2005 ANNUAL REPORT OF OPERATIONS AND MAINTENANCE ACTIVITIES

PARTIAL RIVER CHANNELIZATION PROJECT FORMER SINCLAIR REFINERY SITE

WELLSVILLE, NEW YORK

Prepared For

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Appendix A – CD containing electronic copy of this report

Appendix B – June 27, 2005 Correspondence

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Appendix D – Post High Water Inspection Checklists and Photographs
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1.0 OVERVIEW

1.1 Introduction

This document presents a summary of the 2005 operation and maintenance activities for the Partial River Channelization Project at the Former Sinclair Refinery Site Operable Unit 1 (OU-1) located in Wellsville, New York (Figure 1). Operation and maintenance (O&M) procedures for this project are detailed in *Operations and Maintenance Plan for the Partial River Channelization on the Genesee River, Wellsville, New York* (O&M Plan); dated April 1992, and prepared by Ebasco Services. An electronic copy of this report is included as Appendix A.

1.2 Project Background

A Consent Decree, effective May 19, 1989, between Atlantic Richfield and the United States Environmental Protection Agency (USEPA) outlined, in part, that Atlantic Richfield protect the Central Elevated Landfill Area (CELA), and the smaller South Landfill Area (SLA) from inundation and erosion. A dike was constructed on the west bank of the river to protect the CELA and SLA from erosion and inundation by floodwater. The west dike is designed to protect against erosion and overtopping up to the 100-year flood elevation. Dike construction and bank riprap stabilization of the east bank of the river was performed to protect against erosion. The east dike and bank stabilization is designed to protect the east bank from erosion up to the bank full flood condition of the river. Figure 2 shows dike station locations used in construction and in referencing for this project.

The Consent Decree outlines that Atlantic Richfield maintains the Partial River Channelization Project in accordance with the procedures detailed in the above referenced O&M Plan. The O&M Plan contains details related to the project background and construction history.

1.3 Report Format

As previously stated, this report is being submitted to document the operations and maintenance activities that were conducted in 2005 and to meet the requirements of the Consent Decree. The remainder of this report is organized as follows:

- Section 2 outlines the approved requirements for operations, maintenance and reporting.
- Section 3 details the routine operation and maintenance activities performed during 2005.
- Section 4 discusses Genesee River flood inspections conducted in 2005.

- Section 5 summarizes 2005 project activities
- Section 6 describes other issues pertaining to the project.

2.0 OPERATION, MAINTENANCE AND REPORTING REQUIREMENTS

The purpose of this section is to specify the currently approved operations, maintenance and report requirements. The requirements are outlined in the O&M Plan and in subsequent correspondence between USEPA and Atlantic Richfield Company.

2.1 Operations Requirements

The O&M Plan requires that specific routine inspections be conducted. In addition, the O&M Plan requires additional inspections in the event that certain river flow conditions exist. The inspections are conducted using checklists developed for the O&M Plan. The operations requirements are described below.

- Annual visual inspection (for sloughing, erosion, etc.) during a low river flow period, which is defined as a flow rate of less than 180 cubic feet per second (cfs). Low flow conditions typically occur between June and October.
- Visual inspection after each major flood (i.e. 4,500 cfs), which can occur during any season of the year. A major flood is defined as when water in the river (east dike between stations 1+67 and 6+67) approaches the top of the east dike (Elevation 1496.00 ft above mean sea level [amsl]). Also, discharge data from U.S. Geological Survey gauging station 04221000, which is located about 1.8 miles downstream from the project site is used to verify the flood conditions and as a source for establishing a database for identifying flood conditions.
- The 1992 O&M plan required an annual check of the soil pH (maintained above 5.8) along the west dike during a period of low flow. Pursuant to USEPA's June 27, 2005 correspondence (Appendix B), the requirement for soil pH testing was modified to every 3 years as part of the agronomic soil testing. The next soil agronomic testing to be will be conducted in 2006.
- Annual visual inspection with photographs, during a low flow period, of the riverbed where sediment removal was performed to control and improve river flow condition (opposite west dike station 20+00), to check for shoaling.
- A patrol and visual inspection during each high water event for any damage that may jeopardize the integrity of the dike and protection of the landfill (provided safe conditions exist).
- A survey of the dike profile/cross section every 200 feet and at every slope transition during a low flow period by a licensed surveyor to determine dike settlement and changes in cross sections. The O&M Plan states that the frequency of the surveys will

be based on significant changes to the survey data. The O&M Plan also outlines an annual survey of the riverbed at the toe of the slopes during a low flow period, to check for displacement or unusual settlement of the riprap slope protection. The dike survey frequency was changed in 2002 to one survey every five years; this change is documented in a letter from EPA to Terry Moore dated November 8, 2002 and included as Appendix C. The next survey is scheduled for 2006.

2.2 Maintenance Requirements

The O&M Plan requires that Atlantic Richfield perform such maintenance and inspections as may be necessary to assure the serviceability of the dikes and the 100-year flood protection of the CELA. Routine maintenance requirements to preserve the integrity of the dikes and landfill are detailed below. Additional maintenance activities may be required if conditions identified during inspections warrant.

- Along the west bank dike, lime application will be applied as necessary to maintain soil pH above 5.8.
- Along the west slope of the west dike, fertilizer will be applied as needed, based on the agronomic soil test performed every three years. An agronomic soil test was completed in 2003 and the next agronomic soil test is scheduled for 2006.
- Along the west bank dike, vegetation will be mowed when turf reaches a height of more than six inches. Mowing will not be closer than four inches to the ground in order to promote vigor and control woody plants and other noxious weeds. Vegetation should be allowed to attain a height of eight to twelve inches prior to the onset of winter.
- Remove woody growth, other than tall grass and vegetation, from both dikes annually.
- Maintenance of the road on the top of the west dike. Maintenance includes the repair of the roadway due to water ponding, removal of woody growth other than grass and aggregate replacement due to ruts, to preserve the six inch surface requirement.

2.3 Reports

The currently approved O&M Plan outlines the following reports and notifications.

- Atlantic Richfield will notify the USEPA 14 days prior to annual inspections.
- The USEPA will be notified of any corrective actions requiring more than 30 days to complete.
- An annual summary report of O&M activities for the previous year will be submitted to the USEPA and New York State Department of Environmental Conservation (NYSDEC).

3.0 2005 ROUTINE OPERATIONS AND MAINTENANCE ACTIVITIES

3.1 Overview of 2005 Routine Operations and Maintenance

Operations and maintenance activities conducted during 2005 included east and west dike low flow inspections. Woody growth removal was not conducted in 2005 due to a combination of property access issues and the onset of snow (preventing safe work on the slopes). Woody growth removal is planned for the spring 2006. No significant operations or maintenance issues were identified in 2005.

3.2 Routine Operations

Annual Visual Inspections

East and west dike and the river bed low flow inspections were conducted on August 9, 2005. No significant issues were noted during the inspection

A summary of the annual low flow dike inspection findings are provided below. At the time of the low flow inspection, the river gage height was 4.22 ft. Completed inspection checklists and inspection photographs are presented in Appendix D of this report. A summary of the annual flow inspection is provided below.

- No observed settlement, sloughing or loss of grade.
- No observed caving on either side of dike.
- No evidence of seepage, saturated areas, or sand boils.
- No evidence of riprap displacement or unusual settlement.
- Access roads were in good condition.
- No evidence of unauthorized traffic.
- Vegetative cover in good condition.
- Woody growth removal last completed in November 2004. Some woody growth (approximately one-year growth) present.
- No evidence of unauthorized excavation, loose sod, or sod removal.
- No evidence of fires or vandalism.
- No shoaling observed in the channel.

Soil pH/Agronomic Testing

The soil pH was checked on March 17, 2005; the soil pH was 7.2 standard units. As described in Section 2.1, soil pH testing is now required every three years as part of agronomic testing. The next scheduled event will occur in 2006.

Surveys

As outlined in the O&M Plan, surveys of the west and east dikes were performed by a New York State Licensed Surveyor annually from 1992 through 2001. The 1992 and 1993 surveys were conducted by Douglas C. Meyers, P.C., Arcade, New York. James B. Ball, L.S., Wellsville, New York completed the surveys from 1994 through 2001. The 1992 to 2001 dike survey data is included as Table 1 for reference. A detailed review of the surveys completed between 1992 and 2001 was completed as part of the 2001 annual report preparation. Based on the review of this 10-year period of annual survey data, no significant settlement has occurred to the dikes. The O&M plan states that the frequency of surveys will be based on significant changes to the survey data. Review of the 10 years of survey data revealed that significant changes are more easily identified with visual surveys. Approval to modify the survey frequency from annually to every five years was granted in a letter dated November 08, 2002 from USEPA to Mr. Terry Moore, Atlantic Richfield (Appendix C). The next survey is scheduled for 2006.

3.3 Routine Maintenance

Lime/Fertilizer Application

Lime applications are required to maintain soil pH above 5.8. Fertilizer is applied as needed based upon agronomic soil testing. Soil testing, including pH and agronomic testing, is conducted every three years. The soil testing was not scheduled to be completed in 2005; the next soil testing and possible applications of lime or fertilizer will be in 2006.

Mowing

The CELA side of the west dike was not mowed during 2005. The specialized rental equipment was not available during the 2005 mowing season. West dike mowing will be completed in 2006.

Woody Growth Removal

Woody growth removal was not completed in 2005 due to a combination of property access issues and the onset of snow preventing safe work on the rip rap slopes. Woody growth removal is anticipated to be completed in the spring 2006. Some woody growth observed during the 2005 annual low flow inspection.

Roadway Maintenance

Maintenance including repair of the roadway on the top of the dike due to water ponding, removal of woody growth and aggregate replacement due to ruts is conducted when

appropriate. Based upon routine inspections conducted in 2005, no roadway maintenance was conducted.

4.0 GENESEE RIVER FLOOD INSPECTION

The Genesee River is northerly flowing and located along the east side of the Former Sinclair Refinery Site. A United States Geologic Survey (USGS), Water Resources Division river gage station is located on the Genesee River approximately 1.8 miles down stream of the partial river channelization site. The station identification number is 04221000. The automatic gage measures water height (stage) and the USGS has developed an expanded rating table to correlate water height with stream flow (discharge).

