APPENDIX C—WASTEWATER

This appendix contains three Technical Memorandum that were developed to support the Wastewater Planning Element of the WaQSP. The following is a list of items contained in each technical memorandum.

Technical Memorandum #1

- *Description of existing wastewater facilities*—Provides a summary of current capacity and treatment technologies of wastewater treatment facilities located in Salt Lake County.
- *Expansion and Improvement Plans* — This section presents a review of known expansion and improvement plans of existing sewer agencies located in Salt Lake County with respect to flow, process, biosolids and water quality.
- *Technology Review- Emerging Trends and Issues* — This section discusses current and emerging technology trends in the wastewater treatment industry that could affect future plant expansions and sitings.

Technical Memorandum #2

- *Current Regulatory Standards and Trends* — This section presents a summary of current federal, and state standards and future regulatory outlook including the Jordan River Total Maximum Daily Load (TMDL) and water quality standard development on the Great Salt Lake.
- *Permitting Process and Planning Framework* — This section presents an overview of the current planning and permitting process, a summary of the 208 Plan amendment process undertaken for the Riverton plant for South Valley Sewer District, and a summary of the proposed permitting process as developed during technical workshops with SL County and stakeholder groups.

Technical Memorandum #3

- *Wastewater Flow Projections* — This section provides a summary of wastewater flow and loading projections to 2030. Projections are based on Traffic Analysis Zone (TAZ) and Wasatch Front Regional Council (WFRC) population and employment projections. In addition, this section includes a summary of flow and routing alternatives in comparing current and ultimate planned Water Reclamation Facility (WRF) capacity to flow projections.
- *Updated Permitting Process and Planning Framework* — This section presents an update of the current planning and permitting process as developed during Phase II technical workshops with SL County and stakeholder groups.

Jordan River

DRAFT TECHNICAL MEMORANDUM NO.1

SALT LAKE COUNTY
WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

FOR

SALT LAKE COUNTY

NOVEMBER 2006

BROWN AND CALDWELL

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1.0 INTRODUCTION

There are several activities occurring in Salt Lake County related to wastewater management that require the original (October 1978) 208 Water Quality Management Plan to be revisited. The geographic scope of development requires a comprehensive planning process to assure the best solutions to wastewater treatment and water quality are achieved. Brown and Caldwell has been contracted by Stantec Consulting to evaluate the planning components necessary to revisit the wastewater element of the 208 Water Quality Management Plan. The information gathered in this initial phase of the process including existing and planned future facilities of each sewer agency will be used to help develop future wastewater management alternatives. The geographic proximity of each collection/treatment provider along with trends in wastewater treatment technology will in large measure dictate the formulation of feasible wastewater management alternatives.

At this time, Salt Lake County, the State designated area wide water quality management planning agency, has limited knowledge of existing sewer agency master planning information, plans for expansion and impediments to accepting new wastewater flows. The recent court ruling upholding rejection of siting a wastewater treatment facility in Riverton is but one example of the urgent need to understand the issues surrounding wastewater management in Salt Lake County.

Questions posed concerning capacity, costs, treatment technologies, reuse, biosolids management, and the future plans of the wastewater agencies is the basis for undertaking this planning effort which will allow Salt Lake County and affected stakeholders to make knowledgeable planning decisions that are critical to protecting water quality and public health and will allow the highest and best use of the wastewater resource.

This draft technical memorandum is the first of two technical memorandum that will present initial findings. This technical memorandum includes information gathered on existing and future sewer agency master planning information and a review of emerging technology trends and issues that could affect future plant expansions. At the conclusion of the project a final report will be developed encompassing the results of both technical memorandum and any comments received.

This technical memorandum is divided into sections that discuss the following:

Section 1.0 *Introduction* — This section provides relevant background of the project and an overview of Brown and Caldwell's approach.

Section 2.0 *Description of Existing Facilities* — This section presents a summary of current capacity and treatment technologies of wastewater treatment facilities located in Salt Lake County.

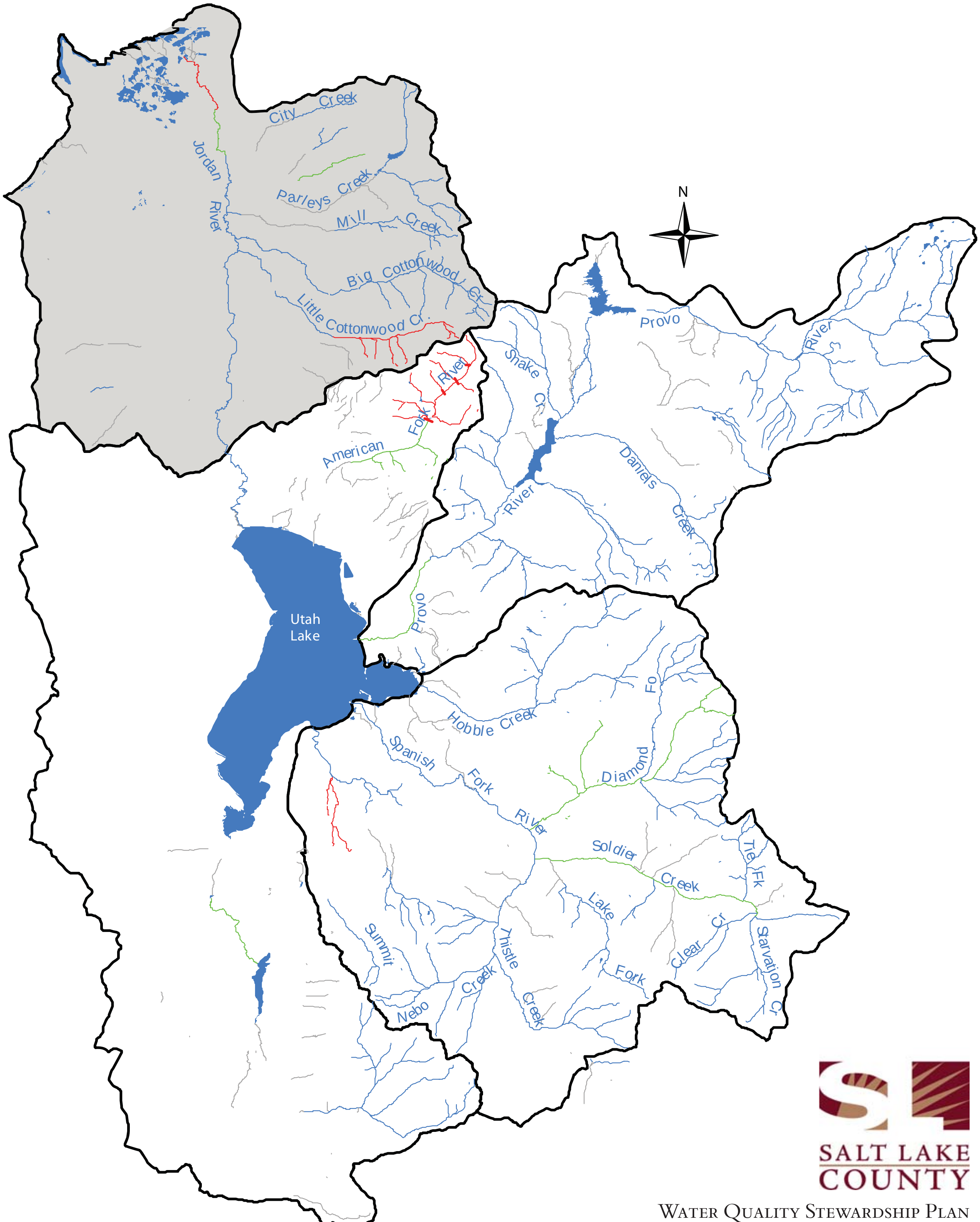
Section 3.0 *Expansion and Improvement Plans* — This section presents a review of known expansion and improvement plans of existing sewer agencies located in Salt Lake County with respect to flow, process, biosolids and water quality.

Section 4.0 *Technology Review- Emerging Trends and Issues* — This section discusses current and emerging technology trends in the wastewater treatment industry that could affect future plant expansions and sitings.

Section 5.0 *Summary and Conclusions*

1.1 PROJECT BACKGROUND

In 1978, Salt Lake County completed its Area-Wide Water Quality Management Plan in accordance with section 208 of the Clean Water Act. This plan has served as a guiding document for nearly 28 years. In August of 2005, a request was made to amend the Area-Wide Water Quality Management Plan for a new plant in Riverton. In the process of re-visiting the 1978 plan, it became apparent that numerous factors such as land-use, population projections, jurisdictional boundaries, water quality requirements/impairments, water supply/use, and wastewater treatment processes have changed significantly since 1978. In addition, planned developments along the West Bench will generate a significant quantity of wastewater flow as these areas are developed. As a result, the Salt Lake County Council allocated monies into the 2006 budget to initiate the development of a Water Quality Stewardship Plan (WaQSP), which will update the existing Area-Wide Water Quality Management Plan. This WaQSP will update the essential elements found in the original Area-Wide Water Quality Management Plan.



SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

SALT LAKE COUNTY
UTAH LAKE/JORDAN RIVER MANAGEMENT UNIT
FIGURE 1-1

BROWN AND CALDWELL

1.2 PROJECT APPROACH

The following task descriptions outline the project approach and consultant services required to complete Phase 1 of the wastewater element of the WaQSP. Phase 2 of the project is planned to commence in Spring 2007 and will include those tasks necessary to evaluate wastewater flow projections in regards to current and planned treatment capacity. These tasks will be coordinated with the other elements of the Salt Lake County Watershed and Water Quality Stewardship planning effort.

1.2.1. Task 1 – Project Initiation and Understanding

The initial activity of this project is a project initiation meeting that will be attended by key County personnel the Stantec Program Manager and the Consultant's Project Manager and Project Engineer. The purpose of the meeting will be to introduce the project team, establish lines of communication, discuss the Scope of Work, technical approach, and County's expectations, and review the project schedule. During the meeting, arrangements will be made for additional meetings, and for transfer of information and files needed to complete the work.

1.2.2. Task 2 – Wastewater Treatment Technology Review

Task 2.1 – Describe Regulatory Setting. Consultant will review current and planned regulatory programs that impact or could impact wastewater management and treatment technologies in Salt Lake County. The primary focuses of this subtask include Jordan River water quality standards; the Jordan River TMDL process; water quality standard development for the Great Salt Lake and Farmington Bay; existing and possible future wastewater treatment discharge limits; reclaimed water standards and trends including blending with surface water, direct landscape irrigation, aquifer storage and commercial building toilet flushing. The description of regulatory programs will also include requirements for biosolids disposal on land as well as give-away or sale of biosolids to the public.

Regulatory impediments to reuse options identified above will be described.

Task 2.2 – Treatment Technology Trends. Consultant will identify trends in wastewater treatment and make a preliminary assessment of technology trends based on envisioned regulatory scenarios.

Task 2.3 – Biosolids Technology Trends. Consultant will present technologies and scenarios for improving biosolids quality that are sustainable, conserve energy, provide beneficial use and address greenhouse gas emissions.

Task 2.4 – Water Reclamation Technology Trends. Consultant will present an overview of various proven water reclamation technologies and describe the appropriate applications for each methodology. Technology trends in the United States will be the focus. Important projects within Salt Lake County and will be described and compared to national trends in reclamation and reuse.

Task 2.5 – Decentralized Treatment Trends. Consultant will describe the trends in small and decentralized wastewater management systems. The environmental importance of decentralized wastewater management the remaining in unsewered areas of Salt Lake County will be addressed.

Task 2.6 – Other Related Wastewater Treatment Trends. Consultant will describe developing trends that are occurring across the limited States that use "scalping" facilities that are located near the points of end use while solids are conveyed to a central treatment plant and sitting treatment and reclamation facilities in residential settings with measures that completely control odors and completely conceal the physical appearance of the facility.

1.2.3. Task 3 – Define County Role in Wastewater Management

Task 3.1 – Preparation and Meetings with Stakeholders. Consultant will prepare for and conduct meetings with key individuals at the following stakeholder groups to identify and consider the concerns in development of wastewater management plan framework for the Salt Lake County Water Quality Stewardship Plan (WaQSP).

- Publicly-Owned Treatment Works (POTWs) and Dischargers
- Sewer Collection Agencies and Municipalities

- Jordan River Watershed Council
- State Division of Water Quality
- Salt Lake County Environmental Health
- Kennecott Land
- Potential Reclaimed Water Supply Agencies

Task 3.2 – Compile and Review Stakeholder Concerns. Consultant will compile the concerns from key stakeholders listing in Task 3.1 and will integrate the information into the framework for the regional wastewater planning process. The concerns compiled will be reviewed and will serve as the partial basis for conceiving and developing a viable wastewater resource management plan for Salt Lake County.

Task 3.3 – Develop Regional Wastewater Planning Procedures and Requirements. Consultant will identify critical planning elements for future wastewater treatment and water reclamation facilities to serve as a framework to achieve the goals and objectives of the Salt Lake County Water Quality Stewardship Plan (WaQSP) and the statutory requirements of Section 208 of the Clean Water Act. Consultant will develop a decision making process to identify the best long-term options for wastewater management that considers the values and concerns of citizens, interest groups, key agencies and policy makers. The defined process will strive to ensure that public values and agency policy are integrated into the overall decision making process with full recognition of technical, environmental, public health, and financial considerations.

1.2.4. Task 4 – Reports and Meetings

Task 4.1 – Meetings. Consultant will participate in up to five progress meetings with County and Stantec personnel during performance of activities of the planning process scoping efforts and seven meetings with stakeholders identified in Task 3.1. Consultant will conduct follow-up discussions with Stakeholders, the County, and Stantec to clarify consultant questions.

Task 4.2 – Prepare Draft Report. Consultant will prepare a concise draft report to summarize and present the results and recommendations of the Phase 1 master planning efforts. The recommendations will include a scope of services and a level of effort fee estimate for Phase 2 WaQSP activities.

Task 4.3 – Prepare Final Report. Consultant will incorporate comments on the draft technical memorandums into a final document and Phase 2 scope of services.

2.0 DESCRIPTION OF EXISTING FACILITIES

The original 208 Plan recommended consolidation of nine existing treatment plants into four, two of which discharge into the Jordan River. County area was geographically split into four specific planning areas for evaluating future wastewater treatment over the thirty year planning period (1975 to 2005). The recommendations of the 208 Plan for each area is summarized below:

Salt Lake City Planning Area. Wastewater flows from the population of Salt Lake City will be collected and treated at the Salt Lake City Water Reclamation Facility (SLCWRF). Effluent from the plant is discharged into the Salt Lake City Sewage Canal "Oil Drain". Future flows will be met by upgrade and expansion of the plant.

Magna Planning Area. Wastewater flows from the Magna Sewer District are collected and treated in the Magna Water Reclamation Facility (MagnaWRF). Effluent from the plant is discharged into Kersey Creek. Future flows will be met by upgrade and expansion of the plant.

Upper Jordan Planning Area. At the time of the 208 Plan, there existed three treatment plants (Lark, Sandy and Midvale) in the planning area. The town of Lark, a mining community of approximately 800 at its peak, was phased out in 1979 by Kennecott Copper Corporation. The 208 Plan recommended that the Sandy and Midvale plants be regionalized to form the South Valley Water Reclamation Facility (SVWRF). Effluent from the SVWRF is discharged to the Jordan River.

In August of 2005, an amendment to the 208 Plan was submitted to include an additional wastewater treatment plant located in Riverton. The project is currently on hold pending litigation over the facility site.

Lower Jordan Planning Area. At the time of the 208 Plan, there existed five sewage treatment plants (Murray, Cottonwood, Salt Lake City Suburban Sanitary District No.1, South Salt Lake, and Granger-Hunter). Similar to the Upper Jordan area, these five treatment plants were regionalized to form the Central Valley Water Reclamation Facility (CVWRF). Effluent from the CVWRF is discharged to the Jordan River.

