FULLER & MORRIS

Engineering, Inc.

June 27, 1996

Sam I. Sasaki
City Manager
810 SW Alder Street
Newport, Oregon 97365

Dear Sam,

Subject : City of Newport
Wastewater Facilities Plan - 1995 Update

Enclosed is the Final Edition of the Wastewater Facilities Plan with incorporated review comments received from the City and the Oregon Department of Environmental Quality.

This Facilities Plan evaluates alternatives for wastewater effluent discharge points, treatment plant sites, treatment processes, and conveyance pipelines for the City's wastewater facilities needs projected through year 2020, and beyond.

The Preferred Alternative selected by the City's Wastewater Advisory Committee consists of a new 5.0 MGD oxidation ditch process treatment plant located on a new site approximately 1/2 mile north of the City's airport in the South Beach area. Raw sewage conveyance pipelines will be constructed from the north side of Yaquina Bay, tunneled under the bay, through South Beach State Park and east of Highway 101 to the new treatment plant site. Treated effluent from the plant will be conveyed, through a pipeline that parallels the raw sewage pipeline, to be discharged into the Pacific Ocean through the City's existing ocean outfall diffuser off Nye Beach.

It has been our sincere pleasure working with you, your staff, and the Wastewater Advisory Committee to prepare this Plan. Thank you for all the help you have provided us. We look forward to continuing to assist you through the design and construction phases of this major undertaking for the City.

Sincerely,

James K. Fuller

James K. Fuller

Thomas W. Morris

Thomas W. Morris

Copies : Oregon Department of Environmental Quality

37049 Moss Rock Drive • Corvallis, Oregon 97330 • Office and Fax 503/745-1006

WASTEWATER FACILITIES PLAN - 1995 UPDATE

FOR THE
CITY OF NEWPORT, OREGON

FINAL EDITION

FULLER & MORRIS ENGINEERING, INC. / CH2M HILL

PROJECT NO. 9403.0

MAY, 1996

REGISTERED PROFESSIONAL
ENGINEER
6534
OREGON
JULY 11, 1969
JAMES K. FULLER

Renewal Date 12/31/97

CONTENTS

WASTEWATER FACILITIES PLAN - 1995 UPDATE
CITY OF NEWPORT, OREGON

TABLES

FIGURES

ACRONYMS AND ABBREVIATIONS

AADF	annual average daily flow
ADWF	average dry weather flow
ASST	activated sludge with selector technology
AWWF	average wet weather flow
BOD	biochemical oxygen demand
BOD_5	5-day biological oxygen demand
DEQ	Oregon Department of Environmental Quality
DO	dissolved oxygen
DWMDF	dry weather maximum daily flow
DWMiDF	dry weather minimum daily flow
DWMiMADF	dry weather minimum month average daily flow
DWMMADF	dry weather maximum month average daily flow
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration

gpcpd	gallons per capita per day
H_2S	hydrogen sulfide
I/I	infiltration and inflow
MCRT	mean cell residence time
mg/L	milligrams per liter
mgd	million gallons per day
MLSS	mixed liquor suspended solids
NFPA	National Fire Protection Act
NPDES	National Pollution Discharge Elimination System
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
OSHA	Occupational Safety and Health Administration
pH	hydrogen (ion) concentration
ppcpd	pounds per capita per day
ppm	parts per million
POR	period of record
PSRP	process to significantly reduce pathogens
RBC	rotating biological contactor
rpm	revolution per minute
SBR	sequencing batch reactors
SFO	Stipulation and Final Order
SRT	solids retention time
SWIM	Statewide interagency meeting
TSS	total suspended solids
TWAS	total waste activated sludge
UGB	urban growth boundary
UV	ultraviolet
VSS	volatile suspended solids
WAS	waste activated sludge
WWAC	Wastewater Advisory Committee
WWMDF	wet weather maximum daily flow
WWMMADF	wet weather maximum month average daily flow
WWTP	wastewater treatment plant

Chapter 1

INTRODUCTION

A. PURPOSE, BACKGROUND AND NEED

Purpose

This Facilities Plan evaluates alternatives for effluent discharge points, treatment plant sites, treatment processes, and conveyance pipelines for new wastewater facilities in the South Beach area of the City of Newport, Oregon. The facilities are needed for the purpose of providing treatment of sanitary sewage collected within the City's urban growth boundary, which includes land on both sides of Yaquina Bay. A new treatment plant will be needed in the South Beach area of the City, south of the bay. New conveyance pipelines will be needed to transport raw sewage collected from the north side of Yaquina Bay to the new treatment plant in South Beach and a new effluent disposal pipeline will be needed to transport the treated effluent from the new plant to the City's existing ocean outfall pipeline on the north side of the bay.

The new treatment plant will be sized for the year 2020 projected residential population of 17,000 people. The plant will be designed to provide secondary treatment for 5.0 million gallons per day (mgd) average daily wastewater flow. Additional land will be acquired initially at the new treatment plant site for plant expansion to year 2050. Conveyance pipelines will be sized for the year 2020 projected residential population of 17,000 people, with provisions for adding supplemental pipelines for a year 2050 projected population of 32,000 people at ultimate build-out density inside the Newport Urban Growth Boundary.

Background And Need

The City's Wastewater System Master Plans of 1980 and 1988 identified the need for future increased treatment capacity in the South Beach area when the existing treatment plant capacity limit was reached. The existing treatment plant, which was constructed on the north side of the bay in 1963 and expanded in 1984, has a treatment capacity of about 3.2 mgd. Presently, wastewater flows to the existing plant average about 2.5 mgd. Flows expected for year 2000 will be near the plant's 3.2 mgd capacity. In order to have additional treatment capacity available when it is needed, the City must begin planning now to construct the new facilities. Existing plant facilities occupy nearly all of the available space on the plant site. Adequate space for future expansion does not exist on the site for the projected year 2020 population, therefor additional treatment plant capacity needs to be constructed on a new site. Also, the existing site is surrounded by residential and commercial development. The City proposes relocating its wastewater treatment plant to a new site to address public concerns over odor control and sludge hauling through the city's central residential and commercial area.

B. INTRODUCTION TO FACILITIES PLAN

This Facilities Plan contains the following elements: A summary of the existing conditions concerning the Newport Wastewater System; projections of future population, flows and loads; an analysis of Mid-Coast Basin water quality and regulatory standards; a wastewater facilities alternatives analysis; an environmental review of the wastewater alternatives; comparative cost estimates of the wastewater alternatives; a detailed description of the preferred alternative for wastewater facilities; a financial plan; and recommendations for facilities implementation. The remainder of this report is organized into the following nine chapters.

- Chapter 2: Existing Conditions

This chapter summarizes the existing conditions of the Newport study area and the wastewater system, and includes information on existing wastewater flows and characteristics. The Planning period is from year 1995 to 2020, and the study area is the anticipated City of Newport urban growth boundary for year 2020. The wastewater collection system conveys wastewater from residences, businesses, industries and public facilities to the existing wastewater treatment plant. No fish processing industrial wastewater is collected in the system. The collection system experiences rainfall induced infiltration and inflow during the wet weather season. The amount of I/I is not anticipated to be excessive, with continued sewer rehabilitation conducted by the City aimed at I/I reduction.

The existing wastewater treatment plant was constructed in 1964 and was expanded in the early 1980s. The expanded capacity is 3.2 mgd. The plant has received two Stipulation and Final Orders (SFOs) from DEQ for a mixing zone effluent chlorine limitation and for making improvements to the treatment process to improve biochemical oxygen demand (BOD) and total suspended solids (TSS) reduction. While the plant improvements are being implemented by the City at this time, the plant is nearing its capacity and it's expected service life and the City is beginning plans for a new treatment plant on a new site located on industrially zoned land in the South Beach area of Newport.

- Chapter 3: Future Conditions

The population projection for the planning period was derived from the Newport Comprehensive Plan. The residential population is projected to grow from 9300 in year 1995 to 17,000 in year 2020. Ultimate build-out residential population is projected to be approximately 32,000 around year 2040. Tourist population is in addition to the residential population and largely accounts for the relatively high per capita flowrates shown for the residential population. Commercial, industrial, tourist, and I/I flows are expected to grow in proportion to the residential population. The projected year 2020 annual average flow is 4.00 mgd and the wet weather maximum month average daily flow is 5.00 mgd. The design peak instantaneous flow is projected to be 15.00 mgd. The design maximum month BOD load is 7,700 lb/day.

- Chapter 4: Regulatory Requirements

Regulations for Mid Coast Basin, Pacific Ocean discharge, effluent reuse, sludge processing, and plant reliability / redundancy are summarized in this chapter.

- Chapter 5: Wastewater Facilities Alternatives

In this chapter, three potential wastewater treatment plant sites are examined, five effluent disposal options are evaluated, four conveyance alternatives are evaluated, five treatment process options are evaluated, and effluent disinfection and sludge disposal options are evaluated.

The 3 sites are all in the South Beach area east of U.S. Highway 101 and north of the Newport Municipal Airport.

The effluent disposal options are:

Discharge to wetlands
Discharge to Thiel Creek or Beaver Creek
Discharge to Yaquina Bay upstream of Marine Science Center
Discharge to Yaquina Bay between the jetties
Discharge to Pacific Ocean

The conveyance alternatives are:

Inner bay crossing with new ocean outfall - Alternative A
Inner bay crossing with existing ocean outfall - Alternative B
Outer bay crossing with existing ocean outfall - Alternative C
Inner bay crossing with expanded existing plant - Alternative D

The treatment process alternatives are:

Oxidation ditch process (2-types)
Schreiber Process
Submerged biological contactor process
Deep shaft aeration/flotation clarifier process

The effluent disinfection alternatives are:

Chlorine
Ultraviolet radiation

The sludge disposal options are:

Aerobic Digestion / Land Application
Lime Stabilization / Land Application

Each of the alternatives for conveyance and new WWTP included phased implementation suboptions:

Suboption 1 - Build the Facilities needed for year 2020 in two phases

Suboption 2 - Build all the Facilities needed for year 2020 at the first construction period

The preferred alternative for the South Beach WWTP Project consists of a new oxidation ditch process WWTP located on a new 40-acre site 3,600 feet north of the airport, using Alternative C2 (outer bay crossing with existing 24-inch diameter ocean outfall installed in year 1990) as the preferred conveyance option, with ultraviolet radiation disinfection and land application of lime stabilized sludge at the existing airport sludge disposal site. Alternative C2 is preferred to construct all of the year 2020 needed Facilities during the initial construction period.

- Chapter 6: Environmental Review

The preferred alternative WWTP site and the conveyance pipeline routes will require permitting by jurisdictional regulatory agencies prior to construction. No know wetland areas are expected to be disturbed other than the upper beach, temporarily during pipeline construction. The project is expected to use design features acceptable to the agencies to avoid or minimize adverse impacts to the environment.

- Chapter 7: Cost Estimates

This chapter presents the comparative cost estimates for Alternatives A, B, C, and D. The total present worth cost for the preferred alternative, Alternative C2, consisting of capital costs and present worth costs for wastewater system operation and maintenance for a 20-year period is 46.04 million dollars, and is the lowest present worth cost of the alternatives using a new WWTP at South Beach.

- Chapter 8: Preferred Alternative

This chapter lists and describes the major elements of the New South Beach WWTP Project.

1. New Nye Beach lift station
2. New raw sewage and effluent disposal pipelines from Nye Beach to South Beach WWTP
3. New South Beach lift station
4. New South Beach WWTP
5. New Marine Science Center lift station
6. New force main and gravity sewer from MSC to new South Beach lift station
7. Rehabilitation of existing Bay front lift station

8. Maintain existing ocean outfall (24-inch diameter portion) and diffuser off Nye Beach
9. Maintain existing sludge disposal site at Newport Municipal Airport
10. Abandon existing Northside WWTP

The capital costs for the project are estimated at 32.14 million dollars.

Chapter 9: Financial Plan

A recommendation has been made to city council to defer the bond issue election to allow formation of a promotional committee; immediately increase fees to build up a sewer reserve fund; and break out some of the project elements to allow implementation prior to bond issue to reduce overall bonded indebtedness. An enclosed financial plan has been prepared to address financing issues.

Chapter 10: Wastewater Facilities Implementation

This chapter presents a project schedule for the New South Beach WWTP Project to be complete by year 2000 and identifies other future wastewater facilities construction needs.

C. CONTRIBUTING DOCUMENTS

The following reports supported the completion of this Facilities Plan:

- City of Newport Comprehensive Plan 1990-2010 (Adopted October 7, 1991) (Hereinafter referred to as the Comprehensive Plan)

- City of Newport Wastewater Facilities Plan - Update 1989 to Evaluate Ocean Outfall Reconstruction, September, 1989 (Hereinafter referred to as the 1989 Facilities Plan)

- City of Newport Wastewater System Master Plan - Update 1988, February, 1988 (Hereinafter referred to as the 1988 Wastewater System Master Plan)

Chapter 2

EXISTING CONDITIONS

This chapter discusses the existing conditions of the study area and wastewater facilities. Included in this chapter are sections discussing study area characteristics, existing wastewater facilities and operations, existing wastewater flows and characteristics, existing facility deficiencies, and results of the infiltration and inflow (I/I) evaluation.

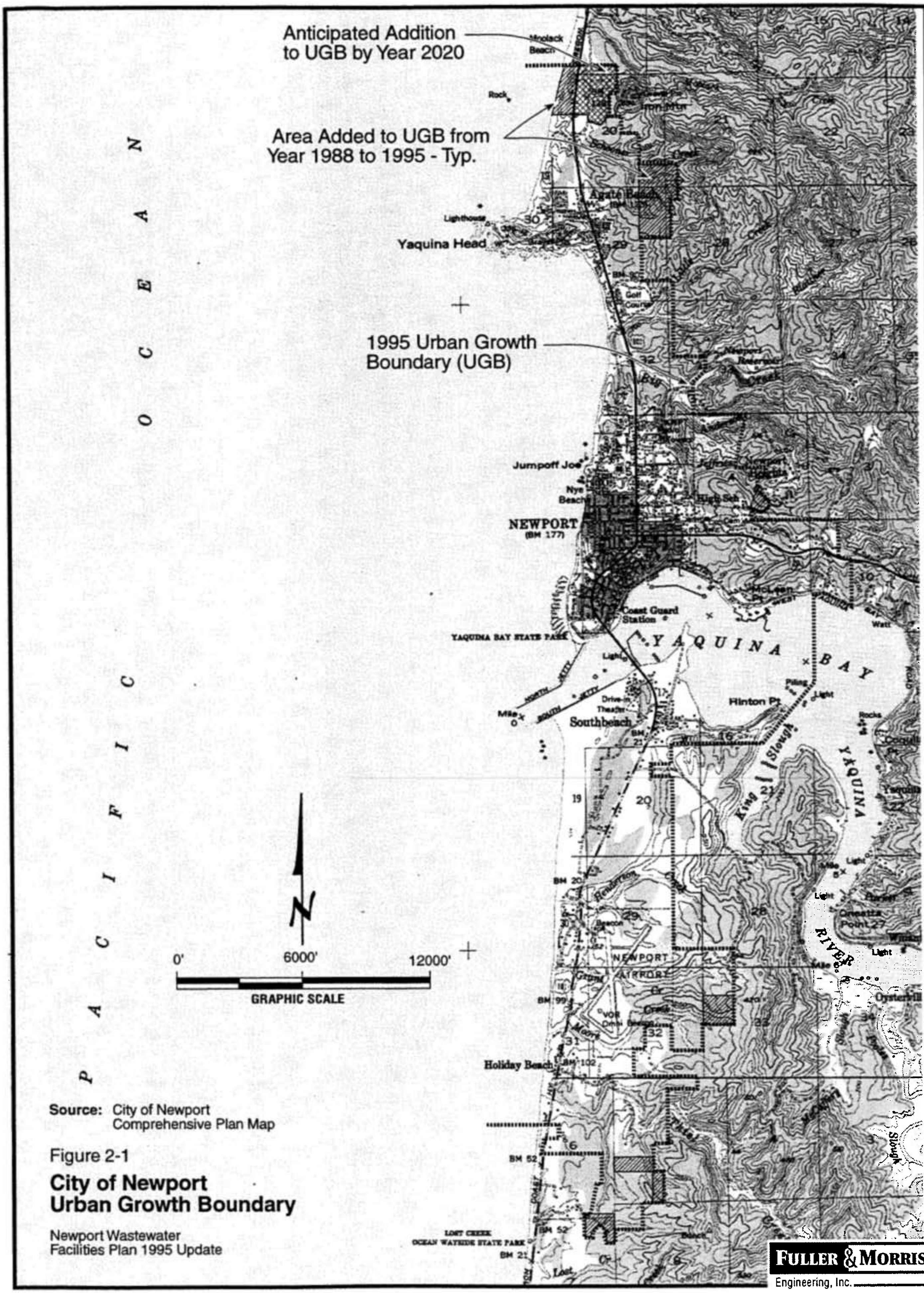
A. STUDY AREA CHARACTERISTICS

Location

The City of Newport is located at the mouth of the Yaquina River adjacent to the Pacific Ocean, in Lincoln County, Oregon. Newport lies about 135 miles south of Astoria and the Oregon/Washington border, 114 miles southwest of Portland and 55 miles west of Corvallis. It is the largest city in Lincoln County, and is the County Seat. At the junction of two primary United States highways, Highway 101 and Highway 20, Newport links the Willamette Valley with west coast ports and Asian destinations across the Pacific Ocean via shipping out of Yaquina Bay. The City, incorporated in 1882, has expanded to about 5 miles north of Yaquina Bay and about 5 miles south of the bay, along U.S. 101. The City extends east of the ocean about one mile, with an extension of about 2 miles up the Yaquina River.

Study Area Definition

The Study Area for this Facilities Plan is identical to lands within the City's current Urban Growth Boundary (UGB) plus anticipated additions to the UGB through the planning period till year 2020. The total area contained in the current UGB is approximately 6,000 gross acres of land not including lands subjected to tidal action and resulting flooding. The UGB has expanded by about 400 acres of residential land, with about 300 acres of that expansion occurring on the north side of Yaquina Bay, since the 1988 Wastewater System Master Plan was prepared. Only minor UGB additions are anticipated during the planning period, until year 2020, including about 100 acres of commercial/industrial land located east of Highway 101, north of NE 73rd Street. The anticipated UGB for year 2020 therefor contains approximately 6,100 acres. Larger additions are expected to occur in the period from year 2020 to year 2050, as the demand increases for residential land. The City foresees these additions amounting to about 400 acres, occurring from Big Creek north to about NE 70th Street along the east side of the current UGB. The Study Area showing the anticipated UGB for year 2020 is shown on Figure 2-1.



Source: City of Newport Comprehensive Plan Map

Figure 2-1

City of Newport Urban Growth Boundary

Newport Wastewater Facilities Plan 1995 Update

FULLER & MORRIS Engineering, Inc.

Topography

Newport's land elevation on the north side of Yaquina Bay varies from sea level to 450 feet just east of the City's center; the land south of the bay rises to elevation 250 feet to the east of the City's airport. The land slopes generally from the hills on the east to the ocean on the west. Natural drainage is provided by six minor streams flowing westerly to the ocean on the north side of the bay and five such streams south of the bay, and the major drainage feature of the area, the Yaquina River. The topography varies from gradual to steep on the north/south hillsides between the east to west flowing streams. Gravity drainage basins have been developed for collection of wastewater based on the natural drainage topography. The Study Area is divided into fourteen gravity drainage basins; Drainage Basin N1 trough N7 on the north side of the bay, and Drainage Basin S1 through S7 on the south. The drainage basins are shown on the Wastewater System Master Plan Map, Map WW-1 bound at the back of the report.

Surface Waters

The Yaquina River, and of course the Pacific Ocean are the major surface water features in the Newport area. The river flowing from east to west, bisects the Study Area. The Pacific Ocean (Mid Coast Basin and Siletz Sub-basin) is the receiving water for the discharge from the City's existing wastewater treatment plant (WWTP). The discharge from the WWTP is through a submerged outfall three-port diffuser located on the seafloor approximately 1,850 feet west southwest off Beach Drive in the Nye Beach area. This discharge is authorized by the State of Oregon, Department of Environmental Quality (DEQ) through the National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit No. 101123.
The six small streams that flow from east to west on the north side of Yaquina Bay and the distance from the mouth of the bay that they enter the ocean are:

1.	Nye Creek	8,000 feet
2.	Big Creek (on which the City's water supply is located)	14,000 feet
3.	Little Creek	16,000 feet
4.	An unnamed drainage	19,000 feet
5.	An unnamed drainage immediately south of Yaquina Head	19,300 feet
6.	Schooner Creek	25,000 feet

Jeffries Creek and Anderson Creek are also located on the north side of the bay. They flow into Big Creek downstream of the City's water treatment plant, about 3,000 feet east of the ocean.

The five small streams that flow from east to west on the south side of the bay and the distance from the mouth of the bay that they enter the ocean are:

1.	An unnamed drainage south of South Beach State Park	9,000 feet

2. Henderson Creek 9,800 feet
3. Grant Creek immediately west of the airport 12,500 feet
4. Moore Creek, south of the airport 15,500 feet
5. Thiel Creek 18,500 feet

Soils

The material underlying much of the area of the Newport UGB is sand. Most of this is marine terrace deposits, although these are sometimes difficult to distinguish from older sandstone bedrock or older stabilized dunes. All these areas have sandy soils of either the Netarts, Warrenton, or Yaquina series wherever the soil profile has begun to develop. These series have been mapped by the Soil Conservation Service and are available at the City Planning Department.

To understand the soils of the Newport area, it is helpful to study the area geology. The Newport area is predominantly composed of five geologic units: The Nye Mudstone, the Astoria formation, the Yaquina formation, the Cape Foul weather basalt, and the Quaternary marine deposits. A bulletin describing the characteristics of the five units and mapping the general location of each is the Environmental Geology of Lincoln County, Oregon, prepared by the State of Oregon Department of Geology and Mineral Industries. The map of the Newport area also shows a geologic cross section that bisects the heart of Newport. The bulletin contains an appendix that summarizes planning concerns in the Newport area. Areas of coastal erosion and landslides are extensive in places.

A significant portion of Newport is situated on a marine terrace extending the full length of the city, interrupted only by headlands and Yaquina Bay. The terrace materials consist of weakly cemented sand, silt, and pebbly sand overlain in many areas by old dunes that are fairly stable where they are covered with vegetation. Bedrock, beneath the terrace and dune sediments, tilts seaward and is exposed in sea cliffs in some places. The margins of this terrace are considered risky locations for building due to erosion of the terrace and associated landslides.

In summary the soils and geologic conditions in the Newport area are very complex and site specific. A site specific geologic investigation should be performed by a geologist or engineer registered in the state of Oregon for all structures proposed in this Facilities Plan.

Climate

The City of Newport has a relatively humid climate, influenced by the proximity of the Pacific Ocean. Moisture-bearing winds from the ocean rise and are cooled as they cross the Coast Range. This creates a coastal marine climate characterized by moderate temperatures and a fairly high amount of precipitation, especially during winter months.

Precipitation

Air masses that have followed a long trajectory across the Pacific are usually at ocean temperature and saturated with moisture. As they move onshore, contact with the Coast Range forces the air to rise and cool. This rise is accompanied by a pressure reduction causing condensation and precipitation. Thus, the coastal slope is one of the heaviest annual rainfall areas in the contiguous United States. Figure 2-2 indicates inches of annual rainfall in Lincoln County.

Normal annual precipitation at Newport is about 70 inches, most of which occurs as rain. Because of seasonal changes in ocean temperature, air temperature, and wind direction, precipitation follows a definite seasonal pattern. The wettest months are from November through March, when about 70 percent of the total occurs. Figure 2-3, U.S. Weather Bureau Climatological Summary No. 20 for years 1951 through 1980, shows the mean monthly, maximum monthly, and maximum daily rainfall for the period of record. Figure 2-4, U.S. Weather Bureau Isopluvial Map, shows the 5-year, 24-hour precipitation in the Newport area at about 4.00 inches.

Snow is an unusual event in Newport, averaging only one to two inches per year. The surrounding mountains and mountain passes can however, experience deep snow in the winter months. Even in those areas, though, snowfall is intermittent and occurs only in the higher elevations.

Temperature

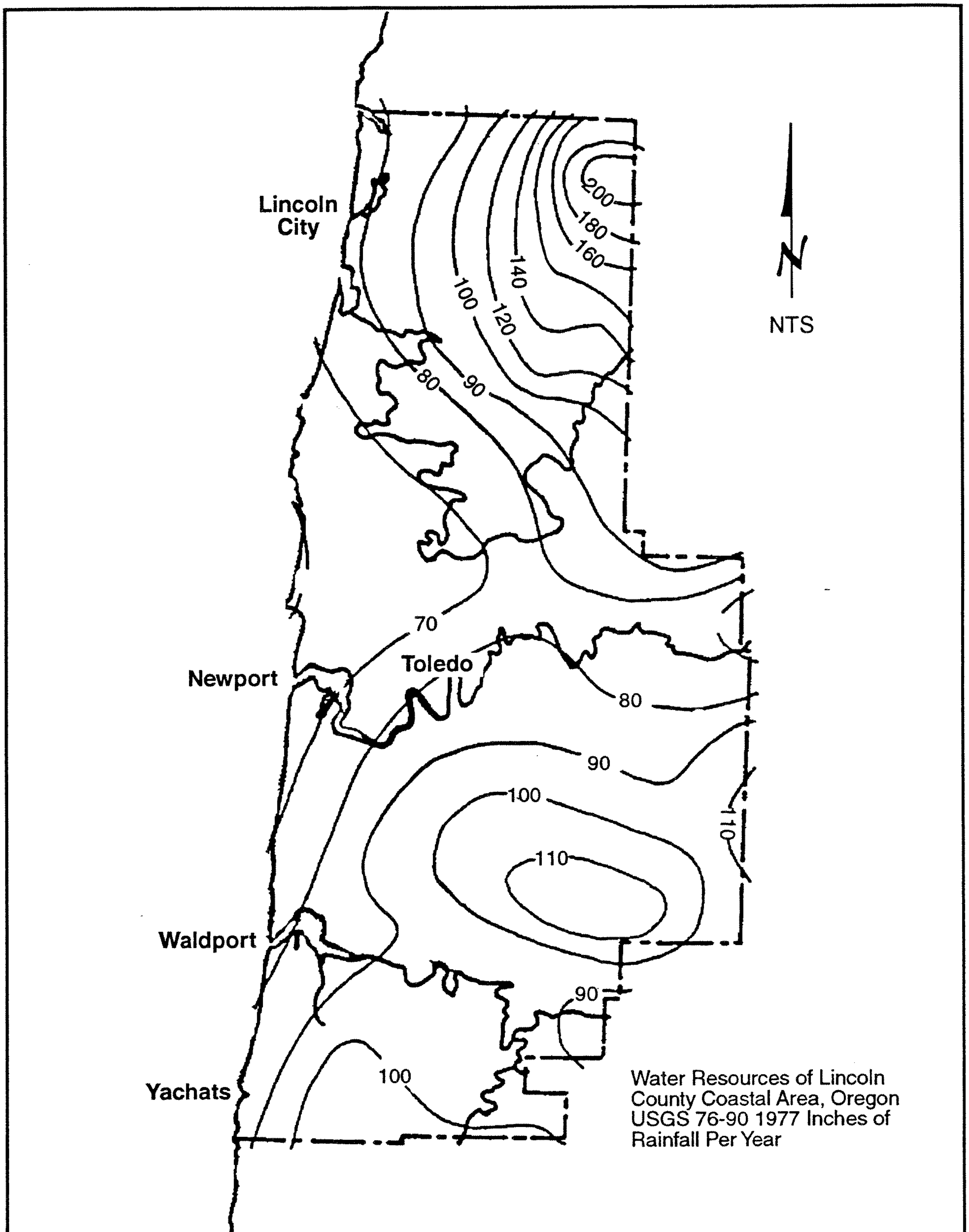
Temperatures are moderate, ranging between an average January temperature of 44 degrees and an average July temperature of 56 degrees -- a difference of only 12 degrees. Extremes extend from 0 degrees to 100 degrees. The average annual growing season is 250 days.

Wind

The Oregon coast is exposed directly to winds that move off the ocean onshore. Prevailing winds are generally from the west, with a southwesterly component during the winter and a northwesterly component in the summer. Wind velocities average 10 to 15 miles per hour, but higher gusts are common. The strongest winds ordinarily develop during the winter months, while summer winds are normally lower in velocity.

Humidity

Because of the constant onshore movement of moist, marine air, relative humidity is high and distinguished by very little seasonal or diurnal change. The annual average high, frequently in the morning, is approximately 90 percent as compared to the average low of 70 percent, ordinarily during the warmest part of the day.



Source: City of Newport Comprehensive Plan

Figure 2-2

Inches of Annual Rainfall in Lincoln County

Newport Wastewater
Facilities Plan 1995 Update

CH2M HILL FULLER & MORRIS Engineering, Inc.

CLIMATOGRAPHY OF THE UNITED STATES NO. 20

NEWPORT, OR

PERIOD: 1951-80
ELEVATION: 154 FT

CLIMATOLOGICAL SUMMARY

	TEMPERATURE (F)																PRECIPITATION TOTALS (INCHES)											
	MEANS			EXTREMES						MEAN NUMBER OF DAYS				DEGREE DAYS								SNOW			MEAN NUMBER OF DAYS		
										MAX		MIN															
	* DAILY MAXIMUM	* DAILY MINIMUM	* MONTHLY	RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR	DAY	90 AND ABOVE	32 AND BELOW	32 AND BELOW	0 AND BELOW	* HEATING BASE 65	* COOLING BASE 65	* MEAN	* GREATEST MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	MEAN	MAXIMUM MONTHLY	YEAR	.10 OR MORE	.50 OR MORE	1.00 OR MORE
JAN	49.6	37.2	43.4	67+	68	23	11+	57	26	0	0	9	0	670	0	12.56	24.24	53	4.60	65	28	.8	10.0	69	17	8	3
FEB	52.4	38.5	45.5	77+	68	28	17+	62	26	0	0	5	0	546	0	8.53	16.64	61	3.09	68	19	.2	3.0	59	14	6	2
MAR	52.6	37.8	45.2	73+	68	20	22+	55	5	0	0	5	0	614	0	8.68	14.47	61	2.82	57	07	.4	10.0	51	15	6	2
APR	54.8	39.5	47.2	78+	80	13	27+	68	13	0	0	3	0	534	0	5.05	10.17	55	2.49	71	09	.0	.0		11	3	1
MAY	58.3	43.3	50.8	89	69	07	30	54	1	0	0	0	0	440	0	3.33	7.13	60	2.15	63	05	.0	.0		8	2	0
JUN	61.9	47.6	54.8	91+	66	15	34+	76	3	0	0	0	0	306	0	2.37	6.78	68	3.51	68	01	.0	.0		6	1	0
JUL	64.2	49.6	56.9	100	61	11	38+	62	2	0	0	0	0	251	0	.79	3.30	74	1.20	74	17	.0	.0		2	0	0
AUG	64.9	49.7	57.3	91	78	07	38+	73	19	0	0	0	0	239	0	1.49	7.60	68	1.72	68	23	.0	.0		4	1	0
SEP	65.2	47.9	56.6	96+	73	4	32+	72	27	0	0	0	0	255	0	2.82	6.32	71	1.88	53	30	.0	.0		6	2	1
OCT	61.4	44.8	53.1	94	80	02	25+	71	29	0	0	0	0	369	0	5.92	11.72	55	3.28	55	09	.0	.0		11	5	1
NOV	55.3	41.3	48.3	79	62	1	20+	78	13	0	0	3	0	501	0	10.17	22.13	73	4.29	75	30	.0	.0		15	7	3
DEC	51.0	38.6	44.8	69+	80	15	1+	72	8	0	0	5	0	626	0	12.91	22.68	68	3.47	64	21	.6	11.0	72	17	9	4
YEAR	57.6	43.0	50.3	100	JUL 61	11	1	DEC 72	8	0	0	30	0	5351	0	74.62	24.24	JAN 53	4.60	JAN 65	28	2.0	11.0	DEC 72	126	50	17

*FROM 1951-80 NORMALS

ESTIMATED VALUE BASED ON DATA FROM SURROUNDING STATIONS

+ ALSO ON EARLIER DATES.

DEGREE DAYS TO SELECTED BASE TEMPERATURES (F)

BASE	HEATING DEGREE DAYS												
BELOW	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
65	670	546	614	534	440	306	251	239	255	369	501	626	5351
60	515	406	459	384	285	163	105	99	122	216	351	471	3576
57	426	325	366	294	192	91	45	44	68	131	264	378	2624
55	367	272	304	234	135	57	18	19	39	85	208	321	2059
50	230	153	157	103	31	8	0	0	6	15	94	184	981

BASE	COOLING DEGREE DAYS												
ABOVE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
55	7	6	0	0	0	51	77	90	87	26	7	0	351
57	0	0	0	0	0	25	42	54	56	10	0	0	187
60	0	0	0	0	0	7	9	16	20	0	0	0	52
65	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0

DERIVED FROM THE 1951-80 MONTHLY NORMALS

PROBABILITY THAT THE MONTHLY PRECIPITATION WILL BE EQUAL TO OR LESS THAN THE INDICATED PRECIPITATION AMOUNT

MONTHLY PRECIPITATION (INCHES)

PROBABILITY LEVELS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
.05	4.24	3.58	3.25	1.58	1.02	.59	.04	.10	.33	1.51	3.19	5.24
.10	5.43	4.36	4.06	2.06	1.34	.81	.11	.19	.55	2.07	4.16	6.43
.20	7.17	5.45	5.22	2.78	1.81	1.16	.22	.38	.94	2.93	5.59	8.10
.30	8.64	6.34	6.19	3.39	2.21	1.47	.34	.58	1.33	3.69	6.82	9.48
.40	10.06	7.18	7.11	3.98	2.60	1.77	.46	.81	1.75	4.44	8.01	10.78
.50	11.51	8.03	8.06	4.59	3.01	2.09	.61	1.08	2.22	5.23	9.24	12.10
.60	13.11	8.94	9.08	5.26	3.46	2.45	.77	1.40	2.77	6.11	10.59	13.53
.70	14.97	10.00	10.27	6.04	3.99	2.87	.98	1.81	3.45	7.15	12.17	15.17
.80	17.36	11.33	11.78	7.06	4.67	3.43	1.26	2.38	4.37	8.52	14.21	17.26
.90	21.06	13.36	14.10	8.64	5.73	4.31	1.73	3.35	5.89	10.67	17.39	20.44
.95	24.47	15.20	16.23	10.10	6.71	5.13	2.18	4.31	7.36	12.69	20.34	23.34

THESE VALUES WERE DETERMINED FROM THE INCOMPLETE GAMMA DISTRIBUTION.

USE FOR CALCULATING MMDWF

USE FOR CALCULATING MMWWF

Source: Oregon Climate Services/Oregon State University

Weather Station Location: Newport Municipal Airport

Figure 2-3

U. S. Weather Bureau Climatological Summary No. 20, Years 1951-1980

NEWPORT WASTEWATER FACILITIES PLAN - 1995 UPDATE

CH2M HILL

FULLER & MORRIS Engineering, Inc.

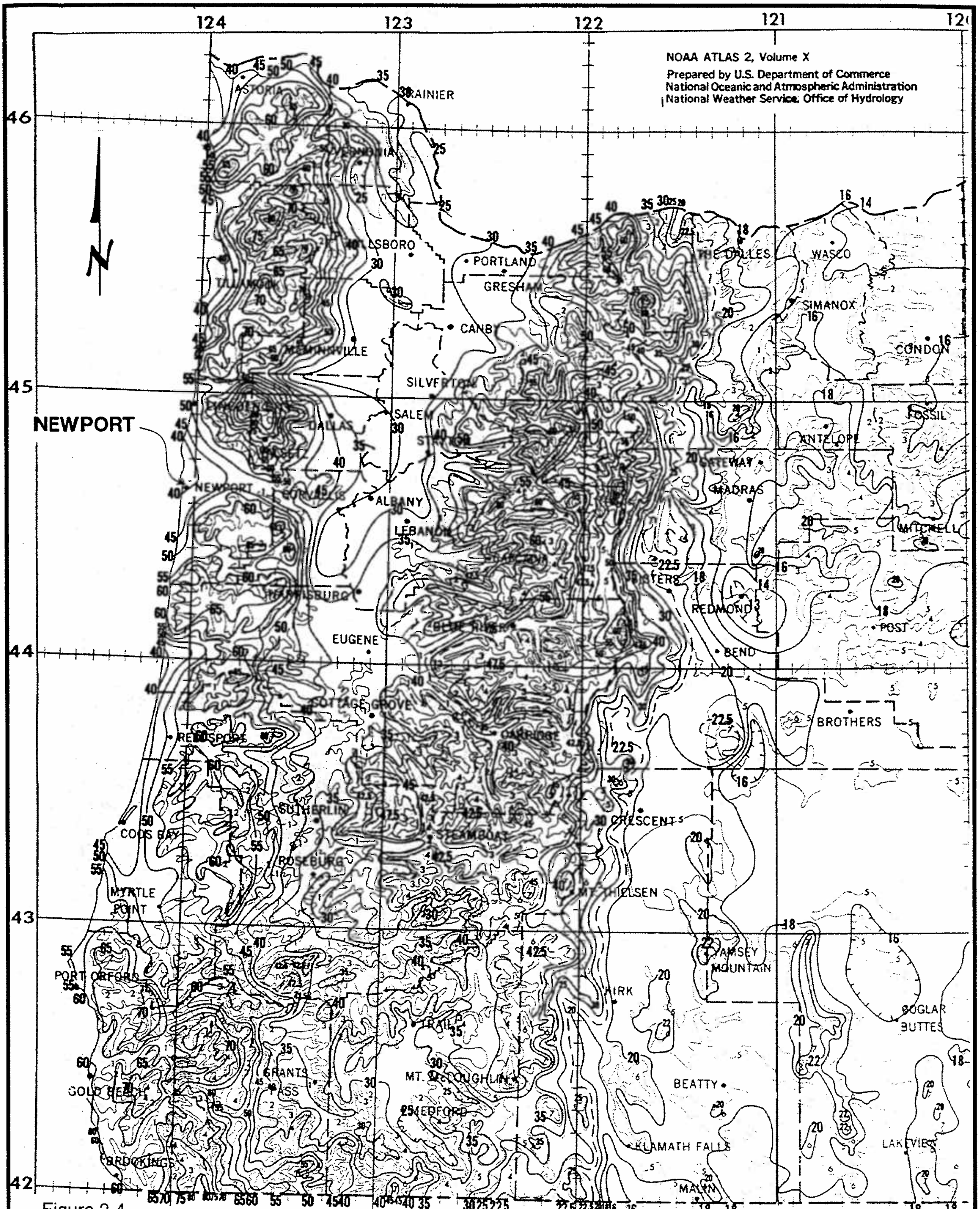


Figure 2-4

U.S. Weather Bureau Isopluvial Map (NOAA, Atlas 2, Volume X, Figure 26)

OREGON

Source: Oregon Climate Services/Oregon State University

Contours Show 5-Year, 24-hour Precipitation In Tenths of an Inch

Newport Wastewater Facilities Plan 1995 Update

CH2M HILL | Fuller & Morris Engineering, Inc.

Population

The population of Newport has increased steadily, more or less, since its incorporation in 1882. The 1900 federal census reported the population at 256. During the next decade, the number of people living in Newport more than doubled, reaching 721 by year 1910. The city experienced a decline in the decade that followed, decreasing to a population of 580 by year 1920. Since 1920, growth has shown a steady increase. The 1975 residential population was about 6,000 people and population is estimated at 9300 in 1995.

The City of Newport has grown at about a 2.22 percent compounded growth rate over the past 20 years. That growth has not been linear but has been characterized by periods of sharp increase and a couple of years of slight decline. The general trend, however, has been a steady rise in the population.

Land Use

The Comprehensive Plan has established various land use districts for the UGB based on existing land use patterns, previous land use commitments, constraints of the area, projected growth, and zoning ordinances. These land use districts are shown on the Comprehensive Plan Map included in the Comprehensive Plan. The various land use districts of the UGB and their respective size are shown in Table 2-1.

Table 2-1
Various Land Use Districts of the Newport Urban Growth Boundary-Year 2020

Land Use District	Acres	Percent of Total
• Residentially Zoned Land	2740	45
• Land Devoted to Streets	1220	20
• Commercially Zoned Land	540	9
• Industrially Zoned Land	480	8
• Parks, Open Spaces, and other Public Lands	1120	18
Total	6,100	100

B. INVENTORY OF EXISTING WASTEWATER FACILITIES AND OPERATIONS

Wastewater Collection System

The City's existing sanitary wastewater collection system collects wastewater from residences, businesses, industries, and public facilities and conveys the wastewater to the City's wastewater treatment plant. No industrial process wastewater is collected from the fish processing industry located along the City's bay front. Flow through each of the fourteen individual drainage basins is mostly by gravity. Drainage basins not tributary to the WWTP by gravity use lift stations to pump the wastewater directly into the WWTP or into interceptor sewers that flow to the WWTP by gravity.

The collection system presently serves approximatley 2,600 acres of the UGB. The system consists of about 40 miles of sanitary sewers (not including individual service laterals to buildings) ranging in size from 6-inch to 18-inch diameter and 21 separate lift stations ranging in capacity from 20 gpm to 1200 gpm. Minor overflows have occurred at some of the lift stations only as a result of a temporary power outage or a failed pump system. The collection system has 12 emergency bypass points in the event of an overflow. All these are covered by the City's Waste Discharge Permit. These bypass points are located in the following lift stations: Schooner Creek, 56th St., 48th St., 42nd St., Big Creek, Nye Beach, Bay Front, OSU Marine Science Center, Ferry Slip Road, NE 10th St., SW 26th St., and SE 3rd St. Design data sheets for the existing lift stations and their discharge manhole inspection sheets are included in Appendix 4.

A new lift station, recently installed on Yaquina Head to serve the Bureau of Land Management's new interpretive center development, will remain the property of the BLM and all operation and maintenance of the new lift station will remain with the BLM staff.

Inspection of the existing lift station discharge manholes revealed that the concrete manholes on the gravity sewer on Bay Boulevard, that receives discharge from the Marine Science Center lift station, have experienced sulfide corrosion, and are in need of replacement. The sewer pipe itself will be examined with closed-circuit television equipment to determine the condition of the pipe. To a lesser degree, the discharge manhole from the Bay Front lift station has experienced sulfide corrosion. It should also be replaced. The remainder of the discharge manholes were not experiencing sulfide corrosion and are in sound condition.

Nuisance odor and corrosion problems caused by the presence of hydrogen sulfide in the raw sewage will be addressed during the predesign engineering phase of the project. An air injection system and a hydrogen peroxide system will be evaluated for inclusion into the new Nye Beach Lift Station. An air injection system and a hydrogen peroxide system will also be evaluated for the new South Beach Lift Station and the new Marine Science Center Lift Station that will replace the existing MSC Lift Station.

Odor and sulfide corrosion will be addressed at the new WWTP by providing a covered headwork's building to allow capture and scrubbing of the air within the headwork's building. Corrosion resistant polyethylene and metals will be used in areas having a highly-corrosive environment in the WWTP and at the lift stations.

Drainage Basins numbered N1 through N7 lie on the north side of Yaquina Bay and basins numbered S1 through S7 lie on the south side of the bay. These drainage basins, the existing collection and interceptor sewers, and the existing lift stations are shown as well as proposed future facilities on Map No. WW-1, Wastewater System Master Plan Map.

Wastewater Treatment and Disposal Facilities

Treatment Plant History

The existing Newport WWTP is located on the west side of Highway 101 in the Nye Beach neighborhood. The original plant was constructed in 1964 with a design capacity of 1.6 mgd. The plant consisted of:

1 12 -foot diameter grit chamber
1 50 -foot diameter primary clarifier
1 75 -foot diameter rock trickling filter
1 50 -foot secondary clarifier
2 30 -foot anaerobic digesters
Chlorine solution disinfection at the outfall
Ocean outfall at Nye Beach

The City added two chlorine contact chambers and the plant was also expanded in 1982 with the addition of a new 72-foot diameter primary clarifier. The existing 50-foot diameter primary clarifier was converted to another secondary clarifier. The second expansion of the plant went into operation in 1985. This expansion included a new 6 mm opening influent screen, a 60-foot diameter 16-foot high plastic media biofilter, and odor control domes over the primary clarifier, trickling filter, and new biofilter. In 1990, a 24-inch 750-foot outfall extension and diffuser was added to the existing 18-inch diameter outfall. Early in 1994, the City replaced the trickling filter rock media with plastic media to improve BOD removal performance. The City is also adding a centrifuge for waste sludge thickening to improve plant solids removal and digester performance. A Site Plan of the existing WWTP is shown on Figure 2-5.

Facilities Description

A flow schematic of the existing WWTP is shown on Figure 2-6. Wastewater from the collection system enters the plant through 12-inch, 15-inch, and 21-inch-diameter sewer pipes that enter the influent inlet box. The raw wastewater flows by gravity through a 6 mm-opening automatic influent screen that removes rags and debris that could damage downstream equipment. Screened wastewater then flows by a channel to a 12-foot diameter detritor grit basin. Grit and sand are removed in this basin and conveyed to the screenings box for ultimate disposal at the landfill. From the headwork's, the wastewater flows by gravity through a 24-inch pipe to a single 72-foot diameter primary clarifier.

The primary effluent flows by gravity to a 12-inch parshall flume for plant flow measurement. From the flume, primary effluent flows by gravity to the biofilter pump station. Primary effluent and biofilter recycle are pumped through the biofilters by two 3.17 mgd capacity biofilter pumps. A third pump is used for standby or extreme peak flow events. The two biofilters have plastic cross-flow media and a volume of 31,000 and 45,000 cubic feet. The biofilters are covered by aluminum domes and odor control fans pull air from inside the domes and scrub it through activated carbon vessels.

Biofilter effluent is split and fed by 18-inch pipes to two 50-foot-diameter secondary clarifiers. The clarifier sidewall water depth is 9 feet. Secondary effluent flows by gravity in a 24-inch pipe to two rectangular chlorine contact basins. An ultrasonic effluent flow meter was added to the outlet from the chlorine contact basin in 1992 to measure and record all plant effluent flows. Disinfected effluent flows by gravity in an 18-inch pipe to the Nye Beach outfall to be discharged into the Pacific Ocean. One of the two cells of the Chlorine Contact Basin can be used as a flow balancing chamber to avoid extremely low flows through the outfall pipeline.

The outfall was rehabilitated and extended in 1990. The existing 18-inch diameter outfall, length 1,124 linear feet across Nye Beach, was lined with a 17-inch inside diameter fiberglass inversion liner, Insituform. At the end of the newly lined 18-inch diameter outfall, an 18-inch by 24-inch increaser was added to the pipe and 750 linear feet of 24-inch inside diameter concrete coated steel pipe was placed seaward into a concrete encased bedrock trench to the new 3-port diffuser on the seafloor.

Sludge in the primary clarifier is thickened in the clarifier and pumped to a 30-foot diameter primary digester. The primary digester is heated and mechanically mixed. A portion of the sludge from the secondary clarifiers is sent to the primary clarifier as return activated sludge and the remainder is sent through the new centrifuge for thickening and is then pumped to the primary digester. Sludge from the primary clarifier or the secondary clarifier can be sent to the centrifuge for thickening. Digested sludge flows from the primary digester to the secondary digester for further digestion and storage. Digested sludge is hauled by a tank truck and is applied as a liquid to land surrounding the Newport airport.

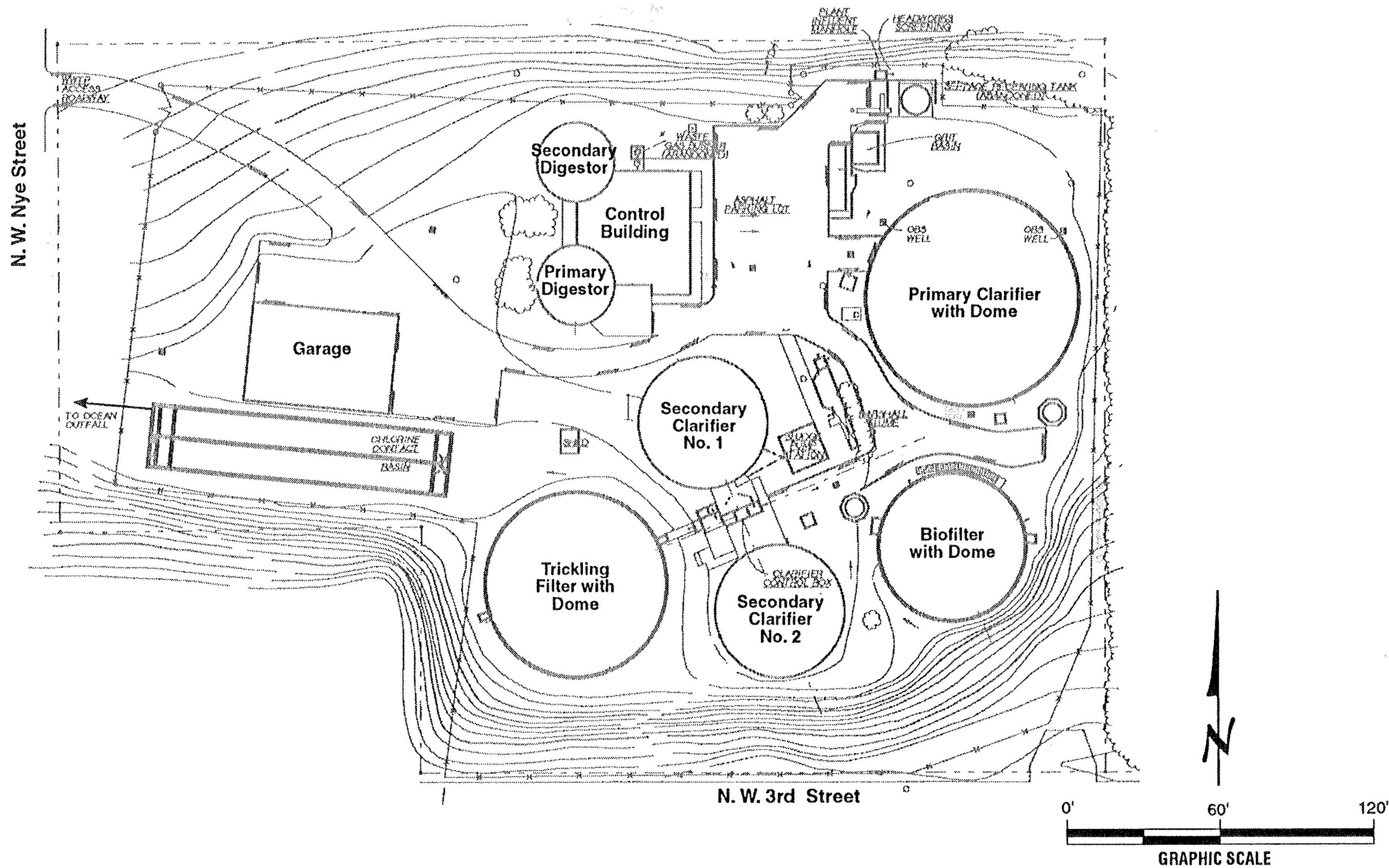


Figure 2-5

Site Plan
Existing North Side WWTP

Newport Wastewater
Facilities Plan 1995 Update

CH2M HILL FULLER & MORRIS Engineering, Inc.

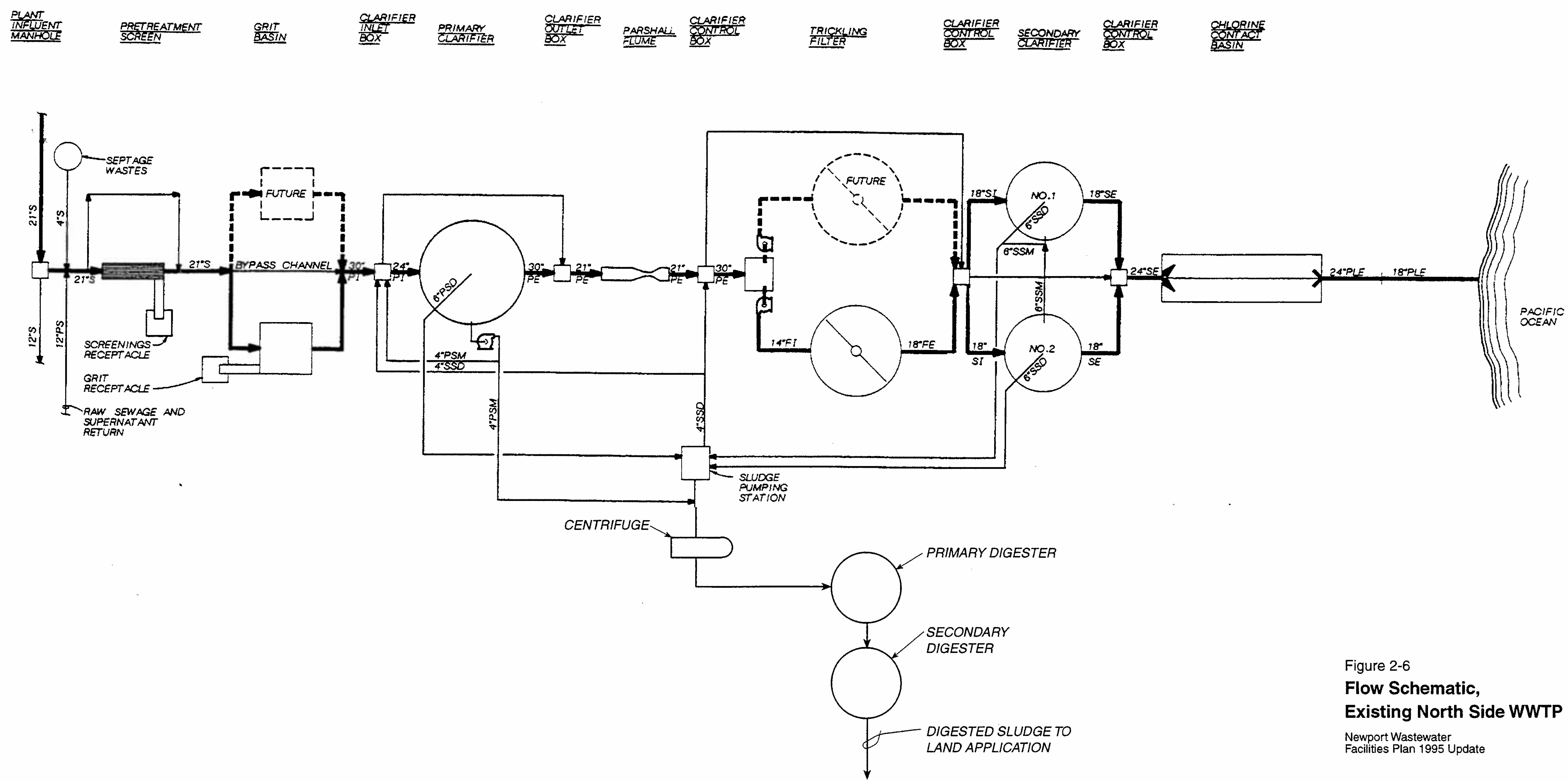


Figure 2-6

Flow Schematic, Existing North Side WWTP

Newport Wastewater
Facilities Plan 1995 Update

CH2M HILL FULLER & MORRIS Engineering, Inc.

Design Criteria

Design criteria for the existing plant and design factors for unit treatment processes and equipment are shown in Table 2-2.

Table 2-2
Existing Plant Design Criteria

Influent	
Flow	3.2 mgd
BOD	5,340 lb/day
TSS	5,340 lb/day
Screen	
Units	1
Opening	6mm
Grit Removal	
Type	Detritor
Primary Clarifier	
Units	1
Diameter	72 feet
Overflow rate	785 gal/day/sf
Trickling Filters	
Units	2
Media	PVC
Total Volume	76,200 cf
Loading Rate	50 lb/day/1,000 cf
Secondary Clarifiers	
Units	2
Diameter	50 feet
Overflow rate	815 gal/day/sf
Chlorine Contact Basins	
Units	2
Detention time	80 minutes @ 3.2 mgd
Anaerobic Digesters	
Units	2
Diameter	30 ft
Total Volume	28,275 cf
Detention Time	20 days

C. EXISTING WASTEWATER FLOWS AND CHARACTERISTICS

Flow Definitions

The flows to the Newport WWTP follow a typical wet season/dry season pattern that is also affected by tourism. The following definitions for wastewater flow rates for design of treatment facilities are used in this Facilities Plan:

- ADWF (average dry weather flow): the average of the daily flows for the months of May through October.
- AWWF (average wet weather flow): the average of the daily flows for the months of November through April.
- DWMDF (dry weather maximum daily flow): the highest daily flow recorded during the months of May through October.
- WWMDF (wet weather maximum daily flow): the highest daily flow recorded during the months of November through April.
- DWMMADF (dry weather maximum month average daily flow): the highest 30-day average daily flow, calculated on a calendar month basis (for May through October), consistent with NPDES reporting requirements.
- WWMMADF (wet weather maximum month average daily flow): the highest 30-day average daily flow, calculated on a calendar month basis (for November through April), consistent with NPDES reporting requirements.
- AADF (annual average daily flow): total flow during the year divided by 365 days.

Additional plant flows are defined as needed.

Historical Treatment Plant Flows and Loads

Historical plant flows for the period of record (POR) are flows for May 1994 through April 1995 and are presented in Table 2-3. The dry weather daily flow averaged 1.89 mgd over the POR while the wet weather daily flow averaged 2.37 mgd. During the year, flows are typically at a minimum in May and/or October and peak in mid- to late-winter (December, January, February, or March). The average daily flow peaked during January for the POR. Prior to October 1993 recorded influent flow was measured at the parshall flume and included the returned activated sludge recycle stream. Beginning in October 1993 the influent flow records were adjusted to subtract 0.29 mgd from the measured flow to show the corrected influent flow amount. In April 1994 an ultrasonic flow meter was installed into the effluent pipe at the outlet from the chlorine contact basin, and all recorded flows since then have been plant effluent flows. Influent flows are higher than the effluent flows by the amount of sludge pumped from the primary clarifier to the primary digester, approximately 50 gpm (0.07 mgd)

Historical WWTP effluent loads are presented in Table 2-4. Five-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) values are usually below 30 milligrams per liter (mg/L) with some exceptions.

Table 2-3
Newport WWTP Historical Influent Characteristics
May 1994 Through April 1995

Total Plant Influent Flows and Loads

Parameter	ADF mgd	BOD mg/l	BOD lbs/day	TSS mg/l	TSS lbs/day
Dry Weather					
May 94	1.802	276	3,906	178	2,522
June 94	1.873	288	4,213	241	3,464
July 94	2.025	261	4,120	224	3,560
Aug. 94	1.956	241	3,723	192	3,008
Sept. 94	1.748	230	3,010	191	2,572
Oct. 94	1.915	211	3,177	184	2,662
Dry Average	1.89	251	3,692	202	2,965
Wet Weather					
Nov. 94	2.096	125	2,064	104	1,720
Dec 94	2.757	107	2,247	83	1,794
Jan 95	2.849	96	2,152	108	2,348
Feb. 95	2.522	103	1,903	134	2,420
Mar 95	1.884	124	1,846	152	2,307
April 95	2.111	177	3,044	194	3,348
Wet Average	2.37	122	2,209	129	2,323
Annual Average	2.13	187	2,951	166	2,644

Table 2-4
Newport WWTP
Historical Effluent Characteristics
May 1994 Through April 1995

Parameter	ADF mgd	BOD mg/l	TSS mg/l
Dry Weather			
May 94	1.73	25	24
June 94	1.80	23	23
July 94	1.95	20	22
Aug. 94	1.88	25	20
Sept. 94	1.68	25	21
Oct. 94	1.84	26	23
Dry Average	1.81	24	22.2
Wet Weather			
Nov. 94	2.02	22	19
Dec. 94	2.69	17	20
Jan 95	2.78	19	25
Feb. 95	2.46	17	33
Mar 95	1.81	27	41
April 95	2.04	35	44
Wet Average	2.30	22.8	30.3
Annual Average	2.06	23.4	26.3

Biomonitoring Results

A dual endpoint toxicity test was performed on Newport WWTP dechlorinated final effluent beginning on May 15, 1995 and running through May 22, 1995. The test was performed by Northwestern Aquatic Sciences in Newport. Test organisms used were Inland Silverside, Menidia beryllina. USEPA test methods were followed for all procedures.

The effluent samples were dechlorinated prior to testing using sodium thiosulfate. Details of the dechlorinated final effluent are as follows.

