MANASQUAN RIVER
WATER QUALITY AND SEDIMENT SAMPLING
SUMMARY REPORT

Prepared For:

THE MANASQUAN WATERSHED MANAGEMENT GROUP

May 2000
0879-E01

Prepared by:

ENVIRONMENTAL DESIGN GROUP
582 PLAZA TERRACE EAST
BRICK, NEW JERSEY 08723

Michael S. Sinnema
Senior Environmental Scientist

Robert R. Fiorile
Environmental Scientist

This report was produced with the assistance of Monmouth County and NJDEP pursuant to National Oceanic and Atmospheric grant award No. NA870Z0241

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1.0 INTRODUCTION

This water quality and sediment sampling summary report has been prepared to present the results of a water quality study performed within the Manasquan River. The Manasquan River, stretching more than 23 miles in length, is located on the border between Ocean and Monmouth Counties and is within the Atlantic Drainage Basin (Figure 1). The Manasquan River drains an 82 square mile area containing extensive urban/suburban development, forest, and agricultural areas. The Manasquan River estuary is hydrologically connected to the Atlantic Ocean by the Manasquan Inlet and to Barnegat Bay through the Point Pleasant Canal. The estuary portion of the Manasquan River includes 6.5 miles in the lower reaches of this watercourse. The estuary has a semi-diurnal tidal exchange with the Atlantic Ocean.

The purpose of this study was to provide water quality data that will be utilized in the Manasquan Watershed Management Group's efforts to identify potential contamination sources and implement mitigation actions, which are targeted to achieve the goal of opening shellfish beds that are either currently closed or restricted. Fecal coliform contamination has been identified as a priority environmental stressor in the Manasquan River watershed by the Manasquan Watershed Management Group (MWMG). Fecal coliform enters surface and groundwater supplies from both nonpoint and point sources. Typical sources of coliform contamination include septic tanks, deteriorating sewerlines, land runoff, stormwater outfalls, boat discharge, and large concentrations of wildlife. According to the New Jersey Department of Environmental Protection's (NJDEP) Reapprasal of the Manasquan River Estuary report (Mumman 1996), there are no direct discharges of treated effluent to the Manasquan Estuary. However, there are numerous stormwater discharges and identified contaminated sites that could possibly be impacting water quality in the estuary. This study was designed to sample bacteriological concentrations and other chemical and physical water quality parameters in the immediate vicinity of selected outfall structures that discharge directly into the Manasquan River.

2.0 METHODS AND MATERIALS

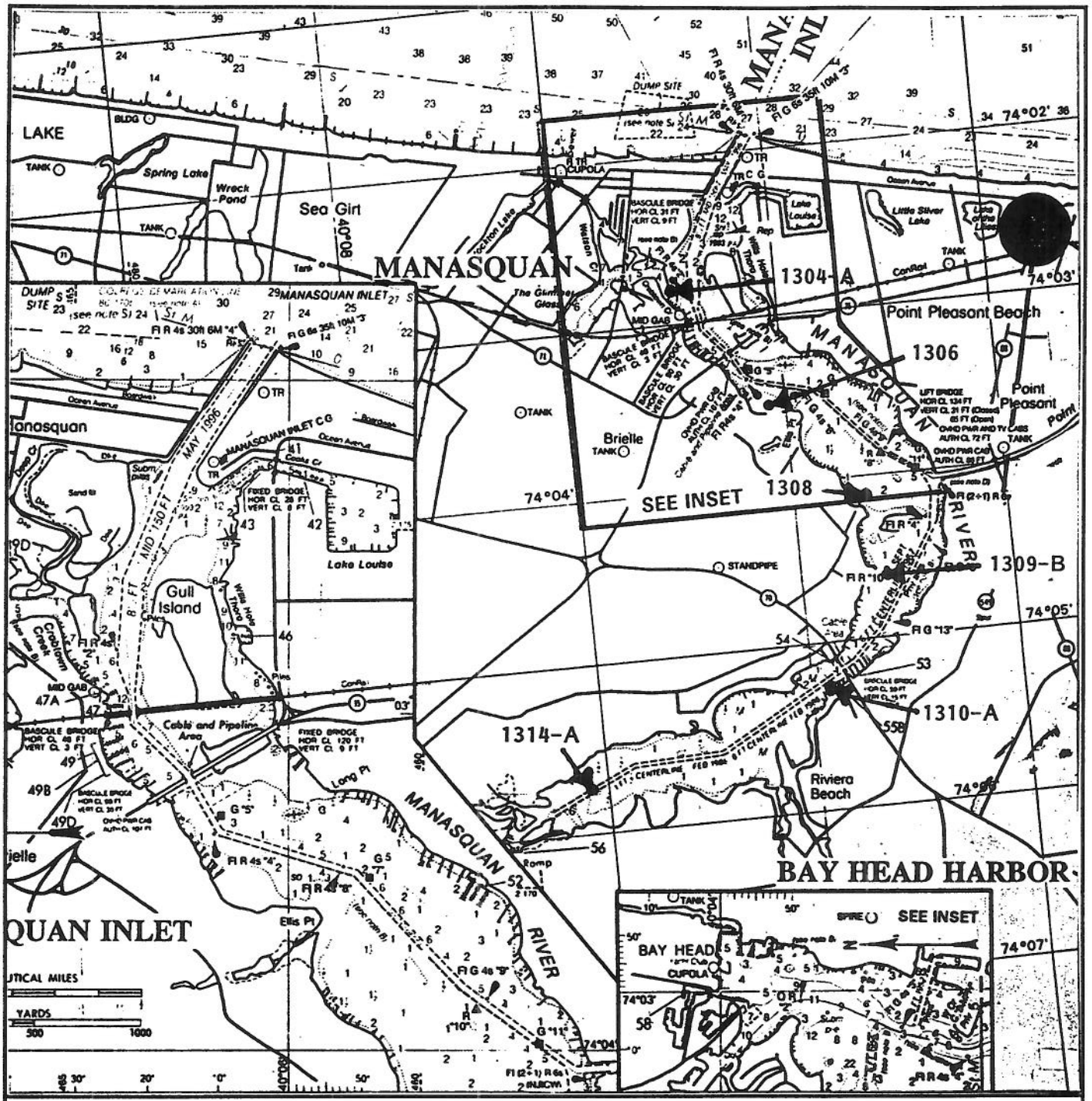
Six (6) sampling locations were established throughout the Manasquan River (Figure 2). These sampling locations were predetermined by the New Jersey Department of Environmental Protection (NJDEP), Division of Science and Research, Bureau of Marine Water Monitoring. These six (6) sampling stations are used by the NJDEP to collect data in support of the State's Water Quality Inventory Report. The six (6) sampling stations are identified as 1304-A, 1306, 1308, 1309-B, 1310-A, and 1314-A. The latitude and longitude coordinates for each sampling station are shown in Table 1 below.