The O&M Plan states that visual inspections will be made after each major flood (i.e. 4500 cfs). Major floods are defined in the O&M plan as when the water elevation in the river approaches the top of the east dike between stations 1+65 and 6+67 (elevation of 1,496 ft amsl). The USGS has defined flood stage to be a gage height of 11 ft, which equates to a flow of 8907 cfs. Based on historical measures, a flow greater than 7,000 cfs (gage height > 10 ft) is required for the water level to approach the top of the east dike.

Provisional 2005 gage height and streamflow data from the USGS river gage station are included in this report. Provisional data is subject to change by the USGS. The 2005 daily average stage and discharge data is presented in tabular form as Table 2 and graphically as Figure 3.

There were two events in 2005 which resulted in flows exceeding 4500 cfs. It should be noted that while flows exceeded 4500 cfs neither event resulted in average daily water levels greater than 10 ft gage height which is necessary for the water level to approach the top of the dike. On January 14, 2005 the daily average stream flow was 5,817 cfs (gage height of 9.33 ft msl). The event lasted for only one day. Although a formal inspection was not documented, subsequent inspections showed no damage to the project area.

A second major flood occurred on November 29, 2005. The average daily stream flow for November 29, 2005 was 5,686 cfs (gage height of 9.20 ft msl). The event lasted for one day. A post major flood inspection of the east and west dikes was completed on December 1, 2005. At the time of inspection the gage height reading was 4.97 ft (286.8 cfs). Details of the post high water event inspection are provided below. Note that no damage was noted to the project area.

Post High Water Inspection, December 1, 2005 – West Dike

A summary of the post high water dike inspection findings completed on December 1, 2005 are provided below. Completed inspection checklists and inspection photographs are presented in Appendix A of this report.

- No settlement, sloughing or loss of grade.
- No caving on either side of dike.
- No seepage, saturated areas, or sand boils.
- No evidence of riprap displacement or unusual settlement.
- Access roads are in good condition.
- No evidence of unauthorized traffic.
- Vegetative cover in good condition.
- Woody growth present.
- No unauthorized excavation, loose sod, or sod removal.
- No evidence of fires or vandalism.
- No shoaling in the channel.

Post High Water Inspection, December 1, 2005 - East Dike

A summary of the post high water dike inspection findings completed on December 1, 2005 is provided below. Completed inspection checklists and inspection photographs are presented in Appendix D of this report.

- No settlement, sloughing or loss of grade.
- No caving.
- No seepage, saturated areas, or sand boils.
- No evidence of riprap displacement or unusual settlement.
- Access roads are not applicable.
- No evidence of unauthorized traffic.
- Woody growth present.
- No unauthorized excavation, loose sod or sod removal.
- No evidence of burrowing animals.
- No evidence of fires or vandalism.
- No shoaling in the channel.

5.0 Summary

Based on the results of inspections and observations over the past year, no evidence of significant deterioration, erosion and/or settlement at the Partial River Channelization Project site was noted. Routine maintenance was conducted; no additional maintenance was required or conducted in 2005.

6.0 OTHER ISSUES

Due to potential safety concerns related to current removal techniques, the manner in which woody growth is removed is being evaluated. During 2005, USEPA suggested the application of glyphosate herbicide (Rodeo ™, Round-up ™) to the cut stem as an effective method for woody growth control. This method, as well as, other potential alternatives is currently under review. Any recommendations for modification to the current protocol will be submitted to EPA for approval prior to implementation.

Tables

Table 1

Genesee River Dike Surveyed Elevations (1992-2001)
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(ft msl)

Station & Distance From Baseline	Location Description	1992 Elevation	1993 Elevation	1994 Elevation	1995 Elevation	1996 Elevation	1997 Elevation	1998 Elevation	1999 Elevation	2000 Elevation	2001 Elevation	Change From 1992 to 2001	Change From 1993 to 2001	Change From 1999 to 2001	Change From 2000 to 2001	Average Elevation
East Dike Station 0+00																
E000-55.0	Ground Surface		1499.42	1499.73	1499.41	1499.44	1499.45	1499.51	1499.54	1499.43	1499.52		0.10	-0.02	0.09	1499.49
E000-35.0	Slope Break	1499.80	1499.64	1499.73	1499.77	1499.75	1499.76	1499.81	1499.81	1499.79	1499.76	-0.04	0.12	-0.05	-0.03	1499.76
E000-30.4	Start Riprap	1500.30	1500.27	1500.38	1500.31	1500.23	1500.26	1500.31	1500.31	1500.26	1500.26	-0.04	-0.01	-0.05	0.00	1500.29
E000-19.5	Slope Crest	1500.15	1500.12	1500.24	1500.14	1500.10	1500.10	1500.18	1500.18	1500.14	1500.14	-0.01	0.02	-0.04	0.00	1500.15
E000-1	Slope Surface	1492.15	1492.75	1492.87	1492.72	1492.98	1492.73	1492.99	1493.29	1493.12	1492.96	0.81	0.21	-0.33	-0.16	1492.86
East Dike Station 2+00																
E200-55.0	Ground Surface		1496.45	1496.44	1496.41	1496.47	1496.47	1496.52	1496.56	1496.59	1496.53		0.08	-0.03	-0.06	1496.49
E200-35.0	Slope Break		1496.27	1496.31	1496.33	1496.33	1496.34	1496.39	1496.39	1496.36	1496.33		0.06	-0.06	-0.03	1496.34
E200-26.2	Start Riprap	1496.30	1496.24	1496.33	1496.28	1496.24	1496.26	1496.33	1496.31	1496.28	1496.27	-0.03	0.03	-0.04	-0.01	1496.28
E200-14.5	Slope Crest	1496.45	1496.42	1496.52	1496.47	1496.44	1496.45	1496.50	1496.48	1496.43	1496.43	-0.02	0.01	-0.05	0.00	1496.46
E200-5.6	Slope Surface	1492.70	1492.62	1492.78	1492.73	1492.72	1492.73	1492.80	1492.78	1492.75	1492.74	0.04	0.12	-0.04	-0.01	1492.74
East Dike Station 4+00																
E400-55.0	Ground Surface		1496.39	1496.45	1496.39	1496.46	1496.43	1496.47	1496.52	1496.55	1496.41		0.02	-0.11	-0.14	1496.45
E400-35.0	Slope Break	1496.30	1496.18	1496.33	1496.38	1496.38	1496.37	1496.40	1496.40	1496.38	1496.34	0.04	0.16	-0.06	-0.04	1496.35
E400-26.6	Start Riprap	1495.90	1495.83	1495.88	1495.88	1495.91	1495.89	1495.93	1495.92	1495.89	1495.85	-0.05	0.02	-0.07	-0.04	1495.89
E400-14.0	Slope Crest	1495.50	1495.46	1495.33	1495.50	1495.52	1495.49	1495.54	1495.53	1495.50	1495.49	-0.01	0.03	-0.04	-0.01	1495.49
E400-6.5	Slope Surface	1492.50	1492.51	1492.58	1492.58	1492.59	1492.52	1492.57	1492.58	1492.59	1492.50	0.00	-0.01	-0.08	-0.09	1492.55
East Dike Station 6+00																
E600-55.0	Ground Surface		1496.21	1496.20	1496.18	1496.21	1496.21	1496.27	1496.25	1496.36	1496.26		0.05	0.01	-0.10	1496.24
E600-35.0	Slope Break	1496.05	1496.05	1496.07	1496.12	1496.12	1496.08	1496.13	1496.13	1496.12	1496.10	0.05	0.05	-0.03	-0.02	1496.10
E600-22.6	Start Riprap	1496.45	1496.36	1496.46	1496.12	1496.45	1496.36	1496.42	1496.40	1496.38	1496.39	-0.06	0.03	-0.01	0.01	1496.38
E600-13.7	Slope Crest	1496.10	1496.07	1496.09	1496.10	1496.06	1496.01	1496.08	1496.06	1496.04	1496.03	-0.07	-0.04	-0.03	-0.01	1496.06
E600-4.7	Slope Surface	1492.35	1492.26	1492.29	1492.30	1492.26	1492.19	1492.22	1492.21	1492.15	1492.12	-0.23	-0.14	-0.09	-0.03	1492.24
East Dike Station 8+00																
E800-55.0	Ground Surface		1497.20	1497.28	1497.22	1497.19	1497.32	1497.31	1497.34	1497.35	1497.26		0.06	-0.08	-0.09	1497.27
E800-35.0	Slope Break	1496.80	1496.73	1496.84	1496.87	1496.87	1496.91	1496.95	1496.95	1496.92	1496.91	0.11	0.18	-0.04	-0.01	1496.88
E800-18.7	Start Riprap	1496.80	1496.77	1496.91	1496.84	1496.78	1496.82	1496.86	1496.85	1496.81	1496.81	0.01	0.04	-0.04	0.00	1496.83
E800-10.3	Slope Crest	1496.20	1496.12	1496.25	1496.18	1496.25	1496.29	1496.34	1496.32	1496.27	1496.28	0.08	0.16	-0.04	0.01	1496.25
E800-2.5	Slope Surface	1493.10	1493.14	1493.28	1493.21	1493.16	1493.20	1493.21	1493.20	1493.16	1493.11	0.01	-0.03	-0.09	-0.05	1493.18
East Dike Station 10+00																
E1000-55.0	Ground Surface		1499.08	1499.16	1499.07	1499.06	1499.11	1499.15	1499.20	1499.17	1499.12		0.04	-0.08	-0.05	1499.12
E1000-32.0	Slope Break	1498.50	1498.47	1498.58	1498.60	1498.53	1498.52	1498.56	1498.56	1498.54	1498.53	0.03	0.06	-0.03	-0.01	1498.54
E1000-29.0	Slope Break	1499.00	1498.95	1499.01	1499.06	1499.03	1499.07	1499.09	1499.09	1499.08	1499.06	0.06	0.11	-0.03	-0.02	1499.04
E1000-27.6	Start Riprap	1499.00	1498.97	1498.98	1499.04	1499.00	1499.03	1499.02	1499.07	1499.03	1499.00	0.00	0.03	-0.07	-0.03	1499.01
E1000-18.4	Slope Crest	1498.95	1498.91	1499.03	1498.97	1498.93	1498.94	1498.95	1498.96	1498.96	1498.94	-0.01	0.03	-0.02	-0.02	1498.95
E1000-5.2	Slope Surface	1493.35	1493.06	1493.17	1493.11	1493.09	1493.11	1493.11	1493.12	1493.11	1493.08	-0.27	0.02	-0.04	-0.03	1493.13

Notes: Negative change indicates a decrease in elevation.
Positive change indictes a increase in elevation.