NAS Sample No.	3746E	3776E	3800E
Collection Date	5/15/95	5/17/95	5/19/95
Receipt Date	5/15/95	5/17/95	5/19/95
Conductivity (umhos/cm)	560	660	670
pH	6.8	7.3	7.2
Hardness (mg/L)	80	80	80
Alkalinity (mg/L)	70	70	70
Salinity (ppt)	0.0	0.0	0.0
Total Chlorine (mg/L)	0.32	0.12	0.08

Test concentrations were 100, 50, 25, 12.5, 6.25, and 0 percent. Yaquina Bay seawater was used for dilution water. The effects criteria of the test were: (1) mortality, and (2) growth inhibition. Mortality was defined as lack of visible movement during a 30 second observation period. Growth inhibition was measured as the difference in weight gain of fish between a treatment level and the control.

Acute endpoint: There were no mortalities of inland silversides in the 100% effluent and only one in the controls after 48 hours, therefore the effluent passed the acute test criterion according to Oregon DEQ guidelines.

Chronic Endpoint: The biological effects, given as the NOEC and LOEC for survival and growth, and the LC50/IC25 for survival/growth, are shown below.

	Survival	Growth
NOEC (%)	100	50
LOEC (%)	>100	100
7-Day LC50/IC25 (%) (95% conf. int.)	>100	88.7
Method	By inspection	Linear Interpolation

The sample received was split into two subsamples. One subsample was passed through a zeolite column to remove ammonia and was labeled "NH3 Stripped." The other subsample (the control sample) was tested as received and labeled "NH3 Not Stripped." The concentrations of effluent used for the tests were 6.25, 12.5, 25, 50, and 100 percent effluent. Two tests were also performed with 100 percent dilution water not stripped, and 100 percent dilution water stripped, as controls.

The fathead minnows showed a statistically significant reduction in growth when compared to the control at the 100 percent concentration. The fathead minnows showed no statistically

significant reduction in survival or reproduction when compared to the control at any NH3 Stripped effluent concentration.
The water flea showed no statistically significant reduction in survival or reproduction when compared to the control at any NH3 Stripped or Not Stripped effluent concentration.
Algae showed a statistically significant reduction in growth when compared to the control at both the 100 percent NH3 Stripped and Not Stripped effluent concentrations.

The bioassay testing revealed the following chronic toxicity concerns for the Newport WWTP effluent at present:

- The untreated (not stripped) effluent sample exhibited chronic toxicity at the 100 percent effluent for fathead minnow growth.

- The treated (stripped) effluent sample exhibited no toxicity for the fathead minnow.

- Neither the treated or untreated effluent samples were chronically toxic to the water flea.

- Both the treated and untreated effluent samples exhibited chronic toxicity to algae at the 100 percent effluent.

Quarterly future bioassay testing is required by the NPDES permit for 1 year beginning no later than January 1, 1994.

D. IDENTIFICATION OF EXISTING DEFICIENCIES

Previous Capacity Report Summaries

During the summer of 1993, the Newport plant had difficulty meeting its effluent permit discharge requirements and received a "Notice of Noncompliance" from DEQ. The plant lab analysis of the influent indicated that an abnormally high BOD concentration was being experienced at the inlet to the plant. CH2M HILL was retained by the City to investigate the effect of oil and grease on plant performance and interim improvements to maximize the efficiency of the plant.

This investigation resulted in two technical memoranda. The first memorandum addressed oil and grease in the plant influent and identified potential interim improvements. It was determined that reducing oil and grease by enforcing a grease trap ordinance would reduce maintenance at the plant, but would not reduce the overall load to the trickling filters. Interim plant improvements that were identified included secondary sludge thickening, chemical addition to the clarifiers, electric drives for filter distributor arms, adding aerated solids contact after the trickling filters, replacing the old trickling filter rock media with plastic media, and improving filter ventilation.

The second technical memorandum provided a more detailed evaluation of the interim improvements as well as verification of plant influent and effluent BOD by splitting samples between the plant lab and the CH2M HILL lab. The results of this study recommended that the filter media changeout, sludge thickening, filter electric drive retrofit, and filter ventilation be implemented.

Stipulation and Final Orders

The City of Newport has agreed to two Stipulation and Final Orders. The first Stipulation and Final Order (SFO), dated June 30, 1993, requires a mixing zone study and sets interim limits for chlorine residual.

Ocean Outfall Mixing Zone

DEQ issued Stipulation and Final Order (SFO) No. WQMW - WVR93-115 on June 30, 1993 requiring the City to submit additional mixing zone information to DEQ to allow them to assign a final chlorine effluent limit. In response to the SFO, the City retained CH2M HILL to provide an Ocean Outfall Dilution Study.

The study conducted computer program runs using the UDKHDEN computer, EPA Plume Model simulations for six critical effluent flow/ocean condition situations. The computer simulations were compared to actual dilution measured in the field upon completion of the outfall in November of 1990. Measured dilution compared very closely with the computer simulated dilution. The computer model results indicated that effluent dilution will vary from 28:1 to 40:1 at 15 feet down plume from the diffuser; and vary from 100:1 to 150:1 at a point 150 feet down plume of the diffuser, depending on the treatment plant flow rate and ocean conditions for tide level, wave height and current speed. The Study also pointed out that the new diffuser is placed on the seafloor within the surf zone, and that the computer model cannot simulate the high turbulence associated with the surf zone and wave action. As a result, the computer simulated dilution's are probably lower than actual dilution whenever the ocean runs at an average or higher surf condition.

Based on the results of the Dilution Study, the City requested in March of 1994, an expansion of the effluent discharge mixing zone and the zone of initial dilution (ZID). The requested mixing zone expansion was from a 150 - foot radius around the point of discharge to a 250 - foot radius, and the requested expansion for the ZID was from 15 - foot radius, around the point of discharge to a 25 - foot radius. DEQ granted the City's request and issued Addendum No. 1 on March 21, 1995 and assigned a final chlorine effluent limitation of 0.47 ppm daily maximum. SFO No. WQMW - WVR - 93 - 115 has been terminated since the City met the requirements of the SFO.

The second SFO and its addendum dated November 21, 1994, sets dates for implementing the recommendations of the Interim Improvements memorandum by CH2M HILL. The old trickling filter rock media was replaced with new plastic media in 1994. A new centrifuge for secondary sludge thickening and the electric drives for the filter distributor arms will be operational in late 1995.

NPDES Permit

The City's NPDES Waste Discharge Permit was renewed in 1993 following expiration of the previous permit. The permit was renewed on June 30,1993 and is designed to be effective for 5 years. The current permit is included in Appendix 1.

Effluent Limits

The current plant Discharge Permit requires a year-round effluent BOD_5 and TSS monthly average concentration limit of 30 mg/L, and 800 lb/day monthly average mass load limit for both BOD and TSS.

Process Deficiencies

Several process deficiencies have been identified for the existing plant. The lack of a redundant primary clarifier makes it difficult to process peak flows and loads and perform routine maintenance on the existing primary clarifier. The small secondary clarifiers have a high average flow overflow rate, and therefore, they lose suspended solids to the effluent under high flow conditions. The plant currently experiences problems in handling the volume of secondary sludge produced, but this problem will be eliminated when the new sludge thickening centrifuge is operational. Odor is an occasional problem, despite the existing odor control system. This is exacerbated by the proximity of businesses and residences adjacent to the plant.

Improvements to Ocean Outfall Diffuser

The outfall extension constructed in 1990 placed a new 3-port diffuser concrete encased into the seafloor bedrock at approximately elevation - 15.0 mean lower low water (mllw) datum. The bedrock is overlaid with sand that moves seasonally with changing ocean conditions such as currents and wave actions caused by storms. Generally the depth of sand over the bedrock (and the diffuser) is deeper in the late summer and early fall, and lessens as winter storms scour the sand overlaying the seafloor bedrock.

The outfall has plugged on several different occasions since constructed in November 1990. These plugging events occurred when effluent flow was either mistakenly shut-off to perform maintenance on the chlorine contact basin at the treatment plant, or when the effluent flow was very low (around 0.5 mgd) in the predawn morning hours and the ocean was extremely rough with large waves and high tides caused by stormy conditions. A continuous head pressure was maintained on the outfall when it plugged, and each time the outfall eventually cleared itself of restricting sand, within a few days, and again flowed freely without overflow. The City has just completed an improvement to the outfall operation. A pump has been installed in the chlorine contact basin to supplement low flows experienced in the predawn to keep the effluent rate above 1.0 mgd to help minimize conditions that have historically led to outfall plugging. The outfall has been observed to flow freely without overflow with effluent flows up to and exceeding 6.0 mgd. It appears the higher the effluent flow, the less likely the outfall will plug or overflow and dilution within the mixing zone is better, all due to the higher flow velocity inside the outfall pipe overcoming restricting sand and through the diffuser ports providing better mixing with ocean water.

Other improvements made to the existing outfall include the addition of [1.]) 15 feet of head pressure to build on the outfall pipeline prior to effluent overflow to the existing stormdrain; [2.]) an "alarm device" placed in the seawall manhole to alert the wastewater staff whenever effluent flow in the manhole rises to a set critical level and [3.]) the addition of a "pressure plate" installed into the floor of the manhole to block the effluent flow from filling the seawall manhole chimney to allow the available head pressure to build more quickly to aid in keeping the diffuser clear of sand.

It should be noted that none of the existing outfall piping system from the existing WWTP down to the new 24-inch diameter pipe increaser on the beach is planned to be used for effluent disposal from the new South Beach WWTP. The only portion of the existing outfall system that is planned for use with the new South Beach WWTP is that portion from a new 24-inch Wye fitting (that lies at an angle-point in the outfall pipeline approximately 1,220 feet seaward of the existing seawall manhole) out through the new 24-inch diameter pipeline to the new 3-port diffuser that lies approximately 650 feet seaward (west) of the Wye fitting. See Figure 5-4. None of the existing outfall system that was lined with a 17-inch insituform liner in year 1990 is planned to be used with the new South Beach WWTP.

Approximately 150 feet of head pressure will be available for the outfall diffuser with the new WWTP (as compared to 44 feet for the existing WWTP). Hydraulic calculations and an analysis of diffuser dilution will be performed during the predesign engineering phase to assure that the outfall/diffuser planned for use with the new South Beach WWTP will be sufficient for handling projected peak effluent flows of 15 mgd.

Building Codes and Safety

Various building codes and safety regulations have changed since the Newport WWTP was constructed. New municipal wastewater plants are required to be designed in accordance with National Fire Protection Act (NFPA) 820, which stipulates various ventilation rates and electrical classifications to be used for safety. While the unremodeled portions of existing plants are not required to be upgraded to NFPA 820 standards, all new or significantly remodeled portions of the plant would need to be upgraded to meet the standard. For those areas not requiring remodeling, NFPA 820 does represent a good set of recommendations for possible upgrades to improve system safety.

The existing chlorination facility may be in need of safety improvements, especially because the facility is located close to neighborhoods. Recent revisions to the Uniform Fire Code, Article 80, require emergency chemical scrubbing equipment for toxic compressible gases. A sprinkler system is also required if the building is constructed of flammable materials. The local fire Marshall or building official may require these improvements if the facility is upgraded. Adding dechlorination may also trigger upgrading. Other regulations that may affect the facility upgrade are the Americans with Disabilities Act and Occupational Safety and Health Administration (OSHA) requirements.

E. INFILTRATION/INFLOW EVALUATION

General

Wastewater collection systems, although constructed to collect and convey domestic wastewater, also inevitably convey a certain quantity of extraneous clear water. This water, commonly referred to as infiltration/inflow (I/I), can originate as groundwater or surface runoff. I/I includes groundwater that leaks into the system from cracks (infiltration) or cross connections with surface runoff stormwater (inflow). The entry of groundwater and stormwater runoff into the wastewater collection system can increase the cost of operating the wastewater conveyance and treatment facilities if excessive. Excessive I/I is defined as the quantity of I/I that can be economically eliminated from a sewer system as determined in a cost-effective analysis. The analysis compares the cost of sewer rehabilitation, plus transporting and treating the remaining I/I and domestic sewage, to the cost for transportation and treatment of all the I/I and the domestic sewage.

Regulatory Requirements

EPA facilities planning guidelines include criteria for evaluating excessive I/I. A target level of 120 gallons per capita per day (gpcpd) has been established to assess impacts of groundwater infiltration. If per capita flow levels for a 7- to 14-day period of high groundwater are higher than 120 gpcpd, then excessive groundwater infiltration may exist. A similar target level of 275 gpcpd has been established for peak I/I conditions during a significant rainfall event. This target reflects the impact of inflow caused by a storm event. If either or both of these targets are exceeded, an I/I cost-effective analysis is warranted.

A comparison of Newport's per capita wastewater flows and EPA's target level per capita flows is shown in table 2 - 5.

Table 2-5
Wastewater Flow Per Capita Comparison

Parameter	Current Residential Population 9300	Current Population W/Tourism 12,300	EPA Target Level
1. Average wet weather Flow for period of record, November 1994 through April, 1995 = 2.37 mgd	255	193	120
2. Average daily flow for wet weather Maximum Day for period of record Dec. 26,1994 = 4.44 mgd	477	361	275

EPA'S target level per capita flow values are based on a national average of some 270 standard statistical area cities. While Newport does experience infiltration, and to a greater extent, inflow during winter months, Newport's per capita flow values exceed the EPA target levels largely because of the nonresidential tourism industry contributing domestic wastewater daily to the wastewater system. Currently 3,000 to 5,000 people (depending on occupancy) contribute wastewater daily from the City's 1500 motel rooms and 800 RV spaces.

Results of 1989 Analysis

The 1989 Facilities Plan included an analysis of I/I at the time. Using flow records from the treatment plant and major pump stations, it was determined that the average wet weather flow for the entire wastewater system was 2.57 mgd comprising of 2.16 mgd of domestic flow and 0.41 mgd of I/I. Infiltration and Inflow amounted to 16 percent of the total average wet weather wastewater flow.

The amount of I/I being contributed from each drainage basin was determined and the drainage basins were prioritized (worst case first) for sewer rehabilitation and I/I removal.
The City has since performed sewer rehabilitation work, aimed at I/I reduction and progress reports have been submitted to DEQ. The report for work performed during 1993 is included in Appendix 5.

A cost effective analysis was done to determine if the City's I/I was excessive and in need of reduction for the outfall extension project. The amount of I/I was determined not excessive for that project.

Cost Effective Analysis For New South Beach Wastewater Conveyance and Treatment Project

The City's current wastewater flow recorded at the existing WWTP during the period of record(POR), May 1994 through April 1995, is broken down into components for:

1. Average daily base flow amount from residential (including tourist) population
2. Infiltration flow amount
3. Inflow amount

This has been done to Facilitate an Infiltration/Inflow Cost Effective Analysis for the South Beach Wastewater Conveyance and Treatment Project.

1. Average daily base flow amount from residential (including tourist) population- is assumed to be equal to the POR average dry weather flow (ADWF) of 1.89 mgd. (The ADWF for one year later, May '95 thru Oct '95 is also recorded at 1.89 mgd).

2. Infiltration flow amount - Infiltration contributed to the sewer system from groundwater leaking into cracks in the sewer pipes and the pipe joints is generally considered to be the difference between the average daily base flow amount and an average weekly flow occurring in non-rainfall, high-groundwater time periods. Four separate weekly periods were evaluated resulting in the following groundwater infiltration amounts:

	Average Weekly Flow	ADWF Amount	Groundwater Infiltration Amount
a. POR, Feb. 4 - Feb. 10, 1995	2.39 mgd	1.89 mgd	0.50 mgd
b. POR, Feb. 21 - Feb. 27, 1995	2.18 mgd	1.89 mgd	0.29 mgd
c. POR, Mar. 25 - Mar. 31, 1995	1.87 mgd	1.89 mgd	0.0 mgd
d. POR, Apr. 21 - Apr. 27, 1995	2.87 mgd	1.89 mgd	0.98 mgd

As shown in the preceding table, the groundwater infiltration amounts vary for the four separate weekly periods. This is generally caused by varying amounts of raw sewage being contributed from the base residential and tourist population for each of the four separate weekly periods. The March 25 through March 31 period resulted in 0 mgd groundwater infiltration, while the April 21 through April 27 period resulted in 0.98 mgd groundwater infiltration. While the base residential population most probably remained the same for the four separate periods, the tourist population fluctuated for the four separate periods. The April 21 through April 27 period occurred during the week following the Easter Holiday, when more tourists were visiting Newport than in the other three periods. An average groundwater infiltration amount for the four separate periods was 0.44 mgd.

In communities such as Newport, where the non-rainfall time periods are of short duration during the period of high - groundwater, it helps to compare total wastewater flows to rainfall amounts to better understand the timing of the infiltration/inflow amounts, and thereby, the I/I components. Infiltration amounts could be greater than the amounts shown above due to infiltration occurring during rainfall periods.

Figures 2-7 through 2-9 are plots of the recorded average daily wastewater flow amounts and rainfall amounts for the months of February, March, and April, 1995. A review of these Figures show that as rainfall occurred, the wastewater flow amount began to increase sharply after a short time delay from the beginning of the rainfall, and the wastewater flow generally decreased at a more gradual rate after the rainfall stopped just prior to the weekly periods of non-rainfall, high-ground water time periods shown above. The sharp increase in wastewater flow show the affect of rainfall induced infiltration and inflow on the total wastewater flow amounts. The more gradual decrease of wastewater flow occurring after the rainfall stopped indicates that rainfall induced infiltration and inflow continued to contribute to the total wastewater flow for several days after the rainfall stopped. This suggests that rainfall induced infiltration may be the highest contributor to the total contribution of infiltration and inflow amounts.

Figures 2-10 and 2-11 are plots of recorded average daily wastewater flow amounts and rainfall amounts for December, 1994 and January, 1995. These plots also show a sharp increase in wastewater flow shortly after rainfall began and a more gradual decrease in wastewater flow after the rainfall had stopped. These plots also suggest rainfall induced infiltration may be a high contributor to the total infiltration and inflow contribution.

3. Inflow amount - is generally the difference between the wastewater average daily dry weather flow during a period of low groundwater, and the highest average daily flow recorded during a storm event occurring during a period of low groundwater.

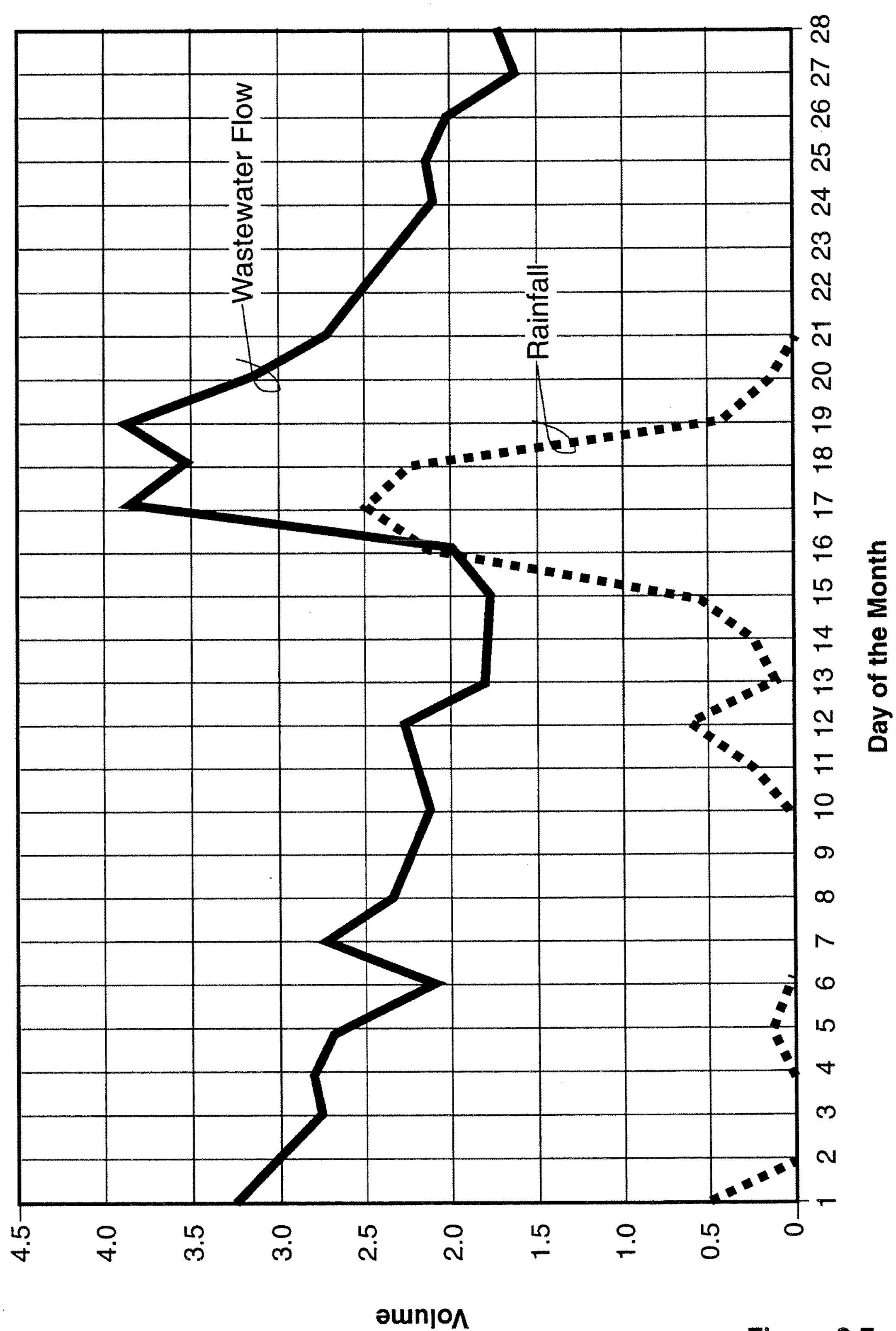


Figure 2-7
February 1995 Flows (MGD) and rain (in)-Newport

FULLER & MORRIS
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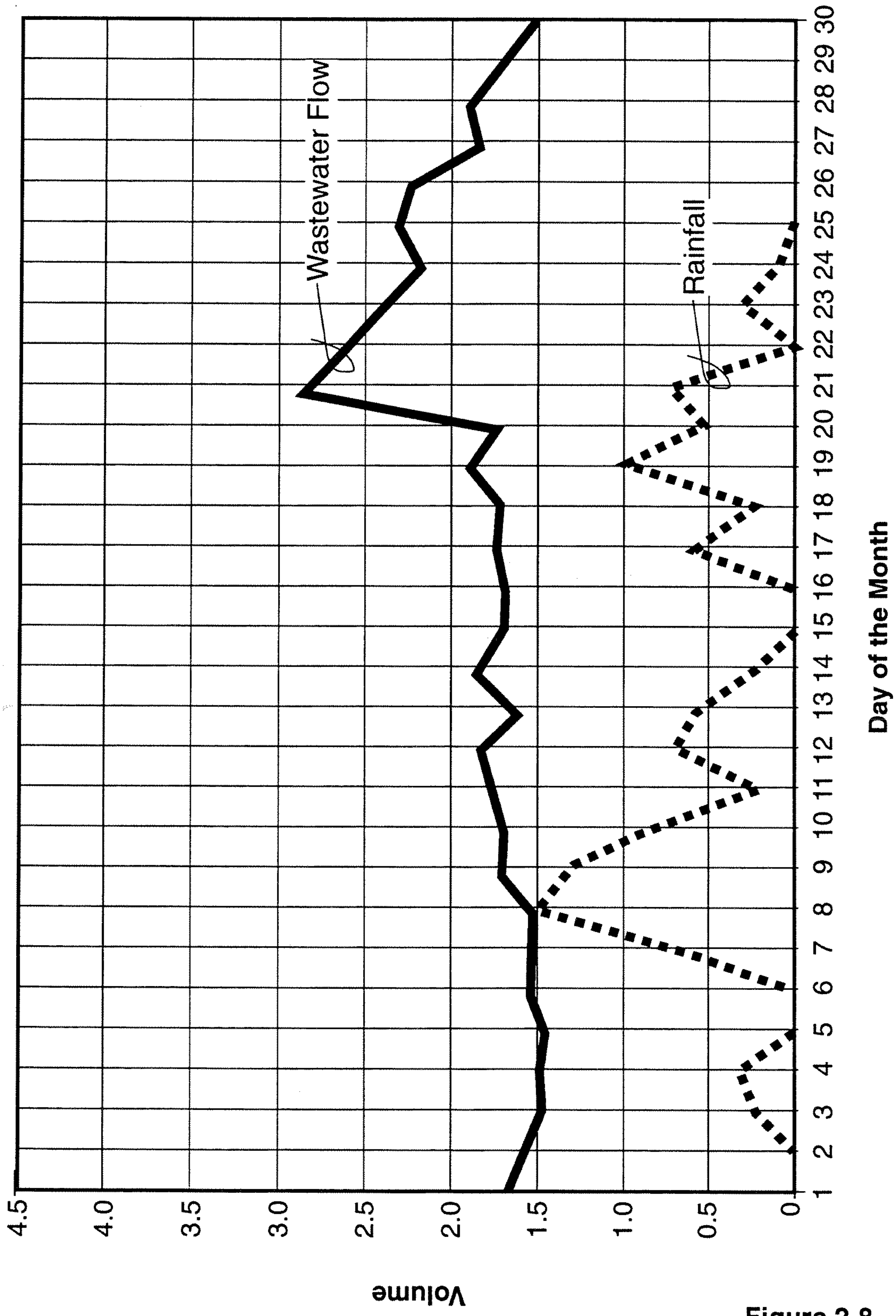

Figure 2-8
March 1995 Flows (MGD) and rain (in)-Newport

FULLER & MORRIS
Engineering, Inc.

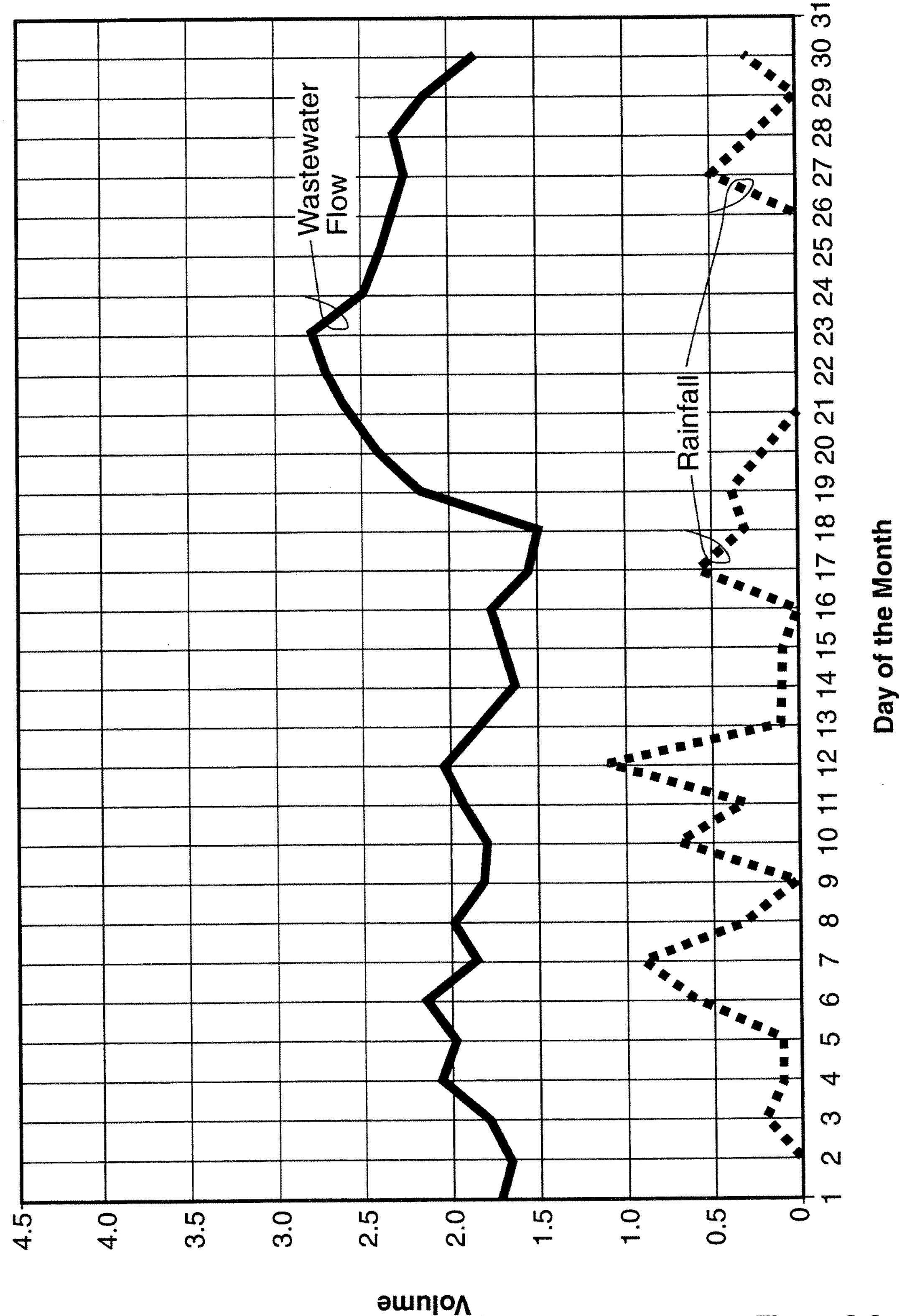

Figure 2-9
April 1995 Flows (MGD) and rain (in)-Newport

FULLER & MORRIS
Engineering, Inc.

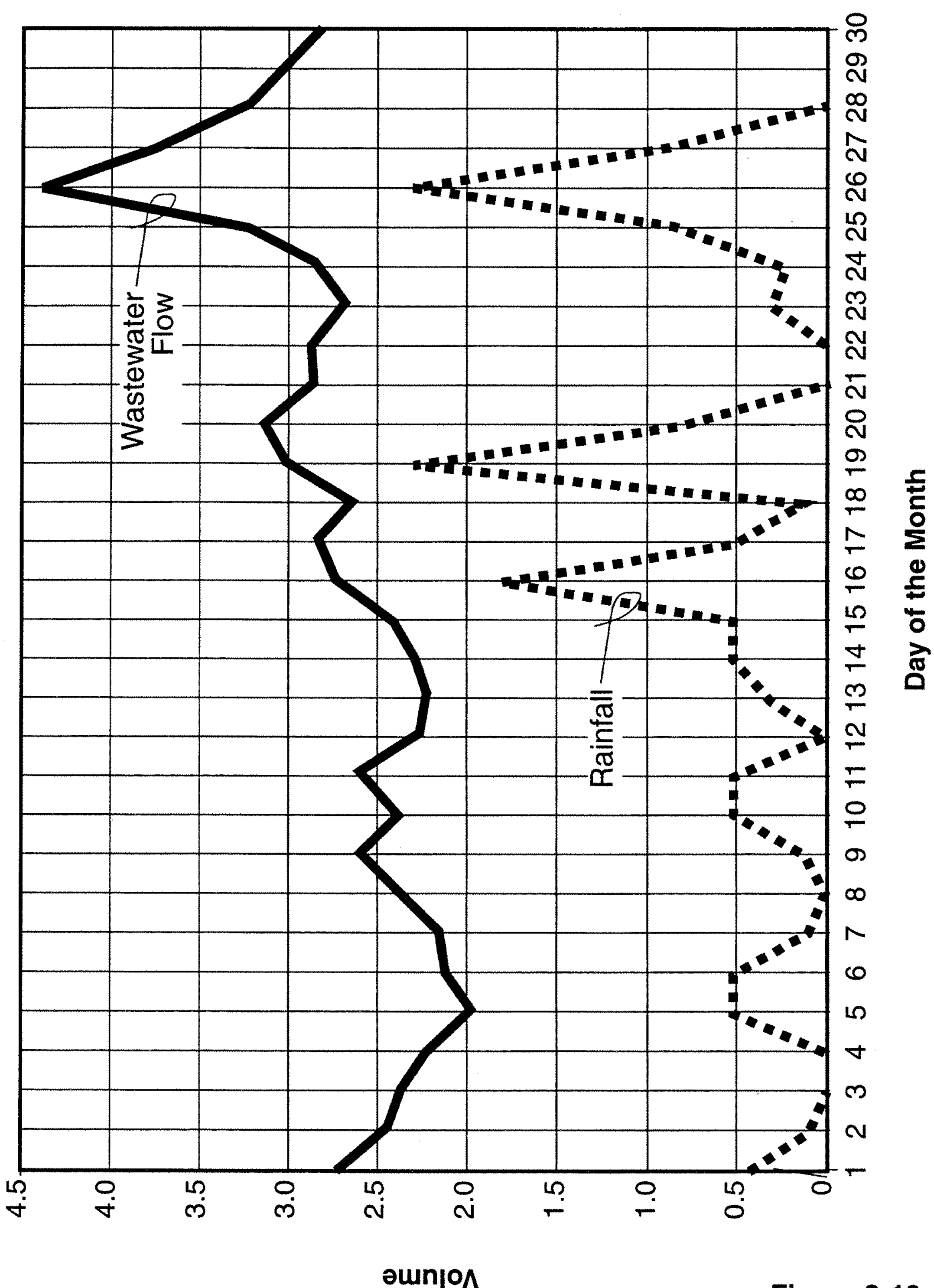

Figure 2-10
December 1994 Flows (MGD) and rain (in)- Newport

FULLER & MORRIS
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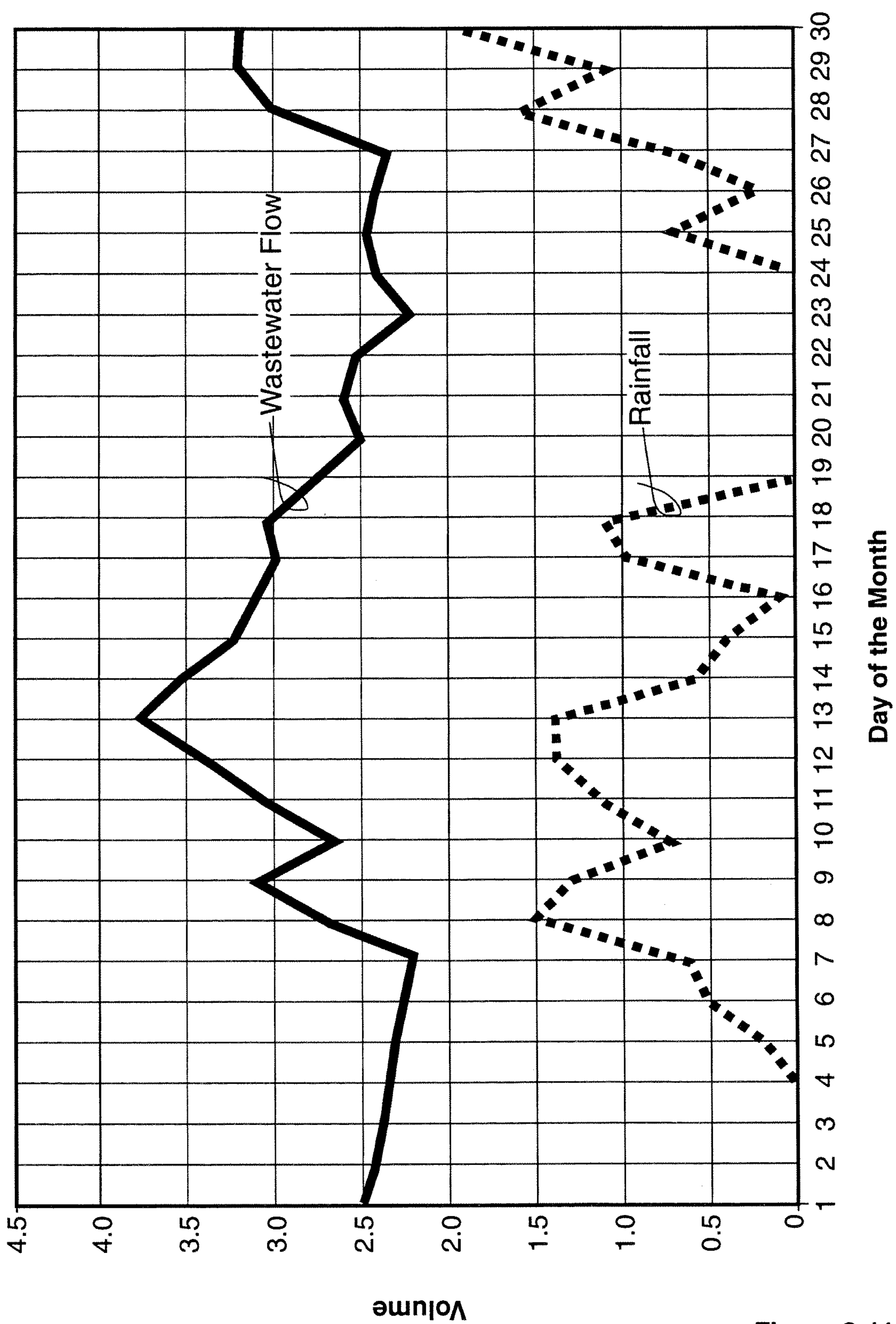

Figure 2-11
January 1995 Flows (MGD) and rain (in)-Newport

FULLER & MORRIS
Engineering, Inc.

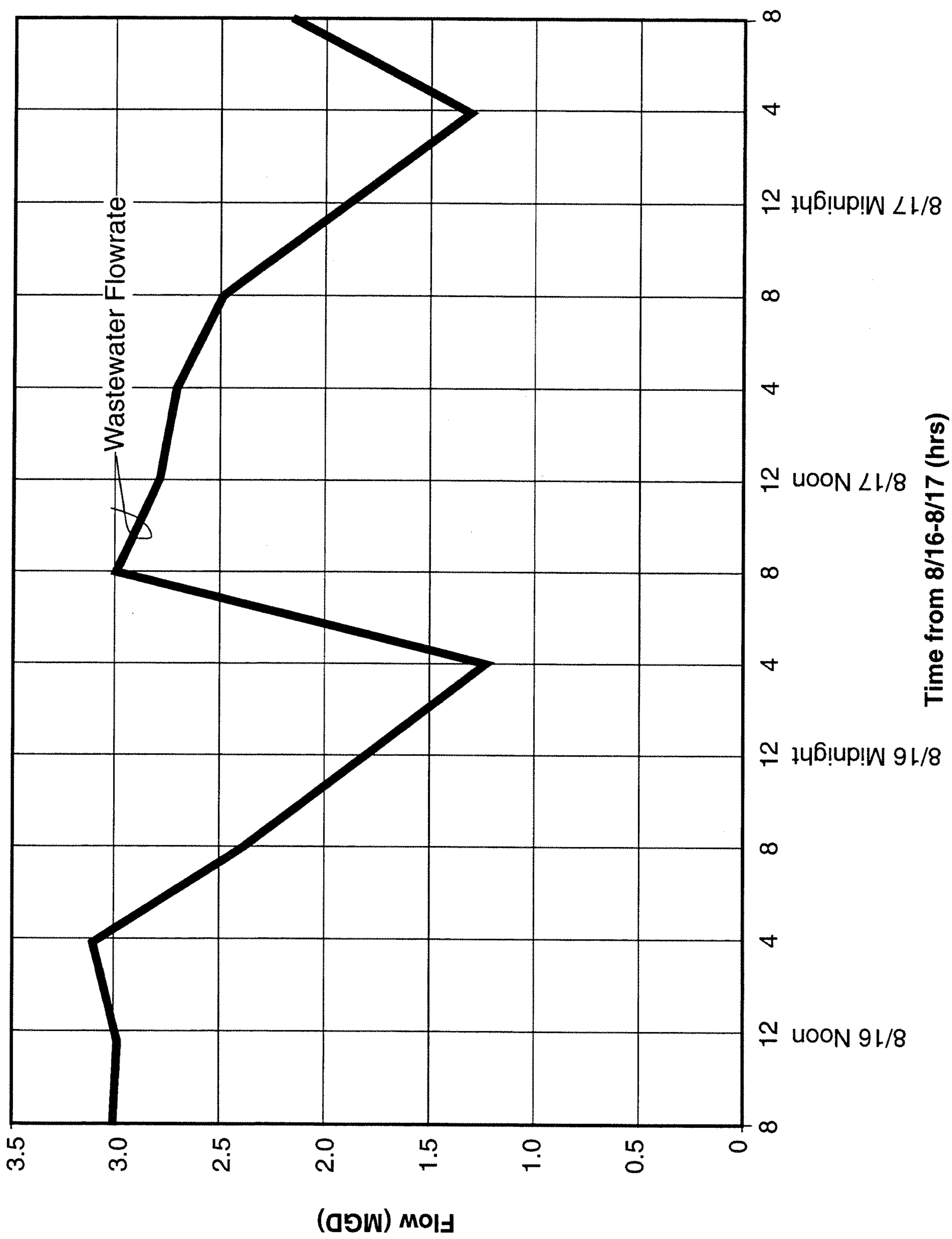

Figure 2-12
August 1995 Hourly
Flowrate Data - Newport

FULLER & MORRIS
Engineering, Inc.

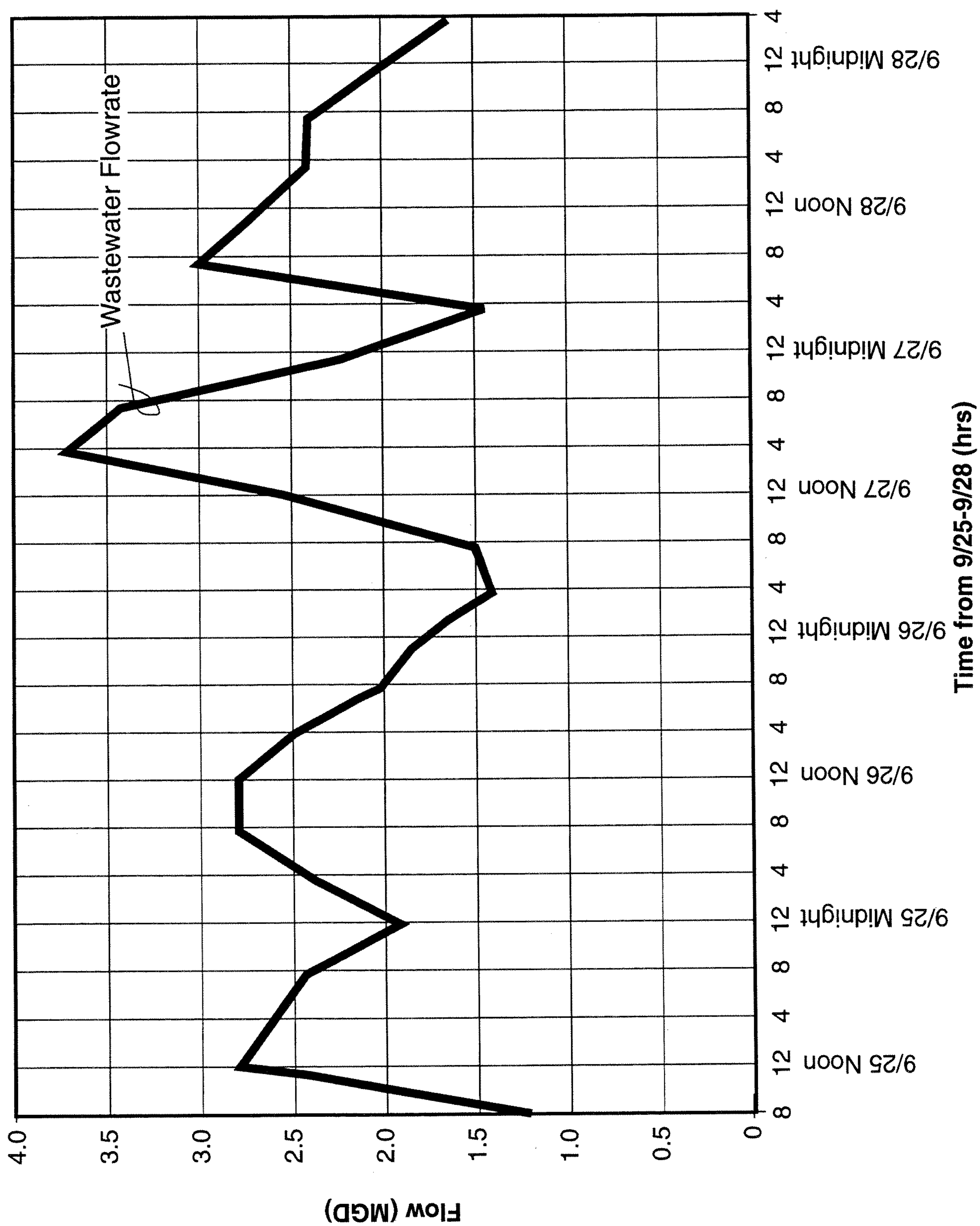

Figure 2-13
September 1995 Hourly
Flowrate Data - Newport

FULLER & MORRIS
Engineering, Inc.

To review the affect of inflow on the total wastewater flow, two time periods were examined having high rainfall occurring during summer dry periods with low-groundwater conditions. Figures 2-12 and 2-13 are plots of recorded wastewater flowrates for August 16, 17, 1995 and September 25 thru 28, 1995.

Recorded rainfall from July 1, through August 15, 1995 was only 0.5 - inches, with no rainfall occurring for the two week period leading up to August 16. One - inch of rainfall occurred on August 16, 1995. The average daily wastewater flows recorded for August 14 through August 17 were 1.72 mgd, 1.73 mgd, 1.64 mgd, and 1.61 mgd, respectively.

Recorded rainfall from September 1, 1995 through September 25, 1995 was 0.9 - inches with four - 0.1 inch days and one - 0.5 inch day. Groundwater levels should be considered to be low at this time due to the long, relatively dry - weather period. On September 26, 27, 28 and 29, recorded rainfall amounts were 1.2, 1.5, 0.8, and 0.4 - inches, respectively. Average daily wastewater flow amounts were 1.77 mgd, 1.80 mgd, 1.77 mgd and 1.61 mgd respectively. These wastewater average daily flow amounts are less than the average daily flow amount for the month of September, of 1.85 mgd.

After reviewing the two high - rainfall events that occurred during low - groundwater time periods, it appears that inflow (stormwater contributed to the sewage collection system through stormwater connections such as catch basins and rooftop gutter systems) does not significantly contribute to the total infiltration and inflow contribution to the wastewater flow collected by the sewer system. Therefore, it appears that most of the infiltration / inflow contribution to the total wastewater flow is rainfall - induced infiltration coming into the sewer system through cracks in sewer pipes and sewer pipe joints. Much of this infiltration could be contributed from the private house sewer service connection pipelines leading from the private houses to the sewer mains in the public streets and right-of-ways.

Based on the wastewater flow analysis shown above, the wet weather maximum daily flow (WWMDF) projected for the 5-year, 24-hour storm is made-up of components for domestic flow, infiltration, and inflow as shown in Table 2-6.

Prior to the February 1996 flood, overflows in the collection system were due only to occasional power outages, except for the Schooner Creek Lift Station. This station is scheduled for hydraulic capacity expansion. During the February, 1996 flood event, 24-hour rainfall totals were 4.2 - inches for February 6, exceeding the 4.0 - inches guideline criteria used by DEQ for the 5 - year, 24 - hour storm. This storm had approximately a four - day duration. Overflows were experienced at Schooner Creek, Bay Front, and Nye Beach Lift stations as well as at the treatment plant. Overflow quantity was not recorded. Numerous power surges and outages contributed to the overflow conditions.

Table 2-6

Summary of Wastewater Flow Components
(Projected for 5-year, 24-hour storm, in MGD)

Flow Year	Residential Pop./ Base Flow (ADWF)	Tourist Pop./ Base Flow (ADWF)	Infiltration Amount	1.) Inflow Amount	Total WWMDF Amount	2.) PIF Flowrate
1. Current 1995	9,300/ 1.43	3,000/ 0.46	3.29	0.82	6.00	7.50
2. Projected 2000	10,500/ 1.61	3,400/ 0.52	3.71	0.93	6.80	8.50
3. Projected 2005	11,750/ 1.81	3,750/ 0.58	4.16	1.04	7.60	9.50
4. Projected 2010	13,500/ 2.08	4,000/ 0.62	4.78	1.19	8.70	10.90
5. Projected 2015	15,000/ 2.31	4,250/ 0.65	5.31	1.33	9.60	12.10
6. Projected 2020	17,000/ 2.61	4,500/ 0.69	6.01	1.50	11.00	13.70

Note:

1. Assumes 20-percent of total I/I contribution to wastewater flow.
2. Projected as described in Chapter 3.

For the I/I cost effective analysis, compare:

1. The cost of sewer rehabilitation to eliminate a portion of I/I, plus transporting and treating the remaining I/I plus domestic sewage, to;

2. The cost of transporting and treatment of all the I/I plus domestic sewage.

<u>Cost No. 1</u>

a. Cost to eliminate approximately 25-percent of the existing infiltration and inflow through sewer rehabilitation. (0.25) (4.11) (PF of 1.25)= 1.30 mgd. Total design peak instantaneous flow rate = 12.5 mgd.

1.) Source detection - assume sewer cleaning, TV inspection, smoke testing, dye testing, review of findings, assume all collection sewers (not including individual service laterials to buildings),
210,000 LF @ \$2.50/LF = \$525,000

2.) Design I/I removal features - assume all collection sewers,
210,000 LF @ \$0.65/LF = 136,500

3.) Construct I/I removal features - assume construction is required on 25 - percent of all collection sewers,
52,500 LF @ \$25/LF (avg. cost/LF) = <u>1,312,500</u>

Subtotal, sewer rehabilitation costs \$1,974,000

b. Cost to transport and treat remaining I/I plus domestic sewage, PIF is 12.5 mgd, instead of 13.70 mgd. (Actual design PIF will be rounded-up to 15.0 mgd. See "Projection of Flows to Design year 2020", and Table 3-3 in Chapter 3).

	Cost in $ Millions
1. Nye Beach Lift Station	0.78
2. 2 - 24" Pipes at Beach Top	2.12
3. Bay Crossing - 48" Bore	3.70
4. 2 - 24" Pipes at Beach Top	2.50
5. South Beach Lift Station	1.16
6. 2 - 30" Pipes	0.95
7. South Beach WWTP	10.59
8. MSC Lift Station	0.30
9. 12" Force Main	0.36
10. 18" Sewer	0.35
11. Rehab Bay Front Lift Station	0.16
Subtotal, transporting and treatment costs	22.97
Construction Contingencies @ 15%	3.45
Engineering and Admin @ 18%	4.76
Total Capital Cost	31.18
Total O&M Cost	13.16
Total Present Worth for Project	44.34
Total Present Worth for Project Plus I/I Reduction	46.31

Cost No. 2

a. Cost to transport and treat all I/I plus domestic sewage, PIF is 15.0 mgd

(See Table 7-6)	Cost in $ Millions
Total Capital Cost	32.14
Total O&M Cost	13.90
Total Present Worth for Project	46.04

Conclusion:

The cost effective analysis shows that Cost No. 1 exceeds Cost No. 2, therefor removal of a portion of infiltration and inflow and transporting / treating the remaining I/I together with domestic sewage flow is not cost effective when compared to the cost of transporting / treating all I/I together with domestic sewage.

The City realizes that sewer rehabilitation, aimed at I/I reduction, is essential to preserve the hydraulic capacity of the conveyance and treatment facilities for domestic sewage needs, and is continuing to employ a sewer rehabilitation program that was begun in 1990 as described earlier in this Chapter and in Appendix 5.

Wastewater overflows have occurred more often in the last few years within the City's wastewater system. To minimize or prevent future overflows, the City should reevaluate their current sewer rehabilitation program and modify it as necessary to maximize I/I reduction. Sewer joint grouting to prevent groundwater infiltration, and sewer pipe replacement where the old sewers are deteriorated, will be necessary to reduce inflow and infiltration to prevent future wastewater overflows.

Chapter 3

FUTURE CONDITIONS

This chapter discusses the projected future conditions of the study area. Projected population, wastewater flows, and wastewater characteristics are presented and discussed.

The time period for wastewater facilities planning is typically 20 years, which is generally consistent with the design life of wastewater treatment facilities. For the Newport plan, the planning period extends to the year 2020, which is 20 years beyond an approximate year 2000 facilities start-up date.

A. POPULATION AND LAND USE PROJECTIONS

Population

The population projections form the basis of the projected flow and therefore the sizing for the Newport Wastewater Treatment Plant and the wastewater collection and conveyance pipelines.

Population projections used in this Facilities Plan are projections for residential population listed in the Comprehensive Plan together with current projections for tourist accommodations, (motel and recreational vehicle (RV) park expansions), developed with the City's Planning Department.

The current residential population of 9,300 is projected out at approximately 2.44 percent compounded growth rate to a residential population of 17,000 at year 2020.

Year 1990 motel room count was 1,500 and RV spaces count was 782. Fifty percent of the 1990 total is expected to be added for the year 2020 count. These tourist accommodations are expected to be added at a rapid pace in the next few years then grow at a slower pace.
Table 3-1 indicates the population projections in 5-year intervals to year 2020 for the design population for the wastewater system.

Table 3-1 Design Population Projection for the Wastewater System				
Year	1.) Comp Plan Residential Population	Motel & RV Population @ 60% Occup. & 2.2 pop/unit	Total Population	Motel & RV Population % of Total
1995	9,300	3,000	12,300	24 %
2000	10,500	3,400	13,900	24 %
2005	11,750	3,750	15,500	24%
2010	13,500	4,000	17,500	23 %
2015	15,000	4,250	19,250	22 %
2020	17,000	4,500	21,500	21 %
1.) Projected at 2.44 percent compounded growth rate.				

Figure 3-1 indicates the historical population together with projected population at 2.44 percent as indicated in the Comprehensive Plan. It should be noted that these population projections are for the residential component only and do not include figures for Motel and RV space population. Total Population in the UGB will include the residential population and the Motel, RV space population, so wastewater facilities must be sized to accommodate them.

At the time of the writing of the 1989 Facilities Plan for construction of improvements to the City's existing ocean outfall sewer, historical residential Population Figures were available for year 1985 at 8,350 residents. At that time, residential population was projected to be 9,300 at year 1990 and 13,500 at year 2010. Residential population growth has occurred slower than projected in the 1989 Facilities Plan.

As noted earlier in Chapter 2, the City's residential population has grown at about a 2.22 percent compounded growth rate over the past 20 years, characterized by periods of sharp increase and some years of slight decline. The City's Planning Department has projected the residential population to grow at about 2.44 percent to 17,000 at year 2020 based on population growth expected to occur due inpart to the recent increases in the construction of retirement residences and tourist accommodations.

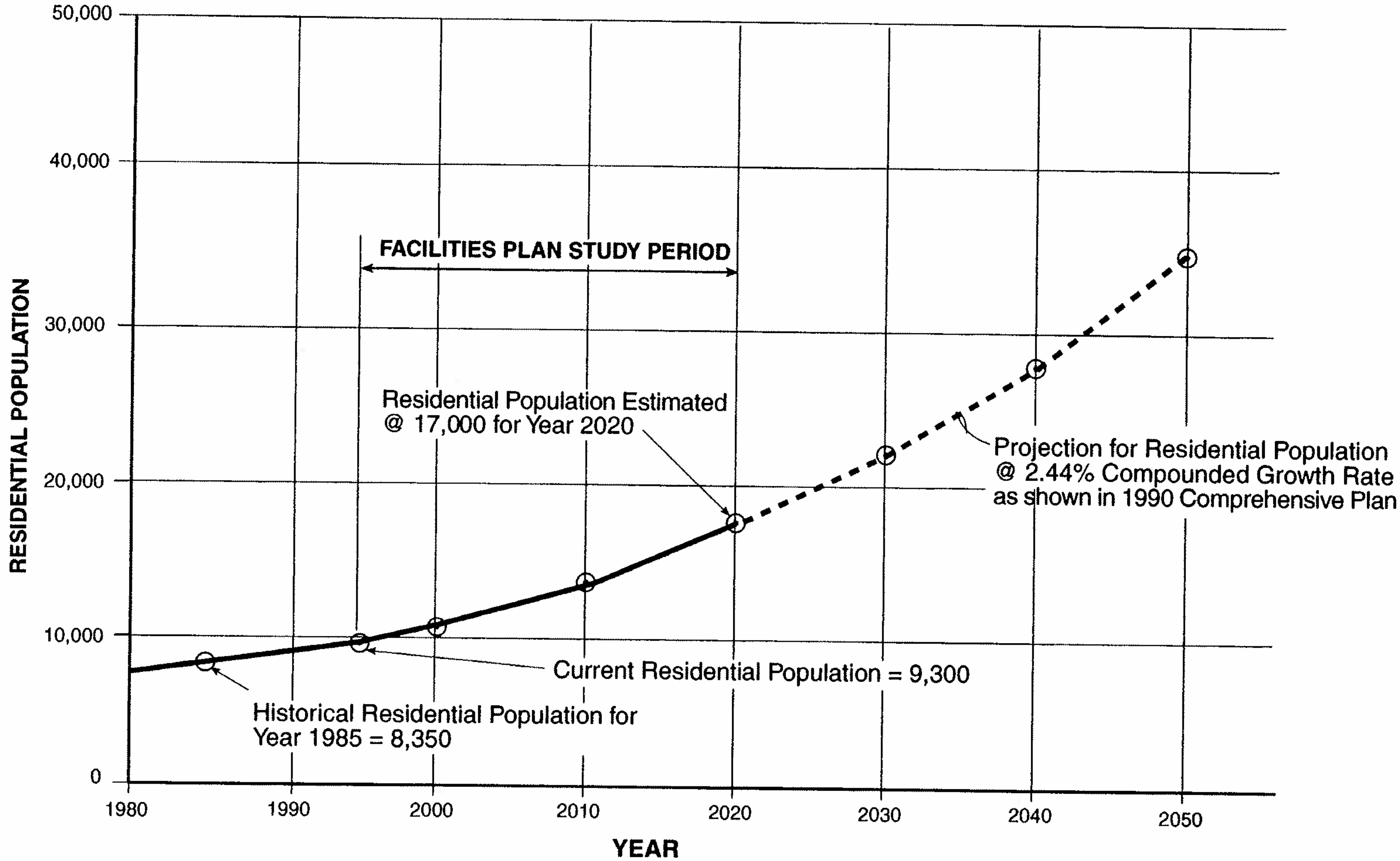

Figure 3-1

Historical and Projected Population for City of Newport, Year 1980 through 2020

Newport Wastewater
Facilities Plan 1995 Update

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Land Use

Land use within the UGB of Newport is controlled by the City's comprehensive Plan. As stated in the Comprehensive Plan, the purpose of the Plan is to guide the development of land within the city limits and coordinate with Lincoln County the development of those lands outside the city limits but within the UGB.

The current UGB together with the expected expansions to year 2020 (Figure 2-1) contains 6,100 acres of land and represents the likely limits of the UGB for the year 2020. Residential, commercial, and industrial land is available within the UGB for future development. The City does not anticipate any significant changes in land use percentages compared to current percentages. Therefore, for future projections, residential, commercial, industrial and infiltration/inflow (I/I) growth is assumed to increase proportionally with residential population growth. With future growth, land will continue to be developed within the UGB in accordance with zoning requirements. The City will expand the wastewater collection system as necessary to serve the additional growth.

B. FUTURE WASTEWATER FLOWS AND CHARACTERISTICS

Two sets of future wastewater flows were determined in this study. The first is for the design of the proposed wastewater treatment plant at South Beach, and the second is for the design of the proposed wastewater collection and conveyance system.

The first set of flows is based on the historical flows at the City's existing North Side WWTP, is extrapolated to projected flows that would occur during a 5-year probability of recurrence, and directly proportioned for the projected residential population of 17,000 for year 2020. The second set of flows is based on population density per acre for the various zoning districts within the UGB, specific per capita flows for the projected population, peaking factors, and allowances for infiltration and inflow (I/I). These calculations are necessary to best estimate where in the UGB the wastewater flows will be generated by the population so the collection sewers, lift stations, and conveyance pipelines can be sized appropriately. Both sets of flows result in the same design flows for the residential population projected for the design year of 2020.

Wastewater Treatment Plant Flows and Loads

Historical Data

Wastewater flow and load data for the period of record (POR), May 1994 through April 1995 were used to determine the historical flow and load variations at the City's existing North Side WWTP. Table 2-3 presented a summary of the historical data and is shown again for convenience in Table 3-2. Based on these data, the dry weather maximum month average daily flow (DWMMADF) was 2.03 mgd. The wet weather maximum month average daily flow (WWMMADF) was 2.85 mgd, and the wet weather maximum day flow (WWMDF) was 4.44 mgd. The dry weather maximum month average daily loading for biochemical oxygen demand (BOD) was 4,213 pounds per day, and the dry weather maximum month average daily loading for total suspended solids (TSS) was 3,560 pounds per day.