TABLE 1
SAMPLING STATION COORDINATES
MANASQUAN RIVER

STATION	LATITUDE (state planar feet)	LONGITUDE (state planar feet)
1304-A	464,530	618,655
1306	462,399	615,544
1308	459,634	612,721
1309-B	456,346	610,346
1310-A	460,786	607,652
1314-A	469,196	604,830

Samples were collected during two (2) separate sampling events. The first sampling event, which occurred on February 24, 2000, is considered the "dry" sampling event. This is considered the dry sampling event due to the fact that the watershed received less than 1 in. of precipitation within a 36 hour period prior to sampling. The second sampling event, which occurred on April 21, 2000, is considered the "wet" sampling event. The second sampling event occurred within one (1) hour of the onset of a significant rainfall event (1 in. in 36 or less hours). According to data supplied by the New Jersey Water Supply Authority, the Manasquan River watershed received exactly 0.00 in. of precipitation within the 36 hour time period prior to the dry sampling event, and exactly 1.00 in. of precipitation over a 10 hour period from the storm that occurred during the wet sampling event. This meteorological data is presented as Appendix A.

Two (2) water column samples, one (1) at the surface and one (1) just above the river bottom, and one (1) bottom sediment sample were taken at each sampling location during the two (2) separate sampling events, resulting in a total of thirty six (36) samples. The water samples collected just above the river bottom were taken with a Kemmer water bottle, then transferred into lab supplied plastic containers. This procedure is consistent with water sampling procedures outlined in the NJDEP, Division of Water Resources' Field Procedures Manual for Water Data Acquisition (NJDEP 1996). Sediment samples were obtained utilizing a core sampler. The sediment samples were also transferred into the lab supplied plastic containers. The sample containers were sealed, labeled, and transported to Garden State Laboratories, Inc., a New Jersey State certified laboratory located in Hillside, NJ, within one (1) hour of being collected.



SAMPLING STATION LOCATION MAP

ENVIRONMENTAL DESIGN GROUP
Landscape Architecture • Land Planning • Environmental Consulting

582 Plaza Terrace East, Brick Township, N.J. 08723
Phone: (732) 477-3203 Fax: (732) 477 4285

Source:
National Oceanic and Atmospheric Adm.
Chart # 12324, Edition #28
Cape May to Sandy Hook, NJ

Figure No. 2

Scale:
1.5 in=1 Nautical Mile

NORTH

The soil and water samples were analyzed for the parameters identified in Table 2 below. Analysis of samples was conducted under the current year Department of Environmental Protection Quality Assurance/Quality Control plan.

TABLE 2
LABORATORY ANALYSIS OF WATER & SEDIMENT SAMPLES
MANASQUAN RIVER

Parameter	Method
Total Coliform	SM189222B
Fecal Coliform	SM189222D
Enterococci	SM189230C
Clostridia perfringens	AEM

SM= Standard Methods For The Examination of Water and Wastewater. 18th Edition.
AEM= Applied and Environmental Microbiology. Jan. 1979, Vol. 37 No. 1. pp 55-66.

