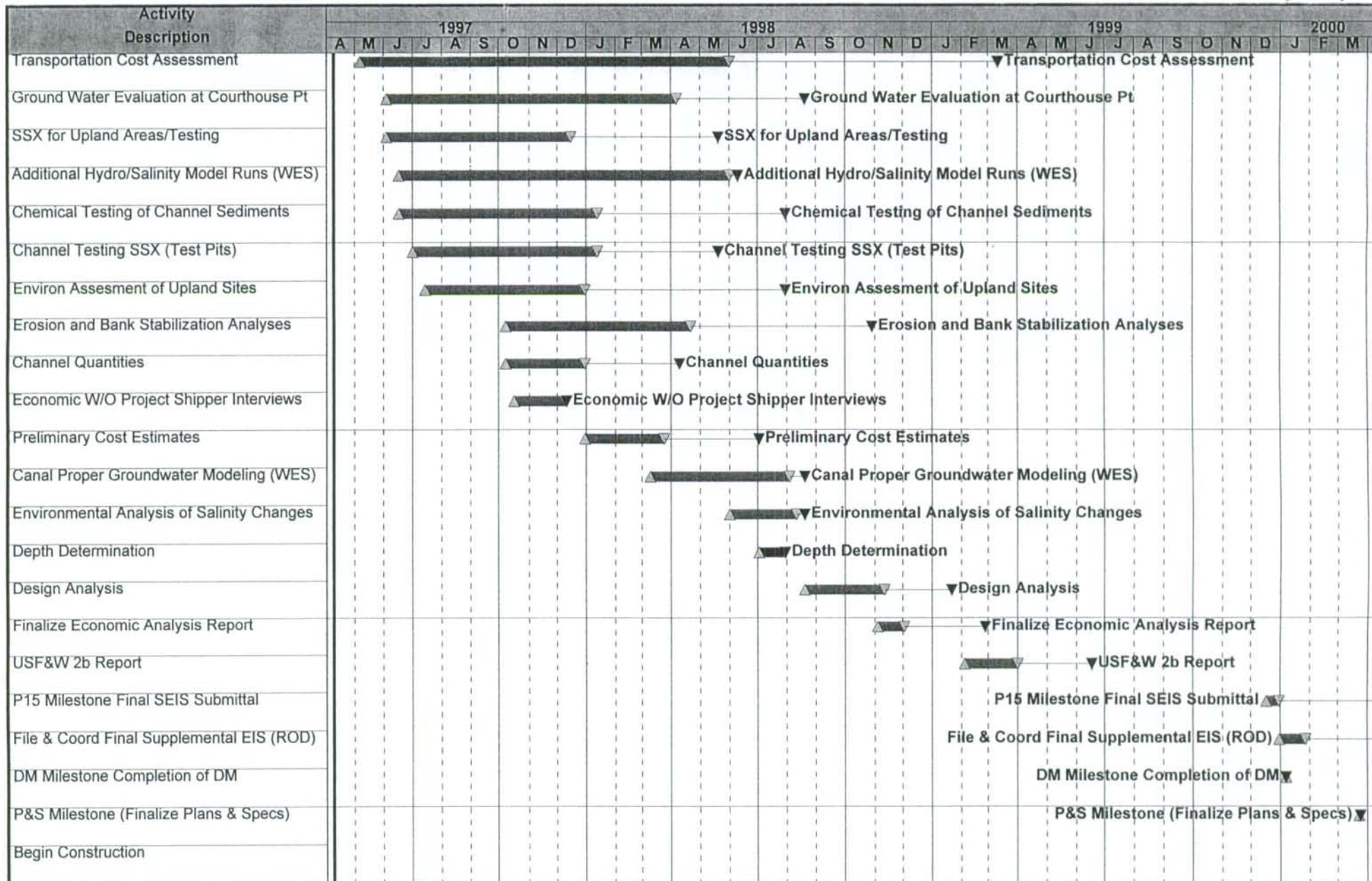
Preliminary Cost Estimate:



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE  
HARBOR CONNECTING CHANNELS  
(DEEPENING), DE AND MD  
PRECONSTRUCTION ENGINEERING AND DESIGN**

**SCHEDULE**





Project Start	06APR97	▲	▼	Early Bar
Project Finish	28DEC00	▲	▼	Float Bar
Data Date	06APR97	▲	▼	Progress Bar
Run Date	19MAY98	▲	▼	Critical Activity

© Primavera Systems, Inc.

CDXX

USACE PHILADELPHIA DISTRICT

C&D CANAL PED (PMP)

Classic Schedule Layout

Sheet 1 of 1



### Commercial Reasons for Not Using the C&D Canal

Vessel Type	Container	Container	Container	Bulker	Bulker
Vessel Size	3000 TEU	3500 TEU	4000 TEU	40,000 DWT	60,000 DWT
C&D Pilotage \$	9406	9920	11155	7060	8549
CH Pilotage \$	6269	6627	7174	5085	6274
CD Differential \$	3137	3293	3981	1975	2275
CD Surcharges \$	1545	1701	2329	562	862

Notes: Reflects pilotage rates as of May, 1998

Source: LBI



C&D Canal Sailings 1996-1997 by Direction and Proportion of Total Eligible Vessels Calling at Baltimore Harbor

Vessel	North No.	North %	North East No.	North East %	East No.	East %
Container	294	75	-	-	-	-
Bulk	163	90	8	30	-	-
General Cargo	62	75	7	15	2	10
RoRo	65	50	3	20	1	10
Vehicle	242	75	21	20	1	10
Tank	64	85	6	40	-	-

Notes: Eligible vessels excludes sailing and air draft constraints and vessels not equipped with bow thrusters greater than 750 feet loa.

Source: LBI from BMI records



Cumulative Annual Container Vessel Sailings Eligible for Diversion to C&D Canal by Project Depth

YEAR	<35	>35<36	>36<37	>37<38	>38<39	>39<40	>40<41	>41
2002	239	451	476	506	541	581	626	626
2007	274	536	582	632	686	745	807	807
2012	224	550	649	744	835	921	1003	1003
2017	219	635	794	942	1077	1201	1314	1326
2022	336	880	1079	1269	1450	1621	1783	1815

Notes: Eligible vessels defined for sailing and air draft constraints and bow thrusters for loa > 750 feet

Source: LBI



Annual Container Vessel Sailings Eligible for Diversion to C&D Canal by Project Depth

YEAR	<35	>35<36	>36<37	>37<38	>38<39	>39<40	>40<41	>41
2002	239	212	25	30	35	40	45	0
2007	274	262	46	50	54	58	63	0
2012	224	326	99	95	91	86	82	0
2017	219	416	159	147	136	124	112	12
2022	336	544	199	190	181	171	162	32

Notes: Eligible vessels defined for sailing and air draft constraints and bow thrusters for loa > 750 feet

Source: LBI



C&D Canal Net Present Value of Benefits 2002-2052 at Discount Rate 7.125% (\$ millions) @ \$6250 Per Eligible Sailing

Project	75 % Diversions	80% Diversions	85% Diversions
Safety			
36	16.590	17.695	18.801
37	22.915	24.442	25.970
38	29.097	31.037	32.976
39	35.135	37.478	39.820
40	41.031	43.766	46.501
41	46.782	49.901	53.020

Source: LBI



C&D Canal Net Present Value of Benefits 2002-2052 at Discount Rate 7.125% (\$ millions) @ 6000 Per Sailing

Project	75 % Diversions	80% Diversions	85% Diversions
Safety			
36	15.925	16.987	18.049
37	21.998	23.465	24.931
38	27.933	29.795	31.657
39	33.730	35.979	38.227
40	39.389	42.015	44.641
41	44.911	47.905	50.899

Source: LBI



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE HARBOR  
CONNECTING CHANNELS PRECONSTRUCTION ENGINEERING AND DESIGN**

**PUBLIC INVOLVEMENT**

C&D Canal PED Study Initiation Letter dated 6 June 1991

C&D Canal and Museum Pamphlet

Update Newsletter dated April 1998

Partnering Session, 5 May 1998

Working Group Meetings:11

10 Feb 1997, 9 April 1997, 21 May 1997, 18 June 1997, 4 Aug 1997, 9 Sept 1997, 22 Oct  
1997, 8 Dec 1997, 4 Feb 1998, 1 April 1998, 21 May 1998

Coordination of Scopes of Work with working group

Coordination of Draft Technical Reports with working group

Economic Scoping Meetings with Working Group, MPA, and Corps

Chemical Testing Scoping Meeting with DNREC, MDE, MPA, working group, and Corps

Response to Comment Letters

Shoreline Erosion Questionnaire

Strategy Meetings with MPA: 16 May 1997, 18 July 1997, 5 September 1997, 9 October 1997,  
and 18 February 1998,

Meeting with Pilots Associations, 21 May 1997



**CHESAPEAKE AND DELAWARE CANAL-BALTIMORE HARBOR  
CONNECTING CHANNELS PRECONSTRUCTION ENGINEERING AND DESIGN**

**TECHNICAL REPORTS**

**ENGINEERING**

- Hydrographic Surveys for C&D Canal and Baltimore Connecting Channels of Brewerton and Tolchester, CENAP and CENAB, Spring 1997
- Aerial Photography, Woodward-Clyde (Aerial Data Reduction Associates (ADR))
- Preparation of Planimetric AutoCAD drawings and topographic Drawings for the C&D Canal, Woodward-Clyde (Aerial Data Reduction Associates (ADR))

**GEOTECHNICAL**

- Final Field Inspection & Geotechnical Testing Report (Channel Test Pits), GEO-Technical Services, Inc. dated 3 April 1998
- Final Survey Report for the Soil Boring Locations C&D Canal, Whitman, Requart and Associates, no date
- Final Lab Testing Report for SSX Testing at Pearce Creek Dredged Disposal Area, Woodward-Clyde dated 5 December 1998
- Final Lab Testing Report for SSX Testing at Courthouse Point Dredged Disposal Area, Woodward-Clyde dated 24 March 1998

**ECONOMIC**

- Draft Commodity Forecasts, Louis Berger International, Inc. dated March 1998

**ENVIRONMENTAL**

- Draft Water Quality & Sediment Chemical Testing for C&D Canal, Versar, Inc. dated March 1998
- Draft Habitat Evaluation, Wetland Delineation, & Environmental Assessments for 10 Federal Upland Sites, Versar, Inc dated March 1998
- Three-Dimensional Hydrodynamic Salinity Modeling, U.S. Army Corps of Engineers Waterways Experiments Station (WES), no report to date, 3 technical workshops

**GROUNDWATER**

- Draft Hydrogeologic Study (Courthouse Point Federal Upland Dredged Material Placement Site), GTS Technologies, Inc. dated 1 May 1998
- Courthouse Point Federal Upland Dredged Material Placement Site Groundwater Modeling, CENAP and CENAB, no report to date
- Draft Groundwater Study of the C&D Canal, Maryland Environmental Service dated February 1998
- Canal Proper Groundwater Modeling, CENAP and WES, no report to date



GAHAGAN & BRYANT ASSOCIATES, Inc.

UNIT O

9008 YELLOW BRICK ROAD  
BALTIMORE, MARYLAND 21237  
(410) 682-5595 FAX: (410) 682-2175

TAMPA, FLORIDA - TEL (813) 831-4408  
HOUSTON, TEXAS - TEL (713) 267-2785

WILMINGTON, DELAWARE - TEL (302) 652-4948  
NOVATO, CALIFORNIA - TEL (415) 883-7683

May 26, 1998

Maryland Port Administration  
Harbor Development  
Attn: Frank Hamons  
2310 Broening Highway  
Baltimore, MD 21224.

**Re: C&D Canal & Baltimore Connecting Channels Deepening Project  
Cost Analysis Supplement - 37 ft Channel Draft Report**

Dear Mr. Hamons:

We are pleased to transmit herewith three copies of the draft report for C&D Canal & Baltimore Connecting Channels Deepening Project: Cost Analysis Supplement for the 37 ft Channel. We appreciate the opportunity to be of service to you and hope that we can assist you with future projects as well.

Should you have any questions on this report, or need any additional information, please do not hesitate to contact us.

Very Truly Yours,  
GAHAGAN & BRYANT ASSOCIATES, INC.



---

Dennis C. Urso, P.E., Vice President

**cc:** Bill Gahagan, P.E., Pete Steele; GBA-Wilmington.  
Ram Mohan, Ph.D., P.E., Dick Thomas, P.E; GBA-Baltimore.



## TABLE OF CONTENTS

1.0	PURPOSE .....	1
2.0	BACKGROUND .....	1
3.0	COST ANALYSIS PROCESS .....	4
3.1	Dredging Alternatives .....	4
3.2	Dredging Scenarios .....	5
4.0	COST ANALYSIS FOR THE 37 FT PROJECT .....	5
4.1	Dredging Quantities .....	6
4.2	Placement Sites .....	6
4.3	Project Costs .....	6
5.0	SUMMARY .....	6
	REFERENCES .....	9
	LIST OF FIGURES	
1a	Project Location Map (C&D Canal) .....	2
1b	Project Location Map (Baltimore Harbor Connecting Channels) .....	3
	LIST OF TABLES	
1	Placement Site Costs for Scenario 3B (37 ft) .....	7
2	Total Project Cost for Scenario 3B (37 ft) .....	8
	APPENDICES	
A	37 ft Dredging Plans	
B	37 ft New Work Summary	
C	37 ft New Work + Existing Project Summary	
D	37 ft Dredging Scenario 3B - New Work	
E	37 ft Dredging Scenario 3B - New Work + Existing Project	
F	37 ft Cost Estimate for Dredging Scenario 3B	
	LIST OF PLATES	
A-1	C&D Canal Station 0+000 to Station 45+000	
A-2	C&D Canal Station 45+000 to Station 90+000	
A-3	C&D Canal Station 90+000 to Station 180+000	
A-4	Tolchester Station 25+000 to C&D Canal Station 180+000	
A-5	Brewerton-Tolchester-Swan Point	



## 1.0 PURPOSE

The Maryland Port Administration (MPA) retained Gahagan & Bryant Associates, Inc. (GBA) to provide an independent technical review of the Corps' design memorandum (USACE, 1996a), in an effort to identify potential cost saving scenarios. Accordingly, GBA performed a detailed project optimization with multiple cost estimates and reviewed the technical and economic aspects of the C&D Canal and Baltimore Harbor Connecting Channels 40 ft Deepening Project.

Upon receipt of GBA's cost optimization report, MPA requested GBA to evaluate the costs for the 37 ft and 38 ft projects. This report is a supplement to GBA's cost optimization report and provides the results of the cost analysis for the 37 ft project.

## 2.0 BACKGROUND

The C&D Canal is a navigational channel joining the Delaware River to the Chesapeake Bay, spanning over 47 miles, with widths varying from 400 to 450 ft (Figure 1a). The Baltimore Harbor Connecting Channels include 8 miles of Tolchester Channel at 600 ft width, and 6 miles of Brewerton Extension Channel at 450 ft to 600 ft width (Figure 1b). The entire project covers a total length of 61 miles.

The existing project grade for the C&D Canal is 35 ft, with advance maintenance varying from 0 ft to as much as 5 ft (applied at full channel width, when applicable), and an overdepth of 1 ft, resulting in a final project grade of 36 to 41 ft. For the Tolchester and Brewerton channels, the existing project grade is 35 ft, with advance maintenance of 2 ft over the full width, and a overdepth of 1 ft, resulting in a final project grade of 38 ft.

USACE (1996a) conducted a study to evaluate the ability of the C&D Canal to accommodate the demands of the present and future waterborne commerce. The USACE plan consisted of a channel with a project depth of 40 ft (MLLW), select locations with advance maintenance, an allowable overdepth of 1 ft, and widths of 450 and 600 ft. The estimated dredging quantity for the USACE plan was 18 million cubic yards (mcy), and the total project cost was \$83 million. In order to reduce costs while maintaining an acceptable project design, several optimization alternatives were reviewed.

Currently, USACE is in the process of optimizing the project as part of the Preconstruction, Engineering and Design (PED) phase. The most recent modifications to the C&D canal consists of a dredging depth of 40 ft, plus an overdepth of 1 ft, and performing advance maintenance varying from 0 ft to up to 5 ft (depending on the location) along either the full width, or just along the north or south quarter of the channel width, determined based on shoaling patterns. The resulting total channel depths vary from 41 to 45 ft, depending on location. The slope of the channel will be 3H:1V, and the width is designed to be 450 ft, except along the Reedy Point Flare (mean width of 3,500 ft), Sandy Point Bend (mean width of 775 ft), and Howell Point Anchorage (mean width of 2,350 ft).





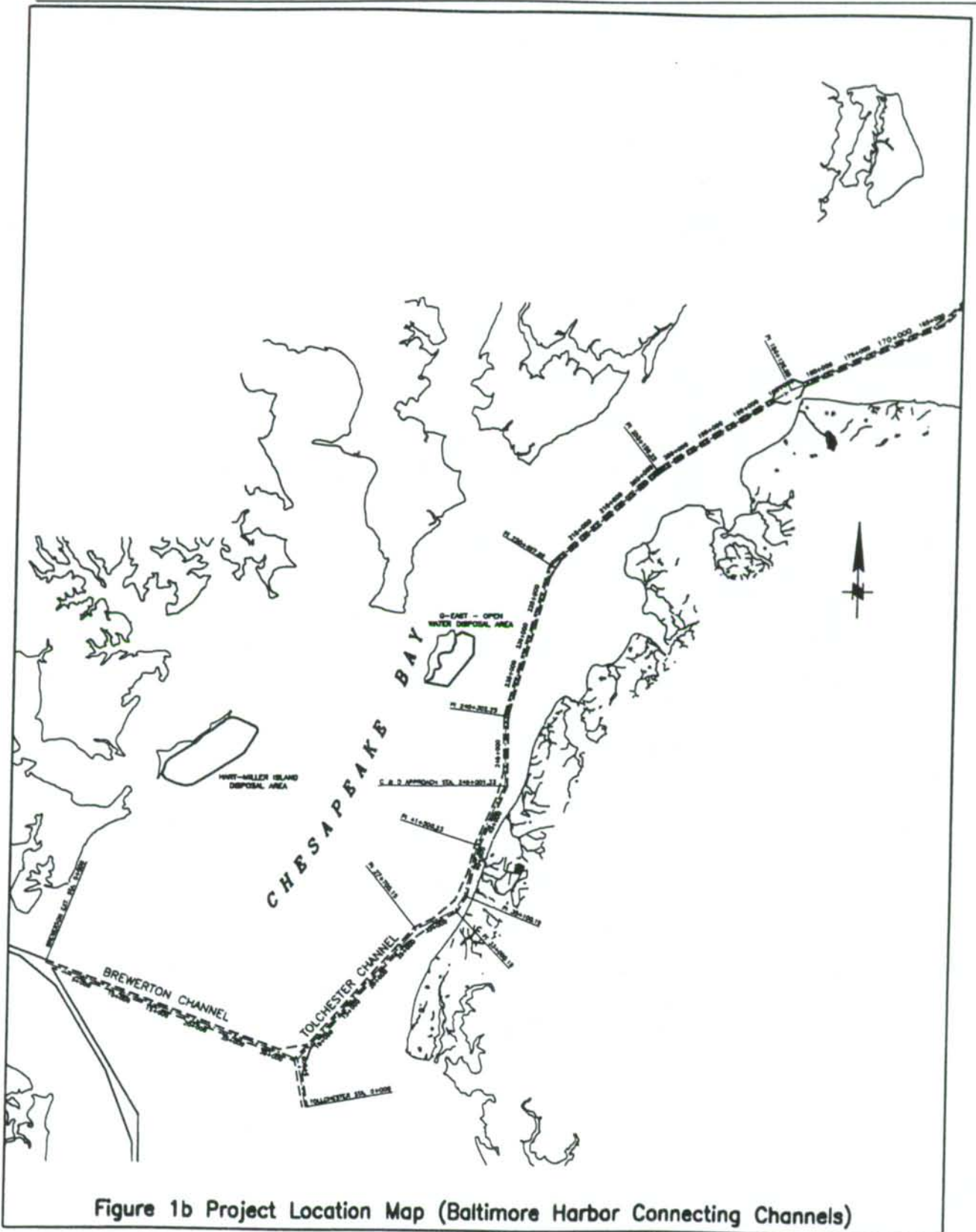


Figure 1b Project Location Map (Baltimore Harbor Connecting Channels)



The most recent modifications made to the Brewerton Eastern Extension and the Tolchester Channel calls for a dredging depth of 40 ft, plus 2 ft of advance maintenance and 1 ft of overdepth, for a total depth of 43 ft. The slope of the channel will be 3H:1V, and the width is designed to be 600 ft, except along the following areas: (i) Brewerton-Tolchester Flare portion of the Brewerton Channel (mean width of approximately 1,600 ft), (ii) Tolchester-Swan Point Flare portion of the Tolchester Channel (mean width of approximately 1,100 ft), and (iii) bends along the Tolchester Channel (widths varying from approximately 1,000 ft to 1,300 ft, depending on location).

### **3.0 COST ANALYSIS PROCESS**

GBA's cost analysis process involved a review of USACE channel bathymetry, channel borings and test dig data, channel cross sections, and pilots review. Based on these, dredging volumes were computed for the most recent USACE modification to their feasibility plan. A comparison of the GBA dredging quantities (19 mcy) to the most recent version of the USACE plan volumes (20.6 mcy) indicates that both estimates match well.

GBA's analysis identified several methods of optimizing the project, resulting in cost savings through reduced dredging volumes. In order to evaluate such options further, GBA performed a review of the channel dimensions, including advance maintenance. GBA evaluated several dredging scenarios using variations of the above described channel dimensions, including channel deepening by extending the side slopes straight down from existing project grade, reduction in advance maintenance depths and locations, and reduction in proposed width of the Brewerton channel from 600 to 450 ft, which is the existing width for that channel. GBA also assumed an excess non pay depth of 0.5 ft, for costing purposes only. We also performed a review of the historic dredging records of the C&D canal, Tolchester and Brewerton channels available from the USACE Philadelphia and Baltimore Districts to arrive at channel shoaling rates (USACE, 1996b, 1998d).

The results of the shoaling computations indicated that in general, the computed advance maintenance dredging depths for the 1, 2, 3, 4 and 5 year dredging cycles are lower than the USACE values for the C&D Canal. For the Brewerton Channel, an advance maintenance depth of 2 ft was assumed due to the potential for high shoaling. The advance maintenance depths for the Tolchester channel was kept at 2 ft from Stations 4+000 to 8+000, and Stations 24+600 to 51+500. At all other locations along the Tolchester and Swan Point Channels, the advance maintenance was assumed to be 0 ft.

#### **3.1 Dredging Alternatives**

GBA evaluated two dredging alternatives for the project using combinations of dredging & transport equipment and placement sites: (i) *Alternative A* - This consists of using hydraulic dredge and pipelines for the C&D canal, and using clamshell, barge, and open water placement for the Tolchester and Brewerton channels; and (ii) *Alternative B* - This consists of using hydraulic dredge and pipelines for Stations -9+27 to 18+500 and Stations 90+000 to 203+000 (C&D canal); clamshell, barge and hydraulic unloader for Stations 18+500 to 90+000 and Stations 203+000 to 239+740 (C&D canal); and using clamshell, barge and hydraulic unloader for the Tolchester and Brewerton channels.



In order to determine the cost effective alternative for use in the various dredging scenarios for the project, the dredging costs were evaluated for both alternatives (A&B) for the USACE plan (GBA Scenario 1). Evaluation of the resulting costs for the two alternatives indicated that Alternative A would cost approximately \$54 million, while Alternative B would cost approximately \$69 million. Therefore, Alternative A was selected as the cost-effective alternative for use in further analysis of the various dredging scenarios.

### **3.2 Dredging Scenarios**

Several dredging scenarios were identified for the C&D Canal Deepening Project, as part of the initial planning process. A dredging scenario refers to a specific template of channel geometry and advance maintenance grade, with variations in channel width (through extension of channel side slopes straight down from existing grade) and final project grade (through reduction in advance maintenance depths) made between the various scenarios.

GBA's initial evaluations also included three scenarios for Swan Point Channel, which considered avoiding deepening of the Brewerton Channel through the use of Swan Point Channel (Scenarios 1S, 2S, and 3S). However, the Swan Point scenarios were not carried forward for further evaluations due to the potential for reduction in benefits resulting from the additional shipping time (almost 1 hour), and the relatively minor reduction in dredging quantities obtained when compared to keeping the Brewerton Channel at its existing width of 450 ft.

Based on the above considerations, GBA evaluated six potential dredging scenarios, details of which can be obtained from the 40 ft Cost Optimization report (GBA, 1998).

## **4.0 COST ANALYSIS FOR THE 37 FT PROJECT**

The channel template of Scenario-3B was used to evaluate the costs for the 37 ft project since it was determined to be the least costly scenario from previous analysis (GBA, 1998). The template for this scenario varies from the USACE plan template (Scenario 1) in that the slopes are extended straight down from the existing project grade to the deepened project depth. Also, the deepening templates are optimized based on revised advance maintenance depths derived from GBA's analysis of channel shoaling rates and estimates of channel maintenance dredging frequencies. Another major variation is in the width of the Brewerton Channel Extension, which is kept at 450 ft, to reduce the dredging quantities and project costs.

The materials from the various channel reaches (and stations) were classified into six categories based on geotechnical properties. Mud was defined as consisting of organic silts, peat, muck and soft clay with blow counts less than 2 blows/ft. Medium clay has blow counts between 2 and 10 blows/ft and the hard clay is greater than 10 blows/ft. Both the fine sand and coarse sand have blow counts between 2 and 50 blows/ft with the coarse sand grains being greater than the No. 10 sieve. The dense sand has blow counts greater than 50 and typically consists of fine sand.



#### **4.1 Dredging Quantities**

Dredging quantities were determined based on the following: (i) new work only, (ii) new work + existing project. For each of these, the quantities were broken up into project grade, advance maintenance, over depth, and total volume (see Appendices B-E). It can be seen that the new work only dredging quantity was approximately 3.1 mcy, while the new work plus existing project quantity was approximately 6.4 mcy.

#### **4.2 Placement Sites**

GBA's analysis considered material allocation to the following placement sites: (i) Reedy Point North and (ii) Reedy Point South, (iii) Biddles Point, (iv) Bethel, (v) St. Georges, (vi) Courthouse Point, (vii) Pearce Creek, (viii) Hart-Miller Island, and (ix) Kent Island Deep (Site 104). Various combinations of these placement sites were used for the analysis. The available capacities at these sites varies from 0.6 mcy to 30 mcy. Using the topographic data, estimates of required dike elevations for accommodating dredged material from the various scenarios were computed. Potential future capacities were then estimated based on the required dike elevations. GBA also assessed required modifications to the existing placement sites based on conversations with USACE Philadelphia District (Brown, 1998) and based on inspections during field visits.

#### **4.3 Project Costs**

Total project costs were broken down into three parts for ease of comparison:

- Dredging, Transport & Placement Costs (including costs for navigational aids),
- Placement Site Costs (including dike raising, clearing and grubbing, new spillways or modification of existing spillways, and hydroseeding of the exterior of the dikes), and
- Design & Construction Management Costs (including USACE PED and management during construction).

Total project costs for the 37 ft project was estimated to be \$29.6 million, as summarized in Tables 1 and 2. The resulting unit cost was approximately \$9.6/cy.

### **5.0 SUMMARY**

The 37 ft deepening project would involve removal of approximately 3.1 and 6.4 mcy for the new work only, and new work + existing projects. The estimated costs for the new work only project is approximately \$29.6 million, resulting in a unit cost of \$9.6/cy.

*C&D Canal & Baltimore Connecting Channels Deepening Project  
Cost Analysis Supplement - 37 ft Channel - Draft Report*

TABLE 1  
Placement Site Costs for 37' Deepening, Scenario 3B

Item	Quantity	Unit	Unit Cost	Item Cost	Comments
<b>A Pearce Creek</b>					
1 Mobilization & Demobilization	1	lump sum	\$0	\$0	5% of items 2 thru 6.
2 Dike Construction/Raising	0	cubic yard	\$3.75	\$0	includes excavation & placement costs.
3 New Spillway(s)	0	each	\$130,000	\$0	
4 Spillway(s) Modification	0	each	\$70,000	\$0	
5 Site Clearing and Grubbing	0	acres	\$3,000	\$0	
6 Hydroseeding	0	square yard	\$1	\$0	
Subtotal (A):				\$0	
<b>B Courthouse Point</b>					
1 Mobilization & Demobilization	1	lump sum	\$0	\$0	5% of items 2 thru 6.
2 Dike Construction/Raising	0	cubic yard	\$3.75	\$0	includes excavation & placement costs.
3 New Spillway(s)	0	each	\$130,000	\$0	
4 Spillway(s) Modification	0	each	\$70,000	\$0	
5 Site Clearing and Grubbing	0	acres	\$3,000	\$0	
6 Hydroseeding	0	square yard	\$1	\$0	
Subtotal (B):				\$0	
<b>C Bethel</b>					
1 Mobilization & Demobilization	1	lump sum	\$0	\$0	5% of items 2 thru 6.
2 Dike Construction/Raising	0	cubic yard	\$3.75	\$0	includes excavation & placement costs.
3 New Spillway(s)	0	each	\$130,000	\$0	
4 Spillway(s) Modification	0	each	\$70,000	\$0	
5 Site Clearing and Grubbing	0	acres	\$3,000	\$0	
6 Hydroseeding	0	square yard	\$1	\$0	
Subtotal (C):				\$0	
<b>E Schoolhouse Road</b>					
1 Mobilization & Demobilization	1	lump sum	\$0	\$0	5% of items 2 thru 6.
2 Dike Construction/Raising	0	cubic yard	\$3.75	\$0	includes excavation & placement costs.
3 New Spillway(s)	0	each	\$130,000	\$0	
4 Spillway(s) Modification	0	each	\$70,000	\$0	
5 Site Clearing and Grubbing	0	acres	\$3,000	\$0	
6 Hydroseeding	0	square yard	\$1	\$0	
Subtotal (D):				\$0	
<b>E Biddles Point</b>					
1 Mobilization & Demobilization	1	lump sum	\$10,490	\$10,490	5% of items 2 thru 6.
2 Dike Construction/Raising	0	cubic yard	\$3.75	\$0	includes excavation & placement costs.
3 New Spillway(s)	1	each	\$130,000	\$130,000	
4 Spillway(s) Modification	0	each	\$70,000	\$0	
5 Site Clearing and Grubbing	26.6	acres	\$3,000	\$79,800	
6 Hydroseeding	0	square yard	\$1	\$0	
Subtotal (E):				\$220,290	
<b>F Reedy Point N&amp;S</b>					
1 Mobilization & Demobilization	1	lump sum	\$35,144	\$35,144	5% of items 2 thru 6.
2 Dike Construction/Raising	200,600	cubic yard	\$2.00	\$401,200	Placement & shaping during channel dredging.
3 New Spillway(s)	0	each	\$130,000	\$0	
4 Spillway(s) Modification	2	each	\$70,000	\$140,000	
5 Site Clearing and Grubbing	28.5	acres	\$3,000	\$85,500	
6 Hydroseeding	76,176	square yard	\$1	\$76,176	
Subtotal (F):				\$738,020	
<b>TOTAL COST:</b>				<b>\$958,310</b>	
Contingency (15%)				\$143,746	
<b>TOTAL PLACEMENT SITE COST:</b>				<b>\$1,102,000</b>	



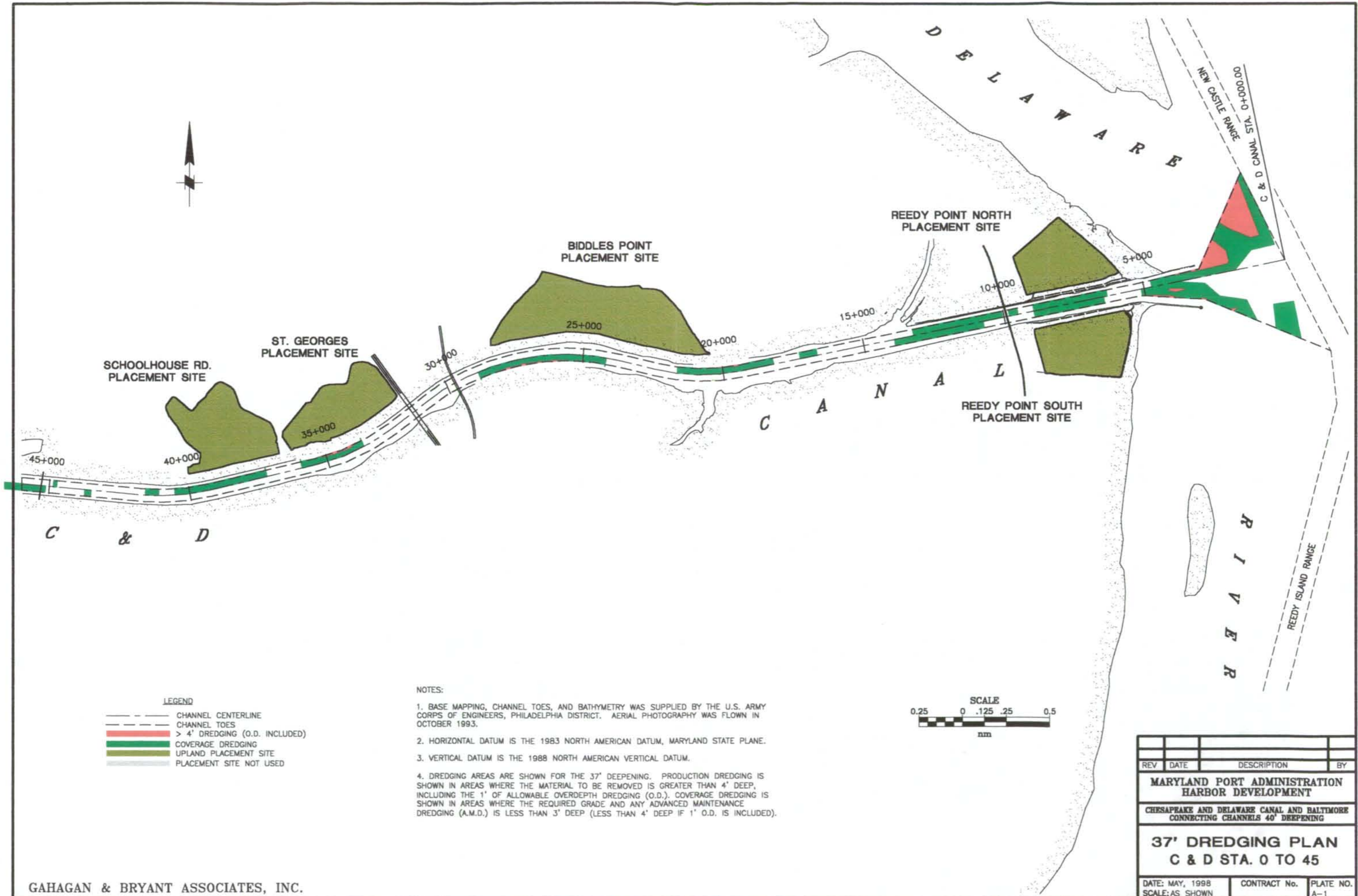
TABLE 2

Total Project Costs for 37' Deepening, Scenario 3B

Item	Quantity	Unit	Unit Cost	Item Cost	Comments
<b>A. Dredging, Transport &amp; Placement Costs</b>					
1. Mobilization & Demobilization	1	lump sum	\$1,120,000	\$1,120,000	mob/demob costs + 15% contingency (dredging)
2. Navigational Aids	1	lump sum	\$90,000	\$90,000	includes 10% contingency.
3. Dredging, Transport & Placement	3,071,938	cubic yard	\$5.36	\$16,466,844	includes 15% contingency.
<i>Subtotal (A):</i>				\$17,676,844	
<b>B. Placement Site Costs</b>					
1. Mobilization & Demobilization	1	lump sum	\$45,634	\$45,634	mob & demob for placement site modifications.
2. Dike Construction/Raising	200,600	cubic yard	\$2.00	\$401,200	includes excavation & placement costs.
3. New Spillway(s)	1	each	\$130,000	\$130,000	see placement site costs table for details.
4. Spillway(s) Modification	2	each	\$70,000	\$140,000	see placement site costs table for details.
5. Site Clearing and Grubbing	55.1	acre	\$3,000	\$165,300	see placement site costs table for details.
6. Hydroseeding	76,176	square yard	\$1	\$76,176	see placement site costs table for details.
<i>Subtotal (B):</i>				\$1,102,000	includes 15% contingency.
<b>C. Design &amp; Construction Management</b>					
1. USACE PED	1	lump sum	\$3,825,000	\$3,825,000	from USACE estimate
2. Construction Management	1	lump sum	\$1,200,000	\$1,200,000	from USACE estimate Less 67 % (Less Const. Time)
<i>Subtotal (C):</i>				\$5,847,000	includes approx. 16% contingency.
<b>TOTAL PROJECT COST:</b>					
<b>ROUNDED PROJECT COST:</b>					\$24,625,844
<b>COST/CY DREDGED:</b>					\$24,630,000
					\$8.02

**APPENDIX A  
37 FT DREDGING PLANS**



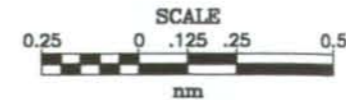


**LEGEND**

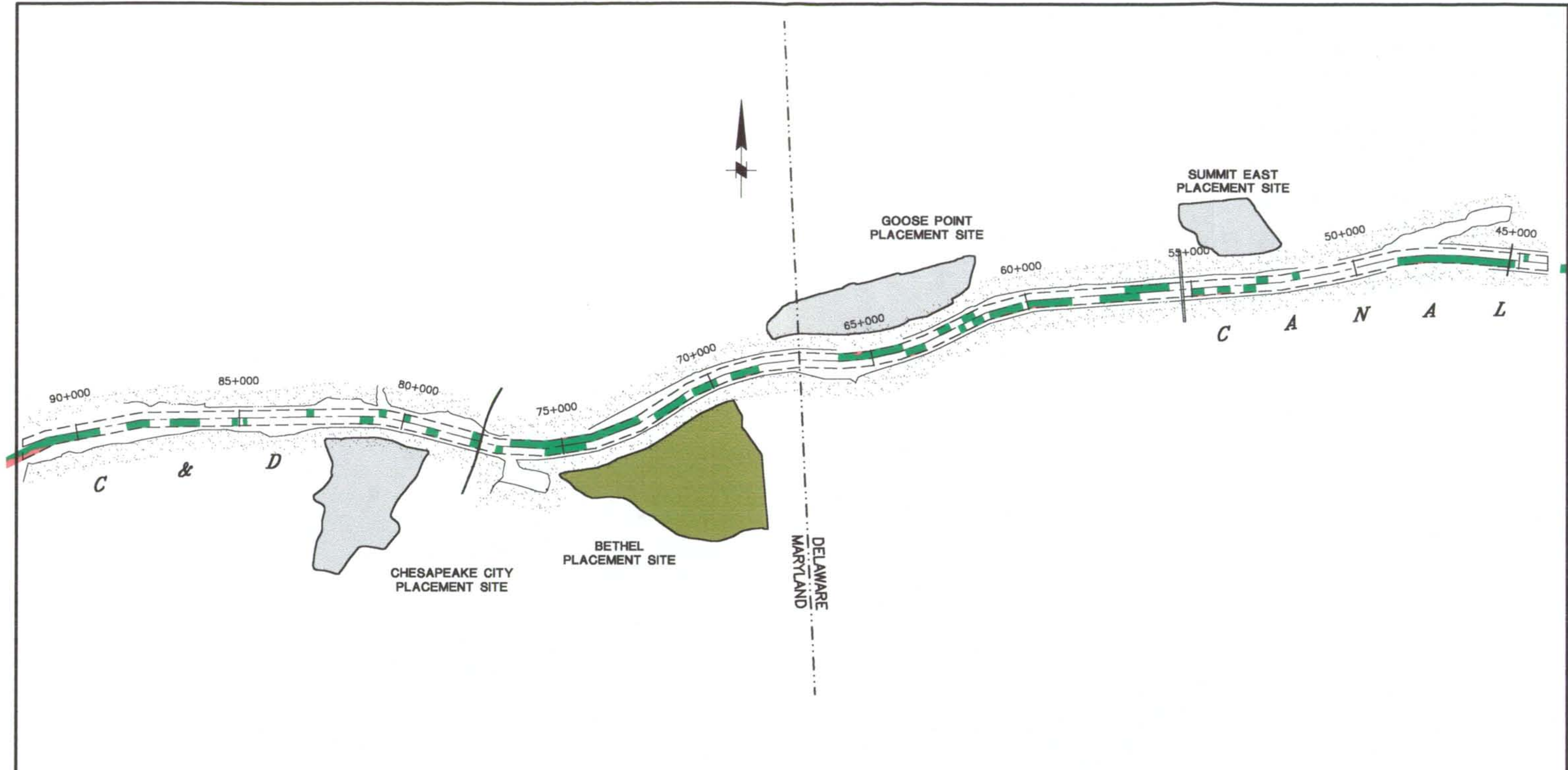
- CHANNEL CENTERLINE
- - - CHANNEL TOES
- > 4' DREDGING (O.D. INCLUDED)
- COVERAGE DREDGING
- UPLAND PLACEMENT SITE
- PLACEMENT SITE NOT USED

**NOTES:**

1. BASE MAPPING, CHANNEL TOES, AND BATHYMETRY WAS SUPPLIED BY THE U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT. AERIAL PHOTOGRAPHY WAS FLOWN IN OCTOBER 1993.
2. HORIZONTAL DATUM IS THE 1983 NORTH AMERICAN DATUM, MARYLAND STATE PLANE.
3. VERTICAL DATUM IS THE 1988 NORTH AMERICAN VERTICAL DATUM.
4. DREDGING AREAS ARE SHOWN FOR THE 37' DEEPENING. PRODUCTION DREDGING IS SHOWN IN AREAS WHERE THE MATERIAL TO BE REMOVED IS GREATER THAN 4' DEEP, INCLUDING THE 1' OF ALLOWABLE OVERDEPTH DREDGING (O.D.). COVERAGE DREDGING IS SHOWN IN AREAS WHERE THE REQUIRED GRADE AND ANY ADVANCED MAINTENANCE DREDGING (A.M.D.) IS LESS THAN 3' DEEP (LESS THAN 4' DEEP IF 1' O.D. IS INCLUDED).



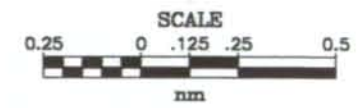
REV	DATE	DESCRIPTION	BY
<b>MARYLAND PORT ADMINISTRATION HARBOR DEVELOPMENT</b>			
<b>CHESAPEAKE AND DELAWARE CANAL AND BALTIMORE CONNECTING CHANNELS 40' DEEPENING</b>			
<b>37' DREDGING PLAN C &amp; D STA. 0 TO 45</b>			
DATE: MAY, 1998		CONTRACT No.	PLATE No.
SCALE: AS SHOWN			A-1



**LEGEND**

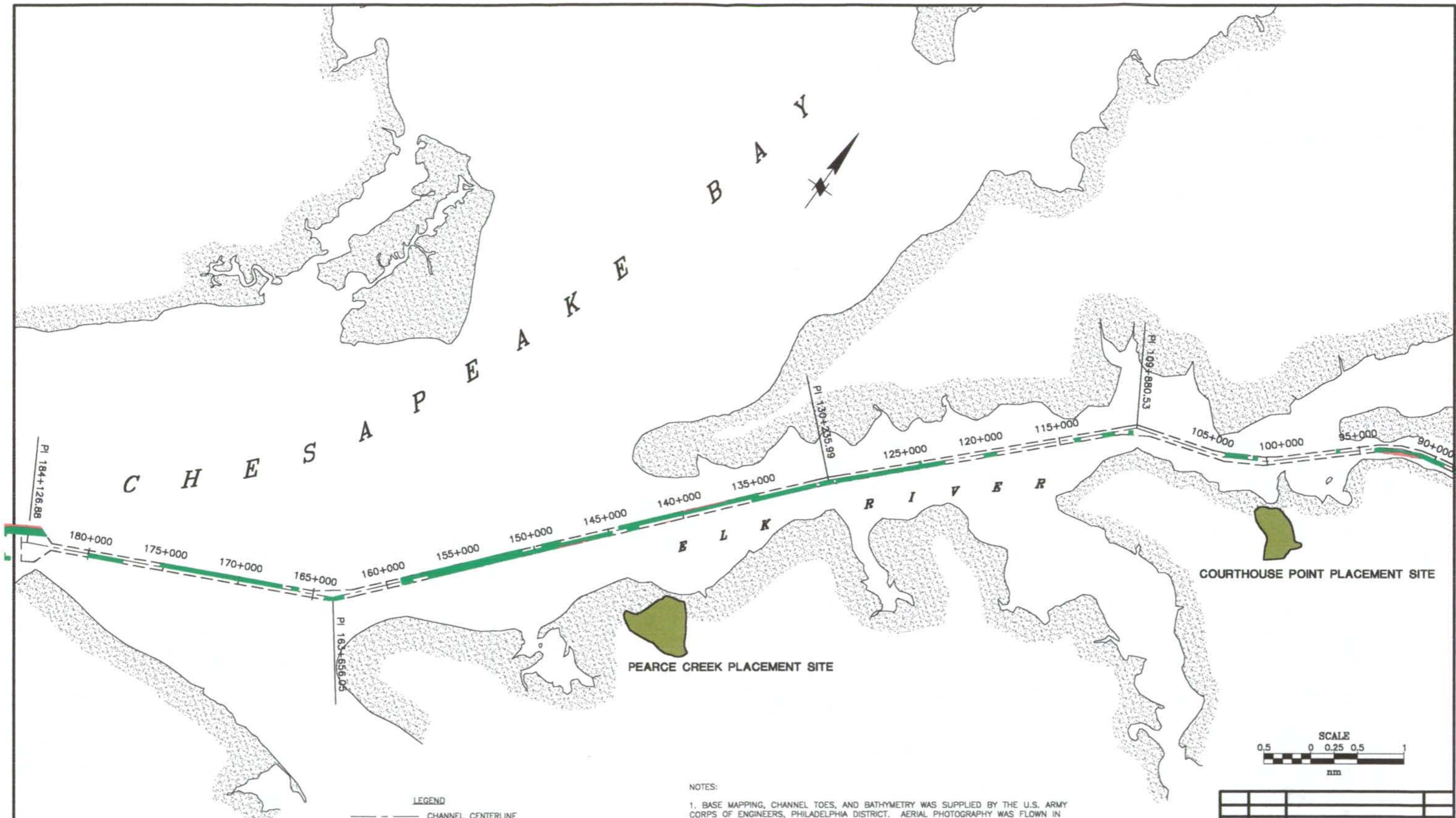
	CHANNEL CENTERLINE
	CHANNEL TOES
	> 4' DREDGING (O.D. INCLUDED)
	COVERAGE DREDGING
	UPLAND PLACEMENT SITE
	PLACEMENT SITE NOT USED

- NOTES:**
1. BASE MAPPING, CHANNEL TOES, AND BATHYMETRY WAS SUPPLIED BY THE U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT. AERIAL PHOTOGRAPHY WAS FLOWN IN OCTOBER 1993.
  2. HORIZONTAL DATUM IS THE 1983 NORTH AMERICAN DATUM, MARYLAND STATE PLANE.
  3. VERTICAL DATUM IS THE 1988 NORTH AMERICAN VERTICAL DATUM.
  4. DREDGING AREAS ARE SHOWN FOR THE 37' DEEPENING. PRODUCTION DREDGING IS SHOWN IN AREAS WHERE THE MATERIAL TO BE REMOVED IS GREATER THAN 4' DEEP, INCLUDING THE 1' OF ALLOWABLE OVERDEPTH DREDGING (O.D.). COVERAGE DREDGING IS SHOWN IN AREAS WHERE THE REQUIRED GRADE AND ANY ADVANCED MAINTENANCE DREDGING (A.M.D.) IS LESS THAN 3' DEEP (LESS THAN 4' DEEP IF 1' O.D. IS INCLUDED).



REV	DATE	DESCRIPTION	BY
<b>MARYLAND PORT ADMINISTRATION HARBOR DEVELOPMENT</b>			
<b>CHESAPEAKE AND DELAWARE CANAL AND BALTIMORE CONNECTING CHANNELS 40' DEEPENING</b>			
<b>37' DREDGING PLAN C. &amp; D. STA. 45 TO 90</b>			
DATE: MAY, 1998		CONTRACT No.	PLATE NO.
SCALE: AS SHOWN			A-2

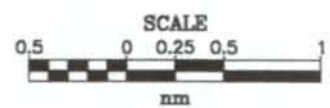




**LEGEND**

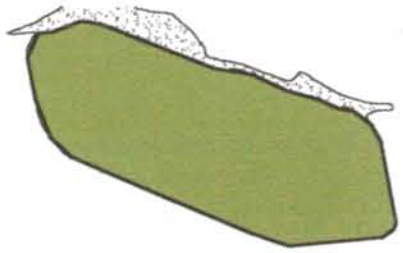
	CHANNEL CENTERLINE
	CHANNEL TOES
	> 4' DREDGING (O.D. INCLUDED)
	COVERAGE DREDGING
	UPLAND PLACEMENT SITE
	PLACEMENT SITE NOT USED

- NOTES:**
1. BASE MAPPING, CHANNEL TOES, AND BATHYMETRY WAS SUPPLIED BY THE U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT. AERIAL PHOTOGRAPHY WAS FLOWN IN OCTOBER 1993.
  2. HORIZONTAL DATUM IS THE 1983 NORTH AMERICAN DATUM, MARYLAND STATE PLANE.
  3. VERTICAL DATUM IS THE 1988 NORTH AMERICAN VERTICAL DATUM.
  4. DREDGING AREAS ARE SHOWN FOR THE 37' DEEPENING. PRODUCTION DREDGING IS SHOWN IN AREAS WHERE THE MATERIAL TO BE REMOVED IS GREATER THAN 4' DEEP, INCLUDING THE 1' OF ALLOWABLE OVERDEPTH DREDGING (O.D.). COVERAGE DREDGING IS SHOWN IN AREAS WHERE THE REQUIRED GRADE AND ANY ADVANCED MAINTENANCE DREDGING (A.M.D.) IS LESS THAN 3' DEEP (LESS THAN 4' DEEP IF 1' O.D. IS INCLUDED).



REV	DATE	DESCRIPTION	BY
<b>MARYLAND PORT ADMINISTRATION HARBOR DEVELOPMENT</b>			
<b>CHESAPEAKE AND DELAWARE CANAL AND BALTIMORE CONNECTING CHANNELS 40' DEEPENING</b>			
<b>37' DREDGING PLAN C &amp; D STA. 90 TO 180</b>			
DATE: MAY, 1998		CONTRACT No.	PLATE NO.
SCALE: AS SHOWN			A-3





HART-MILLER ISLAND  
PLACEMENT SITE

C H E S A P E A K E B A Y

G-EAST - OPEN  
WATER PLACEMENT SITE

STA. 239+740 C & D APPROACH  
PI 58+901 TOLCHESTER CHANNEL

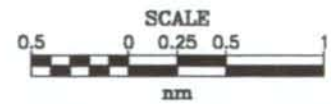


LEGEND

	CHANNEL CENTERLINE
	CHANNEL TOES
	> 4' DREDGING (O.D. INCLUDED)
	COVERAGE DREDGING
	UPLAND PLACEMENT SITE
	PLACEMENT SITE NOT USED

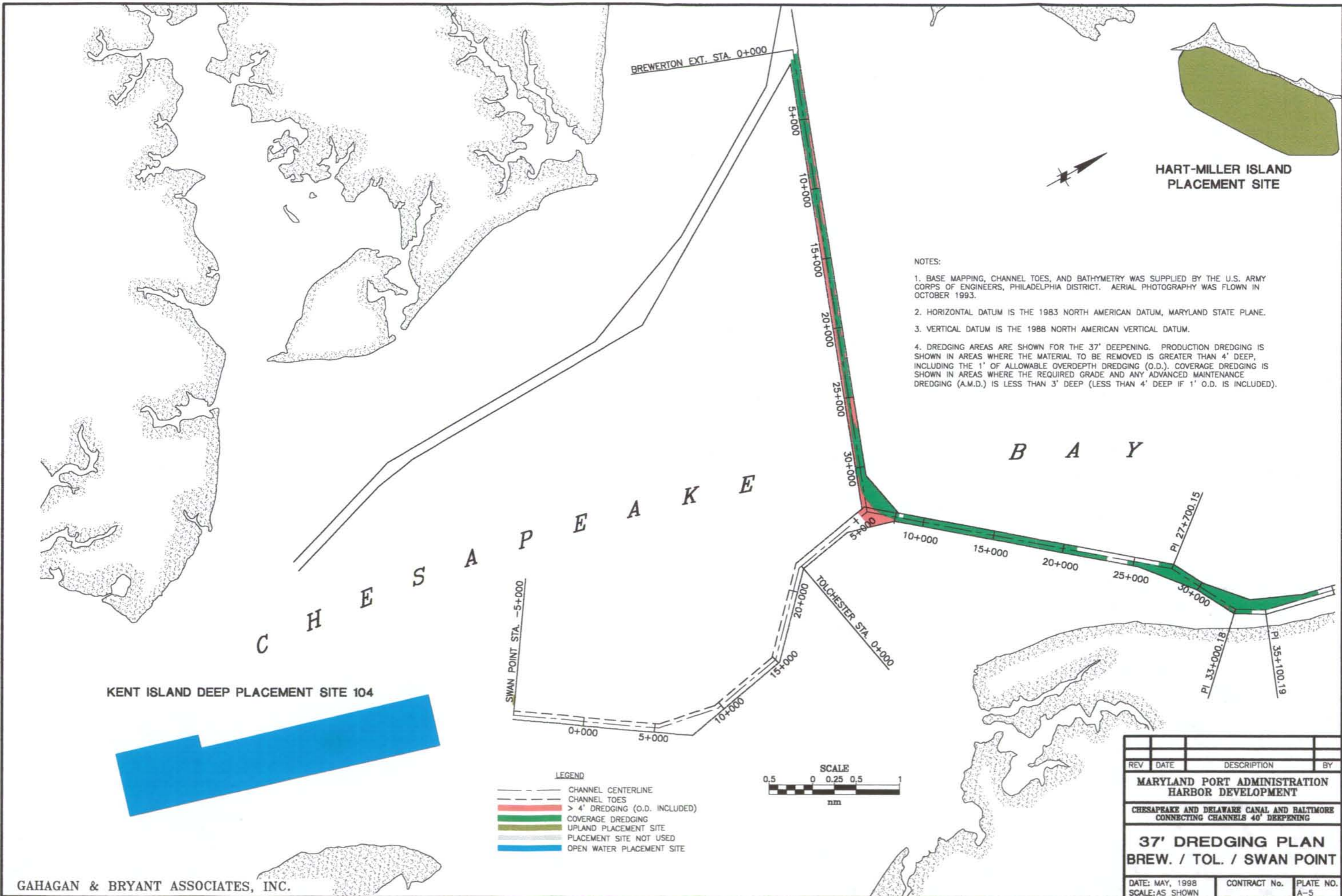
NOTES:

1. BASE MAPPING, CHANNEL TOES, AND BATHYMETRY WAS SUPPLIED BY THE U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT. AERIAL PHOTOGRAPHY WAS FLOWN IN OCTOBER 1993.
2. HORIZONTAL DATUM IS THE 1983 NORTH AMERICAN DATUM, MARYLAND STATE PLANE.
3. VERTICAL DATUM IS THE 1988 NORTH AMERICAN VERTICAL DATUM.
4. DREDGING AREAS ARE SHOWN FOR THE 37' DEEPENING. PRODUCTION DREDGING IS SHOWN IN AREAS WHERE THE MATERIAL TO BE REMOVED IS GREATER THAN 4' DEEP, INCLUDING THE 1' OF ALLOWABLE OVERDEPTH DREDGING (O.D.). COVERAGE DREDGING IS SHOWN IN AREAS WHERE THE REQUIRED GRADE AND ANY ADVANCED MAINTENANCE DREDGING (A.M.D.) IS LESS THAN 3' DEEP (LESS THAN 4' DEEP IF 1' O.D. IS INCLUDED).