Projection of Existing Flows to a 5-year Probability of Recurrence

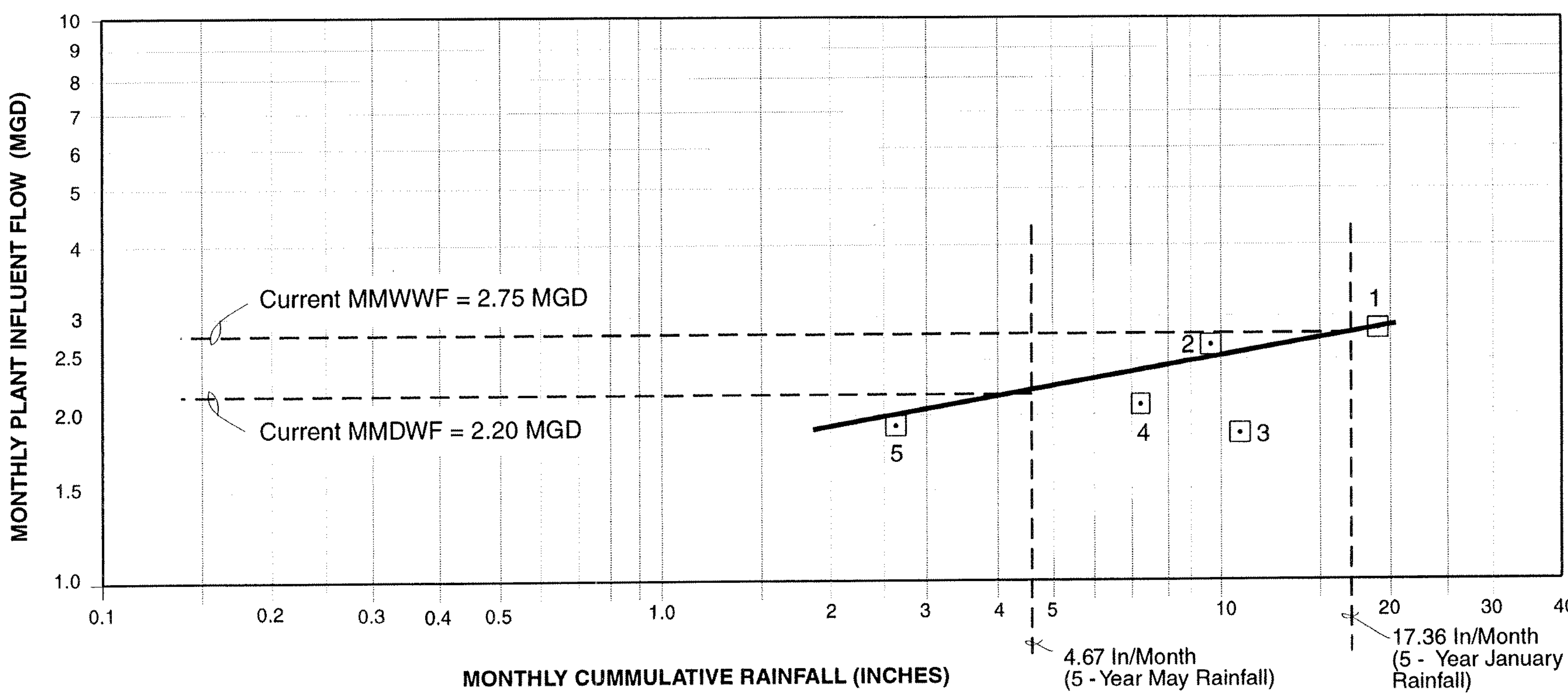
DEQ recommends sizing new wastewater treatment facilities using a 5-year probability of recurrence. In other words flow values should be used that have only a 20-percent probability of being exceeded. DEQ considers one exceedence in 5-years to be an acceptable risk. The historical flow data were projected using the following approach and are summarized in Table 3-2.

1. Using DEQ guidelines for comparing historical flows to the projected flows that would occur during 5-year cumulative rainfall amounts for the months of May and January, current DWMMADF and WWMMADF were determined. These are shown on Figure 3-2. The January, 1995 cumulative rainfall amounted to 19.0 inches. The 5-year cumulative rainfall amount for Newport is 17.36 inches using U.S. weather Bureau Climatalogical Summary No. 20 shown on Figure 2-3. The January, 1995 rainfall exceeded the statistical 5-year cumulative rainfall and is the reason the WWMMADF is adjusted to 2.75 mgd in Table 3-2.

2. Using DEQ guidelines for comparing historically high flow days occurring during significant rainfall events and projecting those flows out to a 5-year 24-hour storm of 4.0 inches, as shown on Figure 2-4, the current WWMDF was plotted at 6.0 mgd. This is shown on Figure 3-3.

3. Current peak instantaneous flow (PIF) for the existing WWTP was estimated using three separate significant rainfall events comparing the PIF that was recorded on the daily flow chart to the average daily flow (ADF) for that day. A peaking factor (PF) was obtained for each of the three events and multiplied by the current WWMDF of 6.0 mgd. The three events and resulting adjusted PIF are shown below.

    a.) WWMDF of 1994 - Monday, Dec. 26, 1994 - Rainfall = 2.3 inches. PIF 5.55/ADF 4.44 = 1.25 PF (6.0 mgd) = 7.50 mgd current adjusted PIF



Jan-May (1995)	Rainfall (Inches)	Flow (MGD)
1. Jan	19.0	2.85
2. Feb	9.5	2.52
3. Mar	10.2	1.88
4. Apr	7.1	2.11
5. May	2.1	1.93

Figure 3-2
Newport Northside WWTP Influent vs. Rainfall

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Date (1994)	Rainfall (In/Day)	Flow (MGD)
1-2	1.8	3.79
1-22	1.3	2.55
2-22	0.8	3.21
2-23	1.7	3.22
2-24	0.7	4.29
3-2	0.7	2.99
3-17	0.7	2.24
4-5	0.8	2.47
4-7	0.8	2.56
11-8	2.1	2.44
11-30	2.4	3.05
12-19	2.3	3.00
12-26	2.3	4.44
1-13-95	1.4	3.79
1-30-95	2.0	3.22

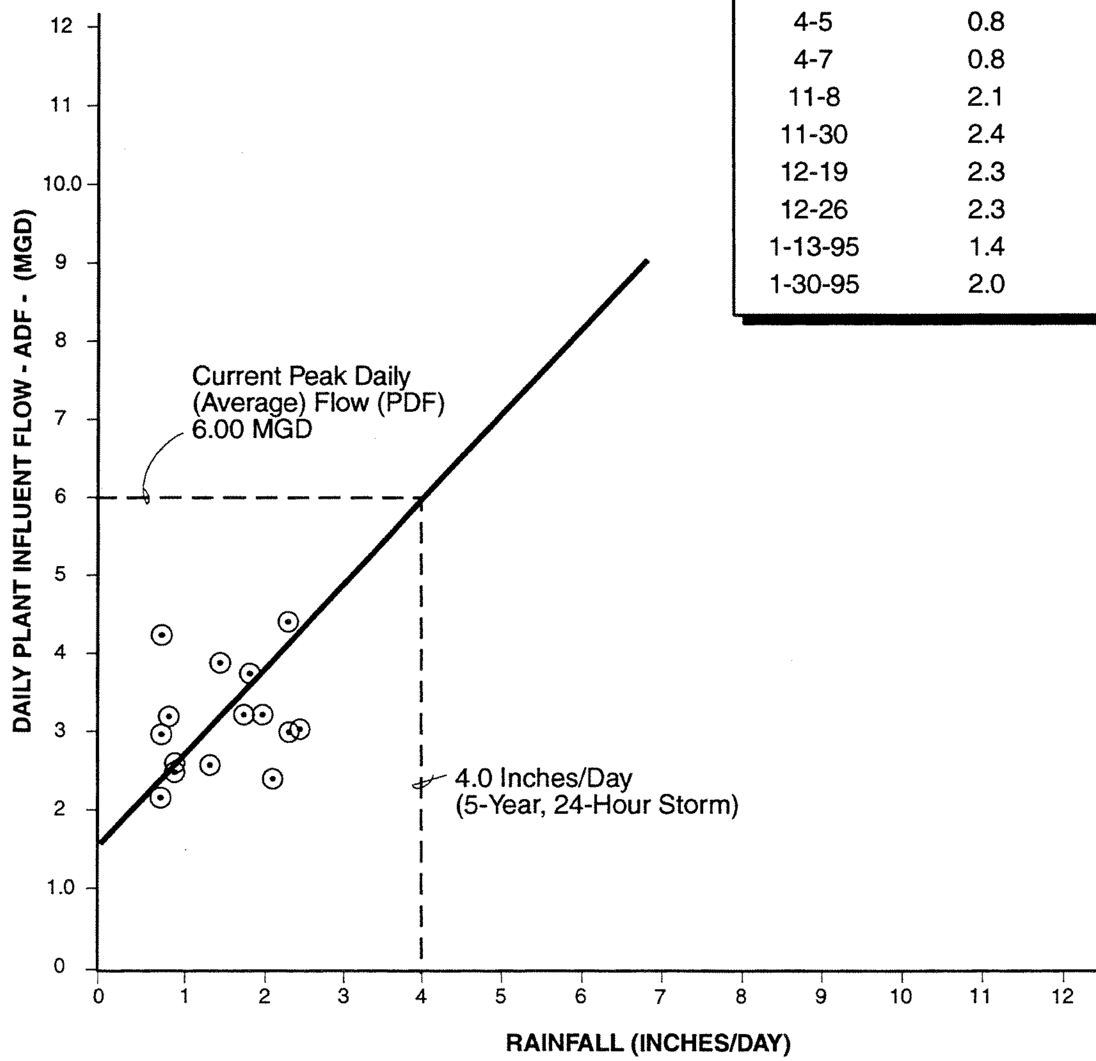

Figure 3-3

Newport Northside WWTP
Peak Daily Influent vs. Rainfall

b.) WWMDF of 1993 - Tuesday, March 23, 1993 - PIF 5.80/ADF 4.60 = 1.26 PF (6.0 mgd) = 7.56 mgd current adjusted PIF

c.) Second highest flow day in 1994 - Thursday, Feb. 24, 1994 - Rainfall = 0.7 inches. PIF 6.10/ADF 4.29 = 1.42 PF (6.0 mgd) = 8.52 mgd. current adjusted PIF

A review of the events indicates that as the ADF increases, the PF for the day decreases. Therefore, the current PIF was estimated at 7.5 mgd for the WWMDF at a 5-year recurrence interval.

4. The total flow received at the existing WWTP was divided by the existing residential population to obtain the per capita flow rates.

The average dry weather per capita flow rate was calculated for the POR at 203 gallons per capita per day (gpcpd). The annual average per capita flow rate was calculated to be 229 gpcpd. While these numbers appear higher than commonly found in municipal wastewater systems, the high numbers are caused largely by the tourist population occupying Newport's 1500 rental motel rooms and 800 rental RV spaces. This tourist population is estimated at 3,000 to 5,000 people depending on the occupancy rate at a given time.

Table 3-2 Existing Wastewater Treatment Influent Flows And Loads Newport North Side WWTP			
Parameter	Flow (mgd)	BOD (lb/day)	TSS (lb/day)
May 94[1.)]	1.80	3,906	2,522
Jun 94	1.87	4,213	3,464
Jul 94	2.03	4,120	3,560
Aug 94	1.96	3,723	3,008
Sep 94	1.75	3,010	2,572
Oct 94	1.92	3,177	2,662
Nov 94	2.01	2,064	1,720
Dec 94	2.76	2,247	1,794
Jan 95	2.85	2,152	2,348
Feb 95	2.52	1,903	2,420
Mar 95	1.89	1,846	2,307
Apr 95	2.11	3,044	3,348
Annual Average Daily Flow/Load	2.13	2,951	2,644
Average Dry Weather Flow/Load	1.89	3,692	2,965
Average Wet Weather Flow/Load	2.37	2,209	2,323
DWMMAD Flow/Load	2.20[2.)]	4,213	3,560
WWMMAD Flow/Load	2.75[3.)]	3,044	3,348
Dry Weather Maximum Daily Flow	2.37[1.)]	-	-
Wet Weather Maximum Daily Flow	6.00[4.)]	-	-
Peak Instantaneous Flow	7.50[5.)]	-	-
Residential Population	9,300	9,300	9,300
Annual Avg. Daily Flow/Load Per Capita	229 gpd	0.32	0.28
Max. Mo. Avg. Daily Flow/Load Per Capita	296 gpd	0.45	0.38

Notes:

1. Period of Record May 94 through Apr 95 - all data taken from WWTP Monitoring Reports
2. Plotted using DEQ guidelines and May 5-year cumulative rainfall of 4.67 inches
3. Plotted using DEQ guidelines and January 5-year cumulative rainfall of 17.36 inches.
4. Plotted using DEQ guidelines and 5-year 24-hour storm of 4.0 inches
5. Calculated using highest recorded ADF in POR, Dec. 26, 1994 (WWMDF) of 4.44 mgd and a peak instantaneous flow on that day of 5.55 mgd for peaking factor of 1.25 multiplied by 6.0 WWMDF

Projection of Flows to Design Year 2020

To determine the design flowrates for the new WWTP for the design year of 2020, the following approach was used and is summarized in Table 3-3.

1. The WWTP will be designed based on the WWMMADF of 5.0 mgd.

2. The City should be encouraged to continue with their existing wastewater collection system rehabilitation aimed at I/I reduction.

3. Since the City does not anticipate any significant changes in land use percentages compared to current percentages, the various components of the total wastewater flow to the WWTP consisting of residential, commercial, industrial, and I/I components is assumed to increase proportionally with residential population growth.

4. The current per capita flowrates were multiplied by the projected design year 2020 residential population of 17,000 to accommodate for the tourist population at the same percentage as the current tourist population percentage of the residential population.

5. A Statistical Probability Plot of the wastewater flow projections for the new WWTP is shown on Figure 3-4 along with a plot of the current year 1995 wastewater flows. This plot can be used as a check of the wastewater flow projections listed in Table 3-3. It should be noted that the proportional projection of the peak instantaneous flow is 13.71 mgd, but the hydraulic design PIF will be rounded up to 15.0 mgd. The proportional projection for the AADF and the WWMMADF are 3.89 mgd and 5.03 mgd respectively. Design flows for AADF and WWMMADF are rounded to 4.0 mgd and 5.0 mgd respectively.

The new WWTP will be designed for a hydraulic flow of 15.0 mgd to accommodate the PIF and for an organic loading of 7,700 lb/day of BOD and 6,500 lb/day of TSS. The Orbal oxidation ditch process is not expected to be adversely affected by a short-term PIF of up to 15.0 mgd.

Projection of Loads to Design Year 2020

To determine the design loadings for BOD and TSS for the new WWTP for the design year of 2020, the following approach was used and is also summarized in Table 3-3.

1. The WWTP will be designed based on the maximum month loads for BOD and TSS.

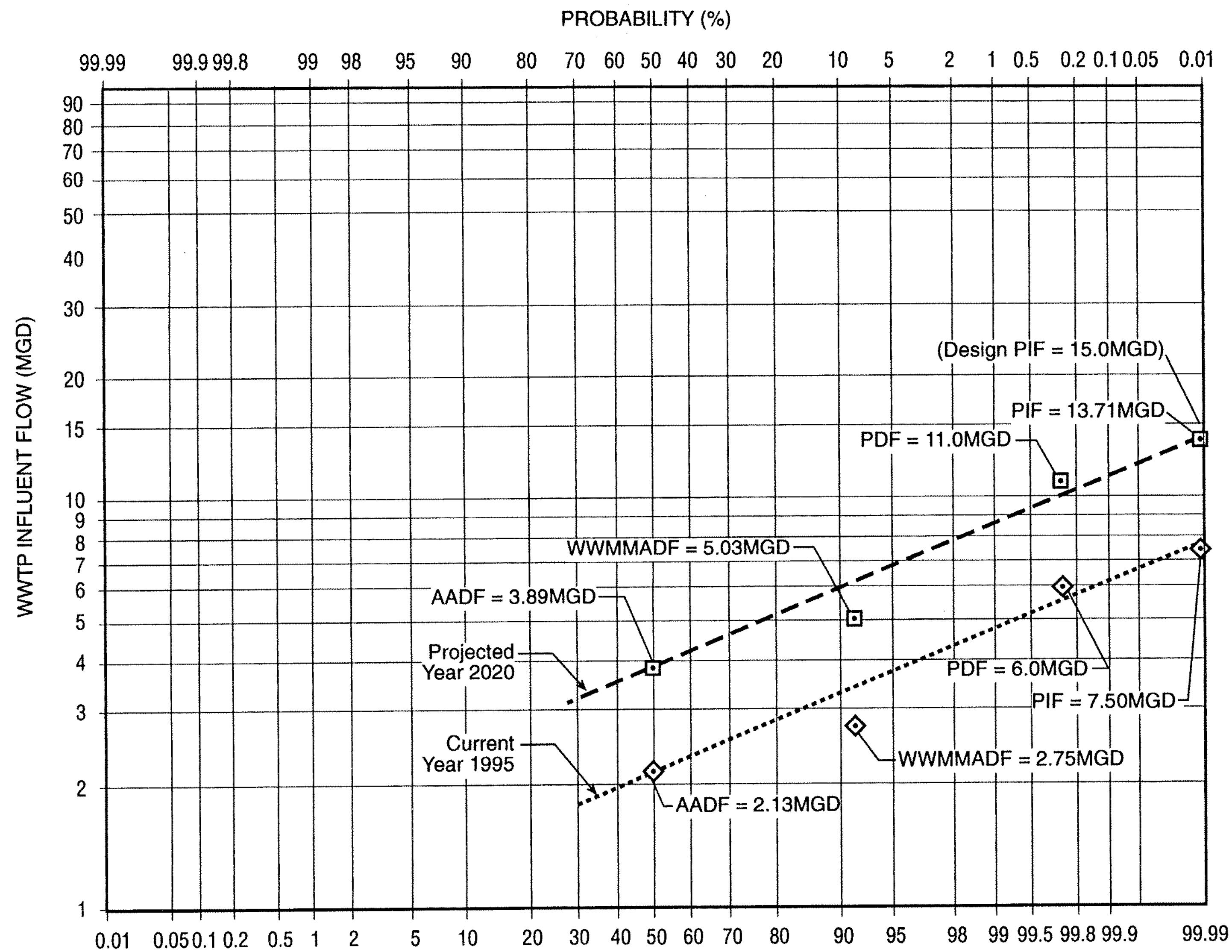

Figure 3-4

Newport Current & Design Years Flows Probability Plot

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Facilities Plan 1995 Update

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2. The current per capita load rates were multiplied by the projected design year 2020 residential population of 17,000 to accommodate for the tourist population at the same percentage as the current tourist population percentage of the residential population.

Table 3-3
Design Wastewater Treatment influent Flows and Loads - year 2020
Newport's South Beach WWTP

Parameter	Flow (mgd)	BOD (lb/day)	TSS (lb/day)
Annual Average Daily Flow/Load	4.00	5,400	4,850
Average Dry Weather Flow/Load	3.50	6,750	5,450
Average Wet Weather Flow/Load	4.35	4,050	4,250
DWMMAD Flow/Load	4.00	7,700	6,500
WWMMAD Flow/Load	5.00	5,600	6,120
Dry Weather Maximum Daily Flow	4.35	-	-
Wet Weather Maximum Daily Flow	11.00	-	-
Peak Instantaneous Flow	15.00	-	-
Residential Population	17,000	17,000	17,000
Annual Avg. Daily Flow/Load Per Capita	229 gpd	0.32	0.28
Max. Mo. Avg. Daily Flow/Load Per Capita	296 gpd	0.45	0.38

Wastewater Collection and Conveyance System Flows

The method used to calculate design flows for the wastewater collection and conveyance system is the same as was used in the 1988 Wastewater System Master Plan. The following approach and assumptions were used to calculate the total wastewater peak flow for each collection system drainage basin and for collection points along conveyance pipelines, and at wastewater lift stations. The wastewater peak flowrates are shown on the Wastewater System Master Plan Map No. WW-1.

1. Population Densities used for the various zoning districts within the UGB were.

Zoning	Population Density Per Gross Acre of Land
• Low density residential (single-family residential and duplexs)	9
• Planned Destination Resort (single-family residential)	6.5
• High density residential (mobile homes and apartments)	18
• Commercial / Industrial	42
• Public Buildings	8
• Public Recreation	4
• Public Open Space	0

2. All gravity trunk sewers are sized to carry the total peak flowrate of wastewater forecasted for the projected population stated herein for the year 2020, when flowing full. Supplemental sewers are shown for the major transmission wastewater system for flowrates projected for year 2050.

3. The total peak flowrate of wastewater consists of the following:

   a. Average daily base flow from residential population (residential population x 229 gpcpd)

   b. Average daily base flow from other zoning population equivalent (population equivalent from other zoning x 50 gpcpd) (This allows for domestic sewage contributed by people and equipment working in and being served in industrial and commercial businesses within the drainage basin.)

   c. A peaking factor multiplied times the sum of the above two figures to give peak domestic flowrate. Peaking Factors are decreasing values as population increases, as shown on Figure 3-5.

   d. An infiltration/inflow allowance, which is added to the peak domestic flowrate mentioned above. For sewers constructed before 1980, (Drainage Basins N1, N2, and N3) an allowance of 700 gallons per acre per day (gpapd) is used.
   For sewers constructed after 1980, (the remaining drainage basins) an allowance of 500 gpapd is used. (Wastewater flows recorded at Newport's major pump stations and the WWTP in 1988 for ADWF and AWWF indicate that average I/I ranged from 250 gpapd to 400 gpapd.

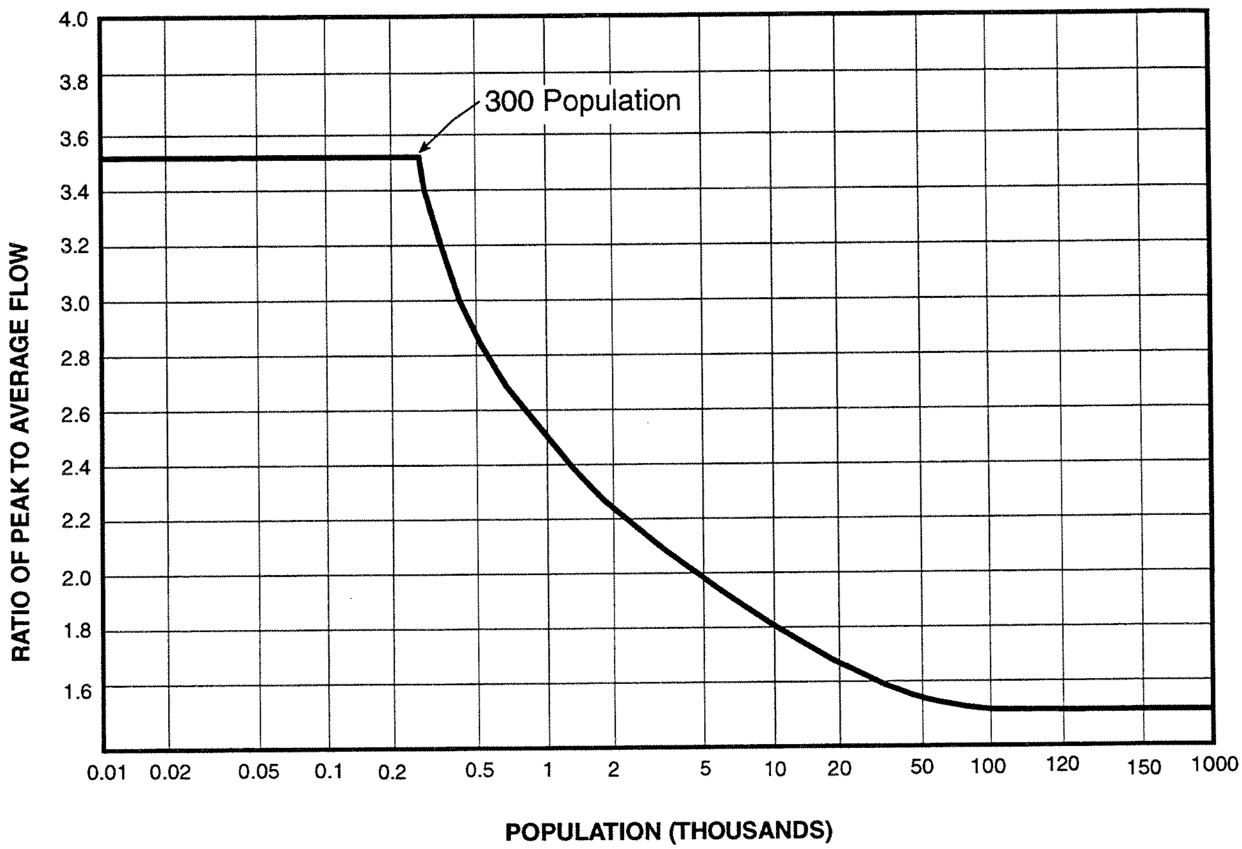

Figure 3-5
Ratio of Peak Flow to Average Daily Flow

Newport Wastewater
Facilities Plan 1995 Update

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4. All gravity trunk sewers are sized assuming a minimum slope will be available to provide a velocity of not less than 2 feet per second (fps) when flowing half-full or full. An "n" coefficient of 0.013 is used and pipe sizes are selected from "Manning's Formula" flow diagram. In some cases, smaller pipe sizes than those shown on Map WW1 could provide adequate capacity due to steepness of slope actually available in final design sewer locations.

5. All existing lift station sizes have been shown based on the available pumping capacity with the largest existing pump out of service. For instance, if the Nye Beach lift station contains two pumps, each rated at 1,200 gallons per minute (gpm), then the capacity of the station is 1,200 gpm, to allow for equal standby pumping capacity.

6. Proposed lift stations are sized to carry the peak domestic flowrate plus an allowance for infiltration, or in other words, the total peak flowrate of wastewater projected to be tributary to them.

7. All expanded and proposed lift stations are sized for the population projected herein for the year 2020 unless otherwise noted.

8. All expanded and proposed force mains are sized to carry the total peak flowrate of wastewater pumped into them by the contributing lift station at a velocity of not greater than 5 feet per second (fps).

Chapter 4

REGULATORY STANDARDS AND DESIGN CRITERIA

This chapter summarizes current and proposed regulations, and establishes the design criteria used to develop the treatment and disposal alternatives for the City of Newport wastewater treatment system. The criteria listed include the Mid Coast Basin standards and Pacific Ocean discharge criteria, reuse criteria for land application of effluent and biosolids, and EPA criteria for reliability and redundancy.

A. MID COAST BASIN WATER QUALITY STANDARDS

The standards for river basins in the State of Oregon are established by the DEQ through OAR 340-41-245. These rules are reviewed on a yearly basis for setting new or modifying existing standards. The following presents a discussion of State water quality standards outside of a defined mixing zone, for specific areas of the Mid Coast Basin.

Water Quality Parameters/Standards

Dissolved Oxygen (DO)

According to OAR Chapter 340, Division 41, DO concentrations are not to be less than saturation concentrations for marine waters.

Temperature

Marine and estuarine waters: No significant increase above natural background temperatures shall be allowed, and water temperatures shall not be altered to a degree which creates or can reasonably be expected to create an adverse effect on fish ore other aquatic life.

Turbidity

No more than a 10 percent cumulative increase in natural stream turbidities are to be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction, or other legitimate activities that cause the standard to be exceeded, may be authorized by DEQ provided all practicable turbidity control techniques have been applied.

pH

pH values for marine waters are not to fall outside the range 7.0 to 8.5.

Bacteria

Bacteria of the *coliform group* associated with fecal sources and bacteria of the *enterococci group* shall not exceed the criteria values described below. However, the DEQ can designate site-specific bacteria criteria on a case-by-case basis to protect beneficial uses. Site-specific values shall be described in and included as part of a water quality management plan.

- Estuarine waters other than shellfish growing waters: A log mean of 200 fecal coliform per 100 milliliters based on a minimum of five samples in a 30-day period with no more than ten percent of the samples in the 30-day period exceeding 400 per ml.

- Bacterial pollution or other conditions deleterious to waters used for domestic purposes, livestock watering, irrigation, bathing, or shellfish propagation, or otherwise injurious to public health shall not be allowed.

Toxic Substances

Toxic substances are not to be introduced above natural background levels in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bio-accumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare; aquatic life; wildlife; or other designated beneficial uses.

Mixing Zone

A mixing zone is a designated portion of a receiving water that serves as a zone of dilution where wastewaters and receiving waters mix thoroughly. The DEQ may suspend all or part of the water quality standards, or set less restrictive standards, in the defined mixing zone under the following conditions:

1. The water within the mixing zone shall be free of:

- Materials in concentrations that will cause acute toxicity to aquatic life (bioassay testing required and approved by DEQ). Acute toxicity is lethality to aquatic life as measured by significant difference in lethal concentration between the control and 100 percent effluent in an acute bioassay test. Lethality in 100 percent effluent may be allowed due to ammonia and chlorine only when it is demonstrated on a case-by-case basis that immediate dilution of the effluent within the mixing zone reduces toxicity below lethal concentrations.

- Materials that will settle to form objectionable deposits.

- Floating debris, oil, scum, or other materials that cause nuisance conditions.

- Substances in concentrations that produce deleterious amounts of fungal or bacterial growths.

2. The water outside the boundary of the mixing zone shall:

- Be free of materials in concentrations that will cause chronic (sublethal) toxicity. Chronic toxicity is measured as the concentration that causes long-term sublethal effects, such as significantly impaired growth or reproduction in aquatic organisms, during a testing period based on test species life cycle.

- Meet all other water quality standards under normal annual low flow conditions.

Marine Discharge Criteria

The requirements for effluent discharge from the Newport wastewater treatment plant to the Pacific Ocean are defined in the current NPDES Waste Discharge Permit, that expires in 1998, are shown in Table 4-1. However, the permit is intended to be opened for review and modification during the course of the plant expansion or construction of a new wastewater treatment plant..

Table 4-1 City of Newport WWTP Discharge Criteria and Mass Load Limits for Pacific Ocean					
Parameters	**Average Effluent Concentrations***		**Mass Load Limitations**		
	Monthly mg/L	**Weekly mg/L**	**Monthly Average lb/day**	**Weekly Maximum lb/day**	**Daily Maximum lb/day**
BOD5	30	45	800	1200	1600
TSS	30	45	800	1200	1600
FC/100 ml	200	400	-	-	-

Other Parameters:

pH	Shall be within the range 6.0-9.0.
CBOD5, BOD5, TSS	Shall not be less than removal efficiency 85% monthly average.
Total Residual Chlorine	Shall not exceed daily maximum of 0.10 mg/l, monthly average of 0.04 mg/l.
Mixing Zone	Shall not extend beyond 250 feet radius around the point of discharge.

* Average effluent concentrations based on the following (projected) flows:
Average Dry weather flow = 3.2 mgd

Wastewater Effluent Reuse Criteria

An alternative to direct river discharge of treated effluent during dry weather is to apply treated effluent to meet irrigation demands at agricultural lands, golf courses, and parks. Effluent can also be reused as reclaimed water for specific nonagricultural industrial uses such as cooling water. The standards for effluent reuse in Oregon are established by the DEQ through OAR Chapter 340 Division 55 (340-55).

Treatment and Monitoring Requirements for Effluent Reuse

Through OAR 340-55, DEQ has established treatment and monitoring requirements for potential agricultural and nonagricultural uses of the treated effluent. DEQ has classified reclaimed water into four categories and assigned a minimum degree of treatment required:

- Level I: Less than biological treatment or biological treatment without disinfection.
- Level II: Biological treatment plus disinfection.
- Level III: Biological treatment plus disinfection (stricter coliform limit).

- Level IV: Biological treatment, clarification, coagulation, and filtration treatment plus disinfection.

Limits for total coliform (organisms/100 ml) and turbidity (NTU) have been established for the four categories. These standards serve as a general guideline for defining the anticipated water quality required for the various uses. In addition to the water quality limits, DEQ has provided standards for the minimum monitoring required for total coliform and turbidity based on the four categories. Table 4-2 summarizes the treatment and monitoring requirements for the four reuse categories. DEQ may include additional permit effluent limitations and/or other permit conditions other than those shown in Table 4-2 if they have reason to believe that the reclaimed water may contain physical or chemical contaminants that would impose potential hazards to the public or environment.

Table 4-2
Treatment and Monitoring Requirements for Agricultural Use of Reclaimed Water*

	Reuse Category Level Minimum Degree of Treatment Required			
	1	2	3	4
	Less than biological treatment or biological treatment without disinfection	Biological treatment plus disinfection	Biological treatment plus disinfection	Biological, clarification, coagulation, and filtration treatment plus disinfection
Reclaimed Water Quality				
Total coliform (#/100 ml)				
7-day median	No limit	23	2.2	2.2
Two consecutive samples	No limit	240	No limit	No limit
Maximum	No limit	No limit	23	23
Turbidity (NTU)				
24-hour mean	No limit	No limit	No limit	2
5% of the time during any 24-hour period	No limit	No limit	No limit	5
Minimum Monitoring Requirements				
Total coliform	Not required	One sample/week	Three samples/ week	Daily
Turbidity	Not required	Not required	Not required	Hourly or continuous

* From OAR Chapter 340, Division 55.

General Requirements

A number of general requirements have been outlined in DEQ's Chapter 340 Division 55 rule. These requirements address agricultural and nonagricultural uses that are acceptable based on the effluent water quality level, irrigation system, public access requirements, and buffer zones for irrigation. Table 4-3 summarizes these general requirements based on the different levels of reclaimed water quality.

Table 4-3 Agricultural Use Allowed With Different Levels of Reclaimed Water Quality ** Page 1 of 2				
Reuse Category Level Minimum Degree of Treatment Required				
	1	2	3	4
	Less than biological treatment or biological treatment without disinfection	Biological treatment plus disinfection	Biological treatment plus disinfection	Biological, clarification, coagulation, and filtration treatment plus disinfection
Nonagricultural Uses - Irrigation Method Allowed				
Parks, playgrounds, schoolyards, golf courses with contiguous residences	*	*	*	Surface or spray[a,b]
Golf courses without contiguous residences	*	Surface or spray[a,b]	Suface or spray[a,b]	
Cemeteries, highway medians, landscapes without frequent public access	*	Suface or spray[a,b]	Surface or spray[a,b]	Surface or spray[a,b]
Unrestricted impoundments	*	*	*	Surface or spray[a,d]

Table 4-3 Agricultural Use Allowed With Different Levels of Reclaimed Water Quality ** Page 2 of 2				
Reuse Category Level Minimum Degree of Treatment Required				
	1	2	3	4
	Less than biological treatment or biological treatment without disinfection	Biological treatment plus disinfection	Biological treatment plus disinfection	Biological, clarification, coagulation, and filtration treatment plus disinfection
Restricted Impoundments	*	*	Surface or spray[ade]	Surface or spray[ed]
Landscape Impoundments	*	Surface or spray[ade]	Surface or spray[ade]	Surface or spray[ed]
Other Requirements				
Public access	"Prevented" (fences, gates, locks)	"Controlled" (signs, rural or nonpublic lands)	"Controlled" (signs, rural or nonpublic lands)	No direct public contract during irrigation cycle
Buffers for Irrigation	Surface: 10 ft Spray: Sitespecific	Surface: 10 ft Sprays 70 ft	Surface: 10 ft Spray: 10 ft	None Required

* = Not allowed.
** = From OAR Chapter 340, Division 55.
[a]Signs shall be posted around the perimeter and other locations indicating that reclaimed water is used and is not safe for drinking, and in the case of effluent quality Levels II and III, for body contact.
[b]Reclaimed water shall be applied in a manner so that it is not sprayed onto areas where food is prepared or served or onto drinking fountains.
[c]Reclaimed water shall be applied in a manner so that it is not sprayed within 100 feet from areas where food is prepared or served or where drinking fountains are located.
[d]There shall be no disposal of reclaimed waters into surface or groundwaters without authorization by an NPDES or WPCF permit.
[e]Aerators or decorative fixtures that may generate aerosols shall not be used unless approved in writing by the DEQ.

Nonagricultural Uses

Nonagricultural uses cover irrigation at parks, playgrounds, golf courses, cemeteries, highway medians, and other landscape irrigation.

Level IV effluent is the least restrictive with respect to the types of uses for which the treated effluent can be beneficially reused and is the most costly to produce.

DEQ provides guidelines on public access and buffer zones for irrigation systems depending on the effluent water quality level beneficially reused. As illustrated in Table 4-5, public access requirements for the different effluent levels range from "prevented" (fences, gates, locks) to no direct public contact during the irrigation cycle. The current level of effluent from the City of Newport WWTP approaches Level II. The disinfection limit is the only criteria the plant is not currently required to meet, although the plant is capable of meeting the Level II standard. Under a Level II effluent quality reuse program, public access must be "controlled." This means that this effluent can only be used for irrigation on rural or nonpublic lands with limited potential for direct public contact. The site used would also require signs indicating the use of reclaimed water in the irrigation system. This level of public access control would be similar for Level III effluent quality; however, it would be reduced to no restrictions except prevention of direct public contact during the irrigation cycle under a reuse program using Level IV effluent quality.

Buffer zones for surface and spray irrigation systems are intended to protect public health and the environment. As with the public access requirements, the buffer zones are least restrictive for Level IV effluent quality. Assuming the City of Newport WWTP achieves Level II effluent quality, the buffer zones for surface (flooding and overland flow) and spray irrigation systems would be 10 and 70 feet, respectively. DEQ may reduce the buffer distances, as identified in Table 4-5, if it determines that alternative controls would adequately protect public health and the environment.

To achieve Level IV, additional treatment such as coagulation, filtration, and more stringent disinfection and turbidity effluent levels would be required.

B. BIOSOLIDS MANAGEMENT CRITERIA

Both federal and state regulations apply to land application of biosolids from WWTPs. Federal regulations include 40 CFR 257 and newly approved Part 503 regulations. The Oregon regulations include the DEQ Oregon Administrative Rules Chapter 340, Division 50. The State of Oregon also publishes guidance documents for interpreting and following the regulations. These materials include "Guidelines for Land Application of Wastewater and Sludge, May 18, 1981," and a "Sludge/Septage Management Plan Submittal Checklist."

For disposal of sludge as interim cover or as fill at a solid waste landfill, federal regulations 40 CFR Part 258 apply. If the sludge is incorporated in the final cover for the landfill, the 503 regulations would still apply.

State regulations take precedence over federal regulations, where applicable. In some instances, state regulations may impose more stringent requirements than federal regulations. However, federal regulations apply if no state regulations are declared.

Regulations

Current federal regulations for land treatment of biosolids are listed in the Federal Register under 40 CFR 257, "Criteria for Classification of Solid Waste Disposal Facilities and Practices," dated September 13, 1979. In the past, Part 257.3-5 has regulated solid waste application to food chain crops; however, these regulations have been considered too general. Therefore, new regulations under 40 CFR Part 503 were required by Section 405 (d) of the Clean Water Act of 1977 (as amended by the Water Quality Act of 1987).

The new regulations under 40 CFR Part 503 have gone through several scientific community and public reviews and were released as final in late 1992.

State regulations for biosolids were defined in December 1984. At that time, DEQ defined rules for the land application and disposal of sewage treatment plant biosolids and biosolids-derived products, including septage (Oregon Administrative Rules Chapter 340, Division 50). These regulations presently remain current for the State of Oregon although the State may update the rules to conform to recently adopted federal regulations.

Biosolids Quality

According to current state and new federal regulations (503), biosolids samples should be analyzed for the parameters listed in Table 4-4.

The nitrogen, phosphorus, and potassium content of the sludge are important when applying biosolids at agronomic rates. Nitrogen content can vary significantly in the biosolids depending on its source, age, and history. The concentration levels of these nutrients should be determined from samples taken immediately prior to biosolids application because stored biosolids can lose nitrogen rapidly. Therefore, it is important that the real nitrogen content of the biosolids is known to avoid under- or over-application. The assumptions used to determine the available nitrogen in the biosolids were:

- 30 percent of the organic nitrogen will be available
- 50 percent of the ammonia nitrogen will be available
- 100 percent of the nitrate-nitrite nitrogen will be available

Table 4-4
Sampling Requirements for the EPA 503 Sludge Regulations[a]

Parameter	Units	Parameter	Units
Arsenic	mg/kg dry weight	Zinc	mg/kg dry weight
Beryllium	mg/kg dry weight	Total Nitrogen	% dry weight
Cadmium	mg/kg dry weight	Nitrate nitrogen	% dry weight
Chromium	mg/kg dry weight	Ammonia nitrogen	% dry weight
Copper	mg/kg dry weight	Phosphorus	% dry weight
Lead	mg/kg dry weight	Potassium	% dry weight
Mercury	mg/kg dry weight	pH	standard units
Molybdenum	mg/kg dry weight	Total solids	%
Nickel	mg/kg dry weight	Volatile solids	%
Selenium	mg/kg dry weight	PCBs[b]	ug/kg

[a]From 40 CFR, Part 503.
[b]PCBs include PCB-1016,-1221,-1232,-1242,-1248,-1254, and -1260.

Under the new federal regulations Part 503, ceiling concentrations, cumulative pollutant loading rates, alternate pollutant limits or "clean biosolids," and annual pollutant loading rate have been established for heavy metals. Table 4-5 shows the federal regulations acceptable levels for land application. These regulations are somewhat different from the state regulations. Table 4-6 shows the acceptable levels of metals in biosolids for land application based on the state regulations. Cumulative loading limits for the metals are also established and are dependent on the soil cation exchange capacity (CEC)-see Table 4-8. These rates are used to determine site life, which is the number of years that biosolids with a uniform metal content can be applied to a specific site. Regardless of CEC, if soil pH is less than 6.5, cumulative loading of cadmium cannot exceed 5 kg/ha (4.5 lb/ac). The soil can be limed to increase the soil pH and thereby increase the site life.

Table 4-5 New Federal Regulations (Part 503) for Heavy Metals*				
Parameter	**Ceiling (mg/kg)**	**Cumulative Loading (kg/ha)**	**Alternate Pollutant Limits (mg/kg)**	**Annual Pollutant Loading Rate (kg/ha/yr.)**
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Chromium	3,000	3,000	1,200	150
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum	75	18	18	0.90
Nickel	420	420	420	21
Selenium	100	100	36	5.0
Zinc	7,500	2,800	2,800	140

* From 40 CFR, Part 503.

Table 4-6 State Regulations for Land Application of Biosolids[a]				
Metal	**Acceptable Concentrations (mg/kg)**	**Maximum Metal Addition (kg/ha)[b]-Cumulative**		
		CEC Less than 5 meq/100g	**CEC 5 to 15 meq/100g**	**CEC greater than 15 meq/100g**
Lead (Pb)	1,000	500	1,000	2,000
Zinc (Zn)	2,000	250	500	1,000
Copper (Cu)	800	125	250	500
Nickel (Ni)	100	50	100	200
Cadmium (Cd)[c]	25	5	15	20

[a]From OAR Chapter 340, Division 50.
[b]Kg/ha is equivalent to 0.89 lb/acre.
[c]The maximum application of cadmium (Cd) for soils with pH values of 6.5 or less is 4.5 lb/acre, regardless of the SEC.

Site Identification and Approval

Prior to approving any potentially sensitive application site (with respect to residential housing, runoff potential, or groundwater threat), DEQ may require that the City provide an opportunity for public comment and public hearing. A statement of land use compatibility from the responsible planning jurisdiction should accompany requests for approval of biosolids land application sites. New sites or expansion of existing sites must be proposed to DEQ prior to use. Newly approved sites would then become part of the sludge management plan.

Site criteria for land applying biosolids includes physical geographical features (geological formation, flood plain proximity, and groundwater and surface water proximity, topography, and soils), and method of application. Oregon DEQ's specific criteria are outlined in Table 4-7.

Special Management Considerations

Land receiving biosolids for agricultural use requires special management considerations. These relate to access to the site, types of crops grown, plant nutrient rates, timing and duration of biosolids land application (site life and seasonal constraints), and grazing restrictions.

<u>Access</u>

Controlled access to municipal biosolids application sites is required for 12 months following a surface application. Controlled access means that public entry or traffic is unlikely. Rural private land is assumed to have controlled access while parks or other public lands may require fencing to ensure control.

<u>Crops</u>

No biosolids or biosolids-derived product is to be used directly on fruits or vegetables that may be eaten raw, and as a general rule, crops grown for human consumption should not be planted until 18 months after application of municipal biosolids. If the edible parts will not be in contact with the biosolid-amended soil, or if the crop is to be treated or processed prior to marketing such that pathogen contamination is not a concern, this requirement may be waived.

No restrictions on planting times have been placed on crops not grown for direct human consumption.

Nutrient Loading

Biosolids application to agricultural land should not exceed the annual nitrogen loading required for maximum crop yield and is, therefore, managed according to its fertilizer value. Biosolids may be applied to approved sites above agronomic rates on a one-time basis or less than once per year as long as runoff, nuisance conditions, or groundwater contamination do not occur. Nitrogen accumulation from higher than agronomic rates and annual nitrogen use will determine the acceptable loading rate and frequency.

Table 4-7
Oregon DEQ Site Criteria for Biosolids Application[a]

Parameter	Criteria
Geology	· Must have a stable formation
Flood Plain	· Restricted period of application and incorporate biosolids if in a flood plain
Groundwater	· At time of application, the minimum depth to permanent groundwater is 4 feet; the minimum depth to temporary groundwater is 1 foot
Topography	· Liquid biosolid application with appropriate management to eliminate surface runoff
· Slope less than or equal to 12%	· Surface application of dewatered or dried biosolids
· Slope greater than 12% but less than 20%	· Direct incorporation of liquid biosolids into the soil
Soils	· Minimum rooting depth of 24 inches · No rapid leaching · Avoid saline or alkali soil · pH of 6.5 to 8.2 where heavy metal accumulator crops[b] are grown (pH can be raised by liming the soil)
Method of application and proximity to water bodies	Buffer strips may be required to protect water bodies. Size depends on method of application and proximity to sensitive area (variable with local conditions and left to discretion of DEQ), as described below: · Direct injection: no limit required · Truck spreading: less than 50-foot buffer strip · Spray irrigation: 300- to 500-foot buffer strip · Near ditch, pond, channel, or waterway; greater than 50-foot buffer strip · Near domestic water source or well; greater than 200-foot buffer strip

[a]From OAR Chapter 340, Division 50.
[b]Heavy metal accumulator crops are crops such as swiss chard, lettuce, spinach, carrots, and other leaf and root crops that have been shown to readily accumulate heavy metals.

Site Life

Site life is important in planning because sites generally have a limited application life, which is determined by the chemistry of the soil and the metals loading from the biosolids. Site life is calculated by dividing lifetime biosolids loading limits based on the most limiting constituent by the annual application rate.

Seasonal Constraints

In western Oregon, where soil damage may occur from application equipment traffic in the wet season, biosolids application should be restricted to the dry season. The main consideration in land applying on sloping ground is to avoid surface runoff and soil erosion.

Grazing Restrictions

Grazing animals should not be allowed on pasture or forage for 30 days after application of digested biosolids, 180 days after application of nondigested biosolids, and 7 days after application of air-dried biosolids.

Site Monitoring and Reporting

No site monitoring is required where biosolids are applied at or below agronomic rates based on crop nitrogen requirements. However, if the biosolids contain high concentrations of heavy metals or other toxic elements, or if crop nitrogen requirements are exceeded on an annual basis, additional soil monitoring and special management practices may be required. Monitoring wells may be required on any site on a case-by-case basis at the discretion of DEQ. Also, groundwater background characterization and/or monitoring may be required at the discretion of DEQ.

Reliability and Redundancy Criteria

New or expanding treatment works are required to meet minimum standards for mechanical, electrical, fluid systems, and component reliability in accordance with EPA's policy. This is to ensure that the treatment facilities will operate effectively on a day-to-day basis and that capabilities are provided for satisfactory operation during power failures, flooding, peak loads, equipment failures, and maintenance shutdowns. These reliability and redundancy standards are important to ensure that unacceptable degradation of the receiving water will not occur as a result of the interrupted operation of specific treatment operation or processes. In that regard, standards have been established for three classes of wastewater treatment works.

The reliability class appropriate for the Newport WWTP will be dependent on the effluent disposal body of water. For discharge to the Pacific Ocean, it is anticipated that reliability Class I will be appropriate for the Newport WWTP, since the discharge from the existing and future facility is in an area used for water contact sports.

Table 4-8 contains the minimum backup requirements for plant components that may be provided at the Newport plant in accordance with the EPA's Works Design Criteria, Reliability Class I for sewage treatment plants. In addition to the standards listed in the table, unit operations are to be designed to pass the peak hydraulic flow with one unit out of service. Also, mechanical components in the facility are to be designed to enable repair or replacement without violating the effluent limitations or causing control diversion.

Table 4-8 is not specific to the Newport WWTP, and all elements presented are not necessarily included in the existing or future facilities. The most significant difference between Class I and Class II reliability is that for secondary sedimentation only 50 percent design capacity is required with one unit out of service for Level II reliability. Also, backup components are not mandatory for wastewater treatment systems used to provide treatment in excess of typical biological treatment and disinfection.

Table 4-8
Reliability Class I Requirements

Plant Component	Requirement
Raw Sewage Pumps	Peak flow with largest unit out of service. Peak flow is defined as the maximum wastewater flow expected during the design period of the treatment works.
Mechanical Bar Screens	One backup with either manual or mechanical cleaning (manual cleaning if only two screens)
Grit Removal	Minimum of two units.
Primary Sedimentation	50% of design flow capacity with largest unit out of service. Design flow is defined as the flow used as the design basis of the component.
Activated Sludge Process	A minimum of two equal volume basins; no backup basin required.
Aeration Blowers	Supply the design air capacity with the largest unit out of service; provide a minimum of two units.
Air Diffusers	Isolation of largest section of diffusers (within a basin) without measurably impairing oxygen transfer.
Secondary Sedimentation	75% of design flow capacity with largest unit out of service. Design flow is defined as the flow used as the design basis of the component.
Disinfectant Contact Basin	50% of the design flow with largest unit out of service. Design flow is defined as the flow used as the design basis of the component.
Effluent Pumps	Peak flow with largest unit out of service. Peak flow is defined as the maximum wastewater flow expected during the design period of the treatment works.
Electrical Power	Two separate and independent sources of electrical power shall be provided, either from two separate utility substations or from a single substation and a works-based generator. Designated backup source shall have sufficient capacity to operate all vital components, critical lighting, and ventilation during peak flow conditions, except that components used to support the secondary processes need not be included as long as treatment equivalent to sedimentation and disinfection is provided.

The reliability criteria for sludge processes presented in Table 4-9 are also based on the guidance offered in the EPA's Works Design Criteria.

Table 4-9 Sludge Handling System Reliability	
System Components	**Required Capacity/Backup**
Sludge Holding Tanks	The volume of the holding tank shall be based on the expected time necessary to perform maintenance and repair of the component in question.
Anaerobic Sludge Digestion	At least two digestion tanks shall be provided. At least two of the digestion tanks provided shall be designed to permit processing all types of sludges normally digested.
Aerobic Sludge Digestion	A backup basin is not required. At least two blowers or mechanical aerators shall be provided. Isolation of largest section of diffusers without measurably impairing oxygen transfer is allowed.
Sludge Pumping	Pumps sized to pump peak sludge quantity and maintain velocities above 2 fps. Provide a minimum of 2 pumps.

Chapter 5

WASTEWATER FACILITIES ALTERNATIVES

The chapter discusses the alternatives studied for the wastewater treatment plant site, options for treated effluent disposal, options for the conveyance pipelines, and options for wastewater treatment processes and sludge disposal. These alternatives were presented to the City staff and the Wastewater Advisory Committee assembled by the City to provide review and comment during the study.

A. TREATMENT PLANT SITE SELECTION

The existing treatment plant on the north side of Yaquina Bay is nearing it's capacity and occupies nearly all space available on the site, making expansion on the existing site very difficult, if possible at all. There are concerns about plant odors and multiple daily trips hauling sludge through the downtown area to the sludge disposal site at the City's airport. The existing WWTP site is surrounded by existing residential and commercial development. For these reasons the City has a desire to abandon the existing plant and move the wastewater treatment facilities to the industrially zoned land on the south side of Yaquina Bay.

Siting Criteria

Criteria for siting a new WWTP was developed with the City with a goal of identifying a minimum of two sites meeting the criteria. The siting criteria is listed below:

1. <u>WWTP Service Area</u>

   The WWTP site should be located to provide wastewater treatment for the entire anticipated service area, which is all the land within the anticipated UGB.

2. <u>Land Area Requirements</u>

   WWTP site land area should be adequate to construct treatment facilities to serve the UGB for a minimum of 50 years and include perimeter buffering.

3. <u>WWTP Site Elevation</u>

   The site should provide for a gravity flow - through treatment process considering 30-feet of head loss through the WWTP and provide for effluent discharge by gravity flow.

4. Land Use and Zoning

The WWTP site should be compatible with neighboring adjacent land use and zoning of public land, airport land, and industrial land in the UGB.

5. Proximity to Sludge Disposal Site

The WWTP site should allow for relatively simple access to the sludge disposal site at the City's airport.

6. Proximity to Effluent Discharge Site

The WWTP site should be higher in elevation than effluent discharge site options including discharge to wetlands, creeks, and the Pacific Ocean, to provide for gravity flow discharge at flowrates projected for a minimum of 50-years.

7. Access Road and Service Utilities

The site location and topography should allow the construction of service vehicle access roads, and sewer, water and electric power utility lines without extreme difficulty.

8. Appropriate Soils and Geology

The site should be situated on stable, well - drained soils, preferably having a low groundwater table, to provide long-term reliability for foundations for the WWTP structures.

9. Potential Environmental Impacts

The site should be located on land that will minimize negative impacts to the surrounding environment such as the airport, wetlands, wildlife, water quality and other natural, cultural, and historic resources.

10. Permitting

The site should be located on land that will minimize negative impacts to the environment to allow regulatory agency permitting by the Oregon Division of Lands, the U.S. Corps of Engineers, Oregon Department of Environmental Quality, and fish and wildlife agencies.

Available Sites

A review of the land area within and reasonably close to the City's UGB was conducted. No practical site on the north side of Yaquina Bay meets the siting criteria mentioned above. Three sites were identified in the South Beach area of the city and weighed against the siting criteria. The sites are shown on Figure 5-1.

Site No. 1

Was determined to be to close to existing developed residential area on the west side of U.S. Highway 101 and the City's airport main north/south runway.

Site No. 2

Also was determined to be to close to the City's airport and the site geology appeared to be undesirable because of questionable stability. A previous landslide occupies most of the site.

Preferred Site

Site No. 3

The land available for this site lies along the western slope and below the north/south ridge separating the Yaquina River from the ocean. The site could be developed within a zone measuring approximately 1000 feet in the east/west direction and 2400 feet in the north/south direction. The city selected the central area of this zone for the Preferred WWTP site. This site was selected as the site best meeting the siting criteria. The Federal Aviation Administration (FAA) was contacted concerning this site. FAA expressed the opinion that while they would prefer no WWTP site within 10,000 feet of the airport, the site could be acceptable with them provided any possible bird activity, caused by the presence of the WWTP, could be controlled so as not to interfer with air traffic. The site lies about 3,600 feet north of the northerly end of the airport's southwest/northeast runway on land lying between alignment projections of the airport's two runways.

To address the FAA concerns, the primary source of bird attraction, the secondary clarifiers, will be will be covered.

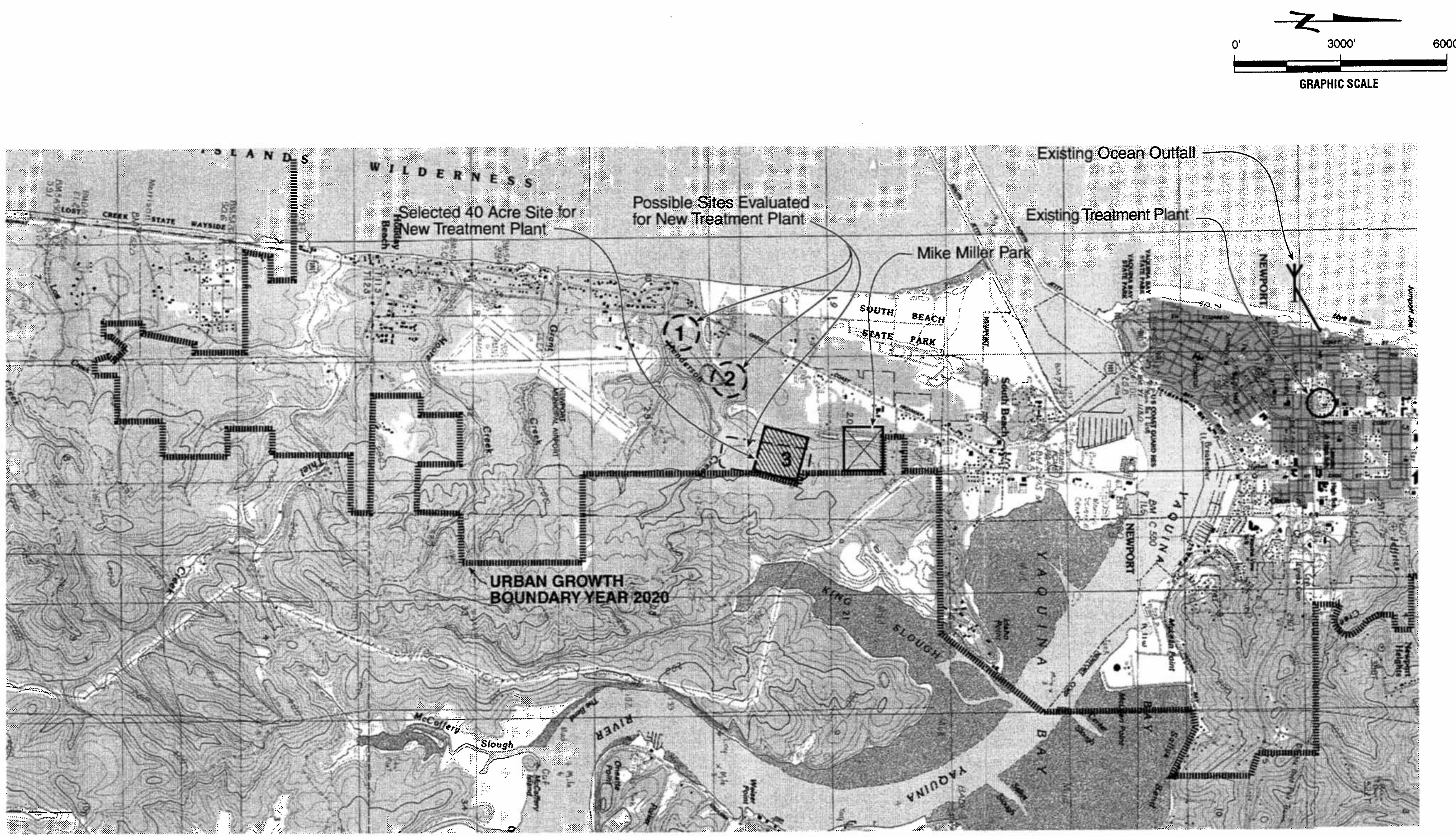

Figure 5-1
New Wastewater Treatment Plant Site Selection

Newport Wastewater
Facilities Plan 1995 Update

CH2M HILL FULLER & MORRIS Engineering, Inc.

The site is an upland area currently forested with second and third growth timber. Adequate space appears to be available on the site for locating WWTP facilities for a population ranging from 30,000 to 40,000 residents, conceivable for Newport's UGB for a 50-year period, with areas for perimeter buffering. The site naturally slopes from east to west at grades between 3 percent and 5 percent on the potentially suitable building area of the site, generally the eastern half of the site, between elevation 180 and elevation 150 mean sea level. The western side of the site slopes from east to west at grades of 15 percent to 20 percent from elevation 150 down to elevation 50 along an existing abandoned railroad grade.

The geological classification for all but the southwest quadrant of the site is *Coastal Terrace Deposits* consisting generally of fine to medium grained marine and nonmarine sand, overlying bedrock. The geological classification for the approximate southwest quadrant of the site is *Landslide Debris*, consisting of apparent small landslides at the western edge of the coastal terrace deposit. This area of the site would be avoided with WWTP structures and pipelines. This area together with onsite perimeter buffering would provide good natural onsite buffering of the WWTP buildable area.

A geologic review of the site indicated the following:

Geologic mapping shows the steep slope on the westside of proposed treatment plant property to be slide prone. This slope is indeed hummocky and appears to be the result of slides. We believe the slides are quite old. The stumps of the old growth do not exhibit any effect of slide other than mild slope creep. The present crop of trees (age 25-30 years) also show effects of mild slope creep.

Slumping failures of this slope appear to be older than the old growth that was first cut (3'-5' stumps approximately 300 years). The slumping appears to be the result of erosion at the toe of the slope possibly when this was the beach line or the south bank of the Yaquina River.

The geology and groundwater regime do provide favorable conditions for continued slumping of this steep slope. The old dune sand is on top of Nye mudstone that dips to the West. Groundwater flowing through the sand concentrates on top of the less permiable mudstone and travels along this contact until it exits on the slope. This action weathers and weakens the contact and eventually leads to new slumps.