Table 1

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(ft msl)

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East Dike Station 12+00																
E1200-55.0	Ground Surface		1500.18	1500.26	1500.24	1500.21	1500.23	1500.30	1500.33	1500.32	1500.29		0.11	-0.04	-0.03	1500.26
E1200-35.0	Slope Break	1499.25	1499.17	1499.06	1499.23	1499.22	1499.22	1499.27	1499.26	1499.29	1499.25	0.00	0.08	-0.01	-0.04	1499.22
E1200-29.0	Slope Break					1499.38	1499.35	1499.40	1499.40	1499.37	1499.36			-0.04	-0.01	1499.38
E1200-27.7	Start Riprap	1499.25	1499.23	1499.38	1499.35	1499.38	1499.20	1499.35	1499.32	1499.36	1499.34	0.09	0.11	0.02	-0.02	1499.32
E1200-17.7	Slope Crest	1499.35	1499.27	1499.28	1499.31	1499.28	1499.25	1499.31	1499.30	1499.28	1499.24	-0.11	-0.03	-0.06	-0.04	1499.29
E1200-4.5	Slope Surface	1493.80	1493.85	1493.99	1494.03	1494.03	1494.04	1494.09	1494.11	1494.07	1494.07	0.27	0.22	-0.04	0.00	1494.01
East Dike Station 14+00																
E1400-55.0	Ground Surface		1499.55	1499.75	1499.57	1499.58	1499.61	1499.59	1499.63	1499.67	1499.67		0.12	0.04	0.00	1499.62
E1400-35.0	Slope Break	1499.30	1499.33	1499.46	1499.32	1499.37	1499.37	1499.30	1499.35	1499.43	1499.34	0.04	0.01	-0.01	-0.09	1499.36
E1400-28.0	Slope Break	1499.55	1499.55	1499.62	1499.65	1499.67	1499.69	1499.69	1499.69	1499.69	1499.67	0.12	0.12	-0.02	-0.02	1499.65
E1400-25.5	Start Riprap	1499.10	1499.12	1499.17	1499.15	1499.16	1499.42	1499.43	1499.58	1499.50	1499.45	0.35	0.33	-0.13	-0.05	1499.31
E1400-15.0	Slope Crest	1499.35	1499.32	1499.52	1499.35	1499.34	1499.34	1499.35	1499.34	1499.34	1499.31	-0.04	-0.01	-0.03	-0.03	1499.36
E1400-3.8	Slope Surface	1494.90	1494.88	1495.12	1494.96	1494.92	1494.91	1494.91	1494.86	1494.78	1494.77	-0.13	-0.11	-0.09	-0.01	1494.90
East Dike Station 16+00																
E1600-55.0	Ground Surface		1499.23	1499.30	1499.31	1499.23	1499.34	1499.32	1499.34	1499.25	1499.32		0.09	-0.02	0.07	1499.29
E1600-35.0	Slope Break		1498.90	1498.92	1498.97	1498.97	1499.01	1498.98	1499.00	1498.96	1498.96		0.06	-0.04	0.00	1498.96
E1600-28.0	Slope Break	1499.05	1499.10	1499.13	1499.16	1499.16	1499.18	1499.20	1499.20	1499.19	1499.17	0.12	0.07	-0.03	-0.02	1499.15
E1600-26.4	Start Riprap	1499.55	1499.53	1499.58	1499.41	1499.50	1499.40	1499.46	1499.35	1499.40	1499.39	-0.16	-0.14	0.04	-0.01	1499.46
E1600-14.7	Slope Crest	1498.95	1498.91	1498.97	1498.93	1498.93	1498.94	1498.98	1498.94	1498.90	1498.88	-0.07	-0.03	-0.06	-0.02	1498.93
E1600-5.2	Slope Surface	1494.30	1494.44	1494.48	1494.47	1494.43	1494.41	1494.45	1494.41	1494.37	1494.36	0.06	-0.08	-0.05	-0.01	1494.41
East Dike Station 18+00																
E1800-55.0	Ground Surface		1500.09	1499.90	1499.92	1500.17	1500.25	1500.22	1500.12	1500.18	1500.18		0.09	0.06	0.00	1500.11
E1800-35.0	Slope Break	1499.60	1499.59	1499.49	1499.51	1499.62	1499.65	1499.67	1499.70	1499.77	1499.63	0.03	0.04	-0.07	-0.14	1499.62
E1800-25.0	Slope Break				1499.57	1499.57	1499.57	1499.60	1499.60	1499.59	1499.56			-0.04	-0.03	1499.58
E1800-23.4	Start Riprap	1499.50	1499.48	1499.56	1499.57	1499.55	1499.49	1499.57	1499.52	1499.57	1499.54	0.04	0.06	0.02	-0.03	1499.54
E1800-13.9	Slope Crest	1499.15	1499.12	1499.07	1499.19	1499.14	1499.15	1499.16	1499.16	1499.16	1499.11	-0.04	-0.01	-0.05	-0.05	1499.14
E1800-5.7	Slope Surface	1496.10	1495.13	1495.09	1495.21	1495.20	1495.15	1495.16	1495.18	1495.17	1495.11	-0.99	-0.02	-0.07	-0.06	1495.25
West Dike Station 0+00																
W000-39.5	River Side	1492.06	1492.10	1492.07	1492.08	1492.10										1492.08
W000-36.0	River Side						1491.87	1492.08	1492.04	1492.14	1492.03			-0.01	-0.11	1492.03
W000-9.7	River Side	1506.16	1506.11	1506.11	1506.12	1506.10	1506.05									1506.11
W000-6.4	River Side							1505.93	1506.10	1506.08	1506.01			-0.09	-0.07	1506.03
W000-0	Baseline	1505.86	1505.86	1505.88	1505.91	1505.91	1505.88	1505.90	1505.91	1505.89	1505.90	0.04	0.04	-0.01	0.01	1505.89
W000-4.4	Swale Side															
W000-31.3	Swale Side	1492.06	1492.00	1492.10	1492.09	1492.09	1492.98	1493.14	1493.11	1492.90	1492.95	0.89	0.95	-0.16	0.05	1492.54
W000-40	Swale Side	1490.51	1490.59	1490.47	1490.52	1490.66	1490.75	1491.20	1491.17	1490.67	1491.27	0.76	0.68	0.10	0.60	1490.78

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Table 1

Genesee River Dike Surveyed Elevations (1992-2001)
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(ft msl)

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West Dike Station 2+00																
W200-46.7	River Side	1491.76	1491.76	1491.73	1491.84	1491.79	1491.89	1492.34	1491.76	1491.80	1491.78	0.02	0.02	0.02	-0.02	1491.85
W200-7.3	River Side	1506.46	1506.48	1506.42	1506.48	1506.45	1506.58	1506.64	1506.61	1506.56	1506.65	0.19	0.17	0.04	0.09	1506.53
W200-0	Baseline	1506.81	1506.77	1506.81	1506.83	1506.83	1506.81	1506.81	1506.82	1506.82	1506.82	0.01	0.05	0.00	0.00	1506.81
W200-9.5	Swale Side	1506.26	1506.25	1506.22	1506.15	1506.10	1506.20	1506.10	1506.13	1506.29	1506.20	-0.06	-0.05	0.07	-0.09	1506.19
W200-18	Swale Side		1502.73	1502.63	1502.75	1502.62	1502.61	1502.47	1502.55	1502.78	1502.68		-0.05	0.13	-0.10	1502.65
W200-30.8	Swale Side	1498.56	1501.77	1501.64	1501.66	1501.69	1501.53	1501.39	1501.68	1501.78	1501.85	3.29	0.08	0.17	0.07	1501.36
West Dike Station 4+00																
W400-90	River Side	1491.46														
W400-82.1	River Side		1491.42	1491.50	1491.44	1491.40	1491.51	1491.44	1491.36	1490.98	1491.36		-0.06	0.00	0.38	1491.38
W400-79.7	River Side	1496.11	1496.11													1496.11
W400-74.1	River Side		1495.70	1497.34	1495.77	1495.75	1495.73	1495.74	1495.68	1495.68	1495.68		-0.02	0.00	0.00	1495.90
W400-64.7	River Side	1497.56														
W400-59.9	River Side		1497.37	1498.33	1497.44	1497.42	1497.40	1497.42	1497.38	1497.37	1497.41		0.04	0.03	0.04	1497.50
W400-49.2	River Side	1498.16														
W400-47.5	River Side		1498.35	1498.33	1498.42	1498.39	1498.38	1498.38	1498.36	1498.36	1498.38		0.03	0.02	0.02	1498.37
W400-6.9	River Side	1506.96	1506.91	1506.79	1506.78	1506.79	1506.67	1506.69	1506.77	1506.85	1506.77	-0.19	-0.14	0.00	-0.08	1506.80
W400-0	Baseline	1506.96	1506.91	1506.93	1506.96	1506.96	1506.95	1506.96	1506.97	1506.97	1506.97	0.01	0.06	0.00	0.00	1506.95
W400-5.8	CELA Side				1506.90	1506.88	1506.84	1506.93	1506.92	1507.00	1506.93			0.01	-0.07	1506.91
W400-6.0	CELA Side	1507.01	1507.00	1507.00												1507.00
W400-18.0	CELA Side		1501.48	1501.38	1501.47	1501.46	1501.46	1501.49	1501.48	1501.44	1501.49		0.01	0.01	0.05	1501.46
W400-24.2	CELA Side	1499.46														
W400-31.6	CELA Side	1498.71	1498.66	1498.64	1498.72	1498.69	1498.69	1498.69	1498.68	1498.67	1498.70	-0.01	0.04	0.02	0.03	1498.69
West Dike Station 6+00																
W600-68.4	River Side	1497.16	1497.21	1496.90	1497.16	1497.25	1497.12	1497.20	1497.16	1497.14	1497.14	-0.02	-0.07	-0.02	0.00	1497.14
W600-47.5	River Side	1498.46	1498.50	1498.45	1498.52	1498.58	1498.56	1498.60	1498.58	1498.52	1498.45	-0.01	-0.05	-0.13	-0.07	1498.52
W600-31.3	River Side	1498.31	1498.36	1498.29	1498.37	1498.34	1498.32	1498.37	1498.34	1498.30	1498.34	0.03	-0.02	0.00	0.04	1498.33
W600-8.0	River Side	1507.01	1507.00	1506.93	1506.98	1506.93	1506.90	1506.85	1506.91	1506.87	1506.86	-0.15	-0.14	-0.05	-0.01	1506.92
W600-0	Baseline	1506.96	1506.92	1506.91	1506.95	1506.95	1506.93	1506.97	1506.96	1506.95	1506.95	-0.01	0.03	-0.01	0.00	1506.95
W600-5.4	CELA Side	1506.96	1507.05	1506.83	1506.88	1506.90	1506.89	1506.85	1506.92	1506.90	1507.03	0.07	-0.02	0.11	0.13	1506.92
W600-16.2	CELA Side		1500.66	1500.56	1500.61	1500.42	1500.54	1500.58	1500.22	1500.54	1500.53		-0.13	0.31	-0.01	1500.52
W600-16.7	CELA Side	1501.01														
West Dike Station 8+00																
W800-55.0	River Side		1499.38	1499.17	1499.26	1499.29	1499.41	1499.39	1499.31	1499.46	1499.26		-0.12	-0.05	-0.20	1499.33
W800-49.0	River Side	1499.47	1499.48	1499.33	1499.40	1499.39	1499.35	1499.57	1499.42	1499.46	1499.46	-0.01	-0.02	0.04	0.00	1499.43
W800-46.0	River Side	1498.87	1498.84	1499.13	1499.19	1499.14	1499.18	1499.20	1499.19	1499.16	1499.17	0.30	0.33	-0.02	0.01	1499.11
W800-28.8	River Side	1499.62	1499.61	1499.55	1499.62	1499.58	1499.60	1499.60	1499.60	1499.61	1499.61	-0.01	0.00	0.01	0.00	1499.60