In addition to collecting sediment and water samples, certain physical and chemical parameters were recorded at each sampling location during both sampling events. The physical parameters recorded include water temperature (F), water depth (feet), and turbidity (ft). The chemical parameters recorded include pH, conductivity (mg/cm), salinity (%), and dissolved oxygen (mg/l). The following parameters were recorded using a Horiba Water Quality Checker, model number U-10: pH, conductivity, salinity, dissolved oxygen, and water temperature. Turbidity was measured using a Secchi disk. Water depth was measured using a survey rod marked in 0.10 ft increments. Air temperature data was obtained from the New Jersey Water Supply Authority, Manasquan Water Supply System. Tidal flow rates for each sampling station were obtained from the United States Department of the Interior, Geological Survey, New Jersey Installation.

The sample locations were field located with a Trimbel Global Positioning System using longitude/latitude coordinates referenced to North American datum 1983 (NAD '83).

3.0 RESULTS

The two (2) sampling events occurred approximately two (2) months apart, with the dry sampling event occurring first. The Laboratory Reports of Analysis, which display the results of the bacteriological water quality analysis (i.e., coliform, enterococci, and Clostridium perfringens concentrations), are presented in Table 3 and as Appendix B. The chemical and physical water quality data collected during both sampling events are presented as Appendix C.

Sampling location 1314-A exhibited the highest concentrations of the four (4) contaminants analyzed. This sampling station is located farthest upstream than all other sampling stations.

During the dry sampling event, the highest concentrations of total coliform were observed in the water samples taken just above the river bottom. Conversely, the surface water samples taken

during the wet sampling event contained the highest total coliform concentrations of all samples collected during this event. The laboratory results from the two (2) sampling events presenting data by station number is included below as Table 3.

TABLE 3
BACTERIOLOGICAL WATER QUALITY DATA
MANASQUAN RIVER

1314-A		Date Sampled 2/24	4/21
SURFACE			
	TOTAL COLIFORM	30	440
	FECAL COLIFORM	<10	160
	ENTEROCOCCI	<10	260
	CLOSTRIDIUM PERFRINGENS	10	<10
BOTTOM			
	TOTAL COLIFORM	30	170
	FECAL COLIFORM	<10	30
	ENTEROCOCCI	<10	120
	CLOSTRIDIUM PERFRINGENS	<10	20
SEDIMENT			
	TOTAL COLIFORM	40	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	50	<10
	CLOSTRIDIUM PERFRINGENS	<10	<10

TABLE 3 (Continued)

1310-A

		Date Sampled 2/24	4/21
SURFACE			
	TOTAL COLIFORM	30	80
	FECAL COLIFORM	<10	10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	10	<10
BOTTOM			
	TOTAL COLIFORM	90	20
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	10	<10
SEDIMENT			
	TOTAL COLIFORM	10	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	<10	60

1309-B

		Date Sampled 2/24	4/21
SURFACE			
	TOTAL COLIFORM	20	40
	FECAL COLIFORM	<10	20
	ENTEROCOCCI	<10	10
	CLOSTRIDIUM PERFRINGENS	<10	<10
BOTTOM			
	TOTAL COLIFORM	170	10
	FECAL COLIFORM	<10	10
	ENTEROCOCCI	<10	10
	CLOSTRIDIUM PERFRINGENS	<10	<10
SEDIMENT			
	TOTAL COLIFORM	<10	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	<10	<10

TABLE 3 (Continued)

1308		Date Sampled 2/24	4/21
SURFACE			
	TOTAL COLIFORM	<10	40
	FECAL COLIFORM	<10	10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	10	<10
BOTTOM			
	TOTAL COLIFORM	<10	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	20	10
SEDIMENT			
	TOTAL COLIFORM	<10	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	10	<10

1306		Date Sampled 2/24	4/21
SURFACE			
	TOTAL COLIFORM	<10	30
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	<10	<10
BOTTOM			
	TOTAL COLIFORM	<10	70
	FECAL COLIFORM	<10	60
	ENTEROCOCCI	<10	80
	CLOSTRIDIUM PERFRINGENS	<10	80
SEDIMENT			
	TOTAL COLIFORM	<10	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	30	<10

TABLE 3 (Continued)

1304-A		Date Sampled 2/24	4/21
SURFACE			
	TOTAL COLIFORM	<10	<10
	FECAL COLIFORM	<10	10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	10	10
BOTTOM			
	TOTAL COLIFORM	<10	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	10
	CLOSTRIDIUM PERFRINGENS	10	20
SEDIMENT			
	TOTAL COLIFORM	<10	<10
	FECAL COLIFORM	<10	<10
	ENTEROCOCCI	<10	<10
	CLOSTRIDIUM PERFRINGENS	10	30

4.0 CONCLUSIONS

Results from this sampling project indicate that the tested contaminant levels within sediment samples obtained from the Manasquan River were low (equal to or less than 10 organisms per milliliter for each parameter) during both the wet and dry events and that surface water samples collected during the wet sampling event contained significantly higher concentrations of tested contaminants than those collected during the dry sampling event. As such, it can be reasonably concluded that the tested contaminants detected in the Manasquan River water column entered the river from sources outside of the river channel. The sources likely include upland non-point sources that enter the Manasquan River via stormwater outfalls and tributaries.