REV	DATE	DESCRIPTION	BY
<b>MARYLAND PORT ADMINISTRATION HARBOR DEVELOPMENT</b>			
<b>CHESAPEAKE AND DELAWARE CANAL AND BALTIMORE CONNECTING CHANNELS 40' DEEPENING</b>			
<b>37' DREDGING PLAN - TOL. STA 25 TO C &amp; D STA. 180</b>			
DATE: MAY, 1998	CONTRACT No.	PLATE NO.	
SCALE: AS SHOWN		A-4	





BREWERTON EXT. STA. 0+000

HART-MILLER ISLAND  
PLACEMENT SITE

- NOTES:
1. BASE MAPPING, CHANNEL TOES, AND BATHYMETRY WAS SUPPLIED BY THE U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA DISTRICT. AERIAL PHOTOGRAPHY WAS FLOWN IN OCTOBER 1993.
  2. HORIZONTAL DATUM IS THE 1983 NORTH AMERICAN DATUM, MARYLAND STATE PLANE.
  3. VERTICAL DATUM IS THE 1988 NORTH AMERICAN VERTICAL DATUM.
  4. DREDGING AREAS ARE SHOWN FOR THE 37' DEEPENING. PRODUCTION DREDGING IS SHOWN IN AREAS WHERE THE MATERIAL TO BE REMOVED IS GREATER THAN 4' DEEP, INCLUDING THE 1' OF ALLOWABLE OVERDEPTH DREDGING (O.D.). COVERAGE DREDGING IS SHOWN IN AREAS WHERE THE REQUIRED GRADE AND ANY ADVANCED MAINTENANCE DREDGING (A.M.D.) IS LESS THAN 3' DEEP (LESS THAN 4' DEEP IF 1' O.D. IS INCLUDED).

B A Y

C H E S A P E A K E

KENT ISLAND DEEP PLACEMENT SITE 104

SWAN POINT STA. -5+000

TOLCHESTER STA. 0+000

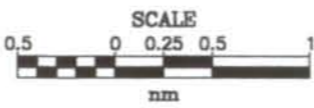
PI 27+700.15

PI 33+000.18

PI 35+100.19

LEGEND

- CHANNEL CENTERLINE
- - - CHANNEL TOES
- █ > 4' DREDGING (O.D. INCLUDED)
- █ COVERAGE DREDGING
- █ UPLAND PLACEMENT SITE
- █ PLACEMENT SITE NOT USED
- █ OPEN WATER PLACEMENT SITE



REV	DATE	DESCRIPTION	BY
<b>MARYLAND PORT ADMINISTRATION HARBOR DEVELOPMENT</b>			
<b>CHESAPEAKE AND DELAWARE CANAL AND BALTIMORE CONNECTING CHANNELS 40' DEEPENING</b>			
<b>37' DREDGING PLAN BREW. / TOL. / SWAN POINT</b>			
DATE: MAY, 1998		CONTRACT No.	PLATE No.
SCALE: AS SHOWN			A-5

**APPENDIX B  
37 FT NEW WORK SUMMARY**



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels, 37' Deepening  
Appendix B - New Work Only Volume Summary**

C & D CANAL		GRADE				ADVANCED MAINTENANCE				OVER DEPTH				TOTAL = GRADE + A.M. + O.D.			
STATIONS		L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total
From	To	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)
-0+927	0+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0+000	10+000	0.000	0.152	0.000	0.152	0.000	0.000	0.000	0.000	0.000	0.213	0.000	0.213	0.000	0.364	0.000	0.364
10+000	18+500	0.000	0.006	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.025	0.000	0.031	0.000	0.031
18+500	31+000	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.009	0.000	0.021	0.000	0.021	0.000	0.039	0.000	0.039
31+000	40+000	0.000	0.006	0.000	0.006	0.000	0.005	0.000	0.005	0.000	0.012	0.000	0.012	0.000	0.023	0.000	0.023
40+000	55+000	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.007	0.000	0.007	0.000	0.011	0.000	0.011
55+000	70+000	0.000	0.005	0.000	0.005	0.000	0.003	0.000	0.003	0.000	0.009	0.000	0.009	0.000	0.017	0.000	0.017
70+000	80+000	0.000	0.003	0.000	0.003	0.000	0.004	0.000	0.004	0.000	0.010	0.000	0.010	0.000	0.017	0.000	0.017
80+000	90+000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.003	0.000	0.003
90+000	100+000	0.000	0.015	0.000	0.015	0.000	0.008	0.000	0.008	0.000	0.020	0.000	0.020	0.000	0.044	0.000	0.044
100+000	110+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
110+000	120+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
120+000	129+500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
129+500	140+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
140+000	150+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
150+000	160+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.063	0.000	0.063	0.000	0.063
160+000	170+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
170+000	180+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
180+000	190+000	0.000	0.083	0.000	0.083	0.000	0.000	0.000	0.000	0.000	0.054	0.000	0.054	0.000	0.136	0.000	0.136
190+000	203+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
203+000	210+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
210+000	220+000	0.000	0.000	0.000	0.000	0.000	0.137	0.000	0.137	0.000	0.168	0.000	0.168	0.000	0.305	0.000	0.305
220+000	230+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.016	0.000	0.016	0.000	0.016
230+000	239+740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.149	0.000	0.149	0.000	0.149	0.000	0.149
<b>TOTAL MCY</b>		0.000	0.281	0.000	0.281	0.000	0.168	0.000	0.168	0.000	0.769	0.000	0.769	0.000	1.218	0.000	1.218

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels, 37' Deepening**  
**Appendix B - New Work Only Volume Summary**

TOLCHESTER																	
STATIONS		GRADE				ADVANCED MAINTENANCE				OVER DEPTH				TOTAL = GRADE + A.M. + O.D.			
		L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total
		Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)
From	To																
5+500	20+000	0.000	0.000	0.000	0.000	0.000	0.092	0.000	0.092	0.000	0.098	0.000	0.098	0.000	0.190	0.000	0.190
20+000	30+000	0.000	0.000	0.000	0.000	0.000	0.035	0.000	0.035	0.000	0.081	0.000	0.081	0.000	0.116	0.000	0.116
30+000	40+000	0.000	0.000	0.000	0.000	0.000	0.093	0.000	0.093	0.000	0.171	0.000	0.171	0.000	0.263	0.000	0.263
40+000	50+000	0.000	0.000	0.000	0.000	0.000	0.057	0.000	0.057	0.000	0.081	0.000	0.081	0.000	0.137	0.000	0.137
50+000	58+901	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.006	0.000	0.009	0.000	0.009	0.000	0.015	0.000	0.015
<b>TOTAL MCY</b>		0.000	0.000	0.000	0.000	0.000	0.283	0.000	0.283	0.000	0.439	0.000	0.439	0.000	0.721	0.000	0.721

BREWERTON EXTENSION - 450' CHANNEL																	
STATIONS		GRADE				ADVANCED MAINTENANCE				OVER DEPTH				TOTAL = GRADE + A.M. + O.D.			
		L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total
		Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)
From	To																
0+000	10+000	0.000	0.000	0.000	0.000	0.000	0.125	0.000	0.125	0.000	0.148	0.000	0.148	0.000	0.273	0.000	0.273
10+000	20+000	0.000	0.000	0.000	0.000	0.000	0.136	0.000	0.136	0.000	0.162	0.000	0.162	0.000	0.298	0.000	0.298
20+000	33+200	0.000	0.000	0.000	0.000	0.000	0.257	0.000	0.257	0.000	0.305	0.000	0.305	0.000	0.562	0.000	0.562
<b>TOTAL MCY</b>		0.000	0.000	0.000	0.000	0.000	0.518	0.000	0.518	0.000	0.614	0.000	0.614	0.000	1.133	0.000	1.133



**APPENDIX C  
37 FT NEW WORK + EXISTING PROJECT SUMMARY**

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels, 37' Deepening  
Appendix C - New Work + Existing Project Volume Summary**

C & D CANAL		GRADE				ADVANCED MAINTENANCE				OVER DEPTH				TOTAL = GRADE + A.M. + O.D.			
STATIONS		L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total
From	To	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)
-0+927	0+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0+000	10+000	0.032	0.703	0.048	0.782	0.000	0.000	0.000	0.000	0.000	0.213	0.000	0.213	0.032	0.915	0.048	0.995
10+000	18+500	0.000	0.006	0.002	0.008	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.025	0.000	0.032	0.002	0.034
18+500	31+000	0.001	0.014	0.002	0.017	0.000	0.009	0.000	0.009	0.000	0.021	0.000	0.021	0.001	0.044	0.002	0.048
31+000	40+000	0.000	0.011	0.001	0.012	0.000	0.005	0.000	0.005	0.000	0.012	0.000	0.012	0.000	0.029	0.001	0.030
40+000	55+000	0.008	0.006	0.000	0.014	0.000	0.002	0.000	0.002	0.000	0.007	0.000	0.007	0.008	0.014	0.000	0.023
55+000	70+000	0.004	0.009	0.000	0.014	0.000	0.003	0.000	0.003	0.000	0.009	0.000	0.009	0.004	0.021	0.000	0.026
70+000	80+000	0.007	0.007	0.008	0.023	0.000	0.004	0.000	0.004	0.000	0.010	0.000	0.010	0.007	0.021	0.008	0.037
80+000	90+000	0.000	0.003	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.005	0.000	0.005
90+000	100+000	0.124	0.163	0.000	0.287	0.000	0.008	0.000	0.008	0.000	0.020	0.000	0.020	0.124	0.192	0.000	0.315
100+000	110+000	0.000	0.002	0.001	0.003	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.003	0.001	0.004
110+000	120+000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.003	0.000	0.003
120+000	129+500	0.003	0.007	0.000	0.011	0.000	0.018	0.000	0.018	0.000	0.044	0.000	0.044	0.003	0.069	0.000	0.072
129+500	140+000	0.002	0.007	0.003	0.013	0.000	0.015	0.000	0.015	0.000	0.028	0.000	0.028	0.002	0.051	0.003	0.056
140+000	150+000	0.004	0.014	0.003	0.021	0.000	0.023	0.000	0.023	0.000	0.046	0.000	0.046	0.004	0.083	0.003	0.090
150+000	160+000	0.001	0.001	0.001	0.004	0.000	0.052	0.000	0.052	0.000	0.072	0.000	0.072	0.001	0.125	0.001	0.128
160+000	170+000	0.004	0.002	0.003	0.009	0.000	0.002	0.000	0.002	0.000	0.010	0.000	0.010	0.004	0.014	0.003	0.020
170+000	180+000	0.001	0.000	0.003	0.004	0.000	0.006	0.000	0.006	0.000	0.021	0.000	0.021	0.001	0.028	0.003	0.031
180+000	190+000	0.002	0.083	0.015	0.100	0.000	0.000	0.000	0.000	0.000	0.054	0.000	0.054	0.002	0.136	0.015	0.164
190+000	203+000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.002
203+000	210+000	0.001	0.000	0.000	0.001	0.000	0.002	0.000	0.002	0.000	0.009	0.000	0.009	0.001	0.011	0.000	0.012
210+000	220+000	0.013	0.014	0.002	0.028	0.000	0.450	0.000	0.450	0.000	0.168	0.000	0.168	0.013	0.632	0.002	0.647
220+000	230+000	0.006	0.001	0.002	0.008	0.000	0.080	0.000	0.080	0.000	0.091	0.000	0.091	0.006	0.172	0.002	0.179
230+000	239+740	0.005	0.003	0.003	0.011	0.000	0.173	0.000	0.173	0.000	0.149	0.000	0.149	0.005	0.324	0.003	0.332
<b>TOTAL MCY</b>		<b>0.219</b>	<b>1.056</b>	<b>0.098</b>	<b>1.373</b>	<b>0.000</b>	<b>0.852</b>	<b>0.000</b>	<b>0.852</b>	<b>0.000</b>	<b>1.017</b>	<b>0.000</b>	<b>1.017</b>	<b>0.219</b>	<b>2.924</b>	<b>0.098</b>	<b>3.242</b>



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels, 37' Deepening  
Appendix C - New Work + Existing Project Volume Summary**

TOLCHESTER																	
STATIONS		GRADE				ADVANCED MAINTENANCE				OVER DEPTH				TOTAL = GRADE + A.M. + O.D.			
		L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total
		Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)
From	To																
5+500	20+000	0.008	0.287	0.009	0.305	0.000	0.182	0.000	0.182	0.000	0.192	0.000	0.192	0.008	0.661	0.009	0.678
20+000	30+000	0.000	0.002	0.001	0.003	0.000	0.043	0.000	0.043	0.000	0.088	0.000	0.088	0.000	0.133	0.001	0.134
30+000	40+000	0.001	0.007	0.000	0.008	0.000	0.120	0.000	0.120	0.000	0.171	0.000	0.171	0.001	0.298	0.000	0.299
40+000	50+000	0.007	0.033	0.004	0.043	0.000	0.094	0.000	0.094	0.000	0.081	0.000	0.081	0.007	0.208	0.004	0.218
50+000	58+901	0.005	0.003	0.000	0.008	0.000	0.009	0.000	0.009	0.000	0.010	0.000	0.010	0.005	0.023	0.000	0.028
TOTAL MCY		0.021	0.333	0.014	0.368	0.000	0.449	0.000	0.449	0.000	0.541	0.000	0.541	0.021	1.323	0.014	1.358

BREWERTON EXTENSION - 450' CHANNEL																	
STATIONS		GRADE				ADVANCED MAINTENANCE				OVER DEPTH				TOTAL = GRADE + A.M. + O.D.			
		L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total	L Slope	Channel	R Slope	Total
		Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)	Volume (MCY)
From	To																
0 + 000	10+000	0.005	0.022	0.001	0.028	0.000	0.197	0.000	0.197	0.000	0.148	0.000	0.148	0.005	0.367	0.001	0.373
10+000	20+000	0.003	0.092	0.011	0.106	0.000	0.220	0.000	0.220	0.000	0.162	0.000	0.162	0.003	0.474	0.011	0.488
20+000	33+200	0.007	0.162	0.013	0.183	0.000	0.420	0.000	0.420	0.000	0.305	0.000	0.305	0.007	0.887	0.013	0.908
TOTAL MCY		0.015	0.277	0.025	0.316	0.000	0.838	0.000	0.838	0.000	0.614	0.000	0.614	0.015	1.729	0.025	1.768

C & D CANAL + TOLCHESTER + BREWERTON 450' CHANNEL																	
GRAND TOTAL		0.255	1.665	0.137	2.058	0.000	2.139	0.000	2.139	0.000	2.172	0.000	2.172	0.255	5.976	0.137	6.368

**APPENDIX D  
37 FT DREDGING SCENARIO 3B - NEW WORK**



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table D-1 - New Work Only - C & D Canal Volumes

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
-927	0	0	0	0	0	0	0	0
-800	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0
-400	0	0	0	0	0	0	0	0
-200	0	0	0	0	0	0	1	1
0	0	0	0	0	0	63	233	233
200	67	248	67	248	0	495	2,065	1,818
400	389	1,687	389	1,687	0	1,241	6,428	4,742
600	455	3,125	455	3,125	0	2,095	12,354	9,230
800	1,505	7,259	1,505	7,259	0	3,200	19,611	12,352
1000	2,341	14,245	2,341	14,245	0	4,771	29,522	15,277
1200	1,940	15,858	1,940	15,858	0	4,132	32,973	17,115
1400	1,747	13,658	1,747	13,658	0	3,791	29,342	15,683
1600	1,464	11,893	1,464	11,893	0	3,193	25,864	13,971
1800	1,080	9,421	1,080	9,421	0	2,714	21,878	12,457
2000	972	7,599	972	7,599	0	2,374	18,845	11,246
2200	1,099	7,671	1,099	7,671	0	2,390	17,642	9,971
2400	1,023	7,859	1,023	7,859	0	2,050	16,443	8,584
2600	837	6,885	837	6,885	0	1,819	14,329	7,443
2800	394	4,558	394	4,558	0	807	9,726	5,168
3000	417	3,003	417	3,003	0	890	6,284	3,281
3500	246	6,133	246	6,133	0	551	13,338	7,206
4000	307	5,119	307	5,119	0	688	11,472	6,353
4500	113	3,891	113	3,891	0	420	10,255	6,364
5000	21	1,243	21	1,243	0	43	4,285	3,042
5500	0	195	0	195	0	13	523	328
6000	0	0	0	0	0	46	550	550
6500	38	354	38	354	0	376	3,905	3,552
7000	297	3,099	297	3,099	0	729	10,233	7,133
7500	354	6,024	354	6,024	0	795	14,116	8,092
8000	264	5,719	264	5,719	0	705	13,885	8,167
8500	133	3,670	133	3,670	0	546	11,576	7,906
9000	0	1,229	0	1,229	0	90	5,884	4,655
9500	0	0	0	0	0	0	836	836
10000	0	4	0	4	0	2	19	15
10500	3	36	3	36	0	8	91	55
11000	0	31	0	31	0	212	2,038	2,006
11500	86	800	86	800	0	516	6,743	5,943
12000	99	1,717	99	1,717	0	457	9,012	7,295
12500	10	1,010	10	1,010	0	155	5,664	4,653
13000	20	282	20	282	0	83	2,200	1,918
13500	13	308	13	308	0	40	1,141	833
14000	0	119	0	119	0	0	374	255
14500	0	0	0	0	0	0	0	0
15000	0	0	0	0	0	2	21	21
15500	0	0	0	0	0	0	22	22
16000	0	0	0	0	0	0	1	1
16500	0	0	0	0	0	0	0	0
17000	68	629	68	629	0	170	1,576	947
17500	0	629	0	629	0	0	1,576	947
18000	0	0	0	0	0	0	0	0
18500	11	98	11	98	0	66	615	517
19000	43	495	43	495	0	104	1,579	1,084
19000	43	0	104	0	0	184	0	0
19343	48	578	113	1,380	802	192	2,393	1,013
19500	54	298	123	687	390	209	1,166	479
20000	37	846	96	2,031	1,185	195	3,734	1,702
20120	10	104	38	297	193	116	689	392
20500	32	291	83	851	560	159	1,930	1,079
20896	0	232	0	611	379	3	1,184	573
21000	0	0	2	4	4	16	36	31
21000	0	0	0	0	0	2	0	0
21500	6	57	6	57	0	14	148	91
21673	0	20	0	20	0	0	44	24
22000	0	0	0	0	0	0	0	0
22449	0	0	0	0	0	0	0	0
23000	0	0	0	0	0	0	0	0
23500	0	0	0	0	0	0	0	0

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-1 - New Work Only - C & D Canal Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
23656	0	0	0	0	0	0	0	0
24000	0	0	0	0	0	0	0	0
24587	128	1,396	128	1,396	0	293	3,186	1,790
25000	8	1,040	8	1,040	0	111	3,093	2,053
25000	8	0	91	0	0	213	0	0
25517	18	245	56	1,406	1,160	106	3,054	1,649
26000	52	629	119	1,569	940	210	2,825	1,256
26448	13	539	40	1,317	778	131	2,830	1,512
27000	39	530	96	1,390	860	207	3,455	2,065
27378	35	518	81	1,240	722	173	2,660	1,420
28000	19	618	54	1,555	937	128	3,468	1,913
28309	0	107	1	315	209	33	920	605
28500	1	4	12	47	42	46	280	234
29000	0	11	0	115	104	1	436	321
29000	0	0	0	0	0	0	0	0
29239	0	0	0	0	0	0	0	0
29500	0	0	0	0	0	0	0	0
30000	0	0	0	0	0	0	0	0
30211	0	0	0	0	0	0	0	0
30500	0	0	0	0	0	0	0	0
31000	0	0	0	0	0	0	0	0
31500	0	0	0	0	0	0	0	0
32000	0	0	0	0	0	0	0	0
32404	0	0	0	0	0	0	0	0
33000	0	0	0	0	0	0	0	0
33000	0	0	0	0	0	0	0	0
33405	0	0	0	0	0	0	0	0
34000	59	650	128	1,409	758	207	2,279	870
34405	76	1,015	169	2,224	1,209	272	3,592	1,368
35000	79	1,709	174	3,771	2,061	278	6,059	2,288
35405	0	592	24	1,481	889	102	2,846	1,366
36000	0	0	0	263	263	14	1,278	1,015
36000	0	0	0	0	0	0	0	0
36500	0	0	0	0	0	21	193	193
37000	1	9	1	9	0	48	640	631
37500	0	13	0	13	0	38	800	787
38000	35	324	35	324	0	98	1,257	933
38500	10	409	10	409	0	51	1,380	971
39000	26	332	26	332	0	73	1,152	820
39269	1	138	1	138	0	17	446	308
39500	29	128	29	128	0	70	369	241
40094	0	314	0	314	0	15	936	621
40500	0	0	0	0	0	17	239	239
40919	0	0	0	0	0	0	129	129
41500	4	47	4	47	0	27	290	243
41744	0	20	0	20	0	0	122	102
42000	0	0	0	0	0	7	35	35
42500	0	0	0	0	0	0	69	69
43000	0	0	0	0	0	0	0	0
43500	0	0	0	0	0	0	0	0
44000	0	0	0	0	0	0	0	0
44500	0	0	0	0	0	0	0	0
45000	0	0	0	0	0	0	0	0
45500	14	131	14	131	0	32	297	166
46000	5	174	5	174	0	33	600	426
46000	5	0	33	0	0	67	0	0
46500	2	58	24	525	467	71	1,274	749
46784	0	9	1	129	120	14	445	316
47000	0	0	0	2	2	3	69	67
47500	4	34	19	174	140	51	506	332
47745	0	17	1	91	74	22	331	241
48000	61	288	135	645	356	236	1,220	575
48500	2	587	20	1,441	853	106	3,173	1,732
48706	0	9	0	78	69	0	406	328
49000	0	0	0	0	0	0	0	0
49000	0	0	0	0	0	0	0	0
49500	0	0	0	0	0	0	0	0
49666	0	0	0	0	0	0	0	0
50000	0	0	0	0	0	0	0	0



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-1 - New Work Only - C & D Canal Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
50500	0	0	0	0	0	0	0	0
50500	0	0	0	0	0	0	0	0
50674	0	0	0	0	0	0	0	0
51000	0	0	0	0	0	0	0	0
51500	0	0	0	0	0	0	0	0
51500	0	0	0	0	0	0	0	0
52000	0	0	0	0	0	0	0	0
52274	0	0	0	0	0	0	0	0
52500	0	0	0	0	0	0	0	0
53000	8	71	8	71	0	16	148	77
53500	0	71	0	71	0	0	148	77
54000	26	243	26	243	0	53	494	251
54500	0	243	0	243	0	0	494	251
55000	30	278	30	278	0	61	563	284
55500	0	278	0	278	0	0	563	284
56000	1	9	1	9	0	7	69	61
56500	1	22	1	22	0	3	100	78
57000	0	14	0	14	0	0	31	17
57500	4	33	4	33	0	7	69	36
58000	0	33	0	33	0	0	69	36
58500	0	0	0	0	0	0	0	0
59000	0	0	0	0	0	0	0	0
59500	33	306	33	306	0	67	623	317
59889	0	238	0	238	0	2	499	261
60000	0	0	0	0	0	0	4	4
60500	49	453	49	453	0	168	1,552	1,100
61000	23	668	23	668	0	62	2,126	1,458
61276	0	119	0	119	0	0	317	198
61500	0	0	0	0	0	3	12	12
62000	0	0	0	0	0	0	28	28
62500	2	16	2	16	0	4	41	25
63000	0	16	0	16	0	0	41	25
63311	0	0	0	0	0	0	0	0
63500	5	18	5	18	0	11	39	22
64000	0	47	0	47	0	0	104	57
64000	0	0	0	0	0	11	0	0
64185	0	0	2	7	7	14	84	77
64500	1	5	7	56	51	27	238	182
65059	0	10	5	126	116	18	463	337
65500	120	978	228	1,898	920	362	3,104	1,206
66000	14	1,233	70	2,753	1,519	156	4,800	2,047
66000	14	0	14	0	0	70	0	0
66500	0	125	0	125	0	0	644	519
67206	0	0	0	0	0	0	0	0
67500	0	0	0	0	0	0	0	0
68000	0	0	0	0	0	0	2	2
68349	0	0	0	0	0	1	8	8
69000	19	231	19	231	0	43	534	303
69549	0	195	0	195	0	0	440	245
70000	6	51	6	51	0	34	287	236
70692	0	78	0	78	0	0	446	368
71000	2	13	2	13	0	31	178	165
71500	2	36	2	36	0	34	597	562
72000	0	15	0	15	0	0	313	298
72500	0	0	0	0	0	0	0	0
72500	0	0	0	0	0	4	0	0
73000	32	292	72	666	374	141	1,342	676
73500	21	488	70	1,315	827	165	2,830	1,515
74056	1	224	4	766	542	24	1,944	1,178
74500	5	45	14	152	106	45	571	419
75000	30	322	92	984	662	198	2,255	1,270
75525	0	291	0	897	606	1	1,933	1,036
76000	22	191	55	485	293	103	914	429
76500	26	441	56	1,033	592	100	1,882	849
76500	28	0	26	0	0	56	0	0
76994	0	237	0	237	0	0	516	280
77500	0	0	0	0	0	0	0	0
78000	0	0	0	0	0	0	0	0
78500	0	0	0	0	0	0	0	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table D-1 - New Work Only - C & D Canal Volumes

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
79000	19	175	19	175	0	37	339	164
79627	0	219	0	219	0	28	749	530
80000	0	0	0	0	0	0	193	193
80606	1	12	1	12	0	3	29	16
81000	0	9	0	9	0	3	40	31
81586	0	1	0	1	0	2	54	53
82000	0	0	0	0	0	0	16	16
82500	0	0	0	0	0	0	0	0
83000	0	0	0	0	0	0	0	0
83500	0	0	0	0	0	0	0	0
84000	0	0	0	0	0	0	0	0
84500	0	0	0	0	0	0	0	0
85000	0	0	0	0	0	0	0	0
85500	0	0	0	0	0	0	0	0
86000	0	0	0	0	0	0	0	0
86500	1	10	1	10	0	2	15	4
87000	1	23	1	23	0	4	56	33
87500	0	12	0	12	0	0	41	29
88002	70	647	70	647	0	162	1,505	858
88500	0	642	0	642	0	0	1,493	852
89000	0	0	0	0	0	0	0	0
89500	0	0	0	0	0	3	23	23
90000	0	0	0	0	0	7	91	91
90000	0	0	7	0	0	46	0	0
90500	0	0	12	182	182	76	1,128	946
90934	18	143	61	589	446	140	1,739	1,150
91500	262	2,928	370	4,517	1,588	631	8,086	3,569
92000	147	3,783	255	5,792	2,010	419	9,721	3,929
92300	242	2,159	350	3,362	1,203	600	5,662	2,300
92500	157	1,478	266	2,280	802	450	3,889	1,610
93000	105	2,428	213	4,437	2,010	325	7,176	2,739
93000	105	0	105	0	0	220	0	0
93500	67	1,590	67	1,590	0	169	3,599	2,009
93666	37	319	37	319	0	78	759	441
94000	0	227	0	227	0	24	633	406
94500	0	0	0	0	0	0	224	223
95000	0	0	0	0	0	0	0	0
95500	0	0	0	0	0	0	0	0
96000	0	0	0	0	0	0	0	0
96500	0	0	0	0	0	0	2	2
97000	0	0	0	0	0	0	2	2
97500	0	0	0	0	0	0	0	0
98000	0	0	0	0	0	0	0	0
98500	0	0	0	0	0	57	524	524
99000	0	0	0	0	0	0	524	524
99500	0	0	0	0	0	0	0	0
100000	0	0	0	0	0	0	0	0
100500	0	0	0	0	0	0	0	0
101079	0	0	0	0	0	0	0	0
101079	0	0	0	0	0	0	0	0
101500	0	0	0	0	0	0	0	0
102000	0	0	0	0	0	0	0	0
102500	0	0	0	0	0	0	0	0
103000	0	0	0	0	0	0	0	0
103500	0	0	0	0	0	0	0	0
104053	0	0	0	0	0	0	0	0
104500	0	0	0	0	0	0	0	0
105000	0	0	0	0	0	0	0	0
105500	0	0	0	0	0	0	0	0
106000	0	0	0	0	0	0	0	0
106500	0	0	0	0	0	0	0	0
107000	0	0	0	0	0	0	0	0
107500	0	0	0	0	0	0	0	0
108000	0	0	0	0	0	0	0	0
108500	0	0	0	0	0	0	0	0
109000	0	0	0	0	0	0	0	0
109500	0	0	0	0	0	0	0	0
109881	0	0	0	0	0	0	0	0
110000	0	0	0	0	0	0	0	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table D-1 - New Work Only - C & D Canal Volumes

Station	GRADE Channel		GRADE + AMD Channel		AMD ONLY Channel	GRADE + AMD + OD Channel		OD ONLY Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
110500	0	0	0	0	0	0	0	0
111000	0	0	0	0	0	0	0	0
111000	0	0	0	0	0	0	0	0
111500	0	0	0	0	0	0	0	0
112000	0	0	0	0	0	0	0	0
112500	0	0	0	0	0	0	0	0
113000	0	0	0	0	0	0	0	0
113500	0	0	0	0	0	0	0	0
114000	0	0	0	0	0	0	0	0
114500	0	0	0	0	0	0	0	0
115000	0	0	0	0	0	0	0	0
115500	0	0	0	0	0	0	0	0
116000	0	0	0	0	0	0	0	0
116500	0	0	0	0	0	0	0	0
117000	0	0	0	0	0	0	0	0
117500	0	0	0	0	0	0	0	0
118000	0	0	0	0	0	0	0	0
118500	0	0	0	0	0	0	0	0
119000	0	0	0	0	0	0	0	0
119500	0	0	0	0	0	0	0	0
120000	0	0	0	0	0	0	0	0
120500	0	0	0	0	0	0	0	0
121000	0	0	0	0	0	0	0	0
121500	0	0	0	0	0	0	0	0
122000	0	0	0	0	0	0	0	0
122500	0	0	0	0	0	0	0	0
123000	0	0	0	0	0	0	0	0
123500	0	0	0	0	0	0	0	0
124000	0	0	0	0	0	0	0	0
124500	0	0	0	0	0	0	0	0
125000	0	0	0	0	0	0	0	0
125500	0	0	0	0	0	0	0	0
126000	0	0	0	0	0	0	0	0
126500	0	0	0	0	0	0	0	0
127000	0	0	0	0	0	0	0	0
127500	0	0	0	0	0	0	0	0
128000	0	0	0	0	0	0	0	0
128500	0	0	0	0	0	0	0	0
129000	0	0	0	0	0	0	0	0
129500	0	0	0	0	0	0	0	0
130000	0	0	0	0	0	0	0	0
130236	0	0	0	0	0	0	0	0
130500	0	0	0	0	0	0	0	0
131000	0	0	0	0	0	0	0	0
131500	0	0	0	0	0	0	0	0
132000	0	0	0	0	0	0	0	0
132500	0	0	0	0	0	0	0	0
133000	0	0	0	0	0	0	0	0
133500	0	0	0	0	0	0	0	0
134000	0	0	0	0	0	0	0	0
134500	0	0	0	0	0	0	0	0
135000	0	0	0	0	0	0	0	0
135500	0	0	0	0	0	0	0	0
136000	0	0	0	0	0	0	0	0
136500	0	0	0	0	0	0	0	0
137000	0	0	0	0	0	0	0	0
137500	0	0	0	0	0	0	0	0
138000	0	0	0	0	0	0	0	0
138500	0	0	0	0	0	0	0	0
139000	0	0	0	0	0	0	0	0
139500	0	0	0	0	0	0	0	0
140000	0	0	0	0	0	0	0	0
140500	0	0	0	0	0	0	0	0
141000	0	0	0	0	0	0	0	0
141500	0	0	0	0	0	0	0	0
142000	0	0	0	0	0	0	0	0
142500	0	0	0	0	0	0	0	0
143000	0	0	0	0	0	0	0	0
143500	0	0	0	0	0	0	0	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table D-1 - New Work Only - C & D Canal Volumes

Station	GRADE Channel		GRADE + AMD Channel		AMD ONLY Channel	GRADE + AMD + OD Channel		OD ONLY Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
144000	0	0	0	0	0	0	0	0
144500	0	0	0	0	0	0	0	0
145000	0	0	0	0	0	0	0	0
145500	0	0	0	0	0	0	0	0
146000	0	0	0	0	0	0	0	0
146500	0	0	0	0	0	0	0	0
147000	0	0	0	0	0	0	0	0
147500	0	0	0	0	0	0	0	0
148000	0	0	0	0	0	0	0	0
148500	0	0	0	0	0	0	0	0
149000	0	0	0	0	0	0	0	0
149500	0	0	0	0	0	0	0	0
150000	0	0	0	0	0	0	0	0
150500	0	0	0	0	0	0	0	0
151000	0	0	0	0	0	0	0	0
151500	0	0	0	0	0	0	0	0
152000	0	0	0	0	0	0	0	0
152000	0	0	0	0	0	247	0	0
152500	0	0	0	0	0	255	4,643	4,643
153000	0	0	0	0	0	292	5,067	5,067
153500	0	0	0	0	0	318	5,655	5,655
154000	0	0	0	0	0	339	6,084	6,084
154500	0	0	0	0	0	328	6,176	6,176
155000	0	0	0	0	0	343	6,217	6,217
155500	0	0	0	0	0	331	6,243	6,243
156000	0	0	0	0	0	321	6,041	6,041
156500	0	0	0	0	0	246	5,252	5,252
157000	0	0	0	0	0	215	4,264	4,264
157500	0	0	0	0	0	26	2,230	2,230
158000	0	0	0	0	0	41	625	625
158500	0	0	0	0	0	140	1,680	1,680
159000	0	0	0	0	0	126	2,464	2,464
159000	0	0	0	0	0	0	0	0
159500	0	0	0	0	0	0	0	0
160000	0	0	0	0	0	0	0	0
160500	0	0	0	0	0	0	0	0
161000	0	0	0	0	0	0	0	0
161500	0	0	0	0	0	0	0	0
162000	0	0	0	0	0	0	0	0
162500	0	0	0	0	0	0	0	0
163000	0	0	0	0	0	0	0	0
163500	0	0	0	0	0	0	0	0
163655	0	0	0	0	0	0	0	0
163655	0	0	0	0	0	0	0	0
164000	0	0	0	0	0	0	0	0
164500	0	0	0	0	0	0	0	0
165000	0	0	0	0	0	0	0	0
165000	0	0	0	0	0	0	0	0
165500	0	0	0	0	0	0	0	0
166000	0	0	0	0	0	0	0	0
166500	0	0	0	0	0	0	0	0
167000	0	0	0	0	0	0	0	0
167500	0	0	0	0	0	0	0	0
168000	0	0	0	0	0	0	0	0
168500	0	0	0	0	0	0	0	0
169000	0	0	0	0	0	0	0	0
169000	0	0	0	0	0	0	0	0
169500	0	0	0	0	0	0	0	0
170000	0	0	0	0	0	0	0	0
170500	0	0	0	0	0	0	0	0
171000	0	0	0	0	0	0	0	0
171500	0	0	0	0	0	0	0	0
172000	0	0	0	0	0	0	0	0
172500	0	0	0	0	0	0	0	0
173000	0	0	0	0	0	0	0	0
173500	0	0	0	0	0	0	0	0
174000	0	0	0	0	0	0	0	0
174500	0	0	0	0	0	0	0	0
175000	0	0	0	0	0	0	0	0



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-1 - New Work Only - C & D Canal Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
175500	0	0	0	0	0	0	0	0
176000	0	0	0	0	0	0	0	0
176500	0	0	0	0	0	0	0	0
177000	0	0	0	0	0	0	0	0
177500	0	0	0	0	0	0	0	0
178000	0	0	0	0	0	0	0	0
178500	0	0	0	0	0	0	0	0
179000	0	0	0	0	0	0	0	0
179500	0	0	0	0	0	0	0	0
180000	0	0	0	0	0	0	0	0
180000	0	0	0	0	0	0	0	0
180500	0	0	0	0	0	0	0	0
181000	0	0	0	0	0	0	0	0
181500	0	0	0	0	0	0	0	0
182000	0	0	0	0	0	0	0	0
182500	0	0	0	0	0	0	0	0
183000	9	81	9	81	0	71	655	574
183500	995	9,294	995	9,294	0	1,452	14,097	4,803
184000	755	16,200	755	16,200	0	1,101	23,639	7,439
184127	609	3,207	609	3,207	0	959	4,846	1,639
184500	634	8,584	634	8,584	0	1,010	13,601	5,016
185000	749	12,805	749	12,805	0	1,204	20,495	7,690
185500	1,102	17,141	1,102	17,141	0	1,798	27,797	10,656
186000	274	12,741	274	12,741	0	787	23,935	11,194
186500	0	2,536	0	2,536	0	0	7,285	4,749
187000	0	0	0	0	0	0	0	0
187500	0	0	0	0	0	0	0	0
188000	0	0	0	0	0	0	0	0
188500	0	0	0	0	0	0	0	0
189000	0	0	0	0	0	0	0	0
189500	0	0	0	0	0	0	0	0
190000	0	0	0	0	0	0	0	0
190000	0	0	0	0	0	0	0	0
190500	0	0	0	0	0	0	0	0
191000	0	0	0	0	0	0	0	0
191500	0	0	0	0	0	0	0	0
192000	0	0	0	0	0	0	0	0
192500	0	0	0	0	0	0	0	0
193000	0	0	0	0	0	0	0	0
193500	0	0	0	0	0	0	0	0
194000	0	0	0	0	0	0	0	0
194500	0	0	0	0	0	0	0	0
195000	0	0	0	0	0	0	0	0
195500	0	0	0	0	0	0	0	0
196000	0	0	0	0	0	0	0	0
196500	0	0	0	0	0	0	0	0
197000	0	0	0	0	0	0	0	0
197500	0	0	0	0	0	0	0	0
198000	0	0	0	0	0	0	0	0
198500	0	0	0	0	0	0	0	0
199000	0	0	0	0	0	0	0	0
199500	0	0	0	0	0	0	0	0
200000	0	0	0	0	0	0	0	0
200500	0	0	0	0	0	0	0	0
201000	0	0	0	0	0	0	0	0
201500	0	0	0	0	0	0	0	0
202000	0	0	0	0	0	0	0	0
202500	0	0	0	0	0	0	0	0
203000	0	0	0	0	0	0	0	0
203156	0	0	0	0	0	0	0	0
203500	0	0	0	0	0	0	0	0
204000	0	0	0	0	0	0	0	0
204500	0	0	0	0	0	0	0	0
205000	0	0	0	0	0	0	0	0
205500	0	0	0	0	0	0	0	0
206000	0	0	0	0	0	0	0	0
206500	0	0	0	0	0	0	0	0
207000	0	0	0	0	0	0	0	0
207500	0	0	0	0	0	0	0	0

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-1 - New Work Only - C & D Canal Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
208000	0	0	0	0	0	0	0	0
208500	0	0	0	0	0	0	0	0
209000	0	0	0	0	0	0	0	0
209500	0	0	0	0	0	0	0	0
210000	0	0	0	0	0	0	0	0
210000	0	0	0	0	0	364	0	0
210500	0	0	0	0	0	447	7,510	7,510
211000	0	0	0	0	0	447	8,278	8,278
211500	0	0	0	0	0	447	8,278	8,278
212000	0	0	0	0	0	447	8,278	8,278
212000	0	0	447	0	0	888	0	0
212500	0	0	447	8,278	8,278	888	16,444	8,167
213000	0	0	447	8,278	8,278	888	16,444	8,167
213500	0	0	447	8,278	8,278	888	16,444	8,167
214000	0	0	447	8,278	8,278	888	16,444	8,167
214500	0	0	447	8,278	8,278	888	16,444	8,167
215000	0	0	447	8,278	8,278	888	16,444	8,167
215500	0	0	447	8,278	8,278	888	16,444	8,167
216000	0	0	447	8,278	8,278	888	16,444	8,167
216500	0	0	447	8,278	8,278	888	16,444	8,167
217000	0	0	447	8,278	8,278	888	16,444	8,167
217500	0	0	447	8,274	8,274	888	16,441	8,167
218000	0	0	447	8,274	8,274	888	16,441	8,167
218500	0	0	447	8,278	8,278	888	16,444	8,167
219000	0	0	447	8,278	8,278	888	16,444	8,167
219500	0	0	575	9,467	9,467	1,145	18,821	9,354
220000	0	0	658	11,422	11,422	1,372	23,298	11,876
220000	0	0	0	0	0	0	0	0
220498	0	0	0	0	0	0	0	0
221000	0	0	0	0	0	0	0	0
221500	0	0	0	0	0	0	0	0
222000	0	0	0	0	0	0	0	0
222000	0	0	0	0	0	0	0	0
222500	0	0	0	0	0	0	0	0
223000	0	0	0	0	0	0	0	0
223500	0	0	0	0	0	0	0	0
224000	0	0	0	0	0	0	0	0
224500	0	0	0	0	0	0	0	0
225000	0	0	0	0	0	0	0	0
225500	0	0	0	0	0	0	0	0
226000	0	0	0	0	0	0	0	0
226000	0	0	0	0	0	0	0	0
226500	0	0	0	0	0	0	0	0
227000	0	0	0	0	0	0	0	0
227500	0	0	0	0	0	0	0	0
228000	0	0	0	0	0	0	0	0
228500	0	0	0	0	0	0	0	0
229000	0	0	0	0	0	0	0	0
229000	0	0	0	0	0	447	0	0
229500	0	0	0	0	0	447	8,278	8,278
230000	0	0	0	0	0	390	7,751	7,751
230500	0	0	0	0	0	384	7,163	7,163
231000	0	0	0	0	0	400	7,255	7,255
231500	0	0	0	0	0	415	7,544	7,544
232000	0	0	0	0	0	359	7,164	7,164
232500	0	0	0	0	0	354	6,602	6,602
233000	0	0	0	0	0	428	7,244	7,244
233500	0	0	0	0	0	447	8,104	8,104
234000	0	0	0	0	0	447	8,277	8,277
234500	0	0	0	0	0	440	8,213	8,213
235000	0	0	0	0	0	447	8,213	8,213
235500	0	0	0	0	0	447	8,278	8,278
236000	0	0	0	0	0	447	8,278	8,278
236500	0	0	0	0	0	447	8,278	8,278
237000	0	0	0	0	0	445	8,257	8,257
237500	0	0	0	0	0	350	7,362	7,362
238000	0	0	0	0	0	443	7,343	7,343
238500	0	0	0	0	0	418	7,970	7,970
239000	0	0	0	0	0	367	7,267	7,267



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-1 - New Work Only - C & D Canal Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
239500	0	0	0	0	0	345	6,588	6,588
239740	0	0	0	0	0	370	3,175	3,175
<b>TOTAL (MCY)</b>	0.280944		0.449101		0.168158	1.218075		0.768973

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-2 - New Work Only - Tolchester Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
4000	0	0	583	86	86	1,174	1,181	1,094
4000	0	0	583	0	0	1,174	0	0
4100	0	0	633	2,251	2,251	1,273	4,531	2,280
4200	0	0	677	2,426	2,426	1,368	4,890	2,464
4300	0	0	733	2,613	2,613	1,473	5,261	2,649
4400	0	0	778	2,798	2,798	1,568	5,632	2,834
4500	0	0	842	3,000	3,000	1,682	6,018	3,018
4600	0	0	888	3,205	3,205	1,778	6,408	3,203
4700	0	0	946	3,396	3,396	1,886	6,784	3,388
4800	0	0	996	3,596	3,596	1,986	7,169	3,573
4900	0	0	1,045	3,779	3,779	2,084	7,536	3,758
5000	0	0	1,096	3,963	3,963	2,185	7,905	3,942
5100	0	0	1,146	4,150	4,150	2,285	8,277	4,127
5200	0	0	1,195	4,335	4,335	2,385	8,647	4,312
5300	0	0	1,245	4,520	4,520	2,484	9,017	4,497
5400	0	0	1,295	4,705	4,705	2,584	9,386	4,681
5500	0	0	1,345	4,890	4,890	2,684	9,756	4,866
5600	0	0	1,395	5,074	5,074	2,784	10,125	5,051
5700	0	0	1,445	5,259	5,259	2,883	10,495	5,236
5800	0	0	1,495	5,444	5,444	2,983	10,864	5,420
5900	0	0	1,545	5,629	5,629	3,083	11,234	5,605
6000.04	0	0	1,423	5,498	5,498	2,840	10,973	5,475
6100	0	0	1,452	5,322	5,322	2,897	10,620	5,298
6200	0	0	1,407	5,293	5,293	2,807	10,563	5,270
6300	0	0	1,362	5,127	5,127	2,717	10,230	5,103
6400	0	0	1,317	4,960	4,960	2,627	9,897	4,937
6500	0	0	1,272	4,793	4,793	2,537	9,564	4,770
6600	0	0	1,227	4,627	4,627	2,447	9,230	4,604
6700	0	0	1,182	4,460	4,460	2,357	8,897	4,437
6800	0	0	1,134	4,288	4,288	2,264	8,558	4,270
6900	0	0	1,048	4,040	4,040	2,133	8,144	4,104
7000	0	0	956	3,711	3,711	1,996	7,647	3,936
7100	0	0	826	3,301	3,301	1,803	7,036	3,736
7200	0	0	732	2,886	2,886	1,669	6,430	3,544
7300	0	0	626	2,515	2,515	1,384	5,654	3,139
7400	0	0	545	2,168	2,168	1,218	4,818	2,650
7500	0	0	494	1,924	1,924	1,119	4,328	2,404
7600	0	0	442	1,732	1,732	999	3,923	2,191
7700	0	0	351	1,467	1,467	871	3,463	1,996
7800	0	0	280	1,167	1,167	733	2,970	1,802
7900	0	0	239	961	961	571	2,414	1,453
8000	0	0	196	807	807	532	2,043	1,236
8000	0	0	0	0	0	0	0	0
8100	0	0	0	0	0	0	0	0
8200	0	0	0	0	0	0	0	0
8300	0	0	0	0	0	0	0	0
8400	0	0	0	0	0	0	0	0
8500	0	0	0	0	0	0	0	0
8600	0	0	0	0	0	0	0	0
8700	0	0	0	0	0	0	0	0
8800	0	0	0	0	0	0	0	0
8900	0	0	0	0	0	0	0	0
9000	0	0	0	0	0	0	0	0
9100	0	0	0	0	0	0	0	0
9200	0	0	0	0	0	0	0	0
9300	0	0	0	0	0	0	0	0
9400	0	0	0	0	0	0	0	0
9500	0	0	0	0	0	0	0	0
9600	0	0	0	0	0	0	0	0
9700	0	0	0	0	0	0	0	0
9800	0	0	0	0	0	0	0	0
9900	0	0	0	0	0	0	0	0
10000	0	0	0	0	0	0	0	0
10100	0	0	0	0	0	0	0	0
10200	0	0	0	0	0	0	0	0
10300	0	0	0	0	0	0	0	0
10400	0	0	0	0	0	0	0	0
10500	0	0	0	0	0	0	0	0
10600	0	0	0	0	0	0	0	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table D-2 - New Work Only - Tolchester Volumes

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
10700	0	0	0	0	0	0	0	0
10800	0	0	0	0	0	0	0	0
10900	0	0	0	0	0	0	0	0
11000	0	0	0	0	0	0	0	0
11100	0	0	0	0	0	0	0	0
11200	0	0	0	0	0	0	0	0
11300	0	0	0	0	0	0	0	0
11400	0	0	0	0	0	0	0	0
11500	0	0	0	0	0	0	0	0
11600	0	0	0	0	0	0	0	0
11700	0	0	0	0	0	0	0	0
11800	0	0	0	0	0	0	0	0
11900	0	0	0	0	0	0	0	0
12000	0	0	0	0	0	0	0	0
12100	0	0	0	0	0	0	0	0
12200	0	0	0	0	0	0	0	0
12300	0	0	0	0	0	0	0	0
12400	0	0	0	0	0	0	0	0
12500	0	0	0	0	0	0	0	0
12600	0	0	0	0	0	0	0	0
12700	0	0	0	0	0	0	0	0
12800	0	0	0	0	0	0	0	0
12900	0	0	0	0	0	0	0	0
13000	0	0	0	0	0	0	0	0
13100	0	0	0	0	0	0	0	0
13200	0	0	0	0	0	0	0	0
13300	0	0	0	0	0	0	0	0
13400	0	0	0	0	0	0	0	0
13500	0	0	0	0	0	0	0	0
13600	0	0	0	0	0	0	0	0
13700	0	0	0	0	0	0	0	0
13800	0	0	0	0	0	0	0	0
13900	0	0	0	0	0	0	0	0
14000	0	0	0	0	0	0	0	0
14100	0	0	0	0	0	0	0	0
14200	0	0	0	0	0	0	0	0
14300	0	0	0	0	0	0	0	0
14400	0	0	0	0	0	0	0	0
14500	0	0	0	0	0	0	0	0
14600	0	0	0	0	0	0	0	0
14700	0	0	0	0	0	0	0	0
14800	0	0	0	0	0	0	0	0
14900	0	0	0	0	0	0	0	0
15000	0	0	0	0	0	0	0	0
15100	0	0	0	0	0	0	0	0
15200	0	0	0	0	0	0	0	0
15300	0	0	0	0	0	0	0	0
15400	0	0	0	0	0	0	0	0
15500	0	0	0	0	0	0	0	0
15600	0	0	0	0	0	0	0	0
15700	0	0	0	0	0	0	0	0
15800	0	0	0	0	0	0	0	0
15900	0	0	0	0	0	0	0	0
16000	0	0	0	0	0	0	0	0
16100	0	0	0	0	0	0	0	0
16200	0	0	0	0	0	0	0	0
16300	0	0	0	0	0	0	0	0
16400	0	0	0	0	0	0	0	0
16500	0	0	0	0	0	0	0	0
16600	0	0	0	0	0	0	0	0
16700	0	0	0	0	0	0	0	0
16800	0	0	0	0	0	0	0	0
16900	0	0	0	0	0	0	0	0
17000	0	0	0	0	0	0	0	0
17100	0	0	0	0	0	0	0	0
17200	0	0	0	0	0	0	0	0
17300	0	0	0	0	0	0	0	0
17400	0	0	0	0	0	0	0	0
17500	0	0	0	0	0	0	0	0

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-2 - New Work Only - Tolchester Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
17600	0	0	0	0	0	0	0	0
17700	0	0	0	0	0	0	0	0
17800	0	0	0	0	0	0	0	0
17900	0	0	0	0	0	0	0	0
18000	0	0	0	0	0	0	0	0
18100	0	0	0	0	0	0	0	0
18200	0	0	0	0	0	0	0	0
18300	0	0	0	0	0	0	0	0
18400	0	0	0	0	0	0	0	0
18500	0	0	0	0	0	0	0	0
18600	0	0	0	0	0	0	0	0
18700	0	0	0	0	0	0	0	0
18800	0	0	0	0	0	0	0	0
18900	0	0	0	0	0	0	0	0
19000	0	0	0	0	0	0	0	0
19100	0	0	0	0	0	0	0	0
19200	0	0	0	0	0	0	0	0
19300	0	0	0	0	0	0	0	0
19400	0	0	0	0	0	0	0	0
19500	0	0	0	0	0	0	0	0
19600	0	0	0	0	0	0	0	0
19700	0	0	0	0	0	0	0	0
19800	0	0	0	0	0	0	0	0
19900	0	0	0	0	0	0	0	0
20000	0	0	0	0	0	0	0	0
20100	0	0	0	0	0	0	0	0
20200	0	0	0	0	0	0	0	0
20300	0	0	0	0	0	0	0	0
20400	0	0	0	0	0	0	0	0
20500	0	0	0	0	0	0	0	0
20600	0	0	0	0	0	0	0	0
20700	0	0	0	0	0	0	0	0
20800	0	0	0	0	0	0	0	0
20900	0	0	0	0	0	0	0	0
21000	0	0	0	0	0	0	0	0
21100	0	0	0	0	0	0	0	0
21200	0	0	0	0	0	0	0	0
21300	0	0	0	0	0	0	0	0
21400	0	0	0	0	0	0	0	0
21500	0	0	0	0	0	0	0	0
21600	0	0	0	0	0	0	0	0
21700	0	0	0	0	0	0	0	0
21800	0	0	0	0	0	0	0	0
21900	0	0	0	0	0	0	0	0
22000	0	0	0	0	0	0	0	0
22100	0	0	0	0	0	0	0	0
22200	0	0	0	0	0	0	0	0
22300	0	0	0	0	0	0	0	0
22400	0	0	0	0	0	0	0	0
22500	0	0	0	0	0	0	0	0
22600	0	0	0	0	0	0	0	0
22700	0	0	0	0	0	0	0	0
22800	0	0	0	0	0	0	0	0
22900	0	0	0	0	0	0	0	0
23000	0	0	0	0	0	0	0	0
23100	0	0	0	0	0	0	0	0
23200	0	0	0	0	0	0	0	0
23300	0	0	0	0	0	0	0	0
23400	0	0	0	0	0	0	0	0
23500	0	0	0	0	0	0	0	0
23600	0	0	0	0	0	0	0	0
23700	0	0	0	0	0	0	0	0
23800	0	0	0	0	0	0	0	0
23900	0	0	0	0	0	0	0	0
24000	0	0	0	0	0	0	0	0
24100	0	0	0	0	0	0	0	0
24200	0	0	0	0	0	0	0	0
24300	0	0	0	0	0	0	0	0
24400	0	0	0	0	0	0	0	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table D-2 - New Work Only - Tolchester Volumes