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West Dike Station 8+00 Continued																
W800-7.5	River Side	1507.12	1507.02	1506.88	1506.99	1506.91	1506.93	1506.91	1506.90	1506.87	1506.83	-0.29	-0.19	-0.07	-0.04	1506.94
W800-0	Baseline	1507.12	1507.02	1507.00	1507.00	1507.00	1507.02	1507.00	1507.00	1507.00	1507.01	-0.11	-0.01	0.01	0.01	1507.02
W800-7.3	CELA Side	1507.17	1507.08	1506.96	1506.97	1506.85	1507.00	1506.96	1507.02	1507.09	1507.06	-0.11	-0.02	0.04	-0.03	1507.02
W800-14.0	CELA Side		1502.43	1502.30	1502.37	1502.31	1502.20	1502.34	1502.20	1502.33	1502.28		-0.15	0.08	-0.05	1502.31
W800-15.5	CELA Side	1503.27	1503.27	1502.15	1502.30	1502.21	1502.22	1502.21	1502.15	1502.09	1502.19	-1.08	-1.08	0.04	0.10	1502.41
West Dike Station 10+00																
W1000-64.5	River Side	1497.07	1497.08	1496.96	1496.96	1497.16	1497.18	1497.32	1497.22	1497.45	1497.27	0.20	0.19	0.05	-0.18	1497.17
W1000-57.5	River Side	1496.22	1496.27	1496.11	1496.10	1496.32	1496.22	1496.28	1496.32	1496.43	1496.34	0.12	0.07	0.02	-0.09	1496.26
W1000-54.5	River Side	1495.57	1495.57	1495.52	1495.52	1495.88	1495.91	1495.85	1495.84	1495.96	1495.93	0.36	0.36	0.09	-0.03	1495.76
W1000-38.8	River Side	1495.22	1495.27	1495.22	1495.28	1495.25	1495.25	1495.23	1495.25	1495.23	1495.25	0.03	-0.02	0.00	0.02	1495.25
W1000-7.2	River Side	1507.22	1507.02	1506.98	1506.79	1506.69	1506.77	1506.73	1507.08	1506.78	1506.73	-0.49	-0.29	-0.35	-0.05	1506.88
W1000-0	Baseline	1507.22	1507.02	1507.15	1507.15	1507.15	1507.16	1507.15	1507.16	1507.15	1507.17	-0.05	0.15	0.01	0.02	1507.15
W1000-5.6	CELA Side	1507.32	1507.29	1507.28	1507.23	1507.21	1507.19	1507.14	1507.27	1507.26	1507.20	-0.12	-0.09	-0.07	-0.06	1507.24
W1000-13.3	CELA Side	1503.32	1502.99	1502.90	1502.85	1502.86	1502.73	1502.82	1502.90	1502.87	1502.90	-0.42	-0.09	0.00	0.03	1502.91
W1000-14.7	CELA Side		1502.70	1502.66	1502.64	1502.59	1502.57	1502.25	1502.57	1502.54	1502.56		-0.14	-0.01	0.02	1502.56
West Dike Station 12+00																
W1200-89.0	River Side					1494.95	1492.95	1493.22	1493.27	1493.01	1493.08			-0.19	0.07	1493.41
W1200-87.0	River Side					1492.11	1491.90	1492.18	1491.89	1491.45	1491.79			-0.10	0.34	1491.89
W1200-84.0	River Side	1495.17	1495.29	1495.18	1495.23											1495.22
W1200-75.5	River Side	1495.17	1494.95	1494.63	1494.56											1494.83
W1200-74.0	River Side	1493.32	1493.22	1493.05	1492.97	1490.10										1492.53
W1200-68.5	River Side		1491.70													
W1200-62.3	River Side	1494.22	1494.21	1494.14	1494.19											1494.19
W1200-60.4	River Side					1493.91	1493.82	1494.14	1494.08	1494.04	1494.03			-0.05	-0.01	1494.00
W1200-44.2	River Side	1493.67	1493.67	1494.00	1493.52	1494.06	1493.82	1494.10	1494.10	1494.05	1494.07	0.40	0.40	-0.03	0.02	1493.91
W1200-8.0	River Side	1508.07	1507.95	1507.75	1507.73	1507.60	1507.74	1507.74	1507.73	1507.72	1507.79	-0.28	-0.16	0.06	0.07	1507.78
W1200-0	Baseline	1508.17	1508.10	1508.10	1508.11	1508.11	1508.11	1508.12	1508.13	1508.11	1508.09	-0.08	-0.01	-0.04	-0.02	1508.12
W1200-5.7	CELA Side	1508.17														
W1200-6.0	CELA Side		1508.11	1508.01	1507.91	1508.00	1508.07	1507.86	1508.05	1507.91	1507.87		-0.24	-0.18	-0.04	1507.98
W1200-13.4	CELA Side		1504.40	1504.34	1504.34	1504.29	1504.26	1504.25	1504.26	1504.42	1504.32		-0.08	0.06	-0.10	1504.32
W1200-15.5	CELA Side	1503.52	1504.42	1504.30	1504.13	1504.05	1503.99	1504.06	1504.05	1504.08	1504.05	0.53	-0.37	0.00	-0.03	1504.07
West Dike Station 14+00																
W1400-83.0	River Side	1496.92	1496.88	1496.88	1496.90	1496.88										1496.89
W1400-73.5	River Side	1497.62	1497.68	1497.68	1497.70	1497.68										1497.67
W1400-70.0	River Side	1495.12	1495.23	1495.41	1495.53	1495.06	1495.18	1495.17	1495.18	1495.20	1495.22	0.10	-0.01	0.04	0.02	1495.23
W1400-60.3	River Side	1495.47	1495.46	1495.43	1495.52	1495.46	1495.46	1495.47	1495.49	1495.44	1495.48	0.01	0.02	-0.01	0.04	1495.47
W1400-53.4	River Side	1494.87	1494.85	1494.81	1495.01	1495.33	1495.20	1495.06	1495.11	1495.44	1494.99	0.12	0.14	-0.12	-0.45	1495.07