Development on the bench needs to control the discharge surface runoff in a way that reduces (or at least does not increase) groundwater.

The site occupies and is bordered on the north, west and south sides by the City's I-1 Zoning District, light industrial. The east boundary of the site is common with the current UGB. Good road and pipeline access can be provided to the site from either an existing undeveloped dirt road on the north side of the site or from the existing abandoned railroad grade west of the site.. Sludge disposal to the City's airport sludge disposal site could be provided by the same access roads. No known wetland areas or other unique natural resources exist on the site.

The site is currently owned by a private party with whom the City is negotiating an ownership transfer.

B. EFFLUENT DISPOSAL OPTIONS

The selection of the design wastewater treatment process from the various process options, the site for the WWTP, and the conveyance pipeline locations are all largely driven by the effluent disposal option selected for design. The selected effluent disposal option sets the design criteria for wastewater facilities. Early in this study various effluent disposal options that appeared to be available to the City were identified and discussed with DEQ to obtain an early assessment regarding effluent limitations and overall potential feasibility for each of the options.

Options discussed were:

1. Discharge to wetland (constructed wetlands prior to existing wetlands)
2. Dry weather discharge to irrigation / wet weather discharge to Thiel or Beaver Creek.
3. Discharge to Yaquina Bay upstream of the Marine Science Center
4. Discharge to Yaquina Bay between the jetties in the boat channel
5. Discharge to ocean outfall pipeline to offshore diffuser

DEQ'S preliminary views on the various effluent disposal options were as follows:

1. **Discharge to wetlands -**
(constructed wetlands prior to existing wetlands)

a. Effluent Limitations - City would have to prove that no degrading of the existing wetland would occur. All water quality standards would have to be met prior to discharge to the existing wetland. A minimum of 10/10 tertiary effluent quality plus removal of nutrients and metals, and no toxicity due to ammonia, BOD or chlorine.

b. A dilution ratio of 10:1 wetland flow to effluent flow would be required. (Wetland flow is not available in this amount on a year round basis).

c. Continuous discharge of effluent to wetlands would be significantly different than the intermittent stormwater and ground water flow presently tributary to the wetlands.

d. The only other Oregon coastal community discharging to wetlands is Cannon Beach. Constructed about 7 years ago, the effluent discharge is visually affecting the vegetation, with some trees dying.

e. A comprehensive monitoring system would be required to monitor the impacts of the effluent discharge to assure the WWTP effluent did not degrade the wetland during the service-life of the WWTP.

f. Preliminary Feasibility - DEQ stated they could require extremely comprehensive study prior to accepting this alternative plus require long term monitoring during plant operation, therefore they viewed this as not likely to be feasible.

2. **Discharge to Thiel Creek or Beaver Creek -**
(Dry weather irrigation / wet weather stream discharge)

a. Effluent Limitations - Minimum 10/10 tertiary effluent quality with nutrient and metals removal, and no toxicity to ammonia, BOD or chlorine.
b. Irrigation area could be grasslands surrounding airport runways, but this would require coordination with land used for sludge disposal.
c. Future golf course irrigation area could be a possibility.
d. Dilution rule of 10:1 would be required for stream discharge and could be difficult to meet for discharge to Thiel Creek.
e. Preliminary Feasibility - DEQ viewed this as possibly feasible. It would require evaluation of Thiel Creek (and possibly Beaver Creek further to the south) water quality and wet weather flow.

3. **Discharge to Yaquina Bay upstream of Marine Science Center**

a. Effluent Limitations - Minimum of 10/10 tertiary effluent quality with continuous discharge. Nutrient and metals removal required and a fairly limited mixing zone allowed for dilution without toxicity from ammonia, BOD or chlorine
b. Dilution rule of 10:1 ratio could be met
c. Effluent discharge could not be allowed to degrade bay water quality
d. Discharge would need to be coordinated with Marine Science Center and the Oregon Coast Aquarium seawater intakes.
e. Preliminary Feasibility - DEQ viewed this as possibly feasible

4. **Discharge to Yaquina Bay between the jetties -**
(In the boat channel)

a. <u>Effluent Limitations</u> - 30/30 secondary effluent quality with intermittent discharge on out-going tides only. Stop discharge allowing adequate time to prevent effluent return on in-coming tides.
b. Dilution rule of 30:1 ratio could be met
c. Would require effluent holding basin with capacity to hold effluent during storm surges that would reduce discharge time
d. Would require effluent disposal pipeline large enough to carry all daily flow in a 6-hour period
e. Intermittent discharge could cause diffuser plugging problems caused by moving sands
f. Would require protection from damage caused by ships
g. Permitting could be difficult with Corps of Engineers
h. <u>Preliminary Feasibility</u> - DEQ viewed this as possibly feasible

5. **Discharge to Pacific Ocean-**
(Ocean outfall pipeline to offshore diffuser)

a. <u>Effluent Limitation</u> - 30/30 secondary effluent quality with continuous discharge into a defined mixing zone in which to diffuse ammonia and chlorine toxicity to acceptable levels.
b. Dilution rule of 30:1 ratio could be met
c. A diffuser would be needed at the discharge to aide diffusion in mixing zone.
d. Diffuser location offshore would need evaluation.
e. High head pressure could be provided to discourage diffuser plugging.
f. Outfall location could be north or south of Yaquina Bay.
g. Existing 24-inch diameter outfall pipeline and diffuser constructed in 1990 could be used to maximize use of existing facilities.
h. <u>Preliminary Feasibility</u> - DEQ viewed this as feasible.

Preferred Discharge Point

Effluent discharge to the Pacific Ocean was selected as the Preferred Option for effluent disposal, based on DEQ's early assessment of the effluent disposal options and further discussions with the City Staff and Wastewater Advisory Committee. Discharge to the Ocean makes most use of the City's current investment in the existing outfall extension of 1990, and it eliminates several problems associated with discharging treated effluent into more sensitive smaller waterways, possibly degrading the water quality of those receiving waters.

C. CONVEYANCE PIPELINE OPTIONS

Four separate options were identified for conveying the wastewater to and from the WWTP site. Each of these four options, Alternative A through D, contain a suboption for constructing the design year 2020 wastewater treatment facilities in two phases. Suboption 1 of each of the alternatives would construct initial treatment facilities needed for the design year 2010 and expand the treatment facilities around 2010 for the treatment facilities needed for design year 2020. Suboption 2 for each of the alternatives would initially construct all the treatment facilities needed for design year 2020.

The Oregon Department of Transportation (ODOT) was contacted at the request of the Wastewater Advisory Committee during this portion of the Study regarding the feasibility of using the existing U.S. Highway 101 Yaquina Bay Bridge as a carrying structure for the bay crossing pipelines instead of using bay undercrossings. ODOT determined using the bridge as a carrying structure would not be feasible. The use of bay undercrossings would require considerably less maintenance than using pipelines supported from the bridge. All the alternatives require bay undercrossings. It is anticipated that the "directional-drill" method of construction will be used for the bay undercrossing work to avoid disturbance to the bay bottom and the jetties. The alternatives are shown conceptually on Figures 5-2 through 5-5. It is helpful to refer to these figures while reading through the following descriptions:

Alternative "A"

Alternative "A1" maintains the existing Northside treatment plant to treat 1.5 mgd capacity and constructs the new South Beach treatment plant to 2.5 mgd capacity for a total treatment capacity of 4.0 mgd (design year 2010). Alternative "A2" abandons the existing Northside treatment plant initially and constructs the new South Beach treatment plant to 5.0 mgd (design year 2020). A new raw sewage pipeline would be constructed south from the existing treatment plant along 1st Street and Hatfield Drive to Bay Blvd.; east along Bay Blvd. to a bay undercrossing emerging at Ferry Slip Road next to the Marine Science Center; thence south along Ferry Slip Road and Highway 101 to the new South Beach treatment plant site. A new ocean outfall pipeline would be constructed offshore from South Beach State Park Campground. A diffuser would be placed into an area of the ocean to assure good mixing with the seawater. In the South Beach vicinity, a diffuser would have to placed beyond the south jetty of the Yaquina Bay channel to avoid the quiescent area on the south side of the south jetty. This alternative was shown conceptually on the 1988 Wastewater System Master Plan.

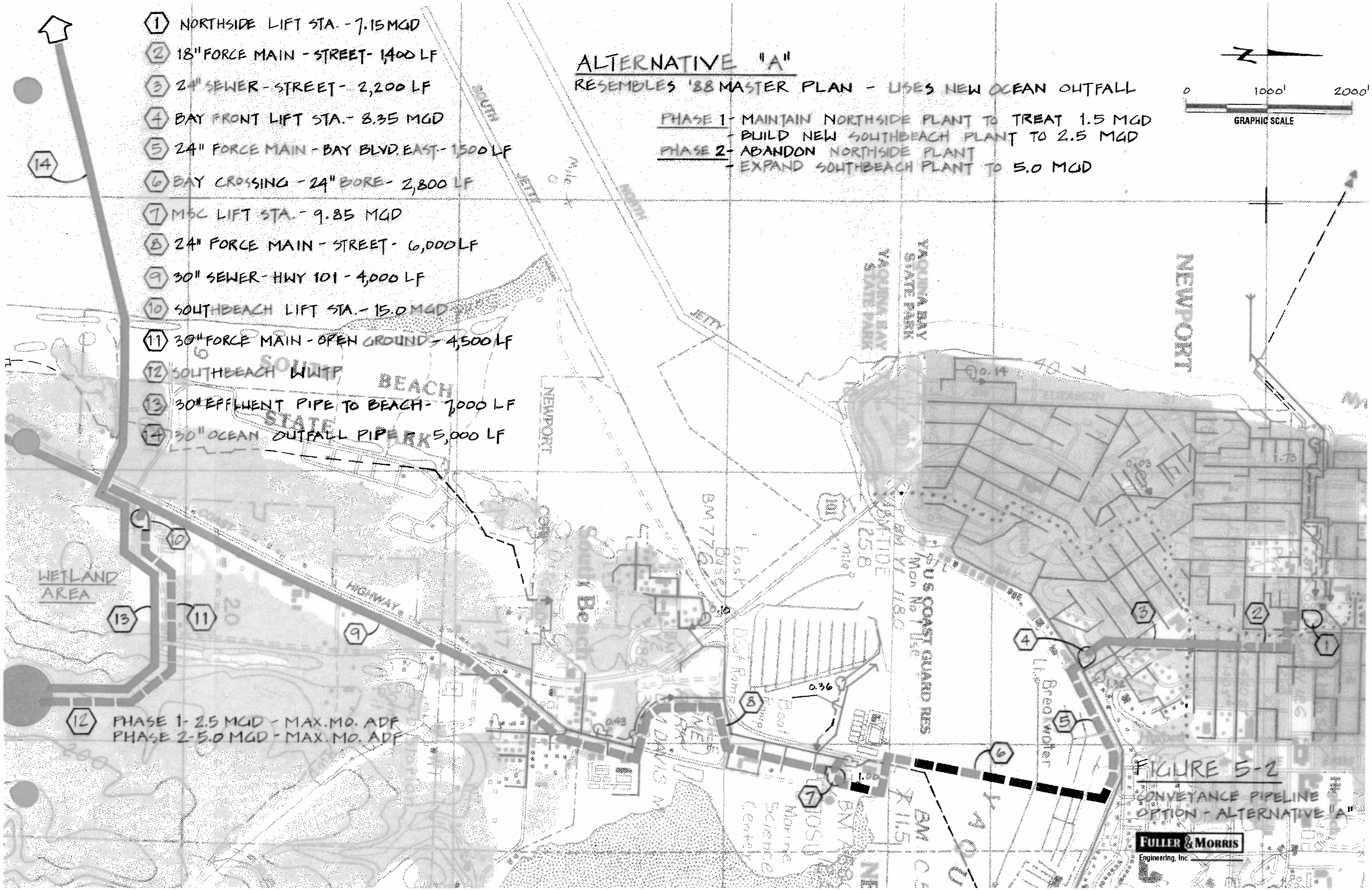

FIGURE 5-2
CONVEYANCE PIPELINE OPTION - ALTERNATIVE "A"
FULLER & MORRIS Engineering, Inc.

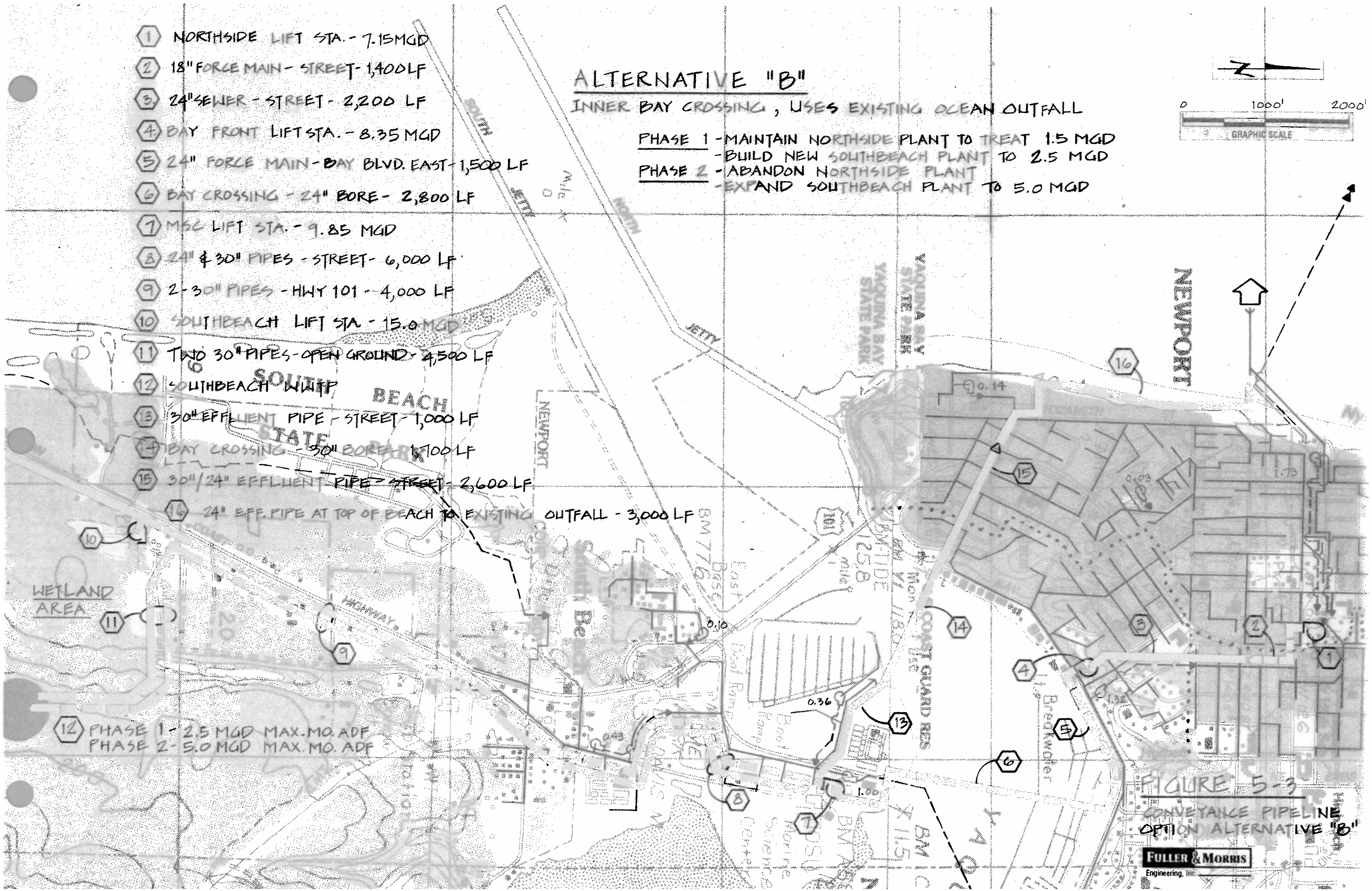

FIGURE 5-3
CONVEYANCE PIPELINE
OPTION ALTERNATIVE "B"

FULLER & MORRIS Engineering, Inc.

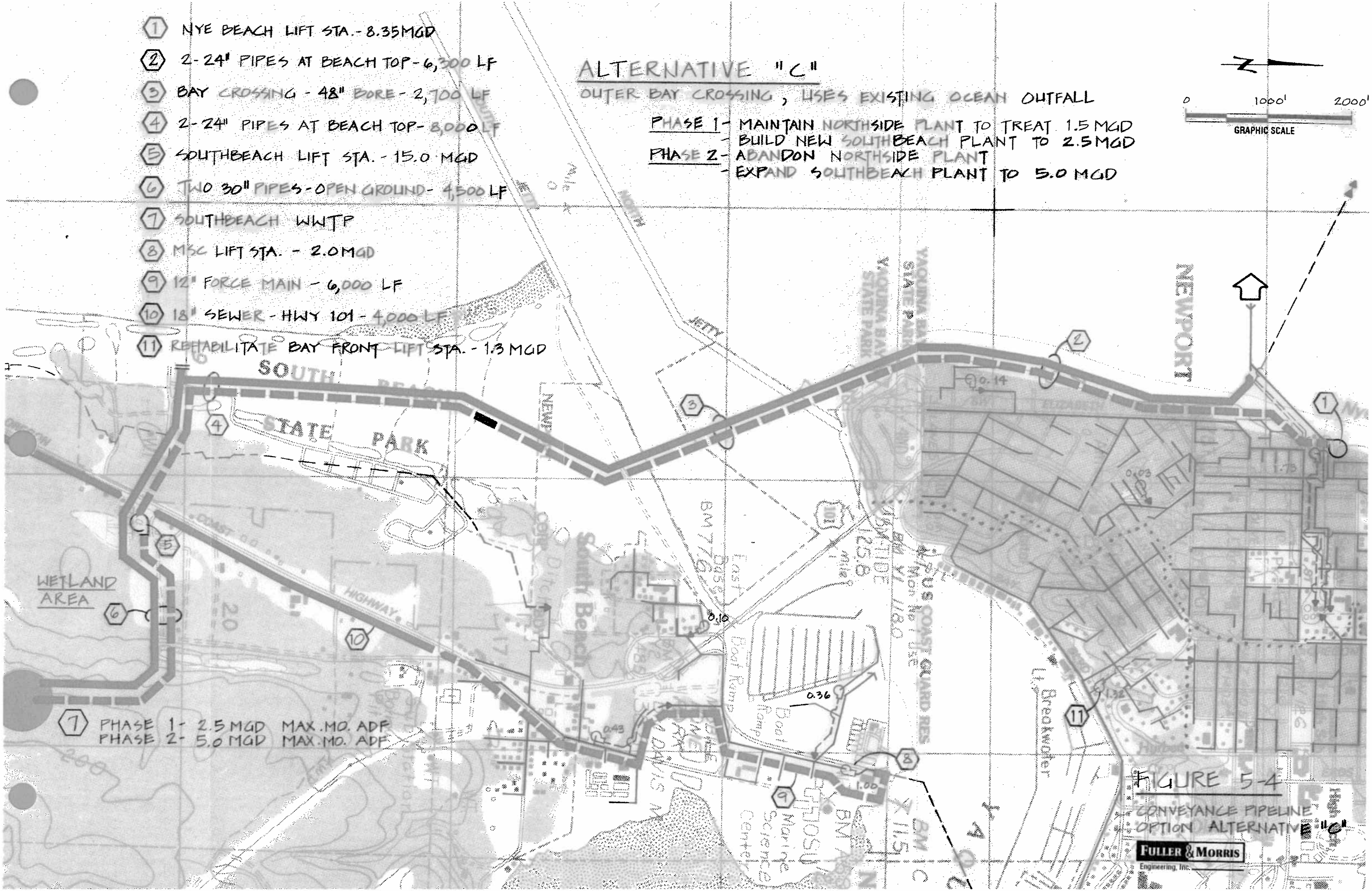

FIGURE 5-4
CONVEYANCE PIPELINE OPTION ALTERNATIVE "C"
FULLER & MORRIS Engineering, Inc.

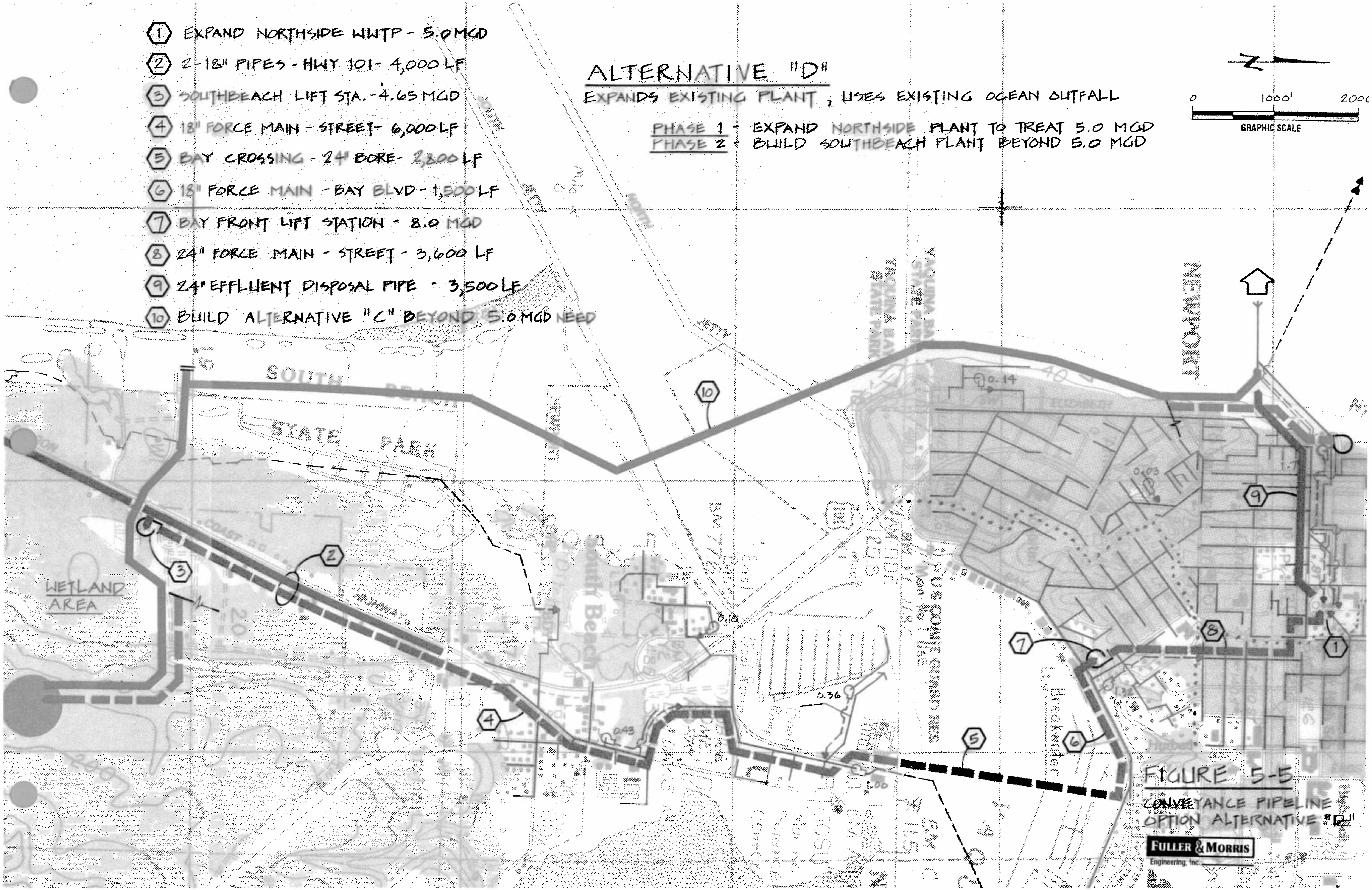

FIGURE 5-5
CONVEYANCE PIPELINE OPTION ALTERNATIVE "D"

FULLER & MORRIS Engineering, Inc.

Alternative "B"

Alternative "B1" maintains the existing Northside treatment plant to treat 1.5 mgd capacity and constructs the new South Beach treatment plant to 2.5 mgd capacity for a total treatment capacity of 4.0 mgd (design year 2010). Alternative "B2" abandons the existing Northside treatment plant initially and constructs the new South Beach treatment plant to 5.0 mgd (design year 2020). A new raw sewage pipeline would be constructed to the new South Beach treatment plant site along the same route as that of Alternative "A". A new effluent disposal pipeline would be constructed parallel to the raw sewage pipeline form the plant site north to Yaquina By, where a new bay undercrossing would emerge at the west end of Bay Blvd. and a new pipeline would be built over the "peninsula" along Fall Street to the beach; thence along the beach to connect with the portion of the existing ocean outfall pipeline installed in 1990 out to the existing, newly installed diffuser.

Alternative "C"

Alternative "C1" maintains the existing Northside treatment plant to treat 1.5 mgd capacity and constructs the new South Beach treatment plant to 2.5 mgd capacity for a total treatment capacity of 4.0 mgd (design year 2010). Alternative "C2" abandons the existing Northside treatment plant initially and constructs the new South Beach treatment plant to 5.0 mgd (design year 2020). A new raw sewage pipeline would be constructed south from the Nye Beach Turnaround area, buried and concrete encased in a trench along the upper portion of the beach to a bay undercrossing emerging on the south side of the south jetty; thence south on to the new treatment plant site. A new effluent disposal pipeline would parallel the raw sewage pipeline, in the same trench and in the same casing pipe in the bay undercrossing, to connect to the portion of the existing ocean outfall pipeline installed in 1990 out to the existing, newly installed diffuser.

The pipeline construction through South Beach State Park would be coordinated with the Oregon Parks and Recreation Department for a common construction corridor with a new bicycle/pedestrian trail they are currently planning for connecting South Beach State Park Campground with the Oregon Coast Aquarium.

Alternative "D"

This alternative is based on expanding the existing Northside treatment plant without constructing a new treatment plant at South Beach. Wastewater collected on the south side of Yaquina Bay would continue to be conveyed to the (expanded) Northside treatment plant. The existing 8-inch diameter bay undercrossing pipeline currently is flowing at near-maximum capacity, so a new bay undercrossing pipeline (and associated lift stations) would need to be constructed to convey the wastewater that will be contributed from future new development on the south side of the bay. Also a new conveyance pipeline would need to constructed from the new bay crossing west on Bay Blvd., and north, up Hatfield Drive and 1 st Street to the existing plant. A new effluent disposal pipeline would be needed from the existing plant to connect to the portion of newly installed ocean outfall in 1990.

Alternative "D1" expands the existing Northside plant to 4.0 mgd (design year 2010) using biofilter/activated sludge treatment technology. Alternative "D2" expands the existing plant to 5.0 mgd (design year 2020) using deep shaft aeration treatment technology. These plant expansions facilities "fill-up" the available space on the plant site. Actual construction of these expansions would require a new access road structure or locating the new facilities in the canyon area west of Nye Street.

Construction of this alternative would defer building additional treatment capacity on a new site until the City's wastewater flow nears the new expanded capacity (year 2010 or year 2020 depending on whether 4.0 mgd or 5.0 mgd capacity expansion is built). Investments in this plant expansion would be short-lived if this plant were abandoned in the future when new additional treatment capacity is built on a new site. Also, this alternative does not address the City's concerns regarding odor control and the hauling of sludge through the downtown area to the sludge disposal site at the airport on the south side of the bay. Alternative "D" would require a major expense when the expanded capacity is reached in year 2010 or 2020. This alternative does not provide the same benefits as the other alternatives.

Preferred Conveyance

Alternative C2 was selected by the City Staff and the Wastewater Advisory Committee for the Preferred Alternative. A comparison of this alternative to the other alternative reveals that Alternative C2:

1. Uses less pumping than the other alternatives
2. Bay undercrossing works well for directional-drill technology, thereby minimizes risk of damage to bay channel or jetties from undercrossing construction, and provides most protection for undercrossing pipes from damages that could be caused by navigational ship traffic.

3. Fits well into State Parks plans for constructing their proposed bicycle/pedestrian trail from South Beach State Park Campground to the Oregon Coast Aquarium.
4. Makes the most use of the existing outfall recent investment ($3 million in 1990).
5. Provides most investment in Long Range Plan (beyond year 2020) by using initially proposed effluent disposal pipeline (that parallels new raw sewage pipeline from Nye Beach to the new treatment plant site) for additional raw sewage conveyance when a new outfall is constructed, when it is needed in the future, beyond year 2020.
6. Construction causes less disruption to City residents and commercial businesses by locating the pipelines out of congested areas of the city.

D. TREATMENT PROCESS OPTIONS

Secondary Treatment Options Screening

Screening of secondary treatment options mainly involves selection of the appropriate biological secondary treatment process. Two options were developed for the existing plant site. The options are (1) Biofilter-Activated Sludge and (2) Deep Shaft. These are the only options that could be constructed on the space limited existing site.

The options selected to be evaluated for a new treatment plant are (1) Carrousel, (2) Orbal, (3) Schreiber, (4) Submerged Biological Contractors, (5) Deep Shaft. These options were selected for investigation based on reliability and site considerations. A new headworks will be common to all secondary treatment options.

No-Action Option

The No-Action option would be to leave the existing facilities as they are. This would result in overloading of the trickling filters and would result in noncompliance with the City's National Pollutant Discharge Elimination System (NPDES) permit. As demonstrated by recent process performance problems, such noncompliance is an issue at current population, flows, and loadings. Treatment improvements are therefore required based on current conditions, regardless of future growth. The no-action option is therefore not recommended and is not considered further.

Existing Plant Options

Option 1: Biofilter-Activated Sludge

This option would include a new headwork's, the existing primary clarifier and biofilters, new aeration process, new secondary clarifiers and a new anaerobic digester. The new rectangular secondary clarifiers would be constructed in the northeast corner of the plant site. This will require the existing plant access road to be temporarily relocated. The existing secondary clarifiers would be converted to aeration basins with diffused aeration. A new intermediate pump station would be required to lift flow from the aeration basins to the new secondary clarifiers. The maximum monthly flow capacity for this process on the existing site is 4.0 mgd. The plant is projected to be at capacity in the year 2010.

Option 2: Deep Shaft

The Deep Shaft process is provided by Deep Shaft Technology, Inc. The biological process occurs in a shaft 3 to 6 feet in diameter and 300 to 500 feet deep. Influent goes down a center pipe with air added one-third of the way down. The mixed liquor comes back to the surface in the outer part of the shaft with air added to provide an air-lift pump action. Some mixed liquor is recycled down the shaft again while the remaining goes on to flotation secondary clarifiers. One or two mg/l of polymer clarifies the effluent in the secondary clarifier. This activated sludge process does not require a return sludge pump station because the plant hydraulic gradeline is raised by the air-lift pump action. Return sludge flows from the clarifier to the shaft by gravity. On the existing site, two deep shafts and flotation clarifiers would be constructed. The two existing clarifiers would be converted to flotation clarifiers. The existing primary clarifier and biofilters would be abandoned. A new anaerobic digester would be required for sludge stabilization. This process could treat a maximum monthly flow of 5 mgd on the existing site. This flow is projected to occur in the year 2020. After 2020, additional facilities would be required at a different plant site

Evaluation of Existing Plant Options

As described in Chapter 2, the existing plant site is very limited value for future wastewater treatment. The previous master plan and the City's Comprehensive Plan selected the development of a new wastewater treatment at South Beach as the preferred alternative. This preference was recently confirmed by the City's Wastewater Advisory Committee. Therefore, the process options at the existing plant will not be evaluated unless the plan for a new plant is abandoned.

New Plant Options

Option 1: Carrousel

The Carrousel process is an oxidation ditch licensed by Eimco Process Equipment Company. It consists of vertically mounted, low speed surface aerators in an aeration basin with partitions used to establish a continuous channel. A flow velocity, sufficiently high to maintain the suspension of mixed liquor in the channels, is achieved by the pumping action of the aerators. This pumping action is created by lining up the aerators with the partition wall. The aerator pumps mixed liquor from the upstream channel into the aeration zone where it is completely mixed and forced into the downstream channel. Eimco reports that there are over 600 Carrousel plants in operation.

Option 2: Orbal

The Orbal system is a three-channel looped oxidation ditch system developed by Envirex. Horizontal rotating aeration disks provide aeration and channel velocity to keep the mixed liquor in suspension. Triangular nodules on the surface of the disk provide aeration and mixing. The three concentric channels can be operated at different dissolved oxygen levels to reduce sludge bulking in the secondary clarifiers. Envirex reports over 250 Orbal plants are in operation.

Option 3: Schreiber

The Schreiber process is offered by Schreiber Corporation, Inc. In this process, air diffusers are mounted on a bridge that rotates above a circular basin. The diffusers are suspended near the bottom of the tank. As a result of the circling motion of the bridge, aeration bubbles are dispersed in a sweeping pattern throughout the tank, rather than being released in a straight vertical updraft. This achieves high oxygen transfer efficiency. The aeration can be turned off for short periods of time if additional oxygen is not required by the process. The mixed liquor is mixed by the rotating bridge even when the air is turned off. Air for the diffusers is typically provided by conventional blowers.

Option 4: Submerged Biological Contractors

The submerged biological contractor (SBC) is a process marketed by Envirex. In this process, large drums of polyethylene plastic sheets are 80% submerged in an aeration tank. The SBC's provide a fixed-film media for aerobic biological growth in the activated sludge tank. The biomass removes organics as it rotates through the wastewater. Exposing the growth to air at the top of the rotation provides for the absorption of oxygen. The biomass in the reactor from mixed liquor recycle allows further oxidation of organic waste.

Option 5: Deep Shaft

This option is similar to the deep shaft option at the existing plant site. All facilities would be new and the entire process would be located in a building.

Secondary Treatment Process Option Cost Analysis

The manufacturers of the five secondary treatment processes provided technical and cost proposals for a new Newport facility. The cost proposals were incorporated into facility plan level cost estimates that include: bond and insurance, sitework, headwork's, flow measurement, aeration, secondary clarification, return sludge pumping, UV disinfection, sludge storage, sludge dewatering with lime stabilization, administration building, electrical equipment and instrumentation, and standby generator. The costs shown in Table 5-1 include a 25-percent contingency. The manufacturers proposals also contained estimated horsepower requirements for operation at the design flow. The power estimates were converted to a present worth value for twenty years of operation. The construction cost was added to the present worth of the power cost to determine the total present worth cost of each option.

The cost estimates shown in Table 5-1 have been prepared for guidance in the project evaluation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors. As a result, the final project scope will vary from this estimate. These costs are for comparison purposes only.

Table 5-1, Process Option Present Worth Costs

Process	5 mgd Cost	5 mgd HP	PW Power	Total PW
Carrousel	$12,500,000	244	$1,100,000	$13,600,000
Orbal	$13,000,000	214	$1,000,000	$14,000,000
Schreiber	$13,200,000	210	$1,000,000	$14,200,000
Submerged Biological Contactors	$13,800,000	90	$ 500,000	$14,300,000
Deep Shaft	$11,800,000	180	$ 800,000	$12,600,000

1995 Power cost = $0.06/kWh
Discount Rate = 3.00%
Period = 20 years
PW calculated 14.8775
Annual cost is for the 5 mgd plant. A factor of 0.75 was used in PW calculation because flow will average 4.0 mgd over the 20 yr. period.

Comparison and Selection of Preferred Secondary Treatment Process

The five processes have total present worth cost estimates within a range of less that 15% of each other. Because the range is within the level of accuracy of the cost estimate, the present worth cost of all alternatives are considered to be equal. Therefore, the present worth cost will not be used as a selection criteria. Non-cost evaluation criteria include wet weather flexibility, ability to meet reliability/redundancy requirements, turn-down capability, ease of maintenance, and operation simplicity. The City staff evaluated the five proposals and eliminated the Schreiber process and submerged biological contractors. The staff was not comfortable with the mechanical reliability of the rotating bridge on the Schreiber aeration system and they were concerned about the long term performance of the submerged bearings on the submerged biological contactors.

For the three remaining processes, all will be able to meet the current NPDES permit requirements. Because of the flotation clarifiers and short aeration time, it is likely that the deep shaft process would have a lower effluent quality than the two oxidation ditch processes. It is anticipated that the oxidation ditch processes would be designed to produce 10 mg/1 BOD and TSS under average flow and load conditions. The oxidation ditch process will also be capable of meeting the 85% removal requirement under wet season maximum month flow conditions. For a load of 5,400 lbs./ day and a maximum month flow of 5 mgd, the required effluent under the 85% removal requirement would be 19 mg / 1 for BOD and TSS.

Under normal conditions, the oxidation ditch process should provide effluent ammonia concentrations of 5 mg / 1 or less. In general, the high quality effluent from the oxidation ditch process will improve UV disinfection performance.

The City staff then began to investigate the remaining three processes, Carrousel, Orbal, and Deep Shaft. The City staff visited a Carrousel plant in Port Townsend, Washington, and Orbal plants in Streator and Mendota, Illinois. A CH2M HILL engineer visited the Homer, Alaska, Deep Shaft installation and gave the City staff a video tape of the facility. Based on these investigations, the City staff selected the Orbal process because of its aeration turn-down capability and the unique ability to handle peak-wet weather flows with the concentric channels. The arrangement of the channels and aerators also allows the process to meet reliability and redundancy requirements with a single Orbal basin. The Orbal oxidation ditch process and the Deep Shaft aeration process are shown respectively on Figures 5-6 and 5-7.

E. EFFLUENT DISINFECTION OPTIONS

Disinfection Options Screening

A general description of the available options, various types of disinfectants, the state of current technology, advantages, and disadvantages is provided below. This is followed by comparative evaluation of the options.

Chlorine Option

Included in this category are all compounds that produce free chlorine residuals. Chlorine gas/liquid and sodium and calcium hypochlorites are the most common compounds. Nitrite present in partially nitrified secondary effluent causes tremendous spikes in the chlorine demand, and most chlorine control systems cannot react to the wide variation in demand. It is unlikely that chlorine will be completely eliminated since it provides a residual that is necessary for plant water systems and for control of biological growth on process equipment. The toxicity of chlorine to aquatic organisms is a concern. Stricter restrictions on effluent chlorine residuals often make dechlorination before discharge a necessary additional treatment step. It is anticipated that the future trend in public opinion will limit the use of chlorine as a wastewater disinfectant..

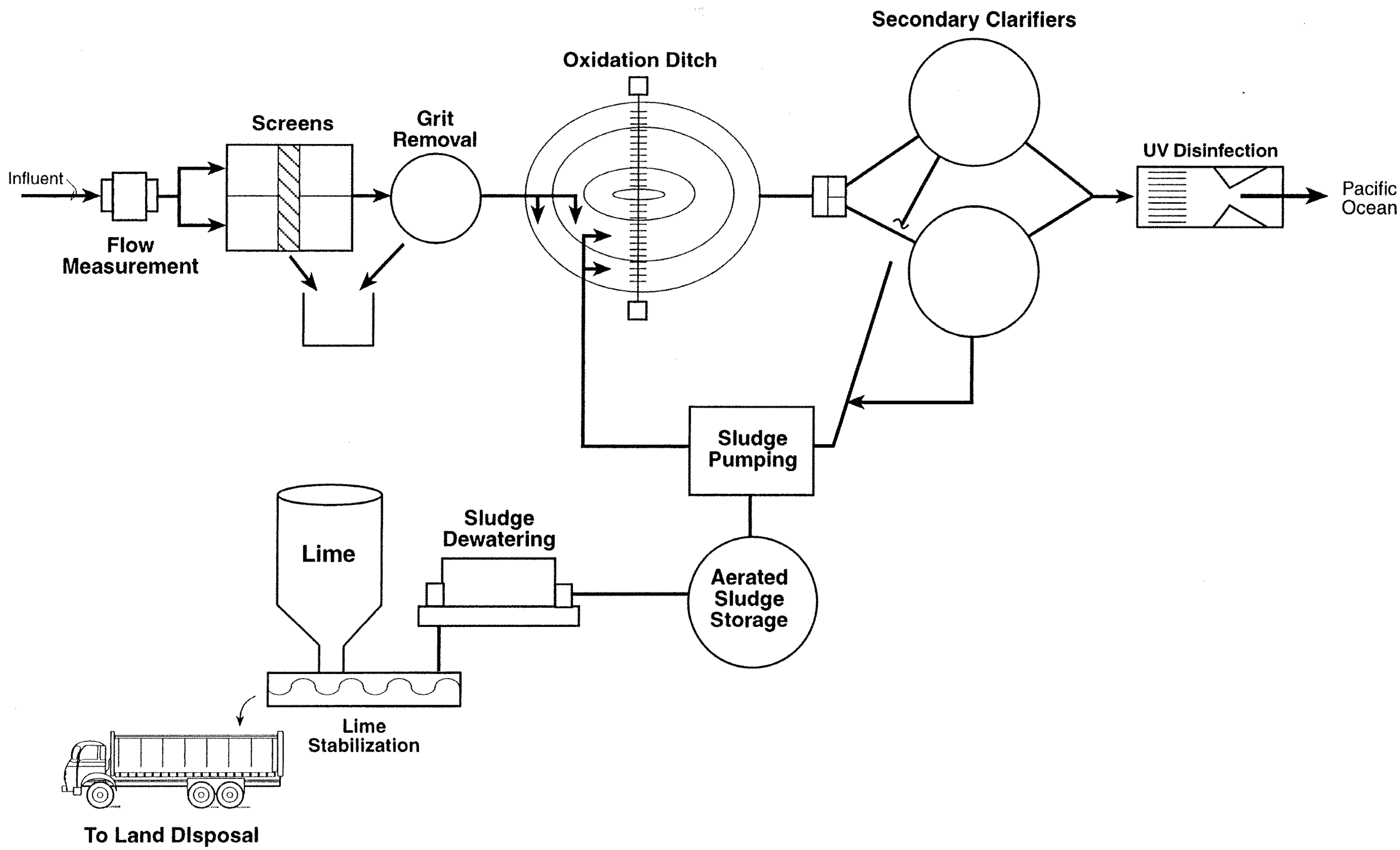

Figure 5-6

**Treatment Process Option,
Oxidation DItch Process**

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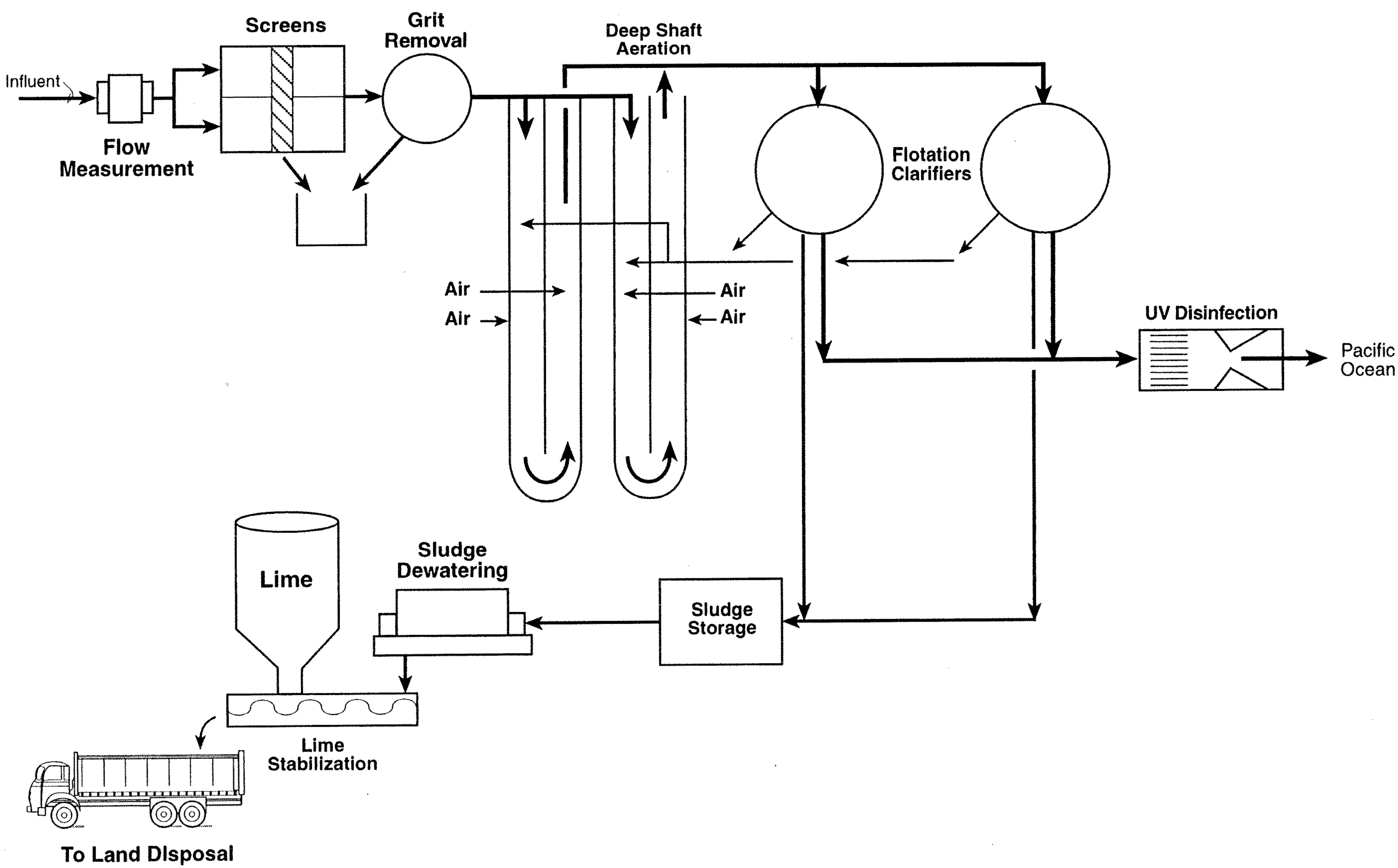

Figure 5-7

Treatment Process Option
Deep Shaft Aeration/Flotation Clarifiers Process

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Chlorine Gas/Liquid

This is currently the most widely used wastewater disinfectant. However, increasingly stringent safety requirements for the handling of chlorine are driving up the cost of chlorine systems. Spill containment, automatic scrubbing, and sprinkler systems are required in most cases.

Sodium and Calcium Hypochlorite

Despite higher operating costs, these disinfectants are gaining in use because of safety concerns with use of toxic chlorine gas. The Rock Creek and Durham Facilities managed by the Unified Sewerage Agency in Washington County, Oregon and the Tryon Creek Wastewater Treatment Plant operated by the City of Portland recently replaced their chlorine gas systems with a sodium hypochlorite systems due to safety concerns. Sodium hypochlorite use is more common in wastewater applications, while calcium hypochlorite is mainly used in small water disinfection applications, such as swimming pools. Of the two, the calcium compound is more expensive, and also a greater fire hazard. Hypochlorite compounds decompose over time, thus limiting effective storage life. Such decomposition is accelerated by contaminants and can release dangerous amounts of chlorine gas into the atmosphere. On-site hypochlorite generation requires a source of brackish water. Generation systems are complex and maintenance-intensive, and very little full-scale experience is available. In addition to THMs, chlorate and chlorite can be formed as byproducts.

Chlorine Dioxide

Chlorine dioxide is rapidly replacing chlorine as the bleaching chemical in the paper industry, but long-term history of chlorine dioxide as a disinfectant is not available. Feed equipment is similar to that used for liquid/gaseous chlorine. Chlorine dioxide gas is explosive (safety concern). There is some evidence that the formation of trihalomethanes is less prevalent for chlorine dioxide than for chlorine or hypochlorite. However, the chlorates and chlorites formed by chlorine dioxide reduction during the disinfection process raise health and taste and odor concerns. Chlorine dioxide is more expensive than both chlorine gas/liquid and sodium hypochlorite, and is not readily available commercially. On-site generation requires additional specialized equipment and incurs high operating and maintenance costs.

<u>Ultraviolet Radiation Option</u>

There are approximately 800 operating UV radiation wastewater disinfection facilities in the US, ranging from 1 mgd to 256 mgd at the largest installation in the US in Atlanta, GA. UV radiation provides no residual. Typical wastewater disinfection installations use low-energy lamps or medium-energy lamps. Three banks of lamps and turbulent flow are generally required.

The two main factors affecting UV disinfection performance are suspended solids concentration and transmittance. Transmittance is affected by suspended as well as dissolved materials such as iron and humics. Newport WWTP effluent samples should be collected to determine the design transmittance value. Although the activated sludge secondary treatment process will influence the transmittance, the current value will provide a preliminary indication. A sample should also be taken to test for iron. In addition to process water, iron can reduce the lamp sleeve transmittance by depositing a coating on the sleeve surface.

The UV dose required is controlled by the water quality and the target inactivation level. Recent research shows that the water quality has little effect on the dose for target effluent total coliform levels above approximately 50 MPN/100 ml, but the dose increases rapidly with deteriorating water quality for effluent total coliform below approximately 5 MPN/100 ml. Therefore, for the current and anticipated future disinfection levels required by DEQ, UV can provide effective disinfection at a reasonable dose.

Particle size distribution is also important to UV disinfection. Particles greater than 20 micrometers in diameter are difficult to disinfect using UV radiation, and larger particles cause a shielding effect. Thus, in addition to the suspended solids concentration, the size distribution contributes to the overall water quality. Particle size distribution will be an important design criterion for future wastewater treatment facilities.

A major advantage of UV disinfection is its greater potential for compliance with future disinfection standards. This is a result of the fact that UV is more effective against viruses and other indicator organisms (such as *Cryptosporidium*) likely to appear in future permits. Partial or near-complete nitrification does not affect UV effectiveness significantly.

Dechlorination Options

Commonly used Dechlorination methods are summarized below.

<u>Sulfur Dioxide Gas</u>

Sulfur dioxide feed metering and application equipment is similar to that of chlorine gas/liquid, and also presents similar safety concerns because of toxicity.

<u>Sodium Bisulfite Liquid</u>

Higher storage volumes and doses are required for Dechlorination, but it is much safer than sulfur dioxide. It is more expensive than sulfur dioxide. However, the cost difference is lower than that between chlorine gas and sodium hypochlorite.

Activated Carbon

There is very little full-scale experience with activated carbon dechlorination systems. It is a capital intensive system, and piloting will be necessary to establish design criteria.

Disinfection Option Evaluation

The increasingly stringent effluent chlorine residual limits, fire code requirements, and safety and handling concerns discussed above in relation to chlorine disinfection make this option highly undesirable for use at the new Newport WWTP. UV radiation is therefore selected as the disinfection option. Other options are not considered further.

F. SLUDGE DISPOSAL OPTIONS

Several sludge stabilization options are available to meet regulations and provide processed biosolids for beneficial reuse. In this section, stabilization options are identified and screened for detailed analysis. Preliminary sizing, cost estimates, and noncost evaluations are presented for each of the screened alternatives. For biosolids reuse/disposal, two options exist: land application (beneficial reuse) and landfill disposal. Because the DEQ discourages landfilling and Newport has land suitable for beneficial reuse and historically has operated a successful land application program, landfilling will not be considered as a method of sludge disposal.

Preliminary Options Screening

Options for sludge stabilization are listed and discussed below. The feasibility of a sludge processing option is determined, among other factors, by its compatibility with liquid treatment options.

Anaerobic Digestion

Anaerobic digestion is a sludge stabilization process that requires the sludge to be mixed in heated tanks without oxygen for a minimum of fifteen days. Anaerobic digestion is generally not cost effective compared to aerobic digestion and lime stabilization for plants smaller than 5 to 10 mgd. Additionally, the anaerobic digestion process does not perform well without primary sludge as a part of the total sludge feed. Because the average design flow at Newport will be 4 mgd and the selected liquids treatment process for the new Newport plant does not have primary clarifiers and primary sludge, this stabilization process will not be considered.

Aerobic Digestion

Aerobic digestion of sludge is usually considered as a viable alternative for plants with flows up to 5 to 10 mgd. Waste sludge is typically thickened, then aerated in a basin for 40-60 days to comply with Federal Part 503 sludge regulations. Aerobically digested sludge can then be applied to the land. Because of the long detention time, basin size and aeration requirements are significant considerations for this sludge stabilation process. Because of the simplicity of the process and its compatibility with the selected liquids treatment process aerobic digestion will receive further evaluation.

Lime Stabilization

Lime stabilization involves raising the pH of sludge through lime addition. Lime stabilization is used to meet Federal Part 503 sludge regulation requirements for Class B pathogen reduction by raising the pH of sludge to 12 for two hours. Vector attraction reduction is achieved by maintaining a pH level of 11.5 for an additional 22 hours. Lime stabilization can be done either with liquid sludge or dewatered sludge cake. Because the City already has mechanical dewatering equipment, and hauling and storage factors are optimized with a dewatered cake, this evaluation will depict the dewatered cake scenario for lime stabilization. For this method either hydrated or quick lime would be directly added to the dewatered sludge cake in a lime/cake mixer. A lime stabilization system would include a lime storage silo, a dry lime feeder, and the lime/sludge cake mixer.

Composting

Several methods of composting have been used to stabilize sludge at municipal wastewater treatment facilities. Composting involves dewatering sludge and then adding amendments (for example, sawdust or wood chips) to the sludge to produce a material that will allow air penetration into the pile. Sludge stabilization occurs within windrows or a compost pile by aerobic bacteria generating heat as they stabilize the sludge. Sludge composting adds to the cost of sludge disposal because of high labor, amendment, and significant materials handling requirements. Only a small percentage of the cost of composting is recovered through the potential sale of the composted product. Where haul distances are reasonable, land application of biosolids is less expensive than composting and compost marketing. Newport has adequate land in the area for biosolids disposal, therefore composting will not be considered further.

Incineration

Incineration involves high-temperature combustion of sludge. In addition to air quality and ash disposal permitting difficulties, incineration is not economical for a treatment facility the size of Newport's. For these reasons, incineration is not considered further.

Dewatering and Drying

This option would involve mechanical dewatering and drying with a high-temperature rotary dryer to remove moisture. The dried biosolids could be marketed as fertilizer. This option would involve air permitting and would significantly increase the complexity of current operations. Also, dewatering and drying is not economically feasible for the plant size being considered for Newport. For these reasons, dewatering and drying is not considered further.

Detailed Analysis of Screened Options

The two options selected for detailed analysis are: (1) Aerobic Digestion, and (2) Lime Stabilization. A description of these options with preliminary sizing of facilities and flow schematics is presented in the following sections. Table 5-2 summarizes the projected quantity of the sludge produced from the Newport plant.

Table 5-2 Projected Biosolids Quantity	
Design Year	2020
MM BOD Load, lb/d	7,700
MM TSS Load, lb/d	6,500
MM WAS, lb/d	7,700
MM WAS Concentration, %	0.7%
MM WAS Volume, gpd	132,000
AD BOD Load, lb/d	5,650
AD TSS Load, lb/d	4,550
AD WAS, lb/d	5,650
AD WAS Concentration, %	0.8%
AD WAS Volume, gpd	85,000
MM = Maximum Month	
AD = Average Day	

Option 1: Aerobic Digestion

A flow schematic of Option 1 is shown in Figure 5-8. Biosolids quantity projections are presented in Table 5-3 and design information is presented in Table 5-4.

For Option 1, the strategy for meeting the new Federal Part 503 sludge regulations is to achieve 38 percent reduction in volatile solids for vector attraction reduction and to achieve the desired degree-days for pathogen reduction (40 days at 20°C) through aerobic digestion. The waste sludge would be thickened by centrifuge and aerated in the aerobic digester for a retention time of 40 days. The aerobic digester would be a basin with

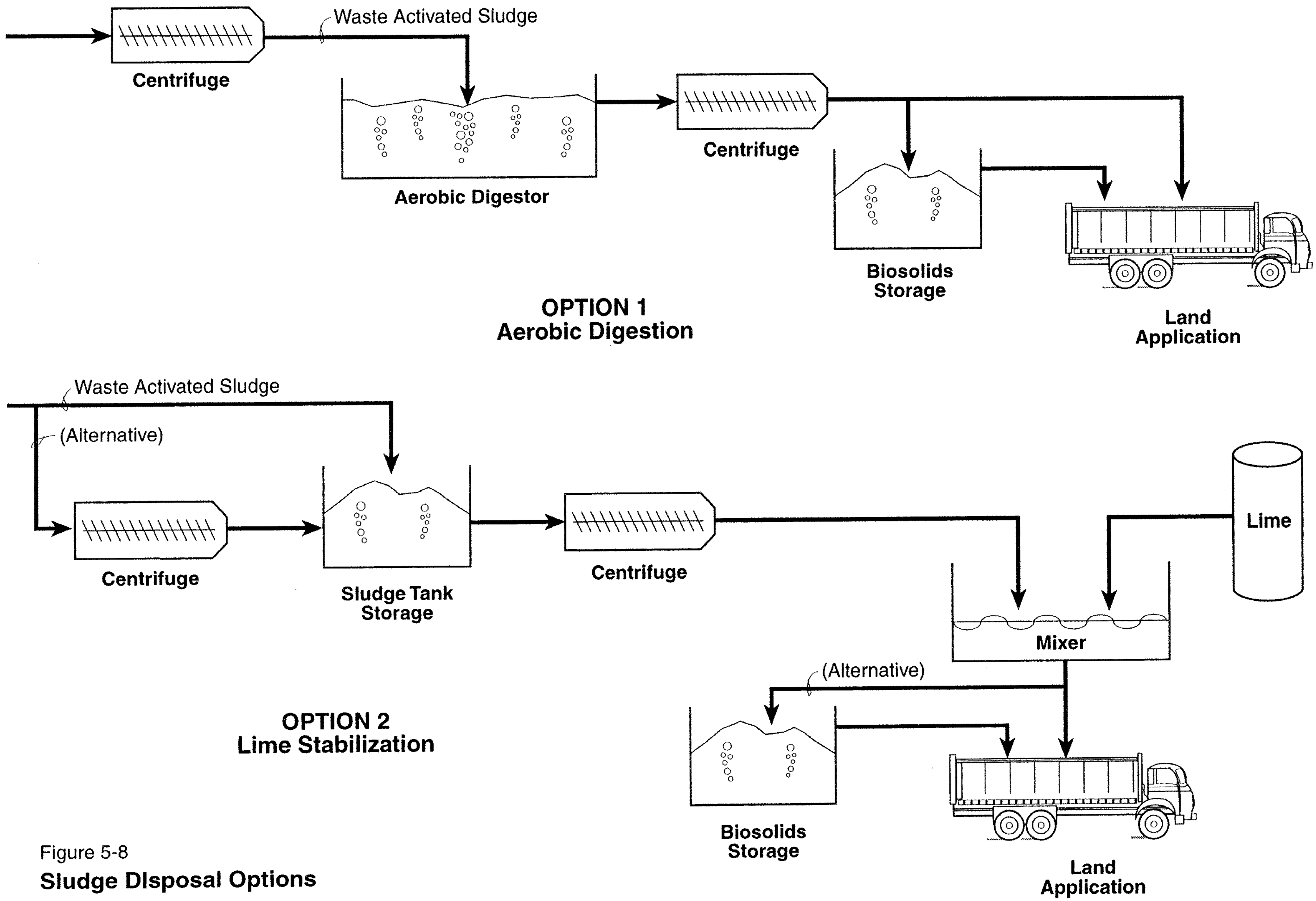

Figure 5-8
Sludge DIsposal Options

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diffused aeration. Digested sludge (biosolids) would be dewatered by centrifuge and either land applied directly or stockpiled until the weather allowed land application. Alternately, biosolids could be thickened by the centrifuge for volume reduction and still be land applied in the liquid mode. The centrifuges and a polymer system would be housed in a building adjacent to the digester. The centrifuges would include the existing machine recently purchased by the City plus an identical unit. These units can be used to both thicken and dewater sludges and thus can provide redundancy for each other.

.Table 5-3 Option 1 Projected Biosolids Production (Average Day)	
Year	2020
Aer. Digester Feed, lb/d	5,650
Aer. Digester Feed Volume, gpd @ 2.5%	27,000
Aerobic Digester Volume, gal	1,083,000
AD Aer. Digest. HRT, days	40
Digested Sludge, lb/d	3,790
Dewatered DS Conc., %	16%
Dewatered DS Volume, cy/day	14

Table 5-4 Sludge Processing Design Information Option 1 - Aerobic Digestion	
Sludge Thickening	
Thickening method	Centrifuge
Number and size of units	1
Percent solids to digestion	2.5%
Aerobic Digestion	
Volume	1,083,000 gallons
Volatile solids destruction	38%
Operating temperature	20°C
Biosolids Dewatering	
Method	Centrifuge
Number and size of units	1
Percent solids to storage or land application	16%
Biosolids Storage (3 months)	
Type	Concrete bunker
Volume	1260 cu.yd.

Option 2: Dewatering and Lime Stabilization

A flow schematic of Option 2 is shown in Figure 5-8. Biosolids production projections are presented in Table 5-5 and design information is presented in Table 5-6. The facilities would include centrifuge sludge dewatering and a lime stabilization system. The two dewatering centrifuges would be housed in a building along with feed pumps, polymer feed equipment, and odor control equipment.