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
24500	0	0	0	0	0	0	0	0
24600	0	0	0	0	0	0	0	0
24600	0	0	2	0	0	31	0	0
24700	0	0	0	4	4	29	112	108
24800	0	0	1	2	2	28	106	105
24900	0	0	6	12	12	43	131	119
25000	0	0	6	22	22	45	161	139
25100	0	0	9	27	27	55	184	157
25200	0	0	12	39	39	60	212	174
25300	0	0	24	66	66	79	257	191
25400	0	0	19	80	80	74	284	204
25500	0	0	39	109	109	109	340	231
25600	0	0	58	181	181	152	484	303
25700	0	0	71	239	239	182	618	379
25800	0	0	92	301	301	219	743	442
25900	0	0	34	232	232	176	732	500
26000	0	0	16	93	93	144	593	500
26100	0	0	61	144	144	223	680	536
26200	0	0	48	202	202	210	802	600
26300	0	0	31	145	145	219	794	649
26400	0	0	20	94	94	125	638	544
26500	0	0	77	180	180	272	736	556
26600	0	0	17	174	174	213	899	725
26700	0	0	64	150	150	298	946	796
26800	0	0	59	229	229	369	1,235	1,006
26900	0	0	87	270	270	462	1,539	1,269
27000	0	0	86	320	320	507	1,795	1,475
27100	0	0	138	415	415	659	2,160	1,745
27200	0	0	259	736	736	858	2,810	2,074
27300	0	0	389	1,201	1,201	1,020	3,478	2,277
27400	0	0	380	1,425	1,425	1,075	3,880	2,455
27500	0	0	417	1,477	1,477	1,153	4,127	2,650
27600	0	0	453	1,612	1,612	1,222	4,398	2,786
27700.2	0	0	472	1,716	1,716	1,209	4,509	2,793
27800	0	0	485	1,767	1,767	1,246	4,537	2,770
27900	0	0	396	1,630	1,630	1,241	4,605	2,975
28000	0	0	258	1,210	1,210	897	3,959	2,749
28100	0	0	352	1,129	1,129	1,099	3,696	2,568
28200	0	0	388	1,369	1,369	1,141	4,148	2,779
28300	0	0	392	1,445	1,445	1,082	4,117	2,672
28400	0	0	412	1,489	1,489	1,115	4,069	2,580
28500	0	0	422	1,544	1,544	1,087	4,078	2,534
28600	0	0	401	1,524	1,524	1,151	4,145	2,621
28700	0	0	318	1,331	1,331	1,011	4,004	2,673
28800	0	0	277	1,100	1,100	909	3,556	2,456
28900	0	0	230	938	938	810	3,184	2,247
29000	0	0	303	987	987	958	3,274	2,288
29100	0	0	230	988	988	829	3,309	2,322
29200	0	0	249	889	889	878	3,161	2,272
29300	0	0	242	910	910	878	3,251	2,340
29400	0	0	163	750	750	727	2,972	2,222
29500	0	0	144	568	568	605	2,468	1,901
29600	0	0	134	514	514	597	2,228	1,713
29700	0	0	93	420	420	473	1,981	1,561
29800	0	0	56	276	276	381	1,580	1,304
29900	0	0	57	209	209	412	1,468	1,258
30000	0	0	59	215	215	443	1,582	1,367
30100	0	0	205	490	490	612	1,954	1,464
30200	0	0	201	752	752	656	2,349	1,597
30300	0	0	212	764	764	657	2,432	1,668
30400	0	0	250	856	856	752	2,611	1,755
30500	0	0	170	779	779	649	2,595	1,816
30600	0	0	187	662	662	706	2,510	1,848
30700	0	0	183	686	686	694	2,594	1,908
30800	0	0	216	739	739	793	2,753	2,014
30900	0	0	229	825	825	860	3,060	2,235
31000	0	0	272	928	928	970	3,388	2,460
31100	0	0	475	1,383	1,383	1,259	4,128	2,745
31200	0	0	546	1,890	1,890	1,359	4,848	2,959

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-2 - New Work Only - Tolchester Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
31300	0	0	530	1,991	1,991	1,332	4,984	2,992
31400	0	0	540	1,981	1,981	1,369	5,003	3,022
31500	0	0	529	1,979	1,979	1,360	5,054	3,075
31600	0	0	497	1,900	1,900	1,380	5,074	3,175
31700	0	0	513	1,871	1,871	1,429	5,203	3,332
31800	0	0	528	1,928	1,928	1,450	5,332	3,403
31900	0	0	580	2,053	2,053	1,536	5,529	3,476
32000	0	0	499	1,997	1,997	1,413	5,461	3,463
32100	0	0	499	1,848	1,848	1,359	5,133	3,286
32200	0	0	549	1,942	1,942	1,465	5,229	3,287
32300	0	0	593	2,115	2,115	1,531	5,547	3,432
32400	0	0	618	2,243	2,243	1,544	5,695	3,452
32500	0	0	642	2,333	2,333	1,545	5,722	3,388
32600	0	0	624	2,343	2,343	1,537	5,708	3,366
32700	0	0	606	2,276	2,276	1,483	5,594	3,318
32800	0	0	672	2,367	2,367	1,612	5,732	3,366
32900	0	0	718	2,575	2,575	1,670	6,078	3,503
33000.2	0	0	686	2,606	2,606	1,648	6,156	3,551
33100	0	0	683	2,532	2,532	1,629	6,057	3,525
33200	0	0	534	2,254	2,254	1,447	5,697	3,443
33300	0	0	443	1,809	1,809	1,166	4,839	3,029
33400	0	0	453	1,661	1,661	1,182	4,348	2,687
33500	0	0	425	1,627	1,627	1,133	4,286	2,660
33600	0	0	516	1,741	1,741	1,243	4,399	2,657
33700	0	0	425	1,741	1,741	1,082	4,305	2,564
33800	0	0	314	1,369	1,369	876	3,626	2,258
33900	0	0	119	803	803	573	2,684	1,881
34000	0	0	8	235	235	211	1,452	1,216
34100	0	0	25	62	62	191	744	682
34200	0	0	56	151	151	248	812	662
34300	0	0	87	266	266	422	1,241	976
34400	0	0	125	394	394	521	1,747	1,354
34500	0	0	158	525	525	629	2,130	1,605
34600	0	0	143	558	558	581	2,241	1,683
34700	0	0	164	569	569	662	2,302	1,733
34800	0	0	146	574	574	654	2,437	1,862
34900	0	0	174	593	593	690	2,489	1,896
35000	0	0	203	698	698	719	2,609	1,911
35100.2	0	0	197	742	742	718	2,666	1,924
35200	0	0	210	752	752	760	2,732	1,981
35300	0	0	244	840	840	837	2,957	2,117
35400	0	0	274	960	960	866	3,152	2,192
35500	0	0	243	959	959	807	3,098	2,140
35600	0	0	270	951	951	833	3,038	2,087
35700	0	0	265	991	991	844	3,107	2,116
35800	0	0	248	950	950	798	3,042	2,092
35900	0	0	276	971	971	826	3,008	2,037
36000	0	0	336	1,133	1,133	895	3,187	2,054
36100	0	0	325	1,225	1,225	833	3,201	1,976
36200	0	0	322	1,200	1,200	805	3,033	1,833
36300	0	0	320	1,190	1,190	743	2,865	1,675
36400	0	0	264	1,083	1,083	678	2,630	1,547
36500	0	0	209	877	877	597	2,361	1,484
36600	0	0	219	793	793	630	2,272	1,479
36700	0	0	150	684	684	540	2,167	1,482
36800	0	0	121	503	503	485	1,899	1,396
36900	0	0	80	373	373	365	1,575	1,203
37000	0	0	89	312	312	394	1,406	1,094
37100	0	0	40	238	238	325	1,332	1,094
37200	0	0	115	287	287	396	1,335	1,048
37300	0	0	199	581	581	458	1,581	999
37400	0	0	177	695	695	405	1,599	904
37500	0	0	172	646	646	381	1,457	811
37600	0	0	153	601	601	341	1,337	736
37700	0	0	133	528	528	303	1,191	663
37800	0	0	112	454	454	259	1,040	586
37900	0	0	94	382	382	217	881	499
38000	0	0	68	300	300	166	709	409
38100	0	0	68	252	252	166	615	363



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-2 - New Work Only - Tolchester Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
38200	0	0	61	238	238	150	585	347
38300	0	0	50	205	205	131	519	315
38400	0	0	43	172	172	116	456	284
38500	0	0	29	134	134	91	383	249
38600	0	0	16	84	84	70	299	215
38700	0	0	13	54	54	56	234	181
38800	0	0	7	36	36	47	191	155
38900	0	0	0	13	13	20	125	113
39000	0	0	0	0	0	11	58	58
39100	0	0	0	0	0	4	27	27
39200	0	0	0	0	0	1	9	9
39300	0	0	0	0	0	0	2	2
39400	0	0	0	0	0	0	0	0
39500	0	0	0	0	0	0	0	0
39600	0	0	0	0	0	0	0	0
39700	0	0	0	0	0	0	0	0
39800	0	0	0	0	0	0	0	0
39900	0	0	0	0	0	0	0	0
40000	0	0	0	0	0	0	0	0
40100	0	0	0	0	0	0	0	0
40200	0	0	0	0	0	0	0	0
40300	0	0	0	0	0	0	0	0
40400	0	0	0	0	0	0	0	0
40500	0	0	0	0	0	0	0	0
40600	0	0	0	0	0	0	0	0
40700	0	0	0	0	0	0	0	0
40800	0	0	0	0	0	0	0	0
40900	0	0	0	0	0	0	0	0
41000	0	0	0	0	0	0	0	0
41100	0	0	0	0	0	1	2	2
41200	0	0	0	0	0	2	6	6
41300	0	0	0	0	0	7	17	17
41400	0	0	1	1	1	8	28	27
41500.2	0	0	0	1	1	12	37	36
41600	0	0	10	19	19	39	93	74
41700	0	0	21	58	58	63	189	131
41800	0	0	34	102	102	91	286	184
41900	0	0	48	151	151	120	391	240
42000	0	0	56	192	192	137	476	284
42100	0	0	66	227	227	155	541	314
42200	0	0	73	258	258	173	608	350
42300	0	0	84	292	292	194	680	389
42400	0	0	95	331	331	216	760	428
42500	0	0	104	368	368	247	857	489
42600	0	0	110	397	397	253	925	528
42700	0	0	120	427	427	275	978	551
42800	0	0	126	456	456	289	1,045	589
42900	0	0	138	490	490	310	1,108	619
43000	0	0	145	524	524	322	1,170	646
43100	0	0	150	546	546	335	1,216	671
43200	0	0	153	561	561	343	1,255	695
43300	0	0	162	583	583	356	1,294	711
43400	0	0	166	608	608	365	1,334	726
43500	0	0	175	633	633	385	1,389	757
43600	0	0	181	660	660	399	1,453	793
43700	0	0	186	680	680	404	1,488	808
43800	0	0	189	694	694	412	1,511	817
43900	0	0	189	700	700	412	1,526	826
44000	0	0	198	717	717	428	1,557	840
44100	0	0	192	722	722	419	1,568	846
44200	0	0	196	719	719	427	1,567	847
44300	0	0	192	719	719	423	1,574	854
44400	0	0	197	720	720	431	1,581	861
44500	0	0	196	727	727	433	1,601	873
44600	0	0	193	720	720	427	1,594	874
44700	0	0	190	710	710	424	1,576	866
44800	0	0	191	706	706	425	1,572	866
44900	0	0	185	696	696	413	1,552	856
45000	0	0	193	701	701	426	1,554	853

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-2 - New Work Only - Tolchester Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
45100	0	0	182	695	695	409	1,546	851
45200	0	0	186	682	682	428	1,549	866
45300	0	0	184	685	685	437	1,602	917
45400	0	0	179	672	672	437	1,619	947
45500	0	0	184	673	673	477	1,692	1,019
45600	0	0	197	706	706	525	1,856	1,150
45700	0	0	197	729	729	543	1,979	1,249
45800	0	0	211	755	755	573	2,068	1,312
45900	0	0	226	810	810	609	2,189	1,379
46000	0	0	228	842	842	629	2,292	1,450
46100	0	0	268	919	919	689	2,441	1,522
46200	0	0	287	1,028	1,028	728	2,625	1,597
46300	0	0	305	1,096	1,096	760	2,757	1,661
46400	0	0	306	1,131	1,131	776	2,845	1,714
46500	0	0	319	1,158	1,158	812	2,940	1,782
46600	0	0	342	1,224	1,224	852	3,081	1,857
46700	0	0	353	1,286	1,286	866	3,182	1,896
46800	0	0	357	1,314	1,314	873	3,220	1,907
46900	0	0	348	1,305	1,305	858	3,205	1,900
47000	0	0	343	1,280	1,280	864	3,189	1,910
47100	0	0	348	1,280	1,280	866	3,205	1,926
47200	0	0	348	1,289	1,289	861	3,200	1,911
47300	0	0	329	1,253	1,253	835	3,142	1,888
47400	0	0	317	1,195	1,195	822	3,069	1,874
47500	0	0	322	1,182	1,182	845	3,087	1,905
47600	0	0	315	1,180	1,180	841	3,121	1,942
47700	0	0	303	1,145	1,145	811	3,060	1,915
47800	0	0	285	1,089	1,089	775	2,937	1,848
47900	0	0	264	1,016	1,016	742	2,808	1,791
48000	0	0	276	999	999	712	2,692	1,693
48100	0	0	207	894	894	551	2,338	1,445
48200	0	0	18	416	416	88	1,182	766
48300	0	0	31	89	89	100	348	258
48400	0	0	32	116	116	71	317	201
48500	0	0	38	129	129	96	310	181
48600	0	0	62	184	184	151	458	274
48700	0	0	82	267	267	185	623	356
48800	0	0	99	336	336	226	761	425
48900	0	0	96	362	362	220	826	464
49000	0	0	103	369	369	240	853	484
49100	0	0	96	370	370	220	853	484
49200	0	0	109	381	381	237	847	466
49300	0	0	109	405	405	244	891	486
49400	0	0	123	431	431	273	959	529
49500	0	0	140	487	487	306	1,073	587
49600	0	0	152	541	541	336	1,190	649
49700	0	0	161	580	580	353	1,276	695
49774.1	0	0	163	445	445	363	982	537
49900	0	0	165	765	765	375	1,721	956
50000	0	0	162	605	605	357	1,356	752
50100	0	0	168	611	611	370	1,347	736
50200	0	0	161	609	609	365	1,362	753
50300	0	0	164	602	602	376	1,372	771
50400	0	0	160	599	599	382	1,404	804
50500	0	0	140	555	555	363	1,381	826
50600	0	0	123	486	486	332	1,289	802
50700	0	0	111	433	433	302	1,175	742
50800	0	0	93	379	379	254	1,030	652
50900	0	0	78	317	317	228	894	577
51000	0	0	47	232	232	177	750	518
51100	0	0	44	169	169	158	620	451
51200	0	0	15	109	109	68	418	308
51300	0	0	3	33	33	51	220	187
51400	0	0	0	5	5	12	116	111
51500	0	0	0	0	0	2	25	25
51500	0	0	0	0	0	0	0	0
51600	0	0	0	0	0	0	0	0
51700	0	0	0	0	0	0	0	0
51800	0	0	0	0	0	0	0	0



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-2 - New Work Only - Tolchester Volumes**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
51900	0	0	0	0	0	0	0	0
52000	0	0	0	0	0	0	0	0
52400	0	0	0	0	0	0	0	0
52800	0	0	0	0	0	0	0	0
53200	0	0	0	0	0	0	0	0
53600	0	0	0	0	0	0	0	0
54000	0	0	0	0	0	0	0	0
54400	0	0	0	0	0	0	0	0
54800	0	0	0	0	0	0	0	0
55200	0	0	0	0	0	0	0	0
55600	0	0	0	0	0	0	0	0
56000	0	0	0	0	0	0	0	0
56400	0	0	0	0	0	0	0	0
56800	0	0	0	0	0	0	0	0
57100	0	0	0	0	0	0	0	0
57400	0	0	0	0	0	0	0	0
57700	0	0	0	0	0	0	0	0
58000	0	0	0	0	0	0	0	0
58338.8	0	0	0	0	0	0	0	0
58600	0	0	0	0	0	0	0	0
58901.1	0	0	0	0	0	0	0	0
<b>TOTAL</b>		<b>0</b>		<b>335,660</b>	<b>335,660</b>		<b>785,963</b>	<b>450,302</b>

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-3 - New Work Only - Brewerton Volumes - 450' Channel**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0
400	0	0	16	30	30	40	73	43
500	0	0	102	218	218	207	458	239
600	0	0	140	447	447	289	920	472
700	0	0	184	600	600	390	1,258	658
800	0	0	263	829	829	545	1,732	904
900	0	0	297	1,038	1,038	662	2,235	1,197
1000	0	0	315	1,133	1,133	686	2,496	1,363
1100	0	0	294	1,129	1,129	637	2,450	1,322
1200	0	0	341	1,177	1,177	732	2,535	1,358
1300	0	0	327	1,237	1,237	746	2,736	1,499
1400	0	0	349	1,253	1,253	763	2,795	1,542
1500	0	0	298	1,199	1,199	722	2,750	1,551
1600	0	0	274	1,060	1,060	697	2,627	1,566
1700	0	0	336	1,131	1,131	760	2,897	1,566
1800	0	0	274	1,130	1,130	672	2,652	1,521
1900	0	0	259	987	987	646	2,441	1,454
2000	0	0	314	1,061	1,061	719	2,527	1,466
2100	0	0	324	1,182	1,182	751	2,722	1,540
2200	0	0	405	1,351	1,351	846	2,958	1,607
2300	0	0	391	1,474	1,474	832	3,107	1,633
2400	0	0	354	1,379	1,379	791	3,005	1,627
2500	0	0	314	1,238	1,238	737	2,831	1,593
2600	0	0	311	1,157	1,157	714	2,686	1,529
2700	0	0	322	1,172	1,172	731	2,676	1,504
2800	0	0	324	1,197	1,197	734	2,713	1,516
2900	0	0	387	1,316	1,316	810	2,858	1,542
3000	0	0	368	1,398	1,398	788	2,958	1,560
3100	0	0	411	1,444	1,444	852	3,037	1,593
3200	0	0	366	1,439	1,439	802	3,064	1,624
3300	0	0	372	1,366	1,366	795	2,958	1,592
3400	0	0	385	1,401	1,401	821	2,993	1,592
3500	0	0	383	1,422	1,422	822	3,043	1,621
3600	0	0	365	1,385	1,385	802	3,008	1,622
3700	0	0	404	1,424	1,424	845	3,050	1,626
3800	0	0	360	1,415	1,415	789	3,025	1,610
3900	0	0	348	1,311	1,311	763	2,874	1,562
4000	0	0	355	1,301	1,301	791	2,878	1,577
4100	0	0	349	1,304	1,304	774	2,898	1,594
4200	0	0	339	1,274	1,274	768	2,857	1,582
4300	0	0	367	1,306	1,306	798	2,901	1,595
4400	0	0	329	1,288	1,288	729	2,827	1,540
4500	0	0	314	1,190	1,190	685	2,617	1,427
4600	0	0	308	1,152	1,152	688	2,542	1,390
4700	0	0	374	1,264	1,264	807	2,768	1,504
4800	0	0	388	1,411	1,411	822	3,017	1,605
4900	0	0	377	1,416	1,416	815	3,032	1,616
5000	0	0	345	1,337	1,337	774	2,944	1,607
5100	0	0	351	1,289	1,289	772	2,864	1,575
5200	0	0	374	1,343	1,343	809	2,928	1,585
5300	0	0	363	1,365	1,365	800	2,979	1,614
5400	0	0	376	1,369	1,369	815	2,992	1,623
5500	0	0	378	1,396	1,396	815	3,019	1,623
5600	0	0	370	1,385	1,385	809	3,006	1,621
5700	0	0	356	1,344	1,344	773	2,929	1,585
5800	0	0	346	1,300	1,300	778	2,873	1,572
5900	0	0	355	1,299	1,299	789	2,902	1,603
6000	0	0	343	1,293	1,293	777	2,899	1,607
6100	0	0	354	1,290	1,290	775	2,873	1,583
6200	0	0	345	1,294	1,294	757	2,837	1,543
6300	0	0	365	1,314	1,314	803	2,890	1,576
6400	0	0	371	1,363	1,363	807	2,982	1,619
6500	0	0	399	1,426	1,426	840	3,050	1,623
6600	0	0	382	1,446	1,446	823	3,079	1,633
6700	0	0	371	1,395	1,395	807	3,018	1,623



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-3 - New Work Only - Brewerton Volumes - 450' Channel**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
6800	0	0	400	1,429	1,429	841	3,053	1,623
6900	0	0	393	1,470	1,470	832	3,098	1,628
7000	0	0	344	1,366	1,366	778	2,980	1,614
7100	0	0	357	1,299	1,299	792	2,907	1,608
7200	0	0	369	1,346	1,346	810	2,966	1,620
7300	0	0	347	1,326	1,326	773	2,931	1,605
7400	0	0	383	1,351	1,351	816	2,943	1,592
7500	0	0	349	1,355	1,355	763	2,924	1,569
7600	0	0	356	1,305	1,305	795	2,886	1,580
7700	0	0	392	1,386	1,386	833	3,015	1,630
7800	0	0	369	1,410	1,410	806	3,034	1,624
7900	0	0	366	1,362	1,362	803	2,979	1,617
8000	0	0	375	1,372	1,372	811	2,990	1,617
8100	0	0	382	1,400	1,400	822	3,025	1,625
8200	0	0	389	1,428	1,428	828	3,057	1,629
8300	0	0	409	1,478	1,478	850	3,108	1,630
8400	0	0	395	1,488	1,488	836	3,121	1,633
8500	0	0	393	1,458	1,458	834	3,091	1,633
8600	0	0	390	1,449	1,449	827	3,075	1,626
8700	0	0	390	1,445	1,445	828	3,064	1,619
8800	0	0	397	1,459	1,459	838	3,085	1,626
8900	0	0	362	1,407	1,407	803	3,039	1,632
9000	0	0	374	1,363	1,363	815	2,996	1,632
9100	0	0	404	1,441	1,441	845	3,074	1,633
9200	0	0	386	1,463	1,463	826	3,096	1,632
9300	0	0	405	1,464	1,464	846	3,096	1,632
9400	0	0	407	1,504	1,504	848	3,137	1,633
9500	0	0	409	1,512	1,512	850	3,146	1,633
9600	0	0	405	1,508	1,508	846	3,142	1,633
9700	0	0	407	1,504	1,504	848	3,137	1,633
9800	0	0	407	1,508	1,508	848	3,141	1,633
9900	0	0	406	1,506	1,506	847	3,139	1,633
10000	0	0	418	1,526	1,526	859	3,160	1,633
10100	0	0	391	1,499	1,499	832	3,132	1,633
10200	0	0	397	1,461	1,461	838	3,093	1,632
10300	0	0	358	1,398	1,398	798	3,030	1,632
10400	0	0	364	1,336	1,336	799	2,959	1,623
10500	0	0	374	1,367	1,367	812	2,984	1,617
10600	0	0	378	1,393	1,393	819	3,020	1,626
10700	0	0	361	1,369	1,369	799	2,997	1,629
10800	0	0	379	1,370	1,370	820	2,999	1,629
10900	0	0	398	1,438	1,438	838	3,070	1,632
11000	0	0	390	1,458	1,458	831	3,089	1,632
11100	0	0	403	1,467	1,467	844	3,100	1,633
11200	0	0	392	1,471	1,471	833	3,105	1,633
11300	0	0	397	1,461	1,461	838	3,094	1,633
11400	0	0	385	1,449	1,449	826	3,082	1,633
11500	0	0	369	1,397	1,397	810	3,030	1,633
11600	0	0	382	1,391	1,391	823	3,024	1,633
11700	0	0	386	1,423	1,423	827	3,056	1,633
11800	0	0	393	1,443	1,443	834	3,076	1,633
11900	0	0	383	1,437	1,437	824	3,070	1,633
12000	0	0	380	1,412	1,412	821	3,046	1,633
12100	0	0	389	1,425	1,425	830	3,058	1,633
12200	0	0	387	1,438	1,438	828	3,071	1,633
12300	0	0	394	1,447	1,447	835	3,080	1,633
12400	0	0	390	1,453	1,453	831	3,087	1,633
12500	0	0	383	1,433	1,433	824	3,066	1,633
12600	0	0	380	1,414	1,414	821	3,048	1,633
12700	0	0	307	1,272	1,272	723	2,860	1,588
12800	0	0	295	1,114	1,114	692	2,620	1,506
12900	0	0	312	1,124	1,124	731	2,635	1,511
13000	0	0	304	1,142	1,142	734	2,714	1,571
13100	0	0	298	1,116	1,116	737	2,724	1,607
13200	0	0	293	1,095	1,095	728	2,712	1,617
13300	0	0	301	1,099	1,099	737	2,713	1,614
13400	0	0	272	1,060	1,060	705	2,670	1,611
13500	0	0	274	1,010	1,010	685	2,574	1,564
13600	0	0	278	1,021	1,021	687	2,541	1,520

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-3 - New Work Only - Brewerton Volumes - 450' Channel**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
13700	0	0	304	1,078	1,078	732	2,627	1,549
13800	0	0	295	1,109	1,109	700	2,652	1,543
13900	0	0	261	1,030	1,030	658	2,516	1,486
14000	0	0	281	1,004	1,004	693	2,502	1,498
14100	0	0	317	1,107	1,107	757	2,685	1,578
14200	0	0	327	1,193	1,193	767	2,822	1,629
14300	0	0	348	1,250	1,250	789	2,881	1,631
14400	0	0	352	1,296	1,296	792	2,928	1,632
14500	0	0	346	1,293	1,293	787	2,925	1,632
14600	0	0	340	1,270	1,270	781	2,903	1,633
14700	0	0	331	1,243	1,243	772	2,876	1,633
14800	0	0	365	1,289	1,289	805	2,920	1,632
14900	0	0	375	1,370	1,370	816	3,001	1,630
15000	0	0	344	1,332	1,332	785	2,964	1,632
15100	0	0	336	1,259	1,259	777	2,892	1,633
15200	0	0	356	1,283	1,283	797	2,916	1,633
15300	0	0	368	1,341	1,341	809	2,974	1,633
15400	0	0	362	1,351	1,351	803	2,985	1,633
15500	0	0	373	1,360	1,360	814	2,994	1,633
15600	0	0	353	1,343	1,343	792	2,973	1,630
15700	0	0	369	1,337	1,337	810	2,967	1,630
15800	0	0	357	1,344	1,344	797	2,977	1,633
15900	0	0	363	1,333	1,333	804	2,966	1,633
16000	0	0	355	1,330	1,330	796	2,963	1,633
16100	0	0	352	1,308	1,308	793	2,942	1,633
16200	0	0	356	1,310	1,310	796	2,941	1,632
16300	0	0	376	1,355	1,355	817	2,986	1,631
16400	0	0	372	1,385	1,385	813	3,017	1,632
16500	0	0	376	1,386	1,386	817	3,019	1,633
16600	0	0	384	1,407	1,407	824	3,040	1,633
16700	0	0	390	1,433	1,433	831	3,066	1,633
16800	0	0	387	1,440	1,440	828	3,074	1,633
16900	0	0	391	1,441	1,441	832	3,074	1,633
17000	0	0	389	1,444	1,444	830	3,077	1,633
17100	0	0	398	1,457	1,457	839	3,090	1,633
17200	0	0	389	1,457	1,457	830	3,090	1,633
17300	0	0	392	1,447	1,447	833	3,081	1,633
17400	0	0	389	1,448	1,448	830	3,081	1,633
17500	0	0	385	1,434	1,434	826	3,067	1,633
17600	0	0	391	1,436	1,436	832	3,070	1,633
17700	0	0	394	1,452	1,452	835	3,086	1,633
17800	0	0	392	1,454	1,454	833	3,088	1,633
17900	0	0	399	1,465	1,465	840	3,099	1,633
18000	0	0	411	1,501	1,501	852	3,134	1,633
18100	0	0	362	1,432	1,432	803	3,065	1,633
18200	0	0	369	1,354	1,354	810	2,988	1,633
18300	0	0	359	1,349	1,349	800	2,981	1,632
18400	0	0	349	1,311	1,311	787	2,937	1,626
18500	0	0	395	1,377	1,377	836	3,004	1,627
18600	0	0	379	1,433	1,433	820	3,066	1,633
18700	0	0	376	1,399	1,399	817	3,032	1,633
18800	0	0	389	1,417	1,417	830	3,050	1,633
18900	0	0	374	1,413	1,413	815	3,046	1,633
19000	0	0	391	1,417	1,417	832	3,051	1,633
19100	0	0	393	1,453	1,453	834	3,086	1,633
19200	0	0	395	1,459	1,459	836	3,092	1,633
19300	0	0	394	1,459	1,459	835	3,093	1,633
19400	0	0	418	1,503	1,503	859	3,137	1,633
19500	0	0	402	1,519	1,519	843	3,152	1,633
19600	0	0	420	1,523	1,523	861	3,156	1,633
19700	0	0	412	1,541	1,541	853	3,175	1,633
19800	0	0	412	1,525	1,525	853	3,159	1,633
19900	0	0	412	1,526	1,526	853	3,159	1,633
20000	0	0	408	1,520	1,520	849	3,153	1,633
20100	0	0	408	1,513	1,513	849	3,146	1,633
20200	0	0	392	1,482	1,482	833	3,115	1,633
20300	0	0	376	1,422	1,422	817	3,055	1,633
20400	0	0	360	1,362	1,362	801	2,995	1,633
20500	0	0	369	1,350	1,350	810	2,983	1,633



**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-3 - New Work Only - Brewerton Volumes - 450' Channel**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
20600	0	0	398	1,420	1,420	839	3,054	1,633
20700	0	0	396	1,470	1,470	837	3,104	1,633
20800	0	0	402	1,479	1,479	843	3,112	1,633
20900	0	0	405	1,495	1,495	846	3,129	1,633
21000	0	0	406	1,503	1,503	847	3,136	1,633
21100	0	0	404	1,501	1,501	845	3,134	1,633
21200	0	0	398	1,486	1,486	839	3,119	1,633
21300	0	0	398	1,475	1,475	839	3,108	1,633
21400	0	0	398	1,475	1,475	839	3,108	1,633
21500	0	0	413	1,501	1,501	854	3,135	1,633
21600	0	0	405	1,514	1,514	846	3,147	1,633
21700	0	0	417	1,522	1,522	858	3,155	1,633
21800	0	0	402	1,516	1,516	843	3,150	1,633
21900	0	0	393	1,472	1,472	834	3,106	1,633
22000	0	0	400	1,469	1,469	841	3,102	1,633
22100	0	0	390	1,464	1,464	831	3,097	1,633
22200	0	0	395	1,455	1,455	836	3,089	1,633
22300	0	0	397	1,468	1,468	838	3,101	1,633
22400	0	0	401	1,478	1,478	842	3,111	1,633
22500	0	0	370	1,428	1,428	811	3,061	1,633
22600	0	0	375	1,381	1,381	816	3,014	1,633
22700	0	0	397	1,430	1,430	838	3,063	1,633
22800	0	0	387	1,451	1,451	828	3,084	1,633
22900	0	0	404	1,464	1,464	845	3,098	1,633
23000	0	0	387	1,465	1,465	828	3,098	1,633
23100	0	0	396	1,450	1,450	837	3,083	1,633
23200	0	0	393	1,460	1,460	834	3,093	1,633
23300	0	0	380	1,430	1,430	821	3,064	1,633
23400	0	0	394	1,433	1,433	835	3,066	1,633
23500	0	0	389	1,450	1,450	830	3,083	1,633
23600	0	0	399	1,459	1,459	840	3,092	1,633
23700	0	0	395	1,470	1,470	836	3,103	1,633
23800	0	0	385	1,443	1,443	826	3,077	1,633
23900	0	0	340	1,343	1,343	781	2,975	1,632
24000	0	0	341	1,261	1,261	781	2,893	1,631
24100	0	0	345	1,270	1,270	776	2,884	1,615
24200	0	0	361	1,308	1,308	802	2,923	1,615
24300	0	0	353	1,324	1,324	788	2,945	1,621
24400	0	0	389	1,375	1,375	830	2,997	1,621
24500	0	0	356	1,380	1,380	797	3,013	1,633
24600	0	0	343	1,295	1,295	784	2,928	1,633
24700	0	0	328	1,242	1,242	767	2,873	1,631
24800	0	0	339	1,234	1,234	776	2,859	1,625
24900	0	0	345	1,266	1,266	786	2,893	1,627
25000	0	0	397	1,375	1,375	838	3,008	1,633
25100	0	0	553	1,759	1,759	1,141	3,666	1,907
25200	0	0	558	2,057	2,057	1,149	4,242	2,185
25300	0	0	563	2,075	2,075	1,154	4,264	2,189
25400	0	0	569	2,096	2,096	1,160	4,285	2,189
25500	0	0	581	2,129	2,129	1,172	4,318	2,189
25600	0	0	583	2,154	2,154	1,174	4,343	2,189
25700	0	0	592	2,175	2,175	1,183	4,364	2,189
25800	0	0	589	2,186	2,186	1,180	4,375	2,189
25900	0	0	594	2,190	2,190	1,185	4,379	2,189
26000	0	0	596	2,203	2,203	1,187	4,392	2,189
26100	0	0	593	2,201	2,201	1,184	4,390	2,189
26200	0	0	589	2,189	2,189	1,180	4,377	2,189
26300	0	0	585	2,174	2,174	1,176	4,363	2,189
26400	0	0	575	2,148	2,148	1,166	4,337	2,189
26500	0	0	575	2,130	2,130	1,166	4,319	2,189
26600	0	0	578	2,135	2,135	1,169	4,324	2,189
26700	0	0	572	2,130	2,130	1,163	4,319	2,189
26800	0	0	565	2,107	2,107	1,156	4,296	2,189
26900	0	0	558	2,080	2,080	1,149	4,269	2,189
27000	0	0	553	2,057	2,057	1,144	4,246	2,189
27100	0	0	559	2,060	2,060	1,150	4,249	2,189
27200	0	0	541	2,037	2,037	1,132	4,226	2,189
27300	0	0	364	1,675	1,675	915	3,789	2,114
27400	0	0	370	1,358	1,358	923	3,404	2,046

**Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening**  
**Table D-3 - New Work Only - Brewerton Volumes - 450' Channel**

Station	GRADE		GRADE + AMD		AMD ONLY	GRADE + AMD + OD		OD ONLY
	Channel		Channel		Channel	Channel		Channel
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)
27500	0	0	433	1,486	1,486	1,011	3,582	2,096
27600	0	0	423	1,586	1,586	1,004	3,732	2,146
27700	0	0	410	1,542	1,542	973	3,661	2,120
27800	0	0	387	1,474	1,474	949	3,559	2,084
27900	0	0	374	1,408	1,408	926	3,472	2,063
28000	0	0	348	1,337	1,337	888	3,359	2,022
28100	0	0	388	1,362	1,362	966	3,434	2,071
28200	0	0	346	1,358	1,358	851	3,365	2,007
28300	0	0	361	1,309	1,309	887	3,218	1,909
28400	0	0	358	1,331	1,331	896	3,302	1,971
28500	0	0	364	1,337	1,337	898	3,322	1,985
28600	0	0	357	1,337	1,337	912	3,352	2,015
28700	0	0	351	1,313	1,313	868	3,298	1,985
28800	0	0	367	1,330	1,330	863	3,206	1,876
28900	0	0	338	1,305	1,305	801	3,082	1,777
29000	0	0	342	1,260	1,260	825	3,011	1,750
29100	0	0	332	1,250	1,250	850	3,102	1,852
29200	0	0	303	1,177	1,177	793	3,043	1,866
29300	0	0	408	1,317	1,317	984	3,291	1,974
29400	0	0	380	1,459	1,459	925	3,536	2,077
29500	0	0	351	1,354	1,354	817	3,226	1,872
29600	0	0	342	1,284	1,284	810	3,012	1,727
29700	0	0	341	1,265	1,265	829	3,034	1,769
29800	0	0	350	1,279	1,279	863	3,132	1,853
29900	0	0	344	1,286	1,286	897	3,258	1,972
30000	0	0	349	1,284	1,284	911	3,347	2,063
30100	0	0	343	1,281	1,281	923	3,396	2,115
30200	0	0	339	1,263	1,263	895	3,367	2,104
30300	0	0	288	1,161	1,161	827	3,190	2,029
30400	0	0	267	1,028	1,028	752	2,925	1,897
30500	0	0	282	1,017	1,017	703	2,695	1,679
30600	0	0	216	921	921	612	2,436	1,514
30700	0	0	226	819	819	578	2,203	1,384
30800	0	0	323	1,017	1,017	854	2,652	1,635
30900	0	0	374	1,290	1,290	971	3,379	2,089
31000	0	0	524	1,662	1,662	1,191	4,003	2,341
31100	0	0	554	1,995	1,995	1,305	4,622	2,626
31200	0	0	582	2,102	2,102	1,425	5,055	2,952
31300	0	0	595	2,178	2,178	1,491	5,400	3,222
31400	0	0	671	2,344	2,344	1,667	5,849	3,505
31500	0	0	824	2,769	2,769	1,936	6,672	3,903
31600	0	0	919	3,228	3,228	2,097	7,468	4,240
31700	0	0	1,046	3,638	3,638	2,308	8,158	4,520
31800	0	0	1,138	4,044	4,044	2,461	8,833	4,789
31900	0	0	1,246	4,415	4,415	2,630	9,430	5,014
32000	0	0	1,383	4,869	4,869	2,829	10,110	5,241
32100	0	0	1,454	5,253	5,253	2,960	10,720	5,467
32200	0	0	1,501	5,471	5,471	3,057	11,143	5,672
32300	0	0	1,590	5,724	5,724	3,216	11,617	5,893
32400	0	0	1,652	6,005	6,005	3,342	12,145	6,141
32500	0	0	1,696	6,200	6,200	3,447	12,572	6,372
32600	0	0	1,722	6,330	6,330	3,531	12,922	6,592
32700	0	0	1,806	6,533	6,533	3,676	13,346	6,813
32800	0	0	1,825	6,724	6,724	3,760	13,769	7,046
32900	0	0	1,845	6,796	6,796	3,837	14,069	7,273
33000	0	0	8	3,430	3,430	19	7,141	3,711
33100	0	0	2	18	18	8	50	32
33200	0	0	23	47	47	49	106	59
33300	0	0	2	46	46	7	103	56
33400	0	0	3	9	9	10	30	21
33500	0	0	8	22	22	20	55	34
33600	0	0	0	16	16	4	45	28
33662.85	0	0	0	0	0	2	7	6
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>518,394</b>	<b>518,394</b>	<b>518,394</b>	<b>1,132,638</b>	<b>614,244</b>	



**APPENDIX E  
37 FT DREDGING SCENARIO 3B -  
NEW WORK + EXISTING PROJECT**

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
-927	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	67	250	0	0	0	0	67	250	0	0	0	0	0	0	0	63	233	0	0	0	0	233
400	0	0	398	1,725	0	0	0	0	398	1,725	0	0	0	0	0	0	0	496	2,067	0	0	0	0	1,818
600	0	0	463	3,191	0	0	0	0	463	3,191	0	0	0	0	0	0	0	1,251	6,467	0	0	0	0	4,742
800	0	0	3,627	15,149	0	0	0	0	3,627	15,149	0	0	0	0	0	0	0	2,103	12,420	0	0	0	0	9,230
1000	0	0	13,706	64,197	1	3	0	0	13,706	64,197	1	3	0	0	0	0	0	5,322	27,501	0	0	0	0	12,352
1200	0	0	18,882	120,898	243	905	0	0	18,882	120,898	243	905	0	0	0	0	0	16,136	79,475	1	3	0	0	15,277
1400	0	0	16,914	132,579	850	3,308	0	0	16,914	132,579	850	3,308	0	0	0	0	0	21,073	137,812	243	905	0	0	17,115
1600	0	0	11,367	104,747	703	5,009	0	0	11,367	104,747	703	5,009	0	0	0	0	0	18,957	148,262	850	3,308	0	0	15,883
1800	0	0	4,180	57,582	436	4,218	0	0	4,180	57,582	436	4,218	0	0	0	0	0	13,097	118,718	703	5,009	0	0	13,971
2000	1	3	2,936	26,356	1	1,618	1	3	2,936	26,356	1	1,618	0	0	0	0	0	5,814	70,039	436	4,218	0	0	12,457
2200	15	56	4,272	26,897	0	3	15	56	4,272	26,897	0	3	0	0	0	15	56	4,338	37,602	1	1,618	0	0	11,246
2400	4	89	3,875	30,173	20	76	4	89	3,875	30,173	20	76	0	0	0	4	89	5,562	36,867	0	3	0	0	9,971
2600	2	21	2,865	24,962	22	156	2	21	2,865	24,962	22	156	0	0	0	2	21	4,903	38,757	20	76	0	0	8,584
2800	31	120	1,644	16,898	30	191	31	120	1,644	16,898	30	191	0	0	0	31	120	3,847	32,405	22	156	0	0	7,443
3000	13	162	904	9,437	35	241	13	162	904	9,437	35	241	0	0	0	13	162	2,057	21,866	30	191	0	0	5,168
3500	0	121	649	14,383	785	7,597	0	121	649	14,383	785	7,597	0	0	0	0	121	1,377	12,718	35	241	0	0	3,281
4000	403	3,730	841	13,797	544	12,307	403	3,730	841	13,797	544	12,307	0	0	0	403	3,730	1,222	20,150	544	12,307	0	0	6,353
4500	845	11,553	433	11,791	287	7,890	845	11,553	433	11,791	287	7,890	0	0	0	845	11,553	739	16,155	287	7,890	0	0	6,364
5000	426	11,769	49	4,465	0	2,655	426	11,769	49	4,465	0	2,655	0	0	0	426	11,769	72	7,507	0	2,655	0	0	3,042
5500	0	3,947	0	458	0	0	0	3,947	0	458	0	0	0	0	0	0	3,947	13	786	0	0	0	0	328
6000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	550	0	0	0	0	550
6500	0	2	38	354	0	0	0	2	38	354	0	0	0	0	0	0	2	376	3,906	0	0	0	0	3,552
7000	4	36	376	3,840	0	0	4	36	376	3,840	0	0	0	0	0	4	36	809	10,974	0	0	0	0	7,133
7500	1	42	399	7,176	0	0	1	42	399	7,176	0	0	0	0	0	1	42	840	15,268	0	0	0	0	8,092
8000	0	8	299	6,455	0	1	0	8	299	6,455	0	1	0	0	0	0	8	740	14,622	0	1	0	0	8,167
8500	0	0	139	4,050	0	1	0	0	139	4,050	0	1	0	0	0	0	0	552	11,957	0	1	0	0	7,906
9000	0	0	0	1,285	0	0	0	0	0	1,285	0	0	0	0	0	0	0	90	5,941	0	0	0	0	4,855
9500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	836	0	0	0	0	836
10000	0	0	1	5	230	2,134	0	0	1	5	230	2,134	0	0	0	0	0	2	20	230	2,134	0	0	15
10500	0	0	4	45	2	2,153	0	0	4	45	2	2,153	0	0	0	0	0	9	100	2	2,153	0	0	55
11000	0	0	0	39	0	19	0	0	0	39	0	19	0	0	0	0	0	212	2,046	0	19	0	0	2,008
11500	0	0	86	800	0	0	0	0	86	800	0	0	0	0	0	0	0	516	8,743	0	0	0	0	5,943
12000	2	15	117	1,884	0	0	2	15	117	1,884	0	0	0	0	0	2	15	475	9,179	0	0	0	0	7,295
12500	0	15	10	1,179	0	1	0	15	10	1,179	0	1	0	0	0	0	15	155	5,832	0	1	0	0	4,853
13000	0	0	23	310	1	14	0	0	23	310	1	14	0	0	0	0	0	86	2,228	1	14	0	0	1,918
13500	0	1	13	339	0	13	0	1	13	339	0	13	0	0	0	0	1	41	1,172	0	13	0	0	833
14000	0	1	0	123	0	0	0	1	0	123	0	0	0	0	0	0	1	0	378	0	0	0	0	255
14500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	21	0	0	0	0	21
15500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	22
16000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
16500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17000	0	0	72	869	0	0	0	0	72	869	0	0	0	0	0	0	0	175	1,816	0	0	0	0	947
17500	0	0	0	869	0	0	0	0	0	869	0	0	0	0	0	0	0	0	1,816	0	0	0	0	947
18000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18500	0	0	11	98	0	0	0	0	11	98	0	0	0	0	0	0	0	86	815	0	0	0	0	517
19000	0	0	53	590	0	4	0	0	53	590	0	4	0	0	0	0	0	114	1,874	0	4	0	0	1,084
19000	0	0	53	0	0	0	0	0	114	0	0	0	0	0	0	0	0	195	0	0	0	0	0	0
19343	0	0	85	879	6	44	0	0	150	1,881	6	44	0	0	0	0	0	230	2,894	6	44	0	0	1,013
19500	0	0	121	599	14	59	0	0	190	989	14	59	0	0	0	0	0	275	1,468	14	59	0	0	479
20000	0	0	82	1,893	6	179	0	0	121	2,879	6	179	0	0	0	0	0	219	4,581	6	179	0	0	1,702