Additionally, it should be noted that conversations with Bonnie Zimmer, NJDEP, regarding the results of this sampling project indicate that the total coliform and fecal coliform levels detected in surface water samples obtained as part of this project are consistent with surface water data collected by NJDEP within the Manasquan River between 1990 and 1995.

5.0 REFERENCES

Connell, R.C. 1991. Evaluation of Adverse Pollution Conditions in New Jersey's Coastal Waters. New Jersey Department of Environmental Protection, Marine Water Classification and Analysis. Leeds Point, NJ.

Mumman, James E. 1996. Reapprasal of Manasquan River Estuary, 1990-1995. New Jersey Department Of Environmental Protection, Division of Science and Research, Bureau of Marine Water Monitoring. Trenton, NJ.

New Jersey Department of Environmental Protection. 1987-1992. Field Procedures Manual for Water Data Acquisition. New Jersey Department of Environmental Protection, Division of Water Resources. Trenton, NJ.

New Jersey Department of Environmental Protection. 1992 and 1995. State of New Jersey Shellfish Growing Water Classification Charts. New Jersey Department of Environmental Protection, Marine Water Classification and Analysis. Leeds Point, NJ.

New Jersey Department of Environmental Protection. 1998. Surface Water Quality Standards (N.J.A.C. 7:9B), Expiration Date: April 18, 2003. New Jersey Department of Environmental Protection, Office of Environmental Planning. Trenton, NJ.

APPENDIX A

NEW JERSEY WATER SUPPLY AUTHORITY
METEOROLOGICAL DATA

Monthly Temperature, Pressure and Relative Humidity Summary

Station: Howell (FRHLD/RISE)
Date: February 2000

Day	Temperature Maximum (F)	Temperature Minimum (F)	Relative Humidity Maximum (%)	Relative Humidity Minimum (%)	Precipitation (inches)	Sea Level Pressure (Inches) MIN / MAX	Sea Level Pressure (Millibars MIN /MAX
1	35.5°F	24.2°F	74.8%	43.7%	0.00"	29.80	29.68 1009 100
2	30.7°F	21.9°F	74.3%	29.7%	0.00"	30.03	29.77 1017 100
3	34.5°F	14.4°F	97.2%	42.9%	0.00"	30.00	29.71 1016 100
4	34.2°F	23.3°F	97.2%	77.3%	0.06"	29.80	29.68 1009 100
5	35.4°F	27.7°F	98.2%	30.3%	0.03"	29.94	29.80 1014 100
6	37.5°F	24.6°F	67.6%	26.1%	0.00"	30.21	29.92 1023 101
7	43.7°F	25.7°F	72.5%	43.1%	0.00"	30.18	29.89 1022 101
8	35.1°F	16.8°F	84.8%	25.1%	0.00"	30.48	30.21 1032 102
9	50.8°F	12.4°F	93.5%	42.5%	0.00"	30.33	29.92 1027 101
10	48.4°F	25.6°F	97.9%	43.0%	0.00"	29.97	29.80 1015 100
11	49.4°F	31.2°F	99.7%	57.8%	0.01"	29.97	29.59 1015 100
12	31.1°F	16.4°F	91.1%	41.0%	0.00"	30.21	30.00 1023 101
13	40.9°F	14.2°F	98.7%	57.7%	0.01"	30.18	29.89 1022 101
14	57.1°F	36.3°F	100.2%	69.6%	0.23"	29.83	29.44 1010 99
15	42.2°F	22.4°F	85.9%	32.9%	0.00"	30.12	29.62 1020 100
16	59.6°F	21.8°F	93.9%	44.3%	0.00"	30.09	29.77 1019 100
17	42.4°F	21.6°F	76.3%	26.6%	0.00"	30.48	30.06 1032 101
18	38.1°F	21.2°F	99.3%	69.4%	0.64"	30.48	29.83 1032 101
19	33.3°F	31.7°F	99.4%	89.7%	0.33"	29.97	29.74 1015 100
20	40.3°F	29.3°F	95.5%	47.0%	0.00"	30.18	29.97 1022 101
21	43.1°F	24.0°F	90.4%	36.4%	0.00"	30.39	30.18 1029 102
22	52.6°F	21.3°F	96.3%	33.1%	0.00"	30.48	30.39 1032 102
23	60.9°F	23.4°F	97.3%	45.0%	0.00"	30.45	30.27 1031 102
24	68.4°F	34.8°F	99.4%	31.8%	0.00"	30.27	30.09 1025 101
25	59.1°F	39.0°F	99.2%	69.0%	0.00"	30.30	30.06 1026 101
26	44.6°F	38.1°F	99.1%	84.8%	0.05"	30.39	30.27 1029 102
27	60.4°F	39.9°F	99.8%	69.6%	0.05"	30.27	29.89 1025 101
28	57.8°F	40.2°F	93.0%	32.6%	0.13"	30.03	29.83 1017 101
29	56.9°F	32.6°F	70.3%	17.3%	0.00"	30.09	30.00 1019 101