WAS would be wasted to an aerated sludge storage tank. Stored sludge would be dewatered by the centrifuges and the dewatered sludge cake would be fed into a mixer to be mixed with dry lime. Sufficient lime would be added to raise the pH of the lime/sludge mixture above 12.0 for a minimum of 2 hours and maintain the pH above 11.5 for an additional 22 hours. Bulk dry lime would be stored in a silo and fed to the mixer with feeding equipment. The lime stabilized biosolids would be either land applied directly or stockpiled until the weather allowed land application. A heated lime treatment process that would provide Class A biosolids could be evaluated during predesign.

Table 5-5
Option 2 (Average Day)

	2020
Aerated Storage Feed, lb/d	5,650
Aerated Storage Feed, gpd	85,000
Aerated Storage Volume, gal	340,000
Storage Detention time	4
Dewatered Sludge Conc., %	16%
Lime Stabilized Sludge, lb/d	7,350
Lime Stab. Sludge Conc., %	25%
Lime Stabilized Sludge, cy/d	15

Table 5-6 Option 2 - Lime Stabilization	
Sludge Thickening	
Thickening method	Decant storage tank or Centrifuge
Percent solids in storage	2.5%
Dewatering	
Dewatering method	Centrifuge
Number of units	2
Lime Stabilization	
Stabilization criteria	pH > 12.0 for 2 hours
	pH > 11.5 for 22 additional hours
Lime dose	0.3 lb CaO/dry lb solids
Lime usage (2015)	1,700 lb/d
Biosolids percent solids	25%
Stabilized cake	15 cubic yards/day
Biosolids Storage (3 months)	
Type	Concrete bunker
Volume	1350 cu.yd.

Cost Evaluation

The capital cost estimates for the two sludge stabilization options are summarized in Table 5-7 Capital costs consist of construction costs for stabilization, thickening/dewatering, and storage facilities. The operation and maintenance costs for the two options are typically similar for this size of wastewater plant. The high power cost of aerobic digestion for Option 1 will offset the cost of the lime for Option 2. For this analysis, it will be assumed that the operation and maintenance cost for both alternatives are the same.

Table 5-7 System Option Capital Cost Estimate Summary		
Item	Option 1 Aerobic Disgestion	Option 2 Lime Stabilization
Aerobic Digestion	$1,300,000	–
Liquid Storage	–	$320,000
Thickening/Dewatering	$800,000	$800,000
Lime Stabilization	–	$350,000
Cake Storage	$500,000	$500,000
Total Capital Cost	$2,600,000	$1,970,000

Noncost Evaluation

O&M Characteristics - The two options are similar regarding O&M characteristics. They both include the centrifuge thickening/dewatering function which is the most O&M intensive component of either option. Option 1 has the O&M associated with aerobic digestion while Option 2 has the lime stabilization equipment. Lime stabilization includes more equipment and therefor could be considered somewhat more O&M intensive.

Performance Reliability - Option 2 may be more reliable because chemical stabilization is more reliable than biological stabilization.

Flexibility - Both options have similar flexibility in that they produce a Class B biosolid cake that can be readily land applied.

Energy Use And Resource Recovery - Option 1 uses significantly more energy due to the aeration requirements of the aerobic digester.

Environmental Impacts - The options have similar environmental considerations including odor concern associated with basic processing and sludge storage. Both include the positive aspect of biosolids reuse through land application.

Table 5-8 Option Noncost Impact Summary		
Impact Criteria	Option 1	Option 2
	Aerobic Digestion	Lime Stabilization
O & M characteristics	+	0
Performance reliability	0	+
Flexibility	0	0
Energy use	-	0
Environmental Impacts	0	0
Overall system option impact	0	+1

Sludge Disposal Option Selection

Option 2, Lime Stabilization, has both the lowest cost and the highest noncost evaluation score. Therefore, Option 2 is recommended for sludge stabilization and disposal.

Biosolids Land Application

This section examines Newports land application program and determines its applicability for the future.

Biosolids Quality

Table 5 -9 summarizes the quality of biosolids currently produced from the Newport plant. The table includes only metals information which is expected to be similar for biosolids from the new plant as well. Nutrient values from the old plant would not be expected to be representative because of the differences in solids processes-anaerobic digestion versus lime stabilization. Table 5-9 indicates that Newport's biosolids, with the possible exception of molybdenum, is an exceptionally clean biosolid.

Table 5-9 Biosolids Quality			
Parameters	Newport Average	EPA Part 503 "Exceptional Quality" Standards	EPA Part 503 "Ceiling Concentrations"
Arsenic (mg/kg)	0	41	75
Mercury (mg/kg)	6.6	17	57
Molybdenum (mg/kg)	20	18[a]	75
Selenium (mg/kg)	0	36	100
Cadmium (mg/kg)	8.2	39	85
Chromium (mg/kg)	41	1,200	3,000
Copper (mg/kg)	449	1,500	4,300
Lead (mg/kg)	80	300	840
Nickel (mg/kg)	35	420	420
Zinc (mg/kg)	1,015	2,800	7,500
[a] = Initially proposed value, currently under revision.			

Land Area Requirement

Land application at agronomic rates is generally based on limiting the amount of nitrogen applied through the biosolids to a value that provides available nitrogen that does not exceed the vegetations uptake capacity. The existing sludge disposal program applies biosolids to ground cover and for soil improvement at the airport. If Newports biosolids are applied at a conservative rate of 100 lbs of total nitrogen per acre, and the biosolids were approximately 3 percent nitrogen, then approximately 620 acres will be required for biosolids disposal in 2020. The airport site includes a total of 1,335 acres with 395 currently used for land application. Although the details of the land application program and associated land application assumptions should be developed during future biosolids management plan preparation, it is reasonable to conclude that more of the site may be required to be used for land application during the life of the program.

Metals Loading Rate and Site Life Analysis

Based on the quality data and projected annual biosolids production, the yearly metals loading rates for arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc were calculated. By comparing the annual metals loading rate with the allowed cumulative loading limits established by EPA and the State of Oregon, the projected site life for the land application of the biosolids was estimated. With the agronomic loading rates of 1.7 tons/acre, the site life was estimated to be 240 years. The limiting metal in the site life analysis was molybdenum. Table 5-10 summarizes the annual loading rate and the projected site life analysis for both the state and federal regulations.

Table 5-10
Cumulative Metals Site Life Analysis

	Agronomic Loading of 1.7 tons/ac-yr (3800 kg/ha--yr)		
Constant	Metal Content (mg/kg)	Cumulative Loading Limits (kg/ha)	Site Life (years)
Arsenic	0	41	--
Cadmium	8.2	39	1,250
Chromium	41	1,200	19,200
Copper	449	1,500	880
Lead	80	300	980
Mercury	6.6	17	680
Molybdenum	20	18	240
Selenium	0	100	--
Nickel	35	420	3150
Zinc	1,015	2,800	720

Biosolids Application

Biosolids will continue to be surface applied to the airport site when weather allows. With the change in sludge type and processing method, future Biosolids Management Plans will have to develop revised site management criteria.

Chapter 6

Environmental Review

This chapter discusses the environmental impacts associated with the alternatives for the wastewater treatment plant site and the alternatives for wastewater conveyance pipelines described in Chapter 5.

Included is a summary of the project pre-application meeting where the project was introduced to numerous regulatory agencies at a State-Wide Interagency Meeting (SWIM) on April 18, 1995; an assessment of potential environmental issues concerning the various permitting requirements of the agencies; and summary comparisions of potential environmental impacts for the alternative wastewater treatment plant sites and wastewater conveyance pipeline routes.

A. SUMMARY OF PROJECT PRE-APPLICATION SWIM MEETING.

The meeting was held in the Corps of Engineers office at the Robert Duncan Plaza in Portland, Oregon. Agencies represented were:

1. Corps of Engineers (COE)
2. Oregon Department of Fish and Wildlife (ODFW)
3. National Marine Fisheries Service (NMFS)
4. Oregon Division of State Lands (DSL)
5. Oregon Department of Environmental Quality (DEQ)
6. Oregon Parks and Recreation Department (State Parks)
7. United States Fish and Wildlife Service (USFWS)
8. Oregon Department of Land Conservation and Development (DLCD)
9. City of Newport

Making the presentation were:

1. City of Newport
2. Fuller and Morris Engineering, Inc.
3. CH2M HILL

The purposes for the meeting were to introduce the upcoming project to the agencies that will be considering environmental issues during project permitting, and to discuss early environmental concerns they could foresee for the different project alternatives.

The need for the project was presented to the group and each alternative for wastewater treatment plant site and converyance pipeline routing was described.

Much of the discussion centered around the proposed pipelines crossing Yaquina Bay and the routing of the pipelines from the bay to the preferred treatment plant site in South Beach. Pipeline construction methods were discussed. The cut and cover method of pipeline construction, where a trench is excavated from the ground surface and the pipes are installed into it, then backfilled with material, was discussed for constructing pipelines on the north side and the south side of the actual bay waterway crossing. Directional drill horizontal boring was the construction method preferred for installing the pipes under the bay. The directional drill method would allow the pipes to be installed under the bay without disturbing the bay bottom or the rock jetties that line both sides of the bay.

It was pointed out to the group that the City Staff and the City's Wastwater Advisory Committee had considered the different alternatives for treatment plant site and conveyance pipeline routing based on technical feasibility, potential environmental impacts, and costs, and had selected a preferred alternative for the project, that being Alternative C2 as described in Chapter 5 and Chapter 8.

The agencies early concerns were:

1. Potential impacts on wetlands, especially in the South Beach State Park area.
2. Potential impacts on fish (in particular, herring spawning areas and rock oyster beds within the bay that might be affected by some of the alternative crossing locations).
3. Impacts of construction on vegetation and wetlands.
4. Project effects on hydrology and drainage.
5. NMFS and ODFW concurred that directional drilling was preferred to cut and cover trenching across Yaquina Bay.

The preliminary overall project schedule was shared with the group to inform them of the permitting and construction time frames.

B. ASSESSMENT OF POTENTIAL ENVIRONMENTAL ISSUES AND CONSIDERATIONS

Table 6-1 lists the various permits and approvals that will be required for implementation of the selected wastewater facilities alternative. Table 6-2 and Table 6-3 compare potential environmental impacts of the wastewater facilities alternatives.

Regulatory Overview

This regulatory overview provides a summary of the major regulatory approvals required for the Yaquina Bay and ocean beach crossings associated with the conveyance pipeline alternatives and the wastewater treatment plant sites evaluated in the Newport Wastewater Facilities Plan - 1995 Update.

A brief statement regarding "potential risk" is included for each major approval. "Potential risk" for the purposes of this discussion, refers to the relative difficulty of receiving the subject permit or approval based on current project concepts and information.

Federal Regulations

Army Corps of Engineers Section 10 permit

The Section 10 (Rivers and Harbors Act) permit is required for any structure placed within a navigable waterway of the U.S. It is assumed that a bay crossing will require a Section 10 Permit. Because a Section 404 permit will also be required for the proposed project (see below), this Section 10 permit will be combined with the 404 permit, by the Corps, for processing and permitting purposes. The permit review process will include an evaluation of potential impacts to the navigability of the river. The environmental reviews typically associated with this permit will be nested in the 404 reviews, which are described below.

Potential Risk- There is little risk that Section 10 permit standards and requirements can not be satisfactorily met, assuming the pipeline placement will be sufficiently below the federal navigation channel to avoid interference with future maintenance dredging.

Corps of Engineers Section 404 (Wetlands) Permit

The Clean Water Act Section 404 (wetlands) permit administered by the Corps of Engineers will be required for any bay crossing alternatives because (it is assumed) there will be filling of materials into wateways of the U.S. (33 CFR 323.2(g)). In addition, any other wetlands determined to be "jurisdictional" along the pipeline routes that would require filling would also require permitting (one permit will cover all wetland impact activities).

The Section 404 permit process requirements include: broadly distributed public notice for review and comment; a National Environmental Policy Act (NEPA) review; Endangered Species Act (ESA) review; coordination with the state and federal fish and wildlife agencies; a 401 Certification from Oregon Department of Environmental Quality (DEQ); a coastal zone management determination of consistency from Oregon Department of Land Conservation and Development and a State Historic Preservation Office (SHPO) clearance.

The discretionary permit is issued or not issued based upon a "public interest" review of the projects potential social and environmental consequences. The federal evaluation has three primary "tests" which are used in the permit evaluation process:

- The need for the (fill) action
- the alternatives to the fill action (locational and design alternatives that may have less impact on the evironment)
- The minimization of impacts caused by the (fill) action (mitigation).

The applicant must demonstrate that all wetland impacts have been avoided to the extent practicable. Having met this test, the applicant must minimize all remaining unavoidable impacts. The applicant will then be required to compensate (mitigate) for the unavoidable impacts (that is, create replacement wetlands, offset potential impacts to fish resources, etc.)

The Corps must balance many factors during their permit review, including economic, social, fish and wildlife values, floodplain management, recreation, and "in general the needs and welfare of the public".

The permit application is a joint filing in Oregon, for the Corps and the Oregon Division of State Lands DSL). The application must include a description of the wetland and other aquatic areas to be impacted, the quantities of the proposed fills and a description of the purpose of the alteration and activities at the site(s). A public notice is prepared and broadly distributed by the Corps (and DSL in Oregon). The permit application will trigger a National Envioronmental Policy Act (NEPA) review, which could result in either an Enviornmental Assessment process or an Environmental Impact Statement (EIS) process. The NEPA environmental reviews are extensive and will include all aspects of the fish and wildlife and related resources (water quality, etc).

Potential Risk - This is a key permit because of its broad range of environmental review. The Corps will not issue this permit without the local and state approvals in place. There is some risk concerning this permit. The Corps is not inclined to issue this permit if there is strong opposition to the project by a state or federal resource agency or the public. Project alternatives will be closely reviewed and if there are potentially significant environmental impacts the Corps may request that an alternative to the preferred action be pursued.

Endangered Species Act (ESA)

The federal ESA requires all federal agencies to insure that any action authorized, funded, or carried out by such agency will not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat critical to the survival of the species (Sec. 7(a)(2)). The Corps, as a part of their permit process, is required to request information from U.S. Fish and Wildlife (USFWS) and National Marine Fisheries Service (NMFS) regarding any listed species or species proposed for listing that may be present in the areas of the proposed project. (NMFS is responsible for the anadromous fish (ocean migrating) and USFWS is reasponsible for all other fish and wildlife and plant species). If species are so identified by NMFS or USFWS, consultation is required with that agency. The applicant would be required to prepare a Biological Assessment (Assessment). The Assessment includes an analysis of all "reasonable and prudent" alternative actions to the proposed action available to the sponsor. The Assessment must describe in detail the nature and extent of the potential impacts of the action on the species of concern.

After reviewing the Assessment, NMFS (and USFWS if appropriate) will issue a Biological Opinion (Opinion) which states whether the project is likely to jeopardize the continued existence of the species or result in an unacceptable level of destruction or adverse modificaiton of the species critical habitat. A jeopardy opinion by the agency would block the project.

It may be appropriate to prepare an Assessment for fish, wildlife and plants for this project that includes species that may be proposed for listing in the foreseeable future, even though the law does not require it, to provide more certainty that the project can meet compliance with the ESA.

Potential Risk - Though the ESA does present the strictest compliance requirements of any of the envionmental laws and regulations, the project can probably find an acceptable project design to avoid adverse impacts to an endangered species. However it will be necessary to undertake the necessary agency coordination to ensure thorough addressment of listed or potentially listed species.

Fish and Wildlife Coordination Act of 1934

This act does not require a specific permit or approval, but does require that the Federal agencies involved in permitting or approvals coordinate with state and federal fish and wildlife agencies. The coordination is typically informal and the Corps, under the Section 404 program, has a well established procedure for coordinaiton with respective agencies. USFWS and NMFS are the federal agencies with which to cooordinate, and the Oregon Department of Fish and Wildlife (ODFW) is the state agency.

Potential Risk- This Act poses no particular risk to the approval process. It does however, necessitate the applicant to consider all concerns expressed by these agencies.

Oregon Regulations

State 401 Certification

The Clean Water Act Section 401 Certification is administered by DEQ for the U.S. Environmental Protection Agency (EPA). The 401 Certification of compliance with state water quality standards is required before the Corps can issue their permits. If the state agency determines that the proposed action will not meet state water quality standards, the 401 Certification is denied and the Corps will not issue the 404 Permit.

The potential water quality impacts of construction activities associated with pipelines and related structures in the bay would receive close evaluation. Trenching construction (versus tunnel-bore) poses potential problems for compliance with water quality standards because of turbidity impacts.

Potential Risk - Certification for the tunnel-bore construction is preffered by several agencies. The permit will require specific construction procedures to be followed and will define (in concert with ODFW and NMFS) the "construction windows" for any in-water work.

State Removal and Fill Permit

The state removal and fill law is administered by DSL. The law requires a permit for any removal or fill activities of 50 cubic yards or more in a waterway of the state (ORS 196). The permit requirements and processes are similar to those of the Section 404 (wetlands) permit administered by the Corps (described above). The actual application and processing are combined by the Corps and DSL in Oregon by administrative agreement. The DSL review would include consultation with ODFW, DEQ, the Department of Land Conservation and Development, the local jurisdiciton (City of Newport), and possibly other agencies. The permit does not (generally) impose any more standard or requirements than those of the Section 404 permit.

Potential Risk - The substantive requirements of this permit appear to be achievable. However, there is some risk with the broad public review this process will receive.

Ocean Shore Improvement Permit

The Department of State Parks and Recreation administers this permit, which is required for any pipeline or other conduit that is to be placed over, along, across, or under the ocean shore (OAR 736-20-040). The Department will determine if the proposed pipeline "will in any way be detrimental to the interests and safety of the public and the preservation of the economic, scenic, and recreational values of the ocean shore" (OAR 736-20-04(3)). The State Parks review includes consultation with ODFW, DSL, Oregon Geology and Mining Industries, Oregon Health Division, local jurisdictions (City of Newport and Lincoln County), and possibly other agencies.

In addition to the Ocean Shore Improvement permit, State Parks, as landowner, would issue an easement or right-of-way for the pipeline through South Beach State Park. This may involve approval by the State Parks and Recreation Commission.

Potential Risk - There is some risk with this permit because of potential concerns raised about construction activities on the beach and impacts on vegetation. However, the concerns can, for the most par, be ddressed through the evaluaiton process.

Coastal Zone Management Act Consistency

The proposed project is located within the coatal zone and is within the jurisdiciton of the Coastal Zone Management Act (CZMA). The CZMA requires that any applicant for a federal license or permit to conduct an activity affecting land or water uses in the coastal zone must certify that the proposed activity will comply with the Oregon Coastal Management Program. The Oregon Department of Land Conservation and Development (DLCD) will be asked to concur that the proposed action is consistent with the Oregon Coastal Management Program.

Potential Risk - DLCD makes the final decision on whether or not federal permits are consistent with the Oregon Coastal Management Program. However, DLCD usually relies on decisions made by the affected local government (city of Newport) and state permit agency, such as DSL.

Newport Conditional Use Permit

The Newport Comprehensive Plan has the following designation for the Yaquina Bay and adjoining lands: Estuarine Management Unit Districts. Placement of a pipeline within these districts would be subject to standards outlined in Section 2-2-13 of Newport's Zoning Code. this section provides guidelines for development within the estuary; identifies allowable uses, activities, and structures; and designates development, conservation, and natural management units within the district.

The preferred pipeline alternative would be located in management units 1, 3, and 4. The pipeline may be allowed as a conditional use, subject to apprval by the Newport Planning Commission. To receive a conditional use permit, the proposed project must meet the following requirements outlined in Seciton 2-2-13.010:

- Compatible with objectives and policies of the management classification.
- Complies with applicable esturine use standards outlined in Section 2-2-3.015 through 2-2-3.090.
- Complies with all policies specific to the individual management unit outlined in the Newport Comprehensive Plan and Section 2-2-13.100.
- Complies with any other special condition which may be attached during the review process.
- Consistent with resource capabilities of the area as defined by Section 2-2-.016.
- Considers cumulative impacts of the proposed use.

The proposed South Beach Wastewater Treatment Plant site is located in the City of Newport's "Light Industrial Zoning District" (I-1). This designation will allow development of the proposed project as a conditioal use, subject to the standards and conditions outlined in the permit. Terms, criteria, and procedures for obtaining a conditional use permit are outlined in Section 2-5-3.

Potential Risk- There is some risk because local permits are relatively easy to appeal and move through the appeal process to LUBA. The criteria for permit review and evaluation may need a careful legal review.

Permits and Approvals

Table 6-1 lists the various permits and approvals that will be required for implementation of the selected wastewater facilities alternative.

Alternatives Comparison for Potential Environmental Impacts

Table 6-1
Permits/Approvals List

Type	Agency	Regulatory Authority	Studies Required	Permit Approval Time Frame	Notes
Section 10 (Waterway structures Permit)	Corps of Engineers	Rivers and Harbors Act	Navigation Maintenance and safety	12 to 24 months	Permit processes and reviews are combined with the Section 404 Permit process
Section 404 (Wetlands) Permit	Corps of Engineers	Section 404 Clean Water Act	• Wetlands delineation • Mitigation plan • Functions and values assessment	18 to 36 months	Joint application form with Oregon DSL Removal and Fill Permit. Would trigger NEPA review, SHPO clearance, ESA review, fish and wildlife coordination, and 401 Certification.
Endangered Species Protection	USFWS, NMFS, ODFW,,	Federal Endangered Species Act, Public Law 93-205 and OR State Endangered Species Act, ORS 496	• Identification of any occurrences of listed or proposed species in project area • Biological assessment for any potentially affected species • Possible assessment of sensitive species not yet listed or proposed for listing	12 to 36 months	Corps must initiate ESA "review" with appropriate agency(ies). Corps may need a Biological Opinion and "clearance" from USFWS and NMFS before authorizing the proposed action.
Fish and Wildlife Coordination	U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), OR Dept. of Fish and Wildlife	Fish and Wildlife Coordination Act of 1934	• Consultations with fish and wildlife agencies • Project impacts on fish and wildlife resources, mitigation recommendations.	See text	This coordination occurs through the federal permitting agencies (Corps). It provides direct input into the decision process by the state and federal fish and wildlife agencies.
401 Certification	Oregon Dept. of Environmental Quality	Section 401 Clean Water Act	• Downstream water quality compliance • Flow impacts assessment • In-water construction impacts and restrictions	6 to 24 months	Federal permits cannot be issued without 401 certification.
Oregon Removal and Fill Permit	Oregon Division of State Lands	ORS 196.800-990	• Wetlands delineation • Wetlands mitigation plan • Functions and values assessment	12 to 24 months	Joint application with Corps of Engineers Section 404 permit.

Table 6-1
Permits/Approvals List

Type	Agency	Regulatory Authority	Studies Required	Permit Approval Time Frame	Notes
Ocean Shore Permit	Department of Parks and Recreation	ORS 390.715 OAR 736-20-040	• Protection of public safety and use • Public interest • Discussion of native vegetation protection and/or mitigation	3 to 6 months	• Public hearing required if Parks receives 10 or more requests.
Conditional Use Permits	City of Newport	Newport Zoning Code Section 2-5-3	• Development may be allowed if consistent with allowed uses and adverse impacts are mitigated	2 months	• Subject to estuarine use standards outlined in Sections 2-2-13.015 to 2-2-13.090.
Environmental Impact Statement	Corps of Engineers	National Environmental Policy Act	• Preparation of an EA or an EIS	18 to 36 months	Corps determine the "threshold" re EA or EIS requirement.
Historic Preservation Office Approval	State Historic Preservation Office	Section 106 Historic Preservation Act 1966; Executive Order 11593	• Archaeological and historical resources reconnaissance and state records review	12 months	Work would be coordinated through NEPA process.
Oregon Coastal Management Program Consistency Determination	Department of Land Conservation and Development	Coastal Zone Management Act Section 307	• No additional studies are required	2 months	DLCD will review the proposed action for consistency with the Oregon Coastal Management Program.

Alternatives Comparison for Potential Environmental Impacts

Table 6-2 and Table 6-3 compare potential environmental impacts of the wastewater facilities alternatives.

The following tables summarize potential environmental impacts based on existing available information. Information presented in these tables is to allow comparison of alternatives regarding their relative impacts to the environment. Additional future environmental analysis may be required for the selected alternative.

Table 6-2
Summary Comparison of Potential Environmental Impacts for Wastewater Treatment Plant Sites

Elements	New South Beach Plant (Preferred Alternative)	Expand Existing Plant
Wetlands	No impacts to wetlands are anticipated.	Potential impacts to riparian areas adjacent to existing site.
Floodplains	No Impact	No Impact
Agricultural Lands	No Impact	No Impact
Wild and Scenic Rivers	No Impact	No Impact
Fish and Wildlife	Potential wildlife habitat disturbance. Wildlife surveys would be conducted as part of the environmental analysis. Mitigation measures would be developed to minimize adverse impacts.	No impacts to fish and wildlife habitat are anticipated. Proposed area for plant expansion is in an existing disturbed urban area.
Threatened and Endangered Species	Informal consultations with agencies indicate that no threatened and endangered species will be impacted. However, a T&E survey will be conducted as part of the environmental analysis.	Same as preferred alternative.
Historical and Cultural Resources	No historical and cultural resources have been identified at this time. Before project construction, a data base search through the State Historic Preservation Office will be conducted to identify any significant cultural resources.	Same as preferred alternative.
Other Unique or Sensitive Resources	There are no known other unique or sensitive resources in the plant area. However, further field investigations will be necessary to confirm.	Same as preferred alternative.

Table 6-3

Summary Comparison of Potential Environmental Impacts for Conveyance Pipeline Alternatives

Elements	Alternative A	Alternative B	Alternative C (Preferred Alternative)	Alternative D
Wetlands	Pipeline will be aligned to avoid or minimize impact to wetland areas.	Pipeline will be aligned to avoid or minimize impact to wetland areas.	Pipeline will be aligned to avoid or minimize impact to wetland areas.	Pipeline will be aligned to avoid or minimize impact to wetland areas.
Floodplains	NA	NA	NA	NA
Agricultural Lands	NA	NA	NA	NA
Wild and Scenic Rivers	NA	NA	NA	NA
Fish and Wildlife	It appears that the pipeline can be aligned to avoid or minimize impacts to fish and wildlife habitat.	It appears that the pipeline can be aligned to avoid or minimize impacts to fish and wildlife habitat.	Use of directional boring would minimize impacts to aquatic resources. Trenching activities in South Beach area will temporarily disturb certain habitats, but final alignment could minimize or avoid permanent impacts.	It appears that the pipeline can be aligned to avoid or minimize impacts to fish and wildlife habitat.
Threatened and Endangered Species	Same as preferred alternative.	Same as preferred alternative.	Informal consultations with agencies indicate that no T&E species will be impacted. However, a T&E survey will be conducted as part of the environmental analysis.	Same as preferred alternative.
Historical and Cultural Resources	Same as preferred alternative.	Same as preferred alternative.	No historical and cultural resources have been identified at this time. Before project construction, a data base search through the State Historic Preservation Office will be conducted to identify any significant resources.	Same as preferred alternative.
Other Unique or Sensitive Resources	Potential disturbance of OSU Marine Science Center and Aquarium activities. Construction activities would be scheduled to minimize any adverse impacts.	Same as Alternative A.	Potential temporary disturbance of 50-foot-wide corridor through South Beach State Park and beach north of Yaquina Bay during pipeline construction, 3-6 months. Construction activities would be coordinated with state parks trail project to minimize adverse impacts on beach and park activities and to avoid unnecessary disturbances of vegetation.	Same as Alternative A.

Chapter 7

COST ESTIMATES

This chapter presents the estimated capital cost and the present worth amount for annual operation and maintenance costs for the planning period from year 2000 to year 2020.

A. TOTAL PRESENT WORTH COST COMPARISONS

A total present worth amount is shown for each of the options of Alternatives "A" "B", "C" and "D" for economic comparison.

The cost estimates are shown in Tables 7-1 through Table 7-8. A cost summary comparison is shown in Table 7-9.

It should be noted that although Alternative "D2" indicates the lowest total present worth for the planning period up to year 2020, it does not reflect the major cost of building new expanded wastewater treatment facilities on a new site when the WWTP capacity is exceeded beyond year 2020. It is conceivable that a project similar to Alternative C2 would be needed following Alternative D2 making Alternative D2 significantly more expensive than constructing Alternative C2 initially.

Construction, operation, maintenance, and replacement cost opinions were developed to allow comparison of alternatives. The costs are order - of - magnitude estimates developed using cost curves and actual project construction cost data where available. The cost estimates are not based on detailed engineering data and should be considered to have an expected accuracy between + 30 percent or - 15 percent. Final project costs will depend on a variety of factors such as the final project scope, market conditions at the time of project construction bidding, and the timing of the implementation schedule. All costs are presented in 1995 dollars.

Table 7-1

Alternative A - 1
Resembles 1988 Master Pan
Uses New Ocean Outfall
Existing Plant: Use @ 1.5 mgd until 2010
New Plant: 2.5 mgd in 2000, 2.5 mgd in 2010

Capital Costs - 1995$ (millions)			
Element	Description	2000	2010
1	Northside Lift Station	0.84M	
2	18" Force Main	0.17M	
3	24" Sewer	0.28M	
4	Bay Front Lift Station	0.91M	
5	24" Force Main	0.16M	
6	24" Bay Crossing	1.73M	
7	MSC Lift Station	0.89M	
8	24" Force Main	0.72M	
9	30" Sewer	0.57M	
10	Southbeach Lift Station	1.34M	
11	30" Force Main	0.47M	
12.1	Southbeach WWTP -2.5 mgd, 2000	6.65M	
12.2	Southbeach WWTP - 2.5 mgd expansion, 2010		6.65M
13	30" Effluent Pipe	0.81M	
14	30" Ocean Outfall	7.00M	
	Subtotal	22.54M	6.65M
	+Construction Contingencies @ 15%	3.38M	1.00M
	Subtotal	25.92M	7.65M
	+ Engineering and Admin @ 18%	4.67M	1.38M
	Total Capital Cost	30.59M	9.03M

O&M Costs for Period 2000-2020 (Present Worth, 1995$) millions			
Element	Description	2000-2009	2010-2020
Existing WWTP			
	Personnel	1.09M	0
	Electricity	0.26M	0
	Chemicals	0.65M	0
	Equip Repair	0.26M	0
	Capital Outlay	0.43M	0
	Supplies	0.26M	0
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricity	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	0.55M	0.81M
	Electricity	0.35M	0.32M
	Chemicals	0.26M	0.19M
	Equip Repair	0.26M	0.19M
	Capital Outlay	0.43M	0.32M
	Supplies	0.26M	0.19M
New Sewer System			
	Electricity	0.55M	0.52M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
	Total O&M Cost	$11.0M	$6.5M
	TOTAL PRESENT WORTH OF OPTION	$57.12M	

Table 7-2

Alternative A-2
Resembles 1988 Master Plan
Uses New Ocean Outfall
Existing Plant: Abandon in 2000
New Plant: 5 mgd in 2000
Capital costs - 1995$ (Millions)

Element	Description	2000	2010
1	Northside Lift Station	0.84M	
2	18" Force Main	0.17M	
3	24" Sewer	0.28M	
4	Bay Front Lift Station	0.91M	
5	24" Force Main	0.16M	
6	24" Bay Crossing	1.73M	
7	MSC Lift Station	0.89M	
8	24" Force Main	0.72M	
9	30" Sewer	0.57M	
10	Southbeach Lift Station	1.34M	
11	30" Force Main	0.47M	
12	Southbeach WWTP	11.00M	
13	30" Effluent Pipe	0.81M	
14	30" Ocean Outfall	7.00M	
	Subtotal	$26.89M	$0.0M
	+Construction Contingencies @ 15%	4.03M	0.0M
	Subtotal	30.92M	0.0M
	+Engineering and Admin @ 18%	5.57M	0.0M
	Total Capital Cost	36.49M	0.0M

O&M COSTS FOR PERIOD 2000-2020
(Present Worth, 1995$) millions

Element	Description	2000-2009	2010-2020
Existing WWTP			
	Personnel	0	0
	Electricity	0	0
	Chemicals	0	0
	Equip Repair	0	0
	Capital Outlay	0	0
	Supplies	0	0
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricity	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	1.09M	0.81M
	Electricity	035M	0.32M
	Chemicals	0.26M	0.19M
	Equip Repair	0.26M	0.19M
	Capital Outlay	0.43M	0.32M
	Supplies	0.26M	0.19M
New Sewer System			
	Electricity	0.54M	0.52M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
	TOTAL O&M COST	$8.5M	$6.5M
	TOTAL PRESENT WORTH OF OPTION	$51.49M	

Table 7-3

Alternative B-1
Inner Bay Crossing
Uses Existing Ocean Outfall
Existing Plant: Use @ 1.5 mgd until 2010
New Plant: 2.5 mgd in 2000, 2.5 mgd in 2010

Capital Costs - 1995$ (Millions)			
Element	Description	2000	2010
1	Northside Lift Station	0.84M	
2	18" Force Main	0.17M	
3	24" Sewer	0.28M	
4	Bay Front Lift Station	0.91M	
5	24" Force Main	0.16M	
6	24" Bay Crossing	1.73M	
7	MSC Lift Station	0.89M	
8	24" & 30" Pipes	0.72M	
9	2 - 30" Sewers	0.57M	
10	Southbeach Lift Station	1.34M	
11	2 - 30" Pipes	0.47M	
12.1	Southbeach WWTP - 2.5 mgd, 2000	6.65M	
12.2	Southbeach WWTP - 2.5 mgd expansion, 2010		6.65M
13	30" Effluent Pipe	2.40M	
14	30" Bay Crossing	1.60M	
15	30"/24" Effluent Pipe	0.16M	
16	24" Effluent Pipe to exist Outfall	0.58M	
	Subtotal	19.47M	$6.65M
	+Construction Contingencies @ 15%	2.92M	1.00M
	Subtotal	22.39M	7.65M
	+ Engineering and Admin @ 18%	4.03M	1.38M
	Total Capital Cost	26.42M	9.03M
O&M COSTS FOR PERIOD 2000-2020 (Present Worth, 1995$) millions			
Element	Description	2000-2009	2010-2020
Existing WWTP	Personnel	1.09M	0
	Electricity	0.26M	0
	Chemicals	0.65M	0
	Equip Repair	0.26M	0
	Capital Outlay	0.43M	0
	Supplies	0.26M	0
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricity	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	0.55M	0.81M
	Electricity	0.35M	0.32M
	Chemicals	0.26M	0.19M
	Equip Repair	0.26M	0.19M
	Capital Outlay	0.43M	0.32M
	Supplies	0.26M	0.19M
New Sewer System			
	Electricity	0.55M	0.52M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
	TOTAL O&M COST	$11.0M	$6.5M
	TOTAL PRESENT WORTH OF OPTION		$52.95M

Table 7-4

Alternative B-2
Inner Bay Crossing
Uses Existing Ocean Outfall
Existing Plant: Abandon in 2000
New Plant: 5 mgd in 2000

Capital Costs - 1995$ millions			
Element	Description	2000	2010
1	Northside Lift Station	$0.84M	
2	18" Force Main	0.17M	
3	24" Sewer	0.28M	
4	Bay Front Lift Station	0.91M	
5	24" Force Main	0.16M	
6	24" Bay Crossing	1.73M	
7	MSC Lift Station	0.89M	
8	24" & 30" Pipes	0.72M	
9	2 - 30" Sewers	0.57M	
10	Southbeach Lift Station	1.34M	
11	2 - 30" Pipes	0.47M	
12	Southbeach WWTP	11.00M	
13	30" Effluent Pipe	2.40M	
14	30" Bay Crossing	1.60M	
15	30"/24" Effluent Pipe	0.16M	
16	24" Effluent Pipe to existing Outfall	0.58M	
	Subtotal	23.82M	$0.0M
	+Construction Contingencies @ 15%	3.57M	0.0M
	Subtotal	27.39M	0.0M
	+Engineering and Admin @ 18%	4.93M	0.0M
	Total Capital Cost	32.32M	0.0M
	O&M Cost for Period 2000-2020 (Present Worth, 1995$) millions		
Element	Description	2000-2009	2010-2020
Existing WWTP			
	Personnel	0	0
	Electricity	0	0
	Chemicals	0	0
	Equip Repair	0	0
	Capital Outlay	0	0
	Supplies	0	0
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricity	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	1.09M	0.81M
	Electricity	0.35M	0.32M
	Chemicals	0.26M	0.19M
	Equip Repair	0.26M	0.19M
	Capital Outlay	0.43M	0.32M
	Supplies	0.26M	0.19M
New Sewer System			
	Electricity	0.54M	0.52M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
	TOTAL O&M COST	$8.5M	$6.5M
	TOTAL PRESENT WORTH OF OPTION		47.32M

Table 7-5

Alternative C-1
Outer Bay Crossing
Uses Existing Ocean Outfall
Existing Plant: Use @ 1.5 mgd until 2010
New Plant: 2.5 mgd in 2000, 2.5 mgd in 2010

	Capital Costs - 1995$ (Millions)		
Element	Description	2000	2010
1	Nye Beach Lift Station	0.91M	
2	2-24" Pipes at Beach Top	2.12M	
3	Bay Crossing - 48" Bore	3.70M	
4	2-24" Pipes @ Beach Top	2.50M	
5	Southbeach Lift Station	1.34M	
6	2-30" Pipes	0.95M	
7.1	Southbeach WWTP - 2.5 mgd, 2000	6.65M	
7.2	Southbeach WWTP - 2.5 mgd Expansion, 2010		6.65M
8	MSC Lift Station	0.30M	
9	12" Force Main	0.36M	
10	18" Sewer	0.35M	
11	Rehabilitate Bay Front Lift Station	0.16M	
	Subtotal	19.34M	6.65M
	+Construction Contingencies @ 15%	2.90M	1.00M
	Subtotal	22.24M	7.65M
	+ Engineering and Admin. @ 18%	4.00M	1.38M
	Total Capital Cost	26.24M	9.03M
	O&M Costs for Period 2000-2020 (Present Worth, 1995$) millions		
Element	Description	2000-2009	2010-2020
Existing WWTP			
	Personnel	1.09M	0
	Electricity	0.26M	0
	Chemicals	0.65M	0
	Equip Repair	0.26M	0
	Capital Outlay	0.43M	0
	Supplies	0.26M	0
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricty	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	0.55M	0.81M
	Electricity	0.35M	0.32M
	Chemicals	0.26M	0.19M
	Equip Repair	0.26M	0.19M
	Capital Outlay	0.43M	0.32M
	Supplies	0.26M	0.19M
New Sewer System			
	Electricity	0.55M	0.52M
	Equip Repair	0.32M	0.24M
	Capital Outlay	0.43M	0.32M
	Supplies	0.58M	0.43M
	TOTAL 0&M COST	$10.3M	$6.0M
	TOTAL PRESENT WORTH OF OPTION	51.57M	

Table 7-6

Alternative C - 2
Outer Bay Crossing
Uses Existing Ocean Outfall
Existing Plant: Abandon in 2000
New Plant: 5 mgd in 2000

Capital Costs - 1995$ (Millions)			
Element	Description	2000	2010
1	Nye Beach Lift Station	0.91M	
2	2-24" Pipes at Beach Top	2.12M	
3	Bay Crossing - 48" Bore	3.70M	
4	2-24" Pipes @ Beach Top	2.50M	
5	Southbeach Lift Station	1.34M	
6	2-30" Pipes	0.95M	
7	Southbeach WWTP	11.00M	
8	MSC Lift Station	0.30M	
9	12" Force Main	0.36M	
10	18" Sewer	0.35M	
11	Rehabilitate Bay Front Lift Station	0.16M	
	Subtotal	23.69M	$0.0M
	+ Construction Contingencies @ 15%	3.55M	0.0M
	Subtotal	27.24M	0.0M
	+ Engineering and Admin @ 18%	4.90M	0.0M
	Total Capital Cost	32.14M	0.0M
	O&M Costs for Period 2000-2020 (Present Worth, 1995$) millions		
Element	Description	2000-2009	2010-2020
Existing WWTP			
	Personnel	0	0
	Electricity	0	0
	Chemical	0	0
	Equip Repair	0	0
	Capital Outlay	0	0
	Supplies	0	0
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricity	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	0.82M	0.61M
	Electricity	0.60M	0.45M
	Chemicals	0.26M	0.19M
	Equip Repair	0.26M	0.19M
	Capital Outlay	0.43M	0.32M
	Supplies	0.26M	0.19M
New Sewer System			
	Electricity	0.54M	0.52M
	Equip Repair	0.32M	0.24M
	Capital Outlay	0.43M	0.32M
	Supplies	0.58M	0.43M
	TOTAL O&M COST	$7.9M	$6.0M
	TOTAL PRESENT WORTH OF OPTION		46.04M

Table 7-7

Alternative D-1
Inner Bay Crossing
Uses Existing Ocean Outfall
Existing Plant: 4.0 mgd in 2000, Abandon in 2010
New Plant: 5 mgd in 2010

	Capital Cost - 1995$ (Millions)		
Element	Description	2000	2010
1	Expand Exist. Northside WWTP	$6.60M	
2	2-18" Pipes	0.72M	
3	Southbeach Lift Station	0.63M	
4	18" Force Main	0.54M	
5	Bay Crossing-24" Bore	1.73M	
6	18" Force Main	0.14M	
7	Bay Front Lift Station	0.75M	
8	24" Force Main	0.55M	
9	24" Effluent disposal Pipe	0.59M	
10	Build Alternative C2		23.69M
	Subtotal	12.25M	23.69M
	+ Construction Contingencies @ 15%	1.84M	3.55M
	Subtotal	14.09M	27.24M
	+ Engineering and Admin @ 18%	2.54M	4.90M
	Total Capital Cost	16.63M	32.14M
	O&M Costs for Period 2000-2020 (Present Worth, 1995$)millions		
Element	Description	2000-2009	2010-2020
Existing WWTP			
	Personnel	1.53M	
	Electricity	0.36M	
	Chemical	0.91M	
	Equip Repair	0.36M	
	Capital Outlay	0.60M	
	Supplies	0.36M	
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricity	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	0	0.61M
	Electricity	0	0.45M
	Chemicals	0	0.19M
	Equip Repair	0	0.19M
	Capital Outlay	0	0.32M
	Supplies	0	0.19M
New Sewer System			
	Electricity	0.22M	0.21M
	Equip Repair	0.16M	0.12M
	Capital Outlay	0.22M	0.16M
	Supplies	0.29M	0.21M
	TOTAL O&M COST	8.4M	$5.2M
	TOTAL PRESENT WORTH OF OPTION		62.37M

Table 7-8

Alternative D-2 Inner Bay Crossing Uses Existing Ocean Outfall Existing Plant: 5 mgd in 2000, Abandon in 2020 New Plant: None			
Capital Costs - 1995$ (Millions)			
Element	Description	2000	2010
1	Expand Exist. Northside WWTP	$8.80M	
2	2-18" Pipes	0.72M	
3	Southbeach Lift Station	0.63M	
4	18" Force Main	0.54M	
5	Bay Crossing - 24" Bore	1.73M	
6	18" Force Main	0.14M	
7	Bay Front Lift Station	0.75M	
8	24" Force Main	0.55M	
9	24" Effluent Disposal Pipe	0.59M	
	Subtotal	$14.45M	$0.0M
	+ Construction Contingencies @ 15%	2.17M	0.0M
	Subtotal	16.62M	0.0M
	+ Engineering and Admin @ 18%	2.99M	0.0M
	Total Capital Cost	19.61M	0.0M
O&M Costs for Period 2000-2020 (Present Worth, 1995$)millions			
Element	Description	2000-2009	2010-2020
Existing WWTP			
	Personnel	1.53M	2.04M
	Electricity	0.36M	0.49M
	Chemicals	0.91M	1.22M
	Equip Repair	0.36M	0.49M
	Capital Outlay	0.60M	0.81M
	Supplies	0.36M	0.49M
Existing Sewer System			
	Personnel	1.09M	0.81M
	Electricity	0.30M	0.22M
	Equip Repair	0.47M	0.35M
	Capital Outlay	0.65M	0.48M
	Supplies	0.86M	0.64M
New WWTP			
	Personnel	0	0
	Electricity	0	0
	Chemicals	0	0
	Equip Repair	0	0
	Capital Outlay	0	0
	Supplies	0	0
New Sewer System			
	Electricity	0.22M	0.21M
	Equip Repair	0.16M	0.12M
	Capital Outlay	0.22M	0.16M
	Supplies	0.29M	0.21M
	TOTAL O&M COST	8.4M	8.74M
	TOTAL PRESENT WORTH OF OPTION		36.75M

Table 7-9

Cost Summary Comparison (Total Present Worth)

Discount Rate = 3%

Alternatives	A-1	A-2	B-1	B-2	C-1	C-2	D-1	D-2
Description	Resembles 1988 Master Plan		Inner Bay Crossing		Outer Bay Crossing		Expand Existing Plant	
Outfall	New		Existing		Existing		Existing	
Existing Plant	Use until 2010	Abandon	Use until 2010	Abandon	Use until 2010	Abandon	Expand to 4.0 mgd	Expand to 5 mgd
New Plant Year 2000	2.5mgd	5mgd	2.5mgd	5mgd	2.5mgd	5mgd	None	None
New Plant Year 2010	2.5mgd	None	2.5mgd	None	2.5mgd	None	5mgd	
Capital cost year 2000	30,590,000	36,490,000	26,420,000	32,320,000	26,240,000	32,140,000	16,630,000	19,610,000
Capital Cost Year 2010	9,030,000	0	9,030,000	0	9,030,000	0	32,140,000	0
O&M Present Worth, 2000	11,000,000	8,500,000	11,000,000	8,500,000	10,300,000	7,900,000	8,400,000	8,400,000
O&M Present Worth, 2010	6,500,000	6,500,000	6,500,000	6,500,000	6,000,000	6,000,000	5,200,000	8,740,000
Total Present Worth	57,120,000	51,490,000	52,950,000	47,320,000	51,570,000	46,040,000	62,370,000	1.) 36,750,000

Note: 1. Present worth cost analysis for a period of time exceeding 20 years significantly favors Alternative C2 over Alternative D2, because a new WWTP constructed on a new site would be needed for Alternative D2 after approximately 20 years.

Chapter 8

PREFERRED ALTERNATIVE

This chapter summarizes the findings and conclusions of the wastewater facilities planning and presents the preferred alternative selected by the Newport City Staff and the Wastewater Advisory Committee for the new South Beach Wastewater Treatment Plant Project. Preferred Alternatives were selected for the WWTP site, the wastewater conveyance system, wastewater treatment process, and effluent and sludge disposal.

Included is a summary of the major elements that make up the New South Beach Wastewater Treatment Plant Project, a description of the elements, and a cost estimate.

A. PREFERRED ALTERNATIVE FOR THE NEW SOUTH BEACH WASTEWATER TREATMENT PLANT PROJECT

Chapter 5 presented the evaluation of wastewater facilities alternatives considered appropriate to meet the regulatory requirements given in chapter 4 and to meet the overall wastewater system needs and objectives of the City. Chapter 6 presented an environmental review of the potential impacts of the alternatives and chapter 7 presented cost comparisons of the various alternatives. Each alternative was considered on technical feasibility, environmental impacts and cost in order to select the most technically feasible, environmentally sound, cost-effective system for the City.

Facilities Summary

The major elements that makeup the Preferred Alternative for the New South Beach Wastewater Treatment Plant Project are:

1. New Nye Beach lift station - 8.35 mgd
2. New raw sewage and effluent disposal conveyance pipelines from Nye Beach lift station to new South Beach WWTP
3. New South Beach lift station - 15.00 mgd
4. New South Beach WWTP - 5.00 mgd WWMMADF
5. New Marine Science Center lift station - 2.00 mgd
6. New force main and gravity sewer from MSC lift station to new South Beach lift station.
7. Rehabilitation of existing Bay Front lift station
8. Maintain existing ocean outfall and diffuser off Nye Beach
9. Maintain existing sludge disposal site at Newport Municipal Airport
10. Abandon existing Northside WWTP

These facilities are shown on Figure 8-1, Preferred Alternative for Wastewater Facilities; Figure 8-2, Proposed South Beach Area Wastewater Facilities; and Figure 8-3, Site Plan, Preferred Alternative for Proposed New South Beach WWTP.

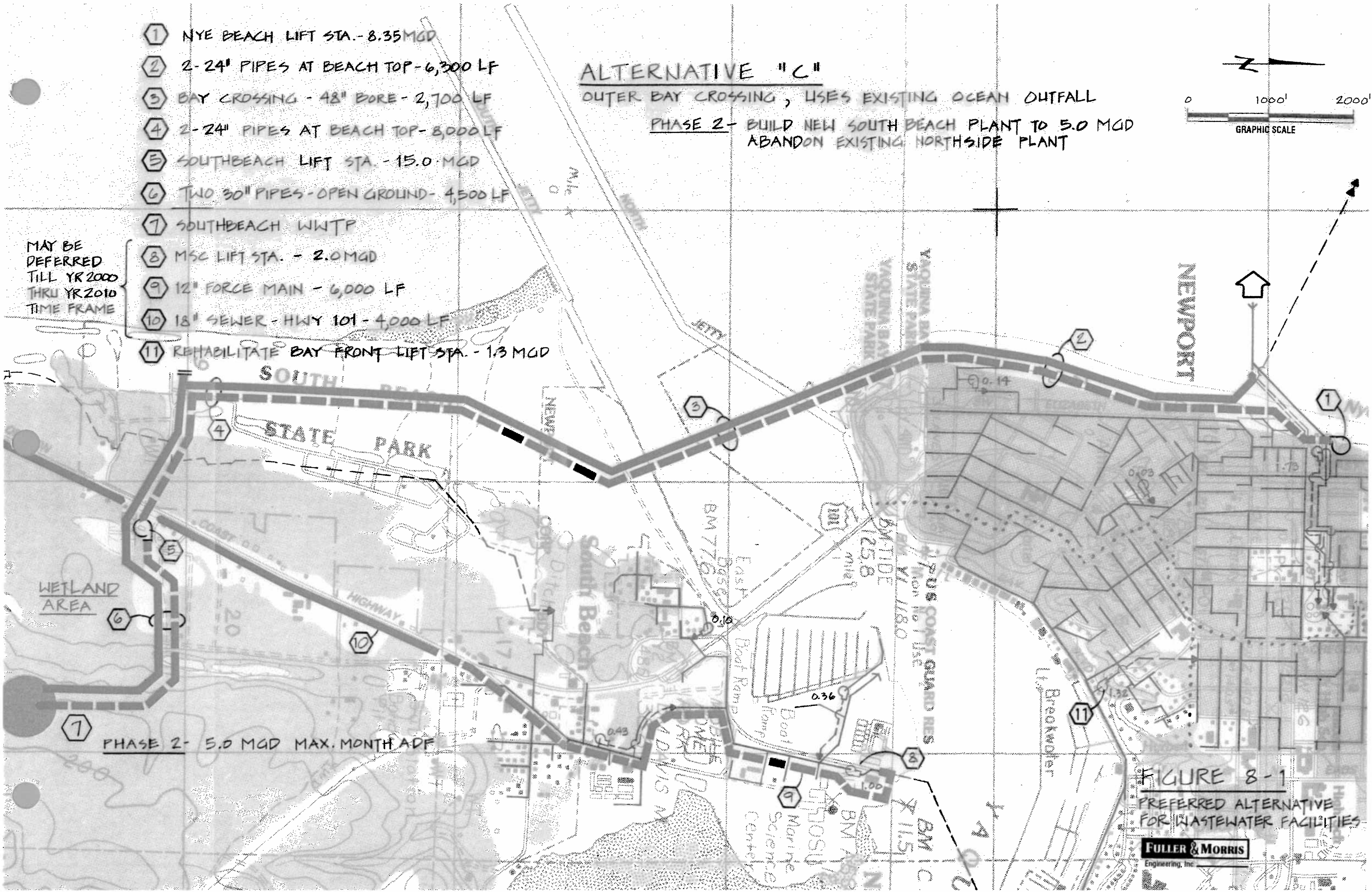
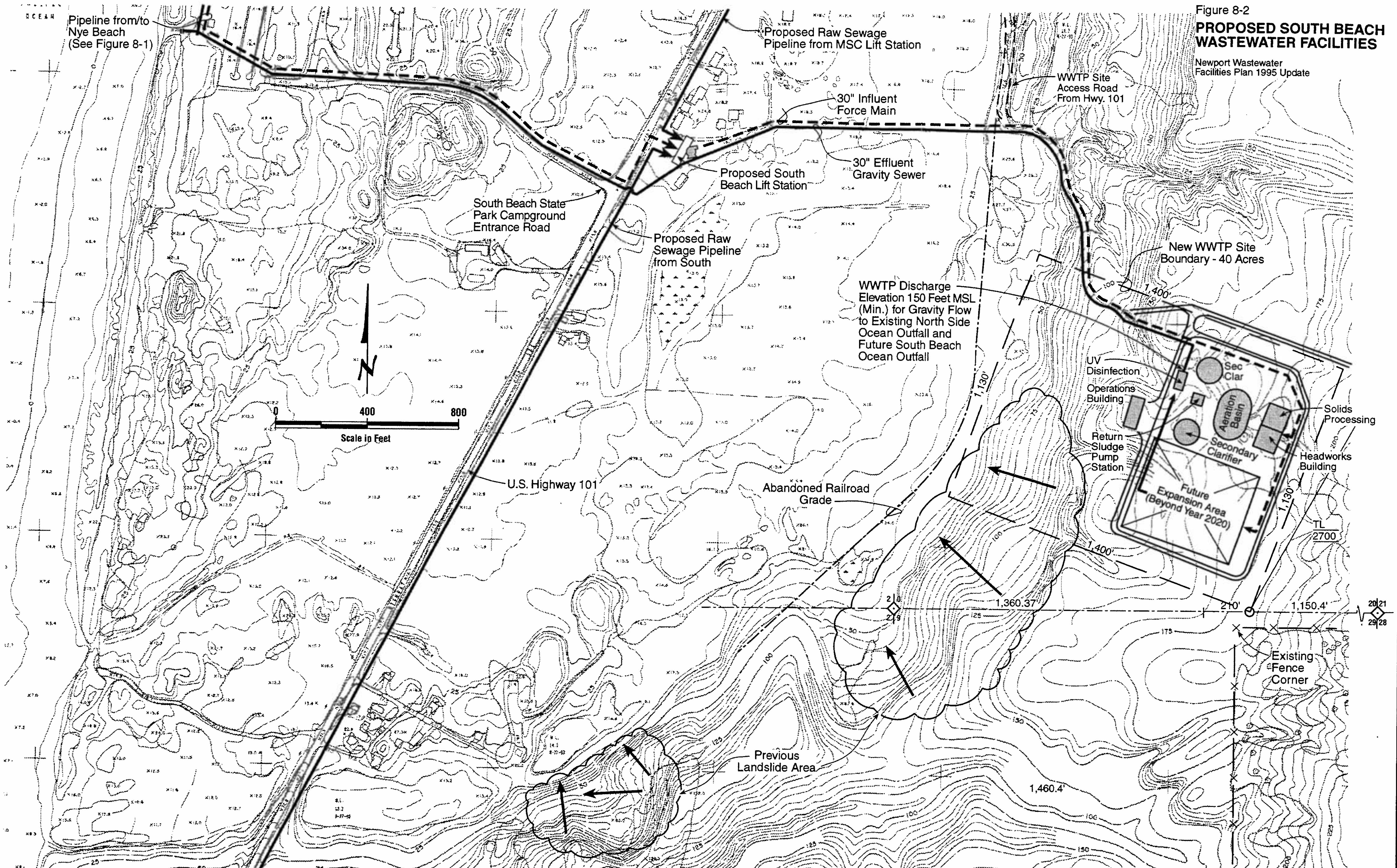


FIGURE 8-1
PREFERRED ALTERNATIVE FOR WASTEWATER FACILITIES

Figure 8-2
PROPOSED SOUTH BEACH WASTEWATER FACILITIES
Newport Wastewater Facilities Plan 1995 Update



CH2M HILL
FULLER & MORRIS Engineering, Inc.

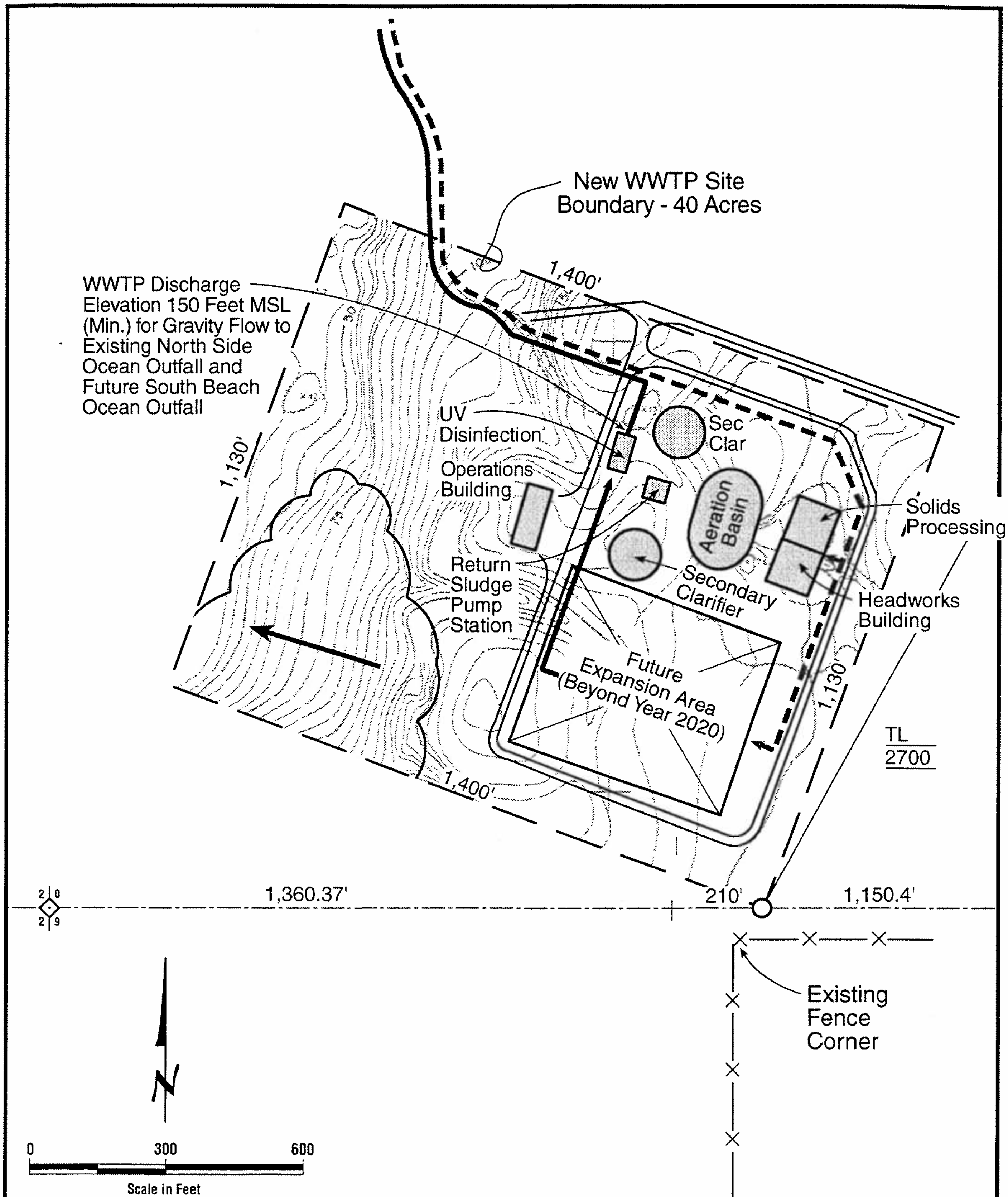


Figure 8-3

Site Plan, Preferred Alternative for Proposed New South Beach WWTP

Newport Wastewater
Facilities Plan 1995 Update

CH2M HILL
FULLER & MORRIS
Engineering, Inc.

Facilities Description

1. New Nye Beach Lift Station

A new lift station will be constructed at the Nye Beach Turnaround parking lot. Initial Capacity will be 8.35 mgd (peak flowrate) with provisions of adding pumps to increase capacity.