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY			
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)
20120	0	0	12	165	1	14	0	0	40	358	1	14	0	193	0	0	0	118	750	1	14	0	392	0	0
20500	0	0	48	423	9	71	0	0	100	983	9	71	0	560	0	0	0	175	2,061	9	71	0	1,079	0	0
20896	0	0	0	351	0	88	0	0	0	730	0	88	0	379	0	0	0	3	1,303	0	88	0	573	0	0
21000	0	0	0	0	0	0	0	0	2	4	0	0	0	4	0	0	0	16	36	0	0	0	31	0	0
21000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
21500	0	0	8	77	158	1,462	0	0	8	77	158	1,462	0	0	0	0	0	16	168	158	1,462	0	91	0	0
21673	0	0	0	27	0	506	0	0	0	27	0	506	0	0	0	0	0	0	51	0	506	0	24	0	0
22000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22449	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23656	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24587	0	0	141	1,528	0	0	0	0	141	1,528	0	0	0	0	0	0	0	305	3,318	0	0	0	1,790	0	0
25000	0	0	8	1,133	0	0	0	0	8	1,133	0	0	0	0	0	0	0	111	3,186	0	0	0	2,053	0	0
25000	0	0	8	0	0	0	0	0	91	0	0	0	0	0	0	0	0	213	0	0	0	0	0	0	0
25517	2	17	25	315	0	0	2	17	63	1,475	0	0	0	1,160	0	2	17	113	3,124	0	0	0	1,649	0	0
26000	29	274	139	1,473	0	0	29	274	206	2,413	0	0	0	940	0	29	274	297	3,670	0	0	0	1,256	0	0
26448	0	241	14	1,268	0	0	0	241	40	2,047	0	0	0	778	0	0	241	132	3,559	0	0	0	1,512	0	0
27000	17	179	99	1,150	0	0	17	179	156	2,011	0	0	0	860	0	17	179	267	4,076	0	0	0	2,065	0	0
27378	8	167	52	1,059	0	0	8	167	98	1,781	0	0	0	722	0	8	167	191	3,201	0	0	0	1,420	0	0
28000	2	101	28	926	0	0	2	101	64	1,863	0	0	0	937	0	2	101	137	3,776	0	0	0	1,913	0	0
28309	0	13	0	161	0	0	0	13	1	369	0	0	0	209	0	0	13	33	974	0	0	0	805	0	0
28500	0	0	1	4	0	0	0	0	12	47	0	0	0	42	0	0	0	46	260	0	0	0	234	0	0
29000	0	0	0	11	0	0	0	0	0	115	0	0	0	104	0	0	0	1	436	0	0	0	321	0	0
29239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32404	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34000	0	0	128	1,393	12	133	0	0	195	2,152	12	133	0	758	0	0	274	3,022	12	133	0	870	0	0	
34405	0	0	194	2,404	18	229	0	0	287	3,814	18	229	0	1,209	0	0	390	4,982	18	229	0	1,366	0	0	
35000	0	0	185	4,174	12	335	0	0	279	8,235	12	335	0	2,061	0	0	364	8,524	12	335	0	2,288	0	0	
35405	0	0	0	1,365	0	90	0	0	24	2,275	0	90	0	889	0	0	102	3,840	0	90	0	1,366	0	0	
36000	0	0	0	0	0	0	0	0	0	263	0	0	0	263	0	0	14	1,278	0	0	0	1,015	0	0	
36000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37000	0	0	1	9	0	0	0	0	1	9	0	0	0	0	0	0	0	21	193	0	0	0	193	0	0
37500	0	0	0	13	0	0	0	0	0	13	0	0	0	0	0	0	0	48	840	0	0	0	631	0	0
38000	0	0	35	324	0	0	0	0	35	324	0	0	0	0	0	0	36	800	0	0	0	787	0	0	
38500	0	0	10	409	0	0	0	0	10	409	0	0	0	0	0	0	98	1,257	0	0	0	933	0	0	
39000	0	0	43	488	4	38	0	0	43	488	4	38	0	0	0	0	51	1,380	0	0	0	971	0	0	
39289	0	0	1	222	0	20	0	0	1	222	0	20	0	0	0	0	90	1,308	4	38	0	820	0	0	
39500	0	0	38	169	1	3	0	0	38	169	1	3	0	0	0	0	17	530	0	20	0	308	0	0	
40094	0	0	0	419	0	8	0	0	0	419	0	8	0	0	0	0	79	410	1	3	0	241	0	0	
40500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	1,041	0	8	0	621	0	0	
40919	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	239	0	0	0	239	0	0	
41500	0	0	4	47	0	0	0	0	4	47	0	0	0	0	0	0	0	0	129	0	0	129	0	0	
41744	0	0	0	20	0	0	0	0	0	20	0	0	0	0	0	0	27	290	0	0	0	243	0	0	
42000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122	0	0	102	0	0	
																		7	35	0	0	0	35	0	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
42500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45500	0	0	14	131	0	0	0	0	14	131	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46000	0	0	5	174	0	0	0	0	5	174	0	0	0	0	0	0	32	297	0	0	0	0	166	0
46500	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	33	800	0	0	0	0	426	0
46784	0	0	2	58	0	0	0	0	33	0	0	0	0	0	0	0	67	0	0	0	0	0	0	0
47000	0	0	0	0	0	0	0	0	24	525	0	0	467	0	0	0	71	1,274	0	0	0	0	749	0
47500	0	0	0	0	0	0	0	0	1	129	0	0	120	0	0	0	14	445	0	0	0	0	316	0
47745	0	0	4	34	0	0	0	0	0	2	0	0	2	0	0	0	3	89	0	0	0	0	67	0
48000	0	0	0	17	0	0	0	0	19	174	0	0	140	0	0	0	51	506	0	0	0	0	332	0
48500	261	1,233	113	531	0	0	261	1,233	187	867	0	0	74	0	0	22	331	0	0	0	0	241	0	
48706	0	2,417	2	1,064	0	0	0	2,417	20	1,917	0	0	356	0	261	1,233	288	1,463	0	0	0	0	575	0
49000	0	0	0	9	0	0	0	0	0	78	0	0	853	0	0	2,417	106	3,649	0	0	0	0	1,732	0
49000	0	0	0	0	0	0	0	0	0	0	0	0	69	0	0	0	406	0	0	0	0	328	0	
49000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49666	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50674	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52274	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53000	0	0	15	136	17	161	0	0	15	136	17	161	0	0	0	0	0	0	0	0	0	0	0	0
53500	0	0	0	136	0	161	0	0	0	136	0	161	0	0	0	23	214	17	161	0	0	0	77	0
54000	223	2,068	115	1,063	0	0	223	2,068	115	1,063	0	0	0	0	0	0	214	0	161	0	0	0	77	0
54500	0	2,068	0	1,063	0	0	0	2,068	0	1,063	0	0	0	0	223	2,068	142	1,313	0	0	0	0	251	0
55000	19	175	110	1,015	0	0	19	175	110	1,015	0	0	0	0	0	2,068	0	1,313	0	0	0	0	251	0
55500	0	175	0	1,015	0	0	0	175	0	1,015	0	0	0	19	175	140	1,299	0	0	0	0	284	0	
56000	0	0	1	9	0	0	0	0	1	9	0	0	0	0	0	175	1,299	0	0	0	0	284	0	
56500	0	0	2	24	2	17	0	0	2	24	2	17	0	0	0	7	89	0	0	0	0	61	0	
57000	0	0	0	18	0	17	0	0	0	18	0	17	0	0	0	4	103	2	17	0	0	78	0	
57500	0	0	5	50	7	86	0	0	5	50	7	86	0	0	0	0	33	0	17	0	0	17	0	
58000	0	0	0	50	0	86	0	0	0	50	0	86	0	0	0	9	86	7	86	0	0	36	0	
58500	0	0	0	0	0	0	0	0	0	0	0	86	0	0	0	0	86	0	86	0	0	36	0	
59000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
59500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59500	3	27	95	876	0	0	3	27	95	876	0	0	0	0	3	27	129	1,193	0	0	0	0	317	0
59889	0	21	0	882	0	0	0	21	0	882	0	0	0	0	0	21	2	943	0	0	0	0	261	0
60000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	0
60500	56	517	56	541	0	0	56	517	56	541	0	0	0	0	0	0	0	0	0	0	0	0	4	0
61000	0	517	30	820	0	0	0	517	30	820	0	0	0	0	56	517	177	1,641	0	0	0	0	1,100	0
61276	0	0	0	154	0	0	0	0	0	154	0	0	0	0	0	517	89	2,279	0	0	0	0	1,458	0
61500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	352	0	0	0	0	0	196	0
62000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	12	0	0	0	0	12	0
62500	0	0	2	18	1	5	0	0	2	18	1	5	0	0	0	0	0	28	0	0	0	0	28	0
63000	0	0	0	18	0	5	0	0	0	18	0	5	0	0	0	0	5	43	1	5	0	0	25	0
63311	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	0	5	0	0	25	0
63500	0	831	9	33	0	0	0	831	9	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64000	237	2,198	0	87	0	0	237	2,198	0	87	0	0	0	0	237	831	16	54	0	0	0	0	22	0
64000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,198	0	144	0	0	0	0	57	0
64000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
64185	0	0	0	0	0	0	0	0	2	7	0	0	0	7	0	0	0	14	84	0	0	0	77	0
64500	0	0	1	5	0	0	0	0	7	56	0	0	0	51	0	0	0	27	238	0	0	0	182	0
65059	0	0	0	10	0	0	0	0	5	126	0	0	0	116	0	0	0	18	463	0	0	0	337	0
65500	0	0	215	1,759	2	13	0	0	323	2,679	2	13	0	920	0	0	0	458	3,885	2	13	0	1,206	0
66000	0	0	14	2,119	0	0	0	0	70	3,638	0	15	0	1,519	0	0	0	156	5,685	0	15	0	2,047	0
66000	0	0	14	0	0	0	0	0	14	0	0	0	0	0	0	0	0	70	0	0	0	0	0	0
66500	0	0	0	125	0	0	0	0	0	125	0	0	0	0	0	0	0	0	844	0	0	0	519	0
67206	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68349	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
69000	7	85	36	432	0	0	7	85	36	432	0	0	0	0	0	0	0	1	8	0	0	8	0	0
69549	0	71	0	365	0	0	0	71	0	365	0	0	0	0	0	0	71	0	810	0	0	0	245	0
70000	0	0	8	51	0	0	0	8	51	0	0	0	0	0	0	0	0	34	267	0	0	0	236	0
70692	0	0	0	78	0	0	0	0	78	0	0	0	0	0	0	0	0	0	446	0	0	0	368	0
71000	0	0	2	13	0	0	0	2	13	0	0	0	0	0	0	0	0	31	178	0	0	0	165	0
71500	0	0	2	36	0	0	0	2	36	0	0	0	0	0	0	0	0	34	597	0	0	0	562	0
72000	0	0	0	15	0	0	0	0	15	0	0	0	0	0	0	0	0	0	313	0	0	0	296	0
72500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
73000	0	0	38	348	3	0	0	78	722	0	3	0	374	0	0	0	147	1,398	0	3	0	0	676	0
73500	0	0	24	572	0	3	0	73	1,400	0	3	0	827	0	0	0	168	2,914	0	3	0	0	1,515	0
74056	0	0	1	256	0	0	0	4	798	0	0	0	542	0	0	0	24	1,976	0	0	0	0	1,178	0
74500	0	1	7	82	1	8	0	1	168	1	8	0	106	0	0	1	47	587	1	8	0	0	419	0
75000	0	1	53	557	15	145	0	1	116	1,219	15	145	0	662	0	1	222	2,490	15	145	0	0	1,270	0
75525	0	0	0	518	0	143	0	0	0	1,124	0	143	0	606	0	0	1	2,160	0	143	0	0	1,036	0
76000	0	0	28	247	1	12	0	0	61	541	1	12	0	293	0	0	110	970	1	12	0	0	429	0
76500	0	0	120	1,373	439	4,079	0	0	151	1,965	439	4,079	0	592	0	0	194	2,815	439	4,079	0	0	849	0
76500	0	0	120	0	439	0	0	0	120	0	439	0	0	0	0	0	151	0	439	0	0	0	0	0
76994	0	0	0	1,100	0	4,018	0	0	0	1,100	0	4,018	0	0	0	0	0	1,380	0	4,018	0	0	280	0
77500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
79000	350	3,239	104	966	0	0	350	3,239	104	966	0	0	0	0	0	350	3,239	122	1,130	0	0	0	164	0
79627	0	4,062	0	1,211	0	0	0	4,062	0	1,211	0	0	0	0	0	0	4,062	28	1,742	0	0	0	530	0
80000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	193	0	0	0	193	0
80606	0	0	1	16	9	101	0	1	16	9	101	0	0	0	0	0	3	33	9	101	0	0	16	0
81000	0	0	0	12	0	85	0	0	0	12	0	85	0	0	0	0	0	3	43	0	85	0	31	0
81568	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	54	0	0	0	53	0
82000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	16	0
82500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86500	0	0	1	10	0	0	0	1	10	0	0	0	0	0	0	0	0	2	15	0	0	0	4	0
87000	1	6	1	24	0	0	1	6	1	24	0	0	0	0	0	1	6	5	57	0	0	0	33	0
87500	0	6	0	13	0	0	0	6	0	13	0	0	0	0	0	0	6	0	42	0	0	0	29	0
88002	6	58	164	1,526	0	0	6	58	164	1,526	0	0	0	0	0	6	58	257	2,385	0	0	0	858	0
88500	0	58	0	1,514	0	0	0	58	0	1,514	0	0	0	0	0	0	58	0	2,366	0	0	0	852	0
89000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
89500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	23	0	0	0	23	0
90000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	91	0	0	0	91	0
90500	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	46	0	0	0	0	0	0
90500	0	0	0	0	0	0	0	12	182	0	0	0	0	182	0	0	0	76	1,128	0	0	0	946	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
90934	7	57	30	242	0	0	7	57	73	687	0	0	0	446	0	7	57	152	1,838	0	0	0	1,150	0
91500	1,557	16,397	1,168	12,555	0	0	1,557	16,397	1,276	14,144	0	0	0	1,588	0	1,557	16,397	1,537	17,712	0	0	0	3,569	0
92000	1,731	30,446	3,299	41,359	0	0	1,731	30,446	3,408	43,368	0	0	0	2,010	0	1,731	30,446	3,571	47,297	0	0	0	3,929	0
92300	1,778	19,496	3,360	36,996	0	0	1,778	19,496	3,468	38,199	0	0	0	1,203	0	1,778	19,496	3,719	40,499	0	0	0	2,300	0
92500	1,674	12,788	2,885	22,390	0	0	1,674	12,788	2,794	23,192	0	0	0	802	0	1,674	12,788	2,977	24,802	0	0	0	1,610	0
93000	1,244	27,020	1,201	35,979	0	0	1,244	27,020	1,309	37,989	0	0	0	2,010	0	1,244	27,020	1,421	40,727	0	0	0	2,739	0
93000	1,244	0	1,201	0	0	0	1,244	0	1,201	0	0	0	0	0	0	1,244	0	1,316	0	0	0	0	0	0
93500	491	16,066	149	12,496	0	0	491	16,066	149	12,496	0	0	0	0	0	491	16,066	251	14,505	0	0	0	2,009	0
93666	0	1,512	82	649	0	0	0	1,512	82	649	0	0	0	0	0	0	1,512	104	1,090	0	0	0	441	0
94000	0	2	0	366	0	0	0	2	0	366	0	0	0	0	0	0	2	24	792	0	0	0	406	0
94500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	224	0	0	0	223	0
95000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
97000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
97500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
98000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	524	0	0	0	524	0
99500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	524	0	0	0	524	0	0
100000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101079	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101079	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101500	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
102000	0	1	0	0	2	22	0	1	0	2	22	0	0	0	0	1	8	51	2	22	0	0	51	0
102500	0	4	0	0	9	102	0	4	0	9	102	0	0	0	0	4	5	101	9	102	0	0	101	0
103000	0	4	5	45	15	221	0	4	5	45	15	221	0	0	0	4	25	279	15	221	0	0	234	0
103500	0	2	74	728	19	310	0	2	74	728	19	310	0	0	0	2	127	1,408	19	310	0	0	660	0
104053	0	5	0	755	0	190	0	5	0	755	0	190	0	0	0	5	0	1,304	0	190	0	0	546	0
104500	0	3	0	0	3	21	0	3	0	0	3	21	0	0	0	3	0	2	3	21	0	0	2	0
105000	0	0	0	0	1	30	0	0	0	0	1	30	0	0	0	0	0	2	1	30	0	0	2	0
105500	0	3	0	2	25	0	3	0	0	2	25	0	0	0	0	3	1	5	2	25	0	0	5	0
106000	0	3	0	0	3	43	0	3	0	3	43	0	0	0	0	3	3	35	3	43	0	0	35	0
106500	0	1	0	2	43	0	1	0	2	43	0	0	0	0	0	1	3	55	2	43	0	0	55	0
107000	0	1	0	0	25	0	1	0	0	1	25	0	0	0	0	1	0	24	1	25	0	0	24	0
107500	0	0	0	0	6	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6	0	0	0	0
108000	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
108500	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
109000	1	7	0	0	0	1	7	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0
109500	2	26	0	0	0	2	26	0	0	0	0	0	0	0	2	26	0	1	0	0	0	0	1	0
109881	1	22	0	0	0	1	22	0	0	0	0	0	0	0	1	22	0	1	0	0	0	0	1	0
110000	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
110500	1	12	0	0	0	1	12	0	0	0	0	0	0	0	1	12	0	0	0	0	0	0	0	0
111000	0	11	0	0	0	0	11	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0
111000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
111500	5	45	0	0	0	5	45	5	50	0	0	0	50	0	5	45	41	400	0	0	0	0	350	0
112000	3	75	0	0	0	3	75	2	66	0	0	0	66	0	3	75	29	842	0	0	0	0	576	0
112500	0	32	0	0	0	0	32	0	16	0	0	0	16	0	0	32	0	265	0	0	0	0	249	0
113000	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	2	2	22	0	0	0	0	22	0
113500	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	22	0	0	0	0	22	0
114000	2	16	0	0	0	2	16	0	0	0	0	0	0	0	2	16	11	100	0	0	0	0	100	0
114500	0	16	0	0	0	0	16	0	0	0	0	0	0	0	0	16	0	100	0	0	0	0	100	0
115000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
90934	7	57	30	242	0	0	7	57	73	687	0	0	0	446	0	7	57	152	1,838	0	0	0	1,150	0
91500	1,557	16,397	1,168	12,555	0	0	1,557	16,397	1,276	14,144	0	0	0	1,568	0	1,557	16,397	1,537	17,712	0	0	0	3,569	0
92000	1,731	30,446	3,299	41,359	0	0	1,731	30,446	3,408	43,368	0	0	0	2,010	0	1,731	30,446	3,571	47,297	0	0	0	3,829	0
92300	1,778	19,496	3,360	36,996	0	0	1,778	19,496	3,468	38,199	0	0	0	1,203	0	1,778	19,496	3,719	40,499	0	0	0	2,300	0
92500	1,874	12,788	2,685	22,390	0	0	1,874	12,788	2,794	23,192	0	0	0	802	0	1,874	12,788	2,977	24,802	0	0	0	1,610	0
93000	1,244	27,020	1,201	35,979	0	0	1,244	27,020	1,309	37,989	0	0	0	2,010	0	1,244	27,020	1,421	40,727	0	0	0	2,739	0
93000	1,244	0	1,201	0	0	0	1,244	0	1,201	0	0	0	0	0	1,244	0	1,244	0	1,316	0	0	0	0	0
93500	491	18,066	149	12,496	0	0	491	18,066	149	12,496	0	0	0	0	491	18,066	251	14,505	0	0	0	2,009	0	
93666	0	1,512	82	849	0	0	0	1,512	82	849	0	0	0	0	0	1,512	104	1,090	0	0	0	441	0	
94000	0	2	0	386	0	0	0	2	0	386	0	0	0	0	0	2	24	792	0	0	0	406	0	
94500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	224	0	0	0	223	0	
95000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
97000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
97500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57	524	0	0	0	524	0
99000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	524	0	0	0	524	0	0
99500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101079	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101079	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101500	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0
102000	0	1	0	0	2	22	0	1	0	0	2	22	0	0	0	0	1	6	51	2	22	0	51	0
102500	0	4	0	0	9	102	0	4	0	0	9	102	0	0	0	4	5	101	9	102	0	101	0	
103000	0	4	5	45	15	221	0	4	5	45	15	221	0	0	0	4	25	279	15	221	0	234	0	
103500	0	2	74	728	19	310	0	2	74	728	19	310	0	0	0	2	127	1,408	19	310	0	680	0	
104053	0	5	0	755	0	190	0	5	0	755	0	190	0	0	0	5	0	1,304	0	190	0	548	0	
104500	0	3	0	0	3	21	0	3	0	0	3	21	0	0	0	3	0	2	3	21	0	2	0	
105000	0	0	0	0	1	30	0	0	0	0	1	30	0	0	0	0	0	2	1	30	0	2	0	
105500	0	3	0	0	2	25	0	3	0	0	2	25	0	0	0	3	1	5	2	25	0	5	0	
106000	0	3	0	0	3	43	0	3	0	0	3	43	0	0	0	3	3	35	3	43	0	35	0	
106500	0	1	0	0	2	43	0	1	0	0	2	43	0	0	1	3	55	2	43	0	43	0	55	0
107000	0	1	0	0	1	25	0	1	0	0	1	25	0	0	0	1	0	24	1	25	0	24	0	
107500	0	0	0	0	8	0	0	0	0	0	8	0	0	0	0	0	0	0	8	0	0	0	0	0
108000	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
108500	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
109000	1	7	0	0	0	0	1	7	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0
109500	2	26	0	0	0	0	2	26	0	0	0	0	0	0	2	26	0	1	0	0	0	1	0	0
109881	1	22	0	0	0	0	1	22	0	0	0	0	0	0	1	22	0	1	0	0	0	1	0	0
110000	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
110500	1	12	0	0	0	0	1	12	0	0	0	0	0	0	1	12	0	0	0	0	0	0	0	0
111000	0	11	0	0	0	0	0	11	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0
111000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
111500	5	45	0	0	0	0	5	45	5	50	0	0	0	50	5	45	41	400	0	0	0	350	0	
112000	3	75	0	0	0	0	3	75	2	86	0	0	86	3	75	26	842	0	0	0	576	0	0	
112500	0	32	0	0	0	0	0	32	0	16	0	0	16	0	0	32	0	265	0	0	0	249	0	
113000	0	2	0	0	0	0	0	2	0	0	0	0	0	0	2	2	22	0	0	0	22	0	0	
113500	0	2	0	0	0	0	0	2	0	0	0	0	0	0	2	2	22	0	0	0	22	0	0	
114000	2	16	0	0	0	0	2	16	0	0	0	0	0	0	2	16	11	100	0	0	0	100	0	
114500	0	16	0	0	0	0	0	16	0	0	0	0	0	0	16	0	100	0	0	0	100	0	0	
115000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
117000	1	6	0	0	0	0	1	6	0	0	0	0	0	0	0	1	6	8	75	0	0	0	75	0
117500	0	9	0	0	0	0	0	9	0	0	0	0	0	0	0	0	9	3	105	0	0	0	105	0
118000	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3	1	43	0	0	0	43	0
118500	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	1	23	0	0	0	23	0
119000	1	11	0	0	0	0	1	11	0	0	0	0	0	0	0	1	11	10	102	0	0	0	102	0
119500	3	37	0	0	0	0	3	37	1	13	0	0	0	13	0	3	37	26	327	0	0	0	314	0
120000	1	37	0	0	0	0	1	37	0	13	0	0	0	13	0	1	37	22	438	0	0	0	424	0
120500	0	10	0	0	0	0	0	10	0	0	0	0	0	0	0	0	10	19	379	0	0	0	379	0
121000	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	51	846	0	1	0	846	0
121500	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	3	497	0	1	0	497	0
122000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	237	0	0	0	237	0
122500	1	7	0	0	0	0	1	7	0	0	0	0	0	0	0	1	7	87	1,014	0	0	0	1,014	0
123000	2	29	0	0	0	0	2	29	3	31	0	0	0	31	0	2	29	107	1,797	0	0	0	1,796	0
123500	5	71	0	0	1	8	5	71	44	442	1	8	0	442	0	5	71	282	3,602	1	6	0	3,160	0
124000	7	116	0	4	0	7	7	116	46	841	0	7	0	837	0	7	116	256	4,979	0	7	0	4,138	0
124500	11	173	9	87	0	4	11	173	82	1,006	0	4	0	919	0	11	173	234	4,534	0	4	0	3,528	0
125000	12	220	14	211	1	13	12	220	88	1,390	1	13	0	1,179	0	12	220	289	4,846	1	13	0	3,456	0
125500	14	247	20	317	1	18	14	247	91	1,860	1	18	0	1,343	0	14	247	252	5,015	1	18	0	3,355	0
126000	19	305	45	808	0	10	19	305	131	2,055	0	10	0	1,447	0	19	305	271	4,840	0	10	0	2,785	0
126500	22	374	64	1,015	0	1	22	374	160	2,688	0	1	0	1,673	0	22	374	292	5,207	0	1	0	2,519	0
127000	20	366	61	1,159	0	0	20	366	160	2,958	0	0	0	1,799	0	20	366	301	5,486	0	0	0	2,528	0
127500	25	415	75	1,259	0	0	25	415	173	3,080	0	0	0	1,821	0	25	415	314	5,693	0	0	0	2,613	0
128000	20	419	63	1,275	0	0	20	419	165	3,132	0	0	0	1,857	0	20	419	315	5,821	0	0	0	2,689	0
128500	14	321	32	877	0	0	14	321	125	2,685	0	0	0	1,807	0	14	321	270	5,417	0	0	0	2,732	0
129000	8	210	4	335	0	0	8	210	79	1,885	0	0	0	1,549	0	8	210	225	4,585	0	0	0	2,700	0
129500	4	109	0	38	0	0	4	109	7	791	0	0	0	754	0	4	109	84	2,855	0	0	0	2,064	0
130000	2	49	0	0	0	0	2	49	0	63	0	0	0	63	0	2	49	46	1,203	0	0	0	1,139	0
130236	3	20	0	0	0	0	3	20	14	81	0	0	0	61	0	3	20	95	617	0	0	0	556	0
130500	4	31	0	0	0	0	4	31	8	107	0	0	0	107	0	4	31	74	827	0	0	0	720	0
131000	1	39	0	0	0	0	1	39	0	77	0	0	0	77	0	1	39	15	828	0	0	0	749	0
131500	5	50	0	0	0	0	5	50	14	129	0	0	0	129	0	5	50	84	919	0	0	0	790	0
132000	14	179	20	189	0	0	14	179	74	818	0	0	0	629	0	14	179	169	2,341	0	0	0	1,523	0
132500	22	341	48	836	0	0	22	341	118	1,780	0	0	0	1,142	0	22	341	215	3,556	0	0	0	1,776	0
133000	26	445	49	903	0	0	26	445	111	2,115	0	0	0	1,212	0	26	445	203	3,874	0	0	0	1,759	0
133500	17	399	17	815	0	0	17	399	56	1,541	0	0	0	926	0	17	399	123	3,019	0	0	0	1,478	0
134000	10	255	1	167	0	0	10	255	14	843	0	0	0	476	0	10	255	52	1,618	0	0	0	975	0
134500	11	199	3	34	0	2	11	199	22	334	0	2	0	300	0	11	199	68	1,103	0	2	0	770	0
135000	4	146	0	28	2	19	4	146	5	251	2	19	0	224	0	4	146	47	1,056	2	19	0	805	0
135500	1	51	0	0	3	48	1	51	3	72	3	48	0	72	0	1	51	44	835	3	48	0	763	0
136000	0	12	0	2	8	106	0	12	15	162	8	106	0	160	0	0	12	62	979	8	106	0	817	0
136500	0	3	3	28	10	166	0	3	30	415	10	166	0	387	0	0	3	94	1,447	10	166	0	1,032	0
137000	0	0	19	201	16	243	0	0	66	896	16	243	0	895	0	0	0	150	2,257	16	243	0	1,361	0
137500	0	0	33	484	21	345	0	0	95	1,494	21	345	0	1,011	0	0	0	191	3,153	21	345	0	1,859	0
138000	0	0	45	721	23	405	0	0	117	1,960	23	405	0	1,239	0	0	0	228	3,877	23	405	0	1,917	0
138500	0	0	40	784	24	431	0	0	112	2,118	24	431	0	1,334	0	0	0	221	4,157	24	431	0	2,039	0
139000	0	0	38	725	18	390	0	0	121	2,153	18	390	0	1,427	0	0	0	253	4,388	18	390	0	2,235	0
139500	0	0	65	958	21	366	0	0	158	2,578	21	366	0	1,620	0	0	0	279	4,921	21	366	0	2,342	0
140000	0	0	44	1,013	21	390	0	0	127	2,642	21	390	0	1,629	0	0	0	252	4,910	21	390	0	2,268	0
140500	0	0	47	844	21	392	0	0	128	2,346	21	392	0	1,502	0	0	0	241	4,557	21	392	0	2,211	0
141000	0	0	46	860	25	429	0	0	121	2,290	25	429	0	1,429	0	0	0	234	4,392	25	429	0	2,103	0
141500	0	0	24	851	18	394	0	0	86	1,919	18	394	0	1,269	0	0	0	184	3,867	18	394	0	1,948	0
142000	0	0	8	297	13	279	0	0	49	1,246	13	279	0	949	0	0	0	132	2,922	13	279	0	1,676	0
142500	0	2	0	75	7	183	0	2	23	861	7	183	0	586	0	0	2	86	2,019	7	183	0	1,358	0
143000	2	17	0	3	3	98	2	17	5	254	3	98	0	251	0	2	17	84	1,396	3	98	0	1,142	0
143500	6	69	0	0	2	49	6	69	17	204	2	49	0	204	0	6	69	122	1,725	2	49	0	1,522	0
144000	0	54	0	0	3	47	0	54	3	184	3	47	0	184	0	0	54	83	1,708	3	47	0	1,524	0
144500	1	8	0	0	1	37	1	8	0	24	1	37	0	24	0	1	8	54	1,079	1	37	0	1,055	0
145000	3	30	0	0	1	19	3	30	5	45	1	19	0	45	0	3	30	109	1,514	1	19	0	1,469	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
145500	10	114	9	85	1	21	10	114	63	627	1	21	0	542	0	10	114	224	3,092	1	21	0	2,465	0
146000	17	249	51	554	1	19	17	249	158	2,040	1	19	0	1,486	0	17	249	369	5,497	1	19	0	3,457	0
146500	26	398	96	1,361	1	15	26	398	205	3,361	1	15	0	1,999	0	26	398	406	7,178	1	15	0	3,817	0
147000	24	461	112	1,930	0	7	24	461	228	4,014	0	7	0	2,084	0	24	461	382	7,293	0	7	0	3,279	0
147500	31	505	84	1,817	0	1	31	505	181	3,791	0	1	0	1,973	0	31	505	322	8,514	0	1	0	2,724	0
148000	25	517	77	1,491	0	2	25	517	172	3,272	0	2	0	1,781	0	25	517	309	5,837	0	2	0	2,565	0
148500	22	435	107	1,705	37	340	22	435	241	3,826	37	340	0	2,121	0	22	435	431	8,844	37	340	0	3,018	0
149000	18	372	49	1,446	3	365	18	372	136	3,489	3	365	0	2,043	0	18	372	289	6,665	3	365	0	3,176	0
149500	15	314	27	705	1	38	15	314	97	2,159	1	38	0	1,454	0	15	314	231	4,812	1	38	0	2,853	0
150000	11	246	10	348	1	26	11	246	70	1,546	1	26	0	1,199	0	11	246	214	4,117	1	26	0	2,571	0
150500	8	177	1	102	1	22	8	177	33	952	1	22	0	850	0	8	177	135	3,232	1	22	0	2,280	0
151000	6	134	0	9	2	26	6	134	31	591	2	26	0	563	0	6	134	150	2,636	2	26	0	2,045	0
151500	7	128	2	16	4	54	7	128	60	837	4	54	0	822	0	7	128	207	3,303	4	54	0	2,466	0
152000	5	115	1	21	5	83	5	115	53	1,046	5	83	0	1,025	0	5	115	206	3,824	5	83	0	2,778	0
152000	5	0	1	0	5	0	5	0	206	0	5	0	0	0	0	5	0	453	0	5	0	0	0	0
152500	4	85	0	8	6	96	4	85	178	3,554	6	96	0	3,548	0	4	85	433	8,197	6	96	0	4,643	0
153000	4	72	0	0	5	97	4	72	250	3,960	5	97	0	3,960	0	4	72	542	9,027	5	97	0	5,067	0
153500	5	81	20	185	9	129	5	81	380	5,831	9	129	0	5,646	0	5	81	898	11,486	9	129	0	5,855	0
154000	3	77	4	224	9	168	3	77	355	6,801	9	168	0	5,577	0	3	77	893	12,885	9	168	0	6,084	0
154500	5	77	16	192	10	175	5	77	369	6,896	10	175	0	6,505	0	5	77	897	12,872	10	175	0	6,176	0
155000	2	85	5	201	8	167	2	85	300	6,192	8	167	0	5,991	0	2	85	843	12,409	8	167	0	6,217	0
155500	3	48	0	49	5	128	3	48	299	5,548	5	128	0	5,499	0	3	48	630	11,791	5	128	0	6,243	0
156000	1	37	0	0	3	81	1	37	214	4,747	3	81	0	4,747	0	1	37	535	10,789	3	81	0	6,041	0
156500	4	45	0	0	1	37	4	45	133	3,215	1	37	0	3,215	0	4	45	379	8,467	1	37	0	5,252	0
157000	0	39	0	0	0	7	0	39	41	1,816	0	7	0	1,816	0	0	39	256	5,880	0	7	0	4,264	0
157500	0	3	0	0	0	2	0	3	0	380	0	2	0	380	0	0	3	26	2,610	0	2	0	2,230	0
158000	0	0	0	0	0	0	0	0	1	5	0	0	0	5	0	0	0	42	830	0	0	0	625	0
158500	0	4	0	0	0	11	0	4	31	290	1	11	0	290	0	0	4	171	1,970	1	11	0	1,880	0
159000	1	14	0	0	1	18	1	14	27	533	1	18	0	533	0	1	14	153	2,996	1	18	0	2,464	0
159000	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0
159500	0	10	0	0	0	12	0	10	0	0	0	12	0	0	0	0	10	0	0	0	12	0	0	0
160000	0	0	0	0	0	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5	0	0	0
160500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
161000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
161500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162500	2	22	0	0	0	0	2	22	0	0	0	0	0	0	0	2	22	0	4	0	0	0	0	4
163000	9	105	1	7	0	0	9	105	1	7	0	0	0	0	0	9	105	25	235	0	0	0	0	228
163500	53	570	127	1,179	0	0	53	570	127	1,179	0	0	0	0	0	53	570	221	2,275	0	0	0	0	1,096
163655	45	281	71	568	0	0	45	281	71	568	0	0	0	0	0	45	281	141	1,040	0	0	0	0	472
163655	84	0	71	0	1	0	84	0	71	0	1	0	0	0	0	84	0	141	0	1	0	0	0	0
164000	53	877	13	538	4	35	53	877	13	538	4	35	0	0	0	53	877	48	1,208	4	35	0	669	0
164500	12	599	0	122	0	39	12	599	0	122	0	39	0	0	0	12	599	0	440	0	39	0	319	0
165000	6	162	0	0	0	0	6	162	0	0	0	0	0	0	0	6	162	0	0	0	0	0	0	0
165000	6	0	0	0	0	0	6	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0
165500	8	126	0	0	5	46	8	126	0	0	5	46	0	0	0	8	126	0	0	5	46	0	0	0
166000	10	165	0	0	14	178	10	165	0	0	14	178	0	0	0	10	165	23	214	14	178	0	0	214
166500	3	121	0	0	13	250	3	121	0	0	13	250	0	0	0	3	121	11	315	13	250	0	0	315
167000	8	88	0	0	15	255	8	88	0	0	15	255	0	0	0	8	88	20	283	15	255	0	0	283
167500	4	99	0	0	18	301	4	99	1	14	18	301	0	0	0	4	99	32	476	18	301	0	0	462
168000	5	82	0	0	18	330	5	82	5	81	18	330	0	61	0	5	82	48	739	18	330	0	0	878
168500	5	92	0	0	19	340	5	92	2	63	19	340	0	63	0	5	92	37	785	19	340	0	0	722
169000	2	73	0	0	19	353	2	73	6	89	19	353	0	89	0	2	73	51	814	19	353	0	0	746
169000	2	0	0	0	19	0	2	0	0	51	0	19	0	0	0	2	0	142	0	19	0	0	0	0
169500	3	46	0	0	18	349	3	46	50	942	18	349	0	942	0	3	46	145	2,857	18	349	0	0	1,715
170000	1	29	0	0	18	323	1	29	38	819	18	323	0	819	0	1	29	127	2,519	18	323	0	0	1,700
170500	1	15	0	0	18	318	1	15	53	839	18	318	0	839	0	1	15	150	2,569	18	318	0	0	1,730
171000	0	13	0	0	18	333	0	13	54	990	18	333	0	990	0	0	13	153	2,808	18	333	0	0	1,817

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
171500	0	8	0	0	17	319	0	8	42	895	17	319	0	895	0	0	8	133	2,645	17	319	0	1,750	0
172000	0	4	0	0	13	274	0	4	29	862	13	274	0	862	0	0	4	121	2,350	13	274	0	1,688	0
172500	0	3	0	0	7	189	0	3	2	292	7	189	0	292	0	0	3	80	1,863	7	189	0	1,570	0
173000	0	4	0	0	10	165	0	4	17	175	10	165	0	175	0	0	4	100	1,861	10	165	0	1,486	0
173500	0	2	0	0	10	190	0	2	18	320	10	190	0	320	0	0	2	109	1,927	10	190	0	1,607	0
174000	0	0	0	0	11	198	0	0	17	323	11	198	0	323	0	0	0	96	1,893	11	198	0	1,570	0
174500	0	0	0	0	9	186	0	0	4	190	9	186	0	190	0	0	0	83	1,475	9	186	0	1,285	0
175000	0	0	0	0	8	152	0	0	0	38	8	152	0	38	0	0	0	29	858	8	152	0	821	0
175500	0	0	0	0	5	118	0	0	0	4	5	118	0	4	0	0	0	20	453	5	118	0	449	0
176000	0	0	0	0	3	73	0	0	0	0	3	73	0	0	0	0	0	3	213	3	73	0	213	0
176500	0	2	0	0	1	39	0	0	2	0	0	1	39	0	0	0	0	2	0	1	39	0	31	0
177000	1	14	0	0	0	11	1	14	0	0	0	11	0	0	0	0	1	14	0	0	11	0	0	0
177500	1	20	0	0	0	0	1	20	0	0	0	0	0	0	0	0	1	20	0	0	0	0	0	0
178000	12	116	0	0	1	5	12	116	9	84	1	5	0	84	0	12	116	85	599	1	5	0	515	0
178500	16	252	0	0	0	8	16	252	26	328	0	8	0	328	0	16	252	94	1,474	0	8	0	1,145	0
179000	12	252	0	0	0	2	12	252	19	420	0	2	0	420	0	12	252	101	1,812	0	2	0	1,391	0
179500	14	238	0	0	0	1	14	238	21	373	0	1	0	373	0	14	238	89	1,756	0	1	0	1,386	0
180000	8	209	0	0	0	0	8	209	2	216	0	0	0	216	0	8	209	37	1,168	0	0	0	952	0
180500	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
181000	1	92	0	0	0	0	1	92	0	0	0	0	0	0	0	1	92	0	0	0	0	0	0	0
181500	0	16	0	0	0	0	0	16	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0
182000	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
182500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183000	0	0	9	81	48	446	0	0	9	81	48	446	0	0	0	0	0	71	855	48	446	0	574	0
183500	0	0	895	9,294	160	1,927	0	0	895	9,294	160	1,927	0	0	0	0	0	1,452	14,097	160	1,927	0	4,803	0
184000	0	0	755	16,200	156	2,922	0	0	755	16,200	156	2,922	0	0	0	0	0	1,101	23,639	156	2,922	0	7,439	0
184127	0	0	809	3,207	137	688	0	0	809	3,207	137	688	0	0	0	0	0	959	4,846	137	688	0	1,639	0
184500	0	0	834	8,584	116	1,751	0	0	834	8,584	116	1,751	0	0	0	0	0	1,010	13,601	116	1,751	0	5,016	0
185000	15	135	749	12,805	106	2,059	15	135	749	12,805	106	2,059	0	0	0	15	135	1,204	20,495	106	2,059	0	7,690	0
185500	42	519	1,102	17,141	113	2,028	42	519	1,102	17,141	113	2,028	0	0	0	42	519	1,798	27,797	113	2,028	0	10,656	0
186000	41	764	274	12,741	84	1,824	41	764	274	12,741	84	1,824	0	0	0	41	764	787	23,935	84	1,824	0	11,194	0
186500	12	491	0	2,536	36	1,110	12	491	0	2,536	36	1,110	0	0	0	12	491	0	7,285	36	1,110	0	4,749	0
187000	0	112	0	0	0	333	0	112	0	0	0	333	0	0	0	0	112	0	0	0	333	0	0	0
187500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
188000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
188500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
189000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
189500	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
190000	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
190500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
191000	2	24	0	0	0	0	2	24	0	0	0	0	0	0	0	2	24	0	0	0	0	0	0	0
191500	1	27	0	0	0	0	1	27	0	0	0	0	0	0	0	1	27	0	0	0	0	0	0	0
192000	2	33	0	0	0	0	2	33	0	0	0	0	0	0	0	2	33	1	9	0	0	0	9	0
192500	2	41	0	0	0	2	2	41	0	0	0	2	0	0	0	2	41	1	19	0	2	0	19	0
193000	1	33	0	0	1	9	1	33	0	0	1	9	0	0	0	1	33	0	10	1	9	0	10	0
193500	1	25	0	0	2	25	1	25	0	0	2	25	0	0	0	1	25	1	8	2	25	0	8	0
194000	1	21	0	0	3	46	1	21	0	0	3	46	0	0	0	1	21	8	86	3	46	0	86	0
194500	1	18	0	0	4	67	1	18	0	0	4	67	0	0	0	1	18	25	292	4	67	0	292	0
195000	0	9	0	0	3	67	0	9	0	0	3	67	0	0	0	0	9	9	321	3	67	0	321	0
195500	0	0	0	0	3	54	0	0	0	0	3	54	0	0	0	0	0	6	138	3	54	0	138	0
196000	0	0	0	0	2	44	0	0	0	0	2	44	0	0	0	0	0	0	54	2	44	0	54	0
196500	0	0	0	0	3	47	0	0	0	0	3	47	0	0	0	0	0	3	27	3	47	0	27	0
197000	0	0	0	0	2	49	0	0	0	0	2	49	0	0	0	0	0	1	30	2	49	0	30	0
197500	0	0	0	0	2	37	0	0	0	0	2	37	0	0	0	0	0	0	9	2	37	0	9	0
198000	0	0	0	0	0	20	0	0	0	0	0	20	0	0	0	0	0	0	3	0	20	0	3	0
198500	0	0	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY			
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	
199000	0	0	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
199500	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0
200000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
201000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
201500	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
202000	0	4	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
202500	1	5	0	0	0	0	1	5	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0
203000	0	10	0	0	0	5	0	10	0	0	0	5	0	0	0	0	10	0	0	0	0	5	0	0	0
203156	1	3	0	0	0	2	1	3	0	0	0	2	0	0	0	1	3	0	0	0	2	0	0	0	0
203500	1	11	0	0	0	3	1	11	0	0	0	3	0	0	0	1	11	0	0	0	3	0	0	0	0
204000	3	38	0	0	0	4	3	38	0	0	0	4	0	0	0	3	38	6	59	0	4	0	0	59	0
204500	5	74	0	0	1	7	5	74	0	0	1	7	0	0	0	5	74	20	245	1	7	0	0	245	0
205000	8	122	0	0	0	7	8	122	3	28	0	7	28	0	8	122	74	875	0	7	0	0	847	0	
205500	12	185	0	0	0	2	12	185	21	221	0	2	221	0	12	185	104	1,656	0	2	0	0	1,435	0	
206000	2	127	0	0	0	2	127	0	193	0	0	2	193	0	2	127	0	969	0	0	0	0	0	776	0
206500	1	27	0	0	0	0	1	27	0	0	0	0	0	0	1	27	0	2	0	0	0	0	0	2	0
207000	3	34	0	0	0	3	34	0	0	0	0	3	0	0	3	34	3	29	0	0	0	0	0	29	0
207500	1	37	0	0	0	0	1	37	0	0	0	0	0	0	1	37	0	29	0	0	0	0	0	29	0
208000	2	32	0	0	0	0	2	32	0	0	0	0	0	0	2	32	3	27	0	0	0	0	0	27	0
208500	5	66	0	0	0	0	5	66	0	0	0	0	0	0	5	66	31	312	0	0	0	0	0	312	0
209000	9	133	0	0	0	1	9	133	3	29	0	1	29	0	9	133	78	1,004	0	1	0	0	0	975	0
209500	17	240	0	0	4	36	17	240	62	805	4	36	805	0	17	240	188	2,461	4	36	0	0	0	1,856	0
210000	11	258	0	0	0	37	11	258	22	780	0	37	780	0	11	258	122	2,871	0	37	0	0	0	2,091	0
210000	11	0	0	0	0	0	11	0	301	0	0	0	0	0	11	0	665	0	0	0	0	0	0	0	0
210500	20	289	0	0	2	17	20	289	451	6,959	2	17	6,959	0	20	289	896	14,469	2	17	0	0	0	7,510	0
211000	21	381	0	0	3	43	21	381	860	10,285	3	43	10,285	0	21	381	1,107	16,563	3	43	0	0	0	8,278	0
211500	17	349	0	0	1	41	17	349	487	10,619	1	41	10,619	0	17	349	934	16,897	1	41	0	0	0	8,278	0
212000	14	283	0	0	3	37	14	283	487	9,016	3	37	9,016	0	14	283	934	17,294	3	37	0	0	0	8,278	0
212000	14	0	0	0	3	0	14	0	934	0	3	0	0	0	14	0	1,375	0	3	0	0	0	0	0	0
212500	16	276	0	0	4	57	16	276	915	17,123	4	57	17,123	0	16	276	1,356	25,289	4	57	0	0	0	8,167	0
213000	18	313	0	0	3	80	18	313	923	17,023	3	80	17,023	0	18	313	1,364	25,190	3	80	0	0	0	8,167	0
213500	18	330	0	0	7	93	18	330	976	17,586	7	93	17,586	0	18	330	1,417	25,753	7	93	0	0	0	8,167	0
214000	23	373	0	0	14	196	23	373	1,120	19,405	14	196	19,405	0	23	373	1,561	27,572	14	196	0	0	0	8,167	0
214500	23	422	0	0	14	260	23	422	1,222	21,877	14	260	21,877	0	23	422	1,663	29,844	14	260	0	0	0	8,167	0
215000	33	516	4	33	15	273	33	516	1,324	23,571	15	273	23,536	0	33	516	1,765	31,736	15	273	0	0	0	8,167	0
215500	20	487	0	33	7	211	20	487	1,322	24,497	7	211	24,464	0	20	487	1,763	32,664	7	211	0	0	0	8,167	0
216000	42	575	32	296	8	139	42	575	1,472	25,867	8	139	25,571	0	42	575	1,913	34,034	8	139	0	0	0	8,167	0
216500	55	904	123	1,438	7	139	55	904	1,654	28,950	7	139	27,512	0	55	904	2,095	37,117	7	139	0	0	0	8,167	0
217000	54	1,009	88	1,954	3	97	54	1,009	1,865	30,736	3	97	28,782	0	54	1,009	2,106	38,903	3	97	0	0	0	8,167	0
217500	51	971	102	1,760	0	29	51	971	1,436	28,715	0	29	26,955	0	51	971	1,677	36,882	0	29	0	0	0	8,167	0
218000	80	1,030	71	1,803	1	13	80	1,030	1,621	28,310	1	13	26,706	0	80	1,030	2,062	36,476	1	13	0	0	0	8,167	0
218500	58	1,093	89	1,477	5	58	58	1,093	1,831	31,865	5	58	30,467	0	58	1,093	2,272	40,131	5	58	0	0	0	8,167	0
219000	43	931	5	868	5	93	43	931	1,842	34,012	5	93	33,143	0	43	931	2,283	42,178	5	93	0	0	0	8,167	0
219500	65	994	203	1,921	0	51	65	994	2,424	39,503	0	51	37,582	0	65	994	2,993	48,857	0	51	0	0	0	9,354	0
220000	61	1,166	52	2,357	0	2	61	1,166	1,700	38,183	0	2	35,826	0	61	1,166	2,413	50,059	0	2	0	0	0	11,876	0
220000	61	0	52	0	0	0	61	0	592	0	0	0	0	0	61	0	1,042	0	0	0	0	0	0	0	0
220498	40	930	0	480	1	5	40	930	173	7,054	1	5	8,574	0	40	930	349	12,821	1	5	0	0	0	5,766	0
221000	104	1,341	20	184	0	5	104	1,341	116	2,693	0	5	2,510	0	104	1,341	181	4,922	0	5	0	0	0	2,229	0
221500	0	968	0	183	0	0	0	968	0	1,077	0	0	894	0	0	968	9	1,754	0	0	0	0	0	877	0
222000	2	24	0	0	0	0	2	24	0	3	0	0	0	0	2	24	7	145	0	0	0	0	0	142	0
222000	2	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
222500	2	42	0	0	1	8	2	42	0	0	1	8	0	0	2	42	3	32	1	8	0	0	0	32	0
223000	2	39	0	0	7	89	2	39	1	13	7	89	0	13	0	39	85	819	7	89	0	0	0	806	0
223500	1	30	0	0	6	120	1	30	2	33	6	120	0	33	0	30	162	2,291	6	120	0	0	0	2,259	0
224000	5	55	0	0	6	116	5	55	0	23	6	116	0	23	0	5	55	188	3,241	6	116	0	0	3,218	0
224500	3	75	0	0	4	95	3	75	0	4	4	95	0	4	0	3	75	77	2,450	4	95	0	0	2,448	0
225000	7	92	0	0	5	86	7	92	0	4	5	86	0	4	0	7	92	97	1,805	5	86	0	0	1,801	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-1 - New Work + Existing Project - C & D Canal Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY						
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope				
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)				
225500	18	227	0	0	1	56	18	227	2	20	1	56	0	20	0	18	227	111	1,923	1	56	0	1,903	0				
226000	7	228	0	0	4	47	7	228	5	62	4	47	0	62	0	7	228	333	4,111	4	47	0	4,050	0				
226500	7	0	0	0	4	0	7	0	333	0	4	0	0	0	0	7	0	783	0	4	0	0	0	0				
226500	12	175	0	0	10	127	12	175	597	8,810	10	127	0	8,810	0	12	175	1,047	16,943	10	127	0	8,333	0				
227000	20	299	0	0	10	187	20	299	703	12,040	10	187	0	12,040	0	20	299	1,153	20,373	10	187	0	8,333	0				
227500	13	302	0	0	5	141	13	302	321	9,487	5	141	0	9,487	0	13	302	771	17,820	5	141	0	8,332	0				
228000	9	203	0	0	5	88	9	203	246	5,249	5	88	0	5,249	0	9	203	696	13,561	5	88	0	8,332	0				
228500	8	156	0	0	3	76	8	156	364	5,643	3	76	0	5,643	0	8	156	814	13,976	3	76	0	8,333	0				
229000	8	150	0	0	11	131	8	150	343	8,544	11	131	0	8,544	0	8	150	785	14,801	11	131	0	8,257	0				
229000	8	0	0	0	11	0	8	0	785	0	11	0	0	0	0	8	0	1,232	0	11	0	0	0	0				
229500	4	110	0	0	9	182	4	110	802	12,842	9	182	0	12,842	0	4	110	1,049	21,120	9	182	0	8,278	0				
230000	4	72	0	0	11	186	4	72	412	9,392	11	186	0	9,392	0	4	72	802	17,143	11	186	0	7,751	0				
230500	6	90	0	0	15	244	6	90	428	7,779	15	244	0	7,779	0	6	90	812	14,942	15	244	0	7,163	0				
231000	2	86	0	0	14	267	2	86	387	7,550	14	267	0	7,550	0	2	86	787	14,805	14	267	0	7,255	0				
231500	10	108	0	0	17	281	10	108	460	7,842	17	281	0	7,842	0	10	108	874	15,366	17	281	0	7,544	0				
232000	3	119	0	0	9	239	3	119	290	6,943	9	239	0	6,943	0	3	119	649	14,107	9	239	0	7,164	0				
232500	0	27	0	0	8	158	0	27	227	4,794	8	158	0	4,794	0	0	27	582	11,396	8	158	0	8,602	0				
233000	0	0	0	0	15	217	0	0	314	5,017	15	217	0	5,017	0	0	0	743	12,261	15	217	0	7,244	0				
233500	0	4	0	0	17	303	0	4	494	7,486	17	303	0	7,486	0	0	4	941	15,590	17	303	0	8,104	0				
234000	1	17	0	0	19	336	1	17	619	10,307	19	336	0	10,307	0	1	17	1,066	18,584	19	336	0	8,277	0				
234500	0	13	0	0	14	308	0	13	456	9,956	14	308	0	9,956	0	0	13	896	18,169	14	308	0	8,213	0				
235000	2	18	0	0	7	200	2	18	425	8,161	7	200	0	8,161	0	2	18	872	16,374	7	200	0	8,213	0				
235500	3	47	0	0	10	159	3	47	403	7,666	10	159	0	7,666	0	3	47	850	15,944	10	159	0	8,278	0				
236000	10	120	0	0	4	128	10	120	517	8,514	4	128	0	8,514	0	10	120	964	16,792	4	128	0	8,278	0				
236500	17	246	0	0	1	49	17	246	514	9,542	1	49	0	9,542	0	17	246	961	17,819	1	49	0	8,278	0				
237000	28	412	0	2	0	17	28	412	552	9,869	0	17	0	9,867	0	28	412	997	18,126	0	17	0	8,257	0				
237500	25	487	0	2	0	4	25	487	501	9,752	0	4	0	9,750	0	25	487	851	17,114	0	4	0	7,362	0				
238000	47	665	32	296	0	0	47	665	776	11,827	0	0	0	11,531	0	47	665	1,219	19,170	0	0	0	7,343	0				
238500	46	858	57	824	0	0	46	858	773	14,347	0	0	0	13,523	0	46	858	1,191	22,317	0	0	0	7,970	0				
239000	52	900	38	884	0	0	52	900	847	13,155	0	0	0	12,271	0	52	900	1,014	20,422	0	0	0	7,267	0				
239500	42	869	16	507	0	0	42	869	530	10,904	0	0	0	10,397	0	42	869	875	17,491	0	0	0	8,588	0				
239740	26	303	0	73	0	0	26	303	371	4,005	0	0	0	3,932	0	26	303	741	7,180	0	0	0	3,175	0				
TOTAL (MCY)		0.219		1.356		0.098		0.219		1.908		0.098		0.000		0.852		0.000		2.924		0.098		0.000		1.017		0.000



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
4000	0	0	148	0	5	0	0	1,163	0	5	0	0	0	0	0	0	0	1,754	0	5	0	0	0	0
4100	0	0	159	567	1	11	0	0	1,285	4,532	1	11	0	0	3,964	0	0	0	1,925	8,812	1	11	0	2,260
4200	0	0	245	748	18	35	0	0	1,482	5,123	18	35	0	0	4,375	0	0	0	2,172	7,587	18	35	0	2,464
4300	1	2	395	1,186	8	47	1	2	1,805	6,087	8	47	0	0	4,901	0	1	2	2,545	8,736	8	47	0	2,649
4400	0	2	404	1,479	11	35	0	2	1,860	6,787	11	35	0	0	5,308	0	0	2	2,650	9,621	11	35	0	2,834
4500	0	0	561	1,786	20	57	0	0	2,130	7,388	20	57	0	0	5,602	0	0	0	2,970	10,407	20	57	0	3,018
4600	0	0	743	2,414	28	88	0	0	2,418	8,423	28	88	0	0	6,009	0	0	0	3,308	11,628	28	88	0	3,203
4700	2	5	894	3,030	24	96	2	5	2,706	9,490	24	96	0	0	6,461	0	2	5	3,646	12,878	24	96	0	3,368
4800	0	5	1,091	3,678	31	103	0	5	3,010	10,586	31	103	0	0	8,911	0	5	4,000	14,159	31	103	0	3,573	
4900	1	2	1,261	4,356	31	115	1	2	3,286	11,660	31	115	0	0	7,304	0	1	2	4,326	15,417	31	115	0	3,756
5000	1	4	1,446	5,013	34	120	1	4	3,594	12,741	34	120	0	0	7,728	0	1	4	4,684	16,684	34	120	0	3,942
5100	1	5	1,569	5,584	26	110	1	5	3,833	13,755	26	110	0	0	8,171	0	1	5	4,973	17,882	26	110	0	4,127
5200	3	8	1,815	6,267	25	94	3	8	4,194	14,866	25	94	0	0	8,600	0	3	8	5,383	19,178	25	94	0	4,312
5300	3	11	2,035	7,128	25	93	3	11	4,527	16,150	25	93	0	0	9,022	0	3	11	5,796	20,647	25	93	0	4,497
5400	5	14	2,292	8,012	31	104	5	14	4,885	17,430	31	104	0	0	9,418	0	5	14	6,174	22,111	31	104	0	4,681
5500	1	10	2,584	9,029	40	131	1	10	5,274	18,814	40	131	0	0	9,786	0	1	10	6,613	23,680	40	131	0	4,866
5600	0	2	2,686	9,759	52	169	0	2	5,471	19,899	52	169	0	0	10,140	0	0	2	6,860	24,950	52	169	0	5,051
5700	3	8	2,924	10,369	45	179	3	8	5,816	20,903	45	179	0	0	10,513	0	3	8	7,255	26,138	45	179	0	5,236
5800	3	10	3,250	11,433	45	166	3	10	6,242	22,330	45	166	0	0	10,897	0	3	10	7,731	27,751	45	166	0	5,420
5900	3	10	3,522	12,540	31	141	3	10	6,614	23,809	31	141	0	0	11,268	0	3	10	8,153	29,414	31	141	0	5,605
6000.04	15	34	3,199	12,451	35	122	15	34	6,048	23,459	35	122	0	0	11,009	0	15	34	7,465	28,934	35	122	0	5,475
6100	12	50	3,098	11,656	25	111	12	50	6,005	22,312	25	111	0	0	10,655	0	12	50	7,450	27,610	25	111	0	5,296
6200	11	43	3,065	11,414	24	91	11	43	5,862	22,012	24	91	0	0	10,598	0	11	43	7,282	27,282	24	91	0	5,270
6300	12	43	3,057	11,337	27	94	12	43	5,783	21,602	27	94	0	0	10,265	0	12	43	7,139	26,705	27	94	0	5,103
6400	12	44	2,978	11,175	37	119	12	44	5,615	21,107	37	119	0	0	9,932	0	12	44	6,925	26,044	37	119	0	4,937
6500	6	32	2,826	10,748	38	140	6	32	5,372	20,346	38	140	0	0	9,599	0	6	32	6,638	25,117	38	140	0	4,770
6600	2	14	2,788	10,396	44	153	2	14	5,242	19,656	44	153	0	0	9,260	0	2	14	6,462	24,259	44	153	0	4,604
6700	0	4	2,690	10,144	41	158	0	4	5,020	19,002	41	158	0	0	8,856	0	0	4	6,195	23,439	41	158	0	4,437
6800	0	0	2,637	9,865	35	141	0	0	4,819	18,219	35	141	0	0	8,354	0	0	0	5,949	22,469	35	141	0	4,270
6900	0	0	2,424	9,371	28	118	0	0	4,417	17,103	28	118	0	0	7,732	0	0	0	5,502	21,207	28	118	0	4,104
7000	0	0	2,280	8,674	30	108	0	0	4,063	15,703	30	108	0	0	7,029	0	0	0	5,103	19,639	30	108	0	3,936
7100	0	0	2,084	8,044	30	111	0	0	3,652	14,287	30	111	0	0	6,243	0	0	0	4,629	18,023	30	111	0	3,736
7200	0	0	1,920	7,415	44	137	0	0	3,318	12,909	44	137	0	0	5,494	0	0	0	4,255	16,453	44	137	0	3,544
7300	0	0	1,711	6,725	53	179	0	0	2,916	11,546	53	179	0	0	4,821	0	0	0	3,675	14,885	53	179	0	3,139
7400	0	0	1,543	6,026	42	177	0	0	2,601	10,217	42	177	0	0	4,191	0	0	0	3,274	12,867	42	177	0	2,650
7500	0	0	1,388	5,428	41	154	0	0	2,346	9,160	41	154	0	0	3,733	0	0	0	2,971	11,565	41	154	0	2,404
7600	0	0	1,134	4,671	33	138	0	0	1,968	7,988	33	138	0	0	3,317	0	0	0	2,525	10,179	33	138	0	2,191
7700	0	0	890	3,747	90	229	0	0	1,559	6,531	90	229	0	0	2,784	0	0	0	2,079	8,527	90	229	0	1,996
7800	0	0	847	2,846	59	277	0	0	1,181	5,074	59	277	0	0	2,229	0	0	0	1,634	6,877	59	277	0	1,802
7900	0	0	403	1,946	36	177	0	0	839	3,742	36	177	0	0	1,796	0	0	0	1,171	5,195	36	177	0	1,453
8000	0	0	189	1,097	28	119	0	0	504	2,487	28	119	0	0	1,390	0	0	0	840	3,723	28	119	0	1,236
8000	0	0	189	0	28	0	0	0	189	0	28	0	0	0	0	0	0	0	307	0	28	0	0	0
8100	0	0	197	714	27	102	0	0	197	714	27	102	0	0	0	0	0	0	318	1,158	27	102	0	444
8200	0	0	176	890	30	105	0	0	176	890	30	105	0	0	0	0	0	0	287	1,121	30	105	0	432
8300	0	0	177	853	27	106	0	0	177	853	27	106	0	0	0	0	0	0	298	1,084	27	106	0	431
8400	0	0	150	804	27	100	0	0	150	804	27	100	0	0	0	0	0	0	273	1,056	27	100	0	452
8500	0	0	161	576	32	108	0	0	161	576	32	108	0	0	0	0	0	0	300	1,061	32	108	0	485
8600	1	2	154	583	31	117	1	2	154	583	31	117	0	0	0	0	1	2	302	1,116	31	117	0	533
8700	2	6	152	565	28	110	2	6	152	565	28	110	0	0	0	0	2	6	324	1,159	28	110	0	594
8800	3	10	136	536	26	99	3	10	136	536	26	99	0	0	0	0	3	10	332	1,214	26	99	0	678
8900	5	14	147	528	26	96	5	14	147	528	26	96	0	0	0	0	5	14	361	1,283	26	96	0	755
9000	8	24	159	567	24	93	8	24	159	567	24	93	0	0	0	0	8	24	378	1,369	24	93	0	802
9100	3	21	169	608	23	87	3	21	169	608	23	87	0	0	0	0	3	21	395	1,432	23	87	0	824
9200	3	12	162	613	20	80	3	12	162	613	20	80	0	0	0	0	3	12	401	1,475	20	80	0	862
9300	7	18	187	646	20	75	7	18	187	646	20	75	0	0	0	0	7	18	436	1,551	20	75	0	904
9400	5	21	176	672	22	77	5	21	176	672	22	77	0	0	0	0	5	21	422	1,589	22	77	0	917
9500	4	16	205	705	19	75	4	16	205	705	19	75	0	0	0	0	4	16	472	1,656	19	75	0	952
9600	5	17	216	778	20	72	5	17	216	778	20	72	0	0	0	0	5	17	485	1,773	20	72	0	994
9700	6	21	218	804	21	76	6	21	218	804	21	76	0	0	0	0	6	21	494	1,814	21	76	0	1,010