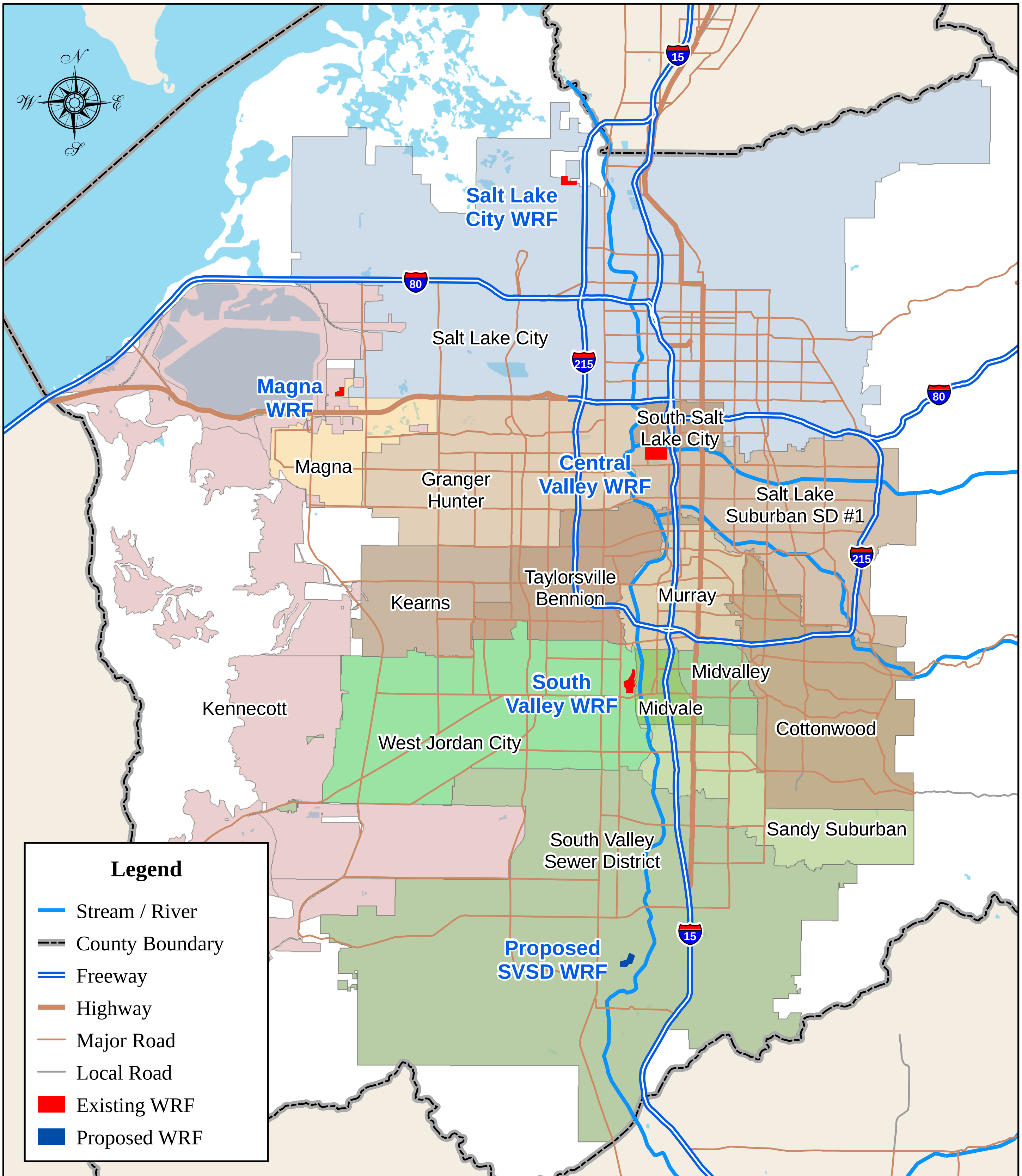
2.1 CURRENT CAPACITY AND TREATMENT TECHNOLOGIES OF EXISTING POTWS

Since the 208 Plan, the four wastewater treatment plants, SLCWRF, MagnaWRF, SVWRF, and CVWRF have undergone numerous expansions and process upgrades to keep pace with growing population, regulatory requirements, improved technology, and regular maintenance and repair. The purpose of this section is to describe the current capacity and main treatment technologies utilized at each of the POTWs currently treating sewage in Salt Lake County. Future expansion and upgrade plans will be discussed in Section 3.0. Location of the existing POTWs and current district boundaries are presented in Figure 2-1.

2.1.1. Salt Lake City Water Reclamation Facility

The original plant located west of I-15 at 2300 North, was completed in 1965, with a capacity of approximately 45-million gallons per day (mgd). In 1981, the City contracted with an engineering firm to conduct the 201 Wastewater Facilities Study. The Salt Lake City Council adopted the plan in 1982. Expansion of the existing plant began in 1985. Plant improvements made during this time included the pretreatment plant rehabilitation, main plant rehabilitation, administration and laboratory building construction, short term aeration facilities and sludge management and storage facilities. Improvements during this period increased treatment capacity to 56 mgd. Increases in biological treatment capacity made during 1993 through 1996, raised the plant's solids handling capacity from 60,000 lbs./day to 96,000 lbs./day. In 2002, a new 48-inch forcemain and replacement of two of the 250 hp with 350 hp influent pumps significantly increased the capacity of the Pretreatment Plant/Influent Pump Station. Currently, the plant is undergoing a major upgrade of its secondary treatment process including new aeration basins, secondary clarifiers, and return activated sludge (RAS) and waste activated sludge pumping facilities in response to substantial increases in organic strength of the wastewater influent.

Process Description. The Salt Lake City Water Reclamation Facility (SLCWRF) is a trickling filter/activated sludge process (TF/AS) plant. The plant utilizes anerobic digestion for solids treatment and cogenerates with digester gas. Liquid chlorine gas is used for disinfection prior to discharge into the Oil Drain/Great Salt Lake. An overview of the plant and current facility index is presented in Figures 2-2 and -3 respectively. Main process components include the following:



0 2 4

Scale in Miles

BROWN AND CALDWELL

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT
SALT LAKE COUNTY
POTW OVERVIEW

FIGURE 2-1

SALT LAKE COUNTY

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SLCWRF
Overview
Figure 2-2

BROWN AND CALDWELL

FACILITY INDEX

NEW / MODIFIED FACILITIES

- A AERATION BASINS
- B SECONDARY CLARIFIER NO. 8
- C SECONDARY CLARIFIER NO. 7
- D NORTH RAS/WAS PUMP STATION
- E SOUTH RAS/WAS PUMP STATION
- F SECONDARY EFFLUENT CHANNEL
- G BLOWER BUILDING
- H TRICKLING FILTER PUMP STATION
- J MANHOLE NO. 2
- K BIOSOLIDS STORAGE PAD
- L ELECTRICAL TRANSFORMER AND POWER FEED
- M SNAIL DEWATERING FACILITY
- N MCC 4A BUILDING
- P MCC 8A BUILDING

EXISTING FACILITIES

1. BIOSOLIDS STORAGE PAD
2. SECONDARY CLARIFIER NO. 5
3. SECONDARY CLARIFIER NO. 6
4. TRICKLING FILTER NO. 1
5. TRICKLING FILTER NO. 2
6. TRICKLING FILTER NO. 3
7. TRICKLING FILTER NO. 4
8. TRICKLING FILTER NO. 5
9. TRICKLING FILTER NO. 6
10. TRICKLING FILTER NO. 7
11. TRICKLING FILTER NO. 8
12. WEST RAS PUMP STATION
13. REAERATION BASINS
14. ADMINISTRATION BUILDING
15. CHLORINE CONTACT BASIN
16. CHLORINE BUILDING
17. COGENERATION BUILDING
18. SECONDARY CLARIFIER NO. 1
19. SECONDARY CLARIFIER NO. 2
20. SECONDARY CLARIFIER NO. 3
21. SECONDARY CLARIFIER NO. 4
22. FLOCCULATION BASINS
23. SNAIL REMOVAL FACILITY
24. EAST RAS PUMP STATION
25. GRAVITY THICKENER
26. PRIMARY CLARIFIER
27. DIGESTER
28. CONTROL BUILDING
29. MAINTENANCE BUILDING
30. SLUDGE DRYING BED
31. ELECTRICAL TRANSFORMER AND POWER FEED
32. SWITCHGEAR BUILDING
33. TUNNEL G
34. POST AERATION
35. POST AERATION BLOWER ROOM & FAN HOUSE

SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

SLCWRF
FACILITY MAP
FIGURE 2-3

BROWN AND CALDWELL

- Pretreatment Plant/Influent Pump Station
- Grit Chambers
- Primary Clarifiers
- Trickling Filters
- Flocculation Basins
- Secondary Clarifiers
- Chlorine Contact Basin
- Anaerobic Digesters
- Sludge Drying Beds

Existing SLCWRF Plant Design Criteria and current UPDES Permit information is located in Appendix B.

Treatment Capacity. Treatment capacity of the SLCWRF is 56 mgd average daily flow (ADF). The plant is currently undergoing a secondary process upgrade to improve treatment capacity of the plant. These improvements are discussed further in Section 3. Currently, the plant receives approximately 33 mgd ADF.

A recent hydraulic capacity evaluation was completed by Carollo Engineers in the Facility Design Report of 2002. The conclusion of this evaluation was that the plant is hydraulically limited to passing approximately 96 mgd due to restrictions in the existing secondary treatment train. The current project addresses this issue by eliminating several bottlenecks identified in the plant and adding capacity through new process components including new aeration basins and secondary clarifiers. Based on these improvements and planned future additions of a fifth primary clarifier the plant is anticipated to pass peak flows of up to 140 mgd through the plant.

2.1.2. Magna Water Reclamation Facility

Magna Water Company, an Improvement District was formed by a resolution of the Board of Salt Lake County Commissioners and the Magna Water Board in 1949. Magna Water Company provides both potable water and sewer services to its customers. The Magna Water Reclamation Facility (MagnaWRF) is located just north of 2100 S, between 7200 W and 8000 W. The original plant included primary treatment followed by trickling filters and disinfection. Major plant expansions included conversion of the plant to an oxidation ditch process by addition of two oxidation ditches, secondary clarifiers and RAS/WAS pumping facilities in 1988. This was followed by improvements to the headworks in 2000. Currently the plant is in design for major improvements including a fixed-bed bioreactor treatment process and a new headworks discussed in Section 3.0.

Process Description. The MagnaWRF is an oxidation ditch process. Solids are sent to sludge drying beds prior to land application and/or landfill. Liquid chlorine gas is used for disinfection prior to discharge to Kersey Creek which flows into the GSL. An overview of the plant, current facility index and process flow diagram is presented in Figures 2-4, 2-5 and 2-6 respectively. Main process components include the following:

- Headworks Including Bar Screens and Grit Removal
- Influent Pump Station
- Oxidation Ditches
- Clarifiers
- Chlorination
- RAS/WAS Pump Station
- Sludge Drying Beds

Existing MagnaWRF Plant Design Criteria is located in Appendix B. A renewal of Magna's UPDES discharge permit is expected in early 2007.

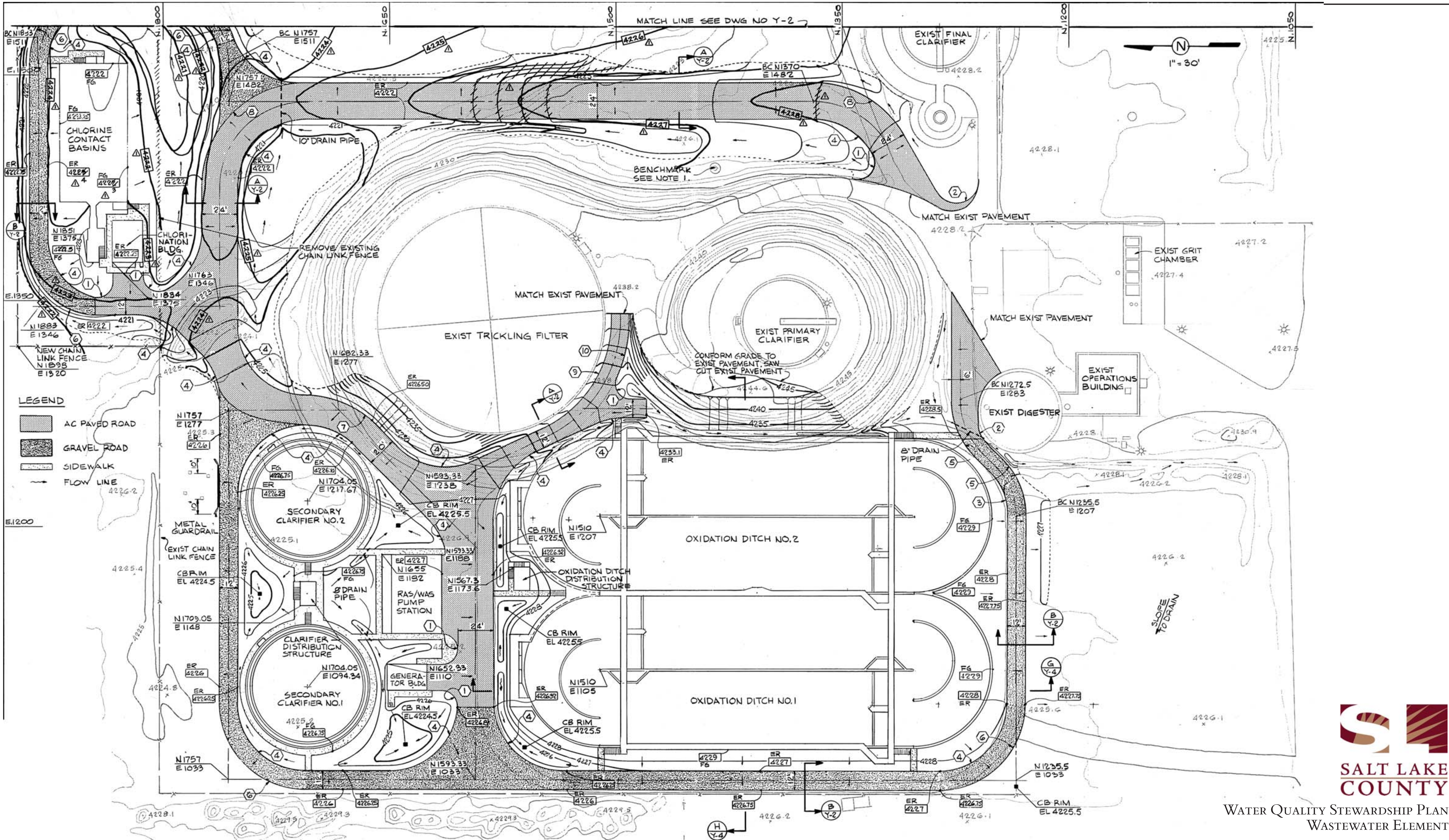
Treatment Capacity. Current treatment capacity of the MagnaWRF is 3.3 mgd ADF with a 6.6 mgd peak hour flow (PHF). The plant is currently in design for treatment of perchlorate laden residual streams from upstream, industrial and remedial action discharges. These improvements are anticipated to essentially double the existing plant capacity. In addition, the plant is considering reuse water opportunities to expand its current secondary water system. These improvements are discussed further in Section 3.0.

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Magna WRF
Overview
Figure 2-4

BROWN AND CALDWELL

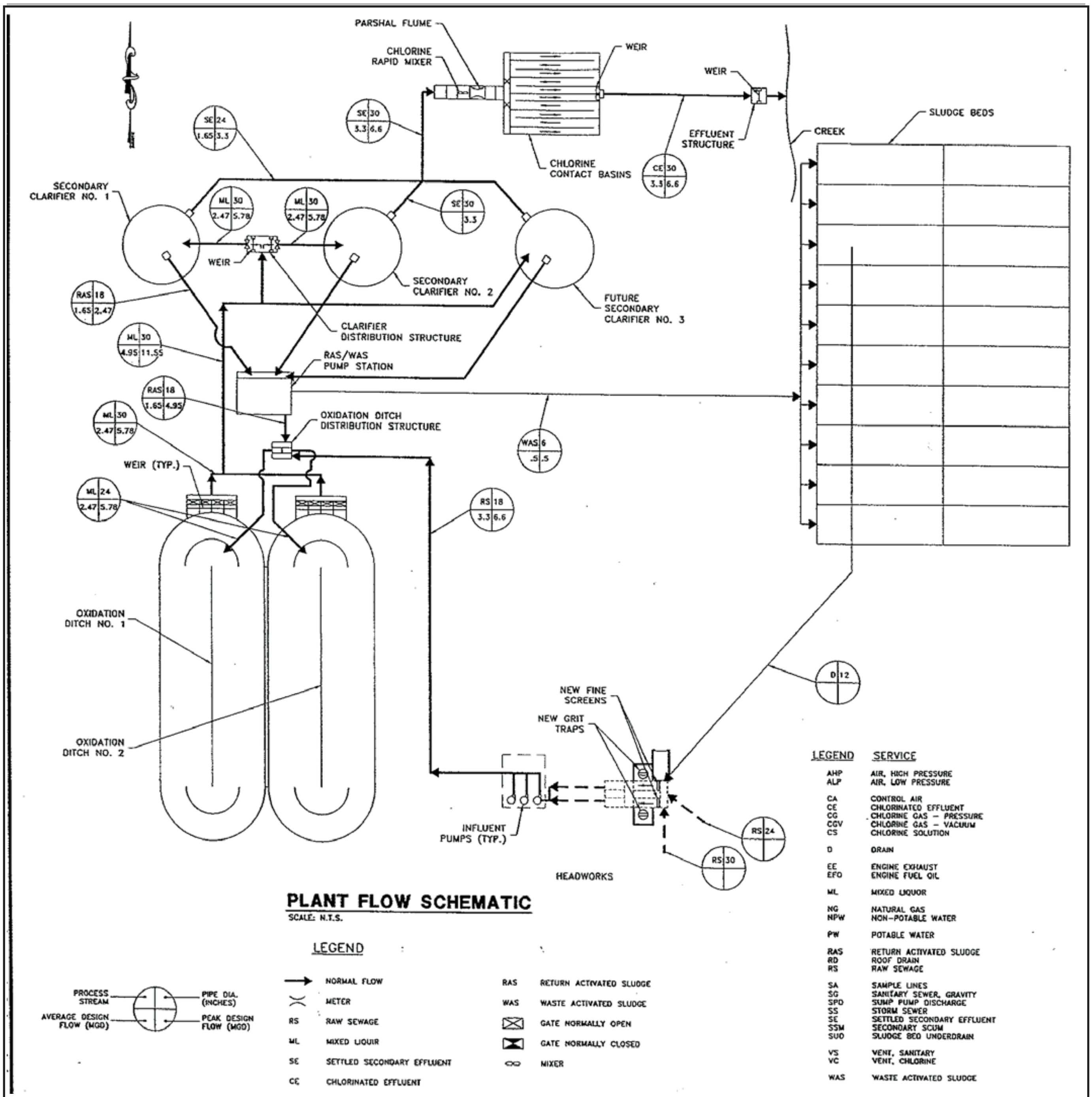


BROWN AND CALDWELL

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Magna WRF
Facility Map
Figure 2-5



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Magna WRF
Process Flow Diagram
Figure 2-6

BROWN AND CALDWELL

Capacity of the MagnaWRF is considered to be 3.3 mgd ADF. Currently the plant receives flows of approximately 2.6 mgd ADF and 3.9 mgd PHF.