2. New Conveyance Pipelines

A new 24-inch diameter (or equivalent multiple pipes) pipeline transporting raw sewage from the drainage basins on the north side of the bay will be constructed beginning at a new lift station constructed at Nye Beach Turnaround. The pipeline will be located as shown conceptually on Figure 8-1. It will be constructed with a parallel pipeline (in a common trench) transporting treated effluent from the new South Beach WWTP. Actual locations will be coordinated with the Oregon Parks and Recreation Department and other jurisdictual regulatory agencies. The bay undercrossing would consist of a 48-inch diameter casing pipe containing the equivalent of two 24-inch carrier pipelines, along with several smaller control conduits and possibly, a water transmission pipeline. This construction would probably be performed using a "directional - drill" bore hole to avoid excavating an open trench across the bay that could interfere with navigational traffic and the rock jetties, and possibly environmentally sensitive bay water quality and bay bottom. Using directional drill technology, a bore hole would be drilled under the bottom of bay located from thirty to fifty feet below the bay bottom, for a distance of approximately 2,700 feet across the bay. The bore entry and exit would be on an incline angle of about 15 degrees. The casing and carrier pipes would then be pulled through the bore hole. No disturbance is expected to occur to the bay or jetties using this method.

The pipelines on both sides of the bay undercrossing would be constructed using the cut and cover (trenching) method. The pipelines would be placed parallel to each other into a common trench. North of the bay a trench would be excavated about three feet deep into the bedrock underlying the beach sand cover, and backfilled with a concrete cap covering, flush with the top of the bedrock. Beach sand would then be carried by tidal action and naturally cover the concrete cap. South of the bay, depth to bedrock will probably dictate that the pipelines be located between the sand dunes, trenched deep enough to ensure they are not exposed (minimum cover over pipes is estimated to be three feet) and backfilled with native sand cover. The pipeline construction through South Beach State Park will be coordinated with a new bicycle/pedestrian trail that the Oregon Parks and Recreation Department plans to build between South Beach Site Park Campground and the Oregon Coast Aquarium. The pipeline and trail will follow the same alignment through the sand dunes to the southern terminus of the trail. From there the pipeline will follow the campground entrance road to cross U.S. Highway 101.

A new major lift station will be constructed on the east side of U.S. Highway 101 to pump raw sewage collected from all the drainage basins (on both sides of the bay) within the UGB. The pipelines will be routed east from the lift station crossing a wetland area without disturbance, on an existing earth fill to the base of the hill whereon the new WWTP site is located. From this point the pipelines will be routed to the new WWTP site either on an existing dirt road that traverses up the hillside or on an abandoned railroad grade that runs along the base of the hill and routed to the site at the western side of the site. Final routing will be determined following a geological review of the routes and acquisition of easements.

3. New South Beach Lift Station

A new lift station will be constructed on the east side of U.S. Highway 101 across from the South Beach State Park Campground entrance road. Initial capacity will be 15.00 mgd (peak flowrate) with provisions of adding pumps to increase capacity. This will be the influent pump station for the new South Beach WWTP.

4. New South Beach WWTP

The new plant will have preliminary treatment, secondary treatment, disinfection, and solids processing. Preliminary treatment will include two mechanical screens with 1/4" screen openings and grit removal using a vortex grit basin and grit classifiers. The screenings will be pressed and sent to the landfill with the dewatered grit. Preliminary effluent will flow to a single three-channel Orbal oxidation ditch for biological stabilization. Individual channels can be isolated to maintain aeration equipment. The Orbal ditch effluent will be split to two secondary clarifiers. A sludge pump station will pump return sludge to the Orbal ditch and waste sludge to the sludge storage tank. Secondary clarifier effluent will flow to a UV channel for disinfection. Final plant effluent will flow by gravity through a new effluent disposal pipeline to the existing 24-inch diameter ocean outfall and diffuser for discharge into the Pacific Ocean.

Waste sludge will be dewatered by centrifuges, mixed with lime for stabilization, and applied to land surrounding the City's airport.

5. New Marine Science Center Lift Station

A new lift station will be constructed adjacent to the existing lift station. Capacity will be 2.00 mgd initially. This lift station will receive flow from Drainage Basin S5 and S6 on the South side of the bay and from Drainage Basin N7 on the north side of the bay as long as the existing 8-inch force main across the bay is kept in service. This element may be deferred until year 2000 to year 2010 because of additional time needed to establish utility corridor east of Highway 101 and because it is not essential to the major conveyance system.

6. New Force Main and Gravity Sewer from MSC Lift Station

A 12-inch force main will be constructed south on Ferry Slip Road to an 18-inch gravity sewer along the east side of U.S. Highway 101 to the new South Beach Lift Station. This element may be deferred until year 2000 to year 2010 because of additional time needed to establish utility corridor east of Highway 101 and because it is not essential to the major conveyance system.

7. Rehabilitation of Existing Bay Front Lift Station

This existing major lift station serving the Bay Front area, Drainage Basin N2, will be rehabilitated to ensure reliability and be provided with a new superstructure. Modifications to the wetwell are expected to be minor.

8. Maintain Existing Ocean Outfall and Diffuser off Nye Beach

The portion of the existing ocean outfall pipeline that is proposed to be used for effluent discharge was constructed in 1990 and is believed to be in very good condition. It is a 24-inch inside diameter concrete lined and coated steel pipeline excavated into a bedrock trench and encased with concrete backfill. A three-port diffuser discharges effluent into the ocean at the end of the outfall, in compliance with the City's National Pollution Discharge Elimination System (NPDES) permit. A removable blind flange cap was incorporated into the end of a 24-inch wye fitting at the onshore end of the outfall pipeline when it was constructed in 1990. This removable cap on the wye will be the connection point for the new effluent pipeline leading from the new WWTP. None of the existing 18-inch diameter outfall pipeline that was lined with a 17-inch diameter insituform lining is proposed to be used for this project.

It is expected that the existing outfall and diffuser will provide satisfactory effluent diffusion and dilution into the ocean until the WWTP reaches its design capacity of 5.0 mgd. (maximum month average daily flow). Peak effluent flowrates are expected to be approximately 15.0 mgd at that time. A new ocean outfall will be needed for effluent discharge when peak flowrates begin exceeding 15.0 mgd. The new effluent disposal pipeline leading from the South Beach WWTP will be equipped with a capped stubout to accommodate a future outfall extension offshore from South Beach State Park Campground.

9. Maintain Existing Sludge Disposal Site at Newport Municipal Airport

The biosolids produced at the existing plant are of exceptional high quality. Biosolids will continue to be land applied at the 1,335 acre airport site. Approximately 620 acres will be required for the sludge produced in 2020. The City appears to have adequate land available for sludge disposal beyond year 2020. A site life of 240 years was estimated using the existing sludge metals concentrations and a loading rate of 1.7 tons of dry solids per acre.

10. Abandon Existing Northside WWTP

The existing plant site will be abandoned when the new South Beach WWTP is in full service. The existing 18-inch effluent disposal pipeline leading from the plant to Nye Beach Turnaround will be permanently maintained to convey raw sewage (that previously flowed into the existing plant) to the new lift station at Nye Beach. Raw sewage pipeline connections will be required to connect the previous incoming plant sewers to the existing effluent disposal pipeline. The method of abandoning the WWTP will depend on the City's future plans for the structures and the plant site property. Structure demolition and removal may be warranted. Empty, below grade, previously wastewater holding structures such as clarifiers and contact basin will require filling with earth or sand to prevent future collapse.

Cost Estimate

Estimated capital costs for the new South Beach WWTP are shown on Table 8-1. Estimated capital costs for the preferred alternative for the New South Beach Wastewater Treatment Plant Project are shown in Table 8-2. This cost estimate is a duplicate of the capital cost shown in Chapter 7 for Alternative C2. As mentioned in Chapter 7, the costs are order-of-magnitude cost estimates developed without detailed engineering data.

Table 8-1
New South Beach WWTP
Capital Cost Estimate

Item	Cost
Mobilization, Bonds, Insurance	$581,000
Sitework	$1,105,000
Headworks	$635,000
Orbal Oxidation Ditch	$1,910,000
Secondary Clarifiers	$1,314,000
Return Sludge Pump Station	$300,000
UV Disinfection	$675,000
Sludge Storage Tank	$500,000
Sludge Dewatering and Lime Stabilization	$1,670,000
Operations Building	$350,000
Electrical/Instrumentation	$1,700,000
Backup Diesel Engine Generator	$260,000
Construction Total	**$11,000,000**

Table 8-2
Capital Cost Estimate for Preferred Alternative for New South Beach WWTP Project

Alternative C-2
Outer Bay Crossing
Uses Existing Ocean Outfall
Existing Plant: Abandon in 2000
New Plant: 5 mgd in 2000

Capital Cost - 1995$ millions		
Element	Description	
1	Nye Beach Lift Station	0.91M
2	2-24" Pipes at Beach Top	2.12M
3	Bay Crossing - 48" Bore	3.70M
4	2-24" Pipes @ Beach Top	2.50M
5	Southbeach Lift Station	1.34M
6	2-30" Pipes	0.95M
7	Southbeach WWTP	11.00M
8	MSC Lift Station	0.30M
9	12" Force Main	0.36M
10	18" Sewer	0.35M
11	Rehabilitate Bay Front Lift Station	0.16M
	Subtotal	23.69M
	+ Construction Contingencies @ 15%	3.55M
	Subtotal	27.24M
	+ Engineering and Admin @ 18% [1.)]	4.90M
	Total Capital Cost	32.14M

Note:
1. Engineering Cost Breakdown:

• Preliminary and Final Design	8%
• Bidding and Contract Award	2%
• Engineering During Construction	4%
• Resident Engineering Inspection	2%
• O&M Manual Prep and Start-up	2%
Total	18%

Chapter 9

FINANCIAL PLAN

This chapter summarizes discussions the City Staff and Wastewater Advisory Committee have had with their financial consultant retained to assist the City to prepare a Financial Plan to identify and develop funding resources to pay the capital costs and operation and maintenance costs of the New South Beach Wastewater Treatment Plant Project.

A. FINANCIAL PLAN FOR THE PREFERRED ALTERNATIVE

Public Financial Management, Inc. (PFM) was retained by the City to assist in preparation of a Financial Plan. Work sessions were held with the City Staff and WWAC wherein PFM identified property taxes, user fees, system development charges, motel room tax and Urban Renewal District assessments as potential revenue sources. PFM gave examples of customer charges for each revenue source as if it were the only source available to pay for the project.

The City Staff and WWAC have considered the example customer charges for each of the revenue sources and the impacts to Newport's sewer customers. They have decided to develop a financial plan that uses a combination of the available revenue sources and have proposed the following recommendations to the Newport City Council.

1. The election for the bond issue should be delayed to a later date. This will provide for an opportunity for the creation of a promotional committee. The role of this committee would be to educate and inform the community with regards to the needs of the new Wastewater Plant, and the various methods of financing it.

2. That the Council consider increasing the following fees to build up a reserve:

   a. Increase the sewer rates by 75% for all rate classifications;
   b. Increase the room tax by 1% for a total of 7% tax;
   c. Increase the sanitary sewer system development charges (SDC's) by 100%;
   d. To develop additional sewer strength charges for certain rate classifications.

3. To break down the plans for the proposed South Beach Wastewater Treatment Plant Project into units, some of which can be financed outside of the proposed bond issue, and to use some of the increased fees that are proposed in order to reduce the overall bond indebtedness. It is the committee's recommendation that the increased rate be adopted in August of 1995 in order to generate revenues for some improvements that can be accomplished prior to having a bond election.

A financial plan for funding the capital costs and operation and maintenance costs of the New South Beach Wastewater Treatment Plant Project has been developed to address these funding issues. The preliminary Financial Plan is shown following:

DEQ Financial Plan Summary

		1996-1999	2000-2009	2010-2019
Revenues				
	User Charges	$ 5,104,558	$11,948,274	$12,013,601
	SDC	$ 520,394	$ 1,061,056	$ 789,526
	General Obligation Bond Procee	$ 14,405,788	$ -	$ -
	TIF Proceeds	$ 8,424,932	$ -	$ -
	Sewer Revenue Bond Proceeds	$ 6,563,201	$ -	$ -
	Interest Income	$ 2,396,575	$ 47,845	$ -
	Room Taxes	$ 590,114	$ 144,018	$ -
Expenses				
	Existing WWTP	$ 1,115,130	$ -	
	Other System Operation	$ 1,747,573	$ 4,368,932	$ 4,368,932
	Debt Service	$ 462,612	$ 4,472,194	$ 4,118,461
	Construction Expenses	$ 31,693,558		

Note: All figures in 1995 dollars

City of Newport
Financial Plan

	On-hand	1996			
Inflation Factor		1.030	1.030	1.030	1.030
1995 Construction Estimate		242,500	242,500	249,000	430,500
		1	2	3	4
Construction Cash Requirements		249,775	249,775	256,470	443,415
Resouces					
Room Taxes		38,250	38,441	38,633	38,827
New SDC		15,000	15,000	15,000	15,000
New Sewer Revenues		145,000	145,000	145,000	145,000
South Urban Renewal	590,000	56,500	56,500	56,500	56,500
North Urban Renewal	1,564,000	-	177,500	177,500	177,500
Sewer Revenue Bonds - Proceeds					
Sewer Revenue Bonds - Debt Service					
General Obligation Bonds - Proceeds					
DEQ/EDD Bond Proceeds - first series					
DEQ/EDD Bond Debt Service - first series (tax increment)					
DEQ/EDD Bond Proceeds - second series					
DEQ/EDD Bond Debt Service - second series (sewer revenue lein)					
DEQ/EDD Bond Proceeds - third series					
DEQ/EDD Bond Debt Service - third series (junior lein sewer pledge)					
		19,550	19,857	22,388	24,870
Ending Cash Balance	1,564,000	1,588,525	1,791,048	1,989,599	2,003,881
Investment Rate	5.0%				
DEQ/EDD #1Debt Service Coverage					
Sewer Bonds Debt Service Coverage					

City of Newport
Financial Plan

		1997		
Inflation Factor	1.061	1.061	1.061	1.061
1995 Construction Estimate	405,000	377,500	402,500	100,000
	1	2	3	4
Construction Cash Requirements	429,665	400,490	427,012	106,090
Resouces				
Room Taxes	39,021	39,216	39,412	39,609
New SDC	15,000	15,000	15,000	15,000
New Sewer Revenues	146,450	146,450	146,450	146,450
South Urban Renewal	56,500	56,500	56,500	56,500
North Urban Renewal	177,500	177,500	177,500	177,500
Sewer Revenue Bonds - Proceeds				
Sewer Revenue Bonds - Debt Service				
General Obligation Bonds - Proceeds			15,283,100	
DEQ/EDD Bond Proceeds - first series	5,700,000			
DEQ/EDD Bond Debt Service - first series (tax increment)	(213,566)	(213,566)	(213,566)	(213,566)
DEQ/EDD Bond Proceeds - second series				
DEQ/EDD Bond Debt Service - second series (sewer revenue lein)				
DEQ/EDD Bond Proceeds - third series				
DEQ/EDD Bond Debt Service - third series (junior lein sewer pledge)				
	25,049	94,002	92,935	282,564
Ending Cash Balance	7,520,169	7,434,781	22,605,100	23,003,066
Investment Rate				
DEQ/EDD #1Debt Service Coverage	1.10	1.10	1.10	1.10
Sewer Bonds Debt Service Coverage				

City of Newport
Financial Plan

	1998			
Inflation Factor	1.093	1.093	1.093	1.093
1995 Construction Estimate	100,000	3,698,750	3,698,750	3,698,750
	1	2	3	4
Construction Cash Requirements	109,273	4,041,724	4,041,724	4,041,724
Resouces				
Room Taxes	39,807	40,006	40,206	40,407
New SDC	15,000	15,000	15,000	15,000
New Sewer Revenues	147,915	147,915	147,915	147,915
South Urban Renewal	56,500	56,500	56,500	56,500
North Urban Renewal	177,500	177,500	177,500	177,500
Sewer Revenue Bonds - Proceeds				
Sewer Revenue Bonds - Debt Service				
General Obligation Bonds - Proceeds				
DEQ/EDD Bond Proceeds - first series				
DEQ/EDD Bond Debt Service - first series (tax increment)	(213,566)	(213,566)	(213,566)	(213,566)
DEQ/EDD Bond Proceeds - second series			6,962,900	
DEQ/EDD Bond Debt Service - second series (sewer revenue lein)			-	-
DEQ/EDD Bond Proceeds - third series				
DEQ/EDD Bond Debt Service - third series (junior lein sewer pledge)				
	287,538	292,556	248,483	290,899
Ending Cash Balance	23,404,487	19,878,674	23,271,887	19,744,817
Investment Rate				
DEQ/EDD #1Debt Service Coverage	1.10	1.10	1.10	1.10
Sewer Bonds Debt Service Coverage				

City of Newport
Financial Plan

	1999			
Inflation Factor	1.126	1.126	1.126	1.126
1995 Construction Estimate	3,698,750	3,698,750	3,698,750	3,698,750
	1	2	3	4
Construction Cash Requirements	4,162,976	4,162,976	4,162,976	4,162,976
Resouces				
Room Taxes	40,609	40,812	41,016	41,221
New SDC	15,000	15,000	15,000	15,000
New Sewer Revenues	149,394	149,394	149,394	149,394
South Urban Renewal	56,500	56,500	56,500	56,500
North Urban Renewal	177,500	177,500	177,500	177,500
Sewer Revenue Bonds - Proceeds				
Sewer Revenue Bonds - Debt Service				
General Obligation Bonds - Proceeds				
DEQ/EDD Bond Proceeds - first series				
DEQ/EDD Bond Debt Service - first series (tax increment)	(213,566)	(213,566)	(213,566)	(213,566)
DEQ/EDD Bond Proceeds - second series				
DEQ/EDD Bond Debt Service - second series (sewer revenue lein)	(225,338)	-	(295,338)	-
DEQ/EDD Bond Proceeds - third series				
DEQ/EDD Bond Debt Service - third series (junior lein sewer pledge)				
	246,810	197,859	151,116	100,099
Ending Cash Balance	15,828,750	12,089,274	8,007,920	4,171,092
Investment Rate				
DEQ/EDD #1Debt Service Coverage	1.10	1.10	1.10	1.10
	0.73		0.56	
Sewer Bonds Debt Service Coverage				

City of Newport
Financial Plan

	2000					
Inflation Factor	1.159	1.159	1.159	1.159		
1995 Construction Estimate	3,698,750	-	-	-		
	1	2	3	4		
Construction Cash Requirements	4,287,865	-	-	-	35,736,904	
Resouces						
Room Taxes	41,427	41,635	41,843	42,052	802,451	
New SDC	15,000	15,000	15,000	15,000	300,000	
New Sewer Revenues	150,888	150,888	150,888	150,888	2,958,583	
South Urban Renewal	56,500	56,500	56,500	56,500	1,130,000	
North Urban Renewal	177,500	177,500	177,500	177,500	3,372,500	
Sewer Revenue Bonds - Proceeds					-	
Sewer Revenue Bonds - Debt Service					-	
General Obligation Bonds - Proceeds					15,283,100	
DEQ/EDD Bond Proceeds - first series					5,700,000	
DEQ/EDD Bond Debt Service - first series (tax increment)	(213,566)	(213,566)	(213,566)	(213,566)	(3,417,060)	
					-	
DEQ/EDD Bond Proceeds - second series					6,962,900	
DEQ/EDD Bond Debt Service - second series (sewer revenue lein)	(223,762)	-	(298,762)	-	(1,043,200)	
					-	
DEQ/EDD Bond Proceeds - third series					-	
DEQ/EDD Bond Debt Service - third series (junior lein sewer pledge)					-	
	52,139	-	2,091	1,235	2,452,040	
Ending Cash Balance	(60,648)	167,308	98,802	328,410	196,430,943	
Investment Rate					-	
					-	
					-	
					-	
DEQ/EDD #1Debt Service Coverage	1.10	1.10	1.10	1.10		
	0.74		0.56			
Sewer Bonds Debt Service Coverage						

Sewer Revenues Year Beginning June	Revenues	Gal/Day	Max DS at 1.15 Coverage	Growth Rate	Assessed Value	Tax Levy at $2/thousand
1996	580,000		504,348		510,373,799	1,020,748
1997	585,800		509,391		561,411,179	1,122,822
1998	591,658		514,485		578,253,514	1,156,507
1999	597,575		519,630		595,601,120	1,191,202
2000	603,550	1,500,000	524,826		613,469,153	1,226,938
2001	619,363	1,578,600	538,577	0.0524	631,873,228	1,263,746
2002	635,591	1,661,319	552,688		650,829,425	1,301,659
2003	652,243	1,748,372	567,168		670,354,307	1,340,709
2004	669,332	1,839,986	582,028		690,464,937	1,380,930
2005	686,868	1,936,402	597,277		711,178,885	1,422,358
2006	704,864	2,037,869	612,926		732,514,251	1,465,029
2007	723,332	2,144,653	628,984		754,489,679	1,508,979
2008	742,283	2,257,033	645,464		777,124,369	1,554,249
2009	761,731	2,375,302	662,375		800,438,100	1,600,876
2010	781,688	2,500,000	679,729		824,451,243	1,648,902
2011	809,751	2,679,500	704,131	0.0718	849,184,781	1,698,370
2012	838,821	2,871,888	729,410		874,660,324	1,749,321
2013	868,935	3,078,090	755,595		900,900,134	1,801,800
2014	900,129	3,299,097	782,721		927,927,138	1,855,854
2015	932,444	3,535,972	810,821		955,764,952	1,911,530
2016	965,919	3,789,854	839,929		984,437,900	1,968,876
2017	1,000,595	4,061,966	870,083		#########	2,027,942
2018	1,036,517	4,353,615	901,319		#########	2,088,780
2019	1,073,728	4,666,205	933,676		#########	2,151,444
2020	1,112,274	5,000,000	967,195		#########	2,215,987

SOURCES AND USES OF FUNDS

City of Newport
1997 General Obligation Bonds

Sources:	
Bond Proceeds:	
Par Amount	15,595,000.00
	15,595,000.00

Uses:	
Delivery Date Expenses:	
Cost of Issuance	311,900.00
Other Uses of Funds:	
Project Fund	15,283,100.00
	15,595,000.00

BOND DEBT SERVICE

City of Newport
1997 General Obligation Bonds

Period Ending	Principal	Coupon	Interest	Debt Service	Annual Debt Service
Jun 1, 1997	-	-	-	-	-
Dec 1, 1997	-	-	490,767.50	490,767.50	-
Jun 1, 1998	35,000.00	4.500%	490,767.50	525,767.50	-
Jun 30, 1998	-	-	-	-	1,016,535.00
Dec 1, 1998	-	-	489,980.00	489,980.00	-
Jun 1, 1999	120,000.00	5.000%	489,980.00	609,980.00	-
Jun 30, 1999	-	-	-	-	1,099,960.00
Dec 1, 1999	-	-	486,980.00	486,980.00	-
Jun 1, 2000	215,000.00	5.200%	486,980.00	701,980.00	-
Jun 30, 2000	-	-	-	-	1,188,960.00
Dec 1, 2000	-	-	481,390.00	481,390.00	-
Jun 1, 2001	260,000.00	5.300%	481,390.00	741,390.00	-
Jun 30, 2001	-	-	-	-	1,222,780.00
Dec 1, 2001	-	-	474,500.00	474,500.00	-
Jun 1, 2002	310,000.00	5.400%	474,500.00	784,500.00	-
Jun 30, 2002	-	-	-	-	1,259,000.00
Dec 1, 2002	-	-	466,130.00	466,130.00	-
Jun 1, 2003	365,000.00	5.500%	466,130.00	831,130.00	-
Jun 30, 2003	-	-	-	-	1,297,260.00
Dec 1, 2003	-	-	456,092.50	456,092.50	-
Jun 1, 2004	425,000.00	5.600%	456,092.50	881,092.50	-
Jun 30, 2004	-	-	-	-	1,337,185.00
Dec 1, 2004	-	-	444,192.50	444,192.50	-
Jun 1, 2005	490,000.00	5.700%	444,192.50	934,192.50	-
Jun 30, 2005	-	-	-	-	1,378,385.00
Dec 1, 2005	-	-	430,227.50	430,227.50	-
Jun 1, 2006	560,000.00	5.800%	430,227.50	990,227.50	-
Jun 30, 2006	-	-	-	-	1,420,455.00
Dec 1, 2006	-	-	413,987.50	413,987.50	-
Jun 1, 2007	635,000.00	5.900%	413,987.50	1,048,987.50	-
Jun 30, 2007	-	-	-	-	1,462,975.00
Dec 1, 2007	-	-	395,255.00	395,255.00	-
Jun 1, 2008	715,000.00	6.000%	395,255.00	1,110,255.00	-
Jun 30, 2008	-	-	-	-	1,505,510.00
Dec 1, 2008	-	-	373,805.00	373,805.00	-
Jun 1, 2009	805,000.00	6.100%	373,805.00	1,178,805.00	-
Jun 30, 2009	-	-	-	-	1,552,610.00
Dec 1, 2009	-	-	349,252.50	349,252.50	-
Jun 1, 2010	900,000.00	6.200%	349,252.50	1,249,252.50	-
Jun 30, 2010	-	-	-	-	1,598,505.00
Dec 1, 2010	-	-	321,352.50	321,352.50	-
Jun 1, 2011	1,005,000.00	6.300%	321,352.50	1,326,352.50	-
Jun 30, 2011	-	-	-	-	1,647,705.00
Dec 1, 2011	-	-	289,695.00	289,695.00	-
Jun 1, 2012	1,115,000.00	6.400%	289,695.00	1,404,695.00	-
Jun 30, 2012	-	-	-	-	1,694,390.00
Dec 1, 2012	-	-	254,015.00	254,015.00	-
Jun 1, 2013	1,240,000.00	6.500%	254,015.00	1,494,015.00	-
Jun 30, 2013	-	-	-	-	1,748,030.00
Dec 1, 2013	-	-	213,715.00	213,715.00	-
Jun 1, 2014	1,370,000.00	6.600%	213,715.00	1,583,715.00	-
Jun 30, 2014	-	-	-	-	1,797,430.00
Dec 1, 2014	-	-	168,505.00	168,505.00	-
Jun 1, 2015	1,515,000.00	6.700%	168,505.00	1,683,505.00	-
Jun 30, 2015	-	-	-	-	1,852,010.00
Dec 1, 2015	-	-	117,752.50	117,752.50	-

BOND DEBT SERVICE

City of Newport
1997 General Obligation Bonds

Period Ending	Principal	Coupon	Interest	Debt Service	Annual Debt Service
Jun 1, 2016	1,675,000.00	6.700%	117,752.50	1,792,752.50	-
Jun 30, 2016	-	-	-	-	1,910,505.00
Dec 1, 2016	-	-	61,640.00	61,640.00	-
Jun 1, 2017	1,840,000.00	6.700%	61,640.00	1,901,640.00	-
Jun 30, 2017	-	-	-	-	1,963,280.00
	15,595,000.00		14,358,470.00	29,953,470.00	29,953,470.00

TAX LEVY

City of Newport
1997 General Obligation Bonds

Period Ending	Principal	Interest	Debt Service	Net Levy	Assessed Valuation	Mill Levy
Jun 30, 1998	35,000.00	981,535.00	1,016,535.00	1,016,535.00	561411000.00	1.810679
Jun 30, 1999	120,000.00	979,960.00	1,099,960.00	1,099,960.00	578411000.00	1.901693
Jun 30, 2000	215,000.00	973,960.00	1,188,960.00	1,188,960.00	595601000.00	1.996236
Jun 30, 2001	260,000.00	962,780.00	1,222,780.00	1,222,780.00	613469000.00	1.993222
Jun 30, 2002	310,000.00	949,000.00	1,259,000.00	1,259,000.00	631469000.00	1.993764
Jun 30, 2003	365,000.00	932,260.00	1,297,260.00	1,297,260.00	650829000.00	1.993242
Jun 30, 2004	425,000.00	912,185.00	1,337,185.00	1,337,185.00	670354000.00	1.994745
Jun 30, 2005	490,000.00	888,385.00	1,378,385.00	1,378,385.00	690464000.00	1.996317
Jun 30, 2006	560,000.00	860,455.00	1,420,455.00	1,420,455.00	711178000.00	1.997327
Jun 30, 2007	635,000.00	827,975.00	1,462,975.00	1,462,975.00	732514000.00	1.997197
Jun 30, 2008	715,000.00	790,510.00	1,505,510.00	1,505,510.00	754489000.00	1.995404
Jun 30, 2009	805,000.00	747,610.00	1,552,610.00	1,552,610.00	777124000.00	1.997892
Jun 30, 2010	900,000.00	698,505.00	1,598,505.00	1,598,505.00	800438000.00	1.997038
Jun 30, 2011	1,005,000.00	642,705.00	1,647,705.00	1,647,705.00	824451000.00	1.998548
Jun 30, 2012	1,115,000.00	579,390.00	1,694,390.00	1,694,390.00	849184000.00	1.995316
Jun 30, 2013	1,240,000.00	508,030.00	1,748,030.00	1,748,030.00	874660000.00	1.998525
Jun 30, 2014	1,370,000.00	427,430.00	1,797,430.00	1,797,430.00	900900000.00	1.995149
Jun 30, 2015	1,515,000.00	337,010.00	1,852,010.00	1,852,010.00	927927000.00	1.995857
Jun 30, 2016	1,675,000.00	235,505.00	1,910,505.00	1,910,505.00	955764000.00	1.998930
Jun 30, 2017	1,840,000.00	123,280.00	1,963,280.00	1,963,280.00	984437000.00	1.994318
	15,595,000.00	14,358,470.00	29,953,470.00	29,953,470.00		

SOURCES AND USES OF FUNDS

City of Newport
1998 Sewer Revenue Bonds

Sources:	
Bond Proceeds:	
Par Amount	7,105,000.00
	7,105,000.00

Uses:	
Delivery Date Expenses:	
Cost of Issuance	142,100.00
Other Uses of Funds:	
Project Fund	6,962,900.00
	7,105,000.00

BOND DEBT SERVICE

City of Newport
1998 Sewer Revenue Bonds

Period Ending	Principal	Coupon	Interest	Debt Service	Annual Debt Service
Sep 1, 1998	-	-	-	-	-
Mar 1, 1999	-	-	225,337.50	225,337.50	-
Jun 30, 1999	-	-	-	-	225,337.50
Sep 1, 1999	70,000.00	4.500%	225,337.50	295,337.50	-
Mar 1, 2000	-	-	223,762.50	223,762.50	-
Jun 30, 2000	-	-	-	-	519,100.00
Sep 1, 2000	75,000.00	5.000%	223,762.50	298,762.50	-
Mar 1, 2001	-	-	221,887.50	221,887.50	-
Jun 30, 2001	-	-	-	-	520,650.00
Sep 1, 2001	95,000.00	5.200%	221,887.50	316,887.50	-
Mar 1, 2002	-	-	219,417.50	219,417.50	-
Jun 30, 2002	-	-	-	-	536,305.00
Sep 1, 2002	115,000.00	5.300%	219,417.50	334,417.50	-
Mar 1, 2003	-	-	216,370.00	216,370.00	-
Jun 30, 2003	-	-	-	-	550,787.50
Sep 1, 2003	135,000.00	5.400%	216,370.00	351,370.00	-
Mar 1, 2004	-	-	212,725.00	212,725.00	-
Jun 30, 2004	-	-	-	-	564,095.00
Sep 1, 2004	160,000.00	5.500%	212,725.00	372,725.00	-
Mar 1, 2005	-	-	208,325.00	208,325.00	-
Jun 30, 2005	-	-	-	-	581,050.00
Sep 1, 2005	185,000.00	5.600%	208,325.00	393,325.00	-
Mar 1, 2006	-	-	203,145.00	203,145.00	-
Jun 30, 2006	-	-	-	-	596,470.00
Sep 1, 2006	210,000.00	5.750%	203,145.00	413,145.00	-
Mar 1, 2007	-	-	197,107.50	197,107.50	-
Jun 30, 2007	-	-	-	-	610,252.50
Sep 1, 2007	240,000.00	5.900%	197,107.50	437,107.50	-
Mar 1, 2008	-	-	190,027.50	190,027.50	-
Jun 30, 2008	-	-	-	-	627,135.00
Sep 1, 2008	270,000.00	6.000%	190,027.50	460,027.50	-
Mar 1, 2009	-	-	181,927.50	181,927.50	-
Jun 30, 2009	-	-	-	-	641,955.00
Sep 1, 2009	305,000.00	6.100%	181,927.50	486,927.50	-
Mar 1, 2010	-	-	172,625.00	172,625.00	-
Jun 30, 2010	-	-	-	-	659,552.50
Sep 1, 2010	345,000.00	6.200%	172,625.00	517,625.00	-
Mar 1, 2011	-	-	161,930.00	161,930.00	-
Jun 30, 2011	-	-	-	-	679,555.00
Sep 1, 2011	390,000.00	6.300%	161,930.00	551,930.00	-
Mar 1, 2012	-	-	149,645.00	149,645.00	-
Jun 30, 2012	-	-	-	-	701,575.00
Sep 1, 2012	440,000.00	6.400%	149,645.00	589,645.00	-
Mar 1, 2013	-	-	135,565.00	135,565.00	-
Jun 30, 2013	-	-	-	-	725,210.00
Sep 1, 2013	500,000.00	6.500%	135,565.00	635,565.00	-
Mar 1, 2014	-	-	119,315.00	119,315.00	-
Jun 30, 2014	-	-	-	-	754,880.00
Sep 1, 2014	560,000.00	6.600%	119,315.00	679,315.00	-
Mar 1, 2015	-	-	100,835.00	100,835.00	-
Jun 30, 2015	-	-	-	-	780,150.00
Sep 1, 2015	630,000.00	6.700%	100,835.00	730,835.00	-
Mar 1, 2016	-	-	79,730.00	79,730.00	-
Jun 30, 2016	-	-	-	-	810,565.00
Sep 1, 2016	700,000.00	6.700%	79,730.00	779,730.00	-
Mar 1, 2017	-	-	56,280.00	56,280.00	-

BOND DEBT SERVICE

City of Newport
1998 Sewer Revenue Bonds

Period Ending	Principal	Coupon	Interest	Debt Service	Annual Debt Service
Jun 30, 2017	-	-	-	-	836,010.00
Sep 1, 2017	780,000.00	6.700%	56,280.00	836,280.00	-
Mar 1, 2018	-	-	30,150.00	30,150.00	-
Jun 30, 2018	-	-	-	-	866,430.00
Sep 1, 2018	900,000.00	6.700%	30,150.00	930,150.00	-
Jun 30, 2019	-	-	-	-	930,150.00
	7,105,000.00		6,612,215.00	13,717,215.00	13,717,215.00

Chapter 10

WASTEWATER FACILITIES IMPLEMENTATION

This chapter discusses the implementation of the wastewater facilities that makeup the New South Beach WWTP Project described in Chapter 8 and the implementation of the future wastewater facilities that will be required to provide service to the lands within the UGB but are not a part of the New South Beach WWTP Project.

Included is a description of the implementation steps and a Project Schedule for the South Beach WWTP Project, and a time frame for the other future wastewater facilities.

A. IMPLEMENTATION OF THE NEW SOUTH BEACH WWTP PROJECT

Facilities Plan Approval and Adoption

This Facilities Plan and its recommendations should be approved by DEQ and adopted by the City of Newport before proceeding with the next steps of project permitting and beginning project preliminary and final designs. The DEQ review should be accomplished within 60 days of their receiving the Draft of the Facilities Plan to give the City a general approval, or identify additional issues that should be addressed.

Project Permitting

Permit applications to the jurisdictional regulatory agencies should incorporate project preliminary design information and be submitted to the agencies closely following DEQ Facilities Plan approval. Chapter 6, Table 6-1 lists the permitting agencies and the possible time frames for permit approvals.

Project Predesign

Once the Facilities Plan has been approved and adopted, the predesign effort can begin. The predesign provides a more detailed engineering development of the facilities presented in the Facilities Plan recommendation. Depending on the project scope predesign can be completed in two to six months and typically includes flow diagrams, design criteria, and general layouts of the facilities and piping. The predesign is typically the 10 percent to 15 percent level of the total design effort. The DEQ has guidelines that define the information that must be in the predesign. The predesign must be approved by DEQ before the final design can begin.

Project Final Design

The final design involves the preparation of design drawings, specifications, and contracts that describe the scope of the facilities to be constructed. Designs must comply with industry standards, building codes, safety requirements, permits, and other standards. Designs are typically subject to review and approval by local and state agencies. The DEQ must review and approve the construction contract documents before construction can begin. Permitting agency requirements will need to be included into the final design documents. Depending on the project scope, the final design will typically take 6 to 12 months to complete.

Construction Bidding

This step involves the activities to solicit bids form interested contractors to construct the project. The bidding process for public projects is regulated by state law. The bidding period includes preparation of bid documents, bid advertisements, design clarifications, bid opening, bid evaluations, and ultimately selecting a construction contractor. For a project of this size, the bid period will typically be 6 to 12 weeks with another 4 weeks to evaluate bids and award the contract. A total of 2 to 3 months should be allowed for this step.

Project Construction

Conveyance pipelines and associated lift stations could be constructed simultaneous with the new WWTP. Wastewater treatment plant construction typically includes site preparation, excavation, concrete work for the treatment processes, and complex mechanical and electrical equipment. The lift station and WWTP facilities will require some specially designed process equipment made for each application, which can involve up to a year for manufacture and testing. Several months will also be required at the end of construction for startup and operational testing of the lift station pumping equipment and treatment processes. Overall, wastewater construction is more complex and requires a longer construction period than other types of construction.

Project Schedule

The schedule for the New South Beach WWTP Project is shown on Figure 10-1. Individual elements of the Project may be broken away from the basic project to accommodate permitting requirements or cash flow preferences.

B. CONSTRUCTION OF FUTURE FACILITIES NOT INCLUDED IN THE SOUTH BEACH WWTP PROJECT

This Facilities Plan identifies wastewater collection and conveyance pipelines and associated lift stations that are not included in the New South Beach WWTP Project, but will be needed to provide wastewater service to currently undeveloped land within the UGB, or are expansions to existing conveyance systems. Examples include the conveyance pipelines and lift stations that transport wastewater flow from Drainage Basin S7 on the southern end of the UGB, and the future trunk sewers, lift stations and force mains shown throughout the drainage basins on Map No. WW1, the Wastewater System

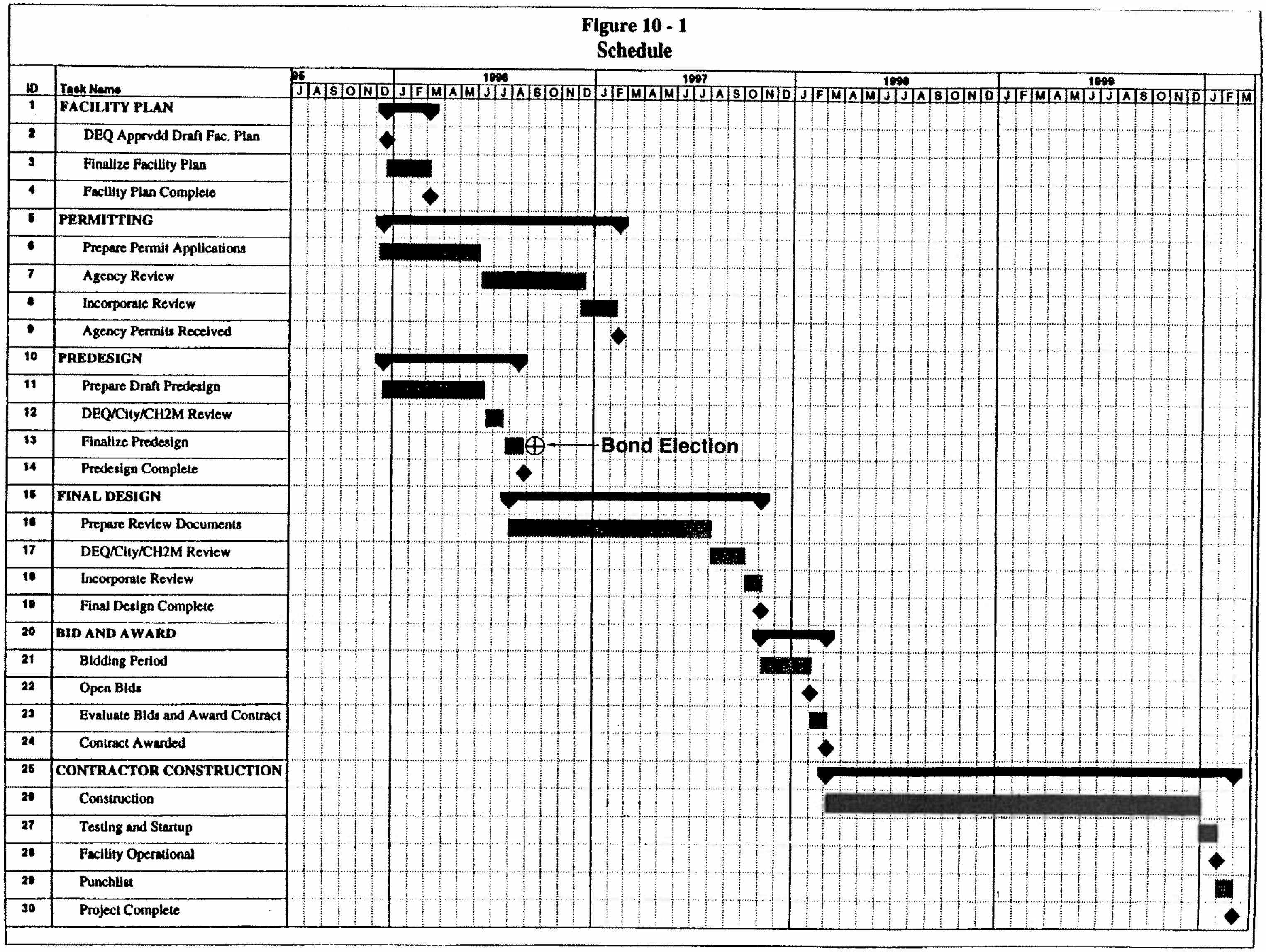


Figure 10-1

South Beach WWTP Project Facilities Design and Construction Schedule

Newport Wastewater
Facilities Plan 1995 Update

CH2M HILL
FULLER & MORRIS Engineering, Inc.

Master Plan Map. Design and construction for these facilities will occur as the projected development takes place within the UGB.

APPENDIX NO. 1

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

Department of Environmental Quality
811 Southwest Sixth Avenue, Portland, OR 97204
Telephone: (503) 229-5696

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:

City of Newport
810 SW Alder St.
Newport, OR 97365

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated Domestic Sewage	001	Pacific Ocean (Approx. 1830 ft. WSW of Beach Drive)
Emergency Overflows:		
Schooner Creek	002	Schooner Crk
56th St	003	Pacific Ocn
48th St	004	Pacific Ocn
42th St	005	Pacific Ocn
Big Creek	006	Pacific Ocn
Nye Beach	007	Pacific Ocn
Bay Front	008	Yaquina Bay
OSU Marine S.C.	009	Yaquina Bay
Ferry Slip Road	010	Yaquina Bay
NE 10th St	011	Pacific Ocn
SW 26th St	012	Yaquina Bay
SE 3rd St	013	Yaquina Bay

PLANT TYPE AND LOCATION:

Trickling Filter STP
420 NW Nye Street
Newport, Oregon
Treatment System Class: III
Collection System Class: III

RECEIVING SYSTEM INFORMATION:

Basin: Mid Coast
Sub-basin: Siletz
Receiving Stream: Pacific Ocean
Hydro Code: 10=*PACI 188.0 D
County: Lincoln

EPA REFERENCE NO: OR002277-2

Issued in response to Application No. 998824 received November 17, 1988.

This permit is issued based on the land use findings in the permit record.

Michael Downs
Michael Downs, Administrator

JUN 30 1993
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system and discharge to public waters adequately treated wastewaters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

Unless authorized by another NPDES permit, each other direct and indirect discharge to public waters is prohibited.

SCHEDULE A

1. **Waste Discharge Limitations** not to be exceeded after permit issuance.

a. Outfall Number 001 (Sewage Treatment Plant Discharge)

(1) May 1 through October 31:

Parameter	Average Effluent Concentrations Monthly	Average Effluent Concentrations Weekly	Mass Load Limits (See note 1/) Monthly Average lb/day	Weekly Average lb/day	Daily Maximum lbs
BOD_5	30 mg/l	45 mg/l	800	1200	1600
TSS	30 mg/l	45 mg/l	800	1200	1600

(2) November 1 through April 30:

Parameter	Average Effluent Concentrations Monthly	Average Effluent Concentrations Weekly	Mass Load Limits (See note 2/) Monthly Average lb/day	Weekly Average lb/day	Daily Maximum lbs
BOD_5	30 mg/l	45 mg/l	800	1200	1600
TSS	30 mg/l	45 mg/l	800	1200	1600

(3)

Other Parameters	Limitations
Fecal Coliform Bacteria	Shall not exceed 200/100 ml monthly geometric mean and 400/100 ml weekly geometric mean.
pH	Shall be within the range 6.0-9.0.
BOD_5 and TSS removal efficiency	Shall not be less than 75 percent monthly average.
Total Residual Chlorine	Shall not exceed a daily maximum of ~~0.42~~ * 0.47 mg/l. (See note 3/)

(4) Notwithstanding the effluent limitations established by this permit, no wastes shall be discharged and no activities shall be conducted which will violate Water Quality Standards as adopted in OAR 340-41-245 except in the following defined mixing zone:

That portion of the Pacific Ocean not to extend beyond a radius of one hundred fifty ~~(150)~~ * 250 feet from the point of discharge. The ZID shall include that portion of the Pacific Ocean within a fifteen * ~~(15)~~ 25 foot radius of the point of discharge. (See note 3/)

1/ Based on average dry weather design flow to the facility equaling 3.2 MGD.

2/ Mass Load Limits based upon prior permit limits. Schedule C, Condition 2 requires the permittee to select an alternate basis for calculating winter time mass load limits. Upon review and approval of the engineering study to determine the design average wet weather flow, pursuant to OAR 340-41-120(9), or upon receipt of a request to base the daily maximum on twice the monthly average limit, and upon request of the permittee, the Department intends to modify this permit and include revised mass load limits.

* - MODIFIED BY ADDENDUM NO. 1, ATTACHED.

3/ When the permittee submits additional dilution and mixing zone information as required in Schedule C, the Department will reopen this permit and amend the total residual chlorine limit and the mixing zone as appropriate.

b. Outfalls Number 002 to 013

No wastes shall be discharged from these outfalls and no activities shall be conducted which violate water quality standards as adopted in OAR 340-41-245, unless the cause of the discharge is an upset as defined in Conditions B4 and B6 of the attached General Conditions.

SCHEDULE B

1. Minimum Monitoring and Reporting Requirements.
(unless otherwise approved in writing by the Department)

The permittee shall monitor the parameters as specified below at the locations indicated. The laboratory used by the permittee to analyze samples shall have a quality assurance/quality control (QA/QC) program to verify the accuracy of sample analysis. If QA/QC requirements are not met for any analysis, the results shall be included in the report, but not used in calculations required by this permit. When possible, the permittee shall re-sample in a timely manner for parameters failing the QA/QC requirements, analyze the samples, and report the results.

a. Influent

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Flow meter
Flow Meter Calibration	Semi-annual	Verification
BOD_5	2/week	Composite
TSS	2/week	Composite
pH	3/week	Grab

b. Outfall Number 001

Item or Parameter	Minimum Frequency	Type of Sample
BOD_5	2/week	Composite
TSS	2/week	Composite
pH	3/week	Grab
Fecal Coliform	2/week	Grab
Quantity Chlorine Used	Daily	Measurement
Chlorine Residual	Daily	Grab
Average Percent Removed (BOD_5 and TSS)	Monthly	Calculation
Toxics: Bioassay (See Note 1/)	Quarterly	Acute & chronic bioassay

c. Sludge Management - from secondary anaerobic sludge digester

Item or Parameter	Minimum Frequency	Type of Sample
Sludge analysis including: Total solids (% dry wt.) Volatile solids (% dry wt.) Sludge nitrogen NH_3-N; NO_3-N; & TKN-N (% dry wt.) Phosphorus-P (% dry wt.) Potassium (% dry wt.) Sludge metals content for As, Cd, Cr, Cu, Pb, Hg, Mo, Ni, Se & Zn (mg/kg) pH (standard units)	Semi-Annual	Composite samples to be representative of the product to be land applied. (See Note 2/)

Item or Parameter	Minimum Frequency	Type of Sample
% volatile solids reduction accomplished through digestion	Monthly	Calculation (See Note 3/)
Record of locations where sludge is applied on land (Site location map to be maintained at treatment facility for review upon request by DEQ)	Each Occurrence	Date, volume & locations where sludges were applied recorded on site location map.

d. Outfalls Number 002 through 019 (Emergency Overflows)

Item or Parameter	Minimum Frequency	Type of Sample
Flow	Daily (During each occurrence)	Estimate duration and volume

Notes:

1/ Beginning no later than January 1995, the permittee shall conduct bioassay testing for a period of one (1) year in accordance with the frequency specified above. If the bioassay tests show that the effluent samples are not toxic at the dilutions determined to occur at the Zone of Immediate Dilution and the Mixing Zone, no further bioassay testing will be required during this permit cycle. Note that bioassay test results will be required along with the next NPDES permit renewal application.

2/ Composite samples from the secondary anaerobic digester shall consist of at least 6 aliquots of equal volume collected throughout an operating day. The sampling times should be spaced to get samples from all parts of the operating day.

3/ Calculation of the % volatile solids reduction is to be based on comparison of average waste sludge total and volatile solids entering the anaerobic digester process from the primary clarifier and a representative composite sample of sludge solids being land applied from the sludge storage pond (as defined in note 2/ above).

2. Reporting Procedures

Monitoring results shall be reported on approved forms. The reporting period is the calendar month. Reports must be submitted to the Department by the 15th day of the following month.

State monitoring reports shall identify the name, certificate classification and grade level of each principal operator designated by the permittee as responsible for supervising the wastewater collection and treatment systems during the reporting period. Monitoring reports shall also identify each system classification as found on page one of this permit.

Monitoring reports shall also include a record of the quantity and method of use of all sludge removed from the treatment facility and a record of all applicable equipment breakdowns and bypassing.

SCHEDULE C

Compliance Conditions and Schedules

1. By no later than 12 months after permit issuance, the permittee shall submit either an engineering evaluation which demonstrates the design average wet weather flow, or a request to retain the existing mass load limits. The design average wet weather flow is defined as the average flow between November 1 and April 30 when the sewage treatment facility is projected to be at design capacity for that portion of the year. Upon acceptance by the Department of the design average wet weather flow determination, the permittee may request a permit modification to include higher winter mass loads based on the design average wet weather flow.

2. Within 180 days of permit modification to include higher winter mass load limits as specified in Condition 1 of this Schedule, the permittee shall submit to the Department for review and approval a proposed program and time schedule for identifying and reducing inflow. Within 60 days of receiving written Department comments, the permittee shall submit a final approvable program and time schedule. The program shall consist of the following:

   a. Identification of all overflow points and verification that sewer system overflows are not occurring up to a 24-hour, 5 year storm event or equivalent;

   b. Monitoring of all pump station overflow points;

   c. A program for identifying and removing all inflow sources into the permittee's sewer system over which the permittee has legal control; and,

   d. If the permittee does not have the necessary legal authority for all portions of the sewer system or treatment facility, a program and schedule for gaining legal authority to require inflow reduction and a program and schedule for removing inflow sources.

3. Within 90 days of permit issuance, the permittee shall submit, to the Department for review and approval, a report that describes procedures for handling, transporting, and disposal of rags, grit, scum and screenings generated at the treatment facility. Upon written approval by the Department, the permittee shall conform with the approved procedures. Modified procedures may be followed upon prior approval in writing by the Department.

4. By no later than June 30, 1994, the permittee shall submit to the Department a report which either identifies known sewage bypass locations and a plan for estimating the frequency, duration and quantity of sewage bypassing treatment, or confirms that there are no bypass points. The report shall also provide a schedule to eliminate the bypass(es), if any.

5. The permittee shall have in place a program to identify and reduce inflow and infiltration into the sewage collection system. An annual report shall be submitted to the Department by January 15 each year which details sewer collection maintenance activities that have been done in the previous year and outlines those activities planned for the following year.

6. By no later than June 30, 1994, the permittee shall submit either additional information on the dye testing performed at the new outfall mixing zone, or, the results of a computer simulation based on the dye testing that will allow the Department to adequately describe the mixing zone and ZID and set permit limits for toxic compounds.

7. Notwithstanding the Department's acceptance of the positive certification for plant performance, and to prevent the future occurrence of diffuser plugging problems, the permittee shall complete the actions stated in the following schedule:

   a. By no later than July 31, 1993, the permittee shall have installed an alarm to the level recorder in the seawall manhole.

   b. By no later than September 30, 1993, the permittee shall have installed a pressure plate to the floor of the seawall manhole.

* c. By no later than June 30, ~~1994~~ 1995, the permittee shall have completed ~~pump conversions in the Bay Front Pump Station and the Big Creek Pump Station.~~ conversions to the chlorine contact basins for use as surge flow balancing tanks.

* d. By June 30, ~~1995~~ 1996, the permittee shall submit a progress/evaluation report to the Department on the performance of Outfall 001 as a result of the above improvements.

   e. The Department may reopen and modify this permit to incorporate any applicable compliance schedule, if the diffuser continues to plug and cause the outfall to overflow at manhole 0-3 into the adjacent on-shore storm drain. If the progress/evaluation report indicates that there is potential for the outfall to continue to plug, the City shall consider additional remedies (from among those described in the performance evaluation report and in consultation with the Department) to correct the outfall diffuser plugging problem.

8. The permittee is expected to meet the compliance dates which have been established in this schedule. Either prior to or no later than 14 days following any lapsed compliance date, the permittee shall submit to the Department a notice of compliance or noncompliance with the established schedule. The Director may revise a schedule of compliance if he determines good and valid cause resulting from events over which the permittee has little or no control.

* - MODIFIED AS SHOWN BY ADDENDUM NO. 1, ATTACHED.

SCHEDULE D

Special Conditions

1. All sludge shall be managed in accordance with a current sludge management plan approved by the Department of Environmental Quality. No substantial changes shall be made in sludge management activities which significantly differ from operations specified under the approved plan without the prior written approval of the Department.

   This permit may be modified to incorporate any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Clean Water Act, if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or controls a pollutant or practice not limited in this permit.

2. The permittee shall comply with Oregon Administrative Rules (OAR), Chapter 340, Division 49, "Regulations Pertaining To Certification of Wastewater System Operator Personnel" and accordingly:

   a. The permittee shall have its wastewater system supervised by one or more operators who are certified in a classification and grade level (equal to or greater) that corresponds with the classification (collection and /or treatment) of the system to be supervised as specified on page one of this permit.

   Note: A "supervisor" is defined as the person exercising authority for establishing and executing the specific practice and procedures of operating the system in accordance with the policies of the permittee and requirements of the waste discharge permit. "Supervise" means responsible for the technical operation of a system, which may affect its performance or the quality of the effluent produced. Supervisors are not required to be on-site at all times.

   b. The permittee's wastewater system may not be without supervision (as required by Special Condition 2.a. above) for more than thirty (30) days. During this period, and at any time that the supervisor is not available to respond on-site (i.e. vacation, sick leave or off-call), the permittee must make available another person who is certified at no less than one grade lower than the system classification.

   c. If the wastewater system has more than one daily shift, the permittee shall have the shift supervisor, if any, certified at no less than one grade lower than the system classification.

   d. The permittee is responsible for ensuring the wastewater system has a properly certified supervisor available at all times to respond on-site at the request of the permittee and to any other operator.

   e. The permittee shall notify the Department of Environmental Quality in writing within thirty (30) days of replacement or redesignation of certified operators responsible for supervising wastewater system operation (including shifts). The notice shall be filed with the Water Quality Division, Operator Certification Program (see address on page one). This requirement is in addition to the reporting requirements contained under Schedule B of this permit.

   f. Upon written request, the Department may grant the permittee reasonable time, not to exceed 120 days, to obtain the services of a qualified person to supervise the wastewater system. The written request must include justification for the time needed, a schedule for recruiting and hiring, the date the system supervisor availability ceased and the name of the alternate system supervisor(s) as required by 2.b. above.

3. Bioassay

a. The permittee shall conduct chronic whole effluent toxicity bioassay tests of outfall 001 in accordance with the frequency specified in Schedule B with an echinoderm species, a bivalve species and Menidia beryllina (Inland Silverside). The echinoderm species may be either Stronglyocentrotus purpuratus (Purple Urchin) or Dendraster variegatus (Sand Dollar). The bivalve species may be either Crassostrea gigas (Pacific Oyster) or Mytilus edulis (Blue Mussel).

b. Bioassay tests may be dual end-point tests in which both acute and chronic end-points can be determined from the results of a single chronic test (the acute end-point shall be based upon a 48-hour time period).

c. Bioassay shall be conducted in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms, EPA/600/4-87/028 and Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-90/027. Quality assurance criteria, statistical analyses and data reporting for the bioassays shall be in accordance with the EPA document and Department requirements for chronic testing referenced above.

d. The permittee shall make available to the Department, on request, the written standard operating procedures they, or the laboratory performing the bioassays, are using for all toxicity tests required by the Department.

e. An acute bioassay test shall be considered to show toxicity if there is significant difference in survival between the control and 100 percent effluent, unless the permit specifically provides for a Zone of Immediate Dilution (ZID) for biotoxicity. If the permit specifies such a ZID, acute toxicity shall be indicated when a significant difference in survival occurs at dilutions greater than that which is found to occur at the edge of the ZID.

f. A chronic bioassay test shall be considered to show toxicity if a significant difference in survival occurs at dilutions greater than that which is known to occur at the edge of the mixing zone, or if there is no dilution data for the edge of the mixing zone and any chronic bioassay test shows a statistically significant effect in 100 percent effluent as compared to the control, another toxicity test using the same species and the same methodology shall be conducted within two weeks. If the second test also indicates toxicity, the permittee shall follow the procedure described in section (h) of this permit condition.

g. If toxicity is shown by either an acute or a chronic test at the established criteria, another toxicity test using the same species and Department approved methodology shall be conducted within two weeks, unless otherwise approved by the Department. If the second test also indicates toxicity, the permittee shall follow the procedure described in section (h) of this permit condition.

h. If, after following the procedure as described in sections (e) or (f) of this permit condition, two consecutive bioassay test results indicate acute and/or chronic toxicity, the permittee shall evaluate the source of the toxicity and submit a plan and time schedule for demonstrating compliance with water quality standards. Upon approval by the Department, the permittee shall implement the plan until compliance has been achieved. Evaluations shall be completed and plans submitted to the Department within 6 months unless otherwise approved in writing by the Department.

i. If bioassay testing indicates acute and/or chronic toxicity, the Department may reopen and modify this permit to include new limitations and/or conditions as determined by the Department to be appropriate.

4. The permittee shall notify the DEQ Willamette Valley Region office (phone 378-8240), in accordance with the response times noted in the General Conditions of this permit, of any malfunction so corrective action can be coordinated between the permittee and the Department.

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NPDES GENERAL CONDITIONS

SECTION A. STANDARD CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468.720 and is grounds for enforcement action; for permit termination, suspension, or modification; or for denial of a permit renewal application.

2. Penalties for Violations of Permit Conditions

Oregon Law (ORS 468.140) allows the Director to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit.

In addition, Oregon Law (ORS 468.990) classifies a willful or negligent violation of the terms of a permit or failure to get a permit as a misdemeanor and a person convicted thereof shall be punishable by a fine of not more than $25,000 or by imprisonment for not more than one year, or by both. Each day of violation constitutes a separate offense.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, the permittee shall correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application shall be submitted at least 180 days before the expiration date of this permit.

The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions

This permit may be modified, suspended, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute;

b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

The filing of a request by the permittee for a permit modification or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Toxic Pollutants

The permittee shall comply with any applicable effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

7. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.

8. Permit References

Except for effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Duty to Halt or Reduce Activity

For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. <u>Bypass of Treatment Facilities</u>

a. Definitions

(1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not include nonuse of singular or multiple units or processes of a treatment works when the nonuse is insignificant to the quality and/or quantity of the effluent produced by the treatment works. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.

(1) Bypass is prohibited unless:

(a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and

(c) The permittee submitted notices and requests as required under paragraph c of this section.

(2) The Director may approve an anticipated bypass, after considering its adverse effects and any alternatives to

bypassing, when the Director determines that it will meet the three conditions listed above in paragraph b(1) of this section.

c. Notice and request for bypass.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior written notice, if possible at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section D, Paragraph D-5.

4. Upset

a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Section B.4.c. of these General Conditions are met. No determination made during administrative review of claims that non-compliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and that the permittee can identify the causes(s) of the upset;

(2) The permitted facility was at the time being properly operated; and

(3) The permittee submitted notice of the upset as required in Section D.5., hereof (24-hour notice).

(4) The permittee complied with any remedial measures required under Section A.3 hereof.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

5. <u>Treatment of Single Operational Event</u>

For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without an NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.

6. <u>Overflows from Wastewater Conveyance Systems and Associated Pump Stations</u>

a. Definitions

(1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.