Mean Maximum Temperature: 45.7°F (29)
Mean Minimum Temperature: 26.1°F (29)
Extreme Maximum: 68.4°F
Extreme Minimum: 12.4°F
Total Precipitation: 1.54"(29)

Daily Station Summary

Station: Howell, (FRHLD)
Date: April 21, 2000

Hour	Temperature Air (F)	Temperature Dewpoint (F)	Relative Humidity (%)	Precipitation Liquid (in)	Precipitation Snow (in)	Wind Measurements Average (MPH)	Wind Measurements Gust (MPH)	Sea-Level Pressure (in)
1 AM	47.8 F	43.3 F	84.1%	0.00"	-----	ESE @ 1	SSE @ 7	29.86"
2 AM	47.6 F	43.8 F	86.4%	0.00"	-----	SE @ 3	SE @ 9	29.83"
3 AM	47.2 F	44.8 F	91.2%	0.00"	-----	SSE @ 6	SSE @ 13	29.80"
4 AM	47.0 F	45.5 F	94.4%	0.00"	-----	S @ 5	SSE @ 11	29.80"
5 AM	47.4 F	46.0 F	94.8%	0.00"	-----	S @ 7	SSE @ 16	29.74"
6 AM	48.1 F	46.6 F	94.4%	0.00"	-----	SSE @ 10	SSE @ 13	29.74"
7 AM	48.5 F	46.9 F	94.1%	0.00"	-----	SSE @ 2	SE @ 12	29.74"
8 AM	48.7 F	47.0 F	93.7%	0.00"	-----	E @ 5	SSE @ 17	29.71"
9 AM	48.5 F	47.3 F	95.5%	0.03"	-----	SSE @ 9	SE @ 21	29.71"
10 AM	49.0 F	47.1 F	93.0%	0.00"	-----	SSE @ 7	SSE @ 19	29.71"
11 AM	48.9 F	46.8 F	92.3%	0.01"	-----	S @ 6	SSE @ 18	29.71"
12 PM	48.6 F	47.4 F	95.5%	0.06"	-----	SE @ 5	SE @ 21	29.65"
1 PM	48.6 F	47.9 F	97.4%	0.22"	-----	ESE @ 4	SSE @ 17	29.62"
2 PM	49.5 F	48.9 F	97.8%	0.13"	-----	S @ 8	SSE @ 12	29.62"
3 PM	50.5 F	49.8 F	97.4%	0.14"	-----	SSE @ 3	SSE @ 16	29.59"
4 PM	51.1 F	50.6 F	98.1%	0.02"	-----	SE @ 4	ESE @ 11	29.56"
5 PM	51.9 F	51.5 F	98.5%	0.03"	-----	SSE @ 5	SSE @ 11	29.53"
6 PM	51.9 F	51.6 F	98.9%	0.05"	-----	ENE @ 3	ENE @ 10	29.50"
7 PM	49.1 F	48.9 F	99.2%	0.24"	-----	NNE @ 1	ENE @ 13	29.50"
8 PM	47.4 F	47.1 F	98.9%	0.01"	-----	NNW @ 2	E @ 19	29.50"
9 PM	47.3 F	47.0 F	98.9%	0.01"	-----	N @ 5	ENE @ 14	29.50"
10 PM	47.3 F	47.0 F	98.9%	0.00"	-----	ENE @ 5	NE @ 16	29.50"
11 PM	46.7 F	46.4 F	98.9%	0.00"	-----	NE @ 5	ENE @ 14	29.47"
12 AM	46.8 F	46.4 F	98.5%	0.04"	-----	NE @ 4	NNE @ 16	29.44"

Total Precipitation: 0.99"(24)