2.1.3. Central Valley Water Reclamation Facility

The Central Valley Water Reclamation Facility (CVWRF) was designed to replace five small antiquated wastewater treatment plants in the central part of the valley as part of the 208 program. Construction of the regional plant was completed in 1985. CVWRF serves populations within five sewage collection districts and two municipalities. Member entities include Granger-Hunter Improvement District (GHID), Kearns Improvement District (Kearns), Taylorsville-Bennion Improvement District (TBID), City of South Salt Lake (SSL), Murray City Corporation (Murray), Salt Lake City Suburban District No.1 (District 1) and Salt Lake County Cottonwood Sanitary District (Cottonwood). The CVWRF is located just North of 3200 South at 800 West Central Valley Road.

Process Description. The CVWRF process includes primary treatment for initial removal of solids followed by a trickling filter/solids contact (TF/SC) secondary process. The plant utilizes anerobic digestion for solids treatment and cogenerates with the digester gas. Class B biosolids are produced by the plant. Liquid chlorine gas disinfection followed by sulfur dioxide dechlorination is performed prior to discharge. The plant operates a small-scale filtration system that provides reuse water to an onsite golf course. An overview of the plant, current facility index and process flow diagram is presented in Figures 2-7, 2-8 and 2-9 respectively. Main process components include the following:

- Pretreatment Including Screening and Grit Removal
- Primary Clarifiers
- Trickling Filters
- Solids Contact Tanks
- Final Sedimentation Clarifiers
- Chlorine Contact Basins
- Return Sludge and Waste Pumps
- Digester Feed Pumps

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

CVWRF

Overview

Figure 2-7

BROWN AND CALDWELL

1. Headworks
2. Primary Clarifiers
3. Trickling Filters
4. Solids Contact Basins
5. Secondary Clarifiers
6. Chlorine Contact Basins
7. Anerobic Digesters
8. Biosolids Dewatering
9. Cogeneration

BROWN AND CALDWELL

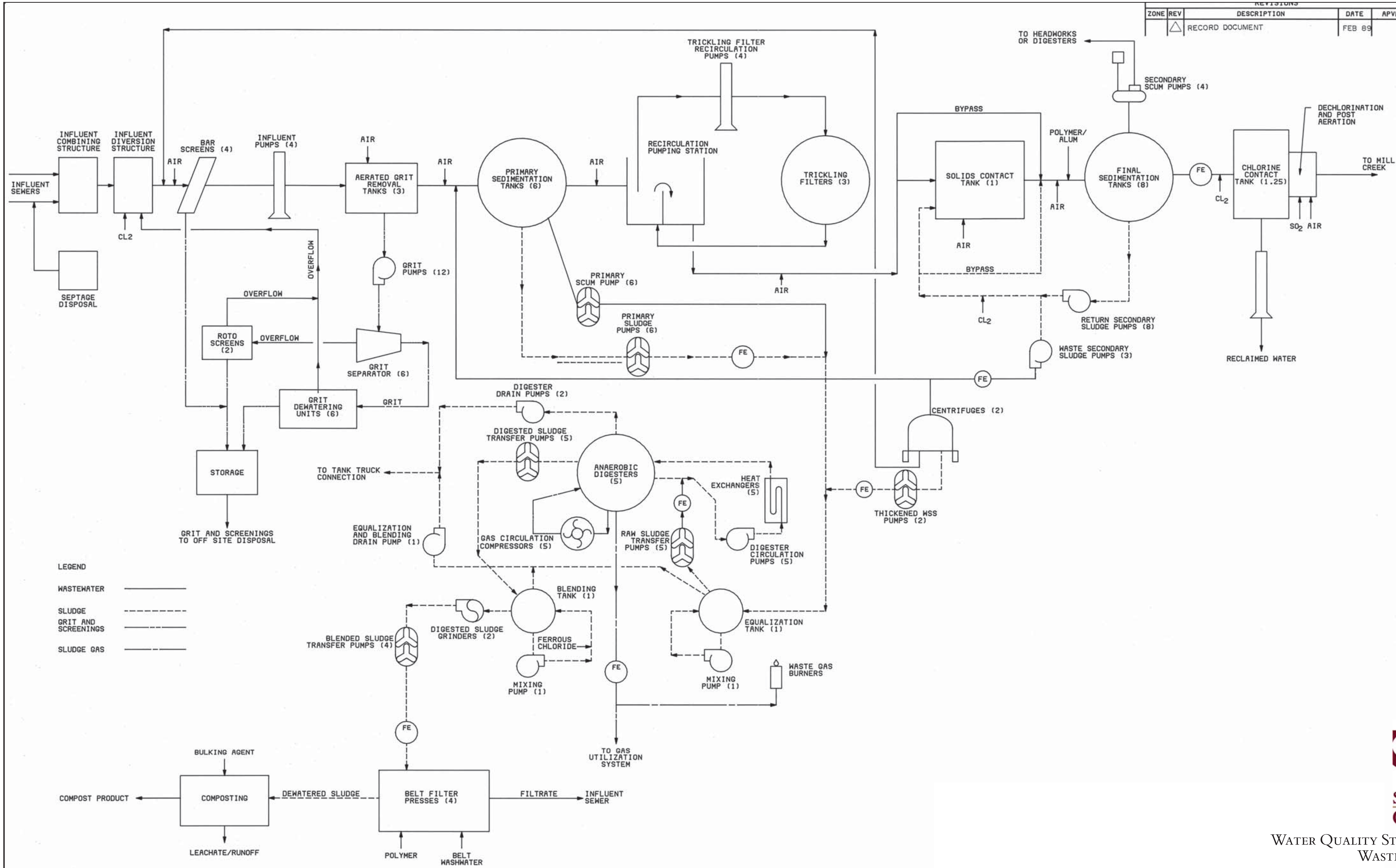
SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

CVWRF

Facility Map

Figure 2-8



BROWN AND CALDWELL

SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

CVWRF
PROCESS FLOW DIAGRAM
FIGURE 2-9

- Anaerobic Digesters – Conventional and Egg Shaped
- Screen Presses

Existing CVWRF Plant Design Criteria and UPDES Permit discharge information is located in Appendix B.

Treatment Capacity. The CVWRF has a capacity of 75 mgd ADF and receives approximately 50 mgd ADF of flow.

2.1.4. South Valley Water Reclamation Facility

The South Valley Water Reclamation Facility (SVWRF) was designed to replace three small wastewater treatment plants in the upper Jordan planning area as part of the 208 program. The SVWRF is located approximately 15 miles south of Salt Lake City on the West Bank of the Jordan River in West Jordan, Utah (7495 South 1300 West West Jordan). The facility provides wastewater treatment for the cities of Midvale, West Jordan, South Jordan, Riverton, Bluffdale, Draper, Copperton, and unincorporated portions of South Salt Lake County. The SVWRF treatment plant was commissioned for service in 1985 with an initital capacity of 25.5 mgd ADF. In 1992, the plant was upgraded to its current capacity of 38 mgd ADF.

Process Description. The SVWRF in an oxidation ditch process. The plant utilizes dissolved air flotation (DAF) thickening and belt press dewatering of undigested solids. Disinfection consists of ultra-violet disinfection (UV) with hypochlorite back-up. The plant discharges to the Jordan River. An overview of the plant, current facility index and process flow diagram is presented in Figures 2-10, 2-11 and 2-12 respectively. Main process components include the following:

- Pretreatment Including Screening and Grit Removal
- Oxidation Ditches
- Final Clarifiers
- Ultra-Violet Disinfection
- Final Sedimentation Clarifiers
- Return Sludge and Waste Pumps
- DAF-Thickening

SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

SVWRF

OVERVIEW

FIGURE 2-10

BROWN AND CALDWELL

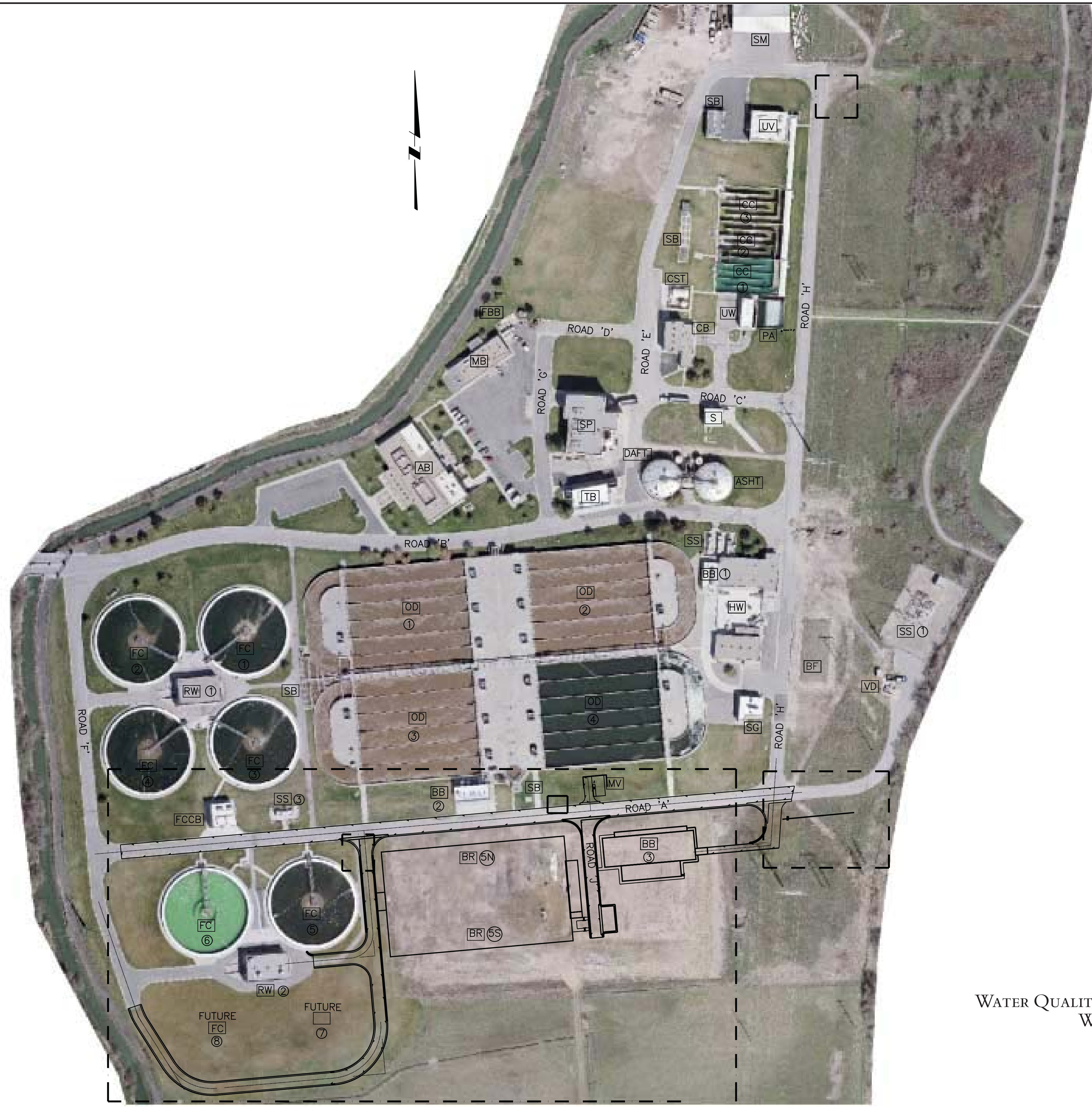
LEGEND

EXISTING FACILITIES

AB	ADMINISTRATION BUILDING
OD	OXIDATION DITCH
ASHT	AERATED SLUDGE HOLDING TANK
BB	BLOWER BUILDING
BF	BIOFILTER
CB	CHEMICAL BUILDING
CC	CHLORINE CONTACT TANK
CST	CHEMICAL STORAGE TANKS
DAFT	DISSOLVED AIR FLOTATION TANK
FBB	FILTER BYPASS BOX
FC	FINAL CLARIFIER
HW	HEADWORKS
MB	MAINTENANCE BUILDING
FCCB	FINAL CLARIFIER CHEMICAL BUILDING
PA	POST AERATION
RW	RAS/WAS PUMPING STATION
S	STORAGE BUILDING
SM	SECONDARY MAINTENANCE BLDG
SB	SPLITTER BOX
SG	STANDBY GENERATOR BUILDING
SP	SOLIDS PROCESSING BUILDING
SS	ELECTRICAL SUBSTATION
TB	THICKENER BUILDING
UV	UV DISINFECTION
UW	UTILITY WATER PUMPING STA
VD	VAULT DUMPING STATION
1	UNIT NUMBER

PROJECT 4C NEW FACILITIES

BB	BLOWER BUILDER NO. 3
BR	BIOREACTOR
MV	METER VAULT
SD	SOLIDS DRYING FACILITY



BROWN AND CALDWELL

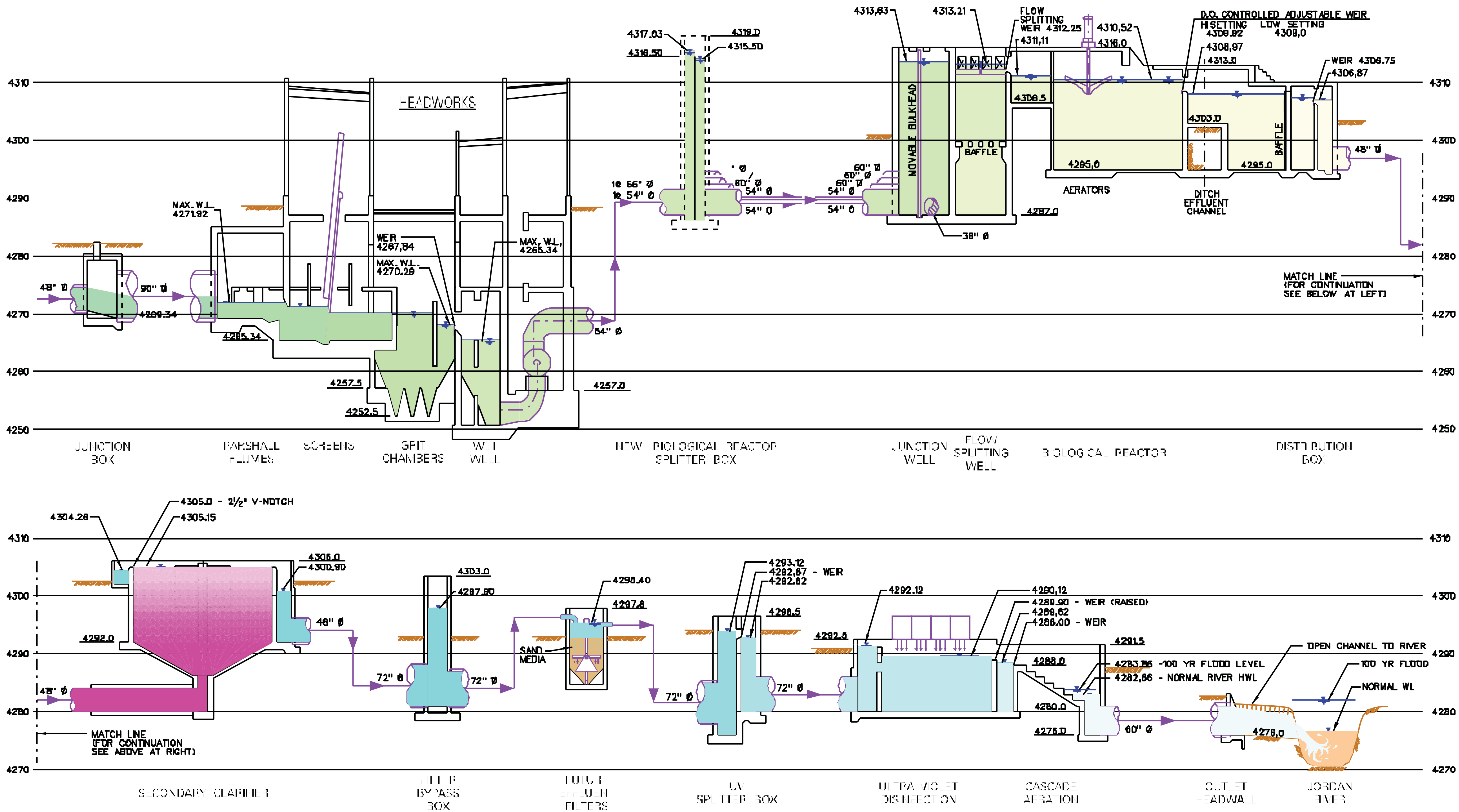
SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SVWRF

Facility Map

Figure 2-11



SOUTH VALLEY WATER RECLAMATION FACILITY
BIOLOGICAL TREATMENT EVALUATION STUDY

HYDRAULIC PROFILE
100 MGD – ADF
165 MGD – PHF

WITH FILTRATION AND UV DISINFECTION

BROWN AND CALDWELL

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SVWRF

Hydraulic Flow Profile

Figure 2-12

- Belt Press Dewatering

Existing SVWRF Plant Design Criteria and UPDES Permit Discharge information is located in Appendix B.