(3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.

b. Prohibition of overflows. Overflows are prohibited unless:

(1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage; and

(2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and

(3) The overflows are the result of an upset as defined in Condition B4 and meeting all requirements of this condition.

c. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.

d. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in Condition D.5.

7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permittee shall take such steps as are necessary to alert the public about the extent and nature of the discharge. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

8. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in such a manner as to prevent any pollutant from such materials from entering public waters, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Sampling and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and shall be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Director.

2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

4. Penalties of Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than two years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years or both.

5. Reporting of Monitoring Results

Monitoring results shall be summarized each month on a Discharge Monitoring Report form approved by the Department. The reports shall be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR. Such increased frequency shall also be indicated. For a pollutant parameter that may be sampled more than once per day (e.g., Total Chlorine Residual), only the average daily value shall be recorded unless otherwise specified in this permit.

7. Averaging of Measurements

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean, except for bacteria which shall be averaged based on a geometric or log mean.

8. Retention of Records

The permittee shall retain records of all monitoring information, including all calibration and maintenance records of all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

9. Records Contents

Records of monitoring information shall include:

a. The date, exact place, time and methods of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

10. Inspection and Entry

The permittee shall allow the Director, or an authorized representative upon the presentation of credentials to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and

d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes

The permittee shall comply with Oregon Administrative Rules (OAR) 340, Division 52, "Review of Plans and Specifications". Except where exempted under OAR 340-52, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers shall be commenced until the plans and specifications are submitted to and approved by the Department. The permittee shall give notice to the Department as soon as possible of any planned physical alternations or additions to the permitted facility.

2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. <u>Transfers</u>

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit shall be transferred to a third party without prior written approval from the Director. The permittee shall notify the Department when a transfer of property interest takes place.

4. <u>Compliance Schedule</u>

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. <u>Twenty-Four Hour Reporting</u>

The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally (by telephone) within 24 hours from the time the permittee becomes aware of the circumstances. During normal business hours, the Department's Regional office shall be called. Outside of normal business hours, the Department shall be contacted at 1-800-452-0311 (Oregon Accident Response System). A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

e. Public notification steps taken, pursuant to General Condition B-7.

The following shall be included as information which must be reported within 24 hours under this paragraph:

a. Any unanticipated bypass which exceeds any effluent limitation in this permit.

b. Any upset which exceeds any effluent limitation in the permit.

c. Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in the permit.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

6. Other Noncompliance

The permittee shall report all instances of non-compliance not reported under Section D4 or D5, at the time monitoring reports are submitted. The reports shall contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. Duty to Provide Information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Department, it shall promptly submit such facts or information.

8. Signatory Requirements

All applications, reports or information submitted to the Department shall be signed and certified in accordance with 40 CFR 122.22.

9. Falsification of Reports

State law provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $1,000 per violation, or by imprisonment for not more than six months per violation, or by both.

10. <u>Changes to Indirect Dischargers</u> - **[Applicable to Publicly Owned Treatment Works (POTW) only]**

The permittee must provide adequate notice to the Department of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and;

b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For the purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

1. BOD means five-day biochemical oxygen demand.

2. TSS means total suspended solids (non-filterable residue).

3. Mg/l means milligrams per liter.

4. Kg means kilograms.

5. M^3/d means cubic meters per day.

6. MGD means million gallons per day.

7. Composite sample means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.

8. FC means fecal coliform bacteria.

9. Technology based permit effluent limitations means technology-based treatment requirements as defined in 40 CFR 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-41.

10. CBOD means five day carbonaceous biochemical oxygen demand.

11. Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.

12. Quarter means January through March, April through June, July through September, or October through December.

13. Month means calendar month.

14. Week means a calendar week of Sunday through Saturday.

15. Total residual chlorine means combined chlorine forms plus free residual chlorine.

16. The term "bacteria" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and enterococci bacteria.

17. POTW means a publicly owned treatment works.

Expiration Date: 6/30/98
Permit Number: 101123
File Number: 60731

PUBLIC NOTICE

MODIFICATION
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

Department of Environmental Quality
Western Region, 1102 Lincoln St., Suite 210, Eugene, OR 97401
Telephone: (503) 686-7838

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:

City of Newport
810 SW Alder St.
Newport, OR 97365

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated Domestic Sewage	001	Pacific Ocean (Approx. 1830 ft. WSW of Beach Drive)
Emergency Overflows:		
Schooner Creek	002	Schooner Crk
56th St.	003	Pacific Ocean
48th St.	004	Pacific Ocean
42nd St.	005	Pacific Ocean
Big Creek	006	Pacific Ocean
Nye Beach	007	Pacific Ocean
Bay Front	008	Yaquina Bay
OSU Marine S.C.	009	Yaquina Bay
Ferry Slip Road	010	Yaquina Bay
NE 10th St.	011	Pacific Ocean
SW 26th St.	012	Yaquina Bay
SE 3rd St.	013	Yaquina Bay

FACILITY TYPE AND LOCATION:

Trickling Filter STP
420 NW Nye Street
Newport, OR 97365

Treatment System Class: III
Collection System Class: III

RECEIVING SYSTEM INFORMATION:

Basin: Mid Coast
Sub-Basin: Siletz
Hydro Code: 10=*PACI 188.0 D
Receiving Stream: Pacific Ocean
County: Lincoln

EPA REFERENCE NO: OR002277-2

This addendum shall be attached to and made part of Permit No. 101123.

Steve Greenwood, Administrator
Western Region

Date

ADDENDUM NO. 1

Permit No. 101123, Schedule A, Condition No. 1.a.(3) Total Residual Chlorine limit has been modified as follows:

(3)	Other Parameters	Limitations
	Total Residual Chlorine	Shall not exceed a daily maximum of 0.47 mg/l.

Permit No. 101123, Schedule A, Condition No. 1.a.(4) has been modified as follows:

(4) Notwithstanding the effluent limitations established by this permit, no wastes shall be discharged and no activities shall be conducted which violate Water Quality Standards as adopted in OAR 340-41-245 except in the following defined mixing zone:

That portion of the Pacific Ocean not to extend beyond a radius of two hundred fifty (250) feet from the point of discharge. The ZID shall include that portion of the Pacific Ocean within a twenty-five (25) foot radius of the point of discharge.

Permit No. 101123, Schedule C, Condition 7, Paragraphs c. and d. has been modified as follows:

7.c. By no later than June 30, 1995, the permittee shall have completed conversions to the chlorine contact basins for use as surge flow balancing tanks.

7.d. By June 30, 1996, the permittee shall submit a progress/evaluation report to the Department on the performance of Outfall 001 as a result of the above improvements.

APPENDIX NO. 2

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY, OF THE STATE OF OREGON, Department, v. CITY OF NEWPORT Respondent.	STIPULATION AND FINAL ORDER No. WQMW-WVR-93-115 LINCOLN COUNTY

WHEREAS:

1. On June 30, 1993, the Department of Environmental Quality (Department or DEQ) issued National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit Number 101123 (Permit) to the City of Newport (Respondent), pursuant to Oregon Revised Statutes (ORS) 468B.050 and the Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500 as amended. The Permit authorizes the Respondent to construct, install, modify or operate wastewater treatment control and disposal facilities (facilities) and discharge adequately treated wastewaters into the Pacific Ocean, waters of the state, in conformance with the requirements, limitations and conditions set forth in the Permit.

2. The Respondent operates a wastewater treatment facility that utilizes chlorine as a disinfecting agent for the treated effluent prior to discharging to public waters.

3. Chlorine residuals remaining in disinfected wastewaters can be toxic and harmful to aquatic organisms within the receiving stream if streamflow is not adequate to dilute out the residual chlorine to non-toxic levels. Discharges of any substance, including chlorine, that cause water quality stream standards violations outside of a designated mixing zone are prohibited by Oregon Administrative Rules (OAR) 340-41-245(2).

4. The Respondent is required to submit additional mixing zone information under the terms of the Respondent's NPDES Permit as sufficient information currently does not exist regarding the potential for chlorine toxicity. Until such time as the Respondent submits the mixing zone information, a final chlorine effluent limitation cannot be established. This information is scheduled to be submitted by June 30, 1994.

5. Until the mixing zone information is submitted, the Department has included an interim chlorine effluent limit in the Respondent's NPDES Permit. After receipt and evaluation of Respondent's mixing zone information, the Department will reopen the Permit and assign an appropriate final chlorine limitation.

6. The Department and Respondent recognize that a possibility exists that the mixing zone information will show that Respondent may not be in compliance with water quality standard OAR 340-41-245(2) and modifications may be needed in Respondent's wastewater treatment facility to correct chlorine toxicity problems.

7. The Respondent's NPDES Permit also requires the Respondent

to conduct bioassay testing on final effluent. Since the Department and Respondent recognize that whole effluent toxicity due to chlorine may exist, the Department and Respondent wish to mutually address and resolve these potential violations ahead of time since the final corrective options may not be identified, or needed until the additional mixing zone information is available.

8. The Department and Respondent recognize that the Commission has the power to impose a civil penalty and to issue an abatement order for violations of conditions of the Permit. Therefore, pursuant to ORS 183.415(5), the Department and the Respondent wish to limit and resolve any potential future violations referred to in Paragraphs 6 and 7 in advance by this Stipulation and Final Order (SFO).

9. This SFO is not intended to limit, in any way, the Department's right to proceed against Respondent in any forum for any past or future violations not expressly settled herein.

NOW THEREFORE, it is stipulated and agreed that:

10. The Environmental Quality Commission hereby issues a final order:

a. Requiring Respondent to comply with the following schedule:

(1) (A) If the mixing zone information does show a violation of OAR 340-41-245(2), then by September 30, 1994, Respondent shall submit engineering plans and specifications for providing wastewater control

facilities as needed to assure that Respondent can continuously comply with all water quality standards contained in OAR 340-41-245(2).

(B) By December 31, 1995, Respondent shall have wastewater control facilities in operation to comply with the water quality standards for chlorine.

b. Requiring Respondent to meet the following interim requirements which are effective from Permit issuance date through December 31, 1995:

(1) The effluent total residual chlorine concentration shall be kept as low as practicable and in no case shall exceed 0.5 mg/l on a monthly average basis or 1.0 mg/l daily maximum.

c. Requiring Respondent, upon receipt of a written Penalty Demand notice from the Department, to pay the following civil penalties:

(1) One hundred dollars ($100) for each day of each violation of Paragraph 10.b.

(2) Two hundred fifty dollars ($250) for each day of each violation of any other requirement of this SFO.

11. Bioassay tests may be conducted with dechlorinated final effluent.

12. If any event occurs that is beyond Respondent's reasonable control and that causes or may cause a delay or deviation in performance of the requirements of this SFO, Respondent shall

immediately notify the Department verbally of the cause of delay or deviation and its anticipated duration, the measures that have been or will be taken to prevent or minimize the delay or deviation, and the timetable by which Respondent proposes to carry out such measures. Respondent shall confirm in writing this information within five (5) working days of the onset of the event. It is Respondent's responsibility in the written notification to demonstrate to the Department's satisfaction that the delay or deviation has been or will be caused by circumstances beyond the control and despite due diligence of Respondent. If Respondent so demonstrates, the Department shall extend times of performance of related activities under this SFO as appropriate. Circumstances or events beyond Respondent's control include, but are not limited to, acts of nature, unforeseen strikes, work stoppages, fires, explosion, riot, sabotage, or war. Increased cost of performance or consultant's failure to provide timely reports shall not be considered circumstances beyond Respondent's control.

13. Regarding the potential past and future violations set forth in Paragraphs 6 and 7 above, which are expressly settled herein without penalty, Respondent and the Department hereby waives any and all of their rights to any and all notices, hearing, judicial review, and to service of a copy of this SFO. The Department reserves the right to enforce this SFO through appropriate administrative and judicial proceedings.

14. Regarding the schedule set forth in Paragraph 10.a above, Respondent acknowledges that Respondent is responsible for complying with that schedule regardless of the availability of any federal or state grant monies.

15. The terms of this SFO may be amended by the mutual agreement of the Department and Respondent.

16. Respondent acknowledges that it has actual notice of the contents and requirements of the SFO and that failure to fulfill any of the requirements hereof would constitute a violation of this SFO and subject Respondent to payment of civil penalties pursuant to Paragraph 10.c. above.

17. Any stipulated civil penalty imposed pursuant to Paragraph 10.c. shall be due upon written demand. Stipulated civil penalties shall be paid by check or money order made payable to the "State Treasurer, State of Oregon" and sent to: Business Office, Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, OR 97204. Within 21 days of receipt of a "Demand for Payment of Stipulated Civil Penalty" Notice from the Department, Respondent may request a hearing to contest the Demand Notice. At any such hearing, the issue shall be limited to Respondent's compliance or non-compliance with this SFO. The amount of each stipulated civil penalty for each violation and/or day of violation is established in advance by this SFO and shall not be a contestable issue.

18. Providing Respondent has paid in full all stipulated civil

penalties pursuant to Paragraph 17 above, this SFO shall terminate 60 days after respondent demonstrates full compliance with the requirements of the schedule set forth in Paragraph 10.a above.

RESPONDENT

6/21/93
Date

(Name) ______________________
(Title) City Manager

DEPARTMENT OF ENVIRONMENTAL QUALITY

June 30, 1993
Date

Fred Hansen, Director

FINAL ORDER

IT IS SO ORDERED:

ENVIRONMENTAL QUALITY COMMISSION

June 30, 1993
Date

Fred Hansen, Director
Department of Environmental Quality
Pursuant to OAR 340-11-136(1)

APPENDIX NO. 3

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

IN THE MATTER OF: CITY OF NEWPORT, Respondent.	)))))))	STIPULATION AND FINAL ORDER No. WQMW-WR-94-107 LINCOLN COUNTY Permit No. 101123 OR 002277-2

WHEREAS:

1. On June 30, 1993, the Department of Environmental Quality (Department) issued National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit Number 101123 (Permit) to the City of Newport (Respondent), pursuant to Oregon Revised Statutes (ORS) 468B.050. The Permit authorizes Respondent to construct, install, modify and operate wastewater collection, treatment, control and disposal facilities (facilities) and discharge adequately treated wastewaters into the Pacific Ocean, waters of the state, in conformance with the requirements, limitations and conditions set forth in the Permit. The Permit expires on June 30, 1998.

2. Condition 1 of Schedule A of the Permit specifies certain wastewater discharge limits for Respondent's facilities. On certain occasions, respondent has not met these limits in the past and may be unable to meet them in the future if treatment facilities remain unchanged. Failure to consistently meet permitted discharge limits caused the Department to issue Notice of Permit Violation (NPV) No. WQMW-WVR-93-285 to Respondent on December 27, 1993.

3. In response to the NPV, Respondent proposes to evaluate alternatives that will improve treatment plant performance and submit a detailed plan and schedule for implementing selected corrective actions pursuant to the compliance schedule set forth in Paragraph 8A.

///

4. The Department and Respondent recognize that until Respondent completes the actions required by this SFO, Respondent may continue to violate the Permit and Oregon law.

5. Respondent presently is at least capable of meeting the following interim effluent limitations, measured as specified in the Permit:

A. Outfall Number 001 (Sewage Treatment Plant Discharge):

Concentration and Mass Load Limitations					
	Average Effluent Concentrations		Monthly Average	Weekly Average	Daily Maximum
Parameter	Monthly	Weekly	lb./day	lb./day	lbs.
BOD_5	50 mg/l	75 mg/l	800	1,200	1,600
TSS	50 mg/l	75 mg/l	800	1,200	1,600
Other Parameters (year round)					
BOD_5 and TSS Removal Efficiency - 75 percent					

6. The Department and Respondent further recognize that the Environmental Quality Commission has the power to impose a civil penalty and to issue an abatement order for violations of conditions of the Permit. Therefore, pursuant to ORS 183.415(5), the Department and Respondent wish to settle, compromise, and resolve the past and any future violations referred to in Paragraphs 2 and 4 by this Stipulation and Final Order (SFO). Additionally, this SFO will satisfy the requirements of OAR 340-12-040(1)(c) which require that the Department incorporate a compliance schedule of greater than six months into an order providing for stipulated penalties for any noncompliance with the Order.

7. This SFO is not intended to limit, in any way, the Department's right to proceed against Respondent in any forum for any past or future violations not expressly compromised, settled, resolved, or limited herein.

///

NOW THEREFORE, it is stipulated and agreed that:

8. The Environmental Quality Commission shall issue a final order:

A. Requiring Respondent to comply with the following schedule:

(1) Respondent shall retain the services of a consulting engineer to evaluate the problem and, by no later than May 19, 1994, Respondent shall submit a complete and final report to the Department for approval. The report shall include a detailed corrective action plan and schedule for modifying Respondent's sewerage facilities as necessary to meet Permit discharge limits.

(2) Respondent shall comply with the Department approved corrective action plan and schedule.

B. Requiring Respondent to meet the interim effluent limitations set forth in Paragraph 5 above until completion and successful startup of approved corrective actions as required by the schedule specified in Paragraph 8(A).

C. In the event of a violation, requiring Respondent, upon receipt of a written notice from the Department for any violations of the SFO, to pay the following civil penalties:

(1) $250 for each day of each violation of the compliance schedule set forth in Paragraph 8A.

(2) $100 for each violation of each interim limit set forth in Paragraph 8B.

D. Providing that Respondent shall not be subject to further proceedings or penalty for discharges not exceeding the limitations in said Paragraph 5, even though such discharges may exceed the original permit limit.

9. If any event occurs that is beyond Respondent's reasonable control and that causes or might cause a delay or deviation in performance of the requirements of this SFO, Respondent shall notify the Department verbally of the cause of delay or deviation and its

anticipated duration, the measures that have been or will be taken to prevent or minimize the delay or deviation, and the timetable by which Respondent proposes to carry out such measures. Respondent shall confirm in writing this information within five (5) working days of the onset of the event. It is Respondent's responsibility in the written notification to demonstrate to the Department's satisfaction that the delay or deviation has been or will be caused by circumstances beyond the control and despite due diligence of Respondent. If Respondent so demonstrates, the Department shall extend times of performance of related activities under the SFO as appropriate. Circumstances or events beyond Respondent's control include, but are not limited to, acts of nature, unforeseen strikes, work stoppages, fires, explosion, riot, sabotage, or war. A consultant's failure to provide timely reports may not be considered circumstances beyond Respondent's control.

10. Regarding the violations set forth in Paragraphs 2 and 4 above, which are expressly settled herein without penalty, Respondent and the Department hereby waive any and all of their rights to any and all notices, hearing, judicial review, and to service of a copy of the final SFO herein. The Department shall have the right to enforce this SFO through appropriate administrative and judicial proceedings.

11. Regarding the schedule set forth in Paragraph 8A above, Respondent acknowledges that Respondent is responsible for upgrading its sewerage facilities to comply with current permit requirements, as amended, regardless of the availability of any federal or state grant or loan monies.

12. The terms of this SFO may be amended by the mutual agreement of the Department and Respondent.

13. Subject to applicable laws and regulations, Respondent acknowledges that it has actual notice of the contents and requirements of the SFO and that failure to fulfill any of the specific requirements expressed as set forth would constitute a violation of this SFO and subject Respondent to payment of civil penalties pursuant to Paragraph 8C above.

14. Any stipulated civil penalty imposed pursuant to Paragraph 8C shall be due upon written demand. Stipulated civil penalties shall be paid by check or money order made payable to the "State Treasurer, State of Oregon" and sent to: Business Office, Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon 97204. Within 21 days of receipt of a "Demand for Payment of Stipulated Civil Penalty" Notice from the Department, Respondent may request a hearing to contest the Demand Notice. At any such hearing, the issue shall be limited to Respondent's compliance or alleged non-compliance with this SFO. The amount of each stipulated civil penalty for each violation and/or day of violation is established in advance by this SFO and shall not be a contestable issue. However, this shall not preclude the Department and Respondent from settling and compromising any contested issue by mutually agreeable stipulation.

15. Providing Respondent has paid in full all stipulated civil penalties imposed pursuant to Paragraph 8C above, this SFO shall terminate 60 days after Respondent demonstrates full compliance with the requirements of the schedule set forth in Paragraph 8A above.

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RESPONDENT

____
Date

(Name) Sam I. Sasaki
(Title) City Manager

DEPARTMENT OF ENVIRONMENTAL QUALITY

____
Date

Fred Hansen, Director

FINAL ORDER

IT IS SO ORDERED:

ENVIRONMENTAL QUALITY COMMISSION

____
Date

Fred Hansen, Director
Department Environmental Quality
Pursuant to OAR 340-11-136(1)

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

Mr. Lee Ritzman
City of Newport
810 SW Alder Street
Newport, OR 97365

Re: City of Newport
Addendum No. 1 to
Stipulation and Final
Order WQMW-WR-94-107
File No. 60731
EPA # OR 002277-2

Dear Mr. Ritzman:

The Department has taken into consideration your request to clarify and expand the Stipulation and Final Order (SFO) WQMW-WR-94-107 compliance schedule dates contained in Paragraph 8.A.(2). Pursuant to Section 12 of the SFO, the Department concurs with the City's June 10, 1994, written request for modification of the SFO.

Subparagraphs (a), (b) and (c) are hereby added to Paragraph 8.A(2) of the SFO, as follows:

(a) By no later than October 31, 1994, Respondent shall submit plans and specifications for trickling filter motorized drives. Respondent shall complete installation of the trickling filter motorized drives by no later than May 31, 1995.

(b) By no later than October 31, 1994, Respondent shall submit plans and specifications for sludge thickening equipment of adequate capacity and reliability. Respondent shall complete installation of the sludge thickening equipment by no later than May 31, 1995.

(c) By no later than November 30, 1994, Respondent shall submit the results of a BOD Validation Study. The study shall include an evaluation of whether additional modifications to the waste-water facilities are necessary.

811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
TDD (503) 229-6993
DEQ-1

If you have any questions regarding this matter, please call Mark E. Hamlin, at 378-8240, in our Western Region office in Salem.

Sincerely,

Fred Hansen
Director

MEH:b
U:\ENF\ORDERS\NEWPORT3.SFO
cc: Western Region, Salem Office, DEQ
Enforcement Section, DEQ
EPA-OOO

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

Western Region

November 21, 1994

Mr. Lee Ritzman
City of Newport
810 SW Alder Street
Newport, OR 97365

Re: City of Newport
Addendum No. 2 to
Stipulation and Final
Order WQMW-WR-94-107
File No. 60731
EPA # OR 002277-2
Deadline Modification

Gentlemen:

The Department has taken into consideration your request to modify the Stipulation and Final Order (SFO) WQMW-WR-94-107 compliance schedule dates contained in Paragraph 8.A.(2). Pursuant to Section 12 of the SFO, the Department concurs with the City's October 18, 1994, written request which includes the description of need for modification. The Department hereby approves the City of Newport's request.

Now, therefore, the following Paragraph in the SFO shall read as follows:

Paragraph 8.A(2)(b) - By no later than January 15, 1995, Respondent shall submit plans and specifications for sludge thickening equipment of adequate capacity and reliability. Respondent shall complete installation of the sludge thickening equipment by no later than July 31, 1995.

If you have any questions regarding this matter, please call Mark E. Hamlin, at 378-8240, in our Western Region office in Salem.

Sincerely,

Lydia Taylor

Lydia Taylor
Interim Director

U:\ENF\ORDERS\NEWPORT4.SFO

cc: Western Region, Salem Office, DEQ
Water Quality Division, DEQ
Enforcement Section, DEQ
EPA-OOO

Barbara Roberts
Governor

1102 Lincoln
Suite 210
Eugene, OR 97401
(503) 686-7838

DEQ WR-101 1-91

APPENDIX NO. 4

N.W. SCHOONER CREEK ROAD
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION

Location	N.W. 68th Street, west end
Type	Hydronix
Pump Type	Centrifugal
Capacity	400 GPM @ 183' TDH; 2) 200 gpm @ 183' TDH
Pump HP (each)	1) 60 HP @ 1765 rpm; 2) 50 HP @ 1750 rpm
Level Control Type	Mercury Switch Float Balls
Overflow Point	100' West of pump station
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	46.8 Minutes @ 70 gpm ADWF.
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	150 KW
Fuel Tank Capacity	50 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	II

FORCE MAIN

Length	3779' of 6" pressure sewer (600' D.I.P. & 3179' of PVC C900)
Volume	5,550 gallons
Profile	Pump = 0+00, 23.1'; 7+00, 25.0'; 10+00, 115.0'; 23+00, 125.5'; 26+49, 131.7'; 32+00, 143.4'; 37+79, 162.0; Includes 4 x 22-1/2° and 2 x 11-1/4° bends and 6 check valves.
Discharge Manhole	56th and Gladys Street
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 79 to 113 minutes, depending on pump wear (70% to 100%) @ 70 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***1 - Schooner Creek (NW 68th St.)***
LIFT STATION LOCATION - ***at West end of NW 68th St.***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***56th and Gladys St. Intersection***

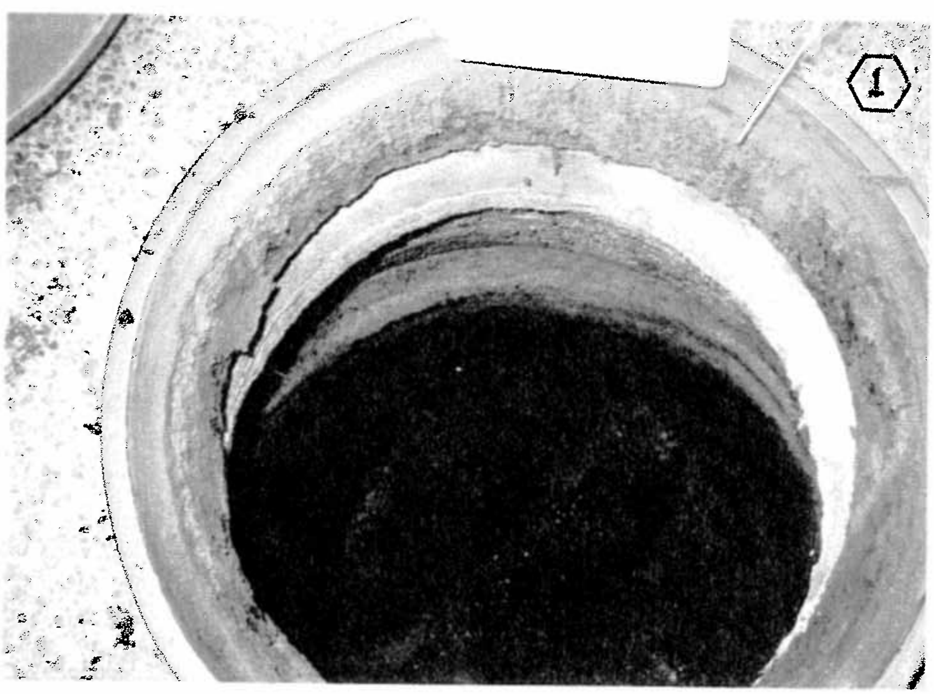
2. Inspection Date / Time - ***9/14/95 / 10:30 a.m.***

3. Manhole Inspected By - ***Dave Theurer, Roy Treichler, Tom Morris***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***1/16" thk. laitance; sound concrete***

6. Additional Comments -
   - MH Lid - ***Exposed in paved street***
   - MH Approx. Depth - ***4 ft.***
   - MH Force Main Inlet Size - ***6-inch***
   - MH Outlet Size - ***8-inch***
   - Force Main Discharging During Inspection - ***No***
   - Corrosion Problem - ***No***



N.W. 56th STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	N.W. 56th Street, west end
Type	Hydronix
Pump Type	Centrifugal
Capacity	150 gpm @ 81' TDH
Pump HP (each)	1) 10 HP @ 1750 rpm; 2) 10 HP @ 1750 rpm
Level Control Type	Mercury Switch Float Ball
Overflow Point	56th and Pinery Street
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	101.69 Minutes @ 25 gpm ADWF
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	II
FORCE MAIN	
Length	2108 of 6" PVC
Volume	3,100 gallons
Profile	0+00, 105.5'; 5+60, 116.0'; 8+20, 118.0'; 9+40, 130.0'; 13+50, 137.5'; 21+08, 167.0' Includes 4 x 45° bends and 4 check valves
Discharge Manhole	N. W. Siletz Place and 55th Street
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 124 to 177 minutes depending on pump wear (70% to 100%) @ 25 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***2 - 56th Street***
LIFT STATION LOCATION ***- at west end of NW 56th St.***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***on 55th St., 500ft± west of Hwy 101***

2. Inspection Date / Time - ***9/14/95 / 11:00 a.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***1/16" thk. laitance; sound concrete***

6. Additional Comments -

    MH Lid - ***Buried under 8-inches of road gravel fill.***
    MH Approx. Depth - ***3 ft.***
    MH Force Main Inlet Size - ***6-inch***
    MH Outlet Size - ***8-inch***
    Force Main Discharging During Inspection - ***Yes***
    Corrosion Problem - ***No***

N.W. 48th STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	N.W. 48th Street, 100 ± Feet west of Highway 101
Type	Hydronix
Pump Type	Centrifugal
Capacity	1) 500 gpm @ 51' TDH; 2) 500 gpm @ 51' TDH
Pump HP (each)	1) 20 HP @ 1750 rpm; 2) 20 HP @ 1750 rpm
Level Control Type	Mercury Switch Float Ball
Overflow Point	46th and Cherokee Lane
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	27.36 Minutes @ 120 gpm ADWF
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	II
FORCE MAIN	
Length	1564 of 10" PVC
Volume	6,480 gallons
Profile	0+00, 64.48'; 0+10, 75.0'; 3+67, 80'; 6+78, 82'; 8+39, 85.2'; 15+64, 90.61' Includes 2 check valves, 3 x 45° and 2 x 22-1/2° bends
Discharge Manhole	NW 42 Court Eastside of Highway 101
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 54 to 81 minutes depending on pump wear (70% to 100%) @ 120 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. *3 - 48th Street*
LIFT STATION LOCATION - *on N.W. 48th St., west of Hwy 101*
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***in golf course lawn, east side of Hwy 101 across from NW 42nd St.***

2. Inspection Date / Time - ***9/14/95 / 11:45 a.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in golf course lawn***
   MH Approx. Depth - ***3 ft.***
   MH Force Main Inlet Size - ***8-inch***
   MH Outlet Size - ***12-inch***
   Force Main Discharging During Inspection - ***Yes***
   Corrosion Problem - ***No***

N. W. 42nd STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	N.W. 42nd Street, 100 feet ± west of Highway 101
Type	Hydronix
Pump Type	Centrifugal
Capacity	100 gpm @ 30' TDH
Pump HP (each)	1) 3 HP @ 1145 rpm; 2) 3 HP @ 1145 rpm
Level Control Type	Mercury Float Switch
Overflow Point	Wet Well Inspection Port
Overflow Discharge	Pump Station Area
Overflow Alarm	None
Avg. Time to Overflow	49.75 Minutes @ 5 gpm ADWF
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	None
EPA Reliability Class	II
FORCE MAIN	
Length	1034' of 4" PVC
Volume	700 gallons
Profile	0+00, 78'; 3+30, 91' with Air & Vac.Rel. Valve; 10+34, 79.0'; 4 x 45° bends
Discharge Manhole	Highway 101
Air Release Valve	Wade Way and Highway 101
Vacuum Release Valve	Wade Way and Highway 101
Average Detention	Ranges from 140 to 200 minutes depending on pump wear (70% to 100%) @ 5 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***4 - 42nd Street***
LIFT STATION LOCATION - ***on NW 42nd St., west of Hwy 101***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***in Oceanview Drive on west side of Hwy 101***

2. Inspection Date / Time - ***9/14/95 / Noon***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in street paving***
   MH Approx. Depth - ***6 ft.***
   MH Force Main Inlet Size - ***6-inch***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***Yes***
   Corrosion Problem - ***No***

BIG CREEK STATION
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	N.W. Ocean View Drive, 50 Feet ± South of Big Creek
Type	Paco
Pump Type	Centrifugal
Capacity	900 gpm - 180' TDH
Pump HP (each)	40 HP
Level Control Type	Mercury Switch Float Ball
Overflow Point	Manhole in Agate Beach State Park
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	17 Minutes @ 320 gpm ADWF.
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	150 KW
Fuel Tank Capacity	50 gal.
Transfer Switch	Manual
Alarm Telemetry Type	Chatterbox (by Raco) Autodialer
EPA Reliability Class	II
FORCE MAIN	
Length	4600' OF 8" Transite
Volume	11,770 gallons
Profile	Ground elevation: 0+00, 25'; 10+00, 60'; 16+50, 100'; 21+50, 125'; 28+00, 147'; 28+60, 144'; 30+50, 147'; 31+50, 147'; 33+50, 150'; 40+00, 156'; 46+00, 152' MH Includes many check valves; 5 x 90° bends; 1 x 45° bend
Discharge Manhole	West Side of Highway 101 between 13th and 14th
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 37 to 53 minutes depending on pump wear (70% to 100%) @ 320 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. *5 - Big Creek*
LIFT STATION LOCATION - *on Oceanview Drive south of Big Creek*
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***in southbound lane of Hwy 101***

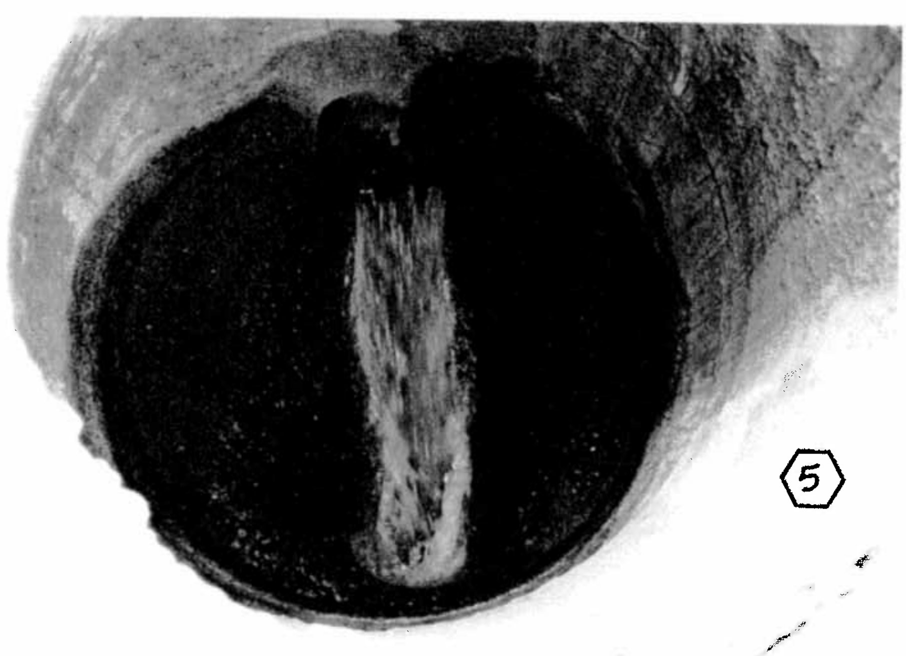
2. Inspection Date / Time - ***9/14/95 / 1:15 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***1/2" diameter steel rod***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in Hwy 101 paving***
   MH Approx. Depth - ***8 ft.***
   MH Force Main Inlet Size - ***6-inch***
   MH Outlet Size - ***12-inch***
   Force Main Discharging During Inspection - ***Yes***
   Corrosion Problem - ***No***



N.W. PARK STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	500 ± Feet north of N.W. 17th Street on N.W. Nye Street
Type	Hydronix
Pump Type	Centrifugal
Capacity	100 gpm @ 77' TDH
Pump HP (each)	1) 10 HP @ 1740 rpm; 2) 10 HP @ 1740 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Pump Station
Overflow Discharge	Manhole West of Pump Station
Overflow Alarm	None
Avg. Time to Overflow	324 Minutes @ 6 gpm ADWF.
Auxiliary Power Type	None
Location	
Output	
Fuel Tank Capacity	
Transfer Switch	
Alarm Telemetry Type	Raco Chatterbox Auto Dialer
EPA Reliability Class	II
FORCE MAIN	
Length	889' of 4" PVC
Volume	600 gallons
Profile	Pump 1+11, 86.0'; 2+23, 86'; 3+75, 92'; 4+50, 105'; 10+00, 142'
Discharge Manhole	N.W. 5th Street and Nye Street
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 100 to 143 minutes depending on pump wear (70% to 100%) @ 6gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***6 - Park Street***
LIFT STATION LOCATION - ***on NW Nye St. north of NW 17th St.***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***at intersection of 15th and Nye Streets***

2. Inspection Date / Time - ***9/14/95 / 1:30 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in street paving***
   MH Approx. Depth - ***12 ft.***
   MH Force Main Inlet Size - ***4-inch***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No***

N. W. SPRING STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	N.W. Spring Street and N.W. 14th Street, S.E. corner
Type	Hydronix
Pump Type	Centrifugal
Capacity	150 gpm @ 56' TDH
Pump HP (each)	1) 7.5 HP @ 1745 rpm; 2) 7.5 HP @ 1745 rpm
Level Control Type	Mercury Float Switches
Overflow Point	14th and Spring Street
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	213.62 Minutes @ 10 gpm ADWF.
Auxiliary Power Type	None
Location	
Output	
Fuel Tank Capacity	
Transfer Switch	
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	II
FORCE MAIN	
Length	645' of 4" Transite
Volume	440 gallons
Profile	Straight slope EL 74' to EL 108'
Discharge Manhole	N.W. 12th and Spring Street
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 44 to 63 minutes depending on pump wear (70% to 100%) @ 10 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. 7 - ***Spring Street***
LIFT STATION LOCATION - ***Spring St. at NW 14th St.***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***NW 12th and Spring St. intersection***

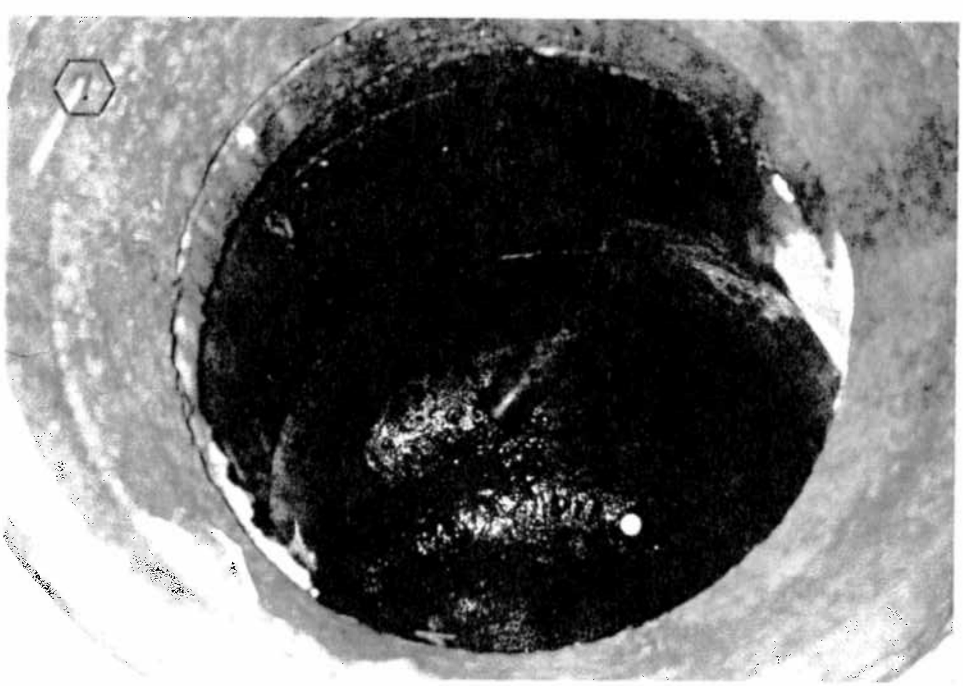
2. Inspection Date / Time - ***9/14/95 / 1:45 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in street paving***
   MH Approx. Depth - ***8 ft.***
   MH Force Main Inlet Size - ***6-inch***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No***



NYE BEACH
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	N.W. Beach Drive, 250 ± feet west of N.W. Coast Street
Type	Allis-Chalmers
Pump Type	Centrifugal
Capacity	1800 gpm @ 85' TDH
Pump HP (each)	1) 60 HP @ 1160 rpm; 2) 60 HP @ 1160 rpm
Level Control Type	Bubble Leveler
Overflow Point	Pump Station
Overflow Discharge	Nye Beach Storm Drain
Overflow Alarm	None
Avg. Time to Overflow	2 Minutes @ 300 gpm ADWF.
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	125 KW
Fuel Tank Capacity	50 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	None
EPA Reliability Class	II
FORCE MAIN	
Length	2192' of 12" A/C
Volume	12,880 gallons
Profile	Pump= 3+73, 31.25'; 5+07, 39.0'; 16+98, 55.50'; 19+30, 57.50'; 19+36, 60.0'; 25+65, 65.44' Includes 5 x 90° bends, 2 x 22° bends and 1 x 11° bend
Discharge Manhole	Head works - WWTP
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 43 to 61 minutes depending on pump wear (70% to 100%) @ 300 gpm ADF
Sulfide Control System	None

COMMENTS:

1. This Force Main will be abandoned during the start-up of the South Beach Wastewater Conveyance and Treatment Project.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***8 - Nye Beach***
LIFT STATION LOCATION - ***on NW Beach Drive south side of Nye Beach Turn around***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***at WWTP inlet screen structure, west wall***

2. Inspection Date / Time - ***9/18/95 / 1:00 p.m.***

3. Manhole Inspected By - ***Roy Treichler, Tom Morris***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed inside Inlet Screen Structure***
   MH Approx. Depth - ***5 ft.***
   MH Force Main Inlet Size - ***12-inch***
   MH Outlet Size - ***21-inch***
   Force Main Discharging During Inspection - ***Yes***
   Corrosion Problem - ***No***

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***9 - Neff Street***
LIFT STATION LOCATION ***- at Neff St. Apartments***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***east side of Neff St., 100ft± north of 6th St.***

2. Inspection Date / Time - ***9/14/95 2:00 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No Laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in gravel shoulder of Neff St.***
   MH Approx. Depth - ***9 ft.***
   MH Force Main Inlet Size - ***4-inch force main connects to 8-inch gravity sewer upstream of discharge manhole.***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***yes***
   Corrosion Problem - ***No***
   This lift station serves one residence - no photo available.

S.W. MINNIE STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	S.W. Minnie Street, 200 ± feet west of S.W. Mark Street
Type	Hydronix
Pump Type	Centrifugal
Capacity	100 gpm @ 35' TDH
Pump HP (each)	1) 3 HP @ 1155 rpm; 2) 3 HP @ 1155 rpm
Level Control Type	Mercury Float Switch
Overflow Point	Wet Well
Overflow Discharge	Pump Station
Overflow Alarm	None
Avg. Time to Overflow	498.45 Minutes @ 5 gpm ADWF.
Auxiliary Power Type	None
Location	
Output	
Fuel Tank Capacity	
Transfer Switch	
Alarm Telemetry Type	None
EPA Reliability Class	II
FORCE MAIN	
Length	235' of 4" A/C
Volume	160 gallons
Profile	Discharge Elev. 57.63', Transition MH 73.1'; 2 x 45° bends
Discharge Manhole	100' north Mark Street and Minnie Street
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 32 to 46 minutes depending on pump wear (70% to 100%) @ 5 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***10 - Minnie and Mark***
LIFT STATION LOCATION ***in Minnie St. west of S.W. Mark St.***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***in center of Mark St. 90ft± north of Minnie St.***

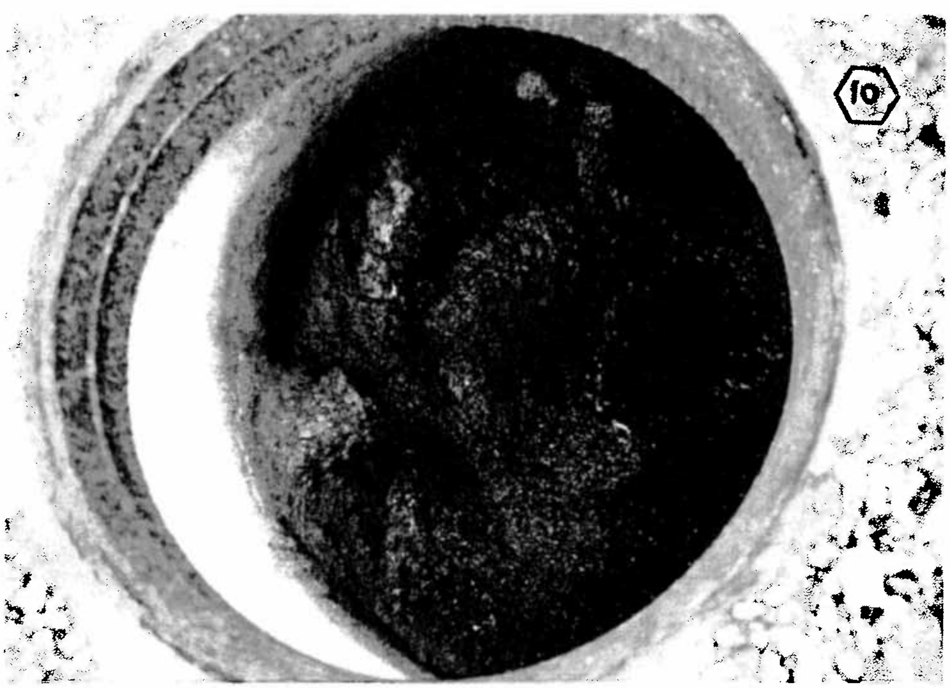
2. Inspection Date / Time - ***9/14/95 / 2:05 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***1/16" thk. laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Buried under 3-inches of road gravel fill***
   MH Approx. Depth - ***3 ft.***
   MH Force Main Inlet Size - ***4-inch***
   MH Outlet Size - ***12-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No***



S.W. 26th STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	S.W. 26th Street and S.W. Abalone Street, N.W. corner
Type	Hydronix
Pump Type	Submersible
Capacity	70 gpm @ 25' TDH
Pump HP (each)	1) 3 HP @ 3450 rpm; 2) 3 HP @ 3450 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Newport Water Sports Parking Lot
Overflow Discharge	Pump Station
Overflow Alarm	None
Avg. Time to Overflow	392.32 Minutes @ 6 gpm ADWF.
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	I
FORCE MAIN	
Length	110' of 3" PVC
Volume	40 gallons
Profile	0+00, 8.0'; 1+10, 15.2'
Discharge Manhole	Abalone Street and 26th Street
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 7 to 10 minutes depending on pump wear (70% to 100%) @ 6 gpm ADWF
Sulfide Control System	Backdrainage System
BACKDRAINAGE SYSTEM	
Control Valve Type	Solenoid Drain Valve
Valve Size	2"

COMMENTS:
None

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***11 - SW 26th Street***
LIFT STATION LOCATION - ***on SW 26th St. west of Hwy 101 Yaquina Bay Bridge***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***30± feet south of intersection of Abalone and SW 26th St.***

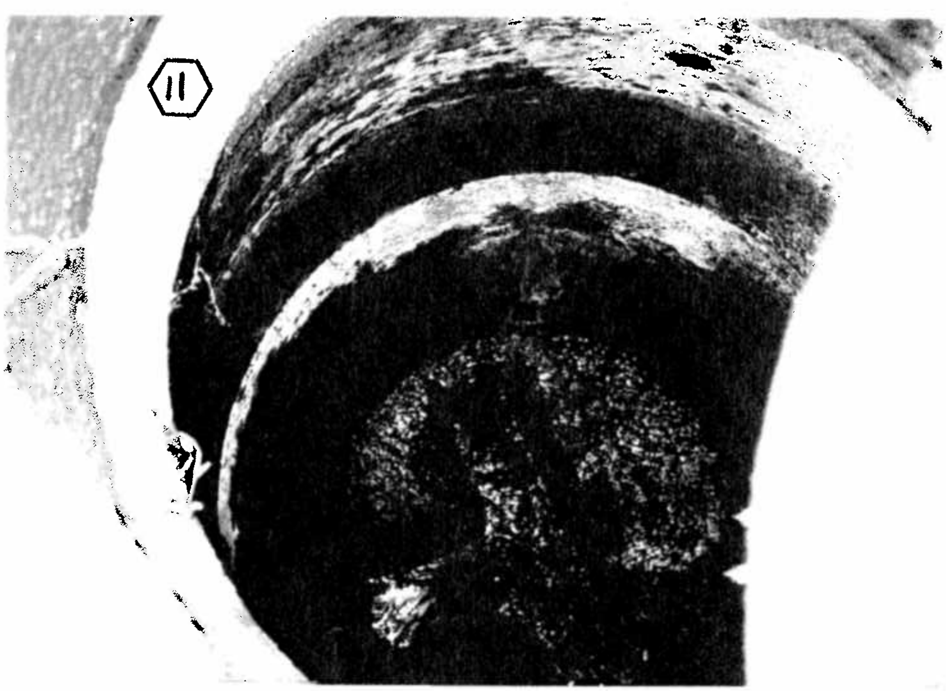
2. Inspection Date / Time - ***9/14/95 / 2:15 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***1/16" thk. laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in lawn grass***
   MH Approx. Depth - ***6 ft.***
   MH Force Main Inlet Size - ***4-inch***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No***



S.E. OSU DRIVE
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	S.E. Marine Science Center Drive, 500 ± feet south of Yaquina Bay.
Type	Hydronix
Pump Type	Centrifugal
Capacity	700 gpm @ 15' TDH
Pump HP (each)	1) 10 HP @ 1745 rpm; 2) 10 HP @ 1745 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Pump Station
Overflow Discharge	Pump Station
Overflow Alarm	None
Avg. Time to Overflow	32.22 Minutes @ 85 gpm ADWF.
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	I
FORCE MAIN	
Length	3530' of 8" (2731' of restrained joint pipe and ball joint pipe (D.I.) & 800' of A/C
Volume	9,030 gallons
Profile	Pump = 10+73, 6.0'; 13+95, 6.0'; 14+25, 0.0'; 18+00, -47.0'; 24+00, -45'; 24+50, -33'; 31+00, -27.0'; 33+09, Air Relief Valve, -9.8'; 35+40, -25.0'; 36+66, -16.0'; 38+04, +16.0'; End, North End of Bay Crossing includes 1 x 45°, 4 x 22° and 1 x 11° bends; <u>then</u> 800 L.F. thru Embarcadero to MH in Bay Blvd. includes 2 x 45°, 2 x 90° bends.
Discharge Manhole	Bay Blvd., East 323' of John Moore Road
Air Release Valve	In Bay
Vacuum Release Valves	None
Average Detention	Ranges from 106 to 151 minutes depending on pump wear (70% to 100%) @ 85 gpm ADWF
Sulfide Control System	Yes, H_2O_2
CHEMICAL FEED SYSTEM	Yes
Type	$H_2 O_2$
Pump Type	Pulsafeeder
Capacity	(1) 44 gpd; (1) 24 gpd
Reaction Time	20 to 30 minutes
Dose Control	<.1 ml per liter Sulfide

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.
2. Discharge manhole and 6 downstream manholes need replaced within 5 years.
3. This Force Main may receive flow from north side of Bay during implementation of the South Beach Wastewater Conveyance and Treatment Project.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. *12 - OSU Marine Science Center*
LIFT STATION LOCATION - *on OSU Drive, 500ft$^{\pm}$ south of Yaquina Bay*
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***in Bay Blvd, north of Embarcadero parking lot (on north side of Yaquina Bay)***

2. Inspection Date/Time - ***9/18/95 / 1:30 p.m.***

3. Manhole Inspected By -***Same as No. 8***

4. Probe Used Inside Manhole- ***6-inch blade screwdriver***

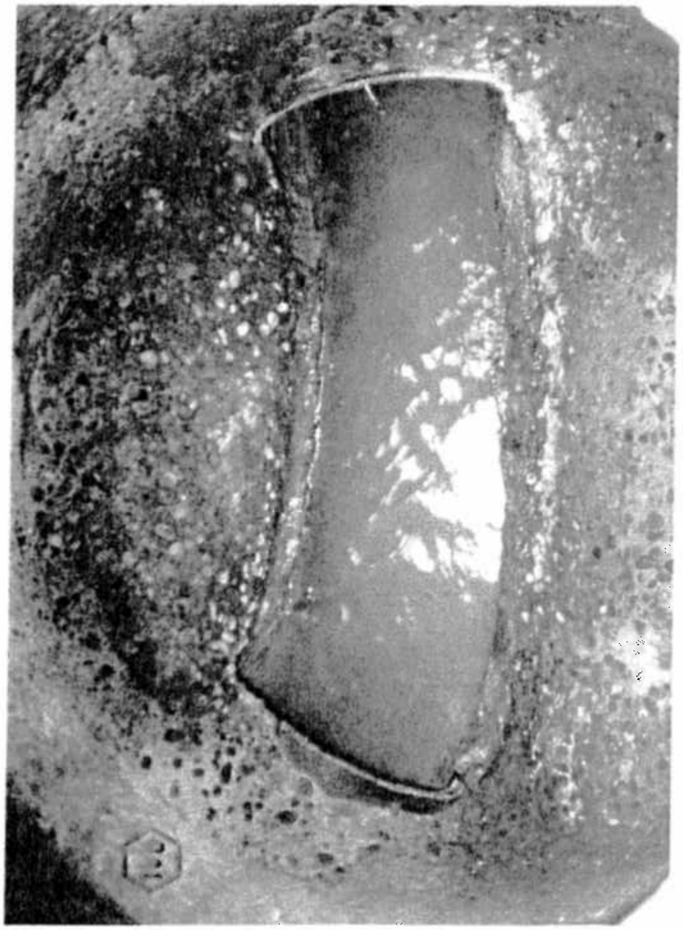
5. Condition of Inside of Concrete Cone - ***1/2" thk. laitance; deteriorated concrete***

6. Additional Comments -

    MH Lid - ***Exposed in Bay Blvd. paving***
    MH Approx. Depth - ***4 ft.***
    MH Force Maine Inlet Size - ***8-inch (OSU); 6-inch (Embarcadero)***
    MH Outlet Size - ***12 -inch***
    Force Main Discharging During Inspection - ***Yes, both***
    Corrosion Problem - ***Yes, concrete and MH frame deteriorated***

    Downstream manhole to west:
    (16B) 1st downstream MH - in street - 1/4" thk. laitance; deteriorate concrete
    (16C) 2nd MH - in yard - 1/2" thk laitance; deteriorated concrete
    3rd MH - in yard - 1 1/2" thk. laitance; deteriorated concrete
    (16E) 4th MH - in yard - 1/2" thk. laitance; deteriorate concrete
    (16F) 5th MH - in yard - 1/2" thk. laitance; deteriorated concrete
    (16G) 6th MH - angle pt. from yard to st. - 1/2" thk laitance; deteriorated concrete
    7th MH - in street - 1/16" thk. laitance; sound concrete
    8th MH - in street - 1/16" laitance; sound concrete

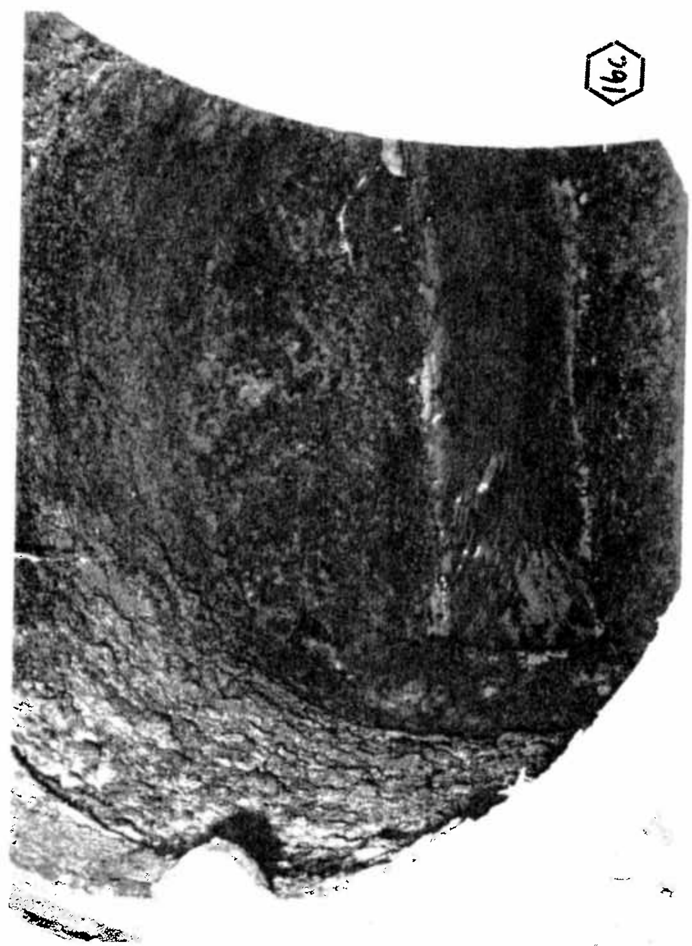
    See photo pages



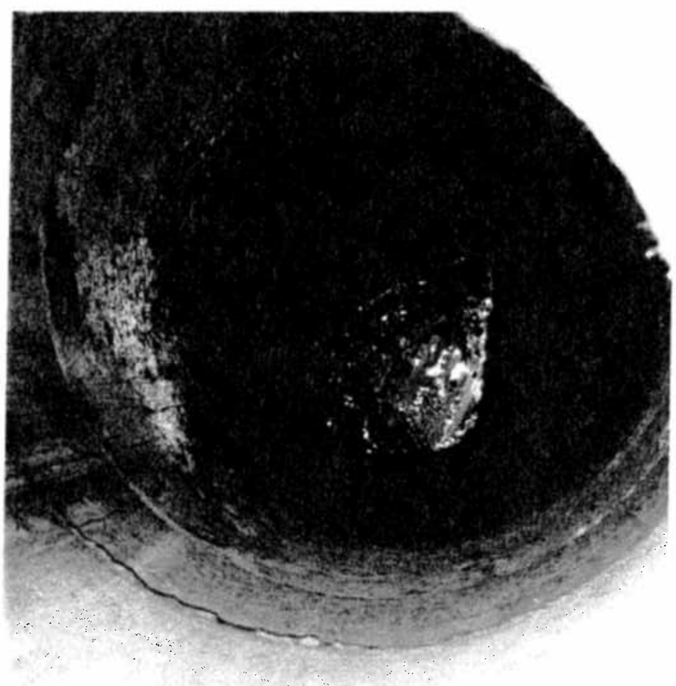
16E

12 16

16C



16G



16F

SOUTH BEACH MARINA
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION

Location	Newport Marina at South Beach, 100± east of 'F' Dock.
Type	Hydronix
Pump Type	Centrifugal
Capacity	250 gpm @ 15' TDH
Pump HP (each)	1) 3 HP @ 1725 rpm; 2) 3 HP @ 1725 rpm; Pump speed 862.5 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Fuel Dock South Beach Marina
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	470.79 Minutes @ 2 gpm ADWF
Auxiliary Power Type	None
Location	
Output	
Fuel Tank Capacity	
Transfer Switch	
Alarm Telemetry Type	None
EPA Reliability Class	II

FORCE MAIN

Length	396' of 6" Transite Pipe
Volume	582 gallons
Profile	Continually ascending force main from pumps to discharge manhole
Discharge Manhole	OSU Drive, west shoulder
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 291 to 415 minutes, depending on pump wear (70% to 100%) @ 2 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***13 - South Beach Marina***
LIFT STATION LOCATION - ***South Beach Marina***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***on OSU Drive (west shoulder) 500ft± south of Marine Science center entrance road.***

2. Inspection Date / Time - ***9/14/95 / 3:00 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***1/16" thk. laitance; sound concrete.***

6. Additional Comments -
   MH Lid - ***Exposed in grass on west shoulder of road***
   MH Approx. Depth - ***10 ft.***
   MH Force Main Inlet Size - ***8-inch***
   MH Outlet Size - ***10-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No.***

S. E. 32ND STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION

Location	S.E. 32nd Street and S.E. Ferry Slip Road, N.W. corner
Type	Hydronix
Pump Type	Centrifugal
Capacity	270 gpm @ 43' TDH
Pump HP (each)	1) 15 HP @ 1750 rpm; 2) 15 HP @ 1750 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Pump Station
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	282.47 Minutes @ 15 gpm ADWF
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal.
Transfer Switch	Manual
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	I

FORCE MAIN

Length	1520' of 6" PVC
Volume	2,230 gallons
Profile	0+00, 4.3'; 9+00, 4.3'; 13+00, 8.5'; 15+20, 11.76'
Discharge Manhole	Ferry Slip Road 545' south of OSU Drive
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 149 to 213 minutes depending on pump wear (70% to 100%) @ 15 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.
2. This Force Main may be abandoned and rerouted shorter during implementation of the South Beach Wastewater Conveyance and Treatment Project.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***14 - SE 32nd Street***
LIFT STATION LOCATION ***NW corner of intersection SE 32nd & Ferry Slip Road***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***on west side of Ferry Slip Road, 300±ft south of OSU Drive***