Daily Station Summary

Station: Howell, (FRHLD)
Date: April 22, 2000

Hour	Temperature Air (F)	Dewpoint (F)	Relative Humidity (%)	Precipitation Liquid (in)	Precipitation Snow (in)	Wind Measurements Average (MPH)	Wind Measurements Gust (MPH)	Sea-Level Pressure (in)
1 AM	47.3 F	47.0 F	98.9%	0.00"	-----	NNE @ 3	ENE @ 16	29.44"
2 AM	47.4 F	47.0 F	98.5%	0.00"	-----	NNE @ 2	ENE @ 12	29.41"
3 AM	46.8 F	46.5 F	98.9%	0.00"	-----	NNW @ 4	NE @ 8	29.41"
4 AM	46.3 F	46.0 F	98.9%	0.00"	-----	NNW @ 5	NW @ 10	29.38"
5 AM	45.9 F	45.7 F	99.2%	0.00"	-----	NNW @ 7	NNW @ 15	29.38"
6 AM	45.5 F	45.2 F	98.9%	0.00"	-----	N @ 3	NE @ 11	29.41"
7 AM	45.7 F	45.4 F	98.9%	0.01"	-----	NW @ 4	NNW @ 12	29.41"
8 AM	45.3 F	44.9 F	98.5%	0.00"	-----	N @ 4	NNW @ 10	29.44"
9 AM	45.8 F	45.3 F	98.1%	0.00"	-----	NNW @ 4	NNW @ 10	29.44"
10 AM	46.2 F	45.6 F	97.7%	0.00"	-----	NNE @ 4	NNW @ 8	29.44"
11 AM	46.8 F	45.8 F	96.2%	0.00"	-----	NNE @ 2	NNE @ 10	29.44"
12 PM	48.5 F	46.3 F	92.0%	0.00"	-----	NNW @ 3	NW @ 11	29.47"
1 PM	49.2 F	46.4 F	89.9%	0.00"	-----	NNW @ 6	NW @ 9	29.47"
2 PM	50.1 F	46.5 F	87.2%	0.00"	-----	NE @ 5	NW @ 9	29.47"
3 PM	51.4 F	46.5 F	83.1%	0.00"	-----	NNE @ 7	WNW @ 12	29.47"
4 PM	51.4 F	46.2 F	82.1%	0.00"	-----	NW @ 3	NW @ 10	29.47"
5 PM	51.5 F	45.9 F	80.9%	0.00"	-----	NNW @ 2	WNW @ 9	29.47"
6 PM	51.9 F	45.7 F	79.1%	0.00"	-----	N @ 3	N @ 8	29.47"
7 PM	51.4 F	45.4 F	79.6%	0.00"	-----	NE @ 4	NNW @ 8	29.50"
8 PM	50.0 F	45.1 F	83.0%	0.00"	-----	CALM	NNW @ 7	29.50"
9 PM	48.8 F	44.9 F	86.2%	0.00"	-----	NNE @ 3	NNW @ 7	29.50"
10 PM	47.7 F	45.0 F	90.2%	0.00"	-----	NNW @ 3	NNE @ 9	29.50"
11 PM	47.0 F	44.5 F	90.9%	0.00"	-----	NNE @ 2	NW @ 9	29.50"
12 AM	46.4 F	44.3 F	92.3%	0.00"	-----	NW @ 4	NNW @ 9	29.53"

Total Precipitation: 0.01"(24)

APPENDIX B

LABORATORY REPORT OF ANALYSIS FOR DRY SAMPLING EVENT (2/24/00)

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224546.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1304A-SURFACE	11:50AM		
Total Coliform	<10	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-17:15
Enterococci	<10	organisms per 100 ml	2/24/00-17:15
Clostridium perfringens	10	organisms per 100 ml	2/24/00
#1304A-BOTTOM	11:51AM		
Total Coliform	<10	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-16:35
Enterococci	<10	organisms per 100 ml	2/24/00-16:35
Clostridium perfringens	10	organisms per 100 ml	2/24/00

< = less than, not detected.

31330

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224548.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1304 A
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED: 12:00PM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	10	organisms per gram	

< = less than, not detected.

31333

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224549.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1306-SURFACE	11:29AM		
Total Coliform	<10	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-16:50
Enterococci	<10	organisms per 100 ml	2/24/00-16:50
Clostridium perfringens	<10	organisms per 100 ml	2/24/00
#1306-BOTTOM	11:31AM		
Total Coliform	<10	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-17:00
Enterococci	<10	organisms per 100 ml	2/24/00-17:00
Clostridium perfringens	<10	organisms per 100 ml	2/24/00

< = less than, not detected.

31331

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224551.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1306
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED: 11:39AM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	30	organisms per gram	

< = less than, not detected.

31334

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224552.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1308-SURFACE	11:02AM		
Total Coliform	<10	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-16:15
Enterococci	<10	organisms per 100 ml	2/24/00-16:15
Clostridium perfringens	10	organisms per 100 ml	2/24/00
#1308-BOTTOM	11:07AM		
Total Coliform	<10	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-16:10
Enterococci	<10	organisms per 100 ml	2/24/00-16:10
Clostridium perfringens	20	organisms per 100 ml	2/24/00

< = less than, not detected.

31332

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224554.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1308
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED: 11:10AM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	10	organisms per gram	

< = less than, not detected.

31335

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224522.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1309B-SURFACE	10:01AM		
Total Coliform	20	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-14:40
Enterococci	<10	organisms per 100 ml	2/24/00-14:40
Clostridium perfringens	<10	organisms per 100 ml	2/24/00
#1309B-BOTTOM	10:01AM		
Total Coliform	170	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-14:50
Enterococci	<10	organisms per 100 ml	2/24/00-14:50
Clostridium perfringens	<10	organisms per 100 ml	2/24/00

< = less than, not detected.

31325

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224524.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1309 B
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED: 10:04AM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	<10	organisms per gram	

< = less than, not detected.

31329

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224519.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1310A-SURFACE	10:25AM		
Total Coliform	30	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-14:00
Enterococci	<10	organisms per 100 ml	2/24/00-14:00
Clostridium perfringens	10	organisms per 100 ml	2/24/00
#1310A-BOTTOM	10:25AM		
Total Coliform	90	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-14:15
Enterococci	<10	organisms per 100 ml	2/24/00-14:15
Clostridium perfringens	10	organisms per 100 ml	2/24/00

< = less than, not detected.