Treatment Capacity. The SVWRF has a treatment capacity of 38 mgd and is currently being expanded to 50 mgd. The plant currently is considered expandable to 80 mgd due to site constraints. Future expansion beyond 50 mgd would be difficult and expensive because it would likely require a complete new parallel treatment system. The plant currently receives approximately 30 mgd ADF.

3.0 EXPANSION AND IMPROVEMENT PLANS

The purpose of this section of the technical memorandum is to summarize known expansion and upgrade plans at each of the existing plants and the planned Riverton Facility. Future and current plans are discussed with regards to flow related expansion, process upgrades, biosolids and water quality.

3.1 EXISTING POTWS

Of the four existing wastewater treatment plants, three plants SLCWRF, MagnaWRF and SVWRF, are undergoing major expansion and/or upgrade projects. CVWRF just recently completed a secondary sedimentation system expansion that added two additional secondary clarifiers, return and waste pumps and related appurtenances. Design concepts for the proposed Riverton Facility as presented in the August, 2005 208 Addendum are also summarized herein.

3.1.1. Salt Lake City Water Reclamation Facility

In response to increases in organic strength of the influent wastewater, the SLCWRF began the process of updating the facility to ensure compliance with permit water quality limitations. Construction of the Secondary Upgrades Project began in the first quarter of 2004. The project primarily consists of six new aeration basins with fine bubble diffusers, two new 159-ft diameter secondary clarifiers, two new 70-mgd RAS/WAS pumping stations, new electrical service, and ancillary facilities. Flow and organic loading criteria for the new process is listed in Table 3-1.

TABLE 3-1. SLVWRF ORGANIC LOADING CRITERIA		
Design Parameter	**Unit**	**Value**
Flow		
Annual Average Daily Flow	mgd	56.0
Maximum Month Daily Flow	mgd	70.0
Total Peak Hour Flow	mgd	140.0
Treated Peak Hour Flow	mgd	96.0
Bypassed Flow	mgd	44.0
Organic Loading		
Average Annual BOD_5	mg/L ppd	290 135,507
Maximum Month Average Daily BOD	mg/L ppd	290 169,383
Average Annual Total Suspended Solids (TSS)	mg/L ppd	190 88,780
Average Annual Ammonia (NH_3-N)	mg/L ppd	18 8,410
Average Annual TKN	mg/L ppd	28.8 13,457

Figures 3-1 and 3-2 present the facility improvements and an updated plant flow diagram of the secondary system improvements. Based on flow projections developed in the 2002 Facility Design Report by Carollo Engineers, the plant rated capacity of 56 mgd is expected to be reached in 2027.

FACILITY INDEX

NEW / MODIFIED FACILITIES

- (A) AERATION BASINS
- (B) SECONDARY CLARIFIER NO. 8
- (C) SECONDARY CLARIFIER NO. 7
- (D) NORTH RAS/WAS PUMP STATION
- (E) SOUTH RAS/WAS PUMP STATION
- (F) SECONDARY EFFLUENT CHANNEL
- (G) BLOWER BUILDING
- (H) TRICKLING FILTER PUMP STATION
- (J) MANHOLE NO. 2
- (K) BIOSOLIDS STORAGE PAD
- (L) ELECTRICAL TRANSFORMER AND POWER FEED
- (M) SNAIL DEWATERING FACILITY
- (N) MCC 4A BUILDING
- (P) MCC 8A BUILDING

EXISTING FACILITIES

- (1) BIOSOLIDS STORAGE PAD
- (2) SECONDARY CLARIFIER NO. 5
- (3) SECONDARY CLARIFIER NO. 6
- (4) TRICKLING FILTER NO. 1
- (5) TRICKLING FILTER NO. 2
- (6) TRICKLING FILTER NO. 3
- (7) TRICKLING FILTER NO. 4
- (8) TRICKLING FILTER NO. 5
- (9) TRICKLING FILTER NO. 6
- (10) TRICKLING FILTER NO. 7
- (11) TRICKLING FILTER NO. 8
- (12) WEST RAS PUMP STATION
- (13) REAERATION BASINS
- (14) ADMINISTRATION BUILDING
- (15) CHLORINE CONTACT BASIN
- (16) CHLORINE BUILDING
- (17) COGENERATION BUILDING
- (18) SECONDARY CLARIFIER NO. 1
- (19) SECONDARY CLARIFIER NO. 2
- (20) SECONDARY CLARIFIER NO. 3
- (21) SECONDARY CLARIFIER NO. 4
- (22) FLOCCULATION BASINS
- (23) SNAIL REMOVAL FACILITY
- (24) EAST RAS PUMP STATION
- (25) GRAVITY THICKENER
- (26) PRIMARY CLARIFIER
- (27) DIGESTER
- (28) CONTROL BUILDING
- (29) MAINTENANCE BUILDING
- (30) SLUDGE DRYING BED
- (31) ELECTRICAL TRANSFORMER AND POWER FEED
- (32) SWITCHGEAR BUILDING
- (33) TUNNEL G
- (34) POST AERATION
- (35) POST AERATION BLOWER ROOM & FAN HOUSE

SALT LAKE COUNTY

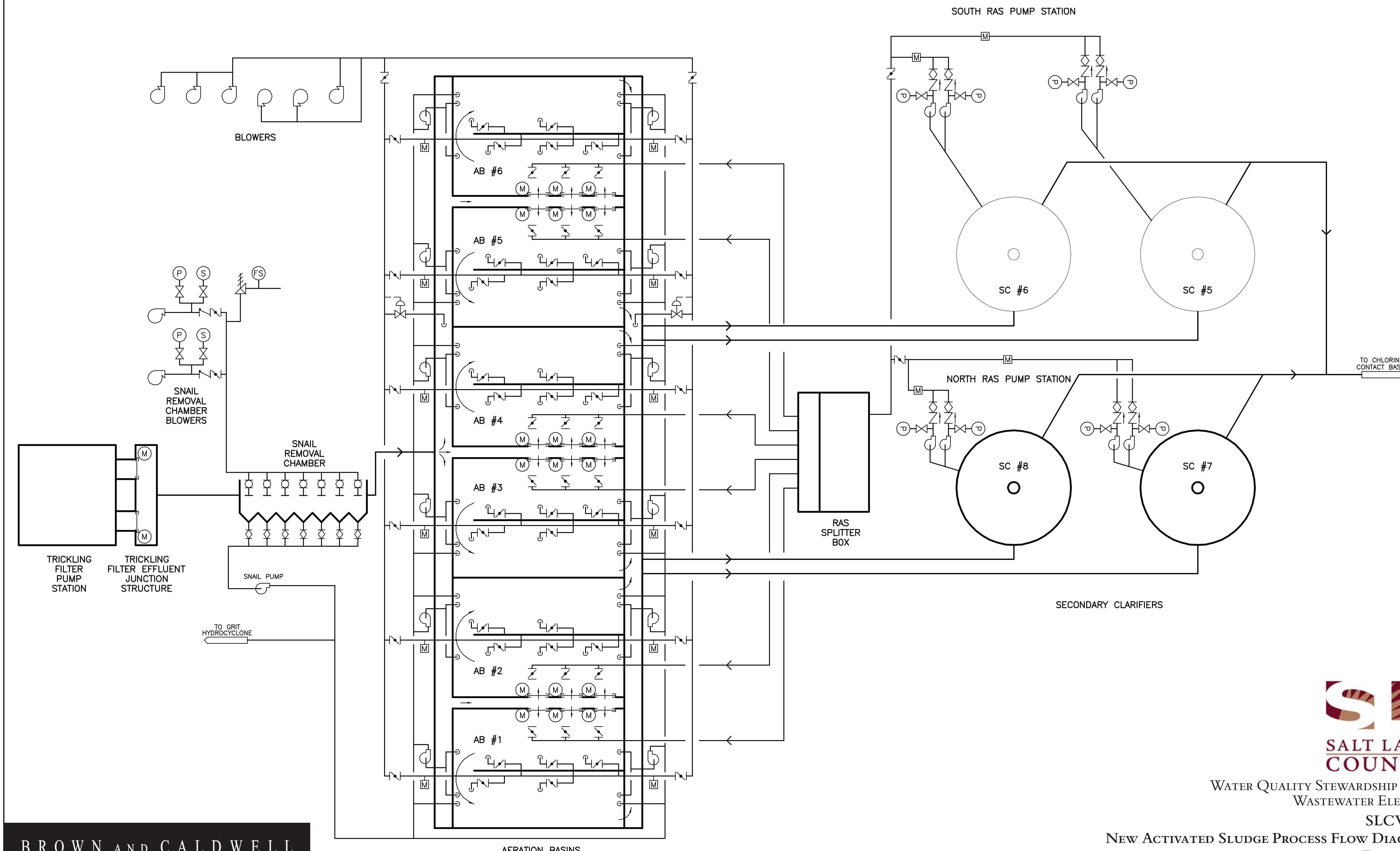
Water Quality Stewardship Plan
Wastewater Element

SLCWRF

Secondary Process Upgrade Summary

Figure 3-1

BROWN AND CALDWELL



BROWN AND CALDWELL

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SLCWRF

New Activated Sludge Process Flow Diagram

Figure 3-2

Based on current improvements and the planned future addition of a fifth primary clarifier the plant is ultimately anticipated to pass peak flows of 140 mgd. A hydraulic profile of the plant is presented in Figure 3-3.

Currently, several process units are being brought online with anticipation that most major construction activities will end in the next six to eight months.

Other projects currently being considered by SLCWRF include reuse opportunities, odor control and biosolids. A new plant site was purchased in the 1990's to accommodate future growth of the City.

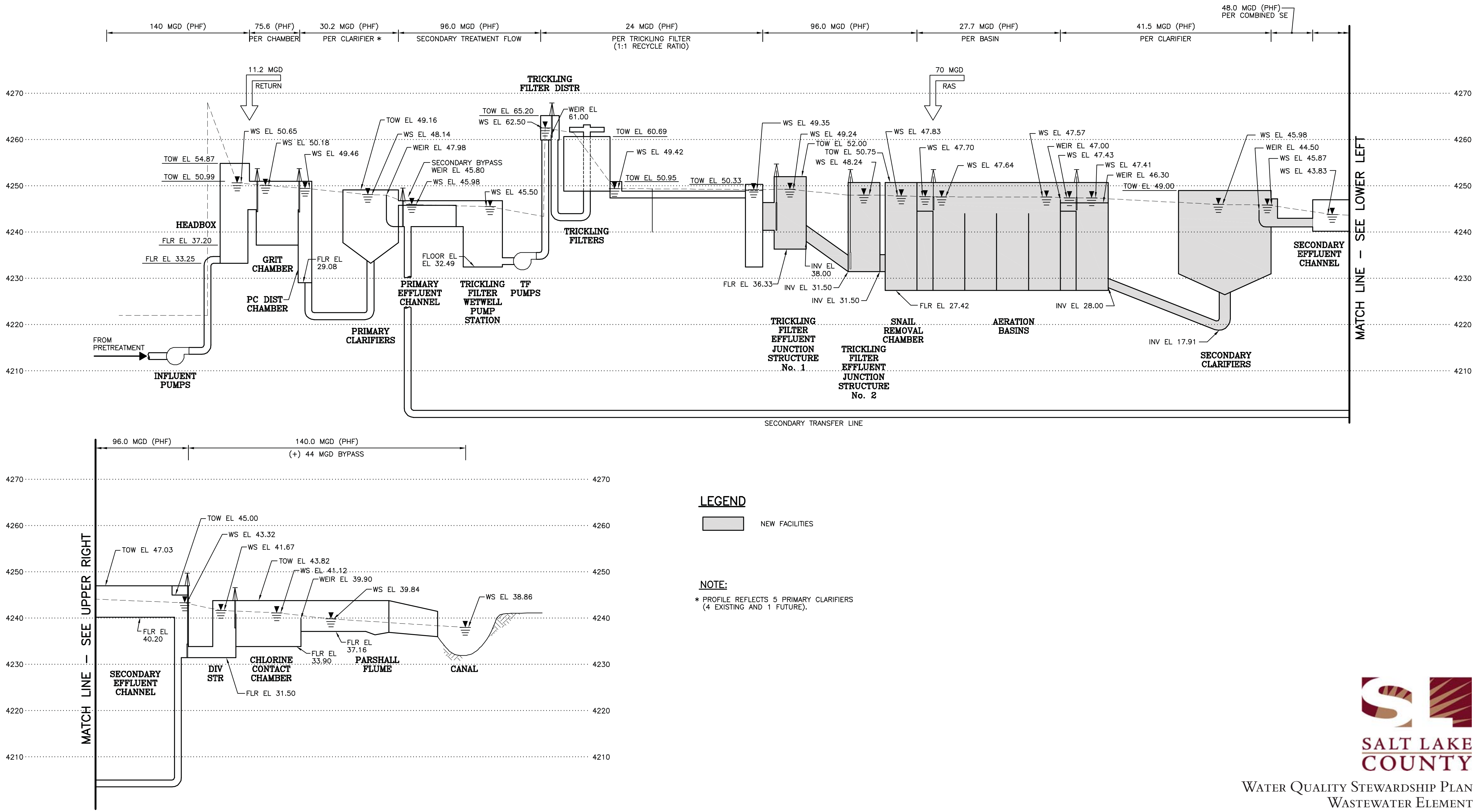
3.1.2. Magna Water Reclamation Facility

Magna Water Company is currently in design of a sidestream treatment process at the MangaWRF primarily for the removal of perchlorate (a byproduct of solid rocket fuel propellant) from upstream industrial discharges and planned groundwater remedial efforts at the Barton Well Field. The process treats perchlorate-laden waste streams by blending the concentrate waste streams with municipal wastewater in a fixed bed bioreactor. Perchlorate is biologically reduced to chloride oxygen by bacteria indigenous to the wastewater. Effluent is discharged back to the plant treatment process. The project consists of a new headworks including screens and grit removal, blending tank, influent pumps and perchlorate treatment facility (BIOBROx). A preliminary site plan and process flow diagram of the new facility is presented in Figures 3-4 and 3-5 respectively.

These improvements are anticipated to improve the existing plant capacity. Other projects currently being considered by MagnaWRF include reuse opportunities to expand the existing secondary system.

3.1.3. Central Valley Water Reclamation Facility

No current major flow or process related improvements to improve capacity are anticipated for the CVWRF. Future projects being considered by CVWRF include alternate means of disinfection (such as UV) and improvements to their solids handling system to produce Class A biosolids.



