

TABLE OF CONTENTS

1 – INTRODUCTION.....	1
CITY OF OLYMPIA WASTEWATER UTILITY	1
WASTEWATER MANAGEMENT PLAN.....	2
<i>Objectives for the Wastewater Management Plan.....</i>	3
<i>Plan Process</i>	4
<i>Ongoing Plan Review</i>	4
ORGANIZATION OF PLAN	4
2 – CONTEXT AND TRENDS.....	7
SERVICE AREA.....	7
HISTORY	7
<i>Wastewater Collection.....</i>	7
<i>Wastewater Treatment</i>	9
PHYSICAL SETTING	10
<i>Geology and Soils</i>	10
<i>Topography.....</i>	10
<i>Climate.....</i>	11
<i>Water Supply.....</i>	11
POPULATION AND LAND USE TRENDS	11
<i>Land Use Trends.....</i>	11
<i>Population and Demand for Sewer Service</i>	12
<i>Wastewater Flows.....</i>	13
CHALLENGES AND ISSUES.....	15
<i>Geology and Soils</i>	15
<i>Topography.....</i>	16
<i>Climate.....</i>	16
<i>Population/Land Use Trends</i>	16
<i>Wastewater Flows.....</i>	17
<i>Equity.....</i>	17
3 – WASTEWATER MANAGEMENT IN NORTH THURSTON COUNTY.....	19
RESPONSIBILITY FOR WASTEWATER MANAGEMENT	19
COLLECTION AND TRANSMISSION SYSTEM.....	20
<i>Neighboring Jurisdictions.....</i>	21
<i>Private Sector.....</i>	22
WASTEWATER TREATMENT	22
<i>LOTT Facilities.....</i>	22
<i>Regional Wastewater Resource Management Plan.....</i>	23
<i>LOTT Capital Improvement Projects in Olympia.....</i>	24
<i>LOTT Programs and Services.....</i>	24
OTHER PUBLIC AND PRIVATE TREATMENT FACILITIES	26
CHALLENGES AND ISSUES.....	26
<i>Technical Coordination within the LOTT Alliance</i>	27
<i>Sewer Service Areas.....</i>	27
<i>Onsite Sewage System Management.....</i>	27

4 – LEGAL AND POLICY FRAMEWORK.....	29
FEDERAL AND STATE STATUTES AND REGULATIONS.....	29
<i>Federal Government</i>	29
<i>State of Washington</i>	29
THURSTON COUNTY.....	30
<i>Growth Management</i>	30
<i>Onsite Sewage Systems</i>	32
REGIONAL AGREEMENTS – WASTEWATER MANAGEMENT.....	32
CITY OF OLYMPIA POLICIES AND REGULATIONS.....	34
<i>Olympia Comprehensive Plan</i>	34
<i>Olympia Ordinances and Development Standards</i>	34
CHALLENGES AND ISSUES.....	36
5 – GRAVITY SEWER SYSTEM.....	37
HISTORY IN OLYMPIA.....	37
<i>Sewer System Expansion</i>	38
<i>Combined Sewers, Inflow and Infiltration</i>	38
GRAVITY SEWER PIPES.....	41
<i>Description and Location</i>	41
<i>Condition Assessment</i>	41
<i>Capacity Analysis</i>	45
<i>Existing Capacity Limitations</i>	46
<i>Future Needs by 2010 and 2025</i>	48
PUMP STATIONS AND FORCE MAINS.....	52
<i>Description and Location</i>	52
<i>Condition Assessment</i>	52
<i>Capacity Analysis</i>	56
CHALLENGES AND ISSUES.....	59
<i>Aging Infrastructure</i>	59
<i>Topography</i>	59
<i>Extension to Existing Development</i>	60
<i>Surge in New Development – Extension to New Development</i>	60
<i>Timing of Extensions</i>	60
6 – STEP SYSTEMS.....	61
HISTORY IN OLYMPIA.....	62
<i>Ownership</i>	62
<i>Moratorium</i>	63
DESCRIPTION AND LOCATION.....	63
CONDITION ASSESSMENT.....	64
<i>Pipeline and Tank Integrity</i>	64
<i>Inflow and Infiltration</i>	64
<i>Operating Efficiency</i>	64
<i>Risk</i>	65
CHALLENGES AND ISSUES.....	65
<i>Cost</i>	65
<i>Effluent Problems</i>	66
<i>Other</i>	67