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY			
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)
9600	8	26	222	816	22	79	8	26	222	816	22	79	0	0	0	8	26	504	1,848	22	79	0	1,033	0	0
9900	7	27	229	834	23	82	7	27	229	834	23	82	0	0	0	7	27	490	1,841	23	82	0	1,007	0	0
10000	8	27	228	846	20	79	8	27	228	846	20	79	0	0	0	8	27	497	1,828	20	79	0	982	0	0
10100	9	32	226	841	19	73	9	32	226	841	19	73	0	0	0	9	32	495	1,836	19	73	0	995	0	0
10200	10	35	232	847	19	72	10	35	232	847	19	72	0	0	0	10	35	495	1,833	19	72	0	986	0	0
10300	9	34	232	856	18	70	9	34	232	856	18	70	0	0	0	9	34	493	1,830	18	70	0	972	0	0
10400	10	34	241	875	20	70	10	34	241	875	20	70	0	0	0	10	34	507	1,852	20	70	0	977	0	0
10500	10	36	240	891	21	75	10	36	240	891	21	75	0	0	0	10	36	507	1,878	21	75	0	986	0	0
10600	12	42	236	883	18	71	12	42	236	883	18	71	0	0	0	12	42	502	1,868	18	71	0	985	0	0
10700	15	50	242	885	19	68	15	50	242	885	19	68	0	0	0	15	50	504	1,864	19	68	0	978	0	0
10800	17	58	245	902	18	64	17	58	245	902	18	64	0	0	0	17	58	516	1,890	18	64	0	968	0	0
10900	17	63	240	898	15	57	17	63	240	898	15	57	0	0	0	17	63	497	1,876	15	57	0	976	0	0
11000	16	62	233	875	15	55	16	62	233	875	15	55	0	0	0	16	62	498	1,842	15	55	0	968	0	0
11100	15	58	217	832	15	56	15	58	217	832	15	56	0	0	0	15	58	479	1,809	15	56	0	977	0	0
11200	11	48	218	805	15	55	11	48	218	805	15	55	0	0	0	11	48	480	1,776	15	55	0	971	0	0
11300	11	40	213	798	14	53	11	40	213	798	14	53	0	0	0	11	40	474	1,767	14	53	0	970	0	0
11400	11	40	209	782	12	49	11	40	209	782	12	49	0	0	0	11	40	460	1,730	12	49	0	949	0	0
11500	13	45	216	787	18	56	13	45	216	787	18	56	0	0	0	13	45	471	1,724	18	56	0	936	0	0
11600	16	54	204	778	11	53	16	54	204	778	11	53	0	0	0	16	54	456	1,717	11	53	0	939	0	0
11700	15	56	188	727	11	40	15	56	188	727	11	40	0	0	0	15	56	426	1,634	11	40	0	906	0	0
11800	17	58	187	894	11	39	17	58	187	894	11	39	0	0	0	17	58	422	1,570	11	39	0	876	0	0
11900	17	63	187	892	11	40	17	63	187	892	11	40	0	0	0	17	63	412	1,545	11	40	0	853	0	0
12000	19	68	196	708	10	40	19	68	196	708	10	40	0	0	0	19	68	422	1,545	10	40	0	837	0	0
12100	24	80	207	746	11	39	24	80	207	746	11	39	0	0	0	24	80	432	1,582	11	39	0	836	0	0
12200	21	83	202	757	14	46	21	83	202	757	14	46	0	0	0	21	83	426	1,589	14	46	0	831	0	0
12300	22	80	193	732	10	44	22	80	193	732	10	44	0	0	0	22	80	413	1,554	10	44	0	822	0	0
12400	21	79	186	701	11	38	21	79	186	701	11	38	0	0	0	21	79	399	1,505	11	38	0	804	0	0
12500	19	74	183	883	12	41	19	74	183	883	12	41	0	0	0	19	74	399	1,478	12	41	0	795	0	0
12600	18	69	172	858	11	42	18	69	172	858	11	42	0	0	0	18	69	383	1,448	11	42	0	790	0	0
12700	17	65	163	820	9	37	17	65	163	820	9	37	0	0	0	17	65	379	1,412	9	37	0	791	0	0
12800	18	66	170	817	9	33	18	66	170	817	9	33	0	0	0	18	66	389	1,423	9	33	0	806	0	0
12900	17	65	164	820	8	31	17	65	164	820	8	31	0	0	0	17	65	382	1,428	8	31	0	808	0	0
13000	17	63	151	584	8	30	17	63	151	584	8	30	0	0	0	17	63	361	1,377	8	30	0	792	0	0
13100	18	65	160	577	8	31	18	65	160	577	8	31	0	0	0	18	65	373	1,359	8	31	0	782	0	0
13200	18	66	161	595	8	30	18	66	161	595	8	30	0	0	0	18	66	367	1,369	8	30	0	774	0	0
13300	18	66	149	573	9	31	18	66	149	573	9	31	0	0	0	18	66	355	1,336	9	31	0	763	0	0
13400	20	70	146	546	9	33	20	70	146	546	9	33	0	0	0	20	70	349	1,303	9	33	0	757	0	0
13500	24	81	154	555	9	34	24	81	154	555	9	34	0	0	0	24	81	353	1,300	9	34	0	744	0	0
13600	18	79	144	552	9	34	18	79	144	552	9	34	0	0	0	18	79	335	1,274	9	34	0	722	0	0
13700	19	68	131	511	8	31	19	68	131	511	8	31	0	0	0	19	68	321	1,215	8	31	0	704	0	0
13800	18	68	132	488	6	25	18	68	132	488	6	25	0	0	0	18	68	317	1,182	6	25	0	695	0	0
13900	15	62	128	481	7	24	15	62	128	481	7	24	0	0	0	15	62	316	1,172	7	24	0	691	0	0
14000	16	57	131	479	8	27	16	57	131	479	8	27	0	0	0	16	57	321	1,180	8	27	0	701	0	0
14100	16	58	133	490	8	30	16	58	133	490	8	30	0	0	0	16	58	321	1,190	8	30	0	701	0	0
14200	18	62	137	501	10	33	18	62	137	501	10	33	0	0	0	18	62	332	1,210	10	33	0	709	0	0
14300	17	64	128	488	8	32	17	64	128	488	8	32	0	0	0	17	64	320	1,208	8	32	0	720	0	0
14400	17	62	135	484	7	27	17	62	135	484	7	27	0	0	0	17	62	332	1,209	7	27	0	725	0	0
14500	8	45	156	538	12	36	8	45	156	538	12	36	0	0	0	8	45	358	1,274	12	36	0	736	0	0
14600	11	35	132	533	7	35	11	35	132	533	7	35	0	0	0	11	35	330	1,271	7	35	0	738	0	0
14700	10	39	106	442	4	20	10	39	106	442	4	20	0	0	0	10	39	309	1,184	4	20	0	742	0	0
14800	13	42	107	395	2	11	13	42	107	395	2	11	0	0	0	13	42	303	1,134	2	11	0	738	0	0
14900	14	49	111	404	3	8	14	49	111	404	3	8	0	0	0	14	49	302	1,122	3	8	0	717	0	0
15000	15	54	116	420	1	7	15	54	116	420	1	7	0	0	0	15	54	290	1,098	1	7	0	678	0	0
15100	18	61	131	457	3	7	18	61	131	457	3	7	0	0	0	18	61	327	1,144	3	7	0	687	0	0
15200	19	68	141	503	11	28	19	68	141	503	11	28	0	0	0	19	68	335	1,227	11	28	0	724	0	0
15300	21	74	148	531	5	30	21	74	148	531	5	30	0	0	0	21	74	342	1,255	5	30	0	724	0	0
15400	22	81	154	557	7	22	22	81	154	557	7	22	0	0	0	22	81	355	1,292	7	22	0	735	0	0
15500	23	83	156	575	5	24	23	83	156	575	5	24	0	0	0	23	83	355	1,315	5	24	0	740	0	0
15600	22	82	162	588	8	25	22	82	162	588	8	25	0	0	0	22	82	362	1,327	8	25	0	739	0	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
15700	22	81	168	810	8	29	22	81	168	810	8	29	0	0	0	22	81	369	1,353	8	29	0	743	0
15800	20	79	162	811	7	27	20	79	162	811	7	27	0	0	0	20	79	362	1,354	7	27	0	743	0
15900	19	73	157	591	6	24	19	73	157	591	6	24	0	0	0	19	73	353	1,324	6	24	0	733	0
16000	19	72	155	577	6	22	19	72	155	577	6	22	0	0	0	19	72	357	1,315	6	22	0	738	0
16100	22	76	146	557	8	22	22	76	146	557	8	22	0	0	0	22	76	351	1,313	8	22	0	756	0
16200	23	82	156	560	8	26	23	82	156	560	8	26	0	0	0	23	82	364	1,325	8	26	0	765	0
16300	25	89	154	573	5	24	25	89	154	573	5	24	0	0	0	25	89	364	1,348	5	24	0	775	0
16400	27	97	144	552	1	12	27	97	144	552	1	12	0	0	0	27	97	348	1,319	1	12	0	767	0
16500	25	97	152	549	1	5	25	97	152	549	1	5	0	0	0	25	97	362	1,315	1	5	0	765	0
16600	24	91	148	556	0	3	24	91	148	556	0	3	0	0	0	24	91	350	1,318	0	3	0	762	0
16700	22	87	156	563	0	0	22	87	156	563	0	0	0	0	0	22	87	347	1,291	0	0	0	728	0
16800	22	82	146	560	2	3	22	82	146	560	2	3	0	0	0	22	82	344	1,279	2	3	0	719	0
16900	23	83	157	561	0	3	23	83	157	561	0	3	0	0	0	23	83	348	1,281	0	3	0	720	0
17000	26	90	173	811	6	12	26	90	173	811	6	12	0	0	0	26	90	373	1,335	6	12	0	724	0
17100	27	97	178	851	8	23	27	97	178	851	8	23	0	0	0	27	97	374	1,383	8	23	0	732	0
17200	30	106	186	876	11	32	30	106	186	876	11	32	0	0	0	30	106	384	1,404	11	32	0	729	0
17300	27	105	192	701	17	52	27	105	192	701	17	52	0	0	0	27	105	402	1,456	17	52	0	755	0
17400	28	100	206	742	9	48	28	100	206	742	9	48	0	0	0	28	100	418	1,516	9	48	0	776	0
17500	32	110	211	777	11	38	32	110	211	777	11	38	0	0	0	32	110	417	1,545	11	38	0	768	0
17600	30	114	194	751	8	35	30	114	194	751	8	35	0	0	0	30	114	397	1,507	8	35	0	756	0
17700	31	112	204	739	11	36	31	112	204	739	11	36	0	0	0	31	112	408	1,491	11	36	0	753	0
17800	28	108	202	753	12	43	28	108	202	753	12	43	0	0	0	28	108	410	1,515	12	43	0	762	0
17900	23	93	188	723	16	53	23	93	188	723	16	53	0	0	0	23	93	389	1,480	16	53	0	756	0
18000	23	85	199	717	17	62	23	85	199	717	17	62	0	0	0	23	85	402	1,465	17	62	0	749	0
18100	35	109	197	733	14	57	35	109	197	733	14	57	0	0	0	35	109	404	1,492	14	57	0	759	0
18200	22	106	201	737	12	47	22	106	201	737	12	47	0	0	0	22	106	412	1,510	12	47	0	773	0
18300	27	90	200	743	12	44	27	90	200	743	12	44	0	0	0	27	90	417	1,534	12	44	0	791	0
18400	30	105	215	789	12	46	30	105	215	789	12	46	0	0	0	30	105	430	1,567	12	46	0	798	0
18500	23	97	194	756	13	48	23	97	194	756	13	48	0	0	0	23	97	406	1,548	13	48	0	792	0
18600	25	89	201	732	16	55	25	89	201	732	16	55	0	0	0	25	89	418	1,526	16	55	0	795	0
18700	26	95	202	747	14	56	26	95	202	747	14	56	0	0	0	26	95	413	1,536	14	56	0	791	0
18800	29	103	188	723	12	49	29	103	188	723	12	49	0	0	0	29	103	395	1,497	12	49	0	774	0
18900	23	96	170	864	12	44	23	96	170	864	12	44	0	0	0	23	96	374	1,424	12	44	0	760	0
19000	26	91	169	828	9	39	26	91	169	828	9	39	0	0	0	26	91	370	1,378	9	39	0	750	0
19100	24	93	169	825	7	30	24	93	169	825	7	30	0	0	0	24	93	371	1,373	7	30	0	748	0
19200	24	90	184	853	13	38	24	90	184	853	13	38	0	0	0	24	90	393	1,414	13	38	0	761	0
19300	21	84	183	880	13	49	21	84	183	880	13	49	0	0	0	21	84	396	1,460	13	49	0	780	0
19400	21	78	178	869	15	51	21	78	178	869	15	51	0	0	0	21	78	389	1,453	15	51	0	784	0
19500	22	78	182	866	15	56	22	78	182	866	15	56	0	0	0	22	78	392	1,446	15	56	0	780	0
19600	19	76	167	847	16	57	19	76	167	847	16	57	0	0	0	19	76	373	1,416	16	57	0	769	0
19700	17	67	143	574	17	61	17	67	143	574	17	61	0	0	0	17	67	336	1,312	17	61	0	736	0
19800	14	56	143	529	16	62	14	56	143	529	16	62	0	0	0	14	56	334	1,241	16	62	0	713	0
19900	14	52	144	531	17	62	14	52	144	531	17	62	0	0	0	14	52	336	1,241	17	62	0	711	0
20000	11	47	44	348	6	42	11	47	44	348	6	42	0	0	0	11	47	145	891	6	42	0	543	0
20100	6	32	27	133	6	22	6	32	27	133	6	22	0	0	0	6	32	125	500	6	22	0	367	0
20200	9	28	25	97	7	25	9	28	25	97	7	25	0	0	0	9	28	118	451	7	25	0	353	0
20300	8	27	20	84	4	20	8	27	20	84	4	20	0	0	0	8	27	114	430	4	20	0	346	0
20400	8	22	25	83	6	18	8	22	25	83	6	18	0	0	0	8	22	121	435	6	18	0	352	0
20500	5	20	21	84	5	20	5	20	21	84	5	20	0	0	0	5	20	117	441	5	20	0	357	0
20600	5	19	18	89	4	17	5	19	18	89	4	17	0	0	0	5	19	110	421	4	17	0	352	0
20700	3	15	8	46	4	15	3	15	8	46	4	15	0	0	0	3	15	83	356	4	15	0	312	0
20800	2	9	11	36	6	19	2	9	11	36	6	19	0	0	0	2	9	78	298	6	19	0	262	0
20900	1	5	4	28	5	21	1	5	4	28	5	21	0	0	0	1	5	62	256	5	21	0	230	0
21000	0	3	8	22	9	27	0	3	8	22	9	27	0	0	0	0	3	81	228	9	27	0	206	0
21100	1	2	10	33	8	29	1	2	10	33	8	29	0	0	0	1	2	89	241	8	29	0	208	0
21200	1	3	15	46	8	26	1	3	15	46	8	26	0	0	0	1	3	76	267	8	26	0	221	0
21300	0	2	18	80	7	29	0	2	18	80	7	29	0	0	0	0	2	78	280	7	29	0	220	0
21400	0	1	17	84	7	27	0	1	17	84	7	27	0	0	0	0	1	87	302	7	27	0	238	0
21500	0	1	22	71	8	27	0	1	22	71	8	27	0	0	0	0	1	83	316	8	27	0	245	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY				
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope		
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)
21600	0	0	28	92	10	33	0	0	28	92	10	33	0	0	0	0	0	96	333	10	33	0	0	241	0	
21700	0	0	24	97	9	35	0	0	24	97	9	35	0	0	0	0	0	84	335	9	35	0	0	238	0	
21800	0	0	23	88	9	34	0	0	23	88	9	34	0	0	0	0	0	88	319	9	34	0	0	232	0	
21900	0	0	25	89	9	33	0	0	25	89	9	33	0	0	0	0	0	88	326	9	33	0	0	237	0	
22000	0	0	21	86	8	31	0	0	21	86	8	31	0	0	0	0	0	83	317	8	31	0	0	231	0	
22100	0	0	17	71	7	28	0	0	17	71	7	28	0	0	0	0	0	71	287	7	28	0	0	216	0	
22200	0	0	16	61	6	25	0	0	16	61	6	25	0	0	0	0	0	73	267	6	25	0	0	206	0	
22300	0	0	15	56	6	22	0	0	15	56	6	22	0	0	0	0	0	62	249	6	22	0	0	192	0	
22400	0	0	10	46	5	20	0	0	10	46	5	20	0	0	0	0	0	55	216	5	20	0	0	170	0	
22500	0	0	10	37	5	18	0	0	10	37	5	18	0	0	0	0	0	51	197	5	18	0	0	160	0	
22600	0	0	4	25	4	17	0	0	4	25	4	17	0	0	0	0	0	37	163	4	17	0	0	138	0	
22700	0	0	1	9	3	14	0	0	1	9	3	14	0	0	0	0	0	24	113	3	14	0	0	104	0	
22800	0	0	0	2	2	9	0	0	0	2	2	9	0	0	0	0	0	22	86	2	9	0	0	84	0	
22900	0	0	0	1	1	7	0	0	0	1	7	0	0	0	0	0	0	18	74	1	7	0	0	74	0	
23000	0	0	0	0	2	8	0	0	0	0	2	8	0	0	0	0	0	13	56	2	8	0	0	58	0	
23100	0	0	0	0	1	5	0	0	0	0	1	5	0	0	0	0	0	10	43	1	5	0	0	43	0	
23200	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	2	23	0	2	0	0	23	0	
23300	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	3	9	0	1	0	0	9	0	
23400	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2	10	0	1	0	0	10	0	
23500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	0	
23600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24700	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	31	0	0	0	0	0	0	0	0
24800	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	29	112	0	0	0	0	108	0	
24900	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	28	106	0	0	0	0	105	0	
25000	0	0	0	0	0	0	0	0	8	12	0	0	0	0	0	0	0	43	131	0	0	0	0	119	0	
25100	0	0	0	0	0	0	0	0	8	22	0	0	0	0	0	0	0	45	161	0	0	0	0	139	0	
25200	0	0	0	0	0	0	0	0	9	27	0	0	0	0	0	0	0	55	184	0	0	0	0	157	0	
25300	0	0	0	0	0	0	0	0	12	39	0	0	0	0	0	0	0	60	212	0	0	0	0	174	0	
25400	0	0	0	0	0	0	0	0	24	67	0	0	0	0	0	0	0	80	258	0	0	0	0	191	0	
25500	0	0	0	0	0	0	0	0	20	81	0	0	0	0	0	0	0	74	285	0	0	0	0	204	0	
25600	0	0	0	0	1	3	0	0	44	118	0	1	0	0	0	0	0	114	348	0	1	0	0	231	0	
25700	0	0	0	0	2	6	0	0	75	219	1	3	0	0	0	0	0	168	522	1	3	0	0	303	0	
25800	0	0	0	0	4	7	0	0	99	322	2	6	0	0	0	0	0	210	701	2	6	0	0	379	0	
25900	0	0	2	4	2	7	0	0	156	473	2	7	0	0	0	0	0	284	915	2	7	0	0	442	0	
26000	0	0	0	0	4	4	0	0	38	360	0	4	0	0	0	0	0	181	860	0	4	0	0	500	0	
26100	0	0	0	0	0	1	0	0	16	101	0	1	0	0	0	0	0	144	601	0	1	0	0	500	0	
26200	0	0	0	0	1	1	0	0	89	158	1	1	0	0	0	0	0	231	694	1	1	0	0	536	0	
26300	0	0	0	0	0	2	0	0	51	223	0	2	0	0	0	0	0	213	823	0	2	0	0	600	0	
26400	0	0	0	0	0	0	0	0	31	152	0	0	0	0	0	0	0	219	800	0	0	0	0	649	0	
26500	0	0	0	0	1	0	0	0	21	96	0	1	0	0	0	0	0	126	840	0	1	0	0	544	0	
26500	0	0	0	0	0	1	0	0	80	187	0	1	0	0	0	0	0	275	743	0	1	0	0	556	0	
26600	0	0	0	0	0	0	0	0	17	179	0	0	0	0	0	0	0	213	903	0	0	0	0	725	0	
26700	0	0	0	1	2	0	0	0	74	168	1	2	0	0	0	0	0	307	964	1	2	0	0	796	0	
26800	0	0	0	0	2	0	0	0	80	248	0	2	0	0	0	0	0	370	1,254	0	2	0	0	1,006	0	
26900	0	0	0	0	1	1	0	0	94	285	1	1	0	0	0	0	0	469	1,554	1	1	0	0	1,269	0	
27000	0	0	0	0	0	1	0	0	86	333	0	1	0	0	0	0	0	507	1,808	0	1	0	0	1,475	0	
27100	0	0	0	0	0	1	0	0	139	416	0	1	0	0	0	0	0	860	2,161	0	1	0	0	1,745	0	
27200	0	0	0	0	1	2	0	0	271	758	1	2	0	0	0	0	0	869	2,832	1	2	0	0	2,074	0	
27300	0	1	7	13	0	2	0	1	445	1,326	0	2	0	0	0	0	1	1,076	3,803	0	2	0	0	2,277	0	



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
27400	1	3	0	13	0	0	1	3	464	1,653	0	0	0	1,670	0	1	3	1,159	4,138	0	0	0	2,455	0
27500	2	5	1	3	0	0	2	5	802	1,974	0	0	0	1,971	0	2	5	1,336	4,624	0	0	0	2,650	0
27600	2	7	4	10	0	0	2	7	680	2,374	0	0	0	2,363	0	2	7	1,448	5,160	0	0	0	2,786	0
27700.2	0	4	13	32	0	0	0	4	736	2,630	0	0	0	2,596	0	0	4	1,474	5,423	0	0	0	2,793	0
27800	1	2	8	39	0	0	1	2	751	2,751	0	0	0	2,712	0	1	2	1,513	5,521	0	0	0	2,770	0
27900	0	2	0	15	0	0	0	2	516	2,346	0	0	0	2,331	0	0	2	1,361	5,321	0	0	0	2,975	0
28000	0	0	2	3	0	0	0	0	294	1,500	0	0	0	1,497	0	0	0	934	4,249	0	0	0	2,749	0
28100	0	0	20	40	0	0	0	0	457	1,391	0	0	0	1,351	0	0	0	1,204	3,959	0	0	0	2,566	0
28200	0	0	0	37	0	1	0	0	443	1,867	0	1	0	1,630	0	0	0	1,196	4,445	0	1	0	2,779	0
28300	0	0	0	0	0	1	0	0	448	1,649	0	1	0	1,649	0	0	0	1,137	4,321	0	1	0	2,672	0
28400	0	0	0	0	0	0	0	0	470	1,899	0	0	0	1,699	0	0	0	1,173	4,279	0	0	0	2,580	0
28500	0	0	10	19	1	3	0	0	491	1,781	1	3	0	1,761	0	0	0	1,157	4,315	1	3	0	2,534	0
28600	0	0	6	31	0	3	0	0	496	1,829	0	3	0	1,798	0	0	0	1,246	4,450	0	3	0	2,621	0
28700	0	0	4	20	0	0	0	0	381	1,825	0	0	0	1,605	0	0	0	1,074	4,298	0	0	0	2,673	0
28800	0	0	4	16	0	0	0	0	314	1,287	0	0	0	1,271	0	0	0	947	3,743	0	0	0	2,456	0
28900	0	0	0	7	0	0	0	0	257	1,058	0	0	0	1,050	0	0	0	838	3,304	0	0	0	2,247	0
29000	0	0	3	6	0	0	0	0	355	1,134	0	0	0	1,128	0	0	0	1,010	3,421	0	0	0	2,288	0
29100	0	0	3	11	0	0	0	0	271	1,160	0	0	0	1,149	0	0	0	870	3,481	0	0	0	2,322	0
29200	0	0	0	5	0	0	0	0	288	1,035	0	0	0	1,030	0	0	0	916	3,307	0	0	0	2,272	0
29300	0	0	9	17	0	0	0	0	325	1,135	0	0	0	1,118	0	0	0	961	3,475	0	0	0	2,340	0
29400	0	0	0	17	0	0	0	0	203	979	0	0	0	962	0	0	0	768	3,201	0	0	0	2,222	0
29500	0	0	0	0	0	0	0	0	186	720	0	0	0	720	0	0	0	647	2,621	0	0	0	1,901	0
29600	0	0	0	0	0	0	0	0	158	636	0	0	0	636	0	0	0	621	2,349	0	0	0	1,713	0
29700	0	0	0	0	0	1	0	0	98	473	0	1	0	473	0	0	0	477	2,034	0	1	0	1,561	0
29800	0	0	0	0	0	1	0	0	57	287	0	1	0	287	0	0	0	382	1,591	0	1	0	1,304	0
29900	0	0	0	0	0	1	0	0	57	211	0	1	0	211	0	0	0	412	1,470	0	1	0	1,258	0
30000	0	0	0	0	0	0	0	0	70	236	0	0	0	236	0	0	0	454	1,603	0	0	0	1,367	0
30100	0	0	81	151	11	21	0	0	406	882	11	21	0	731	0	0	0	613	2,346	11	21	0	1,464	0
30200	0	0	71	282	10	40	0	0	396	1,486	10	40	0	1,204	0	0	0	851	3,083	10	40	0	1,597	0
30300	0	0	85	251	14	44	0	0	404	1,482	14	44	0	1,232	0	0	0	850	3,150	14	44	0	1,666	0
30400	0	0	14	146	4	34	0	0	383	1,457	4	34	0	1,311	0	0	0	885	3,212	4	34	0	1,755	0
30500	0	0	0	27	0	8	0	0	195	1,069	0	8	0	1,043	0	0	0	673	2,885	0	8	0	1,616	0
30600	9	17	26	48	0	9	17	17	247	819	0	0	0	771	0	9	17	767	2,666	0	0	0	1,848	0
30700	0	17	0	48	0	0	0	17	200	828	0	0	0	780	0	0	17	711	2,737	0	0	0	1,908	0
30800	11	20	4	7	0	0	11	20	249	831	0	0	0	825	0	11	20	825	2,845	0	0	0	2,014	0
30900	0	20	0	7	0	1	0	20	257	938	0	1	0	931	0	0	20	888	3,173	0	1	0	2,235	0
31000	0	0	0	0	0	1	0	0	305	1,042	0	1	0	1,042	0	0	0	1,003	3,501	0	1	0	2,460	0
31100	0	0	0	0	0	0	0	0	529	1,544	0	0	0	1,544	0	0	0	1,313	4,289	0	0	0	2,745	0
31200	0	0	1	2	0	0	0	0	622	2,130	0	0	0	2,128	0	0	0	1,435	5,089	0	0	0	2,959	0
31300	0	0	0	2	0	0	0	0	841	2,339	0	0	0	2,337	0	0	0	1,444	5,331	0	0	0	2,992	0
31400	0	0	0	0	0	0	0	0	594	2,288	0	0	0	2,288	0	0	0	1,423	5,310	0	0	0	3,022	0
31500	0	0	0	0	0	0	0	0	592	2,197	0	0	0	2,196	0	0	0	1,424	5,271	0	0	0	3,075	0
31600	3	5	0	0	0	0	3	5	552	2,120	0	0	0	2,119	0	3	5	1,435	5,294	0	0	0	3,175	0
31700	0	5	21	39	0	0	0	5	627	2,184	0	0	0	2,145	0	0	5	1,543	5,516	0	0	0	3,332	0
31800	0	0	10	58	0	0	0	0	846	2,356	0	0	0	2,301	0	0	0	1,568	5,762	0	0	0	3,403	0
31900	8	15	19	53	1	8	15	15	743	2,572	1	1	0	2,519	0	8	15	1,698	6,049	1	1	0	3,476	0
32000	0	15	20	72	0	1	0	15	840	2,561	0	1	0	2,489	0	0	15	1,555	6,024	0	1	0	3,463	0
32100	0	0	26	86	0	0	0	0	869	2,425	0	0	0	2,339	0	0	0	1,529	5,710	0	0	0	3,286	0
32200	0	0	61	161	0	0	0	0	768	2,662	0	0	0	2,501	0	0	0	1,684	5,949	0	0	0	3,287	0
32300	3	5	90	279	0	0	3	5	884	3,060	0	0	0	2,782	0	3	5	1,822	6,493	0	0	0	3,287	0
32400	3	10	144	433	0	0	3	10	1,013	3,513	0	0	0	3,080	0	3	10	1,939	6,965	0	0	0	3,452	0
32500	1	7	143	531	0	0	1	7	1,106	3,923	0	0	0	3,392	0	1	7	2,009	7,311	0	0	0	3,368	0
32600	2	5	45	348	2	3	2	5	942	3,792	2	3	0	3,444	0	2	5	1,856	7,158	2	3	0	3,366	0
32700	2	7	46	189	0	3	2	7	902	3,416	0	3	0	3,246	0	2	7	1,780	6,734	0	3	0	3,318	0
32800	0	4	89	251	1	2	0	4	1,007	3,536	1	2	0	3,285	0	0	4	1,947	6,902	1	2	0	3,366	0
32900	0	0	154	452	1	3	0	0	1,185	4,059	1	3	0	3,607	0	0	0	2,137	7,562	1	3	0	3,503	0
33000.2	5	9	175	612	0	1	5	9	1,221	4,463	0	1	0	3,851	0	5	9	2,182	8,014	0	1	0	3,551	0
33100	1	10	93	496	0	0	1	10	1,122	4,330	0	0	0	3,834	0	1	10	2,068	7,855	0	0	0	3,525	0
33200	1	3	48	280	0	0	1	3	809	3,576	0	0	0	3,315	0	1	3	1,722	7,018	0	0	0	3,443	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY			
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	
33300	0	2	13	112	0	0	0	2	620	2,646	0	0	0	2,534	0	0	2	1,342	5,675	0	0	0	3,029	0	
33400	0	0	7	36	0	0	0	0	0	579	2,221	0	0	0	2,185	0	0	0	1,308	4,906	0	0	0	2,667	0
33500	0	0	0	13	1	1	0	0	0	515	2,027	1	1	0	2,014	0	0	0	1,223	4,687	1	1	0	2,660	0
33600	0	1	27	90	5	11	0	1	741	2,327	5	11	0	2,277	0	0	1	1,468	4,984	5	11	0	2,657	0	
33700	2	4	8	64	3	14	2	4	548	2,388	3	14	0	2,324	0	2	4	1,206	4,952	3	14	0	2,564	0	
33800	41	80	5	24	0	5	41	80	350	1,664	0	5	0	1,640	0	41	80	912	3,922	0	5	0	2,258	0	
33900	1	78	0	10	0	1	1	78	122	874	0	1	0	864	0	1	78	576	2,755	0	1	0	1,881	0	
34000	0	2	0	0	0	0	0	2	8	241	0	0	0	241	0	0	2	211	1,457	0	0	0	1,216	0	
34100	0	0	0	0	0	0	0	0	25	62	0	0	0	62	0	0	0	191	744	0	0	0	862	0	
34200	0	0	0	0	0	0	0	0	56	155	0	0	0	155	0	0	0	250	817	0	0	0	662	0	
34300	0	0	0	0	0	0	0	0	116	323	0	0	0	323	0	0	0	451	1,298	0	0	0	976	0	
34400	0	0	0	0	0	0	0	0	162	515	0	0	0	515	0	0	0	558	1,868	0	0	0	1,354	0	
34500	9	17	10	20	0	0	9	17	209	688	0	0	0	668	0	9	17	680	2,293	0	0	0	1,605	0	
34600	2	20	0	19	0	0	2	20	175	712	0	0	0	693	0	2	20	613	2,395	0	0	0	1,683	0	
34700	1	5	0	0	0	0	1	5	181	659	0	0	0	659	0	1	5	678	2,392	0	0	0	1,733	0	
34800	8	17	2	3	0	0	8	17	162	635	0	0	0	632	0	8	17	670	2,497	0	0	0	1,862	0	
34900	4	22	6	14	0	0	4	22	212	693	0	0	0	679	0	4	22	728	2,569	0	0	0	1,896	0	
35000	1	8	0	11	0	0	1	8	217	795	0	0	0	784	0	1	8	733	2,706	0	0	0	1,911	0	
35100.2	0	1	0	0	0	0	0	1	201	776	0	0	0	776	0	0	1	722	2,700	0	0	0	1,924	0	
35200	0	0	0	0	0	0	0	0	217	772	0	0	0	772	0	0	0	767	2,753	0	0	0	1,981	0	
35300	0	1	0	0	0	0	0	1	267	895	0	0	0	895	0	0	1	859	3,011	0	0	0	2,117	0	
35400	1	2	0	0	0	0	1	2	321	1,089	0	0	0	1,089	0	1	2	913	3,261	0	0	0	2,192	0	
35500	1	4	0	0	0	0	1	4	313	1,175	0	0	0	1,175	0	1	4	877	3,315	0	0	0	2,140	0	
35600	4	11	5	9	0	0	4	11	341	1,211	0	0	0	1,202	0	4	11	904	3,298	0	0	0	2,067	0	
35700	1	10	0	9	0	0	1	10	310	1,206	0	0	0	1,197	0	1	10	890	3,322	0	0	0	2,116	0	
35800	1	5	0	0	0	0	1	5	309	1,147	0	0	0	1,147	0	1	5	859	3,239	0	0	0	2,092	0	
35900	1	4	0	0	0	0	1	4	412	1,336	0	0	0	1,336	0	1	4	962	3,373	0	0	0	2,037	0	
36000	1	4	0	0	0	0	1	4	547	1,776	0	0	0	1,776	0	1	4	1,106	3,630	0	0	0	2,054	0	
36100	1	3	0	0	0	0	1	3	489	1,918	0	0	0	1,918	0	1	3	997	3,894	0	0	0	1,976	0	
36200	3	8	1	1	0	0	3	8	480	1,795	0	0	0	1,794	0	3	8	962	3,628	0	0	0	1,833	0	
36300	0	6	0	1	0	0	0	6	374	1,582	0	0	0	1,581	0	0	6	796	3,257	0	0	0	1,675	0	
36400	0	1	0	0	0	0	0	1	289	1,229	0	0	0	1,229	0	0	1	703	2,776	0	0	0	1,547	0	
36500	3	5	0	0	0	0	3	5	230	962	0	0	0	962	0	3	5	619	2,446	0	0	0	1,484	0	
36600	0	5	0	0	0	0	0	5	222	837	0	0	0	836	0	0	5	632	2,316	0	0	0	1,479	0	
36700	0	1	0	0	0	0	0	1	169	723	0	0	0	723	0	0	1	559	2,205	0	0	0	1,482	0	
36800	0	1	0	0	0	0	0	1	130	553	0	0	0	553	0	0	1	494	1,949	0	0	0	1,396	0	
36900	0	1	0	0	0	0	0	1	82	393	0	0	0	393	0	0	1	368	1,596	0	0	0	1,203	0	
37000	1	2	0	0	0	0	1	2	94	327	0	0	0	327	0	1	2	399	1,421	0	0	0	1,094	0	
37100	0	2	0	0	0	0	0	2	40	249	0	0	0	249	0	0	2	326	1,342	0	0	0	1,094	0	
37200	0	0	0	0	0	0	0	0	115	288	0	0	0	288	0	0	0	396	1,336	0	0	0	1,048	0	
37300	20	37	106	197	0	0	20	37	457	1,061	0	0	0	864	0	20	37	717	2,060	0	0	0	999	0	
37400	14	84	78	342	0	0	14	84	379	1,549	0	0	0	1,207	0	14	84	606	2,453	0	0	0	904	0	
37500	17	58	99	328	0	0	17	58	396	1,436	0	0	0	1,108	0	17	58	606	2,248	0	0	0	811	0	
37600	13	55	86	305	0	0	13	55	340	1,363	0	0	0	1,058	0	13	55	526	2,099	0	0	0	736	0	
37700	8	40	39	194	0	0	8	40	263	1,116	0	0	0	922	0	8	40	433	1,779	0	0	0	863	0	
37800	8	27	19	108	0	0	8	27	201	859	0	0	0	751	0	8	27	347	1,445	0	0	0	586	0	
37900	5	21	14	62	0	0	5	21	156	662	0	0	0	600	0	5	21	280	1,181	0	0	0	499	0	
38000	2	13	0	26	0	0	2	13	96	468	0	0	0	442	0	2	13	194	876	0	0	0	409	0	
38100	2	7	1	2	0	0	2	7	85	353	0	0	0	351	0	2	7	193	716	0	0	0	363	0	
38200	1	6	0	2	0	0	1	6	80	322	0	0	0	321	0	1	6	169	669	0	0	0	347	0	
38300	1	4	0	0	0	0	1	4	61	260	0	0	0	260	0	1	4	142	574	0	0	0	315	0	
38400	0	1	0	0	0	0	0	1	48	201	0	0	0	201	0	0	1	120	485	0	0	0	284	0	
38500	0	1	0	0	0	0	0	1	31	145	0	0	0	145	0	0	1	93	394	0	0	0	249	0	
38600	0	0	0	0	0	0	0	0	16	87	0	0	0	87	0	0	0	70	302	0	0	0	215	0	
38700	0	0	0	0	0	0	0	0	13	54	0	0	0	54	0	0	0	56	234	0	0	0	181	0	
38800	0	0	0	0	0	0	0	0	7	36	0	0	0	36	0	0	0	47	191	0	0	0	155	0	
38900	0	0	0	0	0	0	0	0	0	13	0	0	0	13	0	0	0	20	125	0	0	0	113	0	
39000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	56	0	0	0	56	0	
39100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	27	0	0	0	27	0	



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
39200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9	0	0	0	0	0
39300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
39400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	2
41200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	8
41300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	17	0	0	0	17
41400	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	8	28	0	0	0	27
41500.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	37	0	0	0	36
41600	0	0	0	0	0	0	0	0	10	19	0	0	0	19	0	0	0	0	39	93	0	0	0	74
41700	0	0	0	0	0	0	0	0	24	62	0	0	0	62	0	0	0	0	66	193	0	1	0	131
41800	0	0	0	0	0	1	3	0	45	127	1	3	0	127	0	0	0	0	102	311	1	3	0	184
41900	0	0	4	8	5	12	0	0	76	224	5	12	0	216	0	0	0	0	149	464	5	12	0	240
42000	0	0	13	31	6	21	0	0	104	333	6	21	0	302	0	0	0	0	185	617	6	21	0	284
42100	0	0	16	53	6	23	0	0	123	420	6	23	0	367	0	0	0	0	212	734	6	23	0	314
42200	0	0	21	88	10	30	0	0	138	484	10	30	0	416	0	0	0	0	238	834	10	30	0	350
42300	0	0	25	85	10	36	0	0	162	556	10	36	0	470	0	0	0	0	272	945	10	36	0	389
42400	0	0	31	104	12	40	0	0	189	649	12	40	0	545	0	0	0	0	310	1,078	12	40	0	428
42500	0	0	48	147	14	48	0	0	225	766	14	48	0	620	0	0	0	0	368	1,256	14	48	0	469
42600	0	0	84	209	18	55	0	0	254	888	16	55	0	679	0	0	0	0	397	1,415	16	55	0	528
42700	0	0	79	265	19	64	0	0	284	997	19	64	0	732	0	0	0	0	439	1,548	19	64	0	551
42800	0	0	87	306	19	69	0	0	309	1,099	19	69	0	792	0	0	0	0	472	1,687	19	69	0	589
42900	0	0	101	347	19	70	0	0	341	1,205	19	70	0	858	0	0	0	0	513	1,824	19	70	0	619
43000	0	0	113	396	22	78	0	0	365	1,307	22	78	0	912	0	0	0	0	542	1,954	22	78	0	646
43100	0	0	122	434	21	80	0	0	389	1,396	21	80	0	962	0	0	0	0	574	2,067	21	80	0	671
43200	0	0	129	464	23	83	0	0	401	1,463	23	83	0	999	0	0	0	0	592	2,158	23	83	0	695
43300	0	0	133	484	20	80	0	0	419	1,516	20	80	0	1,034	0	0	0	0	612	2,230	20	80	0	711
43400	0	0	145	515	25	84	0	0	442	1,595	25	84	0	1,080	0	0	0	0	641	2,321	25	84	0	726
43500	0	0	180	801	26	95	0	0	496	1,737	26	95	0	1,136	0	0	0	0	706	2,494	26	95	0	757
43600	0	0	197	898	26	97	0	0	524	1,888	26	97	0	1,190	0	0	0	0	742	2,681	26	97	0	793
43700	0	0	196	729	25	95	0	0	529	1,950	25	95	0	1,220	0	0	0	0	747	2,758	25	95	0	808
43800	0	0	217	765	29	100	0	0	560	2,017	29	100	0	1,251	0	0	0	0	783	2,833	29	100	0	817
43900	0	0	223	814	28	102	0	0	565	2,083	26	102	0	1,269	0	0	0	0	788	2,909	26	102	0	826
44000	0	0	230	839	29	102	0	0	588	2,135	29	102	0	1,296	0	0	0	0	818	2,975	29	102	0	840
44100	0	0	229	850	27	104	0	0	576	2,155	27	104	0	1,305	0	0	0	0	802	3,001	27	104	0	846
44200	0	0	229	848	30	106	0	0	584	2,147	30	106	0	1,299	0	0	0	0	814	2,994	30	106	0	847
44300	0	0	213	819	26	104	0	0	562	2,122	26	104	0	1,303	0	0	0	0	793	2,976	26	104	0	854
44400	0	0	224	806	26	97	0	0	579	2,114	26	97	0	1,305	0	0	0	0	814	2,975	26	97	0	861
44500	0	0	214	810	25	96	0	0	568	2,124	25	96	0	1,314	0	0	0	0	805	2,997	25	96	0	873
44600	0	0	210	785	28	95	0	0	559	2,086	26	95	0	1,301	0	0	0	0	793	2,960	26	95	0	874
44700	0	0	201	781	25	94	0	0	543	2,040	25	94	0	1,279	0	0	0	0	776	2,906	25	94	0	866
44800	0	0	186	718	24	90	0	0	527	1,980	24	90	0	1,264	0	0	0	0	761	2,846	24	90	0	866
44900	0	0	173	665	23	87	0	0	503	1,906	23	87	0	1,241	0	0	0	0	730	2,762	23	87	0	856
45000	0	0	173	641	24	87	0	0	516	1,867	24	87	0	1,246	0	0	0	0	749	2,740	24	87	0	853

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY			
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	
45100	0	0	154	605	21	83	0	0	476	1,837	21	83	0	1,232	0	0	702	2,688	21	83	0	0	851	0	
45200	0	0	156	573	21	78	0	0	481	1,772	21	78	0	1,198	0	0	722	2,638	21	78	0	0	866	0	
45300	0	0	153	571	21	78	0	0	475	1,770	21	78	0	1,199	0	0	729	2,687	21	78	0	0	917	0	
45400	0	0	139	541	19	73	0	0	450	1,714	19	73	0	1,173	0	0	708	2,661	19	73	0	0	947	0	
45500	0	0	142	520	22	74	0	0	462	1,890	22	74	0	1,170	0	0	755	2,709	22	74	0	0	1,019	0	
45600	0	0	123	491	18	73	0	0	454	1,897	18	73	0	1,208	0	0	783	2,847	18	73	0	0	1,150	0	
45700	0	0	129	467	18	67	0	0	459	1,892	18	67	0	1,225	0	0	806	2,941	18	67	0	0	1,249	0	
45800	0	0	108	438	16	84	0	0	445	1,874	16	84	0	1,236	0	0	807	2,966	16	84	0	0	1,312	0	
45900	0	0	104	393	15	58	0	0	460	1,875	15	58	0	1,282	0	0	842	3,054	15	58	0	0	1,379	0	
46000	0	0	96	372	15	57	0	0	452	1,869	15	57	0	1,317	0	0	853	3,139	15	57	0	0	1,450	0	
46100	1	1	91	347	14	54	1	1	497	1,757	14	54	0	1,410	0	1	918	3,279	14	54	0	0	1,522	0	
46200	1	3	81	319	13	50	1	3	520	1,882	13	50	0	1,563	0	1	961	3,479	13	50	0	0	1,597	0	
46300	2	8	78	294	12	47	2	8	542	1,966	12	47	0	1,673	0	2	8	998	3,628	12	47	0	0	1,661	0
46400	4	12	70	273	10	41	4	12	553	2,028	10	41	0	1,755	0	4	12	1,022	3,741	10	41	0	0	1,714	0
46500	3	15	80	277	11	40	3	15	591	2,117	11	40	0	1,840	0	3	15	1,083	3,899	11	40	0	0	1,782	0
46600	6	18	88	311	10	40	6	18	639	2,278	10	40	0	1,967	0	6	18	1,150	4,135	10	40	0	0	1,857	0
46700	8	26	98	344	10	37	8	26	659	2,404	10	37	0	2,060	0	8	26	1,173	4,300	10	37	0	0	1,896	0
46800	10	33	106	377	8	33	10	33	678	2,476	8	33	0	2,099	0	10	33	1,194	4,363	8	33	0	0	1,907	0
46900	9	35	99	379	9	31	9	35	658	2,474	9	31	0	2,095	0	9	35	1,168	4,374	9	31	0	0	1,900	0
47000	10	36	71	314	8	31	10	36	608	2,345	8	31	0	2,031	0	10	36	1,130	4,255	8	31	0	0	1,910	0
47100	7	32	76	273	7	27	7	32	625	2,283	7	27	0	2,011	0	7	32	1,143	4,209	7	27	0	0	1,926	0
47200	10	31	72	276	5	21	10	31	611	2,289	5	21	0	2,013	0	10	31	1,125	4,200	5	21	0	0	1,911	0
47300	12	40	80	282	5	19	12	40	594	2,233	5	19	0	1,951	0	12	40	1,101	4,121	5	19	0	0	1,888	0
47400	16	52	89	312	4	18	16	52	585	2,183	4	18	0	1,871	0	16	52	1,090	4,057	4	18	0	0	1,874	0
47500	15	57	94	339	5	17	15	57	595	2,184	5	17	0	1,845	0	15	57	1,117	4,088	5	17	0	0	1,905	0
47600	19	63	123	402	3	15	19	63	611	2,233	3	15	0	1,831	0	19	63	1,137	4,174	3	15	0	0	1,942	0
47700	17	66	87	389	3	13	17	66	553	2,156	3	13	0	1,767	0	17	66	1,062	4,071	3	13	0	0	1,915	0
47800	15	60	102	351	2	11	15	60	540	2,025	2	11	0	1,674	0	15	60	1,030	3,873	2	11	0	0	1,848	0
47900	16	59	70	318	2	8	16	59	469	1,868	2	8	0	1,551	0	16	59	947	3,660	2	8	0	0	1,791	0
48000	25	76	51	224	3	10	25	76	460	1,721	3	10	0	1,497	0	25	76	897	3,414	3	10	0	0	1,693	0
48100	1	48	36	182	1	8	1	48	320	1,444	1	8	0	1,282	0	1	48	863	2,889	1	8	0	0	1,445	0
48200	26	50	13	91	0	2	26	50	43	872	0	2	0	581	0	26	50	113	1,438	0	2	0	0	766	0
48300	38	120	12	46	0	0	38	120	84	200	0	0	0	153	0	38	120	134	458	0	0	0	0	258	0
48400	50	164	63	139	0	0	50	164	125	351	0	0	0	212	0	50	164	164	553	0	0	0	0	201	0
48500	71	224	49	207	0	0	71	224	108	432	0	0	0	225	0	71	224	167	613	0	0	0	0	181	0
48600	88	258	29	145	0	0	88	258	127	435	0	0	0	290	0	88	258	216	708	0	0	0	0	274	0
48700	85	247	79	202	0	0	85	247	219	840	0	0	0	439	0	85	247	322	996	0	0	0	0	356	0
48800	94	295	72	281	0	0	94	295	243	855	0	0	0	574	0	94	295	369	1,280	0	0	0	0	425	0
48900	78	318	36	200	0	0	78	318	193	808	0	0	0	807	0	78	318	317	1,271	0	0	0	0	464	0
49000	100	330	97	246	0	0	100	330	270	859	0	0	0	813	0	100	330	408	1,342	0	0	0	0	484	0
49100	86	346	92	350	0	0	86	346	262	985	0	0	0	835	0	86	346	386	1,469	0	0	0	0	484	0
49200	107	358	140	429	0	0	107	358	332	1,100	0	0	0	871	0	107	358	460	1,566	0	0	0	0	466	0
49300	89	326	121	483	0	0	89	326	313	1,195	0	0	0	712	0	89	326	448	1,681	0	0	0	0	486	0
49400	116	344	137	478	0	0	116	344	357	1,240	0	0	0	761	0	116	344	507	1,768	0	0	0	0	529	0
49500	99	398	84	410	0	0	99	398	322	1,256	0	0	0	847	0	99	398	468	1,843	0	0	0	0	587	0
49600	104	375	93	327	0	0	104	375	359	1,260	0	0	0	933	0	104	375	543	1,909	0	0	0	0	649	0
49700	119	413	78	315	0	0	119	413	351	1,314	0	0	0	999	0	119	413	543	2,010	0	0	0	0	895	0
49774.1	128	338	96	239	0	0	128	338	377	999	0	0	0	760	0	128	338	577	1,536	0	0	0	0	537	0
49900	136	614	98	453	0	0	136	614	381	1,789	0	0	0	1,316	0	136	614	592	2,724	0	0	0	0	956	0
50000	119	472	82	334	0	0	119	472	365	1,382	0	0	0	1,048	0	119	472	560	2,133	0	0	0	0	752	0
50100	147	493	107	351	0	0	147	493	400	1,415	0	0	0	1,084	0	147	493	802	2,151	0	0	0	0	736	0
50200	100	457	60	310	0	0	100	457	341	1,371	0	0	0	1,060	0	100	457	545	2,123	0	0	0	0	753	0
50300	136	437	81	282	0	0	136	437	362	1,301	0	0	0	1,038	0	136	437	574	2,072	0	0	0	0	771	0
50400	75	391	86	273	0	0	75	391	333	1,288	0	0	0	1,014	0	75	391	556	2,092	0	0	0	0	804	0
50500	135	389	96	300	0	0	135	389	331	1,230	0	0	0	929	0	135	389	554	2,055	0	0	0	0	826	0
50600	87	374	46	263	0	0	87	374	244	1,064	0	0	0	801	0	87	374	454	1,867	0	0	0	0	802	0
50700	114	336	78	230	0	0	114	336	257	927	0	0	0	897	0	114	336	447	1,869	0	0	0	0	742	0
50800	82	363	83	298	0	0	82	363	224	891	0	0	0	593	0	82	363	386	1,543	0	0	0	0	852	0
50900	121	375	68	280	0	0	121	375	190	768	0	0	0	488	0	121	375	340	1,345	0	0	0	0	577	0



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-2 - New Work + Existing Project - Tolchester Volumes

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
51000	36	290	5	136	0	0	36	290	89	480	0	0	0	344	0	36	290	199	999	0	0	0	518	0
51100	96	244	2	14	0	0	96	244	56	231	0	0	0	217	0	96	244	169	861	0	0	0	451	0
51200	2	181	0	4	0	0	2	181	21	142	0	0	0	138	0	2	181	74	450	0	0	0	308	0
51300	0	4	0	0	0	0	0	4	3	44	0	0	0	44	0	0	4	51	231	0	0	0	187	0
51400	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	12	118	0	0	0	111	0
51500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	25	0	0	0	25	0
51500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
52400	13	95	17	126	0	0	13	95	17	126	0	0	0	0	0	13	95	45	337	0	0	0	211	0
52800	0	95	0	126	0	0	0	95	0	126	0	0	0	0	0	0	95	0	337	0	0	0	211	0
53200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56800	0	0	0	0	0	1	4	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0
57100	0	0	0	0	1	7	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0	0	0	0
57400	0	0	0	1	2	15	0	0	0	1	2	15	0	0	0	0	0	0	0	0	0	0	0	0
57700	0	0	0	1	0	13	0	0	0	1	0	13	0	0	0	0	0	5	115	0	13	0	114	0
58000	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	2	38	0	2	0	38	0
58338.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	11	0
58600	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2	8	0	1	0	8	0
58901.1	0	0	0	0	1	9	0	0	0	0	1	9	0	0	0	0	0	21	126	1	9	0	126	0
<b>TOTAL</b>	<b>20,237</b>	<b>402,525</b>	<b>16,099</b>	<b>20,237</b>	<b>16,099</b>	<b>20,237</b>	<b>946,746</b>	<b>16,099</b>	<b>0</b>	<b>544,221</b>	<b>0</b>	<b>20,237</b>	<b>1,541,443</b>	<b>16,099</b>	<b>0</b>	<b>594,697</b>	<b>0</b>							

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-3 - New Work + Existing Project - Brewerton Volumes- 450' Channel

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY				
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope		
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	5	10	3	5	0	0	0	5	10	33	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	8	24	40	78	0	0	0	8	24	232	490	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	3	21	0	75	0	0	0	3	21	210	818	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	7	0	1	0	0	0	0	7	248	845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	1	0	0	0	0	0	0	1	333	1,073	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	1	3	1	1	0	0	0	1	3	376	1,311	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	2	5	0	1	0	0	0	2	5	404	1,442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	3	0	0	0	0	0	0	3	386	1,428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	437	1,486	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	2	8	2	4	0	0	0	2	8	433	1,611	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	6	0	4	0	0	0	0	6	442	1,620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	1	0	0	0	0	0	0	1	368	1,481	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	1	1	1	0	0	0	0	1	327	1,268	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	1	2	8	0	0	0	0	1	450	1,438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	1	0	4	0	0	0	0	1	366	1,491	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1900	2	4	2	3	0	0	0	2	4	381	1,364	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	3	8	8	18	3	3	3	3	8	492	1,817	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0
2100	3	12	17	47	0	0	0	3	12	627	1,887	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2200	5	16	24	78	0	0	0	5	16	808	2,101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2300	4	17	40	120	0	0	0	4	17	836	2,302	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2400	118	224	47	182	0	0	118	224	677	2,246	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2500	8	233	81	200	1	2	8	233	681	2,108	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2600	7	30	98	236	0	1	7	30	661	2,078	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2700	7	28	86	243	0	1	7	28	666	2,088	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2800	10	31	90	230	1	2	10	31	667	2,098	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2900	8	29	80	222	1	3	8	29	654	2,223	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3000	6	21	37	178	0	2	6	21	668	2,221	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3100	2	14	18	102	1	2	2	14	630	2,214	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3200	2	8	8	48	1	3	2	8	682	2,208	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3300	2	8	8	28	1	3	2	8	672	2,101	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3400	2	7	7	7	0	2	2	7	601	2,173	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3500	3	8	23	54	4	12	3	8	659	2,334	4	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3600	12	28	45	125	6	15	12	28	666	2,454	6	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3700	2	27	20	120	4	18	2	27	655	2,445	4	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3800	4	12	31	85	3	13	4	12	628	2,375	3	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3900	3	14	20	86	2	9	3	14	686	2,248	2	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4000	2	8	1	36	1	6	2	8	682	2,127	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4100	3	8	6	13	1	4	3	8	687	2,091	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4200	1	8	10	29	2	6	1	8	638	2,048	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4300	1	5	8	35	1	6	1	5	660	2,033	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4400	7	15	43	98	1	4	7	15	623	2,008	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4500	8	27	40	154	1	3	8	27	605	1,905	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4600	5	23	36	140	1	4	5	23	485	1,833	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4700	4	17	34	128	0	2	4	17	683	1,877	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4800	4	15	39	136	0	2	4	15	688	2,189	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4900	8	25	96	195	0	1	8	25	604	2,209	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5000	14	44	78	263	1	3	14	44	687	2,206	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5100	10	45	71	272	1	4	10	45	607	2,210	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5200	4	27	36	200	1	4	4	27	822	2,276	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5300	3	13	21	108	3	7	3	13	629	2,317	3	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5400	1	7	31	98	17	37	1	7	818	2,307	17	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5500	1	4	13	81	3	38	1	4	840	2,327	3	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5600	2	6	19	80	7	18	2	6	831	2,355	7	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5700	4	10	37	104	3	19	4	10	836	2,346	3	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5800	3	13	30	125	3	13	3	13	684	2,259	3	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5900	3	11	40	129	7	18	3	11	696	2,198	7	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6000	43	86	63	172	6	23	43	86	817	2,245	6	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6100	7	83	67	204	5	21	7	83	819	2,298	5	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6200	4	21	81	218	6	21	4	21	822	2,298	6	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6300	138	283	85	233	8	28	138	283	648	2,352	8	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6400	24	301	128	364	7	28	24	301	751	2,582	7	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6500	87	189	83	406	7	25	87	189	759	2,797	7	25	0	0												



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-3 - New Work + Existing Project - Brewerton Volumes- 450' Channel