BROWN AND CALDWELL

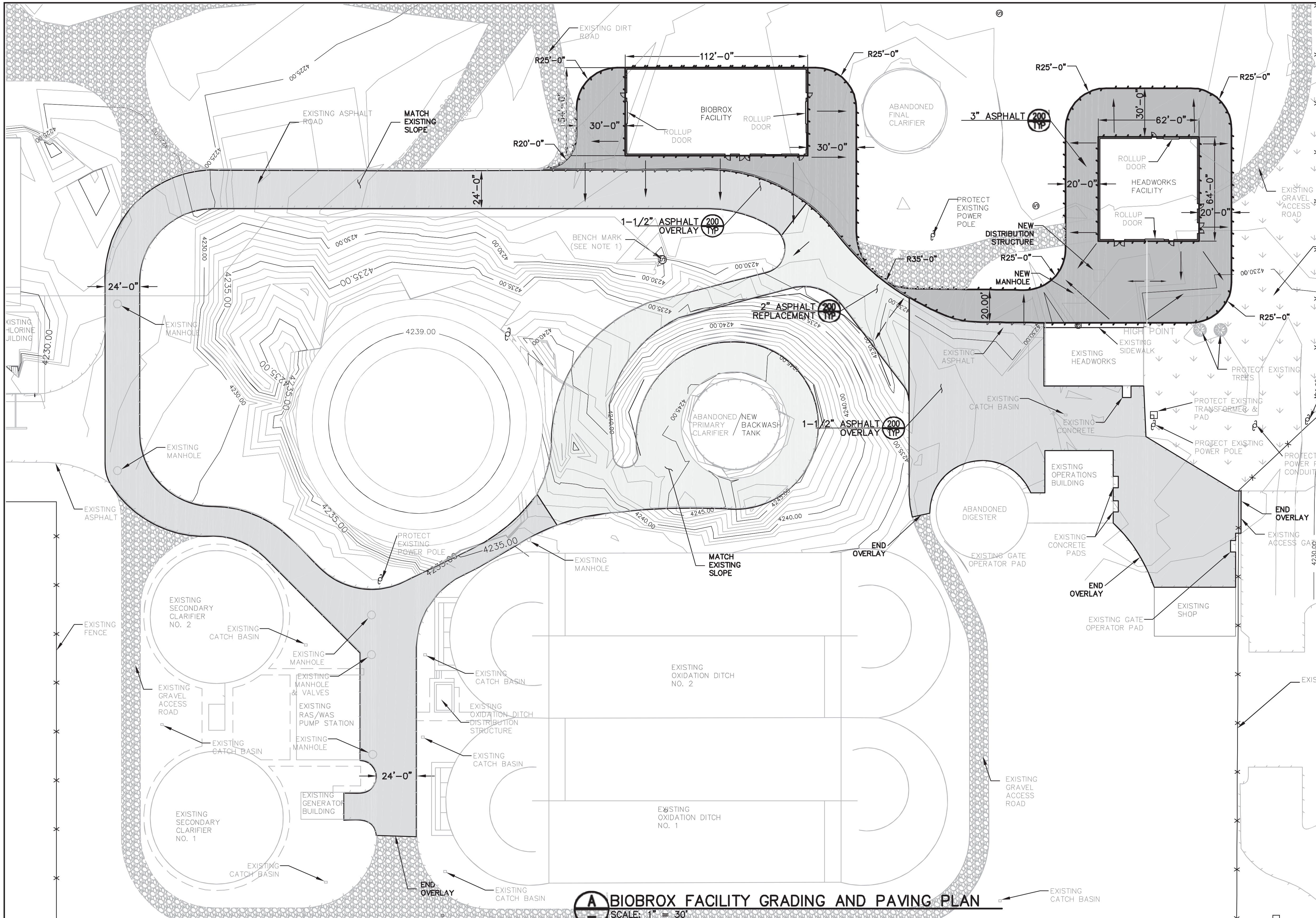
SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SLCWRF

Hydraulic Profile

Figure 3-3



SALT LAKE COUNTY

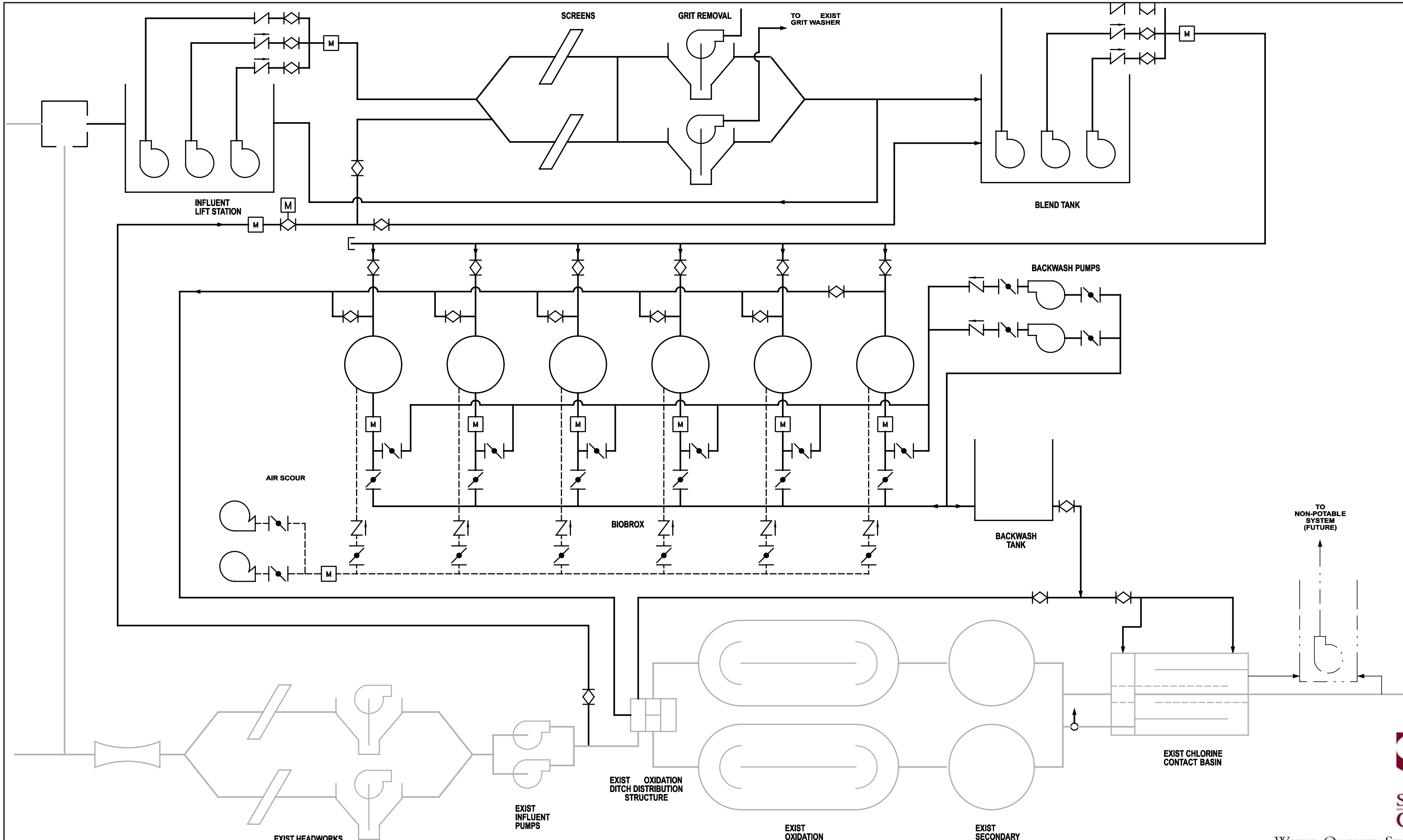
Water Quality Stewardship Plan
Wastewater Element

Magna WRF

Process Upgrade and Expansion

Figure 3-4

BROWN AND CALDWELL



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Magna WRF
Upgrade & Expansion Process Flow Diagram
Figure 3-5

BROWN AND CALDWELL

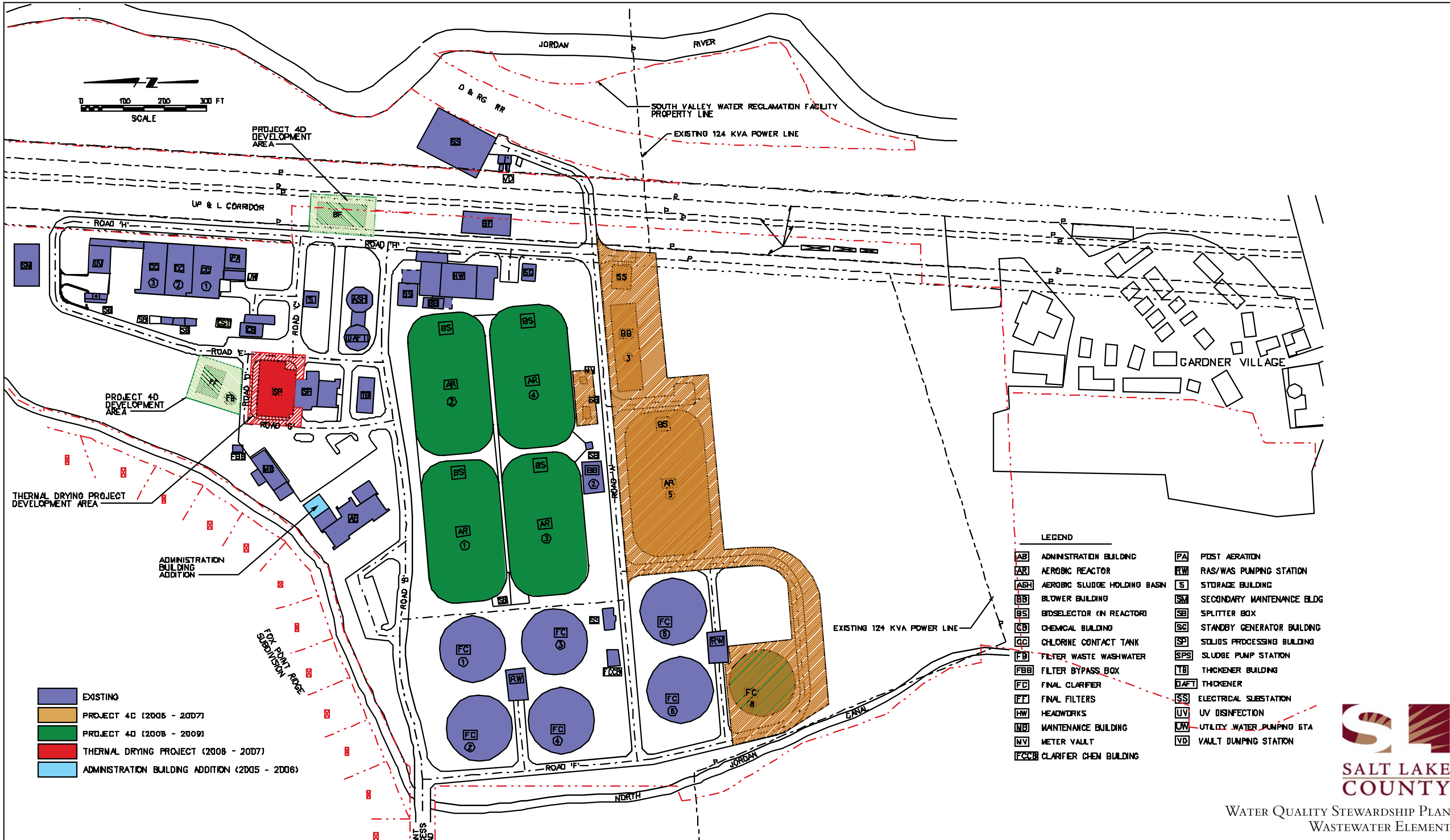
3.1.4. South Valley Water Reclamation Facility

The SVWRF is currently in construction of a major process upgrade to expand the plant from 38 mgd ADF to 50 mgd ADF (Project 4C). The project consists of a new staged aeration aerobic reactor, biosolids thermal dryer, blower building, electrical susbstation and final clarifier. Design criteria listed in the December 2001 Facility Plan - Executive Summary by MWH for flow and loadings of the current plant expansion is listed in Table 3-2.

TABLE 3-2. SVWRF DESIGN, FLOW, AND LOADING CRITERIA

Design Parameter	Unit	Value
Flow		
Peak to Average Daily Flow	ratio	1.65
Average Daily Flow	mgd	50.0
Peak Daily Flow	mgd	82.5
Flow Basis for Loads	mgd	60.0
Influent Characteristics		
BOD5	mg/L	200
Ammonia-Nitrogen (NH3-N)	mg/L	21
TKN	mg/L	31
Loadings		
Max. to Average Month Loadings	ratio	1.1216
Max month BOD5 Loading	lbs/day	112,250
Max Month NH3-N Loading	lbs/day	11,600
Max. Month TKN Loading	lbs/day	17,200

An overview of the project facilities is presented in Figure 3-6.



BROWN AND CALDWELL

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SVWRF
Process Upgrade and Expansion Project
Figure 3-6

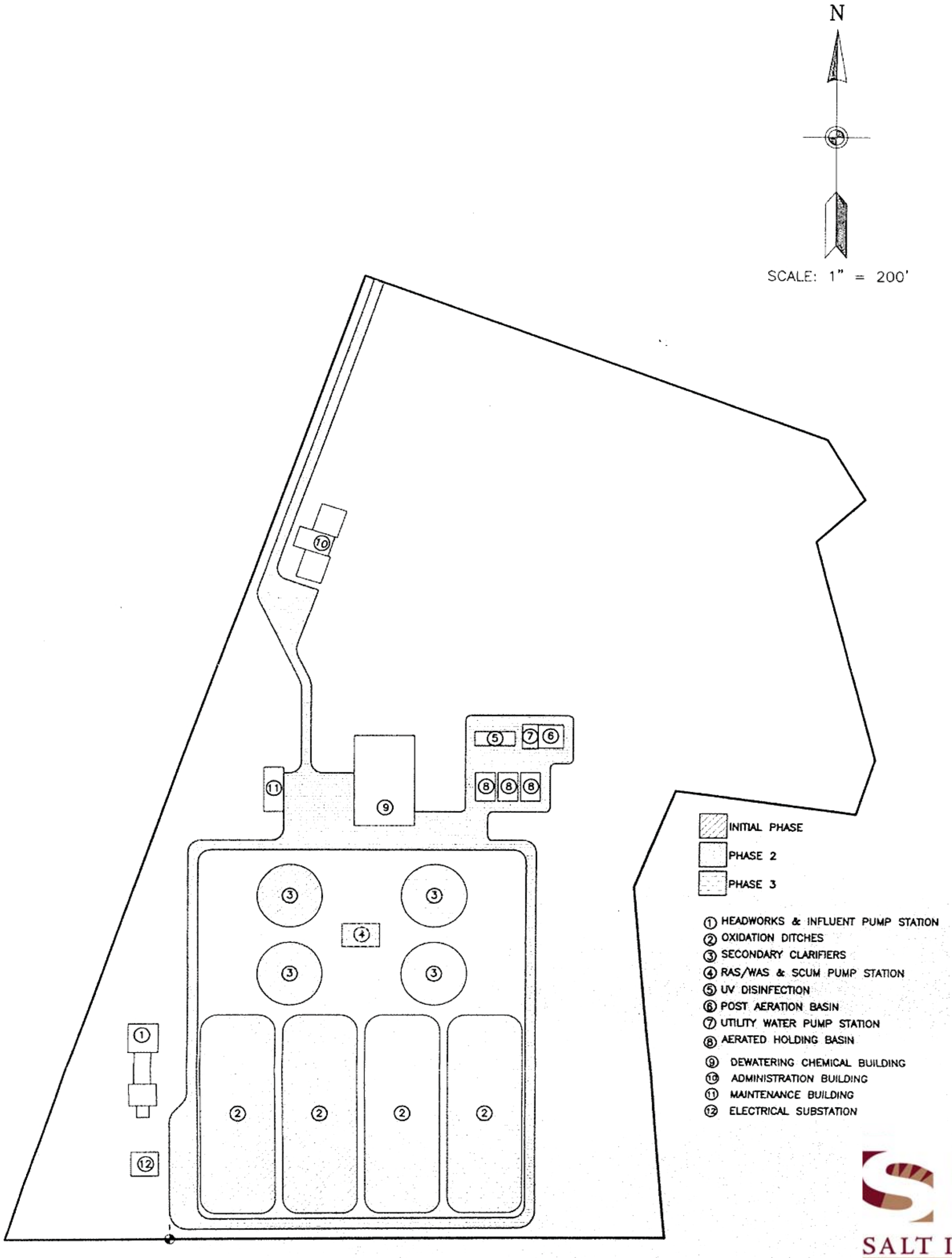
Future planned projects will include modifying the existing oxidation ditches from surface aerators to diffused, staged aeration. These modifications will increase the plant to the ultimate capacity of 50 mgd and ultimately to 80 mgd with the addition of secondary clarifiers. Expansion past 80 mgd is considered cost prohibitive due to existing site constraints.

3.2 PROPOSED SOUTH VALLEY SEWER DISTRICT POTW

The South Valley Sewer District (SVSD) provides wastewater collection services to rapidly growing communities located in south Salt Lake County and north Utah County. Wastewater treatment is currently provided by the SVWRF. Costs associated with providing additional conveyance and treatment capacity at SVWRF has prompted the District to explore alternatives for treatment at a new facility. The Wastewater Treatment Facility Plan and Draft 208 Amendment by Bowen and Collins was developed to evaluate potential sites for building a new facility, alternative treatment methods and preliminary costs. The report recommends building a new plant in Riverton with an initial capacity of 15.0 mgd expandable to 30.0 mgd.