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West Dike Station 14+00 Continued																
W1400-41.6	River Side	1494.47	1494.50	1494.42	1494.52	1494.51	1494.51	1494.46	1494.47	1494.46	1494.48	0.01	-0.02	0.01	0.02	1494.48
W1400-7.0	River Side	1508.57	1508.50	1508.42	1508.47	1508.42	1508.14	1508.39	1508.38	1508.40	1508.42	-0.15	-0.08	0.04	0.02	1508.41
W1400-0	Baseline	1508.37	1508.27	1508.26	1508.30	1508.28	1508.27	1508.25	1508.29	1508.28	1508.29	-0.08	0.02	0.00	0.01	1508.29
W1400-6.2	CELA Side	1508.42														
W1400-6.3	CELA Side		1508.31	1508.29	1508.17	1508.15	1508.21	1508.18	1508.22	1508.25	1508.24		-0.07	0.02	-0.01	1508.22
W1400-12.5	CELA Side		1505.10	1505.01	1505.06	1504.96	1504.74	1504.69	1504.97	1504.95	1504.85		-0.25	-0.12	-0.10	1504.93
W1400-17.0	CELA Side	1502.87	1504.48	1504.35	1504.42	1504.03	1504.04	1504.01	1504.05	1504.03	1504.12	1.25	-0.36	0.07	0.09	1504.04
West Dike Station 16+00																
W1600-76.0	River Side	1496.95	1496.82	1496.75	1496.69	1496.86	1496.84	1497.06	1496.99	1497.26	1497.16	0.21	0.34	0.17	-0.10	1496.94
W1600-58.0	River Side	1496.80	1496.82	1496.24	1496.85	1496.71	1496.98	1496.73	1497.12	1497.35	1497.93	1.13	1.11	0.81	0.58	1496.95
W1600-41.2	River Side	1496.60	1496.60	1496.47	1496.76	1496.90	1496.94	1497.01	1497.14	1497.41	1497.21	0.61	0.61	0.07	-0.20	1496.90
W1600-6.6	River Side	1509.45	1509.41	1509.36	1509.40	1509.32	1509.31	1509.32	1509.29	1509.24	1509.27	-0.18	-0.14	-0.02	0.03	1509.34
W1600-0	Baseline	1508.85	1508.74	1508.74	1508.79	1508.79	1508.78	1508.78	1508.79	1508.76	1508.76	-0.09	0.02	-0.03	0.00	1508.78
W1600-8.3	CELA Side	1508.75	1508.72	1508.67	1508.66	1508.73	1508.61	1508.65	1508.67	1508.66	1508.69	-0.06	-0.03	0.02	0.03	1508.68
W1600-14.0	CELA Side		1506.38	1506.32	1506.33	1506.27	1505.93	1506.25	1506.23	1506.19	1506.12		-0.26	-0.11	-0.07	1506.22
W1600-19.2	CELA Side	1503.25	1505.62	1505.56	1505.60	1505.54	1505.33	1505.55	1505.50	1505.32	1505.46	2.21	-0.16	-0.04	0.14	1505.27
West Dike Station 18+00																
W1800-56.0	River Side	1495.45														1495.45
W1800-52.3	River Side	1496.10	1496.13	1495.73												1495.99
W1800-51.8	River Side				1496.10	1496.10	1495.43	1495.97	1495.94	1496.25	1495.90			-0.04	-0.35	1495.96
W1800-43.0	River Side	1497.65	1497.65	1497.58	1497.63	1497.58	1497.95	1497.79	1497.80	1497.80	1497.80	0.15	0.15	0.00	0.00	1497.72
W1800-27.0	River Side	1502.85	1502.87	1502.76	1502.85	1502.77	1502.80	1502.82	1502.77	1502.72	1502.71	-0.14	-0.16	-0.06	-0.01	1502.79
W1800-20.7	River Side	1503.60	1503.66	1503.40	1503.61	1503.59	1503.51	1503.51	1503.47	1503.64	1503.47	-0.13	-0.19	0.00	-0.17	1503.55
W1800-6.3	River Side	1509.65	1509.65	1509.53	1509.56	1509.47	1509.47	1509.49	1509.46	1509.45	1509.45	-0.20	-0.20	-0.01	0.00	1509.52
W1800-0	Baseline	1508.95	1508.98	1508.70	1508.72	1508.70	1508.74	1508.75	1508.75	1508.74	1508.74	-0.21	-0.24	-0.01	0.00	1508.78
W1800-7.5	CELA Side	1509.10	1509.07	1508.69	1508.88	1508.73	1508.88	1508.83	1508.77	1508.85	1508.84	-0.26	-0.23	0.07	-0.01	1508.86
W1800-14.5	CELA Side		1505.90	1506.10	1506.12	1506.07	1506.09	1506.07	1506.03	1506.03	1506.02		0.12	-0.01	-0.01	1506.05
W1800-17.4	CELA Side	1503.85	1505.84	1505.78	1505.81	1505.76	1505.74	1505.69	1505.73	1505.72	1505.72	1.87	-0.12	-0.01	0.00	1505.56
West Dike Station 20+00																
W2000-196.0	River Side	1501.76														
W2000-179.0	River Side	1496.31														
W2000-177.5	River Side				1496.39											
W2000-150.0	River Side	1495.91														
W2000-135.0	River Side	1495.21														
W2000-126.6	River Side				1496.00											
W2000-107.0	River Side	1495.31														
W2000-104.7	River Side				1495.16											

Notes: Negative change indicates a decrease in elevation.
Positive change indictes a increase in elevation.

Table 1

Genesee River Dike Surveyed Elevations (1992-2001)
Former Sinclair Refinery Site (OU-1)
Wellsville, New York
(ft msl)

Station & Distance From Baseline	Location Description	1992 Elevation	1993 Elevation	1994 Elevation	1995 Elevation	1996 Elevation	1997 Elevation	1998 Elevation	1999 Elevation	2000 Elevation	2001 Elevation	Change From 1992 to 2001	Change From 1993 to 2001	Change From 1999 to 2001	Change From 2000 to 2001	Average Elevation
West Dike Station 20+00 Continued																
W2000-90.0	River Side	1494.01			1494.01											1494.01
W2000-77.9	River Side				1493.42											
W2000-62.9	River Side				1492.36											
W2000-56.0	River Side	1493.21	1493.21		1494.06											1493.49
W2000-52.0	River Side	1495.96	1496.00	1495.46	1496.00	1495.96	1495.93	1495.66	1495.69	1496.24	1495.62	-0.34	-0.38	-0.07	-0.62	1495.85
W2000-42.8	River Side	1496.26	1496.39	1496.57	1496.69	1496.80	1497.05	1497.08	1497.19	1497.39	1497.04	0.78	0.65	-0.15	-0.35	1496.85
W2000-19.6	River Side	1504.71	1504.72	1504.25	1504.64	1504.63	1504.63	1504.60	1504.64	1504.60	1504.59	-0.12	-0.13	-0.05	-0.01	1504.60
W2000-5.8	River Side	1509.71	1509.78	1509.68	1509.75	1509.65	1509.59	1509.52	1509.55	1509.52	1509.51	-0.20	-0.27	-0.04	-0.01	1509.63
W2000-0	Baseline	1509.31	1509.31	1509.24	1509.26	1509.26	1509.23	1509.23	1509.25	1509.25	1509.23	-0.08	-0.08	-0.02	-0.02	1509.26
W2000-8.0	CELA Side	1509.36														
W2000-9.0	CELA Side		1509.14	1508.93	1509.03	1508.90	1508.89	1509.01	1509.06	1509.09	1509.03		-0.11	-0.03	-0.06	1509.01
W2000-16.4	CELA Side		1505.42	1505.42	1505.33	1505.26	1505.38	1505.35	1505.39	1505.40	1505.79		0.37	0.40	0.39	1505.42
W2000-19.4	CELA Side	1503.56	1505.05	1505.06	1504.99	1504.87	1504.93	1504.95	1504.97	1504.87	1504.90	1.34	-0.15	-0.07	0.03	1504.82
West Dike Station 22+00																
W2200-65.0	River Side	1494.71	1494.81	1494.81	1494.71											1494.76
W2200-55.0	River Side	1495.56	1495.62	1495.42	1496.51	1495.47	1496.02	1496.36	1496.20	1496.48	1496.37	0.81	0.75	0.17	-0.11	1496.00
W2200-49.0	River Side	1498.41	1498.43	1498.37	1498.40	1498.34	1498.30	1498.33	1498.32	1498.33	1498.33	-0.08	-0.10	0.01	0.00	1498.36
W2200-40.6	River Side	1498.51	1498.55	1498.76	1498.66	1498.90	1498.74	1498.64	1498.73	1498.71	1498.67	0.16	0.12	-0.06	-0.04	1498.69
W2200-19.8	River Side	1504.56	1504.55	1504.51	1505.00	1504.56	1505.06	1505.05	1505.00	1504.99	1505.02	0.46	0.47	0.02	0.03	1504.83
W2200-6.3	River Side	1509.96	1509.99	1509.84	1510.02	1510.05	1510.03	1510.01	1510.01	1509.98	1509.98	0.02	-0.01	-0.03	0.00	1509.99
W2200-0	Baseline	1509.96	1509.88	1509.85	1509.88	1509.86	1509.85	1509.85	1509.86	1509.85	1509.83	-0.13	-0.05	-0.03	-0.02	1509.87
W2200-7.3	CELA Side	1509.69	1509.73	1509.64	1509.66	1509.67	1509.63	1509.69	1509.76	1509.72	1509.67	-0.02	-0.06	-0.09	-0.05	1509.69
W2200-16.6	CELA Side	1504.66		1504.51	1504.62	1504.53	1504.55	1504.62	1504.63	1504.55	1504.62	-0.04		-0.01	0.07	1504.59
W2200-17.7	CELA Side	1504.31	1504.58	1504.47	1504.34	1504.58	1504.54	1504.59	1504.56	1504.59	1504.52	0.21	-0.06	-0.04	-0.07	1504.51
										Maximum Change		**3.29**	**1.11**	**0.81**	**-0.62**	
										Minimum Change		**0.00**	**± 0.01**	**0.00**	**0.00**	
										Average Change		**0.11**	**0.02**	**-0.01**	**-0.02**	

Notes: Negative change indicates a decrease in elevation.
Positive change indictes a increase in elevation.

Table 2

2005 Daily Average Stage and Discharge
Genesee River at Wellsville, New York
USGS Station 04221000

Date	Stage (ft)	Discharge (cu ft/sec)
1/1/2005	5.37	544
1/2/2005	5.20	426
1/3/2005	5.36	548
1/4/2005	6.15	1266
1/5/2005	5.63	750
1/6/2005	5.66	778
1/7/2005	5.74	845
1/8/2005	5.61	736
1/9/2005	5.55	680
1/10/2005	5.47	620
1/11/2005	5.41	573
1/12/2005	6.10	1325
1/13/2005	8.02	3751
1/14/2005	9.33	5817
1/15/2005	7.06	2366
1/16/2005	6.26	1372
1/17/2005	5.96	1050
1/18/2005	5.69	720
1/19/2005	5.60	680
1/20/2005	5.56	640
1/21/2005	5.39	500
1/22/2005	5.30	420
1/23/2005	5.27	440
1/24/2005	5.16	380
1/25/2005	5.19	420
1/26/2005	5.13	350
1/27/2005	5.15	290
1/28/2005	5.23	260
1/29/2005	4.96	280
1/30/2005	4.97	311
1/31/2005	4.88	250
2/1/2005	4.82	220
2/2/2005	4.80	210
2/3/2005	4.80	220
2/4/2005	4.79	218
2/5/2005	4.77	207
2/6/2005	4.77	206
2/7/2005	4.81	229
2/8/2005	5.09	381
2/9/2005	5.64	769
2/10/2005	6.06	1100
2/11/2005	5.56	600
2/12/2005	5.39	530
2/13/2005	5.28	450
2/14/2005	5.19	439
2/15/2005	5.52	677
2/16/2005	5.72	826
2/17/2005	5.48	629
2/18/2005	5.30	480
2/19/2005	5.21	420
2/20/2005	5.21	400
2/21/2005	5.16	419
2/22/2005	5.12	396
2/23/2005	5.07	361
2/24/2005	4.99	310
2/25/2005	5.00	300
2/26/2005	4.96	300
2/27/2005	5.02	250
2/28/2005	4.92	270
3/1/2005	4.90	272
3/2/2005	4.88	250
3/3/2005	4.84	220
3/4/2005	4.88	220
3/5/2005	4.87	210
3/6/2005	4.84	210
3/7/2005	4.91	270
3/8/2005	5.92	1000
3/9/2005	5.38	520
3/10/2005	5.24	410
3/11/2005	5.17	390
3/12/2005	5.15	370
3/13/2005	5.08	310
3/14/2005	5.06	280
3/15/2005	5.02	270
3/16/2005	4.92	250
3/17/2005	4.90	230
3/18/2005	4.92	240
3/19/2005	4.96	280
3/20/2005	5.16	422
3/21/2005	5.40	578
3/22/2005	5.28	501
3/23/2005	5.47	628
3/24/2005	5.29	501
3/25/2005	5.38	559
3/26/2005	5.44	601
3/27/2005	5.58	708
3/28/2005	6.46	1621
3/29/2005	6.73	1928
3/30/2005	6.56	1724
3/31/2005	6.73	1934
4/1/2005	6.84	2060
4/2/2005	7.77	3430
4/3/2005	8.44	4370
4/4/2005	7.30	2665
4/5/2005	6.85	2078
4/6/2005	6.46	1604
4/7/2005	6.24	1343
4/8/2005	6.04	1133
4/9/2005	5.80	896
4/10/2005	5.62	741
4/11/2005	5.48	629
4/12/2005	5.37	551
4/13/2005	5.29	497
4/14/2005	5.20	443
4/15/2005	5.12	396
4/16/2005	5.06	358
4/17/2005	5.01	331
4/18/2005	4.96	306
4/19/2005	4.93	285
4/20/2005	4.92	283
4/21/2005	5.00	324
4/22/2005	4.90	273
4/23/2005	5.17	423
4/24/2005	5.48	634
4/25/2005	5.27	485
4/26/2005	5.13	401
4/27/2005	5.06	358
4/28/2005	5.04	347
4/29/2005	5.01	329
4/30/2005	5.09	376
5/1/2005	5.10	383
5/2/2005	5.02	338
5/3/2005	4.99	320
5/4/2005	4.96	305
5/5/2005	4.91	274
5/6/2005	4.87	258