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
8600	8	134	101	368	8	27	5	134	767	2,626	8	27	0	2,468	0	5	134	1,208	4,459	8	27	0	1,633	0
8700	6	21	113	396	7	28	8	21	724	2,781	7	28	0	2,398	0	6	21	1,159	4,384	7	28	0	1,623	0
8800	7	24	82	379	8	26	7	24	748	2,722	8	26	0	2,343	0	7	24	1,187	4,346	8	26	0	1,623	0
8900	7	26	89	363	5	21	7	26	751	2,773	5	21	0	2,420	0	7	26	1,189	4,401	5	21	0	1,628	0
9000	39	85	207	567	6	19	39	85	774	2,824	5	19	0	2,257	0	39	85	1,207	4,438	5	19	0	1,614	0
9100	8	89	112	590	7	21	8	89	704	2,736	7	21	0	2,146	0	8	89	1,136	4,343	7	21	0	1,608	0
9200	19	53	84	362	6	22	19	53	681	2,565	6	22	0	2,202	0	19	53	1,121	4,186	6	22	0	1,620	0
9300	6	46	100	341	8	26	6	46	690	2,538	8	26	0	2,198	0	6	46	1,116	4,143	8	26	0	1,606	0
9400	8	26	100	371	10	34	8	26	728	2,625	10	34	0	2,254	0	8	26	1,161	4,217	10	34	0	1,592	0
9500	5	24	104	379	7	32	5	24	714	2,670	7	32	0	2,291	0	5	24	1,128	4,239	7	32	0	1,599	0
9600	7	22	103	386	6	25	7	22	676	2,572	6	25	0	2,198	0	7	22	1,115	4,162	6	25	0	1,600	0
9700	43	82	82	343	5	20	43	82	710	2,586	5	20	0	2,223	0	43	82	1,161	4,196	5	20	0	1,630	0
9800	24	124	162	433	8	21	24	124	772	2,745	8	21	0	2,312	0	24	124	1,209	4,399	8	21	0	1,624	0
9900	61	139	144	648	7	24	61	139	771	2,858	7	24	0	2,310	0	61	139	1,218	4,476	7	24	0	1,617	0
0000	10	113	141	627	10	31	10	113	780	2,872	10	31	0	2,345	0	10	113	1,218	4,490	10	31	0	1,617	0
0100	18	62	136	511	7	32	18	62	777	2,883	7	32	0	2,373	0	18	62	1,249	4,508	7	32	0	1,626	0
0200	43	112	165	637	10	31	43	112	810	2,940	10	31	0	2,403	0	43	112	1,249	4,508	10	31	0	1,629	0
0300	8	86	119	608	4	26	8	86	804	2,890	4	26	0	2,481	0	8	86	1,245	4,620	4	26	0	1,630	0
0400	8	34	148	496	8	19	8	34	811	2,891	8	19	0	2,498	0	8	34	1,252	4,626	8	19	0	1,633	0
0500	6	26	120	498	11	32	6	26	782	2,849	11	32	0	2,454	0	6	26	1,223	4,563	11	32	0	1,633	0
0600	16	39	99	406	9	36	16	39	763	2,861	9	36	0	2,458	0	16	39	1,200	4,487	9	36	0	1,626	0
0700	7	43	87	344	7	30	7	43	722	2,760	7	30	0	2,407	0	7	43	1,159	4,370	7	30	0	1,628	0
0800	63	130	118	381	8	23	63	130	766	2,756	8	23	0	2,376	0	63	130	1,207	4,381	8	23	0	1,628	0
0900	47	203	75	369	3	16	47	203	661	2,643	3	16	0	2,284	0	47	203	1,102	4,276	3	16	0	1,632	0
1000	7	103	86	311	3	11	7	103	663	2,453	3	11	0	2,192	0	7	103	1,104	4,086	3	11	0	1,632	0
1100	31	72	88	248	2	8	31	72	740	2,600	2	8	0	2,362	0	31	72	1,181	4,233	2	8	0	1,633	0
1200	8	74	132	370	8	19	8	74	808	2,868	8	19	0	2,498	0	8	74	1,249	4,500	8	19	0	1,632	0
1300	10	36	157	636	10	33	10	36	842	3,056	10	33	0	2,621	0	10	36	1,283	4,688	10	33	0	1,632	0
1400	13	43	148	661	8	36	13	43	851	3,136	8	36	0	2,576	0	13	43	1,282	4,789	8	36	0	1,633	0
1500	88	148	153	664	10	36	88	148	860	3,169	10	36	0	2,616	0	88	148	1,301	4,802	10	36	0	1,633	0
1600	10	144	127	519	12	40	10	144	809	3,090	12	40	0	2,671	0	10	144	1,250	4,724	12	40	0	1,633	0
1700	13	42	137	480	8	37	13	42	824	3,024	8	37	0	2,533	0	13	42	1,286	4,657	8	37	0	1,633	0
1800	13	47	133	501	12	38	13	47	826	3,053	12	38	0	2,562	0	13	47	1,286	4,686	12	38	0	1,633	0
1900	7	37	143	612	8	37	7	37	826	3,056	8	37	0	2,542	0	7	37	1,286	4,688	8	37	0	1,633	0
2000	8	27	129	604	10	33	8	27	823	3,051	10	33	0	2,547	0	8	27	1,284	4,684	10	33	0	1,633	0
10100	6	23	120	480	10	36	6	23	770	2,849	10	36	0	2,490	0	6	23	1,211	4,582	10	36	0	1,633	0
10200	6	18	84	398	8	32	6	18	738	2,794	8	32	0	2,387	0	6	18	1,179	4,426	8	32	0	1,632	0
10300	6	18	86	334	8	26	6	18	663	2,633	8	26	0	2,299	0	6	18	1,124	4,286	8	26	0	1,632	0
10400	6	18	78	303	8	22	6	18	671	2,508	8	22	0	2,206	0	6	18	1,107	4,131	8	22	0	1,623	0
10500	8	20	82	268	6	21	8	20	667	2,460	6	21	0	2,201	0	8	20	1,094	4,076	6	21	0	1,617	0
10600	7	23	84	233	3	16	7	23	661	2,423	3	16	0	2,190	0	7	23	1,092	4,049	3	16	0	1,626	0
10700	7	25	36	191	3	11	7	25	629	2,366	3	11	0	2,174	0	7	25	1,064	3,993	3	11	0	1,629	0
10800	5	21	58	179	5	14	5	21	649	2,381	5	14	0	2,181	0	5	21	1,090	3,990	5	14	0	1,629	0
10900	17	41	89	271	5	18	17	41	734	2,562	5	18	0	2,291	0	17	41	1,175	4,194	5	18	0	1,632	0
11000	15	80	117	361	5	18	15	80	758	2,766	5	18	0	2,394	0	15	80	1,199	4,396	5	18	0	1,632	0
11100	23	72	198	530	5	20	23	72	849	2,978	5	20	0	2,448	0	23	72	1,290	4,609	5	20	0	1,633	0
11200	20	80	179	643	16	38	20	80	843	3,133	16	38	0	2,490	0	20	80	1,294	4,786	16	38	0	1,633	0
11300	36	104	194	989	17	41	36	104	905	3,184	17	41	0	2,475	0	36	104	1,306	4,797	17	41	0	1,633	0
11400	23	111	173	678	8	42	23	111	839	3,158	8	42	0	2,479	0	23	111	1,280	4,789	8	42	0	1,633	0
11500	31	101	185	827	8	34	31	101	809	3,052	8	34	0	2,424	0	31	101	1,250	4,686	8	34	0	1,633	0
11600	44	140	196	814	7	28	44	140	802	2,984	7	28	0	2,370	0	44	140	1,243	4,617	7	28	0	1,633	0
11700	16	110	158	601	8	27	16	110	798	2,984	8	27	0	2,363	0	16	110	1,239	4,597	8	27	0	1,633	0
11800	15	66	139	551	21	53	15	66	781	2,826	21	53	0	2,374	0	15	66	1,222	4,558	21	53	0	1,633	0
11900	17	59	146	528	5	47	17	59	781	2,892	5	47	0	2,364	0	17	59	1,222	4,558	5	47	0	1,633	0
12000	15	80	120	493	3	14	15	80	759	2,851	3	14	0	2,359	0	15	80	1,200	4,486	3	14	0	1,633	0
12100	17	80	242	671	34	88	17	80	898	3,098	34	88	0	2,398	0	17	80	1,338	4,702	34	88	0	1,633	0
12200	18	86	216	647	14	90	18	86	878	3,289	14	90	0	2,443	0	18	86	1,319	4,823	14	90	0	1,633	0
12300	20	70	231	828	21	85	20	70	807	3,306	21	85	0	2,480	0	20	70	1,348	4,838	21	85	0	1,633	0
12400	19	72	246	861	21	78	19	72	817	3,377	21	78	0	2,498	0	19	72	1,368	5,010	21	78	0	1,633	0
12500	14	81	242	901	15	86	14	81	807	3,378	15	86	0	2,477	0	14	81	1,348	5,011	15	86	0	1,633	0
12600	17	68	286	939	14	63	17	68	832	3,406	14	63	0	2,467	0	17	68	1,373	5,036	14	63	0	1,633	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening  
 Table E-3 - New Work + Existing Project - Brewerton Volumes- 450' Channel

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
13300	0	3	242	851	19	85	0	3	719	2,823	19	85	0	1,772	0	0	3	1,156	4,237	19	85	0	1,614	0
13400	0	0	245	902	19	89	0	0	868	2,906	18	89	0	1,704	0	0	0	1,121	4,217	18	89	0	1,611	0
13500	0	0	247	912	19	70	0	0	899	2,568	19	70	0	1,857	0	0	0	1,111	4,133	19	70	0	1,584	0
13600	0	0	251	921	18	87	0	0	719	2,825	16	87	0	1,704	0	0	0	1,128	4,145	16	87	0	1,520	0
13700	3	5	309	1,037	85	151	3	5	812	2,834	86	151	3	1,797	0	3	5	1,238	4,385	85	151	3	1,549	0
13800	0	0	300	1,129	181	146	0	0	782	2,950	181	146	0	1,822	0	0	0	1,187	4,493	181	146	0	1,543	0
13900	0	0	298	1,047	144	803	0	0	707	2,756	144	803	0	1,709	0	0	0	1,104	4,242	144	803	0	1,498	0
14000	0	0	299	1,028	18	302	0	0	756	2,708	19	302	0	1,680	0	0	0	1,188	4,206	19	302	0	1,498	0
14100	0	0	311	1,113	24	80	0	0	836	2,947	24	80	0	1,835	0	0	0	1,278	4,528	24	80	0	1,578	0
14200	0	0	298	1,129	20	83	0	0	823	3,072	20	83	0	1,944	0	0	0	1,263	4,702	20	83	0	1,629	0
14300	0	0	328	1,158	39	110	0	0	867	3,130	39	110	0	1,974	0	0	0	1,308	4,781	39	110	0	1,631	0
14400	4	8	298	1,152	26	121	4	8	861	3,200	26	121	4	2,048	0	4	8	1,301	4,832	26	121	4	1,632	0
14500	0	8	282	1,071	20	84	0	8	817	3,108	20	84	0	2,037	0	0	8	1,258	4,740	20	84	0	1,632	0
14600	0	0	267	1,017	29	81	0	0	792	2,979	29	81	0	1,982	0	0	0	1,233	4,812	29	81	0	1,633	0
14700	0	0	272	1,000	22	84	0	0	789	2,828	22	84	0	1,928	0	0	0	1,251	4,584	22	84	0	1,633	0
14800	0	0	282	989	18	74	0	0	811	2,983	18	74	0	1,974	0	0	0	1,251	4,584	18	74	0	1,633	0
14900	18	30	284	874	44	115	18	30	854	3,082	44	115	18	2,108	0	18	30	1,284	4,712	44	115	18	1,630	0
15000	22	70	280	871	17	112	22	70	796	3,055	17	112	22	2,084	0	22	70	1,237	4,687	17	112	22	1,633	0
15100	0	40	256	853	36	88	0	40	784	2,889	36	88	0	1,938	0	0	40	1,205	4,522	36	88	0	1,633	0
15200	0	0	276	980	71	200	0	0	813	2,820	71	200	0	1,840	0	0	0	1,254	4,553	71	200	0	1,633	0
15300	42	78	273	1,013	23	175	42	78	824	3,032	23	175	42	2,018	0	42	78	1,265	4,665	23	175	42	1,633	0
15400	0	78	290	1,041	22	84	0	78	838	3,078	22	84	0	2,037	0	0	78	1,279	4,712	22	84	0	1,633	0
15500	0	0	301	1,095	25	87	0	0	876	3,174	25	87	0	2,079	0	0	0	1,317	4,807	25	87	0	1,633	0
15600	0	1	318	1,143	28	89	0	1	867	3,227	28	89	0	2,084	0	0	1	1,308	4,857	28	89	0	1,630	0
15700	0	1	307	1,153	23	86	0	1	872	3,221	23	86	0	2,067	0	0	1	1,313	4,851	23	86	0	1,630	0
15800	0	1	318	1,153	38	113	0	1	875	3,235	38	113	0	2,082	0	0	1	1,315	4,898	38	113	0	1,633	0
15900	0	1	300	1,140	25	117	0	1	869	3,230	25	117	0	2,090	0	0	1	1,310	4,882	25	117	0	1,633	0
16000	2	5	300	1,111	29	100	2	5	861	3,242	29	100	2	2,131	0	2	5	1,322	4,875	29	100	2	1,633	0
16100	0	4	281	1,078	27	104	0	4	834	3,177	27	104	0	2,101	0	0	4	1,275	4,810	27	104	0	1,633	0
16200	0	0	271	1,022	30	108	0	0	841	3,102	30	108	0	2,079	0	0	0	1,281	4,733	30	108	0	1,632	0
16300	8	16	272	1,006	18	89	8	16	872	3,172	18	89	8	2,167	0	8	16	1,313	4,803	18	89	8	1,631	0
16400	0	18	288	1,037	22	74	0	18	879	3,242	22	74	0	2,205	0	0	18	1,320	4,875	22	74	0	1,632	0
16500	0	0	308	1,100	25	89	0	0	897	3,288	25	89	0	2,188	0	0	0	1,338	4,922	25	89	0	1,633	0
16600	0	0	331	1,179	51	141	0	0	937	3,398	51	141	0	2,217	0	0	0	1,378	5,029	51	141	0	1,633	0
16700	1	2	321	1,208	32	154	1	2	931	3,460	32	154	1	2,254	0	1	2	1,372	5,082	32	154	1	1,633	0
16800	0	0	332	1,209	29	113	0	0	956	3,492	29	113	0	2,283	0	0	0	1,388	5,128	29	113	0	1,633	0
16900	0	0	312	1,193	27	103	0	0	934	3,498	27	103	0	2,304	0	0	0	1,375	5,131	27	103	0	1,633	0
17000	12	22	309	1,148	29	102	12	22	936	3,464	28	102	12	2,314	0	12	22	1,377	5,097	28	102	12	1,633	0
17100	0	22	313	1,151	29	106	0	22	949	3,490	29	106	0	2,339	0	0	22	1,390	5,124	29	106	0	1,633	0
17200	28	62	318	1,188	29	101	28	62	943	3,502	28	101	28	2,333	0	28	62	1,384	5,138	28	101	28	1,633	0
17300	1	64	308	1,159	29	103	1	64	962	3,528	29	103	1	2,367	0	1	64	1,403	5,180	29	103	1	1,633	0
17400	0	3	315	1,153	33	118	0	3	956	3,651	33	118	0	2,387	0	0	3	1,387	5,184	33	118	0	1,633	0
17500	1	2	322	1,179	35	128	1	2	941	3,512	35	128	1	2,333	0	1	2	1,362	5,145	35	128	1	1,633	0
17600	3	7	331	1,208	40	138	3	7	955	3,530	40	138	3	2,322	0	3	7	1,406	5,163	40	138	3	1,633	0
17700	8	22	348	1,254	80	184	8	22	961	3,823	80	184	8	2,420	0	8	22	1,432	5,258	80	184	8	1,633	0
17800	1	17	332	1,256	82	228	1	17	984	3,858	82	228	1	2,400	0	1	17	1,425	5,291	82	228	1	1,633	0
17900	1	2	322	1,211	30	169	1	2	977	3,831	30	169	1	2,420	0	1	2	1,418	5,286	30	169	1	1,633	0
18000	0	1	318	1,187	53	154	0	1	960	3,587	53	154	0	2,400	0	0	1	1,401	5,220	53	154	0	1,633	0
18100	0	0	277	1,103	24	143	0	0	865	3,379	24	143	0	2,278	0	0	0	1,306	5,012	24	143	0	1,633	0
18200	0	0	275	1,021	112	262	0	0	872	3,218	112	262	0	2,186	0	0	0	1,313	4,850	112	262	0	1,633	0
18300	0	0	283	995	29	281	0	0	850	3,189	29	281	0	2,184	0	0	0	1,290	4,821	29	281	0	1,632	0
18400	0	0	287	981	30	110	0	0	827	3,108	30	110	0	2,125	0	0	0	1,285	4,732	30	110	0	1,626	0
18500	5	8	298	990	29	109	5	8	874	3,151	29	109	5	2,161	0	5	8	1,315	4,778	29	109	5	1,627	0
18600	0	8	275	1,005	28	106	0	8	878	3,245	28	106	0	2,240	0	0	8	1,319	4,878	28	106	0	1,633	0
18700	0	1	258	987	23	94	0	1	868	3,230	23	94	0	2,243	0	0	1	1,307	4,864	23	94	0	1,633	0
18800	0	1	279	995	28	83	0	1	901	3,274	28	83	0	2,278	0	0	1	1,342	4,907	28	83	0	1,633	0
18900	88	128	305	1,082	28	103	88	128	887	3,311	28	103	88	2,230	0	88	128	1,328	4,945	28	103	88	1,633	0
19000	2	129	280	1,082	26	100	2	129	918	3,338	26	100	2	2,256	0	2	129	1,367	4,972	26	100	2	1,633	0
19100	0	4	298	1,089	25	86	0	4	948	3,452	25	86	0	2,383	0	0	4	1,389	5,085	25	86	0	1,633	0
19200	0	1	267	1,045	26	84	0	1	895	3,413	26	84	0	2,358	0	0	1	1,338	5,048	26	84	0	1,633	0
19300	27	60	288	990	25																			



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-3 - New Work + Existing Project - Brewerton Volumes-450' Channel

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + DD						DD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)				Area (BF)	Volume (CY)	Area (BF)	Volume (CY)	Area (BF)	Volume (CY)			
20000	3	7	336	1,232	46	148	3	7	1,010	3,807	46	148	0	2,575	0	3	7	1,461	5,440	46	148	0	1,633	0
20100	1	7	301	1,177	46	188	1	7	973	3,671	46	188	0	2,484	0	1	7	1,414	5,304	46	188	0	1,633	0
20200	14	27	304	1,120	101	270	14	27	929	3,520	101	270	0	2,400	0	14	27	1,369	5,164	101	270	0	1,633	0
20300	0	26	281	1,048	38	266	0	26	838	3,271	38	266	0	2,226	0	0	26	1,279	4,906	38	266	0	1,633	0
20400	0	0	286	874	78	213	0	0	844	3,115	78	213	0	2,141	0	0	0	1,286	4,748	78	213	0	1,633	0
20500	0	0	292	1,031	28	196	0	0	901	3,231	28	196	0	2,189	0	0	0	1,342	4,864	28	196	0	1,633	0
20600	13	34	287	1,071	48	137	13	34	870	3,466	48	137	0	2,384	0	13	34	1,411	5,098	48	137	0	1,633	0
20700	4	31	272	1,034	44	167	4	31	965	3,565	44	167	0	2,630	0	4	31	1,398	5,198	44	167	0	1,633	0
20800	4	14	241	850	52	178	4	14	919	3,469	52	178	0	2,619	0	4	14	1,398	5,102	52	178	0	1,633	0
20900	3	12	237	896	27	147	3	12	904	3,378	27	147	0	2,491	0	3	12	1,348	5,008	27	147	0	1,633	0
21000	4	13	247	896	47	137	4	13	923	3,386	47	137	0	2,489	0	4	13	1,366	5,018	47	137	0	1,633	0
21100	2	11	222	869	22	128	2	11	918	3,411	22	128	0	2,642	0	2	11	1,368	5,044	22	128	0	1,633	0
21200	1	8	181	786	18	74	1	8	865	3,302	18	74	0	2,636	0	1	8	1,308	4,936	18	74	0	1,633	0
21300	2	6	221	763	83	188	2	6	918	3,301	83	188	0	2,638	0	2	6	1,368	4,934	83	188	0	1,633	0
21400	1	4	210	787	79	300	1	4	885	3,338	79	300	0	2,641	0	1	4	1,328	4,971	79	300	0	1,633	0
21500	2	4	228	813	72	279	2	4	936	3,372	72	279	0	2,680	0	2	4	1,377	5,008	72	279	0	1,633	0
21600	2	8	208	809	38	208	2	8	882	3,386	38	208	0	2,677	0	2	8	1,333	5,018	38	208	0	1,633	0
21700	1	8	224	800	31	130	1	8	914	3,345	31	130	0	2,646	0	1	8	1,366	4,978	31	130	0	1,633	0
21800	1	3	202	790	22	99	1	3	866	3,297	22	99	0	2,607	0	1	3	1,307	4,930	22	99	0	1,633	0
21900	3	7	208	760	28	84	3	7	856	3,188	28	84	0	2,428	0	3	7	1,297	4,821	28	84	0	1,633	0
22000	2	10	183	743	23	96	2	10	852	3,182	23	96	0	2,419	0	2	10	1,293	4,798	23	96	0	1,633	0
22100	3	10	182	694	17	74	3	10	826	3,106	17	74	0	2,411	0	3	10	1,288	4,738	17	74	0	1,633	0
22200	23	48	234	771	36	86	23	48	881	3,159	36	86	0	2,388	0	23	48	1,322	4,782	36	86	0	1,633	0
22300	1	43	251	899	29	118	1	43	899	3,298	29	118	0	2,398	0	1	43	1,340	4,928	29	118	0	1,633	0
22400	1	4	240	909	41	130	1	4	882	3,298	41	130	0	2,389	0	1	4	1,323	4,932	41	130	0	1,633	0
22500	0	3	232	872	46	181	0	3	812	3,137	46	181	0	2,286	0	0	3	1,253	4,770	46	181	0	1,633	0
22600	0	0	206	808	22	126	0	0	790	2,966	22	126	0	2,157	0	0	0	1,231	4,599	22	126	0	1,633	0
22700	1	2	232	909	30	86	1	2	858	3,061	30	86	0	2,242	0	1	2	1,298	4,884	30	86	0	1,633	0
22800	1	2	248	894	47	144	0	2	864	3,189	47	144	0	2,305	0	1	2	1,306	4,823	47	144	0	1,633	0
22900	1	3	218	858	26	133	1	3	860	3,184	26	133	0	2,336	0	1	3	1,301	4,827	26	133	0	1,633	0
23000	1	3	208	790	43	128	1	3	820	3,111	43	128	0	2,321	0	1	3	1,281	4,746	43	128	0	1,633	0
23100	1	2	244	840	36	147	1	2	888	3,180	36	147	0	2,320	0	1	2	1,327	4,783	36	147	0	1,633	0
23200	1	4	221	863	34	129	1	4	883	3,296	34	129	0	2,433	0	1	4	1,334	4,929	34	129	0	1,633	0
23300	2	8	300	780	27	113	2	8	902	3,140	27	113	0	2,380	0	2	8	1,243	4,774	27	113	0	1,633	0
23400	8	20	187	734	36	123	8	20	840	3,041	36	123	0	2,307	0	8	20	1,280	4,674	36	123	0	1,633	0
23500	3	21	187	710	28	120	3	21	813	3,060	28	120	0	2,360	0	3	21	1,264	4,683	28	120	0	1,633	0
23600	6	16	173	866	22	89	6	16	804	2,847	22	89	0	2,329	0	6	16	1,246	4,628	22	89	0	1,633	0
23700	0	11	189	869	25	87	0	11	787	2,878	25	87	0	2,277	0	0	11	1,228	4,580	25	87	0	1,633	0
23800	1	3	174	871	28	98	1	3	788	2,878	28	98	0	2,208	0	1	3	1,208	4,513	28	98	0	1,633	0
23900	1	4	180	856	25	98	1	4	726	2,786	25	98	0	2,111	0	1	4	1,188	4,388	25	98	0	1,632	0
24000	0	3	186	878	25	83	0	3	738	2,710	25	83	0	2,111	0	0	3	1,178	4,342	25	83	0	1,631	0
24100	1	2	189	858	28	96	1	2	717	2,683	28	96	0	2,036	0	1	2	1,148	4,308	28	96	0	1,616	0
24200	0	1	180	846	25	86	0	1	754	2,723	25	86	0	2,078	0	0	1	1,186	4,338	25	86	0	1,616	0
24300	1	2	156	819	18	82	1	2	730	2,748	18	82	0	2,129	0	1	2	1,166	4,370	18	82	0	1,621	0
24400	1	4	173	807	16	82	1	4	808	2,846	16	82	0	2,238	0	1	4	1,247	4,488	16	82	0	1,621	0
24500	1	3	181	818	16	86	1	3	732	2,848	16	86	0	2,230	0	1	3	1,173	4,481	16	86	0	1,633	0
24600	0	1	143	863	12	80	0	1	882	2,837	12	80	0	2,076	0	0	1	1,133	4,271	12	80	0	1,633	0
24700	0	1	108	461	13	48	0	1	808	2,410	13	48	0	1,949	0	0	1	1,048	4,041	13	48	0	1,631	0
24800	8	10	121	420	15	81	8	10	687	2,384	15	81	0	1,844	0	8	10	1,106	3,989	15	81	0	1,626	0
24900	0	8	129	463	13	51	0	8	878	2,487	13	51	0	2,023	0	0	8	1,118	4,113	13	51	0	1,627	0
25000	10	18	228	861	18	83	10	18	917	2,960	18	83	0	2,289	0	10	18	1,368	4,983	18	83	0	1,633	0
25100	274	526	911	2,109	159	323	274	526	1,920	6,256	159	323	0	3,148	0	274	526	2,508	7,182	159	323	0	1,907	0
25200	178	839	848	3,438	132	539	178	839	1,985	7,194	132	539	0	3,756	0	178	839	2,568	8,379	132	539	0	2,186	0
25300	80	442	958	3,522	56	348	80	442	1,983	7,328	56	348	0	3,807	0	80	442	2,584	8,517	56	348	0	2,189	0
25400	80	204	981	3,548	48	183	80	204	2,011	7,414	48	183	0	3,884	0	80	204	2,602	8,603	48	183	0	2,189	0
25500	80	204	922	3,487	40	163	80	204	1,984	7,388	40	163	0	3,911	0	80	204	2,575	8,587	40	163	0	2,189	0
25600	80	223	902	3,378	42	161	80	223	1,987	7,317	42	161	0	3,938	0	80	223	2,568	8,508	42	161	0	2,189	0
25700	32	172	871	3,284	34	140	32	172	1,944	7,243	34	140	0	3,969	0	32	172	2,536	8,432	34	140	0	2,189	0
25800	51	164	877	3,238	40	137	51	164	1,963	7,217	40	137	0	3,979	0	51	164	2,544	8,406	40	137	0	2,189	0
25900	87	219	896	3,283	48	183	87	219	1,977	7,277	48	183	0	3,994	0	87	219	2,568	8,486	48	183	0	2,189	0

Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-3 - New Work + Existing Project - Brewerton Volumes- 450' Channel

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OD						OD ONLY		
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope
	Area (BP)	Volume (CY)	Area (BP)	Volume (CY)	Area (BP)	Volume (CY)	Area (BP)	Volume (CY)	Area (BP)	Volume (CY)	Area (BP)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (BP)	Volume (CY)	Area (BP)	Volume (CY)	Area (BP)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)
26700	73	198	748	2,789	40	166	73	188	1,785	6,643	40	166	0	3,854	0	73	198	2,376	8,932	40	166	0	2,189	0
26800	82	286	872	2,827	34	138	82	288	1,899	6,436	34	138	0	3,808	0	82	288	2,280	8,824	34	138	0	2,188	0
26900	30	208	807	2,369	31	121	30	208	1,610	6,111	31	121	0	3,741	0	30	208	2,201	8,300	31	121	0	2,188	0
27000	23	86	551	2,145	31	115	23	86	1,555	6,981	31	115	0	3,716	0	23	86	2,148	8,050	31	115	0	2,188	0
27100	24	87	518	1,981	30	112	24	87	1,523	6,700	30	112	0	3,719	0	24	87	2,114	7,889	30	112	0	2,188	0
27200	43	123	430	1,758	29	108	43	123	1,380	6,395	29	108	0	3,638	0	43	123	1,981	7,584	29	108	0	2,188	0
27300	0	79	226	1,214	28	104	0	79	841	4,132	28	104	0	2,818	0	0	79	1,382	6,248	28	104	0	2,114	0
27400	0	0	219	824	21	90	0	0	851	3,154	21	90	0	2,310	0	0	0	1,405	5,180	21	90	0	2,048	0
27500	1	1	186	750	22	79	1	1	854	3,154	22	79	0	2,408	0	1	1	1,432	5,256	22	79	0	2,098	0
27600	0	1	196	705	24	84	0	1	871	3,198	24	84	0	2,491	0	0	1	1,453	5,342	24	84	0	2,148	0
27700	0	0	198	727	23	88	0	0	848	3,187	23	88	0	2,458	0	0	0	1,413	5,306	23	88	0	2,120	0
27800	0	0	237	806	25	89	0	0	870	3,185	25	89	0	2,379	0	0	0	1,432	5,269	25	89	0	2,084	0
27900	0	0	201	811	26	84	0	0	805	3,103	26	84	0	2,488	0	0	0	1,367	5,186	26	84	0	2,063	0
28000	0	0	244	824	28	96	0	0	817	3,004	28	96	0	2,180	0	0	0	1,448	5,195	28	96	0	2,022	0
28100	2	4	255	823	25	95	2	4	870	3,124	25	95	0	2,200	0	2	4	1,448	5,195	25	95	0	2,071	0
28200	0	4	248	833	27	96	0	4	802	3,095	27	96	0	2,182	0	0	4	1,307	5,101	27	96	0	2,007	0
28300	0	0	205	841	33	111	0	0	778	2,827	33	111	0	2,086	0	0	0	1,306	4,834	33	111	0	1,908	0
28400	0	0	188	730	28	114	0	0	781	2,852	28	114	0	2,122	0	0	0	1,308	4,823	28	114	0	1,871	0
28500	0	0	199	718	25	98	0	0	773	2,841	25	98	0	2,124	0	0	0	1,308	4,828	25	98	0	1,885	0
28600	0	0	223	779	27	95	0	0	796	2,808	27	95	0	2,127	0	0	0	1,351	4,822	27	95	0	2,015	0
28700	0	0	238	858	24	95	0	0	791	2,838	24	95	0	2,083	0	0	0	1,308	4,824	24	95	0	1,985	0
28800	1	3	233	874	24	89	1	3	819	2,982	24	89	0	2,107	0	1	3	1,315	4,858	24	89	0	1,878	0
28900	0	0	207	869	20	81	0	0	811	3,018	20	81	0	2,129	0	0	0	1,274	4,796	20	81	0	1,777	0
29000	0	0	221	868	29	91	0	0	781	2,947	29	91	0	2,079	0	0	0	1,283	4,897	29	91	0	1,750	0
29100	0	0	210	800	21	83	0	0	755	2,844	21	83	0	2,044	0	0	0	1,273	4,898	21	83	0	1,852	0
29200	0	0	184	730	26	87	0	0	874	2,848	26	87	0	1,818	0	0	0	1,183	4,512	26	87	0	1,886	0
29300	0	0	171	858	14	74	0	0	779	2,891	14	74	0	2,033	0	0	0	1,368	4,885	14	74	0	1,874	0
29400	0	0	188	828	15	53	0	0	773	2,874	15	53	0	2,248	0	0	0	1,318	4,951	15	53	0	2,077	0
29500	0	0	149	886	14	53	0	0	711	2,748	14	53	0	2,182	0	0	0	1,178	4,820	14	53	0	1,872	0
29600	0	0	138	832	12	47	0	0	889	2,582	12	47	0	2,080	0	0	0	1,158	4,318	12	47	0	1,727	0
29700	0	0	150	834	13	46	0	0	705	2,582	13	46	0	2,048	0	0	0	1,193	4,351	13	46	0	1,788	0
29800	0	0	152	859	8	41	0	0	892	2,588	8	41	0	2,028	0	0	0	1,205	4,441	8	41	0	1,853	0
29900	0	0	136	834	8	31	0	0	847	2,480	8	31	0	1,947	0	0	0	1,200	4,452	8	31	0	1,872	0
30000	8	15	102	443	11	35	8	15	833	2,372	11	35	0	1,831	0	8	15	1,196	4,435	11	35	0	2,063	0
30100	0	0	98	361	8	32	0	0	894	2,273	8	32	0	1,820	0	0	0	1,174	4,388	8	32	0	2,115	0
30200	0	0	81	314	3	27	0	0	892	2,198	3	27	0	1,882	0	0	0	1,148	4,300	3	27	0	2,104	0
30300	0	0	86	273	3	21	0	0	812	2,044	3	21	0	1,771	0	0	0	1,062	4,073	3	21	0	2,028	0
30400	2	3	41	189	1	8	2	3	489	1,817	1	8	0	1,818	0	2	3	854	3,713	1	8	0	1,897	0
30500	0	3	43	186	1	8	0	3	474	1,748	1	8	0	1,579	0	0	3	898	3,425	1	8	0	1,879	0
30600	0	0	48	170	0	3	0	0	368	1,537	0	3	0	1,367	0	0	0	752	3,052	0	3	0	1,514	0
30700	2	3	73	218	0	2	2	3	408	1,418	0	2	0	1,200	0	2	3	790	2,800	0	0	0	1,384	0
30800	0	3	148	411	4	8	0	3	832	1,827	4	8	0	1,518	0	0	3	1,184	3,562	4	8	0	1,835	0
30900	0	0	184	578	9	25	0	0	710	2,487	9	25	0	1,807	0	0	0	1,307	4,578	9	25	0	2,088	0
31000	1	2	186	813	10	35	1	2	848	3,071	10	35	0	2,458	0	1	2	1,615	5,411	10	35	0	2,341	0
31100	0	1	153	861	7	32	0	1	893	3,408	7	32	0	2,818	0	0	1	1,644	6,036	7	32	0	2,828	0
31200	0	0	161	880	8	25	0	0	935	3,385	8	25	0	2,804	0	0	0	1,778	6,337	8	25	0	2,852	0
31300	0	0	133	845	2	15	0	0	845	3,482	2	15	0	2,837	0	0	0	1,842	6,704	2	15	0	3,222	0
31400	0	1	175	871	8	14	0	1	1,132	3,848	8	14	0	3,276	0	0	1	2,129	7,351	8	14	0	3,506	0
31500	3	7	244	778	8	22	3	7	1,440	4,782	8	22	0	4,715	0	3	7	2,551	8,686	8	22	0	3,903	0
31800	46	81	284	841	4	18	46	81	1,815	6,657	4	18	0	5,403	0	46	81	2,793	9,997	4	18	0	4,240	0
31700	12	107	186	798	0	8	12	107	1,733	6,198	0	8	0	5,403	0	12	107	2,986	10,719	0	8	0	4,520	0
31800	0	23	325	808	0	0	0	23	2,078	7,057	0	0	0	6,148	0	0	23	3,402	11,848	0	0	0	4,789	0
31900	42	78	333	1,218	0	0	42	78	2,347	8,195	0	0	0	6,876	0	42	78	3,732	13,210	0	0	0	5,014	0
32000	0	78	385	1,330	0	0	0	78	2,583	8,128	0	0	0	7,800	0	0	78	4,028	14,370	0	0	0	5,341	0
32100	1	2	694	1,813	1	2	1	2	2,948	10,241	1	2	0	8,428	0	1	2	4,454	15,708	1	2	0	5,487	0
32200	2	5	899	2,209	1	3	2	5	3,029	11,088	1	3	0	8,858	0	2	5	4,588	16,740	1	3	0	5,872	0
32300	1	5	871	2,185	0	1	1	5	3,189	11,478	0	1	0	8,313	0	1	5	4,785	17,371	0	1	0	5,893	0
32400	118	218	847	2,089	0	0	118	218	3,214	11,820	0	0	0	8,751	0	118	218	4,904	17,980	0	0	0	6,141	0
32500	0	218	743	2,388	0	0	0	218	3,487	12,372	0	0	0	8,984	0	0	218	5,218	18,744	0	0	0	6,372	0
32800	34	84	848	2,845	0	0	34	84	3,557	13,007	0	0	0	10,082	0	34	84	5,388	19,598	0	0	0	6,582	0
32700	1	86	840	3,125	0	0	1	86	3,798	13,820	0	0	0	10,495	0	1	86	5,688	20,433	0	0	0	6,813	0
32800	26	50	1,080																					



Chesapeake & Delaware Canal and Baltimore Harbor Connecting Channels - 37' Deepening

Table E-3 - New Work + Existing Project - Brewerton Volumes-450' Channel

Station	GRADE						GRADE + AMD						AMD ONLY			GRADE + AMD + OG						OG ONLY			
	Left Slope		Channel		Right Slope		Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	Left Slope		Channel		Right Slope		L Slope	Channel	R Slope	
	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Area (SF)	Volume (CY)	Volume (CY)	Volume (CY)	Volume (CY)	
33400	0	1	0	0	0	0	0	0	1	3	9	0	0	0	9	0	0	1	10	30	0	0	0	21	0
33600	7	13	0	0	0	0	0	7	13	8	22	0	0	0	22	0	7	13	20	66	0	0	0	34	0
33800	0	12	0	0	0	0	0	0	12	0	16	0	0	0	16	0	0	12	4	46	0	0	0	28	0
33862.86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	0	0	0	8	0
<b>TOTAL (MCY)</b>	<b>6.815</b>	<b>37.7</b>	<b>0.025</b>	<b>0.025</b>	<b>0.015</b>	<b>1.114</b>	<b>0.025</b>	<b>0.000</b>	<b>0.838</b>	<b>0.000</b>	<b>0.815</b>	<b>1.728</b>	<b>0.825</b>	<b>0.000</b>	<b>0.814</b>	<b>0.000</b>	<b>0.814</b>	<b>0.000</b>	<b>0.814</b>	<b>0.000</b>	<b>0.814</b>	<b>0.000</b>	<b>0.814</b>	<b>0.000</b>	<b>0.000</b>

**APPENDIX F  
37 FT COST ESTIMATE - DREDGING SCENARIO 3B**



## SUMMARY OF ESTIMATED NEW WORK DREDGING COSTS - 37' DEEPENING

No.	Channel Reach		Type of Dredge	Selected Placement Sites	New Work Pay Cubic Yards	Unit Rate (\$/CY)	Estimated Dredging Cost \$
	From Station	To Station					
<b>C&amp;D Canal</b>							
1	(-) 0+927	0+000	Hydraulic	Reedy Point N/S	234	0.00	0
2	0+000	10+000	Hydraulic	Reedy Point N/S	364,186	2.71	986,943
3	10+000	18+500	Hydraulic	Reedy Point N/S	31,073	15.98	496,547
4	18+500	31+000	Hydraulic	Biddles Point	39,110	11.68	456,799
5	31+000	40+000	Hydraulic	St George/School Rd	23,227	16.28	378,130
6	40+000	55+000	Hydraulic	St George/School Rd	11,052	27.13	299,828
7	55+000	70+000	Hydraulic	Bethal	16,894	36.42	615,283
8	70+000	80+000	Hydraulic	Bethal	17,001	16.05	272,873
9	80+000	90+000	Hydraulic	Bethal	3,363	53.17	178,791
10	90+000	100+000	Hydraulic	Courthouse Point	43,666	1.88	82,092
11	100+000	110+000	Hydraulic	Courthouse Point	0	20.48	0
12	110+000	120+000	Hydraulic	Courthouse Point	0	42.23	0
13	120+000	129+500	Hydraulic	Courthouse Point	0	4.35	0
14	129+500	140+000	Hydraulic	Pearce Creek	0	7.10	0
15	140+000	150+000	Hydraulic	Pearce Creek	0	4.82	0
16	150+000	160+000	Hydraulic	Pearce Creek	62,641	4.66	291,906
17	160+000	170+000	Hydraulic	Pearce Creek	0	8.85	0
18	170+000	180+000	Hydraulic	Pearce Creek	0	10.71	0
19	180+000	190+000	Hydraulic	Pearce Creek	136,350	4.50	613,574
20	190+000	203+000	Hydraulic	Pearce Creek	0	0.00	0
21	203+000	210+000	Clamshell	104 - Kent Island Deep	0	13.58	0
22	210+000	220+000	Clamshell	104 - Kent Island Deep	304,677	4.18	1,273,549
23	220+000	230+000	Clamshell	104 - Kent Island Deep	16,028	5.77	92,484
24	230+000	239+740	Clamshell	104 - Kent Island Deep	148,574	5.31	788,929
<b>Tolchester</b>							
25	5+500	20+000	Clamshell	104 - Kent Island Deep	190,122	5.49	1,043,769
26	20+000	30+000	Clamshell	104 - Kent Island Deep	115,757	9.37	1,084,642
27	30+000	40+000	Clamshell	104 - Kent Island Deep	263,266	8.06	2,121,923
28	40+000	50+000	Clamshell	104 - Kent Island Deep	137,322	3.12	428,444
29	50+000	58+901	Clamshell	104 - Kent Island Deep	14,759	6.04	89,145
<b>Brewerton</b>							
30	0+000	10+000	Clamshell	104 - Kent Island Deep	272,984	4.64	1,266,646
31	10+000	20+000	Clamshell	104 - Kent Island Deep	297,743	4.01	1,193,949
32	20+000	33+663	Clamshell	104 - Kent Island Deep	561,911	4.29	2,410,598
<b>37' Deepening Totals</b>					<b>3,071,938</b>	<b>5.36</b>	<b>16,466,844</b>

**SUMMARY OF ESTIMATED TOTAL DREDGING COSTS - 37' DEEPENING**

No.	Channel Reach		Type of Dredge	Selected Placement Sites	Existing + New Work Pay CY	Unit Rate (\$/CY)	Estimated Dredging Cost \$
	From Station	To Station					
<b>C&amp;D Canal</b>							
1	(-) 0+927	0+000	Hydraulic	Reedy Point N/S	234	0.00	0
2	0+000	10+000	Hydraulic	Reedy Point N/S	994,789	2.71	2,700,204
3	10+000	18+500	Hydraulic	Reedy Point N/S	33,799	15.98	540,042
4	18+500	31+000	Hydraulic	Biddles Point	47,785	11.68	558,041
5	31+000	40+000	Hydraulic	St George/School Rd	29,859	16.28	486,040
6	40+000	55+000	Hydraulic	St George/School Rd	22,559	27.13	612,046
7	55+000	70+000	Hydraulic	Bethal	25,700	36.42	936,071
8	70+000	80+000	Hydraulic	Bethal	37,002	16.05	594,044
9	80+000	90+000	Hydraulic	Bethal	5,417	53.17	288,023
10	90+000	100+000	Hydraulic	Courthouse Point	315,450	1.88	594,044
11	100+000	110+000	Hydraulic	Courthouse Point	4,394	20.48	90,006
12	110+000	120+000	Hydraulic	Courthouse Point	2,984	42.23	126,012
13	120+000	129+500	Hydraulic	Courthouse Point	72,174	4.35	314,037
14	129+500	140+000	Hydraulic	Pearce Creek	55,760	7.10	396,030
15	140+000	150+000	Hydraulic	Pearce Creek	89,580	4.82	432,034
16	150+000	160+000	Hydraulic	Pearce Creek	127,534	4.66	594,044
17	160+000	170+000	Hydraulic	Pearce Creek	20,340	8.85	180,016
18	170+000	180+000	Hydraulic	Pearce Creek	31,284	10.71	334,975
19	180+000	190+000	Hydraulic	Pearce Creek	153,573	4.50	690,882
20	190+000	203+000	Hydraulic	Pearce Creek	1,728	0.00	0
21	203+000	210+000	Clamshell	104 - Kent Island Deep	12,024	13.58	163,229
22	210+000	220+000	Clamshell	104 - Kent Island Deep	646,510	4.18	2,700,486
23	220+000	230+000	Clamshell	104 - Kent Island Deep	179,119	5.77	1,032,961
24	230+000	239+740	Clamshell	104 - Kent Island Deep	332,273	5.31	1,765,642
<b>Tolchester</b>							
25	5+500	20+000	Clamshell	104 - Kent Island Deep	678,494	5.49	3,723,460
26	20+000	30+000	Clamshell	104 - Kent Island Deep	133,879	9.37	1,254,281
27	30+000	40+000	Clamshell	104 - Kent Island Deep	299,379	8.06	2,414,245
28	40+000	50+000	Clamshell	104 - Kent Island Deep	217,968	3.12	678,980
29	50+000	58+901	Clamshell	104 - Kent Island Deep	27,843	6.04	168,159
<b>Brewerton</b>							
30	0+000	10+000	Clamshell	104 - Kent Island Deep	373,143	4.64	1,729,607
31	10+000	20+000	Clamshell	104 - Kent Island Deep	487,647	4.01	1,957,820
32	20+000	33+663	Clamshell	104 - Kent Island Deep	907,706	4.29	3,891,614
<b>37' Deepening Totals</b>					<b>6,367,930</b>	<b>5.02</b>	<b>31,947,075</b>



**PRODUCTION CALCULATIONS**

The production rates were estimated on the basis of the operating characteristics of existing equipment similar to that selected.

**HYDRAULIC DREDGE PUMPING DIRECTLY TO THE DISPOSAL SITE**

The production rates of the hydraulic dredge pumping directly to the placement area were determined by considering the excavating and pumping characteristics of the material, the depth of the bank, the area and distribution of the material, the length of the discharge pipelines, the pumping capabilities of the dredge and booster pumps and environmental conditions.

**CLAMSHELL DREDGE WITH BOTTOM DUMP SCOWS**

The production rate of the clamshell dredge was determined by considering the excavating and loading characteristics of the material, the depth of bank, the haul distance to the disposal site, the capacity of the dump scows and the speed of the tow in making the round trip to the disposal site, and environmental conditions.

**CLAMSHELL DREDGE WITH HOPPER SCOWS AND UNLOADER**

The production rate of the clamshell dredge was determined by considering the excavating and loading characteristics of the material, the depth of bank, the area and distribution of the material, the haul distance to the disposal site, the capacity of the hopper scows and the speed of the tow in making the round trip to the disposal site, the pumpout capabilities of the unloader the length of the discharge pipelines, and environmental conditions.

Since portions of the job are below an economic production bank ( $\geq 4'$ ), production is based on both coverage cut and production cut.

**SUMMARY OF PRODUCTION CALCULATIONS**

Project	Dredge Size	Material Type	Type Dredging	Production		Coverage CY/SqFt
				CY/Day	Sq Ft/Day	

**DAILY OPERATING HOURS**

Clamshell Dredge	17	Hrs/Day
Hydraulic Dredge	17	Hrs/Day
Hydraulic Unloader	15	Hrs/Day
Towing Tugs	15	Hrs/Day

Working 7 days per week = 30.4 days per month.

**DREDGING AND PLACEMENT METHODS BY REACH**  
**37' DEEPENING**

Reach Number	From Station	To Station	Dredging Method			Placement Sites
			Dredge	Haul	Placement	
<b>C&amp;D Canal</b>						
1	(-) 0+927	0+000	Hydraulic	Pipeline	Pipeline	Reedy Point N/S
2	0+000	10+000	Hydraulic	Pipeline	Pipeline	Reedy Point N/S
3	10+000	18+500	Hydraulic	Pipeline	Pipeline	Reedy Point N/S
4	18+500	31+000	Hydraulic	Pipeline	Pipeline	Biddles Point
5	31+000	40+000	Hydraulic	Pipeline	Pipeline	St George/School Rd
6	40+000	55+000	Hydraulic	Pipeline	Pipeline	St George/School Rd
7	55+000	70+000	Hydraulic	Pipeline	Pipeline	Bethal
8	70+000	80+000	Hydraulic	Pipeline	Pipeline	Bethal
9	80+000	90+000	Hydraulic	Pipeline	Pipeline	Bethal
10	90+000	100+000	Hydraulic	Pipeline	Pipeline	Courthouse Point
11	100+000	110+000	Hydraulic	Pipeline	Pipeline	Courthouse Point
12	110+000	120+000	Hydraulic	Pipeline	Pipeline	Courthouse Point
13	120+000	129+500	Hydraulic	Pipeline	Pipeline	Courthouse Point
14	129+500	140+000	Hydraulic	Pipeline	Pipeline	Pearce Creek
15	140+000	150+000	Hydraulic	Pipeline	Pipeline	Pearce Creek
16	150+000	160+000	Hydraulic	Pipeline	Pipeline	Pearce Creek
17	160+000	170+000	Hydraulic	Pipeline	Pipeline	Pearce Creek
18	170+000	180+000	Hydraulic	Pipeline	Pipeline	Pearce Creek
19	180+000	190+000	Hydraulic	Pipeline	Pipeline	Pearce Creek
20	190+000	203+000	Hydraulic	Pipeline	Pipeline	Pearce Creek
21	203+000	210+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
22	210+000	220+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
23	220+000	230+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
24	230+000	239+740	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
<b>Tolchester</b>						
25	5+500	20+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
26	20+000	30+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
27	30+000	40+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
28	40+000	50+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
29	50+000	58+901	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
<b>Brewerton</b>						
30	0+000	10+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
31	10+000	20+000	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep
32	20+000	33+200	Clamshell	Barge	O.W. Dump	104 - Kent Island Deep



**HAUL DISTANCES TO PLACEMENT SITES  
37' DEEPENING**

From Station	To Station	Placement Sites	Haul Distance (NM)			Placement Method	
			Min.	Max.	Average		
<b>C&amp;D Canal</b>							
21	203+000	210+000	104 - Kent Island Deep	22.2	22.2	22.2	O.W. Dump
22	210+000	220+000	104 - Kent Island Deep	20.6	20.6	20.6	O.W. Dump
23	220+000	230+000	104 - Kent Island Deep	18.9	18.9	18.9	O.W. Dump
24	230+000	239+740	104 - Kent Island Deep	17.3	17.3	17.3	O.W. Dump
<b>Tolchester</b>							
25	5+500	20+000	104 - Kent Island Deep	9.1	9.1	9.1	O.W. Dump
26	20+000	30+000	104 - Kent Island Deep	10.7	10.7	10.7	O.W. Dump
27	30+000	40+000	104 - Kent Island Deep	12.3	12.3	12.3	O.W. Dump
28	40+000	50+000	104 - Kent Island Deep	14.0	14.0	14.0	O.W. Dump
29	50+000	58+901	104 - Kent Island Deep	15.6	15.6	15.6	O.W. Dump
<b>Brewerton</b>							
30	0+000	10+000	104 - Kent Island Deep	11.5	11.5	11.5	O.W. Dump
31	10+000	20+000	104 - Kent Island Deep	10.5	10.5	10.5	O.W. Dump
32	20+000	33+200	104 - Kent Island Deep	9.4	9.4	9.4	O.W. Dump

**AVERAGE PIPELINE LENGTHS**

From Station	To Station	Placement Sites	Pontoon Line Length (Ft.)	Shore Line and Submerged Line Length (Ft.)			Combined Total Average Line	Type of Placement Equipment
				Min.	Max.	Average		

**Alternate A:**

1	(-) 0+927	0+000	Reedy Point N/S	2,000	7,000	7,000	7,000	9,000	Dredge
2	0+000	10+000	Reedy Point N/S	2,000	2,000	2,000	2,000	4,000	Dredge
3	10+000	18+500	Reedy Point N/S	2,000	4,000	4,000	4,000	6,000	Dredge
4	18+500	31+000	Biddles Point	2,000	1,000	1,000	1,000	3,000	Dredge
5	31+000	40+000	St George/School Rd	2,000	1,000	1,000	1,000	3,000	Dredge
6	40+000	55+000	St George/School Rd	2,000	8,000	8,000	8,000	10,000	Dredge
7	55+000	70+000	Bethal	2,000	9,000	9,000	9,000	11,000	Dredge
8	70+000	80+000	Bethal	2,000	2,000	2,000	2,000	4,000	Dredge
9	80+000	90+000	Bethal	2,000	10,000	10,000	10,000	12,000	Dredge
10	90+000	100+000	Courthouse Point	2,000	8,000	8,000	8,000	10,000	Dredge
11	100+000	110+000	Courthouse Point	2,000	6,000	6,000	6,000	8,000	Dredge
12	110+000	120+000	Courthouse Point	2,000	16,000	16,000	16,000	18,000	Dredge
13	120+000	129+500	Courthouse Point	2,000	26,000	26,000	26,000	28,000	Dredge
14	129+500	140+000	Pearce Creek	2,000	7,000	7,000	7,000	9,000	Dredge
15	140+000	150+000	Pearce Creek	2,000	4,000	4,000	4,000	6,000	Dredge
16	150+000	160+000	Pearce Creek	2,000	10,000	10,000	10,000	12,000	Dredge
17	160+000	170+000	Pearce Creek	2,000	20,000	20,000	20,000	22,000	Dredge
18	170+000	180+000	Pearce Creek	2,000	28,000	28,000	28,000	30,000	Dredge
19	180+000	190+000	Pearce Creek	2,000	38,000	38,000	38,000	40,000	Dredge
20	190+000	203+000	Pearce Creek	2,000	48,000	48,000	48,000	50,000	Dredge

**WEIGHTED AVERAGES**

As can be seen from the production calculations on the following pages, the production capabilities of the dredge, as well as the number of tugs and scows required and the unloading rate of the scows depends on the location of the project, the haul distance, the class of material, and the type of dredging.

The weighted average production rate is used to estimate the equipment wear costs.

The determination of the weighted average number of tugs and scows provides the quantity of equipment required for estimating the various projects.