Figure 3-7 shows the proposed facility layout. The following process elements have been proposed for the new plant:

- Headworks and Influent Pump Station
- Oxidation Ditches
- Secondary Clarifiers
- RAS/WAS Pump Station
- Ultraviolet Disinfection Facility
- Post Aeration Basin and Utility Water Pump Station
- River Discharge Structure
- Aerated Solids Holding Basin
- Solids Dewatering Facility and Transport Equipment
- Administration Building
- Maintenance Building
- Chemical Building



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

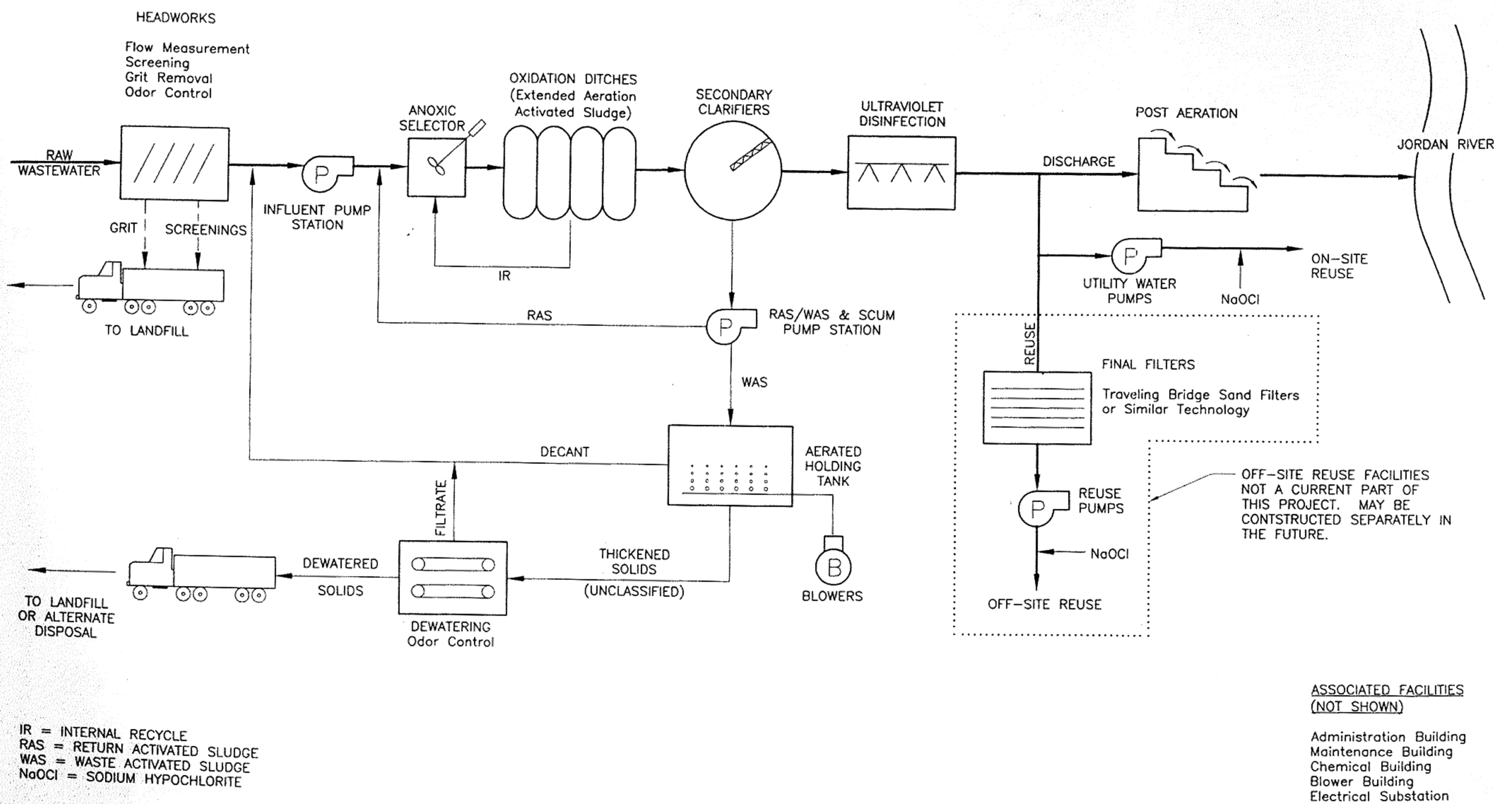
SVSD

Proposed Plant Layout

Figure 3-7

BROWN AND CALDWELL

The report recommended an Oxidation Ditch or Staged Aeration treatment process with the final process to be determined during final design. Alternative process flow diagrams for each process are shown in Figures 3-8 and 3-9.



SALT LAKE COUNTY

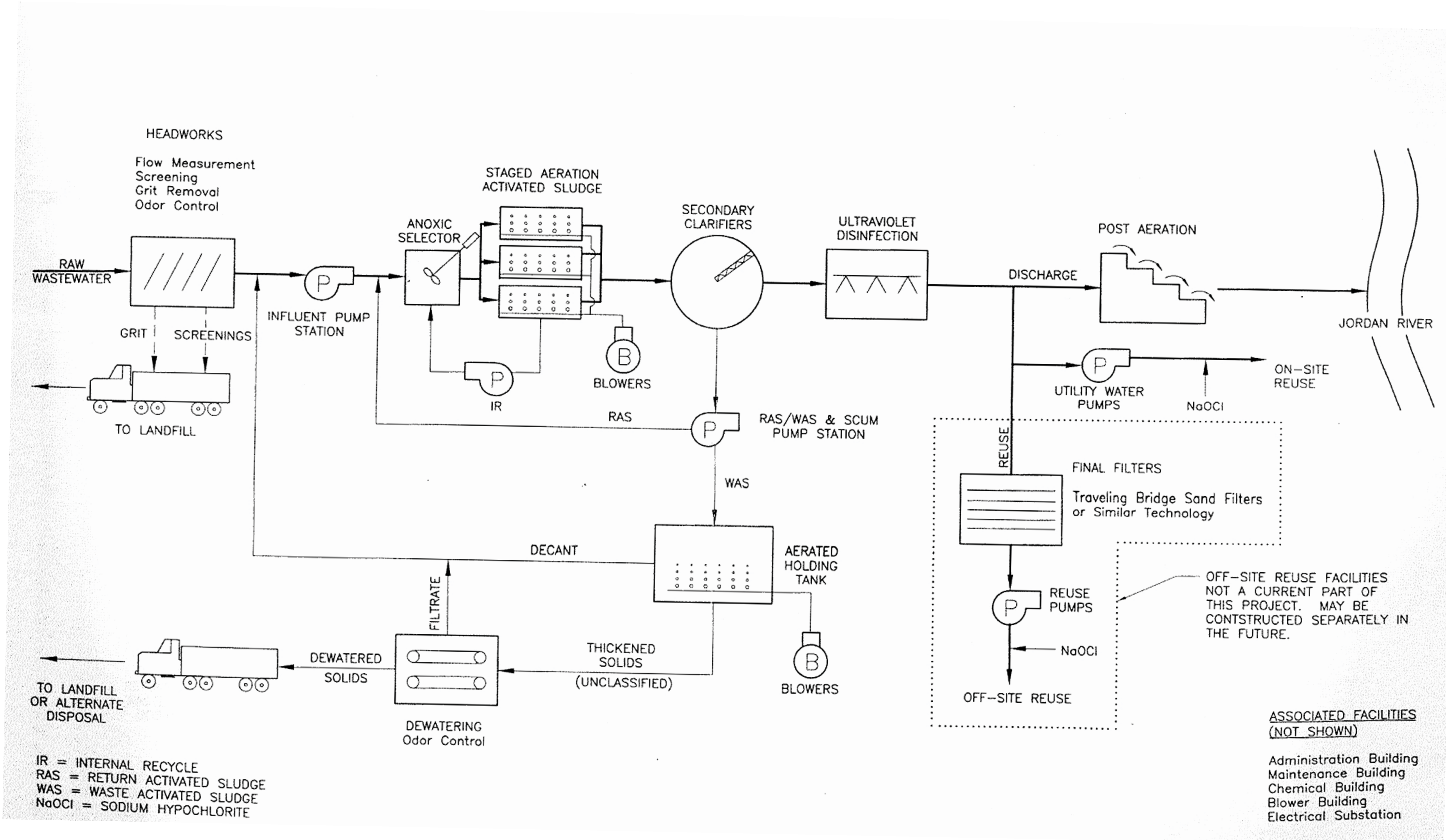
Water Quality Stewardship Plan
Wastewater Element

SVSD

Oxidation Ditch Alternative

Figure 3-8

BROWN AND CALDWELL



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SVSD

Staged Aeration Alternative

Figure 3-9

BROWN AND CALDWELL

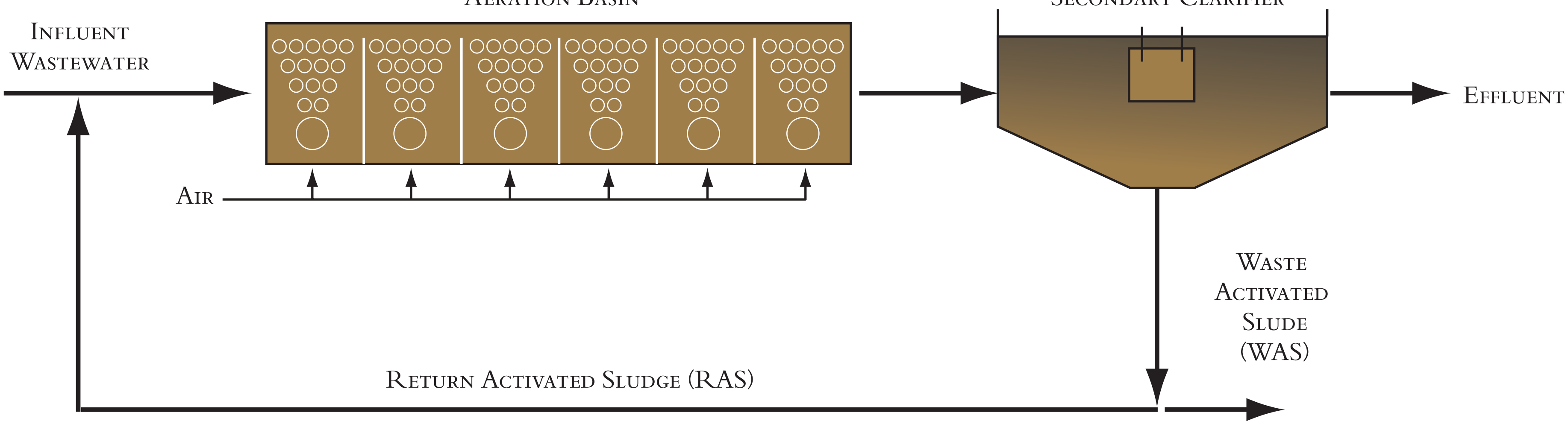
4.0 TECHNOLOGY REVIEW - EMERGING TECHNOLOGIES, TRENDS, AND ISSUES

4.1 WASTEWATER

The four existing treatment plants in Salt Lake County use conventional secondary treatment that incorporates a form of the activated sludge process (Figure 4-1) which has been the predominant secondary treatment technology for the past 30 to 40 years. The CVWRF and SLCWRF both use the trickling filter/solids contact (TF/SC) or trickling filter/activated sludge (TF/AS) process which incorporates a suspended growth activated sludge-like process following a trickling filter system while the SVWRF and Magna treatment facilities both use an extended aeration oxidation ditch process. Since these existing systems have been constructed there have been a number of advances in the wastewater field that may be applicable for enhancing treatment or expanding the capacity of the existing systems or that could be incorporated into the design of new treatment and/or reuse systems constructed in the County.

The following sections provide a review of the emerging technologies, trends, and issues in the wastewater treatment field. The review primarily focuses on secondary treatment, tertiary treatment and disinfection processes since these are the process areas that have the most impact on improving water quality over current technology. Processes such as headworks (screens and grit removal), primary clarification and conventional secondary treatment processes such as trickling filters/biotowers and activated sludge are not covered, although there continue to be significant improvements in the design of these systems and the equipment associated with them.

In addition to treatment processes, this section touches on topics associated with wastewater treatment that are of emerging concern and will likely affect the design of treatment processes in the future. Examples of these issues include air and noise emissions and chemicals of emerging concern (CEC's) such as pharmaceuticals in wastewater effluents.



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Typical Activated Sludge System Configuration for BOD Oxidation and Ammmonia Nitrification

Figure 4-1

BROWN AND CALDWELL

4.1.1. Membrane Bioreactors

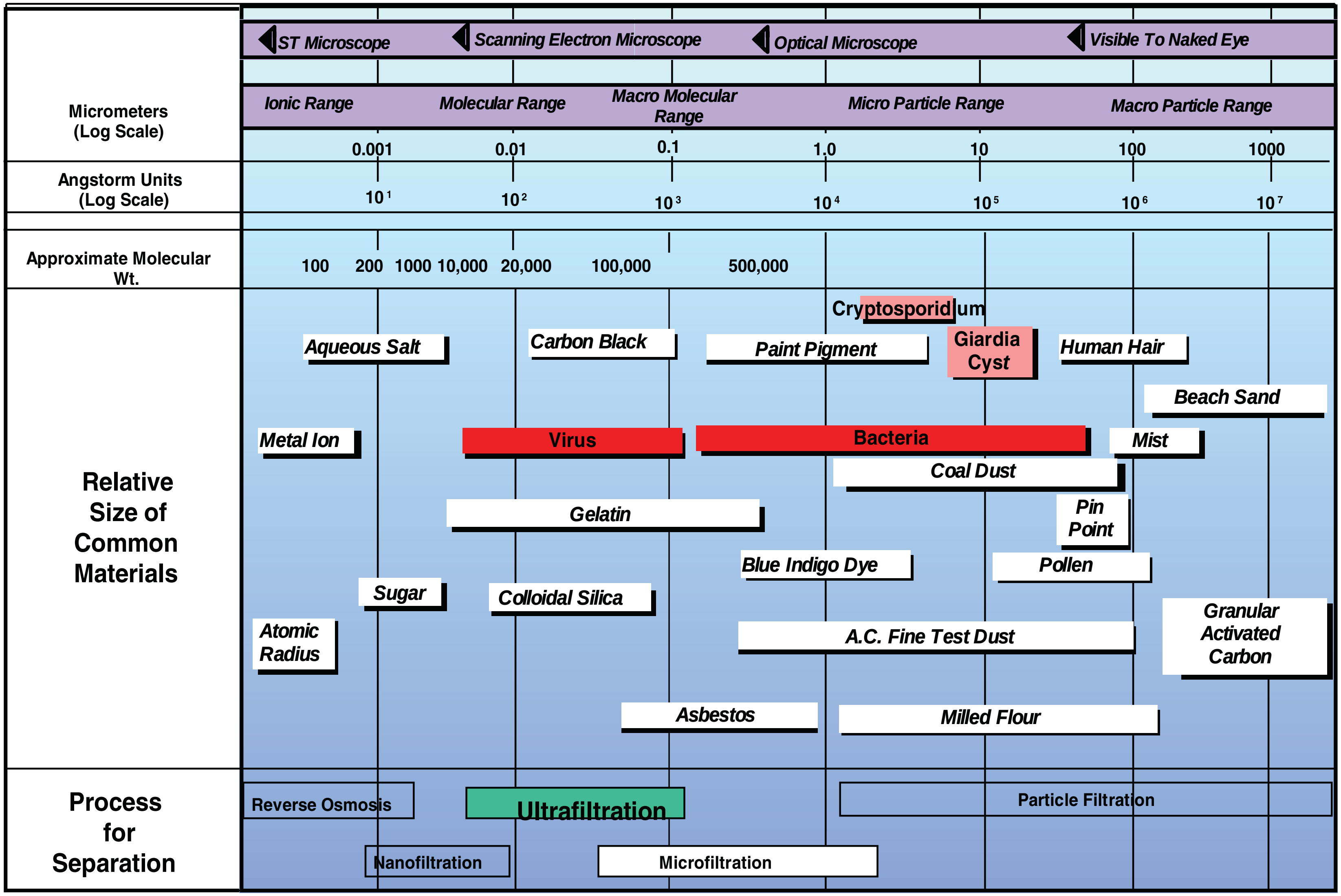
The membrane bioreactor (MBR) process has been in existence for over ten years and its use has significantly increased recently with improvements in membrane technology and the increase need for high quality effluent. An MBR is a combination of the activated sludge process, a wastewater treatment process characterized by a suspended growth of biomass, with a membrane system that rejects particles. MBR membranes from different manufacturers have pore sizes in either the microfiltration or ultrafiltration range and are capable of removing very small particles from the water as illustrated in Figure 4-2. The turbidity and suspended solids concentration of the effluent is far lower than in conventional activated sludge treatment using clarifiers. All particles and biomass are retained and become returned activated sludge (RAS). Biological growth leaves the system as waste activated sludge (WAS).