31324

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224521.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1310 A
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED: 10:32AM

ANALYSIS	RESULT	UNITS	
Total Coliform	10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	<10	organisms per gram	

< = less than, not detected.

31327

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224516.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1314A-SURFACE	9:36AM		
Total Coliform	30	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-13:15
Enterococci	<10	organisms per 100 ml	2/24/00-13:15
Clostridium perfringens	10	organisms per 100 ml	2/24/00
#1314A-BOTTOM	9:38AM		
Total Coliform	30	organisms per 100 ml	2/24/00
Fecal Coliform	<10	organisms per 100 ml	2/24/00-13:30
Enterococci	<10	organisms per 100 ml	2/24/00-13:30
Clostridium perfringens	<10	organisms per 100 ml	2/24/00

< = less than, not detected.

31323

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200224518.0
CLIENT # EDG03
DATE SUBMITTED: 2/24/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1314 A
SAMPLE LOCATION:

DATE SAMPLED: 2/24/00 TIME SAMPLED: 9:43AM

ANALYSIS	RESULT	UNITS	
Total Coliform	40	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	50	organisms per gram	
Clostridium perfringens	<10	organisms per gram	

< = less than, not detected.

31326

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

APPENDIX C

LABORATORY REPORT OF ANALYSIS FOR WET SAMPLING EVENT (4/21/00)

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421566.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

RECEIVED
MAY - 2 2000
Lynch, Giuliano & Assoc.

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1304-A-SURFACE	2:47PM		
Total Coliform	<10	organisms per 100 ml	4/21/00
Fecal Coliform	10	organisms per 100 ml	4/21/00-19:10
Enterococci	<10	organisms per 100 ml	4/21/00-19:10
Clostridium perfringens	10	organisms per 100 ml	4/21/00
#1304-A-BOTTOM	2:47PM		
Total Coliform	<10	organisms per 100 ml	4/21/00
Fecal Coliform	<10	organisms per 100 ml	4/21/00-19:16
Enterococci	10	organisms per 100 ml	4/21/00-19:16
Clostridium perfringens	20	organisms per 100 ml	4/21/00

< = less than, not detected.

34274

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421568.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1304-A
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED: 2:47PM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	30	organisms per gram	

< = less than, not detected.

34275

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421569.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1306-SURFACE	2:36PM		
Total Coliform	30	organisms per 100 ml	4/21/00
Fecal Coliform	<10	organisms per 100 ml	4/21/00-19:23
Enterococci	<10	organisms per 100 ml	4/21/00-19:23
Clostridium perfringens	<10	organisms per 100 ml	4/21/00
#1306-BOTTOM	2:36PM		
Total Coliform	70	organisms per 100 ml	4/21/00
Fecal Coliform	60	organisms per 100 ml	4/21/00-19:30
Enterococci	80	organisms per 100 ml	4/21/00-19:30
Clostridium perfringens	80	organisms per 100 ml	4/21/00

< = less than, not detected.

34276

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421571.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1306
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED: 2:36PM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	<10	organisms per gram	

< = less than, not detected.

34277

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421572.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1308-SURFACE	2:24PM		
Total Coliform	40	organisms per 100 ml	4/21/00
Fecal Coliform	10	organisms per 100 ml	4/21/00-19:37
Enterococci	<10	organisms per 100 ml	4/21/00-19:37
Clostridium perfringens	<10	organisms per 100 ml	4/21/00
#1308-BOTTOM	2:24PM		
Total Coliform	<10	organisms per 100 ml	4/21/00
Fecal Coliform	<10	organisms per 100 ml	4/21/00-19:44
Enterococci	<10	organisms per 100 ml	4/21/00-19:44
Clostridium perfringens	10	organisms per 100 ml	4/21/00

< = less than, not detected.

34278

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421574.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1308
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED: 2:24PM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	<10	organisms per gram	

< = less than, not detected.

34279

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421575.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1309-B-SURFACE	2:04PM		
Total Coliform	40	organisms per 100 ml	4/21/00
Fecal Coliform	20	organisms per 100 ml	4/21/00-18:20
Enterococci	10	organisms per 100 ml	4/21/00-18:20
Clostridium perfringens	<10	organisms per 100 ml	4/21/00
#1309-B-BOTTOM	2:04PM		
Total Coliform	10	organisms per 100 ml	4/21/00
Fecal Coliform	10	organisms per 100 ml	4/21/00-18:27
Enterococci	10	organisms per 100 ml	4/21/00-18:27
Clostridium perfringens	<10	organisms per 100 ml	4/21/00

< = less than, not detected.

34280

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421577.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1309-B
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED: 2:04PM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	<10	organisms per gram	

< = less than, not detected.