Notes: Provisional data provided by USGS and is subject to change
& - Value was computed from affected unit values

Table 2

2005 Daily Average Stage and Discharge
Genesee River at Wellsville, New York
USGS Station 04221000

Date	Stage (ft)	Discharge (cu ft/sec)
5/7/2005	4.84	244
5/8/2005	4.81	229
5/9/2005	4.77	207
5/10/2005	4.74	193
5/11/2005	4.72	180
5/12/2005	4.69	167
5/13/2005	4.67	152
5/14/2005	4.67	154
5/15/2005	4.70	170
5/16/2005	4.65	145
5/17/2005	4.63	134
5/18/2005	4.61	124
5/19/2005	4.58	115
5/20/2005	4.57	108
5/21/2005	4.57	106
5/22/2005	4.56	105
5/23/2005	4.55	99
5/24/2005	4.57	109
5/25/2005	4.58	112
5/26/2005	4.53	94
5/27/2005	4.51	87
5/28/2005	4.54	98
5/29/2005	4.56	105
5/30/2005	4.52	91
5/31/2005	4.50	85
6/1/2005	4.48	77
6/2/2005	4.46	72
6/3/2005	4.46	72
6/4/2005	4.51	89
6/5/2005	4.48	78
6/6/2005	4.63	144
6/7/2005	4.77	208
6/8/2005	4.54	98
6/9/2005	4.51	86
6/10/2005	4.46	73
6/11/2005	4.44	68
6/12/2005	4.43	67
6/13/2005	4.48	82
6/14/2005	4.42	64
6/15/2005	4.44	70
6/16/2005	4.53	98
6/17/2005	4.49	86
6/18/2005	4.48	80
6/19/2005	4.44	71
6/20/2005	4.41	62
6/21/2005	4.39	56
6/22/2005	4.38	53
6/23/2005	4.37	51
6/24/2005	4.36	49
6/25/2005	4.35	46
6/26/2005	4.34	44
6/27/2005	4.37	53
6/28/2005	4.39	58
6/29/2005	4.88	268
6/30/2005	4.62	140
7/1/2005	4.47	81
7/2/2005	4.48	85
7/3/2005	4.40	61
7/4/2005	4.37	54
7/5/2005	4.45	79
7/6/2005	4.56	114
7/7/2005	4.49	89
7/8/2005	4.64	161
7/9/2005	4.66	160
7/10/2005	4.51	97
7/11/2005	4.43	68
7/12/2005	4.39	59
7/13/2005	4.41	65
7/14/2005	4.43	71
7/15/2005	4.37	52
7/16/2005	4.36	50
7/17/2005	4.39	58
7/18/2005	4.38	56
7/19/2005	4.35	47
7/20/2005	4.33	41
7/21/2005	4.31	38
7/22/2005	4.31	37
7/23/2005	4.30	36
7/24/2005	4.29	34
7/25/2005	4.28	31
7/26/2005	4.27	29
7/27/2005	4.29	32
7/28/2005	4.29	32
7/29/2005	4.27	29
7/30/2005	4.26	27
7/31/2005	4.26	27
8/1/2005	4.25	24
8/2/2005	4.24	23
8/3/2005	4.23	22
8/4/2005	4.23	22
8/5/2005	4.23	21
8/6/2005	4.22	20
8/7/2005	4.23	22
8/8/2005	4.22	19
8/9/2005	4.22	19
8/10/2005	4.22	19
8/11/2005	4.21	18
8/12/2005	4.22	20
8/13/2005	4.29	34
8/14/2005	4.35	48
8/15/2005	4.28	31
8/16/2005	4.26	27
8/17/2005	4.25	25
8/18/2005	4.24	24
8/19/2005	4.24	23
8/20/2005	4.25	26
8/21/2005	4.25	25
8/22/2005	4.22	21
8/23/2005	4.22	19
8/24/2005	4.22	19
8/25/2005	4.21	18
8/26/2005	4.21	18
8/27/2005	4.21	18
8/28/2005	4.22	21
8/29/2005	4.24	25
8/30/2005	4.40	67
8/31/2005	5.49	656
9/1/2005	5.02	346
9/2/2005	4.57	119
9/3/2005	4.44	72
9/4/2005	4.39	58
9/5/2005	4.35	48
9/6/2005	4.33	41
9/7/2005	4.31	37
9/8/2005	4.30	35
9/9/2005	4.29	33
9/10/2005	4.28	31
9/11/2005	4.27	30
9/12/2005	4.26	28
9/13/2005	4.26	26
9/14/2005	4.25	25
9/15/2005	4.25	25

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& - Value was computed from affected unit values

Table 2

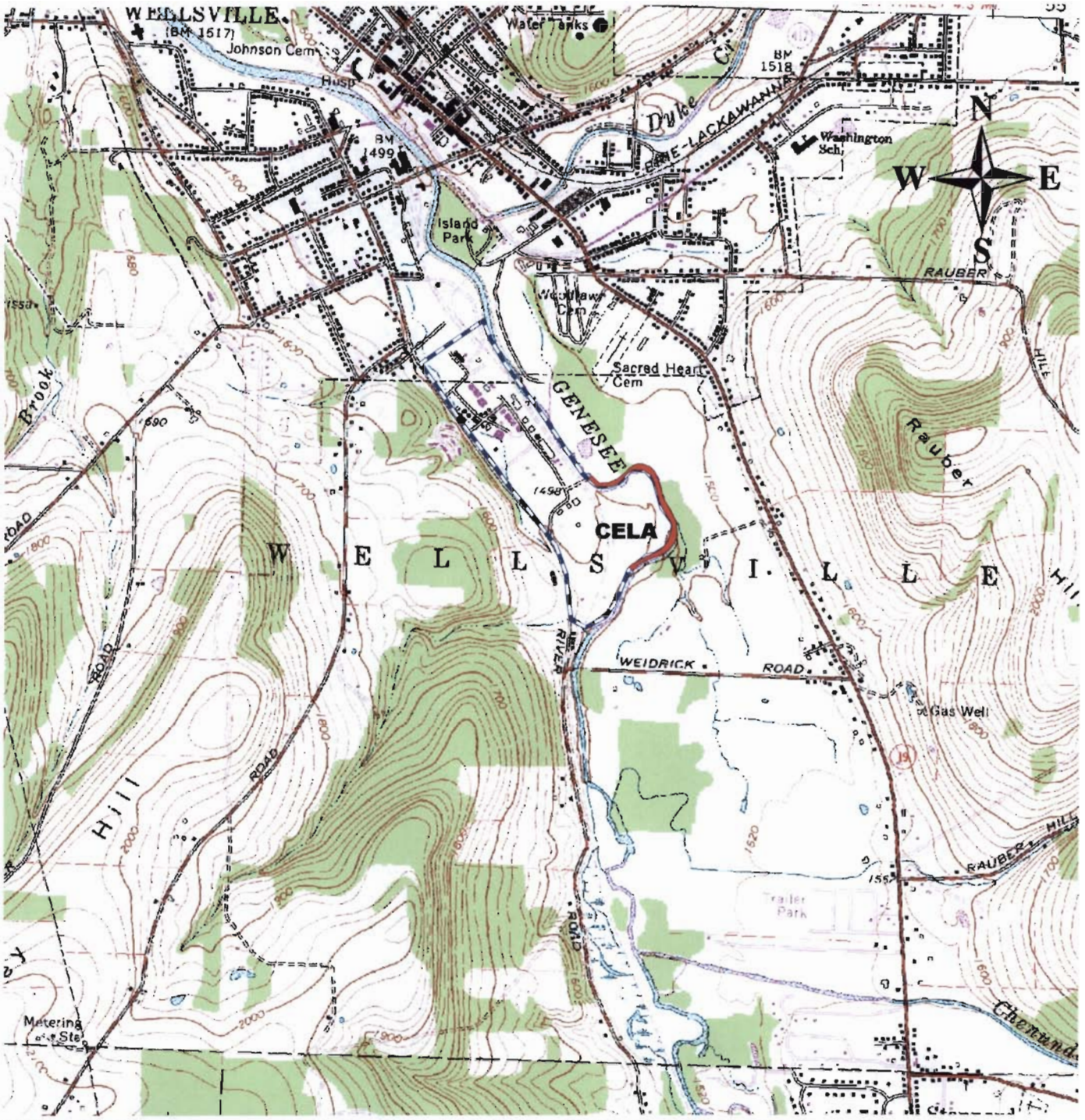
2005 Daily Average Stage and Discharge
Genesee River at Wellsville, New York
USGS Station 04221000