Figure 4-3 shows a schematic of an immersed MBR system. This type of system is marketed by several vendors with various proprietary features such as the type of membranes used. The flat panel and the hollow fiber are the two membrane configuration commonly used. In a typical completer MBR treatment system, preliminary treatment (fine screens and grit removal), sludge processing and effluent disinfection are also required.

The membrane system replaces the traditional gravity sedimentation unit (clarifier) in the activated sludge process. The membrane is operated under a vacuum pressure and is continuously cleaned with air bubbles that create turbulence at the membrane surface and prevent solids accumulation. The membranes are periodically backwashed and chemically cleaned when operating pressures become too high.

MBR technology effectively overcomes the problems associated with poor settling of sludge in conventional activated sludge processes. MBR technology permits bioreactor operation with considerably higher mixed liquor solids concentrations than conventional activated sludge systems that are limited by sludge settling and solids loading on the clarification process. The MBR process is typically operated at a mixed liquor suspended solids (MLSS) concentration in the range of 8,000 to 10,000 mg/L as compared to 2,000 to 3,000 mg/L for conventional activated sludge. Elevated biomass concentrations allow for highly effective removal of both soluble and particulate biodegradable material in the wastewater. The membrane will also keep

Membrane Pore Sizes

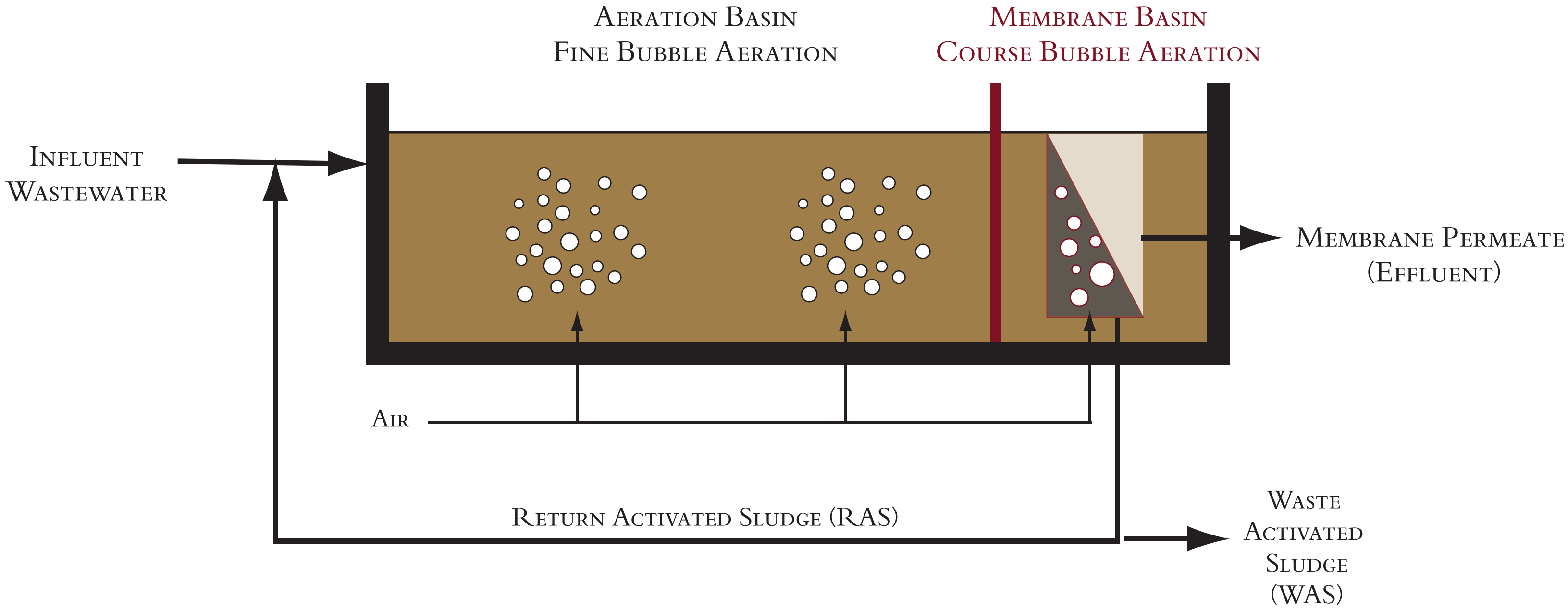


SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

BROWN AND CALDWELL

MEMBRANE PORE SIZES
FIGURE 4-2



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

MBR Process Flow Diagram

Figure 4-3

BROWN AND CALDWELL

high molecular weight, difficult-to-degrade colloidal compounds in the bioreactor, thus giving them longer time to degrade.

In addition to removing biodegradable organics, suspended solids, and inorganic nutrients (such as nitrogen and phosphorus), MBRs retain all particulate matter including slow-growing organisms (thereby treating more slowly biodegraded organics and allowing effective nitrification of ammonia) and remove a very high percentage of pathogens (thereby reducing disinfection requirements). They also require less space than traditional activated sludge systems because less hydraulic residence time (HRT) is needed to achieve a given solids retention time (SRT) and the membrane tanks are significantly smaller than the clarifiers required for equivalent flow capacity.

The MBR process thus combines the unit operations of aeration, secondary clarification and filtration into a single process, producing a high quality effluent, simplifying operation and greatly reducing space requirements. These factors make the MBR process ideal for smaller applications and locations with limited land availability, as well as for decentralized treatment including scalping and reuse facilities. MBR technology is, however, a relatively new technology with limited long-term life cycle data currently available. The major advantages and disadvantages of MBRs are summarized below:

Advantages

+ High quality effluent with the least number of unit processes
+ Particularly advantageous as a pre-treatment step if reverse osmosis treatment is possible in the future
+ Small footprint due to the combination of unit processes
+ Fewer operational units than a conventional treatment plant
+ Relatively easy to expand based on modular design
+ MBRs are less vulnerable to upset from changes in hydraulic or organic loading than activated sludge with clarifiers
+ Reliable performance due to ease of automation

Disadvantages

- High capital cost.
- May have higher operation and maintenance (O&M) costs than other options.
- Dealing with high peak flows is a challenge because of the absolute barrier of the membranes.
- Relatively new technology without significant span of operational data to estimate membrane lifespan, membrane replacement costs, etc.

4.1.2. Integrated Fixed Film Activated Sludge

Fixed film processes such as the trickling filter in which the wastewater is sprayed over a solid media and biofilm grows on the media have been used for wastewater treatment for over 100 years. The use of submerged fixed film processes in the biological treatment of wastewater has been in practice for over 60 years. The "Contact Aeration" process used in the 1930's and 1940's incorporated asbestos panels that were vertically suspended over a perforated pipe aeration grid in the aeration tank. This process lacked Return Activated Sludge (RAS) and thus was not an activated sludge type process but was closer to a trickling filter type process.

In the 1980's and 1990's, work began on the integration of fixed film and activated sludge technologies in which biomass as both fixed biofilm and suspended growth mixed liquor floc are present in the same tank. Because of today's increasingly stringent effluent requirements, high tankage expansion costs, and reduced funding options, increased attention is focusing on the integrated fixed film activated sludge (IFAS) process.

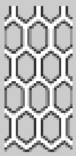
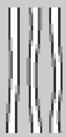
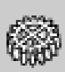
IFAS technology has been incorporated into both municipal and industrial wastewater facilities (new and upgrade) in many variations of suspended growth systems. When included in new plant design, reduced tank volumes can result. In retrofit applications, increased treatment capacity may be realized, along with the other benefits of fixed film type processes such as retention of slow growing nitrifying organisms. However, the benefits of attached nitrifier retention may only be significant at low solids retention times where the suspended nitrifier washout occurs and the attached nitrifiers can out compete them for available ammonia. Ammonia concentrations under these conditions may be relatively high. Therefore the IFAS processes may have an advantage over traditional activated sludge or other ammonia removal processes only if very low effluent ammonia is desired.

There are several types of media available for IFAS systems which fall into two main categories. Figure 4-4 provides a list of the predominant IFAS systems and Figure 4-5 shows one manufactures dispersed IFAS media.

Fixed Media IFAS Systems. Fabric media in a web configuration or as a rope-like material are attached to rigid frames or assembled into modules that are placed within the activated sludge aeration tank. An alternate configuration uses PVC sheet media similar to the media commonly used in trickling filters that is supported in frames within an aerated tank.

Dispersed Media IFAS Systems. Dispersed media systems may use porous sponges or plastic finned-cylinder shapes that are suspended or float (depending upon material density) in the activated sludge tank.

Figure 4-5
Photo of Kaldnes Suspended IFAS Media Showing
New Media On Left and Media with Biogrowth On Right

TYPES OF IFAS MEDIA			
FIXED-IN-PLACE TYPES		**ADVANTAGES**	**DISADVANTAGES**
	Fabric Web-type	• Simple to install • Low initial cost • No maintenance • Rapid upgrade • No material losses	• May foul if influent screening is inadequate
	Rope-type	• Rapid upgrade • No material losses	• Material breakage and entanglement • Field assembly needed • May foul if influent screening is inadequate
	PVC Sheet Media (Trickling Filter Media)	• Rapid upgrade • No material losses	• Structured media may impede mixing • May foul if influent screening is inadequate • Potential plugging from excess biomass
DISPERSED TYPES		**ADVANTAGES**	**DISADVANTAGES**
	Polypropylene Finned Cylinders	• Excellent mixing • May eliminate RAS	• Media losses (washout or abrasion) • Aeration devices and screens may foul • Difficult to maintain aeration
	Sponges		

SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

TYPES OF IFAS MEDIA

FIGURE 4-4

4.1.3. Submerged Biological Filters (Aerated and Anaerobic/Anoxic)

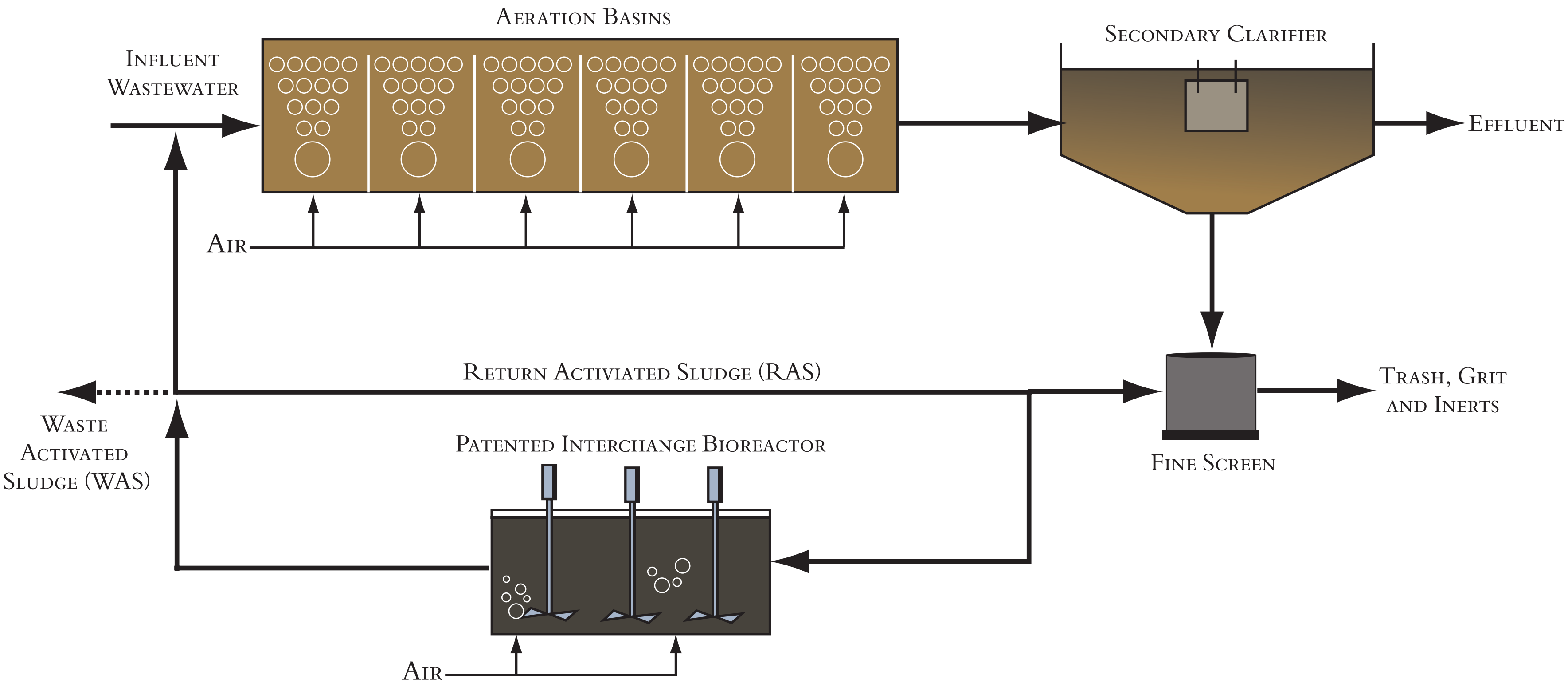
Submerged biological filters employ a media that serves as a substrate on which biological growth can occur as well as a particulate filter. There are several designs which include both upflow and downflow configurations. When aerated, the filters are called biological aerated filters (BAFs) and are typically used for removal of dilute BOD and ammonia such as in tertiary treatment applications for secondary effluent polishing. The filters can also be operated in an anaerobic or anoxic configuration to remove nitrate by reduction to nitrogen gas. In this mode the filters are referred to as denitrification filters. To carry out denitrification either a naturally occurring carbon source in the wastewater such as residual soluble BOD or an external carbon source such a methanol must be added as a carbon substrate for the anaerobic/anoxic organisms.

Biological filters have several advantages including having a small footprint that allows high flows to be treated within a small site and being an enclosed system which reduces odor issues compared to some other technologies.

4.1.4. Cannibal®

The Cannibal® process is a patented process of the activated sludge process which incorporates a sidestream process for the reduction of secondary biosolids (Figure 4-6). The process was formally introduced by US Filter in 2003 but has been in operation at a wastewater plant in Georgia since August 1998.

The Cannibal process combines conventional activated sludge treatment with a smaller, separate sidestream system to recycle and restructure the bacterial population to breakdown and degrade excess biological material. Through the solids reduction process, routine biological wasting is reduced. A portion of the return sludge is pumped to a sidestream bioreactor where the mixed liquor is converted from an aerobic-dominant population to a facultative-dominant population. By carefully controlling the environment, aerobic bacteria are selectively destroyed in this sidestream reactor while enabling the low-yield, facultative bacteria to breakdown and utilize the remains of the aerobes and their byproducts.



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Cannibal Process for Biosolids Minimiation

Figure 4-6

BROWN AND CALDWELL

With the Cannibal process, mixed liquor from the sidestream bioreactor is not "wasted" from the plant. The mixed liquor is recycled back to the main treatment process where the facultative bacteria, in turn, are out-competed by the aerobic bacteria and subsequently broken down in the alternating environments of the aerobic treatment process and the sidestream bioreactor. A steady-state balance between selection and destruction is developed between the sidestream bioreactor and the main treatment process resulting in little net biological solids producion.

Grit and other inert materials such as fibers are removed from the process through the use of a patented solids separation module on the return sludge line. Without routine wasting, this material would build-up in the plant. Occasional purges of solids are required to remove the build-up of fines and the inerts that are not removed through the solids separation module.

4.1.5. Nutrient Removal Processes (N and P)

Discharge of the nutrients nitrogen and phosphorus in wastewater treatment plant effluents can be a major factor in the eutrophication of receiving waters. The limiting nutrient for eutrophication in a receiving water can be either phosphorus or nitrogen depending on the specific nature of the water body or both nutrients can contribute to eutrophication. Initial efforts to reduce phosphorus in wastewater effluents relied on chemical precipitation using alum, ferric chloride or lime.

In the 1970's biological phosphorus removal was discovered and since that time numerous process configurations employing biological phosphorus removal have been developed. Biological phosphorus removal relies on release of phosphorus in an anaerobic zone with the uptake of volatile fatty acids by the biomass. Then the biomass subsequently uptakes excess phosphorus in an aerobic zone and oxidizes stored energy in the form of poly-b-hydroxybutyrate (PHB) which is produced from the volatile fatty acids. The excess uptake of phosphorus in the aerobic zone leads to low concentrations of dissolved phosphorus in the effluent when the biomass is removed in the secondary clarification process. Figure 4-7 shows a typical biological phosphorus removal process that uses anaerobic and aerobic zones in the activated sludge basins. Currently, biological phosphorus removal is the standard process for phosphorus removal in the wastewater treatment field and can achieve effluent phosphorus levels of less than 1.0 mg/L. To reliably achieve effluent concentration significantly less than 1.0 mg/L chemical polishing and effluent filtration is usually employed following the biological process. Chemical polishing can reliably achieve phosphorus levels of less than 0.1 mg/L and some plants are able to get down to less than 0.05 mg/L.