34281

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421578.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1310-A-SURFACE	1:40PM		
Total Coliform	80	organisms per 100 ml	4/21/00
Fecal Coliform	10	organisms per 100 ml	4/21/00-18:33
Enterococci	<10	organisms per 100 ml	4/21/00-18:33
Clostridium perfringens	<10	organisms per 100 ml	4/21/00
#1310-A-BOTTOM	1:40PM		
Total Coliform	20	organisms per 100 ml	4/21/00
Fecal Coliform	<10	organisms per 100 ml	4/21/00-18:40
Enterococci	<10	organisms per 100 ml	4/21/00-18:40
Clostridium perfringens	<10	organisms per 100 ml	4/21/00

< = less than, not detected.

34282

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421580.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1310-A
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED: 1:40PM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	60	organisms per gram	

< = less than, not detected.

34283

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421581.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: WATER
SAMPLE ID:
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED:

ANALYSIS	RESULT	UNITS	DATE ANALYZED
#1314-A-SURFACE	1:26PM		
Total Coliform	440	organisms per 100 ml	4/21/00
Fecal Coliform	160	organisms per 100 ml	4/21/00-18:47
Enterococci	260	organisms per 100 ml	4/21/00-18:47
Clostridium perfringens	<10	organisms per 100 ml	4/21/00
#1314-A-BOTTOM	1:26PM		
Total Coliform	170	organisms per 100 ml	4/21/00
Fecal Coliform	30	organisms per 100 ml	4/21/00-18:56
Enterococci	120	organisms per 100 ml	4/21/00-18:56
Clostridium perfringens	20	organisms per 100 ml	4/21/00

< = less than, not detected.

34284

Certified by U.S. Public Health Service, N.J. State Dept. of Health, N.Y. State Dept. of Health - Lab # 11550 and N.J.D.E.P. - Lab # 20044

Garden State Laboratories, Inc.

Bacteriological and Chemical Testing

410 Hillside Avenue
Hillside, New Jersey 07205

Toll Free: 800-273-8901
Telephone: 908-688-8900
Fax: 908-688-8966
email: hklein@gslabs.com
Internet: www.gslabs.com

Mathew Klein, M.S., Founder (1916-1996)
Harvey Klein, M.S., Laboratory Director

REPORT OF ANALYSIS

REPORT # 200421583.0
CLIENT # EDG03
DATE SUBMITTED: 4/21/00

TO: E.D.G.
582 PLAZA TERRACE EAST

BRICK NJ 08723
ATT: ROB FIORILE

SAMPLE TYPE: SEDIMENT
SAMPLE ID: #1314-A
SAMPLE LOCATION:

DATE SAMPLED: 4/21/00 TIME SAMPLED: 1:26PM

ANALYSIS	RESULT	UNITS	
Total Coliform	<10	organisms per gram	
Fecal Coliform	<10	organisms per gram	
Enterococci	<10	organisms per gram	
Clostridium perfringens	<10	organisms per gram	

< = less than, not detected.

34285

APPENDIX D

CHEMICAL AND PHYSICAL WATER QUALITY DATA

APPENDIX D

Chemical and Physical Water Quality Data
Water Quality and Sediment Sampling Study
Manasquan River

	Dry Sampling Event (2/24/00)					
	1304-A	1306	1308	1309-B	1310-A	1314-A
Air Temp. (° F)	43.70	42.00	42.60	43.70	42.80	43.70
Water Temp. (° F)	41.90	41.54	42.44	42.44	42.44	43.70
Water Depth (feet)	9.50	4.10	5.00	4.60	9.20	1.80
Turbidity (feet)	8.20	4.10	5.00	4.60+	6.60	1.80
Tidal Flow Rate (cfs)	69.00	69.00	69.00	69.00	69.00	71.00
pH	8.45	8.44	8.47	8.47	8.49	8.54
Conductivity (mg/cm)	31.73	31.74	29.35	24.43	23.70	20.95
Salinity (ppt)	32.50	32.80	29.70	38.60	23.30	32.86
Dissolved O_2 (mg/l)	9.72	9.77	11.06	11.75	11.65	11.05
Tide:	Ebb	Ebb	High	Flood	Flood	Flood
Last Significant Rain Event:	Greater than 23 days prior to sampling					
	Wet Sampling Event (4/21/00)					
	1304-A	1306	1308	1309-B	1310-A	1314-A
Air Temp. (° F)	50.00	49.70	49.50	49.50	48.50	48.80
Water Temp. (° F)	61.34	53.24	64.76	64.76	65.84	67.10
Water Depth (feet)						
Turbidity (feet)	10.00	2.00	15.00	12.00	13.00	22.00
Tidal Flow Rate (cfs)	NA	NA	NA	NA	NA	NA
pH	7.72	7.90	7.12	7.77	7.90	7.58
Conductivity (mg/cm)	37.70	45.30	35.70	33.40	34.20	33.90
Salinity (ppt)	24.40	29.00	22.80	21.10	21.70	21.40
Dissolved O_2 (mg/l)	6.52	8.09	5.15	5.05	5.16	3.51
Tide:	Ebb	Ebb	Ebb	Ebb	Ebb	Ebb
Last Significant Rain Event:	Sampling occurred during significant rain event					