**DETERMINATION OF WEIGHTED AVERAGE DREDGE PIPELINE LENGTH**

Reach Number	From Station	To Station	37' Deepening		
			Total Cubic Yards	Average Pipeline Length (Ft)	Total CY-Ft (000)

**C&D Canal**

1	(-) 0+927	0+000	351	9,000	3,160
2	0+000	10+000	1,101,057	4,000	4,404,227
3	10+000	18+500	46,506	6,000	279,036
4	18+500	31+000	58,428	3,000	175,284
5	31+000	40+000	36,065	3,000	108,196
6	40+000	55+000	25,904	10,000	259,037
7	55+000	70+000	30,291	11,000	333,201
8	70+000	80+000	41,968	4,000	167,871
9	80+000	90+000	6,420	12,000	77,039
10	90+000	100+000	325,636	10,000	3,256,361
11	100+000	110+000	5,265	8,000	42,124
12	110+000	120+000	4,238	18,000	76,282
13	120+000	129+500	94,147	28,000	2,636,115
14	129+500	140+000	69,928	9,000	629,350
15	140+000	150+000	112,447	6,000	674,681
16	150+000	160+000	163,639	12,000	1,963,668
17	160+000	170+000	25,152	22,000	553,336
18	170+000	180+000	41,987	30,000	1,259,609
19	180+000	190+000	180,453	40,000	7,218,104
20	190+000	203+000	2,221	50,000	111,044

Total Cubic Yards **2,372,101**

Average/Section **118,605      14,750      1,211,386**

Weighted Average Length of Pipeline **10,214**

SAY **10,200**



**DETERMINATION OF WEIGHTED AVERAGE PRODUCTION RATE - 37' DEEPENING**

Number	Channel Reach		Type of Dredging Equipment	Total CY to Dredge (000)	Average Production Cy/Day	Total CY/Day-CY (000,000)
	From Station	To Station				
<b>C&amp;D Canal</b>						
1	(-) 0+927	0+000	Hydraulic	351	4,071	1,429
2	0+000	10+000	Hydraulic	1,101,057	24,189	26,633,459
3	10+000	18+500	Hydraulic	46,506	5,024	233,646
4	18+500	31+000	Hydraulic	58,428	6,192	361,786
5	31+000	40+000	Hydraulic	36,065	4,454	160,634
6	40+000	55+000	Hydraulic	25,904	2,517	65,200
7	55+000	70+000	Hydraulic	30,291	1,915	58,007
8	70+000	80+000	Hydraulic	41,968	4,140	173,746
9	80+000	90+000	Hydraulic	6,420	1,299	8,339
10	90+000	100+000	Hydraulic	325,636	32,105	10,454,547
11	100+000	110+000	Hydraulic	5,265	3,252	17,123
12	110+000	120+000	Hydraulic	4,238	1,923	8,149
13	120+000	129+500	Hydraulic	94,147	20,455	1,925,777
14	129+500	140+000	Hydraulic	69,928	10,306	720,676
15	140+000	150+000	Hydraulic	112,447	15,347	1,725,721
16	150+000	160+000	Hydraulic	163,639	16,453	2,692,352
17	160+000	170+000	Hydraulic	25,152	8,512	214,091
18	170+000	180+000	Hydraulic	41,987	8,631	362,390
19	180+000	190+000	Hydraulic	180,453	17,964	3,241,651
20	190+000	203+000	Hydraulic	2,221	34,133	75,805

Total Cubic Yards (000)

**2,372,101**

Total CY/Day - Cubic Yards (000,000)

**49,134,528**

Weighted Average Cubic Yards per Day

**20,714**

SAY

**20,700**

CY/Day

**32,000**

**C&D Canal**

21	203+000	210+000	Clamshell	16,366	2,802	45,857
22	210+000	220+000	Clamshell	730,463	13,694	10,002,958
23	220+000	230+000	Clamshell	224,658	8,561	1,923,300
24	230+000	239+740	Clamshell	406,560	9,072	3,688,314

**Tolchester**

25	5+500	20+000	Clamshell	774,408	8,218	6,364,086
26	20+000	30+000	Clamshell	177,677	4,011	712,662
27	30+000	40+000	Clamshell	384,687	6,295	2,421,603
28	40+000	50+000	Clamshell	258,327	19,532	5,045,641
29	50+000	58+901	Clamshell	32,846	7,629	250,586

**Brewerton**

30	0+000	10+000	Clamshell	446,947	10,235	4,574,507
31	10+000	20+000	Clamshell	568,699	11,480	6,528,670
32	20+000	33+663	Clamshell	1,059,973	10,755	11,400,012

Total Cubic Yards (000)

**5,081,613**

Total CY/Day - Cubic Yards (000,000)

**52,958,196**

Weighted Average Cubic Yards per Day

**10,422**

SAY

**10,400**

CY/Day

**MATERIAL CLASSIFICATIONS AND PERCENTAGES BY REACH - 37' DEEPENING  
(New Work + Existing Project)**

Channel Reach			Percentages of Cubic Yards			Quantity (Cubic Yards)			
Reach Number	From Station	To Station	Silts	Loose	Dense	Silts	Loose	Dense	Combined Totals Classes 1 thru 6
			and Mud Class 1 & 2	Granular Material Class 4 & 5	Clays and Sands Class 3 & 6	and Mud Class 1 & 2	Granular Material Class 4 & 5	Clays and Sands Class 3 & 6	
<b>C&amp;D Canal</b>									
1	(-) 0+927	0+000	100%			351	0	0	351
2	0+000	10+000	33%	65%	2%	363,349	715,687	22,021	1,101,057
3	10+000	18+500		89%	11%	0	41,390	5,116	46,506
4	18+500	31+000	9%	62%	28%	5,259	36,225	16,360	57,844
5	31+000	40+000		13%	87%	0	4,688	31,377	36,065
6	40+000	55+000	2%	9%	89%	518	2,331	23,054	25,904
7	55+000	70+000		1%	99%	0	303	29,988	30,291
8	70+000	80+000	6%	76%	18%	2,518	31,895	7,554	41,968
9	80+000	90+000	2%	32%	66%	128	2,054	4,237	6,420
10	90+000	100+000	67%		33%	218,176	0	107,460	325,636
11	100+000	110+000	64%	36%		3,370	1,896	0	5,265
12	110+000	120+000	28%	72%		1,187	3,051	0	4,238
13	120+000	129+500	100%			94,147	0	0	94,147
14	129+500	140+000	100%			69,928	0	0	69,928
15	140+000	150+000	100%			112,447	0	0	112,447
16	150+000	160+000	100%			163,639	0	0	163,639
17	160+000	170+000	100%			25,152	0	0	25,152
18	170+000	180+000	100%			41,987	0	0	41,987
19	180+000	190+000	100%			180,453	0	0	180,453
20	190+000	203+000	100%			2,221	0	0	2,221
21	203+000	210+000	100%			16,366	0	0	16,366
22	210+000	220+000	100%			730,463	0	0	730,463
23	220+000	230+000	100%			224,658	0	0	224,658
24	230+000	239+740	100%			406,560	0	0	406,560
<b>Subtotal Cubic Yards</b>						<b>2,662,875</b>	<b>839,522</b>	<b>247,167</b>	<b>3,749,564</b>
<b>Tolchester</b>									
25	5+500	20+000	100%			774,408	0	0	774,408
26	20+000	30+000	100%			177,677	0	0	177,677
27	30+000	40+000	100%			384,687	0	0	384,687
28	40+000	50+000	100%			258,327	0	0	258,327
29	50+000	58+901	100%			32,846	0	0	32,846
<b>Subtotal Cubic Yards</b>						<b>1,627,945</b>	<b>0</b>	<b>0</b>	<b>1,627,945</b>
<b>Brewerton</b>									
30	0+000	10+000	100%			446,947	0	0	446,947
31	10+000	20+000	100%			568,699	0	0	568,699
32	20+000	33+200	100%			1,059,973	0	0	1,059,973
<b>Subtotal Cubic Yards</b>						<b>2,075,620</b>	<b>0</b>	<b>0</b>	<b>2,075,620</b>
<b>Total Cubic Yards</b>						<b>6,366,441</b>	<b>839,522</b>	<b>247,167</b>	<b>7,453,129</b>
<b>Percent</b>						<b>85%</b>	<b>11%</b>	<b>3%</b>	<b>100%</b>

Class	Type	Blows/Ft.	Description
-------	------	-----------	-------------

**Silts and Mud:**

1	Mud	Less than 2	Organic silts, peat, muck soft clay
2	Clay/Silt	2 to 10	Medium Clay

**Loose Granular Material:**

4	Sand	2 to 50	Fine to Medium Sand < No. 10 Sieve
5	Sand	2 to 50	Course Sand and Gravel > No. 10 Sieve

**Dense Clays and Sands:**

3	Clay	Greater than 10	Firm to Hard Clay
6	Sand	Greater than 50	Dense Compact Sand, typically fine



**MATERIAL QUANTITIES - NEW WORK ONLY 37' DEEPENING**

From Station	To Station	Required Grade	Advance Maintenance	Allowable Overdepth	Total Pay	Non-Pay Overdepth	Total CY to Dredge
<b>C&amp;D Canal</b>							
1	(-) 0+927	0+000	0	0	234	117	351
2	0+000	10+000	151,649	0	212,537	106,268	470,454
3	10+000	18+500	5,660	0	25,413	12,707	43,780
4	18+500	31+000	8,558	9,267	21,285	10,643	49,753
5	31+000	40+000	5,634	5,181	12,411	6,206	29,433
6	40+000	55+000	2,280	2,082	6,689	3,345	14,397
7	55+000	70+000	5,098	2,613	9,183	4,591	21,485
8	70+000	80+000	3,065	4,004	9,932	4,966	21,967
9	80+000	90+000	1,357	0	2,006	1,003	4,366
10	90+000	100+000	15,054	8,240	20,372	10,186	53,852
11	100+000	110+000	0	0	0	0	0
12	110+000	120+000	0	0	0	0	0
13	120+000	129+500	0	0	0	0	0
14	129+500	140+000	0	0	0	0	0
15	140+000	150+000	0	0	0	0	0
16	150+000	160+000	0	0	62,641	31,320	93,961
17	160+000	170+000	0	0	0	0	0
18	170+000	180+000	0	0	0	0	0
19	180+000	190+000	82,589	0	53,761	26,880	163,230
20	190+000	203+000	0	0	0	0	0
21	203+000	210+000	0	0	0	0	0
22	210+000	220+000	0	136,770	167,907	83,953	388,630
23	220+000	230+000	0	0	16,028	8,014	24,042
24	230+000	239+740	0	0	148,574	74,287	222,861
<b>Subtotal Cubic Yards</b>			<b>280,944</b>	<b>168,158</b>	<b>768,973</b>	<b>384,486</b>	<b>1,602,561</b>
			18%	10%	48%	76%	100%
<b>Tolchester</b>							
25	5+500	20+000	0	92,454	97,668	48,834	238,956
26	20+000	30+000	0	35,100	80,657	40,328	156,085
27	30+000	40+000	0	92,650	170,616	85,308	348,574
28	40+000	50+000	0	56,605	80,717	40,359	177,681
29	50+000	58+901	0	5,744	9,015	4,508	19,267
<b>Subtotal Cubic Yards</b>			<b>0</b>	<b>282,552</b>	<b>438,674</b>	<b>219,337</b>	<b>940,563</b>
			0%	30%	47%	77%	100%
<b>Brewerton</b>							
30	0+000	10+000	0	125,377	147,607	73,804	346,788
31	10+000	20+000	0	135,639	162,103	81,052	378,795
32	20+000	33+200	0	257,378	304,533	152,267	714,178
<b>Subtotal Cubic Yards</b>			<b>0</b>	<b>518,394</b>	<b>614,244</b>	<b>307,123</b>	<b>1,439,761</b>
			0%	36%	43%	79%	100%
<b>Total Cubic Yards</b>			<b>280,944</b>	<b>969,104</b>	<b>1,821,891</b>	<b>910,946</b>	<b>3,982,884</b>
			7%	24%	46%	77%	100%

**MATERIAL QUANTITIES - NEW WORK + EXISTING PROJECT - 37' DEEPENING**

	From Station	To Station	Required Grade	Advance Maintenance	Allowable Overdepth	Total Pay	Non-Pay Overdepth	Total CY to Dredge
<b>C&amp;D Canal</b>								
1	(-) 0+927	0+000	0	0	234	234	117	351
2	0+000	10+000	782,252	0	212,537	994,789	106,268	1,101,057
3	10+000	18+500	8,386	0	25,413	33,799	12,707	46,506
4	18+500	31+000	17,233	9,267	21,285	47,785	10,643	58,428
5	31+000	40+000	12,267	5,181	12,411	29,859	6,206	36,065
6	40+000	55+000	13,787	2,082	6,689	22,559	3,345	25,904
7	55+000	70+000	13,904	2,613	9,183	25,700	4,591	30,291
8	70+000	80+000	23,065	4,004	9,932	37,002	4,966	41,968
9	80+000	90+000	3,411	0	2,006	5,417	1,003	6,420
10	90+000	100+000	286,838	8,240	20,372	315,450	10,186	325,636
11	100+000	110+000	2,653	0	1,741	4,394	871	5,265
12	110+000	120+000	316	159	2,509	2,984	1,254	4,238
13	120+000	129+500	10,707	17,522	43,945	72,174	21,973	94,147
14	129+500	140+000	12,567	14,857	28,336	55,760	14,168	69,928
15	140+000	150+000	20,721	23,125	45,734	89,580	22,867	112,447
16	150+000	160+000	3,533	51,792	72,209	127,534	36,105	163,639
17	160+000	170+000	8,749	1,967	9,624	20,340	4,812	25,152
18	170+000	180+000	3,728	6,149	21,406	31,284	10,703	41,987
19	180+000	190+000	99,812	0	53,761	153,573	26,880	180,453
20	190+000	203+000	741	0	986	1,728	493	2,221
21	203+000	210+000	1,485	1,855	8,683	12,024	4,342	16,366
22	210+000	220+000	28,343	450,260	167,907	646,510	83,953	730,463
23	220+000	230+000	8,094	79,946	91,079	179,119	45,539	224,658
24	230+000	239+740	10,871	172,828	148,574	332,273	74,287	406,560
<b>Subtotal Cubic Yards</b>			<b>1,373,464</b>	<b>851,848</b>	<b>1,016,557</b>	<b>3,241,869</b>	<b>508,279</b>	<b>3,750,148</b>
			37%	23%	27%	86%	14%	100%
<b>Tolchester</b>								
25	5+500	20+000	304,559	182,107	191,828	678,494	95,914	774,408
26	20+000	30+000	3,023	43,260	87,595	133,879	43,798	177,677
27	30+000	40+000	8,267	120,496	170,616	299,379	85,308	384,687
28	40+000	50+000	43,435	93,816	80,717	217,968	40,359	258,327
29	50+000	58+901	8,357	9,480	10,006	27,843	5,003	32,846
<b>Subtotal Cubic Yards</b>			<b>367,640</b>	<b>449,160</b>	<b>540,763</b>	<b>1,357,563</b>	<b>270,382</b>	<b>1,627,945</b>
			23%	28%	33%	83%	17%	100%
<b>Brewerton</b>								
30	0+000	10+000	28,081	197,455	147,607	373,143	73,804	446,947
31	10+000	20+000	105,600	219,944	162,103	487,647	81,052	568,699
32	20+000	33+200	182,804	420,369	304,533	907,706	152,267	1,059,973
<b>Subtotal Cubic Yards</b>			<b>316,485</b>	<b>837,768</b>	<b>614,244</b>	<b>1,768,497</b>	<b>307,123</b>	<b>2,075,620</b>
			15%	40%	30%	85%	15%	100%
<b>Total Cubic Yards</b>			<b>2,057,590</b>	<b>2,138,776</b>	<b>2,171,564</b>	<b>6,367,930</b>	<b>1,085,784</b>	<b>7,453,714</b>
			28%	29%	29%	85%	15%	100%



**PRODUCTION AND COVERAGE AREAS AND VOLUMES - 37' DEEPENING  
(New Work + Existing Project)**

Reach Number	From Station	To Station	Dredge Area (Square Feet)			Prod. (pay)	Dredge Volume (Cubic Yards)		
			Production	Coverage	Total		Production	Coverage	Total
<b>C&amp;D Canal</b>									
1	(-) 0+927	0+000	0	33,400	33,400	0	0	351	351
2	0+000	10+000	2,094,000	6,729,200	8,823,200	752,854	833,277	267,779	1,101,057
3	10+000	18+500	0	1,750,000	1,750,000	0	0	46,506	46,506
4	18+500	31+000	61,000	1,781,800	1,842,800	12,187	14,901	43,527	58,428
5	31+000	40+000	68,000	1,181,200	1,249,200	10,909	13,176	22,889	36,065
6	40+000	55+000	15,000	1,572,200	1,587,200	3,615	4,151	21,753	25,904
7	55+000	70+000	30,000	2,278,800	2,308,800	5,356	6,313	23,978	30,291
8	70+000	80+000	17,000	1,982,000	1,999,000	2,923	3,315	38,652	41,968
9	80+000	90+000	0	821,400	821,400	0	0	6,420	6,420
10	90+000	100+000	230,000	881,200	1,111,200	264,736	273,284	52,352	325,636
11	100+000	110+000	1,000	509,000	510,000	166	199	5,067	5,265
12	110+000	120+000	0	547,400	547,400	0	0	4,238	4,238
13	120+000	129+500	0	1,782,600	1,782,600	0	0	94,147	94,147
14	129+500	140+000	65,000	2,486,400	2,551,400	11,556	14,492	55,436	69,928
15	140+000	150+000	23,000	2,767,600	2,790,600	6,873	8,627	103,819	112,447
16	150+000	160+000	0	3,852,000	3,852,000	0	0	163,639	163,639
17	160+000	170+000	0	1,144,400	1,144,400	0	0	25,152	25,152
18	170+000	180+000	0	1,884,000	1,884,000	0	0	41,987	41,987
19	180+000	190+000	282,000	1,853,200	2,135,200	92,672	108,892	71,560	180,453
20	190+000	203+000	0	25,200	25,200	0	0	2,221	2,221
21	203+000	210+000	0	649,600	649,600	0	0	16,366	16,366
22	210+000	220+000	1,649,000	2,933,400	4,582,400	548,871	620,145	110,318	730,463
23	220+000	230+000	11,000	2,878,000	2,889,000	6,594	8,270	216,388	224,658
24	230+000	239+740	304,000	4,152,840	4,456,840	140,433	171,830	234,730	406,560
<b>Subtotals</b>			<b>4,850,000</b>	<b>46,476,840</b>	<b>51,326,840</b>		<b>2,080,875</b>	<b>1,669,273</b>	<b>3,750,148</b>
<b>Tolchester</b>									
25	5+500	20+000	1,803,000	7,872,000	9,675,000	472,290	539,054	235,354	774,408
26	20+000	30+000	0	4,926,400	4,926,400	0	0	177,677	177,677
27	30+000	40+000	80,000	6,593,800	6,673,800	32,392	41,622	343,065	384,687
28	40+000	50+000	391,000	314,800	705,800	201,727	239,079	19,248	258,327
29	50+000	58+901	28,000	414,800	442,800	11,221	13,237	19,609	32,846
<b>Subtotals</b>			<b>2,302,000</b>	<b>20,121,800</b>	<b>22,423,800</b>		<b>1,550,623</b>	<b>1,627,945</b>	<b>2,422,898</b>
<b>Brewerton</b>									
30	0+000	10+000	201,000	4,151,200	4,352,200	121,733	145,811	301,137	446,947
31	10+000	20+000	1,107,000	3,406,000	4,513,000	372,911	434,893	133,807	568,699
32	20+000	33+200	2,091,000	7,138,800	9,229,800	676,683	790,196	269,777	1,059,973
<b>Subtotals</b>			<b>3,399,000</b>	<b>14,696,000</b>	<b>18,095,000</b>		<b>1,370,899</b>	<b>704,721</b>	<b>2,075,620</b>
<b>Combined Totals</b>			<b>10,551,000</b>	<b>81,294,640</b>	<b>91,845,640</b>		<b>5,002,397</b>	<b>4,001,939</b>	<b>8,248,666</b>

**TIME REQUIRED - BANK & STEP PRODUCTION - 37' DEEPENING  
(New Work + Existing Project)**

No.	Channel Reach		Type of Dredge	Step Production			Bank Production			Combined Dredge Months
	From Station	To Station		Sq Ft to Dredge	Sq Ft per Day	Dredge Days	CY to Dredge	CY per Day	Dredge Days	
<b>C&amp;D Canal</b>										
1	(-) 0+927	0+000	Hydraulic	33,400	387,300	0.1	0	39,700	0.0	0.00
2	0+000	10+000	Hydraulic	6,729,200	257,085	26.2	833,277	43,075	19.3	1.50
3	10+000	18+500	Hydraulic	1,750,000	189,054	9.3	0	32,913	0.0	0.30
4	18+500	31+000	Hydraulic	1,781,800	196,209	9.1	14,901	42,011	0.4	0.31
5	31+000	40+000	Hydraulic	1,181,200	152,118	7.8	13,176	39,647	0.3	0.27
6	40+000	55+000	Hydraulic	1,572,200	155,004	10.1	4,151	28,305	0.1	0.34
7	55+000	70+000	Hydraulic	2,278,800	146,286	15.6	6,313	26,613	0.2	0.52
8	70+000	80+000	Hydraulic	1,982,000	197,226	10.0	3,315	38,278	0.1	0.33
9	80+000	90+000	Hydraulic	821,400	166,182	4.9	0	26,058	0.0	0.16
10	90+000	100+000	Hydraulic	881,200	307,605	2.9	273,284	37,548	7.3	0.33
11	100+000	110+000	Hydraulic	509,000	317,856	1.6	199	11,304	0.0	0.05
12	110+000	120+000	Hydraulic	547,400	248,412	2.2	0	16,632	0.0	0.07
13	120+000	129+500	Hydraulic	1,782,600	387,300	4.6	0	25,100	0.0	0.15
14	129+500	140+000	Hydraulic	2,486,400	387,300	6.4	14,492	39,700	0.4	0.22
15	140+000	150+000	Hydraulic	2,767,600	387,300	7.1	8,627	47,700	0.2	0.24
16	150+000	160+000	Hydraulic	3,852,000	387,300	9.9	0	38,500	0.0	0.33
17	160+000	170+000	Hydraulic	1,144,400	387,300	3.0	0	22,400	0.0	0.10
18	170+000	180+000	Hydraulic	1,884,000	387,300	4.9	0	24,100	0.0	0.16
19	180+000	190+000	Hydraulic	1,853,200	387,300	4.8	108,892	20,700	5.3	0.33
20	190+000	203+000	Hydraulic	25,200	387,300	0.1	0	19,000	0.0	0.00
21	203+000	210+000	Clamshell	649,600	111,200	5.8	0	23,000	0.0	0.19
22	210+000	220+000	Clamshell	2,933,400	111,200	26.4	620,145	23,000	27.0	1.75
23	220+000	230+000	Clamshell	2,878,000	111,200	25.9	8,270	23,000	0.4	0.86
24	230+000	239+740	Clamshell	4,152,840	111,200	37.3	171,830	23,000	7.5	1.47
<b>Tolchester</b>										
25	5+500	20+000	Clamshell	7,872,000	111,200	70.8	539,054	23,000	23.4	3.10
26	20+000	30+000	Clamshell	4,926,400	111,200	44.3	0	23,000	0.0	1.46
27	30+000	40+000	Clamshell	6,593,800	111,200	59.3	41,622	23,000	1.8	2.01
28	40+000	50+000	Clamshell	314,800	111,200	2.8	239,079	23,000	10.4	0.44
29	50+000	58+901	Clamshell	414,800	111,200	3.7	13,237	23,000	0.6	0.14
<b>Brewerton</b>										
30	0+000	10+000	Clamshell	4,151,200	111,200	37.3	145,811	23,000	6.3	1.44
31	10+000	20+000	Clamshell	3,406,000	111,200	30.6	434,893	23,000	18.9	1.63
32	20+000	33+200	Clamshell	7,138,800	111,200	64.2	790,196	23,000	34.4	3.24
<b>Total All Reaches</b>				<b>81,294,640</b>	<b>148,054</b>	<b>549.1</b>	<b>4,284,767</b>	<b>26,092</b>	<b>164.2</b>	<b>23.44</b>
<b>Total Hydraulic Dredge</b>				<b>35,863,000</b>	<b>255,198</b>	<b>141</b>	<b>1,280,630</b>	<b>38,109</b>	<b>33.6</b>	<b>5.71</b>
<b>Total Clamshell Dredge</b>				<b>45,431,640</b>	<b>111,200</b>	<b>409</b>	<b>3,004,137</b>	<b>23,000</b>	<b>130.6</b>	<b>17.73</b>

Average CY/Day and SqFt/Day taken from production calculations for single materials (Reaches 13-32) and from the Tables of Average Mixed Rates (Reaches 1-12).



**AVERAGE PRODUCTION RATES - CUBIC YARDS PER DAY  
(New Work + Existing Project)**

No.	Channel Reach		Total Cubic Yards to Dredge	Scenario 3		
	From Station	To Station		Type of Dredge	Total Days	Avg. CY per Day
<b>C&amp;D Canal</b>						
1	(-) 0+927	0+000	351	Hydraulic	0.1	4,071
2	0+000	10+000	1,101,057	Hydraulic	45.5	24,189
3	10+000	18+500	46,506	Hydraulic	9.3	5,024
4	18+500	31+000	58,428	Clamshell	9.4	6,192
5	31+000	40+000	36,065	Clamshell	8.1	4,454
6	40+000	55+000	25,904	Clamshell	10.3	2,517
7	55+000	70+000	30,291	Clamshell	15.8	1,915
8	70+000	80+000	41,968	Clamshell	10.1	4,140
9	80+000	90+000	6,420	Clamshell	4.9	1,299
10	90+000	100+000	325,636	Hydraulic	10.1	32,105
11	100+000	110+000	5,265	Hydraulic	1.6	3,252
12	110+000	120+000	4,238	Hydraulic	2.2	1,923
13	120+000	129+500	94,147	Hydraulic	4.6	20,455
14	129+500	140+000	69,928	Hydraulic	6.8	10,306
15	140+000	150+000	112,447	Hydraulic	7.3	15,347
16	150+000	160+000	163,639	Hydraulic	9.9	16,453
17	160+000	170+000	25,152	Hydraulic	3.0	8,512
18	170+000	180+000	41,987	Hydraulic	4.9	8,631
19	180+000	190+000	180,453	Hydraulic	10.0	17,964
20	190+000	203+000	2,221	Hydraulic	0.1	34,133
21	203+000	210+000	16,366	Clamshell	5.8	2,802
22	210+000	220+000	730,463	Clamshell	53.3	13,694
23	220+000	230+000	224,658	Clamshell	26.2	8,561
24	230+000	239+740	406,560	Clamshell	44.8	9,072
<b>Tolchester</b>						
25	5+500	20+000	774,408	Clamshell	94.2	8,218
26	20+000	30+000	177,677	Clamshell	44.3	4,011
27	30+000	40+000	384,687	Clamshell	61.1	6,295
28	40+000	50+000	258,327	Clamshell	13.2	19,532
29	50+000	58+901	32,846	Clamshell	4.3	7,629
<b>Brewerton</b>						
30	0+000	10+000	446,947	Clamshell	43.7	10,235
31	10+000	20+000	568,699	Clamshell	49.5	11,480
32	20+000	33+200	1,059,973	Clamshell	98.6	10,755

**CLAMSHELL BANK PRODUCTION CALCULATIONS**

Project: C&D Canal Deepening Project  
 Dredge Site: C&D Canal, Tolchester and Brewerton Channels  
 Disposal Site: Various  
 Materials: Silts and Mud  
 Bank: Production Cut, average depth = 4 feet or greater.

Production Factors :

27	CY, Bucket Size	60	Degrees, Swing Angle
40	Ft, Average Digging Depth	2	Rpm, Swing Speed
10	Ft, Average Scow Freeboard	90	Percent, Full Bucket
50	Ft, Lifting Distance	50	Working Minutes per Hour
200	Ft/Min, Hoisting Speed		

Cycle Time :

	Seconds
Load Bucket	8
Lift Load	15
Swing Load	5
Dump Load	2
Return Swing	5
Lower Bucket	9
Lost Time (accelerating, positioning, stepping ahead)	10
<b>Total Cycle Time</b>	<b>54 sec/load</b>

Cycles per Hour :

$$\frac{50 \text{ Working Min/Hr} \times 60 \text{ Sec/Min}}{54 \text{ Sec/Load (Cycle Time)}} = 55.6 \text{ cycles/hr}$$

Volume per Hour :

$$\text{Bucket Size} \times \text{Percent Full} \times \text{Cycles/Hr} = 1,351 \text{ cy/hr}$$

Lost Time :

Weather, greasing, mechanical repairs, shifting scows, changing wires, etc. = 7 hours

Average Daily Operating Time:

$$24 \text{ Hours} - 7 \text{ Lost Time (Hrs)} = 17 \text{ hours}$$

Average Daily Production:

$$17 \text{ Hrs/Day} \times 1,351 \text{ CY per Hour} = 22,967 \text{ cy/day}$$

**USE 23,000 cy/day**



**CLAMSHELL BANK PRODUCTION CALCULATIONS**

Project: C&D Canal Deepening Project  
 Dredge Site: C&D Canal, Tolchester and Brewerton Channels  
 Disposal Site: Various  
 Materials: Loose Granular Materials  
 Bank: Production Cut, average depth = 4 feet or greater.

Production Factors :

21	CY, Bucket Size	60	Degrees, Swing Angle
40	Ft, Average Digging Depth	2	Rpm, Swing Speed
10	Ft, Average Scow Freeboard	90	Percent, Full Bucket
50	Ft, Lifting Distance	50	Working Minutes per Hour
200	Ft/Min, Hoisting Speed		

Cycle Time :

	Seconds
Load Bucket	8
Lift Load	15
Swing Load	5
Dump Load	2
Return Swing	5
Lower Bucket	9
Lost Time (accelerating, positioning, stepping ahead)	10
<b>Total Cycle Time</b>	<b>54</b> sec/load

Cycles per Hour :

$$\frac{50 \text{ Working Min/Hr} \times 60 \text{ Sec/Min}}{54 \text{ Sec/Load (Cycle Time)}} = 55.6 \text{ cycles/hr}$$

Volume per Hour :

$$\text{Bucket Size} \times \text{Percent Full} \times \text{Cycles/Hr} = 1,051 \text{ cy/hr}$$

Lost Time :

Weather, greasing, mechanical repairs, shifting scows, changing wires, etc. = 7 hours

Average Daily Operating Time:

$$24 \text{ Hours} - 7 \text{ Lost Time (Hrs)} = 17 \text{ hours}$$

Average Daily Production:

$$17 \text{ Hrs/Day} \times 1,051 \text{ CY per Hour} = 17,867 \text{ cy/day}$$

USE **17,900** cy/day

**CLAMSHELL BANK PRODUCTION CALCULATIONS**

Project: C&D Canal Deepening Project  
 Dredge Site: C&D Canal, Tolchester and Brewerton Channels  
 Disposal Site: Various  
 Materials: Dense Clays and Sands  
 Bank: Production Cut, average depth = 4 feet or greater.

Production Factors :

14	CY, Bucket Size	60	Degrees, Swing Angle
40	Ft, Average Digging Depth	2	Rpm, Swing Speed
10	Ft, Average Scow Freeboard	90	Percent, Full Bucket
50	Ft, Lifting Distance	50	Working Minutes per Hour
200	Ft/Min, Hoisting Speed		

Cycle Time :

	Seconds
Load Bucket	8
Lift Load	15
Swing Load	5
Dump Load	2
Return Swing	5
Lower Bucket	9
Lost Time (accelerating, positioning, stepping ahead)	10
<b>Total Cycle Time</b>	<b>54</b> sec/load

Cycles per Hour :

$$\frac{50 \text{ Working Min/Hr} \times 60 \text{ Sec/Min}}{54 \text{ Sec/Load (Cycle Time)}} = 55.6 \text{ cycles/hr}$$

Volume per Hour :

$$\text{Bucket Size} \times \text{Percent Full} \times \text{Cycles/Hr} = 701 \text{ cy/hr}$$

Lost Time :

Weather, greasing, mechanical repairs, shifting scows, changing wires, etc. = 7 hours

Average Daily Operating Time:

$$24 \text{ Hours} - 7 \text{ Lost Time (Hrs)} = 17 \text{ hours}$$

Average Daily Production:

$$17 \text{ Hrs/Day} \times 701 \text{ CY per Hour} = 11,917 \text{ cy/day}$$

USE **11,900** cy/day



**CLAMSHELL COVERAGE CUT, OR STEP PRODUCTION CALCULATIONS**

Project: C&D Canal Deepening Project  
 Dredge Site: C&D Canal, Tolchester and Brewerton Channels  
 Disposal Site: Various  
 Materials: Silts and Mud  
 Bank: Coverage Cut, average depth is less than 4 feet.

Production Factors :

27	CY, Bucket Size	60	Degrees, Swing Angle
40	Ft, Average Digging Depth	2	Rpm, Swing Speed
10	Ft, Average Scow Freeboard	50	Working Minutes per Hour
50	Ft, Lifting Distance	250	Sq Ft, Bucket Footprint
200	Ft/Min, Hoisting Speed		

Cycle Time :

	Seconds
Load Bucket	8
Lift Load	15
Swing Load	5
Dump Load	2
Return Swing	5
Lower Bucket	9
Lost Time (accelerating, positioning, stepping ahead)	10
<b>Total Cycle Time</b>	<b>54</b> sec/load

Cycles per Hour :

$$\frac{50 \text{ Working Min/Hr} \times 60 \text{ Sec/Min}}{54 \text{ Sec/Load (Cycle Time)}} = 55.6 \text{ cycles/hr}$$

Area per Hour :

$$\frac{250 \text{ Sq Ft Bucket Area} \times 55.6 \text{ Cycles/Hr}}{2 \text{ Passes per Set (50\% Overlap)}} = 6,950 \text{ sq ft/hr}$$

Lost Time :

Weather, greasing, mechanical repairs, shifting scows, changing wires, etc. 8 hours

Average Daily Operating Time:

$$24 \text{ Hours} - 8 \text{ Lost Time (Hrs)} = 16 \text{ hours}$$

Average Daily Production:

$$16 \text{ Hrs/Day} \times 6,950 \text{ Sq Ft/Hr} = 111,200 \text{ sq ft/day}$$

USE 111,200 sq ft/day

**CLAMSHELL COVERAGE CUT, OR STEP PRODUCTION CALCULATIONS**

Project: C&D Canal Deepening Project  
 Dredge Site: C&D Canal, Tolchester and Brewerton Channels  
 Disposal Site: Various  
 Materials: Loose Granular Materials  
 Bank: Coverage Cut, average depth is less than 4 feet.

Production Factors :

21	CY, Bucket Size	60	Degrees, Swing Angle
40	Ft, Average Digging Depth	2	Rpm, Swing Speed
10	Ft, Average Scow Freeboard	50	Working Minutes per Hour
50	Ft, Lifting Distance	196	Sq Ft, Bucket Footprint
200	Ft/Min, Hoisting Speed		

Cycle Time :

	Seconds
Load Bucket	8
Lift Load	15
Swing Load	5
Dump Load	2
Return Swing	5
Lower Bucket	9
Lost Time (accelerating, positioning, stepping ahead)	10
<b>Total Cycle Time</b>	<b>54</b> sec/load

Cycles per Hour :

$$\frac{50 \text{ Working Min/Hr} \times 60 \text{ Sec/Min}}{54 \text{ Sec/Load (Cycle Time)}} = 55.6 \text{ cycles/hr}$$

Area per Hour :

$$\frac{196 \text{ Sq Ft Bucket Area} \times 55.6 \text{ Cycles/Hr}}{2 \text{ Passes per Set (50\% Overlap)}} = 5,449 \text{ sq ft/hr}$$

Lost Time :

Weather, greasing, mechanical repairs, shifting scows, changing wires, etc. 8 hours

Average Daily Operating Time:

$$24 \text{ Hours} - 8 \text{ Lost Time (Hrs)} = 16 \text{ hours}$$

Average Daily Production:

$$16 \text{ Hrs/Day} \times 5,449 \text{ Sq Ft/Hr} = 87,184 \text{ sq ft/day}$$

**USE 87,200 sq ft/day**



**CLAMSHELL COVERAGE CUT, OR STEP PRODUCTION CALCULATIONS**

Project: C&D Canal Deepening Project  
 Dredge Site: C&D Canal, Tolchester and Brewerton Channels  
 Disposal Site: Various  
 Materials: Dense Clays and Sands  
 Bank: Coverage Cut, average depth is less than 4 feet.

Production Factors :

14	CY, Bucket Size	60	Degrees, Swing Angle
40	Ft, Average Digging Depth	2	Rpm, Swing Speed
10	Ft, Average Scow Freeboard	50	Working Minutes per Hour
50	Ft, Lifting Distance	149	Sq Ft, Bucket Footprint
200	Ft/Min, Hoisting Speed		

Cycle Time :	Seconds
Load Bucket	8
Lift Load	15
Swing Load	5
Dump Load	2
Return Swing	5
Lower Bucket	9
Lost Time (accelerating, positioning, stepping ahead)	10
<b>Total Cycle Time</b>	<b>54</b> sec/load

Cycles per Hour :

$$\frac{50 \text{ Working Min/Hr} \times 60 \text{ Sec/Min}}{54 \text{ Sec/Load (Cycle Time)}} = 55.6 \text{ cycles/hr}$$

Area per Hour :

$$\frac{149 \text{ Sq Ft Bucket Area} \times 55.6 \text{ Cycles/Hr}}{2 \text{ Passes per Set (50\% Overlap)}} = 4,142 \text{ sq ft/hr}$$

Lost Time :

Weather, greasing, mechanical repairs, shifting scows, changing wires, etc. = 8 hours

Average Daily Operating Time:

$$24 \text{ Hours} - 8 \text{ Lost Time (Hrs)} = 16 \text{ hours}$$

Average Daily Production:

$$16 \text{ Hrs/Day} \times 4,142 \text{ Sq Ft/Hr} = 66,272 \text{ sq ft/day}$$

**USE 66,300 sq ft/day**

### AVERAGE HOURLY CLAMSHELL DREDGE PRODUCTION RATES BY REACH - 37' DEEPENING

The average hourly production rates are estimated, in order to develop scow loading times and the number of scows and tugs required.

No.	Channel Reach		Type of Dredge	Type of Material	Total Cubic Yards to Dredge	Total Number of Days	Average Cubic Yards per Day	Hours per Day	Average Cubic Yards per Hour
	From Station	To Station							
<b>C &amp; D Canal</b>									
21	203+000	210+000	Clamshell	Silts & Mud	16,366	5.8	2,802	17	165
22	210+000	220+000	Clamshell	Silts & Mud	730,463	53.3	13,694	17	806
23	220+000	230+000	Clamshell	Silts & Mud	224,658	26.2	8,561	17	504
24	230+000	239+740	Clamshell	Silts & Mud	406,560	44.8	9,072	17	534
<b>Tolchester</b>									
25	5+500	20+000	Clamshell	Silts & Mud	774,408	94.2	8,218	17	483
26	20+000	30+000	Clamshell	Silts & Mud	177,677	44.3	4,011	17	236
27	30+000	40+000	Clamshell	Silts & Mud	384,687	61.1	6,295	17	370
28	40+000	50+000	Clamshell	Silts & Mud	258,327	13.2	19,532	17	1,149
29	50+000	58+901	Clamshell	Silts & Mud	32,846	4.3	7,629	17	449
<b>Brewerton</b>									
30	0+000	10+000	Clamshell	Silts & Mud	446,947	43.7	10,235	17	602
31	10+000	20+000	Clamshell	Silts & Mud	568,699	49.5	11,480	17	675
32	20+000	33+200	Clamshell	Silts & Mud	1,059,973	98.6	10,755	17	633

**Notes:**

Total CY to Dredge taken from table of Material Quantities - New Work + Existing Project (Alternates A & B)

Total No. of Days (Production + Coverage) taken from tables of Time Required - Bank & Step Production (Alternates A & B)

Average CY/Day Column = Total CY to Dredge divided by Total No. of Days.



**TUG AND SCOW REQUIREMENTS - 37' DEEPENING  
(Transport to Kent Island Deep)**

Production Factors:

4,000	CY, Nominal Scow Capacity	5.0	Knots, Sailing Speed Full
3,400	CY, Effective Scow Capacity	10.0	Knots, Sailing Speed Empty
15	Tug Operating Hours per Day	17	Dredge Operating Hours per Day

No.	Channel Reach		Average Haul Dist. (N. Miles)	Scow Transport Time (Hours)				Total Transport
	From Station	To Station		Haul to Placement Site	Bottom Dump	Return Haul	Reposition Scow	
<b>C &amp; D Canal</b>								
21	203+000	210+000	22.2	4.44	0.05	2.22	0.35	7.06
22	210+000	220+000	20.6	4.12	0.05	2.06	0.35	6.58
23	220+000	230+000	18.9	3.78	0.05	1.89	0.35	6.07
24	230+000	239+740	17.3	3.46	0.05	1.73	0.35	5.59

<b>Tolchester</b>								
25	5+500	20+000	9.1	1.82	0.05	0.91	0.35	3.13
26	20+000	30+000	10.7	2.14	0.05	1.07	0.35	3.61
27	30+000	40+000	12.3	2.46	0.05	1.23	0.35	4.09
28	40+000	50+000	14.0	2.80	0.05	1.40	0.35	4.60
29	50+000	58+901	15.6	3.12	0.05	1.56	0.35	5.08

<b>Brewerton</b>								
30	0+000	10+000	11.5	2.30	0.05	1.15	0.35	3.85
31	10+000	20+000	10.5	2.10	0.05	1.05	0.35	3.55
32	20+000	33+200	9.4	1.88	0.05	0.94	0.35	3.22

No.	Channel Reach		Dredge Digging Rate (CY/Hr)	Scow Load Time (Hrs/Load)	No. Scows Loaded per Day	Total Towing Hrs Required	No. of Tugs and Scows in Tow	Total Scows Including Loading
	From Station	To Station						
<b>C &amp; D Canal</b>								
21	203+000	210+000	165	20.63	0.8	5.8	0.4	1.4
22	210+000	220+000	806	4.22	4.0	26.5	1.8	2.8
23	220+000	230+000	504	6.75	2.5	15.3	1.0	2.0
24	230+000	239+740	534	6.37	2.7	14.9	1.0	2.0

<b>Tolchester</b>								
25	5+500	20+000	483	7.03	2.4	7.6	0.5	1.5
26	20+000	30+000	236	14.41	1.2	4.3	0.3	1.3
27	30+000	40+000	370	9.18	1.9	7.6	0.5	1.5
28	40+000	50+000	1,149	2.96	5.7	26.4	1.8	2.8
29	50+000	58+901	449	7.58	2.2	11.4	0.8	1.8

<b>Brewerton (600 Ft Channel)</b>								
30	0+000	10+000	602	5.65	3.0	11.6	0.8	1.8
31	10+000	20+000	675	5.03	3.4	12.0	0.8	1.8
32	20+000	33+200	633	5.37	3.2	10.2	0.7	1.7

**TABLE A - 1**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO REEDY POINT N/S**

Operating Costs

	Clamshell Dredge	0.00	Months @ \$	246,871	0
1	Hydraulic Dredge	0.00	Months @ \$	647,998	0
	Hyd. Unloader	0.00	Months @ \$	266,456	0
	Booster Barge	0.00	Months @ \$	184,803	0
	Towing Tug	0.00	Months @ \$	141,150	0
2	Tending Tug	0.00	Months @ \$	65,363	0
1	Survey/Crewboat	0.00	Months @ \$	59,106	0
	Dump Scows	0.00	Months @ \$	22,233	0
	Hopper Scows	0.00	Months @ \$	6,613	0
1	Derrick Barge	0.00	Months @ \$	74,162	0
1	Deck Barge	0.00	Months @ \$	1,969	0
1	Fuel Barge	0.00	Months @ \$	2,938	0
1	Shore Crew	0.00	Months @ \$	105,242	0
1	Superv/Engrg	0.00	Months @ \$	61,666	0

Total Operating Costs \$

Ownership Costs

0	Clamshell Dredge	0.00	Months @ \$	176,079	0
1	Hydraulic Dredge	0.00	Months @ \$	255,693	0
0	Hyd. Unloader	0.00	Months @ \$	103,040	0
0	Booster Barge	0.00	Months @ \$	36,640	0
0	Towing Tug	0.00	Months @ \$	64,456	0
2	Tending Tug	0.00	Months @ \$	12,248	0
1	Survey/Crewboat	0.00	Months @ \$	8,252	0
0	Dump Scows	0.00	Months @ \$	82,264	0
0	Hopper Scows	0.00	Months @ \$	37,024	0
1	Derrick Barge	0.00	Months @ \$	13,929	0
1	Deck Barge	0.00	Months @ \$	7,503	0
1	Fuel Barge	0.00	Months @ \$	14,591	0

Total Ownership Costs \$

Market Factor @

Overhead @  Total Direct Costs \$

Contingency @  Sub Total \$

Profit @

Bond @  Sub Total \$

Total Dredge Price \$

0 Estimated Dredge Price \$

----- =  \$/CY

234 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$



**TABLE A - 2**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO REEDY POINT N/S**

Operating Costs					
	Clamshell Dredge	1.50	Months @ \$	246,871	0
1	Hydraulic Dredge	1.50	Months @ \$	647,998	971,997
	Hyd. Unloader	1.50	Months @ \$	266,456	0
	Booster Barge	1.50	Months @ \$	184,803	0
	Towing Tug	1.50	Months @ \$	141,150	0
2	Tending Tug	1.50	Months @ \$	65,363	196,088
1	Survey/Crewboat	1.50	Months @ \$	59,106	88,659
	Dump Scows	1.50	Months @ \$	22,233	0
	Hopper Scows	1.50	Months @ \$	6,613	0
1	Derrick Barge	1.50	Months @ \$	74,162	111,242
1	Deck Barge	1.50	Months @ \$	1,969	2,953
1	Fuel Barge	1.50	Months @ \$	2,938	4,406
1	Shore Crew	1.50	Months @ \$	105,242	157,864
1	Superv/Engrg	1.50	Months @ \$	61,666	92,499

Total Operating Costs \$ **1,625,708**

Ownership Costs					
0	Clamshell Dredge	1.50	Months @ \$	176,079	0
1	Hydraulic Dredge	1.50	Months @ \$	255,693	383,540
0	Hyd. Unloader	1.50	Months @ \$	103,040	0
0	Booster Barge	1.50	Months @ \$	36,640	0
0	Towing Tug	1.50	Months @ \$	64,456	0
2	Tending Tug	1.50	Months @ \$	12,248	36,744
1	Survey/Crewboat	1.50	Months @ \$	8,252	12,378
0	Dump Scows	1.50	Months @ \$	82,264	0
0	Hopper Scows	1.50	Months @ \$	37,024	0
1	Derrick Barge	1.50	Months @ \$	13,929	20,894
1	Deck Barge	1.50	Months @ \$	7,503	11,255
1	Fuel Barge	1.50	Months @ \$	14,591	21,887

Total Ownership Costs \$ **486,698**

Market Factor @ **50%** **243,349**

Overhead @ **15%** **280,359**

Contingency @ **10%** **214,942**

Profit @ **15%** **322,412**

Bond @ **0.5%** **13,434**

Total Direct Costs \$ **1,869,057**

Sub Total \$ **2,149,416**

Sub Total \$ **2,686,770**

Total Dredge Price \$ **2,700,204**

2,700,204 Estimated Dredge Price \$

----- = **2.71** \$/CY  
 994,789 Pay Cubic Yards (New Work + Existing Project)

**364,186** New Work Pay CY x **2.71** \$/CY = Est. Dredge Price \$ **986,943**

**TABLE A - 3  
COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO REEDY POINT N/S**

Operating Costs					
	Clamshell Dredge	0.30	Months @ \$	246,871	0
1	Hydraulic Dredge	0.30	Months @ \$	647,998	194,399
	Hyd. Unloader	0.30	Months @ \$	266,456	0
	Booster Barge	0.30	Months @ \$	184,803	0
	Towing Tug	0.30	Months @ \$	141,150	0
2	Tending Tug	0.30	Months @ \$	65,363	39,218
1	Survey/Crewboat	0.30	Months @ \$	59,106	17,732
	Dump Scows	0.30	Months @ \$	22,233	0
	Hopper Scows	0.30	Months @ \$	6,613	0
1	Derrick Barge	0.30	Months @ \$	74,162	22,248
1	Deck Barge	0.30	Months @ \$	1,969	591
1	Fuel Barge	0.30	Months @ \$	2,938	881
1	Shore Crew	0.30	Months @ \$	105,242	31,573
1	Superv/Engrg	0.30	Months @ \$	61,666	18,500

Total Operating Costs \$ **325,142**

Ownership Costs					
0	Clamshell Dredge	0.30	Months @ \$	176,079	0
1	Hydraulic Dredge	0.30	Months @ \$	255,693	76,708
0	Hyd. Unloader	0.30	Months @ \$	103,040	0
0	Booster Barge	0.30	Months @ \$	36,640	0
0	Towing Tug	0.30	Months @ \$	64,456	0
2	Tending Tug	0.30	Months @ \$	12,248	7,349
1	Survey/Crewboat	0.30	Months @ \$	8,252	2,476
0	Dump Scows	0.30	Months @ \$	82,264	0
0	Hopper Scows	0.30	Months @ \$	37,024	0
1	Derrick Barge	0.30	Months @ \$	13,929	4,179
1	Deck Barge	0.30	Months @ \$	7,503	2,251
1	Fuel Barge	0.30	Months @ \$	14,591	4,377

Total Ownership Costs \$ **97,340**

Market Factor @  **48,670**

Total Direct Costs \$ **373,812**  
**56,072**

Overhead @

Sub Total \$ **429,884**  
**42,988**  
**64,483**

Contingency @   
Profit @

Sub Total \$ **537,355**  
**2,687**

Bond @

Total Dredge Price \$ **540,042**

540,042 Estimated Dredge Price \$

----- = **15.98** \$/CY  
33,799 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **496,547**



**TABLE A - 4**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO BIDDLES POINT**

Operating Costs					
	Clamshell Dredge	0.31	Months @ \$	246,871	0
1	Hydraulic Dredge	0.31	Months @ \$	647,998	200,879
	Hyd. Unloader	0.31	Months @ \$	266,456	0
	Booster Barge	0.31	Months @ \$	184,803	0
	Towing Tug	0.31	Months @ \$	141,150	0
2	Tending Tug	0.31	Months @ \$	65,363	40,525
1	Survey/Crewboat	0.31	Months @ \$	59,106	18,323
	Dump Scows	0.31	Months @ \$	22,233	0
	Hopper Scows	0.31	Months @ \$	6,613	0
1	Derrick Barge	0.31	Months @ \$	74,162	22,990
1	Deck Barge	0.31	Months @ \$	1,969	610
1	Fuel Barge	0.31	Months @ \$	2,938	911
1	Shore Crew	0.31	Months @ \$	105,242	32,625
1	Superv/Engrg	0.31	Months @ \$	61,666	19,116

Total Operating Costs \$ **335,979**

Ownership Costs					
0	Clamshell Dredge	0.31	Months @ \$	176,079	0
1	Hydraulic Dredge	0.31	Months @ \$	255,693	79,265
0	Hyd. Unloader	0.31	Months @ \$	103,040	0
0	Booster Barge	0.31	Months @ \$	36,640	0
0	Towing Tug	0.31	Months @ \$	64,456	0
2	Tending Tug	0.31	Months @ \$	12,248	7,594
1	Survey/Crewboat	0.31	Months @ \$	8,252	2,558
0	Dump Scows	0.31	Months @ \$	82,264	0
0	Hopper Scows	0.31	Months @ \$	37,024	0
1	Derrick Barge	0.31	Months @ \$	13,929	4,318
1	Deck Barge	0.31	Months @ \$	7,503	2,326
1	Fuel Barge	0.31	Months @ \$	14,591	4,523

Total Ownership Costs \$ **100,584**

Market Factor @ **50%** **50,292**

Total Direct Costs \$ **386,271**

Overhead @ **15%** **57,941**

Sub Total \$ **444,212**

Contingency @ **10%** **44,421**

Profit @ **15%** **66,632**

Sub Total \$ **555,265**

Bond @ **0.5%** **2,776**

Total Dredge Price \$ **558,041**

558,041 Estimated Dredge Price \$  
----- = **11.68** \$/CY  
47,785 Pay Cubic Yards (New Work + Existing Project)

**39,110** New Work Pay CY x **11.68** \$/CY = Est. Dredge Price \$ **456,799**





**TABLE A - 6**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO ST. GEORGE / SCHOOL RD.**

Operating Costs					
	Clamshell Dredge	0.34	Months @ \$	246,871	0
1	Hydraulic Dredge	0.34	Months @ \$	647,998	220,319
	Hyd. Unloader	0.34	Months @ \$	266,456	0
	Booster Barge	0.34	Months @ \$	184,803	0
	Towing Tug	0.34	Months @ \$	141,150	0
2	Tending Tug	0.34	Months @ \$	65,363	44,447
1	Survey/Crewboat	0.34	Months @ \$	59,106	20,096
	Dump Scows	0.34	Months @ \$	22,233	0
	Hopper Scows	0.34	Months @ \$	6,613	0
1	Derrick Barge	0.34	Months @ \$	74,162	25,215
1	Deck Barge	0.34	Months @ \$	1,969	669
1	Fuel Barge	0.34	Months @ \$	2,938	999
1	Shore Crew	0.34	Months @ \$	105,242	35,782
1	Superv/Engrg	0.34	Months @ \$	61,666	20,966

Total Operating Costs \$ **368,493**

Ownership Costs					
0	Clamshell Dredge	0.34	Months @ \$	176,079	0
1	Hydraulic Dredge	0.34	Months @ \$	255,693	86,936
0	Hyd. Unloader	0.34	Months @ \$	103,040	0
0	Booster Barge	0.34	Months @ \$	36,640	0
0	Towing Tug	0.34	Months @ \$	64,456	0
2	Tending Tug	0.34	Months @ \$	12,248	8,329
1	Survey/Crewboat	0.34	Months @ \$	8,252	2,806
0	Dump Scows	0.34	Months @ \$	82,264	0
0	Hopper Scows	0.34	Months @ \$	37,024	0
1	Derrick Barge	0.34	Months @ \$	13,929	4,736
1	Deck Barge	0.34	Months @ \$	7,503	2,551
1	Fuel Barge	0.34	Months @ \$	14,591	4,961

Total Ownership Costs \$ **110,319**

Market Factor @  **55,160**

Total Direct Costs \$ **423,653**  
 63,548

Overhead @

Sub Total \$ **487,201**  
 48,720  
 73,080

Contingency @   
 Profit @

Sub Total \$ **609,001**  
 3,045

Bond @

Total Dredge Price \$ **612,046**

612,046 Estimated Dredge Price \$  
 ----- = **27.13** \$/CY  
 22,559 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **299,828**

**TABLE A - 7  
COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO BETHEL**

Operating Costs					
	Clamshell Dredge	0.52	Months @ \$	246,871	0
1	Hydraulic Dredge	0.52	Months @ \$	647,998	336,959
	Hyd. Unloader	0.52	Months @ \$	266,456	0
	Booster Barge	0.52	Months @ \$	184,803	0
	Towing Tug	0.52	Months @ \$	141,150	0
2	Tending Tug	0.52	Months @ \$	65,363	67,977
1	Survey/Crewboat	0.52	Months @ \$	59,106	30,735
	Dump Scows	0.52	Months @ \$	22,233	0
	Hopper Scows	0.52	Months @ \$	6,613	0
1	Derrick Barge	0.52	Months @ \$	74,162	38,564
1	Deck Barge	0.52	Months @ \$	1,969	1,024
1	Fuel Barge	0.52	Months @ \$	2,938	1,528
1	Shore Crew	0.52	Months @ \$	105,242	54,726
1	Superv/Engrg	0.52	Months @ \$	61,666	32,066

Total Operating Costs \$ **563,579**

Ownership Costs					
0	Clamshell Dredge	0.52	Months @ \$	176,079	0
1	Hydraulic Dredge	0.52	Months @ \$	255,693	132,960
0	Hyd. Unloader	0.52	Months @ \$	103,040	0
0	Booster Barge	0.52	Months @ \$	36,640	0
0	Towing Tug	0.52	Months @ \$	64,456	0
2	Tending Tug	0.52	Months @ \$	12,248	12,738
1	Survey/Crewboat	0.52	Months @ \$	8,252	4,291
0	Dump Scows	0.52	Months @ \$	82,264	0
0	Hopper Scows	0.52	Months @ \$	37,024	0
1	Derrick Barge	0.52	Months @ \$	13,929	7,243
1	Deck Barge	0.52	Months @ \$	7,503	3,902
1	Fuel Barge	0.52	Months @ \$	14,591	7,587

Total Ownership Costs \$ **168,721**

Market Factor @ **50%** **84,361**

Total Direct Costs \$ **647,940**  
**97,191**

Overhead @ **15%**

Sub Total \$ **745,131**  
**74,513**  
**111,770**

Contingency @ **10%**  
Profit @ **15%**

Sub Total \$ **931,414**  
**4,657**

Bond @ **0.5%**

Total Dredge Price \$ **936,071**

936,071 Estimated Dredge Price \$

----- = **36.42** \$/CY  
25,700 Pay Cubic Yards (New Work + Existing Project)

**16,894** New Work Pay CY x **36.42** \$/CY = Est. Dredge Price \$ **615,283**



**TABLE A - 8  
COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO BETHEL**

Operating Costs					
	Clamshell Dredge	0.33	Months @ \$	246,871	0
1	Hydraulic Dredge	0.33	Months @ \$	647,998	213,839
	Hyd. Unloader	0.33	Months @ \$	266,456	0
	Booster Barge	0.33	Months @ \$	184,803	0
	Towing Tug	0.33	Months @ \$	141,150	0
2	Tending Tug	0.33	Months @ \$	65,363	43,139
1	Survey/Crewboat	0.33	Months @ \$	59,106	19,505
	Dump Scows	0.33	Months @ \$	22,233	0
	Hopper Scows	0.33	Months @ \$	6,613	0
1	Derrick Barge	0.33	Months @ \$	74,162	24,473
1	Deck Barge	0.33	Months @ \$	1,969	650
1	Fuel Barge	0.33	Months @ \$	2,938	969
1	Shore Crew	0.33	Months @ \$	105,242	34,730
1	Superv/Engrg	0.33	Months @ \$	61,666	20,350