Date	Stage (ft)	Discharge (cu ft/sec)
9/16/2005	4.26	26
9/17/2005	4.29	32
9/18/2005	4.28	31
9/19/2005	4.26	26
9/20/2005	4.26	27
9/21/2005	4.26	27
9/22/2005	4.25	25
9/23/2005	4.25	26
9/24/2005	4.25	25
9/25/2005	4.25	26
9/26/2005	4.44	82
9/27/2005	4.57	121
9/28/2005	4.39	58
9/29/2005	4.50	97
9/30/2005	4.54	109
10/1/2005	4.41	64
10/2/2005	4.37	54
10/3/2005	4.34	43
10/4/2005	4.32	38
10/5/2005	4.30	36
10/6/2005	4.30	35
10/7/2005	4.60	185
10/8/2005	5.43	625
10/9/2005	4.83	240
10/10/2005	4.67	160
10/11/2005	4.59	126
10/12/2005	4.55	110
10/13/2005	4.51	97
10/14/2005	4.49	90
10/15/2005	4.47	81
10/16/2005	4.44	74
10/17/2005	4.42	67
10/18/2005	4.40	62
10/19/2005	4.39	59
10/20/2005	4.38	55
10/21/2005	4.36	52
10/22/2005	4.49	99
10/23/2005	5.41	592
10/24/2005	5.19	465
10/25/2005	6.51	1685
10/26/2005	6.47	1637
10/27/2005	5.67	788
10/28/2005	5.37	552
10/29/2005	5.21	449
10/30/2005	5.09	373
10/31/2005	4.99	321
11/1/2005	4.93	285
11/2/2005	4.98	314
11/3/2005	4.87	260
11/4/2005	4.81	228
11/5/2005	4.76	207
11/6/2005	4.79	221
11/7/2005	5.06	363
11/8/2005	4.86	256
11/9/2005	5.11	413
11/10/2005	5.87	984
11/11/2005	5.39	567
11/12/2005	5.24	468
11/13/2005	5.15	413
11/14/2005	5.06	359
11/15/2005	5.31	519
11/16/2005	5.84	994
11/17/2005	5.75	857
11/18/2005	5.48	629
11/19/2005	5.37	552
11/20/2005	5.27	486
11/21/2005	5.19	434
11/22/2005	5.13	396
11/23/2005	5.06	356
11/24/2005	5.02	336
11/25/2005	4.92	282
11/26/2005	4.90	273
11/27/2005	4.90	269
11/28/2005	5.23	464
11/29/2005	7.18	3081
11/30/2005	9.20	5686
12/1/2005	6.81	2030
12/2/2005	6.23	1334
12/3/2005	5.90	993
12/4/2005	5.70	807
12/5/2005	5.54	675
12/6/2005	5.42	585
12/7/2005	5.28	496
12/8/2005	5.20	444
12/9/2005	5.18	420
12/10/2005	5.12	396
12/11/2005	5.09	373
12/12/2005	5.04	347
12/13/2005	4.95	290
12/14/2005	5.10	280
12/15/2005	5.38	290
12/16/2005	4.94	291
12/17/2005	4.93	280
12/18/2005	5.17	260
12/19/2005	4.81	231
12/20/2005	4.77	209
12/21/2005	4.76	206
12/22/2005	4.74	196
12/23/2005	4.73	192
12/24/2005	4.80	222
12/25/2005	4.92	279
12/26/2005	5.16	421
12/27/2005	5.06	360
12/28/2005	5.00	325
12/29/2005	5.17	425
12/30/2005	5.31	511
12/31/2005	5.17	426

Notes: Provisional data provided by USGS and is subject to change
& - Value was computed from affected unit values

Figures

Site Location



Source: Wellsville South New York USGS 7.5 Minute Topographic Quadrangle, 1965, Photorevised 1978