7 – ONSITE SEWAGE SYSTEMS	69
HISTORY IN OLYMPIA	71
<i>County Certification.....</i>	71
<i>Mandatory Hookups.....</i>	71
<i>Groundwater Monitoring.....</i>	71
<i>Public Education.....</i>	72
<i>Henderson Watershed Septic Management Plan.....</i>	73
<i>Management of Community Systems</i>	73
DESCRIPTION	74
<i>Proximity to Public Sewers.....</i>	74
<i>Conformance with Health Rules and Regulations</i>	74
CONDITION ASSESSMENT.....	77
<i>Age of Systems.....</i>	77
<i>Failure Rate</i>	77
CHALLENGES AND ISSUES	78
<i>Public Health Risks of Existing Onsite Systems</i>	78
<i>Potential for Proliferation of Additional Onsite Systems</i>	79
<i>Maintenance and Conversion Costs</i>	79
<i>Implementing Olympia’s Regulatory Authority.....</i>	80
<i>Data Gaps</i>	82
8 – ALTERNATIVE TECHNOLOGIES.....	83
HISTORY IN OLYMPIA	83
DESCRIPTION OF AVAILABLE TECHNOLOGY	84
CHALLENGES AND ISSUES.....	86
<i>Ensuring Sanitary Management and Disposal</i>	86
<i>Handling Changes in Ownership.....</i>	86
<i>Evaluating Life-cycle Costs</i>	87
9 – WASTEWATER BASIN CHARACTERIZATION.....	89
WASTEWATER BASIN CHARACTERISTICS	90
<i>West Olympia.....</i>	90
<i>West Bay.....</i>	90
<i>Downtown.....</i>	93
<i>Northeast Olympia.....</i>	94
<i>South Bay</i>	94
<i>Lilly Road.....</i>	97
<i>Southeast Olympia</i>	97
SUMMARY OF BASIN CHARACTERISTICS AND MANAGEMENT PRIORITIES	100
10 – PLANNING AND PROGRAM IMPLEMENTATION	103
ORGANIZATIONAL RELATIONSHIPS.....	103
PLANNING, POLICY AND PROGRAM MANAGEMENT	104
<i>Current Practices.....</i>	104
<i>Current Staffing</i>	104
<i>Challenges and Issues.....</i>	105
OPERATION & MAINTENANCE	106
<i>Current Practices.....</i>	106
<i>Current Staffing</i>	108
<i>Challenges and Issues.....</i>	108

11 – PLAN DIRECTION AND METHODOLOGY	111
VISION FOR THE FUTURE.....	111
WASTEWATER UTILITY MISSION	112
GOALS FOR WASTEWATER UTILITY.....	112
APPROACH TO DEVELOPING THE PLAN.....	113
12 – GRAVITY SEWER PROGRAM	115
GOAL	115
ANALYSIS	115
STRATEGIES AND 2007–2012 OBJECTIVES	120
PLANNED ACTIONS	121
13 – STEP SYSTEM PROGRAM.....	137
GOAL	137
ANALYSIS	137
STRATEGIES, OBJECTIVES AND PLANNED ACTIONS	139
SPECIFIC SUBSTANTIVE REQUIREMENTS.....	139
14 – ONSITE SEWAGE SYSTEM PROGRAM	140
GOAL	140
ANALYSIS	140
STRATEGIES AND 2007-2012 OBJECTIVES	144
PLANNED ACTIONS	145
SPECIFIC SUBSTANTIVE REQUIREMENTS.....	149
15 – ALTERNATIVE SYSTEMS PROGRAM	151
GOAL	151
ANALYSIS	151
STRATEGY AND PLANNED ACTIONS.....	151
16 – PLANNING AND PROGRAM IMPLEMENTATION	153
GOAL	153
STRATEGY	153
PLANNING, POLICY AND PROGRAM MANAGEMENT	154
<i>Objective and Planned Actions</i>	155
<i>Staffing</i>	156
CAPITAL FACILITIES MANAGEMENT	156
<i>Objective and Planned Actions</i>	156
<i>Staffing</i>	156
OPERATION & MAINTENANCE	157
<i>Objective and Planned Actions</i>	157
<i>Staffing</i>	158
DEVELOPMENT REVIEW, TECHNICAL ASSISTANCE, AND CODE ENFORCEMENT.....	159
<i>Objective and Planned Actions</i>	159
<i>Staffing</i>	160
MONITORING, RESEARCH AND EVALUATION.....	160
<i>Objective and Planned Actions</i>	160
<i>Staffing</i>	161
PUBLIC INVOLVEMENT AND EDUCATION	161
<i>Objective and Planned Actions</i>	161
<i>Staffing</i>	162

ADMINISTRATIVE SUPPORT.....	162
17 – SUMMARY OF PLAN.....	163
18 – CURRENT AND PLANNED UTILITY FINANCE.....	173
CURRENT FINANCES	173
<i>Revenue and Expenses</i>	173
<i>Assets and Liabilities</i>	173
<i>Rates and Rate Structure</i>	174
FINANCIAL POLICIES	175
FUNDING THE PLAN	175
REFERENCES CITED	177
ATTACHMENTS	181
1. WAC REQUIREMENTS FOR WASTEWATER PLANS AND LOCATION IN THIS PLAN..	181