Total Operating Costs \$ **357,655**

Ownership Costs					
0	Clamshell Dredge	0.33	Months @ \$	176,079	0
1	Hydraulic Dredge	0.33	Months @ \$	255,693	84,379
0	Hyd. Unloader	0.33	Months @ \$	103,040	0
0	Booster Barge	0.33	Months @ \$	36,640	0
0	Towing Tug	0.33	Months @ \$	64,456	0
2	Tending Tug	0.33	Months @ \$	12,248	8,084
1	Survey/Crewboat	0.33	Months @ \$	8,252	2,723
0	Dump Scows	0.33	Months @ \$	82,264	0
0	Hopper Scows	0.33	Months @ \$	37,024	0
1	Derrick Barge	0.33	Months @ \$	13,929	4,597
1	Deck Barge	0.33	Months @ \$	7,503	2,476
1	Fuel Barge	0.33	Months @ \$	14,591	4,815

Total Ownership Costs \$ **107,074**

Market Factor @  **53,537**

Total Direct Costs \$ **411,192**  
**61,679**

Overhead @

Sub Total \$ **472,871**  
**47,287**  
**70,931**

Contingency @   
Profit @

Sub Total \$ **591,089**  
**2,955**

Bond @

Total Dredge Price \$ **594,044**

594,044 Estimated Dredge Price \$  
-----  
37,002 Pay Cubic Yards (New Work + Existing Project) = **16.05** \$/CY

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **272,873**

**TABLE A - 9  
COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO BETHEL**

**Operating Costs**

	Clamshell Dredge	0.16	Months @ \$	246,871	0
1	Hydraulic Dredge	0.16	Months @ \$	647,998	103,680
	Hyd. Unloader	0.16	Months @ \$	266,456	0
	Booster Barge	0.16	Months @ \$	184,803	0
	Towing Tug	0.16	Months @ \$	141,150	0
2	Tending Tug	0.16	Months @ \$	65,363	20,916
1	Survey/Crewboat	0.16	Months @ \$	59,106	9,457
	Dump Scows	0.16	Months @ \$	22,233	0
	Hopper Scows	0.16	Months @ \$	6,613	0
1	Derrick Barge	0.16	Months @ \$	74,162	11,866
1	Deck Barge	0.16	Months @ \$	1,969	315
1	Fuel Barge	0.16	Months @ \$	2,938	470
1	Shore Crew	0.16	Months @ \$	105,242	16,839
1	Superv/Engrg	0.16	Months @ \$	61,666	9,867

Total Operating Costs \$ **173,410**

**Ownership Costs**

0	Clamshell Dredge	0.16	Months @ \$	176,079	0
1	Hydraulic Dredge	0.16	Months @ \$	255,693	40,911
0	Hyd. Unloader	0.16	Months @ \$	103,040	0
0	Booster Barge	0.16	Months @ \$	36,640	0
0	Towing Tug	0.16	Months @ \$	64,456	0
2	Tending Tug	0.16	Months @ \$	12,248	3,919
1	Survey/Crewboat	0.16	Months @ \$	8,252	1,320
0	Dump Scows	0.16	Months @ \$	82,264	0
0	Hopper Scows	0.16	Months @ \$	37,024	0
1	Derrick Barge	0.16	Months @ \$	13,929	2,229
1	Deck Barge	0.16	Months @ \$	7,503	1,200
1	Fuel Barge	0.16	Months @ \$	14,591	2,335

Total Ownership Costs \$ **51,914**

Market Factor @ **50%** **25,957**

Total Direct Costs \$ **199,367**

Overhead @ **15%** **29,905**

Sub Total \$ **229,272**

Contingency @ **10%** **22,927**

Profit @ **15%** **34,391**

Sub Total \$ **286,590**

Bond @ **0.5%** **1,433**

Total Dredge Price \$ **288,023**

288,023 Estimated Dredge Price \$

----- = **53.17** \$/CY

5,417 Pay Cubic Yards (New Work + Existing Project)

**3,363** New Work Pay CY x **53.17** \$/CY = Est. Dredge Price \$ **178,791**



**TABLE A - 10  
COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO COURTHOUSE POINT**

Operating Costs					
	Clamshell Dredge	0.33	Months @ \$	246,871	0
1	Hydraulic Dredge	0.33	Months @ \$	647,998	213,839
	Hyd. Unloader	0.33	Months @ \$	266,456	0
	Booster Barge	0.33	Months @ \$	184,803	0
	Towing Tug	0.33	Months @ \$	141,150	0
2	Tending Tug	0.33	Months @ \$	65,363	43,139
1	Survey/Crewboat	0.33	Months @ \$	59,106	19,505
	Dump Scows	0.33	Months @ \$	22,233	0
	Hopper Scows	0.33	Months @ \$	6,613	0
1	Derrick Barge	0.33	Months @ \$	74,162	24,473
1	Deck Barge	0.33	Months @ \$	1,969	650
1	Fuel Barge	0.33	Months @ \$	2,938	969
1	Shore Crew	0.33	Months @ \$	105,242	34,730
1	Superv/Engrg	0.33	Months @ \$	61,666	20,350

Total Operating Costs \$ **357,655**

Ownership Costs					
0	Clamshell Dredge	0.33	Months @ \$	176,079	0
1	Hydraulic Dredge	0.33	Months @ \$	255,693	84,379
0	Hyd. Unloader	0.33	Months @ \$	103,040	0
0	Booster Barge	0.33	Months @ \$	36,640	0
0	Towing Tug	0.33	Months @ \$	64,456	0
2	Tending Tug	0.33	Months @ \$	12,248	8,084
1	Survey/Crewboat	0.33	Months @ \$	8,252	2,723
0	Dump Scows	0.33	Months @ \$	82,264	0
0	Hopper Scows	0.33	Months @ \$	37,024	0
1	Derrick Barge	0.33	Months @ \$	13,929	4,597
1	Deck Barge	0.33	Months @ \$	7,503	2,476
1	Fuel Barge	0.33	Months @ \$	14,591	4,815

Total Ownership Costs \$ **107,074**

Market Factor @ **50%** **53,537**

Total Direct Costs \$ **411,192**  
**61,679**

Overhead @ **15%**

Sub Total \$ **472,871**  
**47,287**  
**70,931**

Contingency @ **10%**  
Profit @ **15%**

Sub Total \$ **591,089**  
**2,955**

Bond @ **0.5%**

Total Dredge Price \$ **594,044**

594,044 Estimated Dredge Price \$

----- = **1.88** \$/CY  
315,450 Pay Cubic Yards (New Work + Existing Project)

**43,666** New Work Pay CY x **1.88** \$/CY = Est. Dredge Price \$ **82,092**

**TABLE A - 11**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO COURTHOUSE POINT**

Operating Costs					
	Clamshell Dredge	0.05	Months @ \$	246,871	0
1	Hydraulic Dredge	0.05	Months @ \$	647,998	32,400
	Hyd. Unloader	0.05	Months @ \$	266,456	0
	Booster Barge	0.05	Months @ \$	184,803	0
	Towing Tug	0.05	Months @ \$	141,150	0
2	Tending Tug	0.05	Months @ \$	65,363	6,536
1	Survey/Crewboat	0.05	Months @ \$	59,106	2,955
	Dump Scows	0.05	Months @ \$	22,233	0
	Hopper Scows	0.05	Months @ \$	6,613	0
1	Derrick Barge	0.05	Months @ \$	74,162	3,708
1	Deck Barge	0.05	Months @ \$	1,969	98
1	Fuel Barge	0.05	Months @ \$	2,938	147
1	Shore Crew	0.05	Months @ \$	105,242	5,262
1	Superv/Engrg	0.05	Months @ \$	61,666	3,083

Total Operating Costs \$ **54,189**

Ownership Costs					
0	Clamshell Dredge	0.05	Months @ \$	176,079	0
1	Hydraulic Dredge	0.05	Months @ \$	255,693	12,785
0	Hyd. Unloader	0.05	Months @ \$	103,040	0
0	Booster Barge	0.05	Months @ \$	36,640	0
0	Towing Tug	0.05	Months @ \$	64,456	0
2	Tending Tug	0.05	Months @ \$	12,248	1,225
1	Survey/Crewboat	0.05	Months @ \$	8,252	413
0	Dump Scows	0.05	Months @ \$	82,264	0
0	Hopper Scows	0.05	Months @ \$	37,024	0
1	Derrick Barge	0.05	Months @ \$	13,929	696
1	Deck Barge	0.05	Months @ \$	7,503	375
1	Fuel Barge	0.05	Months @ \$	14,591	730

Total Ownership Costs \$ **16,224**

Market Factor @ **50%** **8,112**

Overhead @ **15%** Total Direct Costs \$ **62,301**  
**9,345**

Contingency @ **10%** Sub Total \$ **71,646**  
 Profit @ **15%** **7,165**  
**10,747**

Bond @ **0.5%** Sub Total \$ **89,558**  
**448**

Total Dredge Price \$ **90,006**

90,006 Estimated Dredge Price \$  
 ----- = **20.48** \$/CY  
 4,394 Pay Cubic Yards (New Work + Existing Project)

**0** New Work Pay CY x **20.48** \$/CY = Est. Dredge Price \$ **0**



**TABLE A - 12**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO COURTHOUSE POINT**

**Operating Costs**

	Clamshell Dredge	0.07	Months @ \$	246,871	0
1	Hydraulic Dredge	0.07	Months @ \$	647,998	45,360
	Hyd. Unloader	0.07	Months @ \$	266,456	0
	Booster Barge	0.07	Months @ \$	184,803	0
	Towing Tug	0.07	Months @ \$	141,150	0
2	Tending Tug	0.07	Months @ \$	65,363	9,151
1	Survey/Crewboat	0.07	Months @ \$	59,106	4,137
	Dump Scows	0.07	Months @ \$	22,233	0
	Hopper Scows	0.07	Months @ \$	6,613	0
1	Derrick Barge	0.07	Months @ \$	74,162	5,191
1	Deck Barge	0.07	Months @ \$	1,969	138
1	Fuel Barge	0.07	Months @ \$	2,938	206
1	Shore Crew	0.07	Months @ \$	105,242	7,367
1	Superv/Engrg	0.07	Months @ \$	61,666	4,317

Total Operating Costs \$ **75,867**

**Ownership Costs**

0	Clamshell Dredge	0.07	Months @ \$	176,079	0
1	Hydraulic Dredge	0.07	Months @ \$	255,693	17,899
0	Hyd. Unloader	0.07	Months @ \$	103,040	0
0	Booster Barge	0.07	Months @ \$	36,640	0
0	Towing Tug	0.07	Months @ \$	64,456	0
2	Tending Tug	0.07	Months @ \$	12,248	1,715
1	Survey/Crewboat	0.07	Months @ \$	8,252	578
0	Dump Scows	0.07	Months @ \$	82,264	0
0	Hopper Scows	0.07	Months @ \$	37,024	0
1	Derrick Barge	0.07	Months @ \$	13,929	975
1	Deck Barge	0.07	Months @ \$	7,503	525
1	Fuel Barge	0.07	Months @ \$	14,591	1,021

Total Ownership Costs \$ **22,713**

Market Factor @  **11,357**

Overhead @  Total Direct Costs \$ **87,224**  
**13,084**

Contingency @  Sub Total \$ **100,308**  
Profit @  **10,031**  
**15,046**

Bond @  Sub Total \$ **125,385**  
**627**

Total Dredge Price \$ **126,012**

126,012 Estimated Dredge Price \$  
----- = **42.23** \$/CY  
2,984 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$

**TABLE A - 13  
COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO COURTHOUSE POINT**

Operating Costs					
	Clamshell Dredge	0.15	Months @ \$	246,871	0
1	Hydraulic Dredge	0.15	Months @ \$	647,998	97,200
	Hyd. Unloader	0.15	Months @ \$	266,456	0
1	Booster Barge	0.15	Months @ \$	184,803	27,720
	Towing Tug	0.15	Months @ \$	141,150	0
2	Tending Tug	0.15	Months @ \$	65,363	19,609
1	Survey/Crewboat	0.15	Months @ \$	59,106	8,866
	Dump Scows	0.15	Months @ \$	22,233	0
	Hopper Scows	0.15	Months @ \$	6,613	0
1	Derrick Barge	0.15	Months @ \$	74,162	11,124
1	Deck Barge	0.15	Months @ \$	1,969	295
1	Fuel Barge	0.15	Months @ \$	2,938	441
1	Shore Crew	0.15	Months @ \$	105,242	15,786
1	Superv/Engrg	0.15	Months @ \$	61,666	9,250

Total Operating Costs \$ **190,291**

Ownership Costs					
0	Clamshell Dredge	0.15	Months @ \$	176,079	0
1	Hydraulic Dredge	0.15	Months @ \$	255,693	38,354
0	Hyd. Unloader	0.15	Months @ \$	103,040	0
1	Booster Barge	0.15	Months @ \$	36,640	5,496
0	Towing Tug	0.15	Months @ \$	64,456	0
2	Tending Tug	0.15	Months @ \$	12,248	3,674
1	Survey/Crewboat	0.15	Months @ \$	8,252	1,238
0	Dump Scows	0.15	Months @ \$	82,264	0
0	Hopper Scows	0.15	Months @ \$	37,024	0
1	Derrick Barge	0.15	Months @ \$	13,929	2,089
1	Deck Barge	0.15	Months @ \$	7,503	1,125
1	Fuel Barge	0.15	Months @ \$	14,591	2,189

Total Ownership Costs \$ **54,165**

Market Factor @  **27,083**

Total Direct Costs \$ **217,374**  
**32,606**

Overhead @

Sub Total \$ **249,980**  
**24,998**  
**37,497**

Contingency @   
Profit @

Sub Total \$ **312,475**  
**1,562**

Bond @

Total Dredge Price \$ **314,037**

314,037 Estimated Dredge Price \$

----- =  \$/CY  
72,174 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$



**TABLE A - 14**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO PIERCE CREEK**

Operating Costs					
	Clamshell Dredge	0.22	Months @ \$	246,871	0
1	Hydraulic Dredge	0.22	Months @ \$	647,998	142,560
	Hyd. Unloader	0.22	Months @ \$	266,456	0
	Booster Barge	0.22	Months @ \$	184,803	0
	Towing Tug	0.22	Months @ \$	141,150	0
2	Tending Tug	0.22	Months @ \$	65,363	28,760
1	Survey/Crewboat	0.22	Months @ \$	59,106	13,003
	Dump Scows	0.22	Months @ \$	22,233	0
	Hopper Scows	0.22	Months @ \$	6,613	0
1	Derrick Barge	0.22	Months @ \$	74,162	16,316
1	Deck Barge	0.22	Months @ \$	1,969	433
1	Fuel Barge	0.22	Months @ \$	2,938	646
1	Shore Crew	0.22	Months @ \$	105,242	23,153
1	Superv/Engrg	0.22	Months @ \$	61,666	13,567

Total Operating Costs \$ **238,438**

Ownership Costs					
0	Clamshell Dredge	0.22	Months @ \$	176,079	0
1	Hydraulic Dredge	0.22	Months @ \$	255,693	56,252
0	Hyd. Unloader	0.22	Months @ \$	103,040	0
0	Booster Barge	0.22	Months @ \$	36,640	0
0	Towing Tug	0.22	Months @ \$	64,456	0
2	Tending Tug	0.22	Months @ \$	12,248	5,389
1	Survey/Crewboat	0.22	Months @ \$	8,252	1,815
0	Dump Scows	0.22	Months @ \$	82,264	0
0	Hopper Scows	0.22	Months @ \$	37,024	0
1	Derrick Barge	0.22	Months @ \$	13,929	3,064
1	Deck Barge	0.22	Months @ \$	7,503	1,651
1	Fuel Barge	0.22	Months @ \$	14,591	3,210

Total Ownership Costs \$ **71,381**

Market Factor @ **50%** **35,691**

Overhead @ **15%** Total Direct Costs \$ **274,129**  
**41,119**

Contingency @ **10%** Sub Total \$ **315,248**  
 Profit @ **15%** **31,525**  
**47,287**

Bond @ **0.5%** Sub Total \$ **394,060**  
**1,970**

Total Dredge Price \$ **396,030**

396,030 Estimated Dredge Price \$  
 ----- = **7.10** \$/CY  
 55,760 Pay Cubic Yards (New Work + Existing Project)

**0** New Work Pay CY x **7.10** \$/CY = Est. Dredge Price \$ **0**

**TABLE A - 15**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO PIERCE CREEK**

Operating Costs					
	Clamshell Dredge	0.24	Months @ \$	246,871	0
1	Hydraulic Dredge	0.24	Months @ \$	647,998	155,520
	Hyd. Unloader	0.24	Months @ \$	266,456	0
	Booster Barge	0.24	Months @ \$	184,803	0
	Towing Tug	0.24	Months @ \$	141,150	0
2	Tending Tug	0.24	Months @ \$	65,363	31,374
1	Survey/Crewboat	0.24	Months @ \$	59,106	14,185
	Dump Scows	0.24	Months @ \$	22,233	0
	Hopper Scows	0.24	Months @ \$	6,613	0
1	Derrick Barge	0.24	Months @ \$	74,162	17,799
1	Deck Barge	0.24	Months @ \$	1,969	473
1	Fuel Barge	0.24	Months @ \$	2,938	705
1	Shore Crew	0.24	Months @ \$	105,242	25,258
1	Superv/Engrg	0.24	Months @ \$	61,666	14,800

Total Operating Costs \$ **260,114**

Ownership Costs					
0	Clamshell Dredge	0.24	Months @ \$	176,079	0
1	Hydraulic Dredge	0.24	Months @ \$	255,693	61,366
0	Hyd. Unloader	0.24	Months @ \$	103,040	0
0	Booster Barge	0.24	Months @ \$	36,640	0
0	Towing Tug	0.24	Months @ \$	64,456	0
2	Tending Tug	0.24	Months @ \$	12,248	5,879
1	Survey/Crewboat	0.24	Months @ \$	8,252	1,980
0	Dump Scows	0.24	Months @ \$	82,264	0
0	Hopper Scows	0.24	Months @ \$	37,024	0
1	Derrick Barge	0.24	Months @ \$	13,929	3,343
1	Deck Barge	0.24	Months @ \$	7,503	1,801
1	Fuel Barge	0.24	Months @ \$	14,591	3,502

Total Ownership Costs \$ **77,871**

Market Factor @ **50%** **38,936**

Total Direct Costs \$ **299,050**  
**44,858**

Overhead @ **15%**

Sub Total \$ **343,908**  
**34,391**  
**51,586**

Contingency @ **10%**  
 Profit @ **15%**

Sub Total \$ **429,885**  
**2,149**

Bond @ **0.5%**

Total Dredge Price \$ **432,034**

432,034 Estimated Dredge Price \$

----- = **4.82** \$/CY  
 89,580 Pay Cubic Yards (New Work + Existing Project)

**0** New Work Pay CY x **4.82** \$/CY = Est. Dredge Price \$ **0**



**TABLE A - 16**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO PIERCE CREEK**

Operating Costs					
	Clamshell Dredge	0.33	Months @ \$	246,871	0
1	Hydraulic Dredge	0.33	Months @ \$	647,998	213,839
	Hyd. Unloader	0.33	Months @ \$	266,456	0
	Booster Barge	0.33	Months @ \$	184,803	0
	Towing Tug	0.33	Months @ \$	141,150	0
2	Tending Tug	0.33	Months @ \$	65,363	43,139
1	Survey/Crewboat	0.33	Months @ \$	59,106	19,505
	Dump Scows	0.33	Months @ \$	22,233	0
	Hopper Scows	0.33	Months @ \$	6,613	0
1	Derrick Barge	0.33	Months @ \$	74,162	24,473
1	Deck Barge	0.33	Months @ \$	1,969	650
1	Fuel Barge	0.33	Months @ \$	2,938	969
1	Shore Crew	0.33	Months @ \$	105,242	34,730
1	Superv/Engrg	0.33	Months @ \$	61,666	20,350

Total Operating Costs \$ **357,655**

Ownership Costs					
0	Clamshell Dredge	0.33	Months @ \$	176,079	0
1	Hydraulic Dredge	0.33	Months @ \$	255,693	84,379
0	Hyd. Unloader	0.33	Months @ \$	103,040	0
0	Booster Barge	0.33	Months @ \$	36,640	0
0	Towing Tug	0.33	Months @ \$	64,456	0
2	Tending Tug	0.33	Months @ \$	12,248	8,084
1	Survey/Crewboat	0.33	Months @ \$	8,252	2,723
0	Dump Scows	0.33	Months @ \$	82,264	0
0	Hopper Scows	0.33	Months @ \$	37,024	0
1	Derrick Barge	0.33	Months @ \$	13,929	4,597
1	Deck Barge	0.33	Months @ \$	7,503	2,476
1	Fuel Barge	0.33	Months @ \$	14,591	4,815

Total Ownership Costs \$ **107,074**

Market Factor @ **50%** **53,537**

Overhead @ **15%** Total Direct Costs \$ **411,192**  
**61,679**

Contingency @ **10%** Sub Total \$ **472,871**  
 Profit @ **15%** **47,287**  
**70,931**

Bond @ **0.5%** Sub Total \$ **591,089**  
**2,955**

Total Dredge Price \$ **594,044**

594,044 Estimated Dredge Price \$  
 ----- = **4.66** \$/CY  
 127,534 Pay Cubic Yards (New Work + Existing Project)

**62,641** New Work Pay CY x **4.66** \$/CY = Est. Dredge Price \$ **291,906**

**TABLE A - 17**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO PIERCE CREEK**

Operating Costs

	Clamshell Dredge	0.10	Months @ \$	246,871	0
1	Hydraulic Dredge	0.10	Months @ \$	647,998	64,800
	Hyd. Unloader	0.10	Months @ \$	266,456	0
	Booster Barge	0.10	Months @ \$	184,803	0
	Towing Tug	0.10	Months @ \$	141,150	0
2	Tending Tug	0.10	Months @ \$	65,363	13,073
1	Survey/Crewboat	0.10	Months @ \$	59,106	5,911
	Dump Scows	0.10	Months @ \$	22,233	0
	Hopper Scows	0.10	Months @ \$	6,613	0
1	Derrick Barge	0.10	Months @ \$	74,162	7,416
1	Deck Barge	0.10	Months @ \$	1,969	197
1	Fuel Barge	0.10	Months @ \$	2,938	294
1	Shore Crew	0.10	Months @ \$	105,242	10,524
1	Superv/Engrg	0.10	Months @ \$	61,666	6,167

Total Operating Costs \$ **108,382**

Ownership Costs

0	Clamshell Dredge	0.10	Months @ \$	176,079	0
1	Hydraulic Dredge	0.10	Months @ \$	255,693	25,569
0	Hyd. Unloader	0.10	Months @ \$	103,040	0
0	Booster Barge	0.10	Months @ \$	36,640	0
0	Towing Tug	0.10	Months @ \$	64,456	0
2	Tending Tug	0.10	Months @ \$	12,248	2,450
1	Survey/Crewboat	0.10	Months @ \$	8,252	825
0	Dump Scows	0.10	Months @ \$	82,264	0
0	Hopper Scows	0.10	Months @ \$	37,024	0
1	Derrick Barge	0.10	Months @ \$	13,929	1,393
1	Deck Barge	0.10	Months @ \$	7,503	750
1	Fuel Barge	0.10	Months @ \$	14,591	1,459

Total Ownership Costs \$ **32,446**

Market Factor @ **50%** **16,223**

Overhead @ **15%** Total Direct Costs \$ **124,605**  
 18,691

Contingency @ **10%** Sub Total \$ **143,296**  
 Profit @ **15%** **14,330**  
**21,494**

Bond @ **0.5%** Sub Total \$ **179,120**  
 896

Total Dredge Price \$ **180,016**

180,016 Estimated Dredge Price \$  
 ----- = **8.85** \$/CY  
 20,340 Pay Cubic Yards (New Work + Existing Project)

**0** New Work Pay CY x **8.85** \$/CY = Est. Dredge Price \$ **0**



**TABLE A - 18**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO PIERCE CREEK**

Operating Costs					
	Clamshell Dredge	0.16	Months @ \$	246,871	0
1	Hydraulic Dredge	0.16	Months @ \$	647,998	103,680
	Hyd. Unloader	0.16	Months @ \$	266,456	0
1	Booster Barge	0.16	Months @ \$	184,803	29,568
	Towing Tug	0.16	Months @ \$	141,150	0
2	Tending Tug	0.16	Months @ \$	65,363	20,916
1	Survey/Crewboat	0.16	Months @ \$	59,106	9,457
	Dump Scows	0.16	Months @ \$	22,233	0
	Hopper Scows	0.16	Months @ \$	6,613	0
1	Derrick Barge	0.16	Months @ \$	74,162	11,866
1	Deck Barge	0.16	Months @ \$	1,969	315
1	Fuel Barge	0.16	Months @ \$	2,938	470
1	Shore Crew	0.16	Months @ \$	105,242	16,839
1	Superv/Engrg	0.16	Months @ \$	61,666	9,867

Total Operating Costs \$ **202,978**

Ownership Costs					
0	Clamshell Dredge	0.16	Months @ \$	176,079	0
1	Hydraulic Dredge	0.16	Months @ \$	255,693	40,911
0	Hyd. Unloader	0.16	Months @ \$	103,040	0
1	Booster Barge	0.16	Months @ \$	36,640	5,862
0	Towing Tug	0.16	Months @ \$	64,456	0
2	Tending Tug	0.16	Months @ \$	12,248	3,919
1	Survey/Crewboat	0.16	Months @ \$	8,252	1,320
0	Dump Scows	0.16	Months @ \$	82,264	0
0	Hopper Scows	0.16	Months @ \$	37,024	0
1	Derrick Barge	0.16	Months @ \$	13,929	2,229
1	Deck Barge	0.16	Months @ \$	7,503	1,200
1	Fuel Barge	0.16	Months @ \$	14,591	2,335

Total Ownership Costs \$ **57,776**

Market Factor @  **28,888**

Total Direct Costs \$ **231,866**  
**34,780**

Overhead @

Sub Total \$ **266,646**  
**26,665**  
**39,997**

Contingency @   
Profit @

Sub Total \$ **333,308**  
**1,667**

Bond @

Total Dredge Price \$ **334,975**

334,975 Estimated Dredge Price \$

----- = **10.71** \$/CY  
31,284 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$

**TABLE A - 19**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO PIERCE CREEK**

**Operating Costs**

	Clamshell Dredge	0.33	Months @ \$	246,871	0
1	Hydraulic Dredge	0.33	Months @ \$	647,998	213,839
	Hyd. Unloader	0.33	Months @ \$	266,456	0
1	Booster Barge	0.33	Months @ \$	184,803	60,985
	Towing Tug	0.33	Months @ \$	141,150	0
2	Tending Tug	0.33	Months @ \$	65,363	43,139
1	Survey/Crewboat	0.33	Months @ \$	59,106	19,505
	Dump Scows	0.33	Months @ \$	22,233	0
	Hopper Scows	0.33	Months @ \$	6,613	0
1	Derrick Barge	0.33	Months @ \$	74,162	24,473
1	Deck Barge	0.33	Months @ \$	1,969	650
1	Fuel Barge	0.33	Months @ \$	2,938	969
1	Shore Crew	0.33	Months @ \$	105,242	34,730
1	Superv/Engrg	0.33	Months @ \$	61,666	20,350

Total Operating Costs \$ **418,640**

**Ownership Costs**

0	Clamshell Dredge	0.33	Months @ \$	176,079	0
1	Hydraulic Dredge	0.33	Months @ \$	255,693	84,379
0	Hyd. Unloader	0.33	Months @ \$	103,040	0
1	Booster Barge	0.33	Months @ \$	36,640	12,091
0	Towing Tug	0.33	Months @ \$	64,456	0
2	Tending Tug	0.33	Months @ \$	12,248	8,084
1	Survey/Crewboat	0.33	Months @ \$	8,252	2,723
0	Dump Scows	0.33	Months @ \$	82,264	0
0	Hopper Scows	0.33	Months @ \$	37,024	0
1	Derrick Barge	0.33	Months @ \$	13,929	4,597
1	Deck Barge	0.33	Months @ \$	7,503	2,476
1	Fuel Barge	0.33	Months @ \$	14,591	4,815

Total Ownership Costs \$ **119,165**

Market Factor @ **50%** **59,583**

Overhead @ **15%** **71,733**

Contingency @ **10%**  
Profit @ **15%** **82,493**

Bond @ **0.5%** **3,437**

Total Direct Costs \$ **478,223**

Sub Total \$ **549,956**

Sub Total \$ **687,445**

Total Dredge Price \$ **690,882**

690,882 Estimated Dredge Price \$  
----- = **4.50** \$/CY  
153,573 Pay Cubic Yards (New Work + Existing Project)

**136,350** New Work Pay CY x **4.50** \$/CY = Est. Dredge Price \$ **613,574**



**TABLE A - 20**  
**COST SUMMARY - HYDRAULIC DREDGE WITH DIRECT PUMPOUT TO PIERCE CREEK**

Operating Costs					
	Clamshell Dredge	0.00	Months @ \$	246,871	0
1	Hydraulic Dredge	0.00	Months @ \$	647,998	0
	Hyd. Unloader	0.00	Months @ \$	266,456	0
1	Booster Barge	0.00	Months @ \$	184,803	0
	Towing Tug	0.00	Months @ \$	141,150	0
2	Tending Tug	0.00	Months @ \$	65,363	0
1	Survey/Crewboat	0.00	Months @ \$	59,106	0
	Dump Scows	0.00	Months @ \$	22,233	0
	Hopper Scows	0.00	Months @ \$	6,613	0
1	Derrick Barge	0.00	Months @ \$	74,162	0
1	Deck Barge	0.00	Months @ \$	1,969	0
1	Fuel Barge	0.00	Months @ \$	2,938	0
1	Shore Crew	0.00	Months @ \$	105,242	0
1	Superv/Engrg	0.00	Months @ \$	61,666	0

Total Operating Costs \$

Ownership Costs					
0	Clamshell Dredge	0.00	Months @ \$	176,079	0
1	Hydraulic Dredge	0.00	Months @ \$	255,693	0
0	Hyd. Unloader	0.00	Months @ \$	103,040	0
1	Booster Barge	0.00	Months @ \$	36,640	0
0	Towing Tug	0.00	Months @ \$	64,456	0
2	Tending Tug	0.00	Months @ \$	12,248	0
1	Survey/Crewboat	0.00	Months @ \$	8,252	0
0	Dump Scows	0.00	Months @ \$	82,264	0
0	Hopper Scows	0.00	Months @ \$	37,024	0
1	Derrick Barge	0.00	Months @ \$	13,929	0
1	Deck Barge	0.00	Months @ \$	7,503	0
1	Fuel Barge	0.00	Months @ \$	14,591	0

Total Ownership Costs \$

Market Factor @

Overhead @  Total Direct Costs \$

Contingency @  Sub Total \$   
 Profit @

Bond @  Sub Total \$

Total Dredge Price \$

0 Estimated Dredge Price \$

----- =  \$/CY  
 1,728 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$

**TABLE A - 21**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

Operating Costs					
1	Clamshell Dredge	0.19	Months @ \$	246,871	46,906
	Hydraulic Dredge	0.19	Months @ \$	647,998	0
	Hyd. Unloader	0.19	Months @ \$	266,456	0
	Booster Barge	0.19	Months @ \$	184,803	0
0	Towing Tug	0.19	Months @ \$	141,150	0
1	Tending Tug	0.19	Months @ \$	65,363	12,419
1	Survey/Crewboat	0.19	Months @ \$	59,106	11,230
1	Dump Scows	0.19	Months @ \$	22,233	4,224
	Hopper Scows	0.19	Months @ \$	6,613	0
	Derrick Barge	0.19	Months @ \$	74,162	0
	Deck Barge	0.19	Months @ \$	1,969	0
	Fuel Barge	0.19	Months @ \$	2,938	0
	Shore Crew	0.19	Months @ \$	105,242	0
1	Superv/Engrg	0.19	Months @ \$	61,666	11,717

Total Operating Costs \$ **86,496**

Ownership Costs					
1	Clamshell Dredge	0.19	Months @ \$	176,079	33,455
0	Hydraulic Dredge	0.19	Months @ \$	255,693	0
0	Hyd. Unloader	0.19	Months @ \$	103,040	0
0	Booster Barge	0.19	Months @ \$	36,640	0
0	Towing Tug	0.19	Months @ \$	64,456	0
1	Tending Tug	0.19	Months @ \$	12,248	2,327
1	Survey/Crewboat	0.19	Months @ \$	8,252	1,568
1	Dump Scows	0.19	Months @ \$	82,264	15,630
0	Hopper Scows	0.19	Months @ \$	37,024	0
0	Derrick Barge	0.19	Months @ \$	13,929	0
0	Deck Barge	0.19	Months @ \$	7,503	0
0	Fuel Barge	0.19	Months @ \$	14,591	0

Total Ownership Costs \$ **52,980**

Market Factor @ **50%** **26,490**

Overhead @ **15%** Total Direct Costs \$ **112,986**

Contingency @ **10%** **16,948**

Profit @ **15%** Sub Total \$ **129,934**

Bond @ **0.5%** **12,993**

Sub Total \$ **19,490**

Sub Total \$ **162,417**

Total Dredge Price \$ **163,229**

$$\frac{163,229 \text{ Estimated Dredge Price } \$}{12,024 \text{ Pay Cubic Yards (New Work + Existing Project)}} = \mathbf{13.58} \text{ } \$/\text{CY}$$

$$\mathbf{0} \text{ New Work Pay CY } \times \mathbf{13.58} \text{ } \$/\text{CY} = \text{Est. Dredge Price } \$ \mathbf{0}$$



**TABLE A - 22**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

Operating Costs

1	Clamshell Dredge	1.75	Months @ \$	246,871	432,025
	Hydraulic Dredge	1.75	Months @ \$	647,998	0
	Hyd. Unloader	1.75	Months @ \$	266,456	0
	Booster Barge	1.75	Months @ \$	184,803	0
2	Towing Tug	1.75	Months @ \$	141,150	494,023
1	Tending Tug	1.75	Months @ \$	65,363	114,385
1	Survey/Crewboat	1.75	Months @ \$	59,106	103,435
3	Dump Scows	1.75	Months @ \$	22,233	116,721
	Hopper Scows	1.75	Months @ \$	6,613	0
	Derrick Barge	1.75	Months @ \$	74,162	0
	Deck Barge	1.75	Months @ \$	1,969	0
	Fuel Barge	1.75	Months @ \$	2,938	0
	Shore Crew	1.75	Months @ \$	105,242	0
1	Superv/Engrg	1.75	Months @ \$	61,666	107,916

Total Operating Costs \$ **1,368,505**

Ownership Costs

1	Clamshell Dredge	1.75	Months @ \$	176,079	308,138
0	Hydraulic Dredge	1.75	Months @ \$	255,693	0
0	Hyd. Unloader	1.75	Months @ \$	103,040	0
0	Booster Barge	1.75	Months @ \$	36,640	0
2	Towing Tug	1.75	Months @ \$	64,456	225,596
1	Tending Tug	1.75	Months @ \$	12,248	21,434
1	Survey/Crewboat	1.75	Months @ \$	8,252	14,441
3	Dump Scows	1.75	Months @ \$	82,264	431,886
0	Hopper Scows	1.75	Months @ \$	37,024	0
0	Derrick Barge	1.75	Months @ \$	13,929	0
0	Deck Barge	1.75	Months @ \$	7,503	0
0	Fuel Barge	1.75	Months @ \$	14,591	0

Total Ownership Costs \$ **1,001,495**

Market Factor @  **500,748**

Total Direct Costs \$ **1,869,253**  
 280,388

Overhead @

Sub Total \$ **2,149,641**  
 214,964  
 322,446

Contingency @   
 Profit @

Sub Total \$ **2,687,051**  
 13,435

Bond @

Total Dredge Price \$ **2,700,486**

2,700,486 Estimated Dredge Price \$  
 ----- =  \$/CY  
 646,510 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **1,273,549**

**TABLE A - 23**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

**Operating Costs**

1	Clamshell Dredge	0.86	Months @ \$	246,871	212,309
	Hydraulic Dredge	0.86	Months @ \$	647,998	0
	Hyd. Unloader	0.86	Months @ \$	266,456	0
	Booster Barge	0.86	Months @ \$	184,803	0
1	Towing Tug	0.86	Months @ \$	141,150	121,389
1	Tending Tug	0.86	Months @ \$	65,363	56,212
1	Survey/Crewboat	0.86	Months @ \$	59,106	50,831
2	Dump Scows	0.86	Months @ \$	22,233	38,240
	Hopper Scows	0.86	Months @ \$	6,613	0
	Derrick Barge	0.86	Months @ \$	74,162	0
	Deck Barge	0.86	Months @ \$	1,969	0
	Fuel Barge	0.86	Months @ \$	2,938	0
	Shore Crew	0.86	Months @ \$	105,242	0
1	Superv/Engrg	0.86	Months @ \$	61,666	53,033

Total Operating Costs \$ **532,014**

**Ownership Costs**

1	Clamshell Dredge	0.86	Months @ \$	176,079	151,428
0	Hydraulic Dredge	0.86	Months @ \$	255,693	0
0	Hyd. Unloader	0.86	Months @ \$	103,040	0
0	Booster Barge	0.86	Months @ \$	36,640	0
1	Towing Tug	0.86	Months @ \$	64,456	55,432
1	Tending Tug	0.86	Months @ \$	12,248	10,533
1	Survey/Crewboat	0.86	Months @ \$	8,252	7,097
2	Dump Scows	0.86	Months @ \$	82,264	141,494
0	Hopper Scows	0.86	Months @ \$	37,024	0
0	Derrick Barge	0.86	Months @ \$	13,929	0
0	Deck Barge	0.86	Months @ \$	7,503	0
0	Fuel Barge	0.86	Months @ \$	14,591	0

Total Ownership Costs \$ **365,984**

Market Factor @  **182,992**

Total Direct Costs \$ **715,006**  
**107,251**

Overhead @

Sub Total \$ **822,257**  
**82,226**  
**123,339**

Contingency @   
Profit @

Sub Total \$ **1,027,822**  
**5,139**

Bond @

Total Dredge Price \$ **1,032,961**

1,032,961 Estimated Dredge Price \$

----- =  \$/CY  
179,119 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$



**TABLE A - 24**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

Operating Costs

1	Clamshell Dredge	1.47	Months @ \$	246,871	362,901
	Hydraulic Dredge	1.47	Months @ \$	647,998	0
	Hyd. Unloader	1.47	Months @ \$	266,456	0
	Booster Barge	1.47	Months @ \$	184,803	0
1	Towing Tug	1.47	Months @ \$	141,150	207,490
1	Tending Tug	1.47	Months @ \$	65,363	96,083
1	Survey/Crewboat	1.47	Months @ \$	59,106	86,886
2	Dump Scows	1.47	Months @ \$	22,233	65,364
	Hopper Scows	1.47	Months @ \$	6,613	0
	Derrick Barge	1.47	Months @ \$	74,162	0
	Deck Barge	1.47	Months @ \$	1,969	0
	Fuel Barge	1.47	Months @ \$	2,938	0
	Shore Crew	1.47	Months @ \$	105,242	0
1	Superv/Engrg	1.47	Months @ \$	61,666	90,649

Total Operating Costs \$ **909,373**

Ownership Costs

1	Clamshell Dredge	1.47	Months @ \$	176,079	258,836
0	Hydraulic Dredge	1.47	Months @ \$	255,693	0
0	Hyd. Unloader	1.47	Months @ \$	103,040	0
0	Booster Barge	1.47	Months @ \$	36,640	0
1	Towing Tug	1.47	Months @ \$	64,456	94,750
1	Tending Tug	1.47	Months @ \$	12,248	18,005
1	Survey/Crewboat	1.47	Months @ \$	8,252	12,130
2	Dump Scows	1.47	Months @ \$	82,264	241,856
0	Hopper Scows	1.47	Months @ \$	37,024	0
0	Derrick Barge	1.47	Months @ \$	13,929	0
0	Deck Barge	1.47	Months @ \$	7,503	0
0	Fuel Barge	1.47	Months @ \$	14,591	0

Total Ownership Costs \$ **625,577**

Market Factor @  **312,789**

Total Direct Costs \$ **1,222,162**

Overhead @

Sub Total \$ **1,405,486**

Contingency @   
 Profit @

Sub Total \$ **1,756,858**

Bond @

Total Dredge Price \$ **1,765,642**

1,765,642 Estimated Dredge Price \$

----- =  \$/CY  
 332,273 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **788,929**

**TABLE A - 25**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

Operating Costs					
1	Clamshell Dredge	3.10	Months @ \$	246,871	765,301
	Hydraulic Dredge	3.10	Months @ \$	647,998	0
	Hyd. Unloader	3.10	Months @ \$	266,456	0
	Booster Barge	3.10	Months @ \$	184,803	0
1	Towing Tug	3.10	Months @ \$	141,150	437,563
1	Tending Tug	3.10	Months @ \$	65,363	202,624
1	Survey/Crewboat	3.10	Months @ \$	59,106	183,228
2	Dump Scows	3.10	Months @ \$	22,233	137,842
	Hopper Scows	3.10	Months @ \$	6,613	0
	Derrick Barge	3.10	Months @ \$	74,162	0
	Deck Barge	3.10	Months @ \$	1,969	0
	Fuel Barge	3.10	Months @ \$	2,938	0
	Shore Crew	3.10	Months @ \$	105,242	0
1	Superv/Engrg	3.10	Months @ \$	61,666	191,165

Total Operating Costs \$ **1,917,723**

Ownership Costs					
1	Clamshell Dredge	3.10	Months @ \$	176,079	545,845
0	Hydraulic Dredge	3.10	Months @ \$	255,693	0
0	Hyd. Unloader	3.10	Months @ \$	103,040	0
0	Booster Barge	3.10	Months @ \$	36,640	0
1	Towing Tug	3.10	Months @ \$	64,456	199,814
1	Tending Tug	3.10	Months @ \$	12,248	37,969
1	Survey/Crewboat	3.10	Months @ \$	8,252	25,581
2	Dump Scows	3.10	Months @ \$	82,264	510,037
0	Hopper Scows	3.10	Months @ \$	37,024	0
0	Derrick Barge	3.10	Months @ \$	13,929	0
0	Deck Barge	3.10	Months @ \$	7,503	0
0	Fuel Barge	3.10	Months @ \$	14,591	0

Total Ownership Costs \$ **1,319,246**

Market Factor @  **659,623**

Total Direct Costs \$ **2,577,346**  
**386,602**

Overhead @

Sub Total \$ **2,963,948**  
**296,395**  
**444,592**

Contingency @   
Profit @

Sub Total \$ **3,704,935**  
**18,525**

Bond @

Total Dredge Price \$ **3,723,460**

3,723,460 Estimated Dredge Price \$

678,494 Pay Cubic Yards (New Work + Existing Project)

= **5.49** \$/CY

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **1,043,769**



**TABLE A - 26**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

Operating Costs					
1	Clamshell Dredge	1.46	Months @ \$	246,871	360,432
	Hydraulic Dredge	1.46	Months @ \$	647,998	0
	Hyd. Unloader	1.46	Months @ \$	266,456	0
	Booster Barge	1.46	Months @ \$	184,803	0
0	Towing Tug	1.46	Months @ \$	141,150	0
1	Tending Tug	1.46	Months @ \$	65,363	95,430
1	Survey/Crewboat	1.46	Months @ \$	59,106	86,295
1	Dump Scows	1.46	Months @ \$	22,233	32,459
	Hopper Scows	1.46	Months @ \$	6,613	0
	Derrick Barge	1.46	Months @ \$	74,162	0
	Deck Barge	1.46	Months @ \$	1,969	0
	Fuel Barge	1.46	Months @ \$	2,938	0
	Shore Crew	1.46	Months @ \$	105,242	0
1	Superv/Engrg	1.46	Months @ \$	61,666	90,032

Total Operating Costs \$ **664,648**

Ownership Costs					
1	Clamshell Dredge	1.46	Months @ \$	176,079	257,075
0	Hydraulic Dredge	1.46	Months @ \$	255,693	0
0	Hyd. Unloader	1.46	Months @ \$	103,040	0
0	Booster Barge	1.46	Months @ \$	36,640	0
0	Towing Tug	1.46	Months @ \$	64,456	0
1	Tending Tug	1.46	Months @ \$	12,248	17,882
1	Survey/Crewboat	1.46	Months @ \$	8,252	12,048
1	Dump Scows	1.46	Months @ \$	82,264	120,105
0	Hopper Scows	1.46	Months @ \$	37,024	0
0	Derrick Barge	1.46	Months @ \$	13,929	0
0	Deck Barge	1.46	Months @ \$	7,503	0
0	Fuel Barge	1.46	Months @ \$	14,591	0

Total Ownership Costs \$ **407,110**

Market Factor @  **203,555**

Total Direct Costs \$ **868,203**

Overhead @

Sub Total \$ **998,433**

Contingency @   
 Profit @

Sub Total \$ **1,248,041**

Bond @

Total Dredge Price \$ **1,254,281**

1,254,281 Estimated Dredge Price \$

----- =  \$/CY  
 133,879 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **1,084,642**





**TABLE A - 28**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

Operating Costs

1	Clamshell Dredge	0.44	Months @ \$	246,871	108,623
	Hydraulic Dredge	0.44	Months @ \$	647,998	0
	Hyd. Unloader	0.44	Months @ \$	266,456	0
	Booster Barge	0.44	Months @ \$	184,803	0
2	Towing Tug	0.44	Months @ \$	141,150	124,212
1	Tending Tug	0.44	Months @ \$	65,363	28,760
1	Survey/Crewboat	0.44	Months @ \$	59,106	26,007
3	Dump Scows	0.44	Months @ \$	22,233	29,347
	Hopper Scows	0.44	Months @ \$	6,613	0
	Derrick Barge	0.44	Months @ \$	74,162	0
	Deck Barge	0.44	Months @ \$	1,969	0
	Fuel Barge	0.44	Months @ \$	2,938	0
	Shore Crew	0.44	Months @ \$	105,242	0
1	Superv/Engrg	0.44	Months @ \$	61,666	27,133

Total Operating Costs \$ **344,082**

Ownership Costs

1	Clamshell Dredge	0.44	Months @ \$	176,079	77,475
0	Hydraulic Dredge	0.44	Months @ \$	255,693	0
0	Hyd. Unloader	0.44	Months @ \$	103,040	0
0	Booster Barge	0.44	Months @ \$	36,640	0
2	Towing Tug	0.44	Months @ \$	64,456	56,721
1	Tending Tug	0.44	Months @ \$	12,248	5,389
1	Survey/Crewboat	0.44	Months @ \$	8,252	3,631
3	Dump Scows	0.44	Months @ \$	82,264	108,588
0	Hopper Scows	0.44	Months @ \$	37,024	0
0	Derrick Barge	0.44	Months @ \$	13,929	0
0	Deck Barge	0.44	Months @ \$	7,503	0
0	Fuel Barge	0.44	Months @ \$	14,591	0

Total Ownership Costs \$ **251,804**

Market Factor @  **125,902**

Total Direct Costs \$ **469,984**  
 70,498

Overhead @

Sub Total \$ **540,482**  
 54,048  
 81,072

Contingency @   
 Profit @

Sub Total \$ **675,602**  
 3,378

Bond @

Total Dredge Price \$ **678,980**

678,980 Estimated Dredge Price \$

----- = **3.12** \$/CY  
 217,968 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **428,444**

**TABLE A - 29**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

**Operating Costs**

1	Clamshell Dredge	0.14	Months @ \$	246,871	34,562
	Hydraulic Dredge	0.14	Months @ \$	647,998	0
	Hyd. Unloader	0.14	Months @ \$	266,456	0
	Booster Barge	0.14	Months @ \$	184,803	0
1	Towing Tug	0.14	Months @ \$	141,150	19,761
1	Tending Tug	0.14	Months @ \$	65,363	9,151
1	Survey/Crewboat	0.14	Months @ \$	59,106	8,275
2	Dump Scows	0.14	Months @ \$	22,233	6,225
	Hopper Scows	0.14	Months @ \$	6,613	0
	Derrick Barge	0.14	Months @ \$	74,162	0
	Deck Barge	0.14	Months @ \$	1,969	0
	Fuel Barge	0.14	Months @ \$	2,938	0
	Shore Crew	0.14	Months @ \$	105,242	0
1	Superv/Engrg	0.14	Months @ \$	61,666	8,633

Total Operating Costs \$ **86,607**

**Ownership Costs**

1	Clamshell Dredge	0.14	Months @ \$	176,079	24,651
0	Hydraulic Dredge	0.14	Months @ \$	255,693	0
0	Hyd. Unloader	0.14	Months @ \$	103,040	0
0	Booster Barge	0.14	Months @ \$	36,640	0
1	Towing Tug	0.14	Months @ \$	64,456	9,024
1	Tending Tug	0.14	Months @ \$	12,248	1,715
1	Survey/Crewboat	0.14	Months @ \$	8,252	1,155
2	Dump Scows	0.14	Months @ \$	82,264	23,034
0	Hopper Scows	0.14	Months @ \$	37,024	0
0	Derrick Barge	0.14	Months @ \$	13,929	0
0	Deck Barge	0.14	Months @ \$	7,503	0
0	Fuel Barge	0.14	Months @ \$	14,591	0

Total Ownership Costs \$ **59,579**

Market Factor @  **29,790**

Overhead @  Total Direct Costs \$ **116,397**  
17,460

Contingency @  Sub Total \$ **133,857**  
 Profit @  13,386  
20,079

Bond @  Sub Total \$ **167,322**  
837

Total Dredge Price \$ **168,159**

168,159 Estimated Dredge Price \$  
 ----- = **6.04** \$/CY  
 27,843 Pay Cubic Yards (New Work + Existing Project)

New Work Pay CY x  \$/CY = Est. Dredge Price \$ **89,145**



**TABLE A - 30**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

**Operating Costs**

1	Clamshell Dredge	1.44	Months @ \$	246,871	355,495
	Hydraulic Dredge	1.44	Months @ \$	647,998	0
	Hyd. Unloader	1.44	Months @ \$	266,456	0
	Booster Barge	1.44	Months @ \$	184,803	0
1	Towing Tug	1.44	Months @ \$	141,150	203,255
1	Tending Tug	1.44	Months @ \$	65,363	94,122
1	Survey/Crewboat	1.44	Months @ \$	59,106	85,112
2	Dump Scows	1.44	Months @ \$	22,233	64,030
	Hopper Scows	1.44	Months @ \$	6,613	0
	Derrick Barge	1.44	Months @ \$	74,162	0
	Deck Barge	1.44	Months @ \$	1,969	0
	Fuel Barge	1.44	Months @ \$	2,938	0
	Shore Crew	1.44	Months @ \$	105,242	0
1	Superv/Engrg	1.44	Months @ \$	61,666	88,799

Total Operating Costs \$ **890,813**

**Ownership Costs**

1	Clamshell Dredge	1.44	Months @ \$	176,079	253,554
0	Hydraulic Dredge	1.44	Months @ \$	255,693	0
0	Hyd. Unloader	1.44	Months @ \$	103,040	0
0	Booster Barge	1.44	Months @ \$	36,640	0
1	Towing Tug	1.44	Months @ \$	64,456	92,817
1	Tending Tug	1.44	Months @ \$	12,248	17,637
1	Survey/Crewboat	1.44	Months @ \$	8,252	11,883
2	Dump Scows	1.44	Months @ \$	82,264	236,920
0	Hopper Scows	1.44	Months @ \$	37,024	0
0	Derrick Barge	1.44	Months @ \$	13,929	0
0	Deck Barge	1.44	Months @ \$	7,503	0
0	Fuel Barge	1.44	Months @ \$	14,591	0

Total Ownership Costs \$ **612,811**

Market Factor @ **50%** **306,406**

Total Direct Costs \$ **1,197,219**  
**179,583**

Overhead @ **15%**

Sub Total \$ **1,376,802**  
**137,680**  
**206,520**

Contingency @ **10%**  
 Profit @ **15%**

Sub Total \$ **1,721,002**  
**8,605**

Bond @ **0.5%**

Total Dredge Price \$ **1,729,607**

1,729,607 Estimated Dredge Price \$

----- = **4.64** \$/CY  
 373,143 Pay Cubic Yards (New Work + Existing Project)

**272,984** New Work Pay CY x **4.64** \$/CY = Est. Dredge Price \$ **1,266,646**





**TABLE A - 32**  
**COST SUMMARY - CLAMSHELL DREDGE WITH SCOWS BOTTOM DUMPING AT KENT ISLAND DEEP**

Operating Costs					
1	Clamshell Dredge	3.24	Months @ \$	246,871	799,863
	Hydraulic Dredge	3.24	Months @ \$	647,998	0
	Hyd. Unloader	3.24	Months @ \$	266,456	0
	Booster Barge	3.24	Months @ \$	184,803	0
1	Towing Tug	3.24	Months @ \$	141,150	457,324
1	Tending Tug	3.24	Months @ \$	65,363	211,775
1	Survey/Crewboat	3.24	Months @ \$	59,106	191,503
2	Dump Scows	3.24	Months @ \$	22,233	144,067
	Hopper Scows	3.24	Months @ \$	6,613	0
	Derrick Barge	3.24	Months @ \$	74,162	0
	Deck Barge	3.24	Months @ \$	1,969	0
	Fuel Barge	3.24	Months @ \$	2,938	0
	Shore Crew	3.24	Months @ \$	105,242	0
1	Superv/Engrg	3.24	Months @ \$	61,666	199,798

Total Operating Costs \$ **2,004,330**

Ownership Costs					
1	Clamshell Dredge	3.24	Months @ \$	176,079	570,496
0	Hydraulic Dredge	3.24	Months @ \$	255,693	0
0	Hyd. Unloader	3.24	Months @ \$	103,040	0
0	Booster Barge	3.24	Months @ \$	36,640	0
1	Towing Tug	3.24	Months @ \$	64,456	208,837
1	Tending Tug	3.24	Months @ \$	12,248	39,684
1	Survey/Crewboat	3.24	Months @ \$	8,252	26,736
2	Dump Scows	3.24	Months @ \$	82,264	533,071
0	Hopper Scows	3.24	Months @ \$	37,024	0
0	Derrick Barge	3.24	Months @ \$	13,929	0
0	Deck Barge	3.24	Months @ \$	7,503	0
0	Fuel Barge	3.24	Months @ \$	14,591	0

Total Ownership Costs \$ **1,378,824**

Market Factor @  **689,412**

Total Direct Costs \$ **2,693,742**  
404,061

Overhead @

Sub Total \$ **3,097,803**  
309,780  
464,670

Contingency @   
Profit @

Sub Total \$ **3,872,253**  
19,361

Bond @

Total Dredge Price \$ **3,891,614**

3,891,614 Estimated Dredge Price \$

-----  
907,706 Pay Cubic Yards (New Work + Existing Project) =  \$/CY

New Work Pay CY x  \$/CY = Est. Dredge Price \$