Legend

- Approximate Site Boundary
- Approximate Area of River Channelization

2,000 1,000 0 2,000 Feet

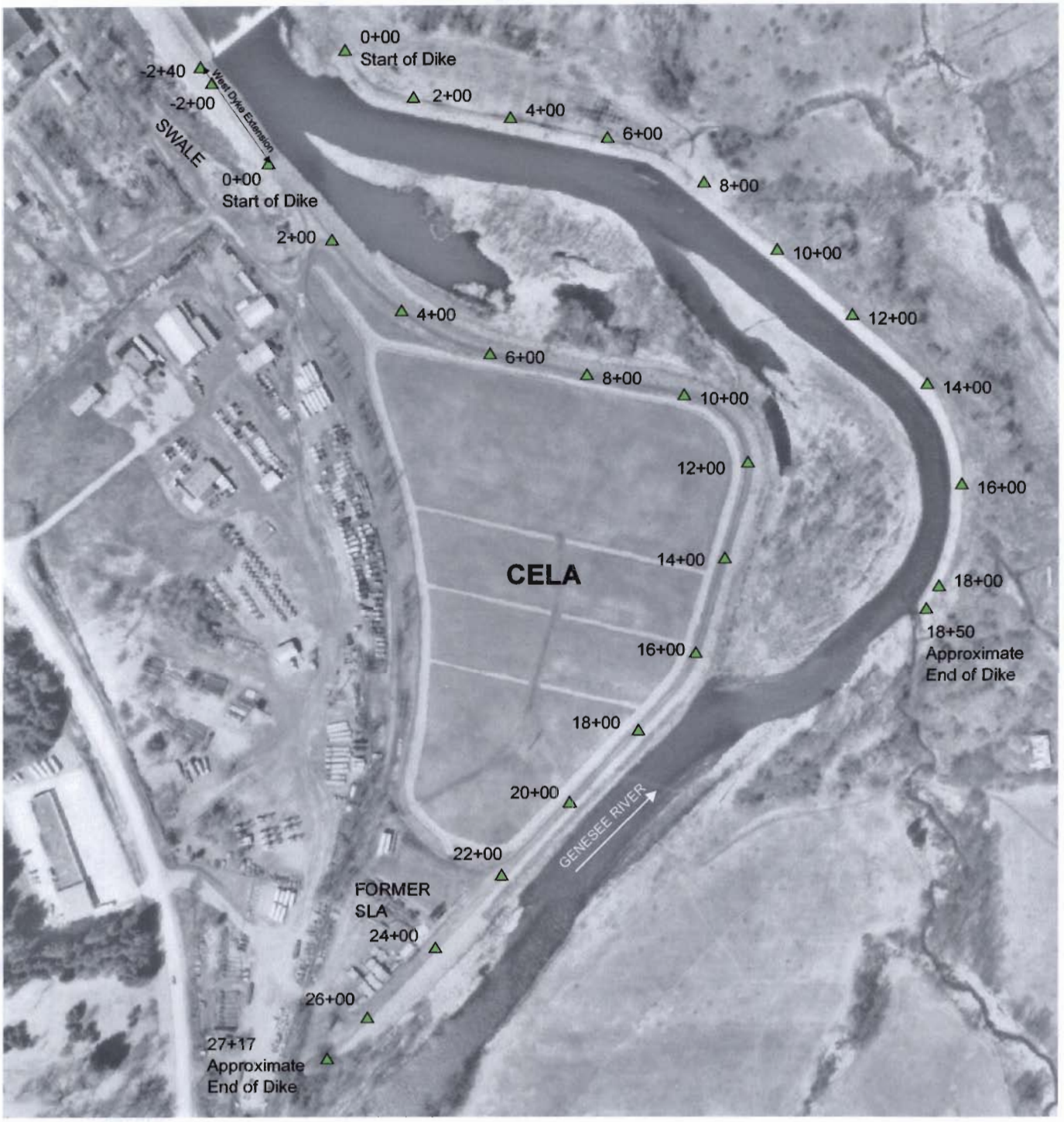
1 inch equals 2,000 feet

FIGURE NO.	1
PROJECT	WELLSVILLE OU-1
DOCUMENT	2005 RIVER REPORT
FILE NO.	SITELOC.MXD

ON-SITE TECHNICAL SERVICES, INC.
72 Railroad Avenue Wellsville, NY 14895

N:\ARCO_WLSV\OU1REPORTS\2005RIVERREPORTS\FIGURES\SITELOC.MXD

EAST & WEST DIKE STATION LOCATIONS



1999 Aerial Photograph

Legend

△ Approximate Location of Dike Station

300 150 0 300

Feet

1 inch equals 300 feet

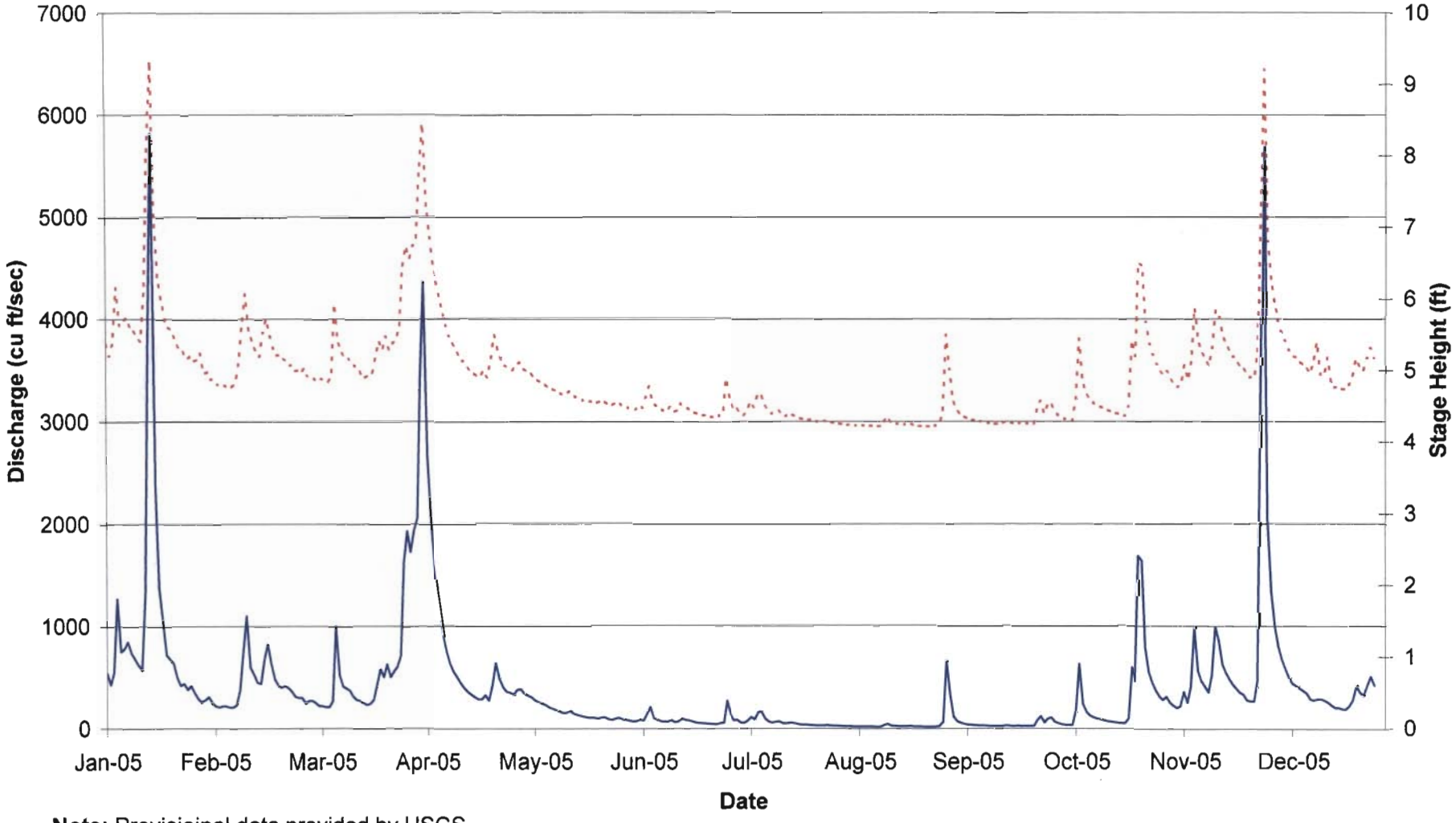
ON-SITE TECHNICAL SERVICES, INC.

72 Railroad Avenue Wellsville, NY 14895

FIGURE NO.	2
PROJECT	WELLSVILLE OU-1
DOCUMENT	2005 RIVER REPORT
FILE NO.	DIKE.MXD

N:\ARCO_WLSVOU1REPORS\2005RIVERREPORTS\FIGURES\DIKE.MXD

Figure 3
Genesee River Daily Average Discharge and Stage
Wellsville, New York



Note: Provisioinal data provided by USGS from the Wellsville, New York gauge station and is subject to revision

Appendix A

(cd/pdf copy of document)

Appendix B

-----Original Message-----
From: Negrelli.Mike@epamail.epa.gov
[mailto:Negrelli.Mike@epamail.epa.gov]
Sent: Monday, June 27, 2005 4:08 PM
To: Hufford, Walter
Cc: mfmoore@gw.dec.state.ny.us
Subject: OU1 Monitoring

Walt-
After discussion with Maurice, we agree to ARCO's proposal to suspend SVOC analysis from the CELA monitoring program as they have been non-detect since 1998. However, EPA reserves the right to have SVOC analysis resume should conditions at the CELA change at some point in the future that would lead us to believe the analysis should be resumed. Further, I believe we have previously agreed to your request to changing the soil pH analysis from annually to every three years, both in the CELA monitoring program and partial river channelization monitoring program. Please inform Jerry Palmer and Jon Brandis at On-Site Health and Safety of this determination.

If you have any questions on this matter, please do not hesitate to contact me.

Appendix C

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

NOV 0 8 2002

BY FEDEX

Terry Moore
Environmental Manager
BP/ARCO Environmental Remediation, L.L.C.
1701 Summit Avenue, Suite 2
Plano, TX 75074

Re: Sinclair Refinery Site, Wellsville, New York

Dear Mr. Moore:

This letter is in response to the Atlantic Richfield Company's ("ARCO's") letter to the U.S. Environmental Protection Agency ("EPA"), dated April 24, 2002, regarding proposed modifications to certain Operation and Maintenance (O&M) requirements for the first operable unit (OU1) at the Sinclair Refinery site in Wellsville, New York. Specifically, ARCO's letter requests modifications to the frequency of elevation surveys of the river channel and banks associated with OU1 and discontinuation of analyzing dissolved metals in the annual ground water sampling (total metals will continue to be analyzed).

ARCO notes that the O&M Manual for OU1 states that the frequency of surveying of cross sections of the dikes will depend on significant changes in surveying data (the elevation surveys of the river bed have no corresponding mention of changing the frequency based on observations). Surveys performed by ARCO annually for the past ten years have indicated no significant changes in survey data for either the dike cross sections or river bed. Accordingly, EPA approves modifying the survey frequency from annually to every five years. As ARCO notes in its letter, annual inspections and periodic patrols following high water events shall continue.

ARCO also requests a discontinuation of the analysis for dissolved metals in the annual ground water sampling. This request is based on recent sampling events showing metals to be below MCLs and a good correlation between dissolved and total metals concentrations (ARCO will continue to perform total metals analysis annually). Therefore, EPA approves of ARCO's proposal to discontinue dissolved metals analysis in the annual ground water sampling at OU1. However, at the request of the New York State Department of Environmental Conservation (NYSDEC), this approval shall be effective starting with the 2003 annual sampling event in order to allow the NYSDEC to collect split samples during the 2002 sampling event. Please contact Maurice Moore at the NYSDEC regional office (716-851-7220) at least two weeks prior to the sampling event in order to make arrangements.

If you have any questions on this matter, please contact me at (212) 637-4278 or by email at negrelli.mike@epa.gov.

Sincerely yours,

Michael J.Negrelli
Remedial Project Manager
New York Remediation Branch

cc: Wayne Mizerak - NYSDEC
Maurice Moore - NYSDEC/R.9

Appendix D

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Scott Watson / Kevin Dye Sheet 1 of 2

Title: _____ Date: 8-9-05

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

(X) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station 0+00 to 18+50 (East/West) EAST

Item Description	Condition*/Remarks
1. Settlement, sloughing or, loss of grade.	✓
2. Caving (either side of dike)	✓
3. Seepage, saturated areas, or sand boils.	✓
4. Riprap slope protection- evidence of displacement or unusual settlement, woody growth in riprap.	✓
5. Access roads	✓
6. Unauthorized traffic	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Scott Wadon / Kevin Dye Sheet 2 of 2

Title: _____ Date: 8-9-05

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

(✓) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station 0+00 to 18+50 (East/West) EAST

Item	Description	Condition*/Remarks
7.	Accumulation of drift, trash, and debris.	✓
8.	Vegetative cover including soil pH check	✓ ?
9.	Weeds or undesirable vegetation.	✓
10.	Unauthorized excavation, loose backfill or sod removal.	✓
11.	Burrowing animals.	✓
12.	Evidence of fires/vandalism	✓
13.	Routine mowing	✓
14.	Shoaling check (photograph)	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

8/09/2005 East Dike Station 16+00 view to the South

8/09/2005 East Dike Station 18+50 view to the North

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Scott Watson / Kevin Dye Sheet 1 of 2

Title: _____ Date: 8-9-05

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

(X) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station -2+40 to 27+17 (East/West) West

Item	Description	Condition*/Remarks
1.	Settlement, sloughing or, loss of grade.	
2.	Caving (either side of dike)	
3.	Seepage, saturated areas, or sand boils.	
4.	Riprap slope protection- evidence of displacement or unusual settlement, woody growth in riprap.	
5.	Access roads	
6.	Unauthorized traffic	

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Scott Warren / Kevin Dye Sheet 2 of 2

Title: _____ Date: 8-9-05

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

( ) Annual during low flow.
( ) Immediately after a high water period.
( ) Other (explain)

Dike Station -2+40 to 27+17 (East/West) West

Item	Description	Condition*/Remarks
7.	Accumulation of drift, trash, and debris.	
8.	Vegetative cover including soil pH check	
9.	Weeds or undesirable vegetation.	
10.	Unauthorized excavation, loose backfill or sod removal.	
11.	Burrowing animals.	
12.	Evidence of fires/vandalism	
13.	Routine mowing	
14.	Shoaling check (photograph)	

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

8/09/2005 West Dike Station 2+00 view to the South

8/09/2005 West Dike Station 4+00 view to the North

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: Scott Watson / K. Dye Sheet 1 of 2

Title: _____ Date: 12-1-05

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

( ) Annual during low flow.
(X) Immediately after a high water period.
( ) Other (explain)

Dike Station -2+40 to 2+00 (East/West) West
16+00 to 27+17

Item	Description	Condition*/Remarks
1.	Settlement, sloughing or, loss of grade.	✓
2.	Caving (either side of dike)	✓
3.	Seepage, saturated areas, or sand boils.	✓
4.	Riprap slope protection- evidence of displacement or unusual settlement, woody growth in riprap.	✓
5.	Access roads	✓
6.	Unauthorized traffic	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

12/01/2005 East Dike Station 14+00 view to the South

12/01/2005 East Dike Station 14+00 view to the North

SINCLAIR REFINERY SITE
PARTIAL RIVER CHANNELIZATION
GENESEE RIVER
WELLSVILLE, NEW YORK

APPENDIX A

INSPECTION CHECKLIST

Inspection By: S. Watson / K. Dye Sheet 2 of 2

Title: _____ Date: 12-1-05

Verified By: _____

Title: _____ Date: _____

Type of Inspection (check only one):

( ) Annual during low flow.
(X) Immediately after a high water period.
( ) Other (explain)

Dike Station 0+00 to 18+60 (East/West) East

Item	Description	Condition*/Remarks
7.	Accumulation of drift, trash, and debris.	✓
8.	Vegetative cover including soil pH check	✓
9.	Weeds or undesirable vegetation.	✓
10.	Unauthorized excavation, loose backfill or sod removal.	✓
11.	Burrowing animals.	✓
12.	Evidence of fires/vandalism	✓
13.	Routine mowing	✓
14.	Shoaling check (photograph)	✓

* Indicate satisfactory condition with a check; briefly describe conditions other than satisfactory; use additional sheets if more space is needed.

Observations and recommendations:

12/01/2005 East Dike Station 4+00 view to the North showing the West Dike

12/01/2005 East Dike Station 18+50 view to the South showing the West Dike