LIST OF TABLES

Table 2.1.	City of Olympia Historic Population Trends.....	12
Table 2.2.	City of Olympia Population Forecast	13
Table 2.3.	Population and Employment Projections.....	13
Table 2.4.	Equivalent Residential Units (ERU) and Rate of Increase	15
Table 3.1.	LOTT Alliance Industrial Pretreatment Permittees in Olympia.....	25
Table 5.1.	Gravity Sanitary Sewer Pipe Inventory (feet).....	43
Table 5.2.	Sanitary Sewer Force Main Inventory (feet)	54
Table 5.3.	Pump Station Capacity and Limitations, Ranked by Priority	58
Table 6.1.	Distribution of STEP Systems by Wastewater Management Basin	64
Table 7.1.	Proximity of Onsite Systems and Infill Lots to Public Sewer	76
Table 7.2.	Onsite Sewage System Characteristics (Olympia and Its UGA).....	76
Table 8.1.	Summary of Potential Alternative Technologies.....	86
Table 9.1.	Summary of Olympia Wastewater Management Basin Characterization	101
Table 9.2.	Wastewater Basin Management Priorities	102
Table 12.1.	Gravity Sewer Challenges and Evaluation of Potential Strategies	117
Table 12.2.	Criteria for Prioritizing Capital Projects	119
Table 12.3.	Repair and Replacement Projects	122
Table 12.4.	Pump Station Physical Deficiencies and Planned Improvements .	123
Table 12.5.	Sewer System Capacity Limitations and Planned Improvements .	124
Table 12.6.	Pump Station Capacity Limitations and Planned Improvements ..	125
Table 12.7.	Sewer System Extension Projects, West Olympia.....	128
Table 12.8.	Sewer System Extension Projects, South Bay	128
Table 12.9.	Sewer System Extension Projects, Lilly Road.....	129
Table 12.10.	Sewer System Extension Projects, Southeast	130
Table 13.1.	STEP System Challenges and Evaluation of Potential Strategies .	138
Table 14.1.	Onsite Sewage System Challenges and Evaluation of Potential Strategies.....	143
Table 17.1.	Staffing	163
Table 17.2.	New or Revised Policies	164
Table 17.3a.	Summary of Strategies	168
Table 17.3b.	Summary of Programs	169
Table 17.4.	Capital Projects, Timing and Estimated Cost	172

LIST OF FIGURES

Figure 2.1. Olympia Service Area and Wastewater Basins	8
Figure 2.2. Calculation of Equivalent Residential Unit (ERU)	14
Figure 3.1. Components of Olympia’s Wastewater Management System	21
Figure 3.2. Wastewater Treatment Plants within 20 Miles of the LOTT Service Area.....	26
Figure 5.1. Components of the Gravity Sewer System.....	37
Figure 5.2. Sources of Inflow and Infiltration	39
Figure 5.3. City of Olympia Gravity Sewer System.....	42
Figure 5.4. Modeled Capacity Limitations, 2006	47
Figure 5.5. Projected Capacity Limitations, 2010	49
Figure 5.6. Projected Capacity Limitations, 2025	50
Figure 5.7. Area of Potential Diversion to LOTT Satellite Treatment Plant.....	51
Figure 5.8. Pump Station Locations	53
Figure 6.1. Conceptual Diagram of a STEP System.....	61
Figure 7.1. Individual Onsite Sewage System.....	69
Figure 7.2. Community Onsite Sewage System	70
Figure 7.3. Potential Risk to Groundwater from Onsite Sewage Systems	72
Figure 7.4. Location of Onsite Systems in Olympia Service Area.....	75
Figure 8.1. Graywater System	84
Figure 8.2. Living System for Wastewater Treatment.....	85
Figure 9.1. Olympia Wastewater Basins and Direction of Flow to Treatment Facility.....	89
Figure 9.2. West Olympia Wastewater Management Basin.....	91
Figure 9.3. West Bay Wastewater Management Basin.....	92
Figure 9.4. Downtown Wastewater Management Basin	93
Figure 9.5. Northeast Olympia Wastewater Management Basin.....	95
Figure 9.6. South Bay Wastewater Management Basin	96
Figure 9.7. Lilly Road Wastewater Management Basin.....	98
Figure 9.8. Southeast Olympia Wastewater Management Basin.....	99
Figure 9.9. Olympia Sewer System Structure and Capacity Projection	100
Figure 10.1. Organizational Relationships.....	104
Figure 12.1. Sewer System Extensions, West Olympia.....	131
Figure 12.2. Sewer System Extensions, South Bay	132
Figure 12.3. Sewer System Extensions, Lilly Road.....	133
Figure 12.4. Sewer System Extensions, Southeast	134
Figure 16.1. Relationship among Wastewater Utility Core Services	154
Figure 18.1. Categories of Utility Revenue (2005).....	174

APPENDICES

A. *Financial Analysis*

B. *SEPA Checklist*

C. *System Information and Analysis*

1. Model Development and Capacity Analysis
2. Pump Station Inventory and Analysis
3. Wastewater Operations and Maintenance Planning
4. Sanitary Sewer Overflow Emergency Management Plan

D. *Sewerage General Plan Implementing Agreement (1992)*

E. *Maps*

1. Topography
2. Surface Water
3. Water Systems
4. Existing and Planned Gravity Sewers, Pump Stations and Force Mains