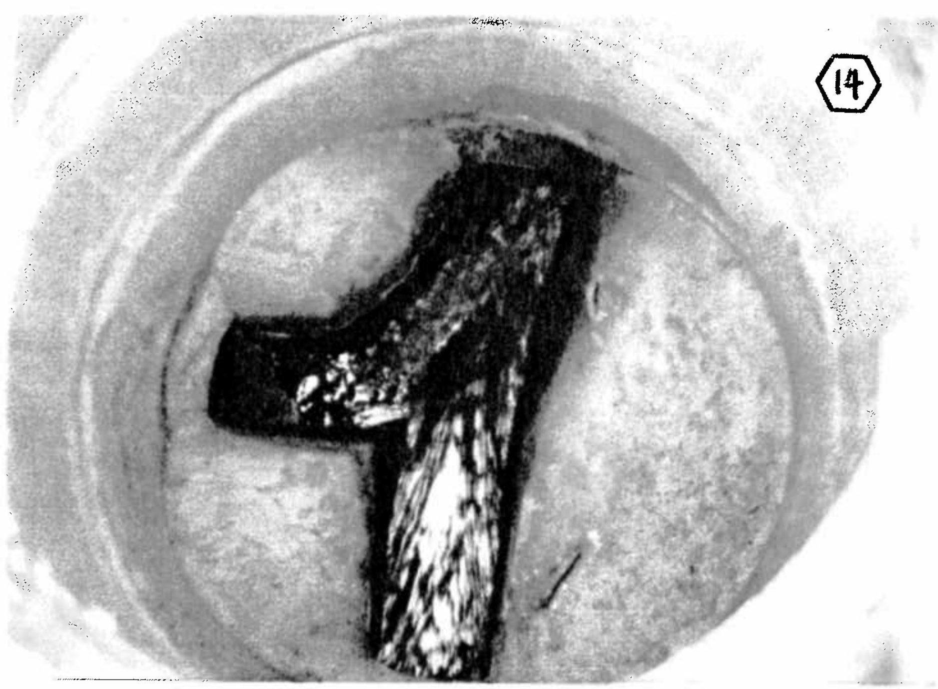
2. Inspection Date / Time - ***9/14/95 / 3:05 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in grass shoulder***
   MH Approx. Depth - ***6 ft.***
   MH Force Main Inlet Size - ***8-inch***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***Yes***
   Corrosion Problem - ***No***



BAY FRONT PUMP STATION
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	S.W. Bay Blvd. and S.W. Hatfield Drive, N.E. corner
Type	Wet well/dry well - Concrete poured in place
Pump Type	Cornell 4 x 4 x 14T VC 40-4 Centrifugals with 14" Impellers, 2 Port - non-clog type.
Capacity	900 gpm @ 54 Hz 1200 @ 60 Hz TDH = 132'; Includes 124' elevation rise and -8' elevation @ pump floor
Pump HP (each)	50 HP High Efficiency Type 92-94% motors
Level Control Type	Primary= General Electric Transducer Backup = Autocon Type 3100 A; Float Type with primary and Back-up Mercury Switches on metal tape actuated drum with counter weight.
Overflow Point	Storm Drain which discharges into Bay at point directly south of pump station through seawall. Elevation of discharge is 8' above average high tide, about 8' below street level.
Overflow Discharge	At seawall south of pump station
Overflow Alarm	None
Avg. Time to Overflow	131.64 Minutes @ 300 gpm ADWF
Auxiliary Power Type	Diesel Generator
Location	Installed behind pump station
Output	65 KW Constant @ 240 VAC 60 Hz
Fuel Tank Capacity	60 gallons approx. 18 hours
Transfer Switch	Manual
Alarm Telemetry Type	None
EPA Reliability Class	I I
FORCE MAIN	
Length	1370' of 8" pipe, (920' of 8" PVC (C900) 450' of 8" A/C pipe)
Volume	3,510 gallons
Profile	Ground Surface EL 14, 0+00; 3+30, 65'; 9+20, 112'; 13+70, 131'; includes 2 check valves
Discharge MH	S.E. 2nd and Avery
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 12 to 17 minutes depending on pump wear (70% to 100%) @ 300 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.
2. Two manholes downstream and 800± feet of downstream gravity sewer need replaced within five years.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***15 - Bay Front***
LIFT STATION LOCATION ***at intersection of Bay Blvd. & Hatfield Drive***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***at intersection of Avery & 2nd Streets.***

2. Inspection Date / Time - ***9/14/95 / 4:00 p.m.***

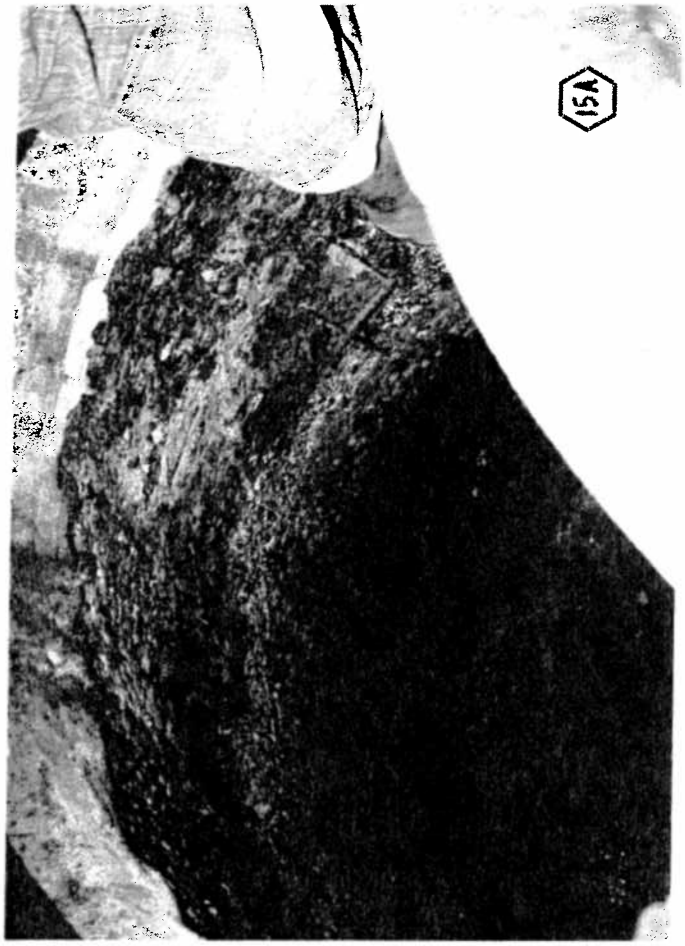
3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***1" thk. laitance; deteriorated concrete***

6. Additional Comments -
   MH Lid - ***Exposed in northbound lane of street paving***
   MH Approx. Depth - ***6 ft.***
   MH Force Main Inlet Size - ***8-inch***
   MH Outlet Size - ***15-inch***
   Force Main Discharging During Inspection - ***Yes***
   Corrosion Problem - ***Yes, concrete deteriorated***
   Downstream manholes to north:
   1st downstream MH - in street - 1/4" thk. laitance; sound concrete
   3rd MH - in street - no laitance; sound concrete

   see photo page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15D


15A


15D

EMBARCADERO
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	In Embarcadero parking lot across from S.E. Moore Drive
Type	Hydronix
Pump Type	Centrifugal
Capacity	500 gpm @ 26' TDH
Pump HP (each)	1) 7.5 HP @ 1750 rpm; 2) 7.5 HP @ 1750 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Pump Station
Overflow Discharge	Pump Station
Overflow Alarm	None
Avg. Time to Overflow	19.61 Minutes @ 60 gpm ADWF.
Auxiliary Power Type	Diesel Generator
Location	Embarcadero
Output	25 KW
Fuel Tank Capacity	50 Gal.
Transfer Switch	Automatic
Alarm Telemetry Type	None
EPA Reliability Class	II
FORCE MAIN	
Length	142' of 6" A/C
Volume	210 gallons
Profile	0+00, 13.42'; 1+42, 19.0' with 90° EL at Discharge Manhole
Discharge Manhole	Bay Blvd. & East 323 from John Nye Road
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 4 to 6 minutes depending on pump wear (70% to 100%) @ 60 gpm ADWF
Sulfide Control System	None

COMMENTS:

None

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. *16 - Embarcadero*
LIFT STATION LOCATION - *Embarcadero parking lot*
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - *in Bay Blvd. north of Embarcadero parking lot (same manhole as force main from OSU Lift Station)*

2. Inspection Date / Time - *9/18/95 / 1:30 p.m.*

3. Manhole Inspected By - *Same as No. 8*

4. Probe Used Inside Manhole - *6-inch blade screwdriver*

5. Condition of Inside of Concrete Cone - *See Lift station no. 12*

6. Additional Comments - *See Lift Station No. 12*
   MH Lid -
   MH Approx. Depth -
   MH Force Main Inlet Size -
   MH Outlet Size -
   Force Main Discharging During Inspection -
   Corrosion Problem -

S.E. 3RD STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	S.E. 3rd Street north side, 400± feet east of Fogarty Street
Type	Hydronix
Pump Type	Submersible
Capacity	70 gpm @ 50' TDH
Pump HP (each)	1) 5 HP 1750 rpm; 2) 5 HP 1750 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Wet Well
Overflow Discharge	Manhole
Overflow Alarm	None
Avg. Time to Overflow	423.71 Minutes @ 2 gpm ADWF.
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal
Transfer Switch	Manual
Alarm Telemetry Type	None
EPA Reliability Class	II
FORCE MAIN	
Length	374' of 3" PVC
Volume	140 gallons
Profile	0+00, 72'; 0+60, 93'; 3+30 EL 95'; 3+58 EL 93'; 3+74 EL 90'. Uses 5 each 45° bends out of wetwell into 8" x 4" WYE + 4" x 3" reducer.
Discharge Manhole	Fogarty and 3rd Street
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 70 to 100 minutes depending on pump wear (70% to 100%) @ 2 gpm ADWF
Sulfide Control System	Backdrainage System
BACKDRAINAGE SYSTEM	
Control Valve Type	Air Pinch Valve
Valve Size	2"

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. *17 - SE 3rd Street*
LIFT STATION LOCATION - *on SE 3rd St., east of Fogarty St.*
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***on Fogarty Street, 75ft± south of 3rd St.***

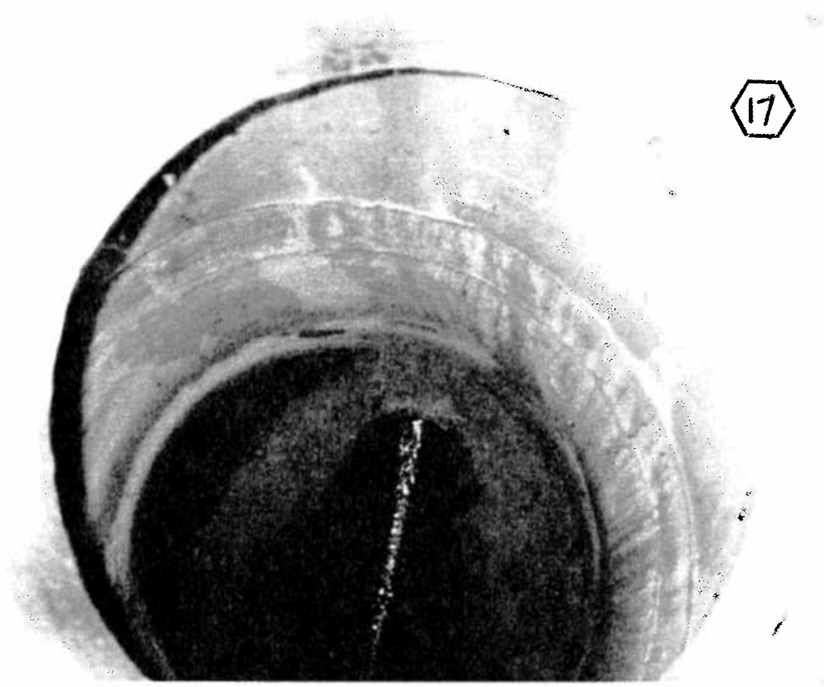
2. Inspection Date/Time - ***9/14/95 / 4:20 p.m.***

3. Manhole Inspected By -***Same as No. 1***

4. Probe Used Inside Manhole- ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in Fogarty St. paving***
   MH Approx. Depth - ***10 ft.***
   MH Force Maine Inlet Size - ***Force main connects to 8-inch gravity sewer upstream of discharge manhole***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No***



N.E. 10th STREET
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	N.E. 10th Street, South Side, 400± feet west of N.E. Eads Street
Type	Hydronix
Pump Type	Submersible
Capacity	35 gpm @ 15' TDH
Pump HP (each)	1) 2 HP 3450 rpm; 2) 2 HP 3450 rpm
Level Control Type	Mercury Float Switch
Overflow Point	Pump Station
Overflow Discharge	Pump Station
Overflow Alarm	None
Avg. Time to Overflow	447.25 Minutes @ 2 gpm ADWF.
Auxiliary Power Type	None
Location	
Output	
Fuel Tank Capacity	
Transfer Switch	
Alarm Telemetry Type	None
EPA Reliability Class	II
FORCE MAIN	
Length	237' of 3" PVC
Volume	90 gallons
Profile	0+00, 139.3'; 2+37, 145.8'; 2 x 45° bends
Discharge Manhole	10th Street and Eads Street
Air Release Valves	None
Vacuum Release Valves	None
Average Detention	Ranges from 45 to 64 minutes depending on pump wear (70% to 100%) @ 2 gpm ADWF
Sulfide Control System	Backdrainage System
BACKDRAINAGE SYSTEM	
Control Valve Type	Solenoid Pinch Valve Outside Wet Well
Valve Size	1-1/4"

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***18 - NE 10th Street***
LIFT STATION LOCATION ***- on NE 10th St., one block west of Eads St.***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***at intersection of NE 10th & Eads St.***

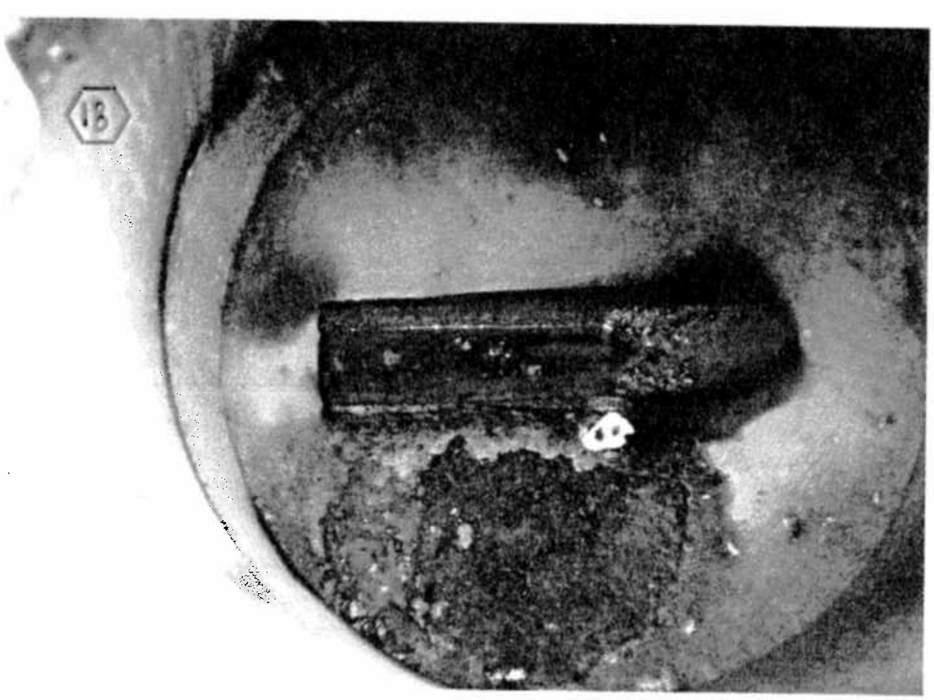
2. Inspection Date / Time - ***9/18/95 / 2:30 p.m.***

3. Manhole Inspected By - ***Same as No. 8***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   - MH Lid - ***Exposed in street paving***
   - MH Approx. Depth - ***5 ft.***
   - MH Force Main Inlet Size - ***2-inch***
   - MH Outlet Size - ***8-inch***
   - Force Main Discharging During Inspection - ***No***
   - Corrosion Problem - ***No***



SAN BAYO
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	West side of Old Big Creek Road, east side of San Bayo subdivision
Type	Hydronix
Pump Type	Centrifugal
Capacity	100 gpm @ 50' TDH
Pump HP (each)	1) 5 HP @ 1750 rpm; 2) 5 HP @ 1750 rpm
Level Control Type	Mercury Float Switches
Overflow Point	Pump Station
Overflow Discharge	Pump Station
Overflow Alarm	None
Avg. Time to Overflow	441.36 Minutes @ 4 gpm ADWF
Auxiliary Power Type	None
Location	
Output	
Fuel Tank Capacity	
Transfer Switch	
Alarm Telemetry Type	None
EPA Reliability Class	II
FORCE MAIN	
Length	395' of 4" PVC
Volume	270 gallons
Profile	0+00, 112.7'; 1+33, 124'; 1+77, 177'; 2+51, 148'; 3+28, 161'; 4+00, 164.3'; Includes 4 x 45° bends.
Discharge Manhole	San Bayo Circle SE side
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 68 to 97 minutes depending on pump wear (70% to 100%) @ 4 gpm ADWF
Sulfide Control System	None

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. *19 - San-Bayo*
LIFT STATION LOCATION - *on Old Big Creek Road, east of San-Bayo*
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - *in San-Bayo Circle*

2. Inspection Date/Time - *9/18/95 / 2:45 p.m.*

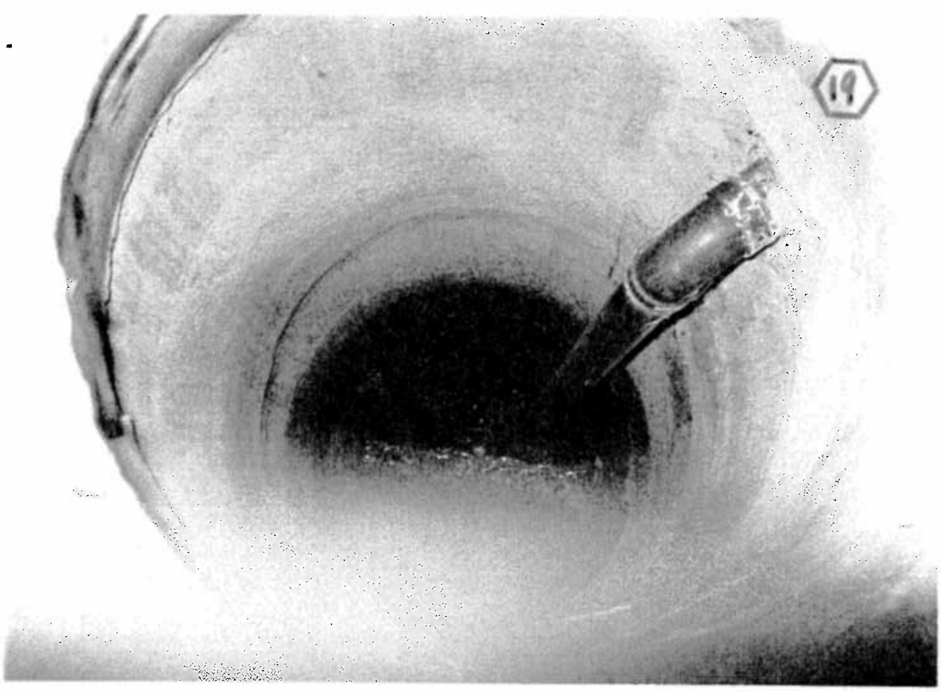
3. Manhole Inspected By -*Same as No. 8*

4. Probe Used Inside Manhole- *6-inch blade screwdriver*

5. Condition of Inside of Concrete Cone - *No laitance; sound concrete*

6. Additional Comments -

   MH Lid - *Exposed in street paving*
   MH Approx. Depth - *15 ft.*
   MH Force Maine Inlet Size - *4-inch inside drop pipe*
   MH Outlet Size - *8-inch*
   Force Main Discharging During Inspection - *No*
   Corrosion Problem - *No*



SOUTHSHORE
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION	
Location	S.W. 61st Street and S.W. Arbor Drive, S.W. corner
Type	Gorman - Rupp
Pump Type	Centrifugal
Capacity	275 gpm @ 112' TDH
Pump HP (each)	1) 25 HP @ 1772 rpm; 2) 25 HP @ 1772 rpm, Pump speed 1950 rpm
Level Control Type	Dual Transducer
Overflow Point	Pump Station
Overflow Discharge	Pump Station
Overflow Alarm	None
Avg. Time to Overflow	320.13 Minutes @ 45 gpm ADWF.
Auxiliary Power Type	4 Cylinder Wisconsin Propane
Location	South Shore
Output	37. HP
Fuel Tank Capacity	250 Gal.
Transfer Switch	Automatic Start
Alarm Telemetry Type	Raco Verbatim Auto-Dialer
EPA Reliability Class	I
FORCE MAIN	
Length	8,639' of pipe, (142' of 5" HDPE and 8497' of 6" HDPE)
Volume	12,620 gallons
Profile	0+00, 13.0'; 2+83, 7.4'; 10+58, 11.2'; 15+28, 26.5'; 15+96, 27.5'; 24+25, 12.0'; 28+28, 15.0'; 41+28, 12.7'; 82+86, 11.8'; 86+39, 14.4'
Discharge Manhole	Highway 101 and 31st Street
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 280 to 400 minutes depending on pump wear (70% to 100%) @ 45 gpm ADWF estimated for future development @ buildout.
Sulfide Control System	Air injection system
AIR INJECTION SYSTEM	
Compressor HP, Type	5 HP with 80 gal receiver, continuous duty
Standard Injection Rate	11 PSI; 12 scfm
Actual Air Rate	11 PSI; 7 acfm @ 11 psig
Air Flowmeter Capacity	10 scfm

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.
2. This Force Main may be abandoned and rerouted shorter to South Beach Lift Station during implementation of the South Beach Wastewater Conveyance and Treatment Project.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. *20 - Southshore*
LIFT STATION LOCATION - ***in Southshore subdivision, 2 miles south of Yaquina Bay***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***in newly developed right-of-way due east of old drive-in theater site***

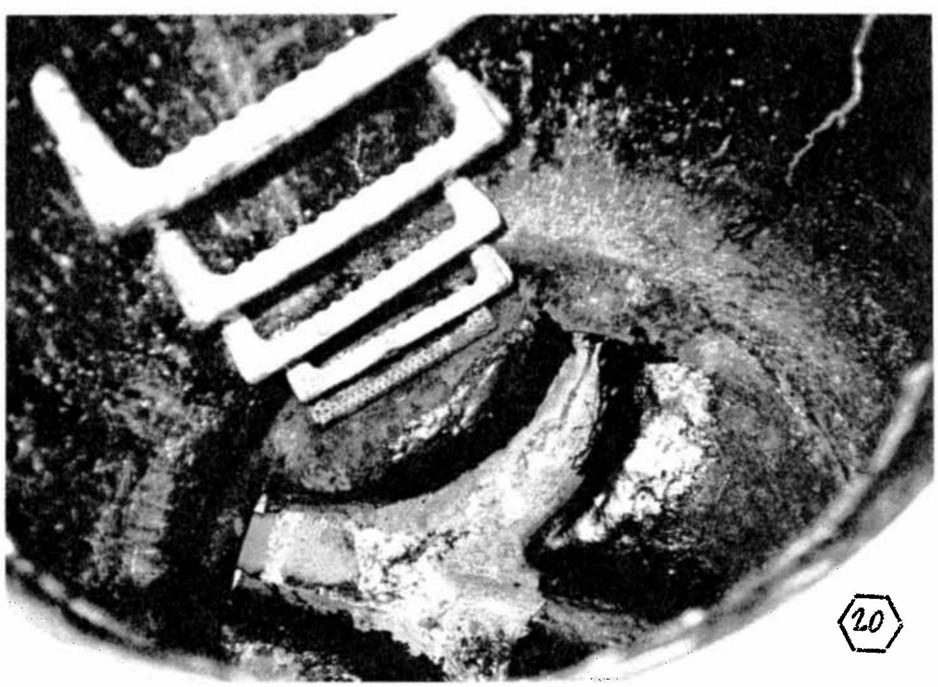
2. Inspection Date / Time - ***9/14/95 / 3:15 p.m.***

3. Manhole Inspected By - ***Same as No. 1***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in sandy right-of-way***
   MH Approx. Depth - ***7 ft.***
   MH Force Main Inlet Size - ***6-inch***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No***
   This is a new force main and lift station - not yet in use.
   Discharge manhole and 3 downstream manholes are coal-tar coated.



YAQUINA BAY ESTATES
May 1996

SEWAGE PUMP STATION DESIGN DATA

PUMP STATION

Location	S.E. Harbor View Drive and S.E. Bay Blvd., N.E. corner
Type	Hydronix
Pump Type	Centrifugal
Capacity	150 gpm @ 72' TDH
Pump HP (each)	1) 10 HP @ 1750 rpm; 2) 10 HP @ 1750 rpm; V.Belt Drive rpm 1625
Level Control Type	Transducer
Overflow Point	Manhole Front of Pump Station
Overflow Discharge	Bar Ditch
Overflow Alarm	None
Avg. Time to Overflow	114.4 Minutes @ 25 gpm ADWF.
Auxiliary Power Type	Portable Diesel Generator
Location	WWTP
Output	30 KW
Fuel Tank Capacity	25 Gal
Transfer Switch	Manual
Alarm Telemetry Type	Raco Chatterbox Auto-Dialer
EPA Reliability Class	I

FORCE MAIN

Length	2505' to MH - 4" PVC
Volume	1,700 gallons
Profile	0+00, 26.0'; 3+55, 35.9'; 11+40, 36.8'; 25+24, 63.0'; includes 3 x 45° and 2 x 90° bends
Discharge Manhole	Harbor Crescent Drive at Bay Blvd.
Air Release Valve	None
Vacuum Release Valves	None
Average Detention	Ranges from 68 to 97 minutes depending on pump wear (70% to 100%) @ 25 gpm ADWF estimated for future development @ buildout.
Sulfide Control System	Air injection system

AIR INJECTION SYSTEM

Compressor HP, Type	4 HP, 1 ∅ Powerex Compressor; 30 Gal Receiver Tank
Standard Injection Rate	8∓ SCFM
Actual Air Rate	150 SCFH
Air Flowmeter Capacity	50-500 SCFH

COMMENTS:

1. Discharge manhole and downstream gravity sewer should be checked annually for corrosion.

EXISTING LIFT STATION DISCHARGE MANHOLE INSPECTION
LIFT STATION NO. ***21 - Harbor View***
LIFT STATION LOCATION - ***on Bay Blvd., east of Port Area***
CITY OF NEWPORT, OREGON

1. Discharge Manhole Location - ***at intersection of Bay Blvd. & Harbor Crescent Dr.***

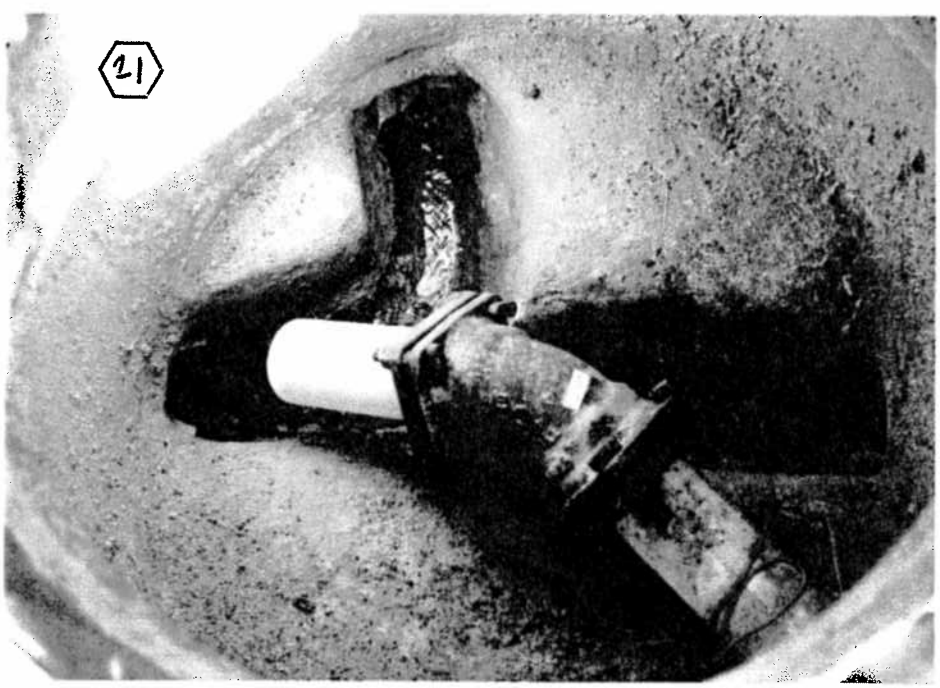
2. Inspection Date / Time - ***9/18/95 / 1:35 p.m.***

3. Manhole Inspected By - ***Same as No. 8***

4. Probe Used Inside Manhole - ***6-inch blade screwdriver***

5. Condition of Inside of Concrete Cone - ***No laitance; sound concrete***

6. Additional Comments -
   MH Lid - ***Exposed in street paving***
   MH Approx. Depth - ***4 ft.***
   MH Force Main Inlet Size - ***4-inch***
   MH Outlet Size - ***8-inch***
   Force Main Discharging During Inspection - ***No***
   Corrosion Problem - ***No***
   This is a new force main and lift station



APPENDIX NO. 5

Newport Wastewater Plant
c/o 810 S.W. Alder St.
Newport, Or 97365

Dept. of Environmental Quality
Willamette Valley Region
750 Front St., Suite 120
Salem, OR 97310
Attn: Mark Hamlin

RE: Infiltration and Inflow
Work for 1993

A. Manhole repairs.

Area C - 8	MH 28 & 6 repaired and sealed.
Area C - 8	MH 9 replaced top ring and sealed.
Area C - 13	MH 1 Sealed inside and drop.
Area C - 13	MH 1 raised and sealed top.
Area C - 13	MH 2 sealed ring and riser.
Area D - 6	MH 8 installed lockdown lid, raised suburban
Area C - 9	Finished 2 manhole bases at 12th & Cottage
Area C - 9	Repaired flow channel at N. W. Hurburt & 12
Area B - 15	MH 3 raised 12" for grade change.
Area C - 7	MH O-1 made brackets and installed sensor
Area C - 16	Vacuum tested 2 manholes for seal after fix
Area C - 8	MH 70 sealed lid for odors.

9 manholes repaired

Line Cleaning

Area C-8	Cleaned 400 feet
Area C-9	Cleaned 320 feet
Area C-13	Cleaned wet well feeder lines
Area C-9	Cleaned 280 feet
Area D-6	Cleaned 70 feet
Area B-16	Cleaned 260 feet
Area B-16	Cleaned 300 feet
Area C-5	Cleaned 400 feet
Area D-8	Cleaned 210 feet
Area C-5	Cleaned 600 feet
Area C-6	Cleaned 400 feet
Area D-6	Cleaned 700 feet
Area D-6	Cleaned 400 feet
Area C-10	Cleaned 210 feet
Area D-3	Cleaned 250 feet on S.W. Elizabeth
Area C-9	Cleaned 250 feet between Lake and Hurburt
Area C-5	Cleaned 180 feet
Area C-5	Cleaned 200 feet at Bay & Naterlin
Area C-5	Cleaned 32 feet to repair line
Area C-6	Cleaned 700 feet from Hwy 101 west
Area C-6	Cleaned Grease from MH 1
Area C-12	Cleaned MH 14 and flow line
Area D-5	Cleaned 600 feet pm S.W. Bay
Area C-5	Cleaned 300 feet from Govt. to Minnie
Area C-7	Cleaned 1100 feet from MH 81 to MH 93

Area D-6	Unplugged MH 49
Area D-8	Cleaned 360 feet at N.E. 17 Ct.
Area C-11	Cleaned Iron Mountain Sub-division lines
Area C-5	Cleaned 300 feet at Mimmie St.
Area C-5	Cleaned 600 feet on Bayley & 8th
Area D-6	Cleaned 180 feet of storm drains
Area D-7	Cleaned 300 feet on N.E. 36 St.

Total cleaned 3382 feet.

TV Inspections

Area C- 8	58' Locate laterals
Area C- 10	140' leak locate
Area B -16	230' lateral and leak locate
Area B- 16	230' Check repair
Area C- 12	110' new connections check
Area D- 8	108' new construction
Area C-10	80' leak repair
Area B- 16	300' new construction
Area B- 16	85' lateral locate
Area C- 9	320' line clean and locate
Area B- 16	230' new construction check
Area C- 14	70' leak locate
Area B- 14	320' new construction check
Area D- 6	400' inspection line condition
Area C- 7	480' line and lateral location
Area C- 9	30' inspected bad joints
Area C- 5	180' Checked Coast Guard lines
Area C- 5	60-' Rechecked parrt of CG lines
Area C- 5	120' Checked Naterlin to Bay St. line
Area C- 5	60' Checked storm drain at Bay & Bay Blvd.
Area C- 12	600' Ran line from MH 14 to MH 18
Area C- 10	780' Checked lines from MH 1 to MH 9
Area C -9	160' Checked storm drain at ball field, B.W.
Area D- 10	93' located lost plumbers snake
Area C- 6	340' Neff St. to 6th
Area D- 8	80' N. E. Douglas to 8th
Area D- 7	110' Storm drains N.E. Harney
Area C- 12	80' Little Creek apts. lateral
Area C- 12	300' New Little Creek lines

5674' TV Inspections

Lines Grouted & Sealed

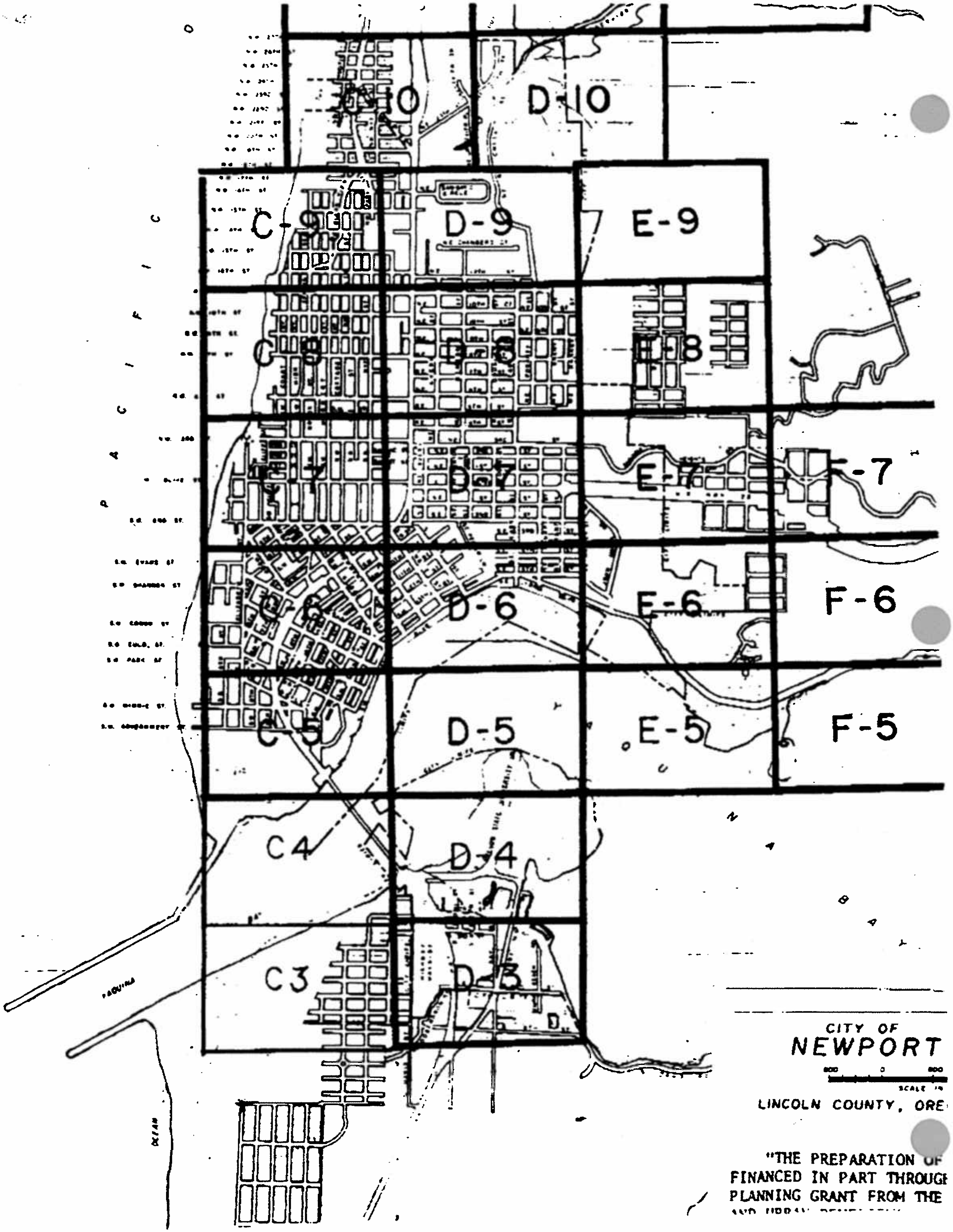
Area C- 6	280' FromMH 27 to MH30 on SW 9th
Area C- 7	100' from MH 78 to MH 79 NW Cottage
Area C- 7	220' from MH 79 to MH 80 NW Cottage
Area C- 7	130' from MH 80 to MH 79 NW Cottage
Area C- 6	120' from MH 9 to Cleanout
Area C- 7	280' from MH 60 to C-8 MH 23 to MH 24
Area C- 5	285' of 10" conc. line SW 12 to Bay
Area C- 5	80' from Minnie St. south

1465' Sealed

PUBLIC WORKS NPT 503 265 3301 06-09-95 13:09 [99] #3

Lines Repaired or replaced

Area C- 6	220' of 18" concrete replaced with 12" PVC
Area C- 10	320' PVC line 8" and 3 manholes for Wal-Mart
Area D- 8	12' section replaced in 8" conc. with PVC due to break
Area C- 8	320' of old concrete 8" replaaced with 8" PVC
Area D- 6	180' of 8" concrete with Ductile iron
	917' lines replaced



C-10
D-10
C-9
D-9
E-9
C-8
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E-8
C-7
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C-6
D-6
E-6
F-6
C-5
D-5
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C4
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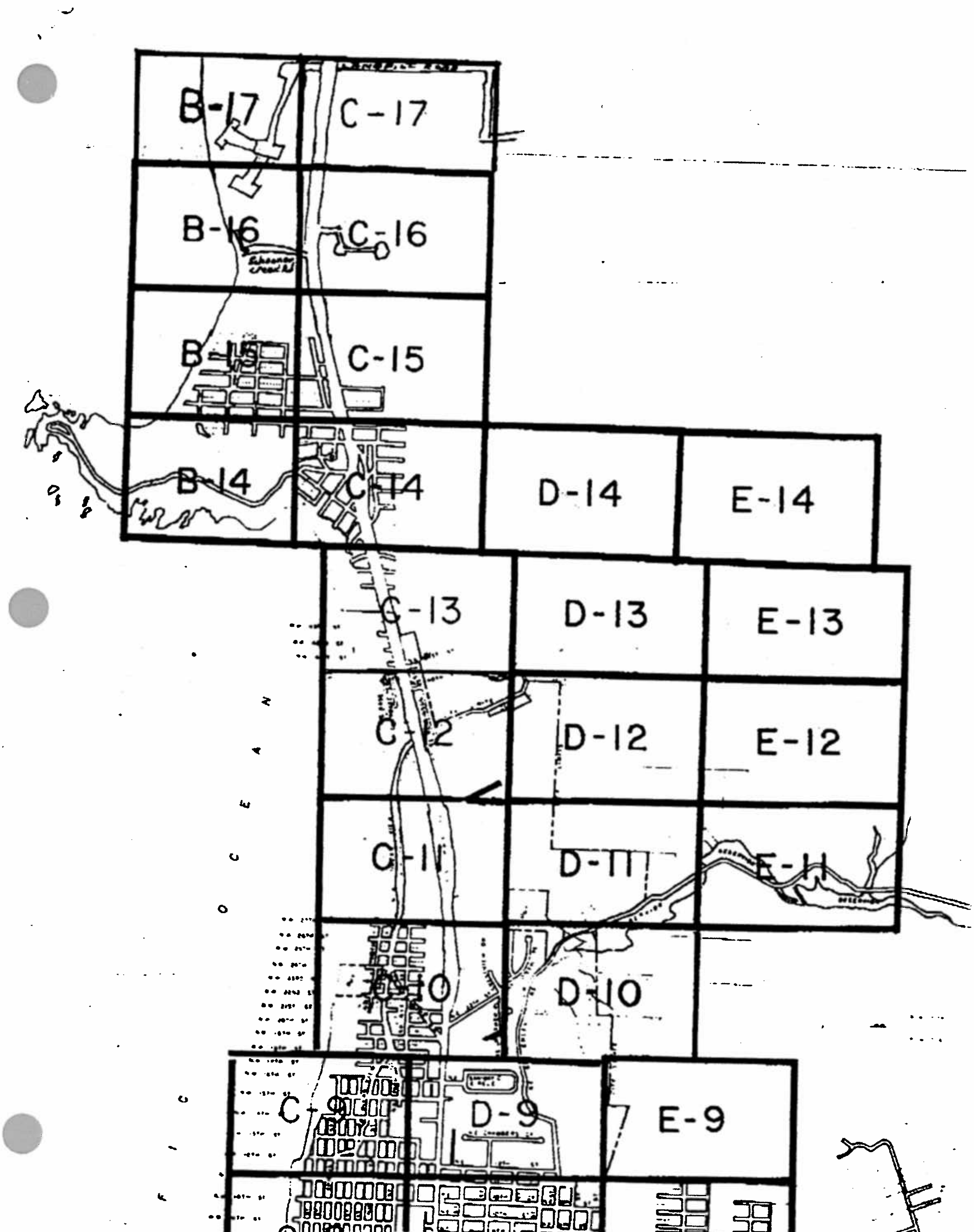
C3
D-3
CITY OF
NEWPORT
LINCOLN COUNTY, ORE
"THE PREPARATION OF
FINANCED IN PART THROUGH
PLANNING GRANT FROM THE


B-17
C-17
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OCEAN

APPENDIX NO. 6

APPENDIX NO. 6

SUMMARY OF PUBLIC PARTICIPATION

A Wastewater Advisory Committee (WWAC) was formed by the City in January, 1995 consisting of nine citizens residing within the city limits to provide comments and guidance at work sessions on a periodic basis throughout the study period. Engineering and financial alternatives were presented to the WWAC for their consideration and decisions regarding selections of preferred alternatives.

The Wastewater Advisory Committee consisted of:

1. John Clark - WWAC Cochair
2. Don Davis - WWAC Cochair
3. Kurt Carstens
4. Michael Frasier
5. Lee Lutz
6. Dave Miller
7. Mary Sullivan
8. Marv Uhlenhake
9. Louise Waarvick

The City Council assisting the WWAC consisted of:

1. Mark Collson - Mayor
2. Dene Bateman
3. Dick Fowler
4. Bill Threlkeld
5. Doug Updenkelder

City Staff also participating in the Work Sessions were:

1. Sam Sasaki - City Manager
2. Lee Ritzman - Director of Public Works
3. Mike Shoberg - City Planner
4. Vance Avery - Wastewater Foreman
5. John Ritchie - Wastewater Foreman
6. Nancy Boyer - Assistant to City Manager
7. Patricia Bearden - City Recorder/ Finance Director

A summary of the Public participation follows:

1. **January 10, 1995 - First Engineering work session**.

Purposes

1. Introduction to facilities planning and discussions regarding possible alternatives for wastewater treatment and discharges of treated effluent and sludge.
2. Receive WWAC concerns and answer questions.
3. Receive WWAC input on which alternatives to evaluate

Conclusions

1. Selected ocean discharge for preferred alternative
2. Further evaluate conveyance alternatives A, B, C.
3. Evaluate higher level of treatment to allow shorter outfall length.

2. February 28, 1995 - Second Engineering Work Session.

Purposes

1. Discuss alternatives evaluated for wastewater treatment and effluent discharge.
2. Receive WWAC concerns and answer questions.
3. Select Preferred Alternative and a second choice for further development.

Conclusions

1. Selected design residential population of 20,000 for design year 2020.
2. Selected conveyance alternative "C" for preferred alternative.

3. April 20, 1995 First Financial Work Session.

Purposes

1. Introduction to municipal financing of wastewater facilities
2. Explain alternatives available to City for financing.
3. Receive WWAC concerns and answer questions.

Conclusions

1. Financial consultants, Public Financial Management Inc. (PFM) will prepare examples of a financial program when capital and O&M costs are estimated by Engineers, for the Preferred Alternative wastewater facilities.

4. May 4, 1995 - Third Engineering Work Session

Purposes

1. Present estimated capital and O&M costs of wastewater alternatives
2. Present overview of planning meetings held with ODOT, SWIM and State Parks, concerning conveyance alternatives.
3. Receive WWAC concerns and answer questions.
4. Review Wastewater Facilities Plan Outline.

Conclusions

1. Confirmed selection of conveyance Alternative "C2" as preferred alternative with conveyance Alternative "C1" as second choice.
2. Approved draft outline for Facilities Plan Report.

5. June 1, 1995 - Second Financial Work Session

Purposes

1. Discuss revenue sources to pay for Wastewater Facilities
2. Receive WWAC input on which financial resources to develop further.

Conclusions

1. PFM presented cost impact on residential user for financing methods of property taxes, system rates, system development charges, hotel taxes, and Urban Renewal Bonds.
2. City will further evaluate a Financial Plan consisting of an immediate increase in sewer rates, room taxes, and system development charges, to begin building a reserve to pay for engineering design and early project needs, and defer bond issue election until time when designs are complete and project capital cost can be better estimated.

6. June 15, 1995 - Conclusions and Recommendations to City Council.

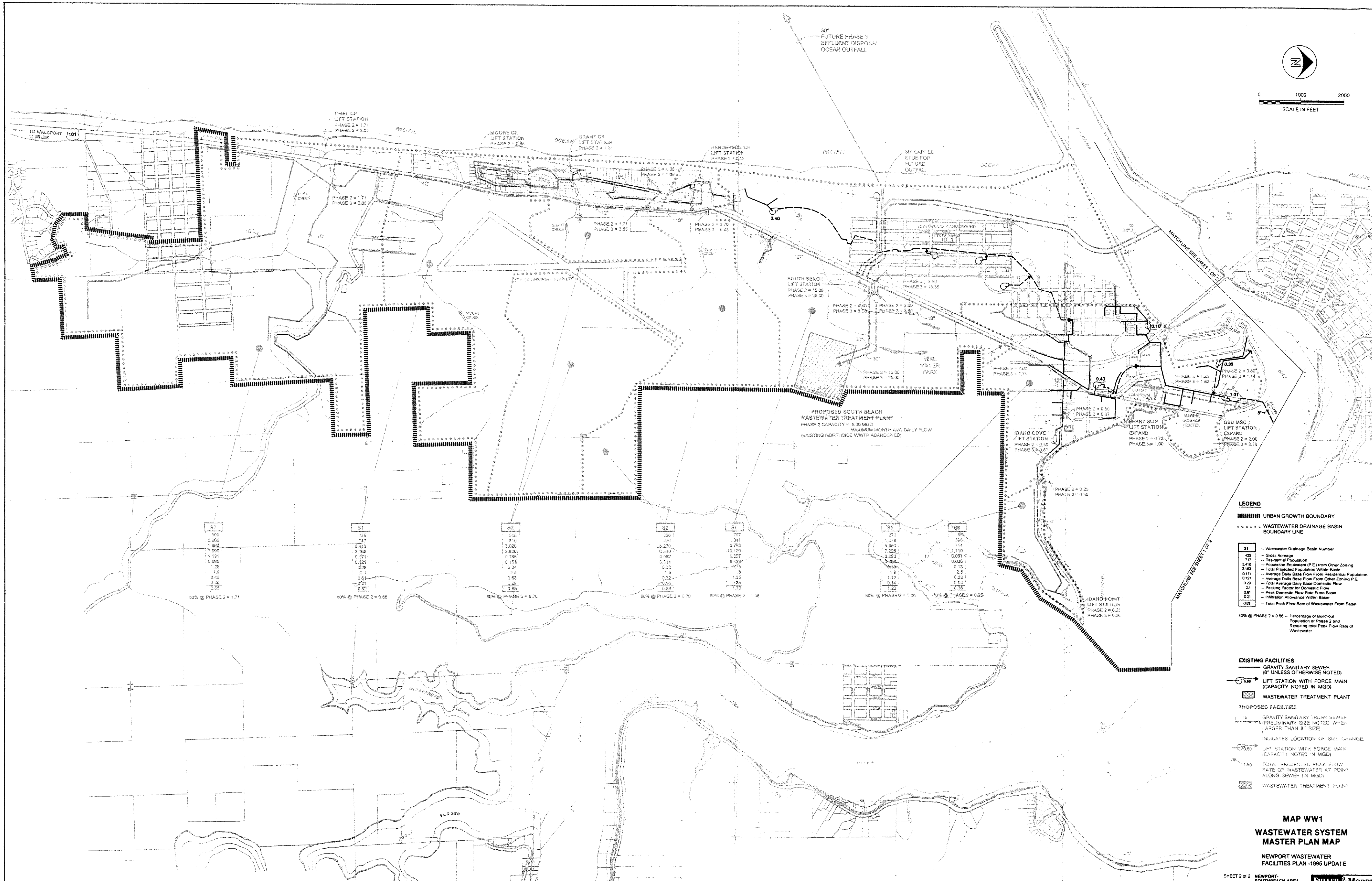
Purposes

1. To bring closure to WWAC efforts and make WWAC recommendations to City Council.

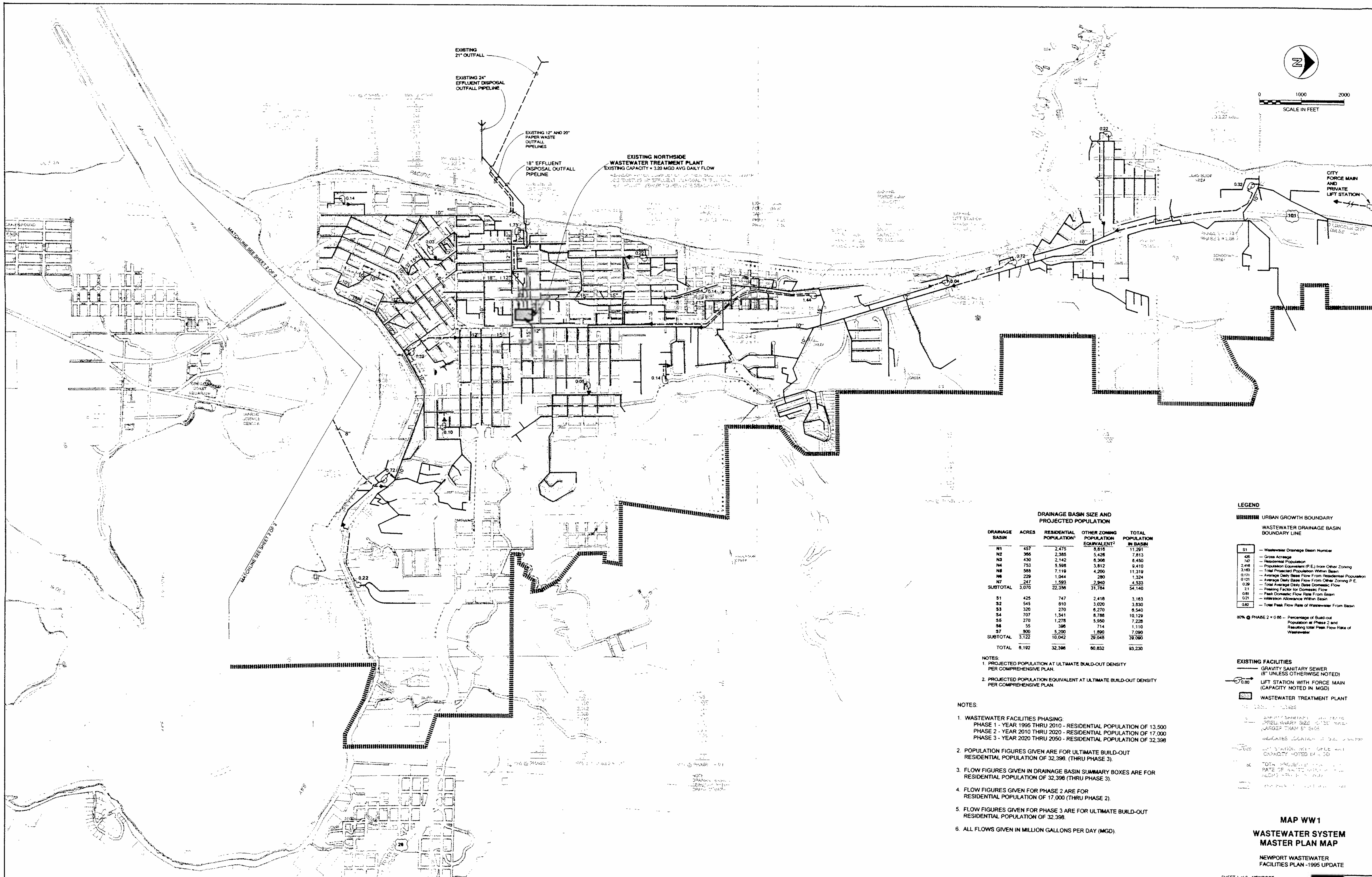
Conclusions

1. Recommend to City Council to delay bond issue election to date later than Fall 1995; to immediately raise all sewer user rates, motel room tax, system development charges, and develop additional sewer strength charges for certain sewer users, to build up a sewer reserve fund; to breakout some of the sewer project elements and accomplish them prior to bond issue election to reduce overall bond indebtedness.

APPENDIX NO. 7



30" FUTURE PHASE 3 EFFLUENT DISPOSAL OCEAN OUTFALL
SCALE IN FEET
0
1000
2000
TO WALDPORT 15 MILES
101
THIEL CR LIFT STATION PHASE 2 = 1.71 PHASE 3 = 2.85
MOORE CR LIFT STATION
GRANT CR LIFT STATION
HENDERSON CR LIFT STATION
30" CAPPED STUB FOR FUTURE OUTFALL
PACIFIC
OCEAN
SOUTH BEACH LIFT STATION PHASE 2 = 15.00 PHASE 3 = 25.00
PROPOSED SOUTH BEACH WASTEWATER TREATMENT PLANT PHASE 2 CAPACITY = 5.00 MGD MAXIMUM MONTH AVG DAILY FLOW (EXISTING NORTHSIDE WWTP ABANDONED)
MIKE MILLER PARK
IDAHO COVE LIFT STATION
FERRY SLIP LIFT STATION EXPAND PHASE 2 = 0.72 PHASE 3 = 1.00
OSU MSC LIFT STATION EXPAND PHASE 2 = 2.00 PHASE 3 = 2.76
IDAHO POINT LIFT STATION
MATCHLINE SEE SHEET 1 OF 2
SLOUGH
RIVER
LEGEND
URBAN GROWTH BOUNDARY
WASTEWATER DRAINAGE BASIN BOUNDARY LINE
S1 — Wastewater Drainage Basin Number
425 — Gross Acreage
747 — Residential Population
2,416 — Population Equivalent (P.E.) from Other Zoning
3,163 — Total Projected Population Within Basin
0.171 — Average Daily Base Flow From Residential Population
0.121 — Average Daily Base Flow From Other Zoning P.E.
0.29 — Total Average Daily Base Domestic Flow
2.1 — Peaking Factor for Domestic Flow
0.61 — Peak Domestic Flow Rate From Basin
0.21 — Infiltration Allowance Within Basin
0.82 — Total Peak Flow Rate of Wastewater From Basin
80% @ PHASE 2 = 0.66 -- Percentage of Build-out Population at Phase 2 and Resulting total Peak Flow Rate of Wastewater
EXISTING FACILITIES
GRAVITY SANITARY SEWER (8" UNLESS OTHERWISE NOTED)
LIFT STATION WITH FORCE MAIN (CAPACITY NOTED IN MGD)
WASTEWATER TREATMENT PLANT
PROPOSED FACILTIES
GRAVITY SANITARY TRUNK SEWER (PRELIMINARY SIZE NOTED WHEN LARGER THAN 8" SIZE)
INDICATES LOCATION OF SIZE CHANGE
LIFT STATION WITH FORCE MAIN (CAPACITY NOTED IN MGD)
TOTAL PROJECTED PEAK FLOW RATE OF WASTEWATER AT POINT ALONG SEWER (IN MGD)
WASTEWATER TREATMENT PLANT
MAP WW1
WASTEWATER SYSTEM MASTER PLAN MAP
NEWPORT WASTEWATER FACILITIES PLAN -1995 UPDATE
SHEET 2 of 2 NEWPORT-SOUTHBEACH AREA
FULLER & MORRIS Engineering, Inc.



DRAINAGE BASIN SIZE AND PROJECTED POPULATION

DRAINAGE BASIN	ACRES	RESIDENTIAL POPULATION[1]	OTHER ZONING POPULATION EQUIVALENT[2]	TOTAL POPULATION IN BASIN
N1	457	2,475	8,816	11,291
N2	366	2,385	5,428	7,813
N3	430	2,142	6,308	8,450
N4	753	5,598	3,812	9,410
N5	588	7,119	4,200	11,319
N6	229	1,044	280	1,324
N7	247	1,593	2,940	4,533
SUBTOTAL	3,070	22,356	31,784	54,140
S1	425	747	2,416	3,163
S2	545	810	3,020	3,830
S3	320	270	6,270	6,540
S4	707	1,341	8,788	10,129
S5	270	1,278	5,950	7,228
S6	55	396	714	1,110
S7	800	5,200	1,890	7,090
SUBTOTAL	3,122	10,042	29,048	39,090
TOTAL	6,192	32,398	60,832	93,230

NOTES:
1. PROJECTED POPULATION AT ULTIMATE BUILD-OUT DENSITY PER COMPREHENSIVE PLAN.
2. PROJECTED POPULATION EQUIVALENT AT ULTIMATE BUILD-OUT DENSITY PER COMPREHENSIVE PLAN.

NOTES:

1. WASTEWATER FACILITIES PHASING:
   PHASE 1 - YEAR 1995 THRU 2010 - RESIDENTIAL POPULATION OF 13,500
   PHASE 2 - YEAR 2010 THRU 2020 - RESIDENTIAL POPULATION OF 17,000
   PHASE 3 - YEAR 2020 THRU 2050 - RESIDENTIAL POPULATION OF 32,398
2. POPULATION FIGURES GIVEN ARE FOR ULTIMATE BUILD-OUT RESIDENTIAL POPULATION OF 32,398. (THRU PHASE 3).
3. FLOW FIGURES GIVEN IN DRAINAGE BASIN SUMMARY BOXES ARE FOR RESIDENTIAL POPULATION OF 32,398 (THRU PHASE 3).
4. FLOW FIGURES GIVEN FOR PHASE 2 ARE FOR RESIDENTIAL POPULATION OF 17,000 (THRU PHASE 2).
5. FLOW FIGURES GIVEN FOR PHASE 3 ARE FOR ULTIMATE BUILD-OUT RESIDENTIAL POPULATION OF 32,398.
6. ALL FLOWS GIVEN IN MILLION GALLONS PER DAY (MGD).

LEGEND

URBAN GROWTH BOUNDARY

WASTEWATER DRAINAGE BASIN BOUNDARY LINE

S1 — Wastewater Drainage Basin Number
425 — Gross Acreage
747 — Residential Population
2,416 — Population Equivalent (P.E.) from Other Zoning
3,163 — Total Projected Population Within Basin
0.171 — Average Daily Base Flow From Residential Population
0.121 — Average Daily Base Flow From Other Zoning P.E.
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80% @ PHASE 2 = 0.66 — Percentage of Build-out Population at Phase 2 and Resulting total Peak Flow Rate of Wastewater

EXISTING FACILITIES

GRAVITY SANITARY SEWER (8" UNLESS OTHERWISE NOTED)

0.80 LIFT STATION WITH FORCE MAIN (CAPACITY NOTED IN MGD)

WASTEWATER TREATMENT PLANT

MAP WW1

WASTEWATER SYSTEM MASTER PLAN MAP

NEWPORT WASTEWATER FACILITIES PLAN -1995 UPDATE

SHEET 1 of 2 NEWPORT-NORTHSIDE AREA

9403.0 MARCH, 1996

FULLER & MORRIS Engineering, Inc.