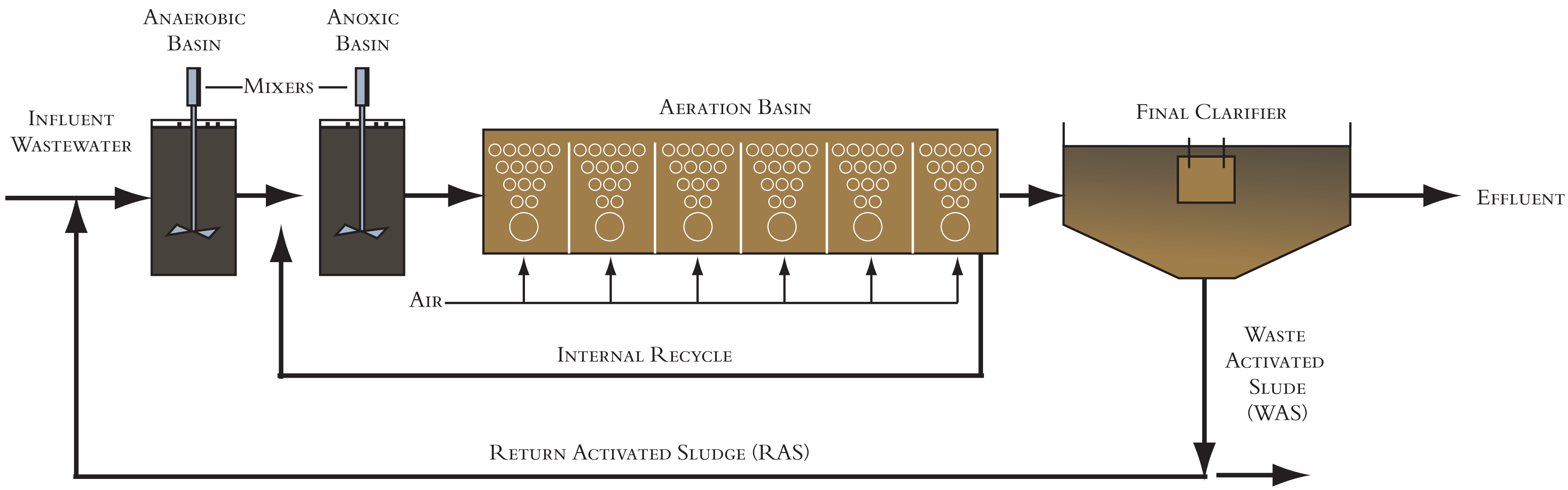
Removal of nitrogen from wastewater has always relied on biological processes. Nitrogen removal is a two step process that involves a nitrification step to convert ammonia to nitrate and a subsequent denitrification step to convert nitrate to nitrogen gas which is minimally soluble in water. Like biological phosphorus removal, numerous configurations of the biological nitrogen removal process have been developed. The process can be designed to remove only ammonia if total nitrogen removal is not required or can be designed for both ammonia and nitrate removal.

Since both nitrogen and phosphorus lead to problems in receiving waters, treatment processes configurations have been developed that combine removal of both nutrients in a single process. The process configuration shown in Figure 4-7 provides a typical configuration of a combined biological total nitrogen and phosphorus removal. Combined removal of both nutrients is the more typical situation and there are many advantages to designing new facilities with the capability of providing biological nutrient removal capability even if the regulatory drivers are in place at the time of design. These advantages include recovery of alkalinity and dissolved

oxygen (in the form of nitrate) in the denitrification process and excellent settling biomass from optimum selection of organisms in the anaerobic and anoxic zones.

4.1.6. Chemically Enhanced Clarification/Flow Blending

Chemically enhanced clarification is a process that can be used for either primary or secondary clarification and involves the addition of metal salts and/or organic polymers to aid in the removal of suspended solids and the suspended fraction of BOD. The process is more commonly used in the primary treatment stage and is referred to as chemically enhanced primary treatment (CEPT). Chemically enhanced clarification is not a new process but has recently been given new attention for the treatment of peak flows in combination with other treatment processes.



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Typical Activated Sludge System Configuration for BOD Oxidation, Ammonia Nitrification, Nitrate Denitrification and Biological Phosphours Removal

Figure 4-7

BROWN AND CALDWELL

The physical-chemical treatment of wastewater originated in the 18th century, and was widely relied upon in the late 19th and early 20th centuries as part of sanitation schemes for municipal areas. The high cost of handling and disposing the large amounts of sludge produced, and the introduction of stricter effluent requirements resulted in the abandoning of this process for systems that relied on biological processes. In recent years however, CEPT, a variation of the early process that relies on considerably lower dosages of chemicals, has found applicability in treatment systems in which high seasonal hydraulic loading variations are experienced; where there is limited space availability; and where the characteristics of the receiving water require treatment levels higher than primary treatment, but not quite as stringent as secondary treatment.

More recently, chemically enhanced clarification in the primary stage or following secondary treatment has been receiving considerable attention given its ability to remove phosphorus, a macronutrient associated with eutrophication problems in some receiving water bodies. Also, incorporating chemical addition to primary clarifiers is being used to increase existing treatment capacities (e.g., higher hydraulic throughput rates; higher removal efficiencies; smaller clarifier sizes) as well as for reducing the influent loads to subsequent biological treatment stages in facilities required to meet more stringent standards. Treatment plants in cities like Seattle and Tacoma, Washington have adopted variations of the chemically enhanced primary treatment (CEPT) process.

Typically, CEPT is accomplished by adding either iron or aluminum salts followed by the addition of an anionic polymer to the primary influent stream. CEPT improves primary clarifier performance in two ways: (1) it makes the settleable TSS settle more quickly, and (2) it decreases the concentration of non-settleable TSS and, therefore, the non-settleable BOD5. CEPT performance reported in the literature indicates that biochemical oxygen demand (BOD) and total suspended solids (TSS) removals of greater than 60 and 85 percent, respectively, are achievable. Total phosphorus removals with CEPT are also in the range of 85 percent.

For chemically enhanced effluent polishing, the iron or aluminum salts and polymer can be added to the mixed liquor prior to the secondary clarifier or more commonly to the final clarifier effluent in a tertiary treatment process. When added to the secondary clarifier effluent, solids contact clarifiers, ballasted sedimentation and/or filters are then used to remove the resulting chemical solids. Total phosphorus concentrations in the range of 0.05 to 0.1 mg/L and TSS concentrations of less than 1 mg/L are achievable with post-secondary chemical clarification.

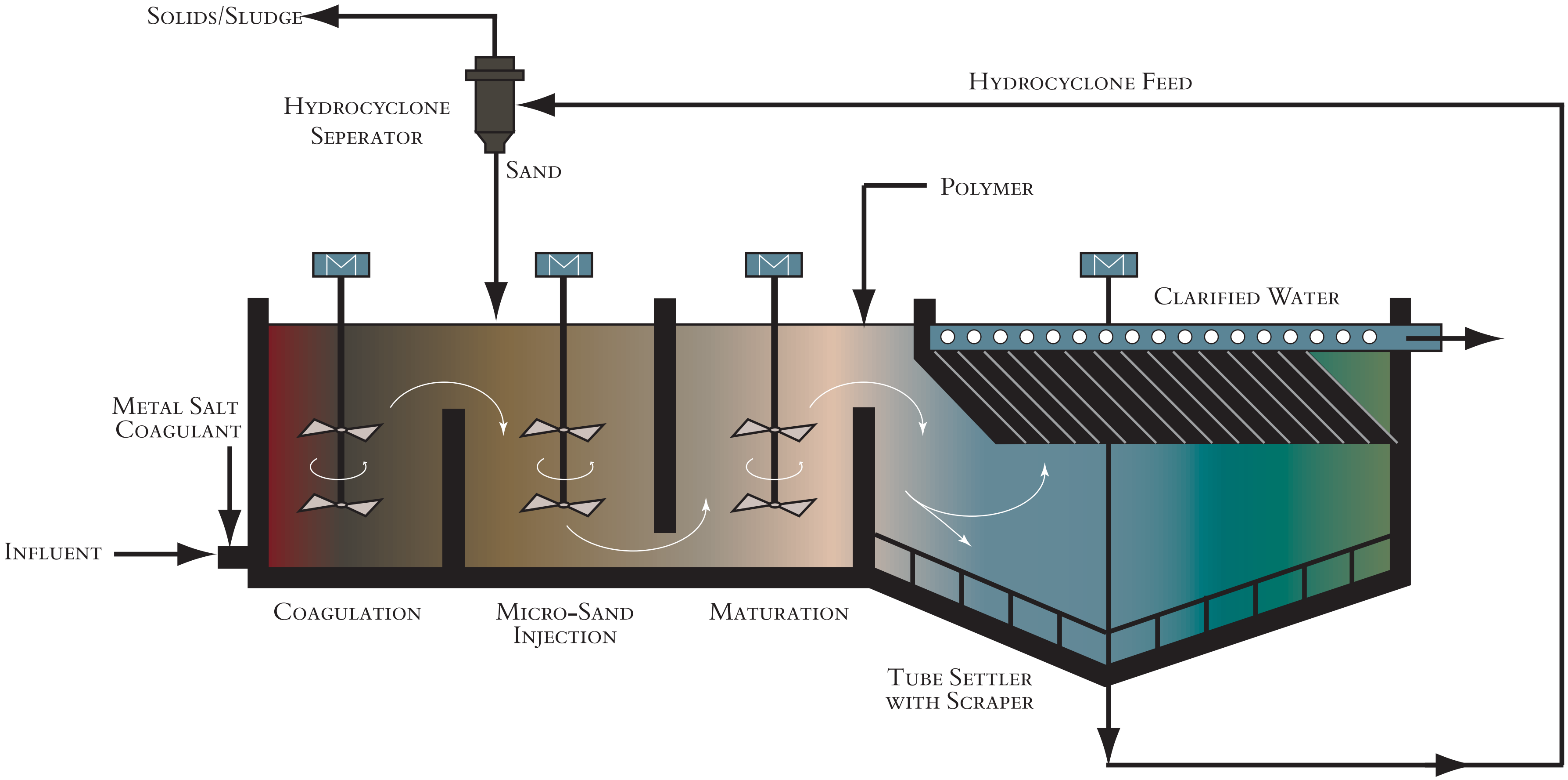
4.1.7. Ballasted Sedimentation

The Actiflo® process (Figure 4-8) marketed by Krüger is a ballasted sedimentation process that has been used for both CEPT and effluent polishing applications (such as chemical phosphorus removal) in the wastewater industry. Ballasted sedimentation refers to the formation of a floc particle around a dense material that aids in the settling process. The Actiflo® process utilizes microsand as the dense seed material for floc formation. The microsand provides surface area that enhances flocculation and acts as a ballast or weight. The resulting sand ballasted floc, display unique settling characteristics, which allow for clarifier designs with high overflow rates and short retention times. These designs result in system footprints that are between 5 and 20 times smaller than conventional clarification systems of similar capacity.

In wastewater treatment, ballasted clarification can be used in most applications involving physical-chemical treatment including coagulation, flocculation and settling. It can be applied to primary and tertiary wastewater treatment where either better performance or cost reduction is desired. It can also be used for storm water treatment including CSOs, SSOs, and other overflows due to its high performance, small footprint and extremely short start-up time. The process achieves efficient removals of TSS, BOD, Total P, COD, metals, fecal coliforms, and

other typical wastewater contaminants, which can be removed by physical-chemical processes. As a tertiary treatment process ballasted sedimentation can achieve effluent turbidities of less than 1 NTU and phosphorus concentrations of less than 0.05 mg/L.

The Actiflo® process is currently in operation worldwide in small communities as well as large metropolitan areas such as Syracuse, NY for effluent polishing and is being installed in Tacoma, WA for CEPT of peak wet weather flows



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

ACTIFLO Process Flow Diagram

Figure 4-8

BROWN AND CALDWELL

4.1.8. Metals Removal (Hg, Se, Cu)

Metals in municipal wastewater treatment plant effluents are generally not a significant issue except in instances where there are significant industrial dischargers or where there are other unique sources. Industrial metals problems are dealt with by source reduction through industrial pretreatment programs.

Recently, metals such as mercury (Hg) and selenium (Se) have gained attention in Utah due to their occurrence in, and potential detrimental effects to the Great Salt Lake (GSL) ecosystem. Selenium is currently under study in the Great Salt Lake and water quality standards may result that could affect future wastewater treatment plant discharge limits. Mercury has also been found at high levels in the lake and may also be studied and regulated in the future.

Copper (Cu) may also pose a future problem for municipal wastewater plants in Utah. Recent UPDES permit renewal of a facility discharging to the Weber River (a tributary to the GSL) has led to a significant lowering of the copper limit based on the water quality standards for the river. Corrosion of copper potable water plumbing systems within collection area has led to concentrations of copper in the influent wastewater, that while lower than the drinking water standard, are significantly higher than the effluent limit and are greater than can be reliably removed by the biological treatment process.

There are many processes for removing metals from wastewater including precipitation (either caustic or sulfide), absorption, ion exchange, electrodialysis, and reverse osmosis. These processes, however, are very expensive for the high flow rates, low influent metals concentrations and low effluent limits typical of municipal treatment systems. They are more commonly found in industrial wastewater treatment applications, primarily as pretreatment prior to discharge to municipal systems.

Currently, there are few good options for metals removal from municipal systems. The use of sulfur containing polymers to tie up metals and bind them to other particles for removal in the clarification process is one promising new process that may applicable to large-scale municipal applications. In this process, an organic polymer similar to those typically used to enhance flocculation of particles has attached sulfur groups that combine with the metal in a reaction similar to sulfide precipitation. The metals are then removed as part of the larger flocculated solids particle in a clarifier or filter.

A second promising process for low level metals removal also involves sulfide precipitation reactions but carried out in a biological process. The ABMet system developed by Zenon is built around an advanced biological treatment process that uses naturally occurring microorganisms in specially developed mixtures, which reduce and precipitate target compounds from solution, or convert target compounds into their insoluble chemical components. This process is carried out in a biological filter similar to those described above in Section 4.1.3 with specific substrates added to the water the drive the desired organism selection and biochemical reactions.

4.1.9. Odor Control

Odor control is an area of emerging concern at many wastewater plants as developments encroach on plant sites. There are many components to odor control in the wastewater field, from the facility site selection and the amount of available buffer area; to the selection and design of liquid and solids processes that minimize the generation of odors; to the selection of HVAC systems and odor control equipment to capture and treat odors that are released. The minimization and control of odors is often one of the single most important factors in the decisions making processes surrounding the locating and design of treatment plants because of the direct public exposure to odors and the resulting complaints.

The first strategy for dealing with odors at wastewater facilities is to provide as much buffer as possible, especially in the prevailing downwind direction from the facility. This strategy has been successful at the North Davis Sewer District (NDSD), which purchased about 500 acres of property on the north, east and south sides the plant site about ten years ago. Existing residences in the purchased area have been demolished to eliminate sources of odor complaint. To date, no odor control has been necessary at the NDSD facility, despite odors from trickling filters and biosolids composting operations.

A similar strategy of locating of treatment facilities in commercial and industrial areas as opposed to residential areas may also minimize odor complaints. Odors are typically less of a problem during the day than at other times due to less stagnant atmospheric conditions.

Commercial and industrial areas are more populated during the day when odor conditions are usually at a minimum and less populated as night when odors tend to settle and concentrate due to quiescent atmospheric conditions. The population in commercial and industrial areas also tends to be either inside buildings where odors are less noticeable or transient through the area which results in less odor complaints compared to residential areas.

In addition to optimum treatment facility location and buffer area, there are many design and maintenance considerations for wastewater treatment processes that minimize the generation and release of odors from a facility. A number of these considerations are listed below and apply to design of both specific processes and the layout and configuration of the facility as a whole.

Design and Operational Considerations.

- Provide ferric chloride addition upstream of plant for sulfide removal in the influent
- Modify/control high-strength industrial discharges
- Provide continuous sludge withdrawal from primary clarifiers
- Direct sidestream recycles into aeration tanks, mix with RAS or treat separately
- Don't co-settle WAS in primary clarifiers or with primary sludge
- Minimize excessive detention times (both wastewater and sludge)
- Provide scum removal and avoid scum layer buildup on liquid surfaces
- Reduce/minimize hydraulic drops (i.e. turbulence at weirs etc.)
- Channel velocities 1.5 fps
- Eliminate sharp corners
- Reduce turbulence in flows
- Minimize stagnant backwater areas
- Provide flushing ability
- Provide preaeration (careful of stripping hydrogen sulfide)
- Aerate channels (if dissolved hydrogen sulfide is low) 2-5 cfm/ft
- Provide 2-staged digestion with fixed primary digester covers
- Provide enclosed residuals storage

- Cover, ventilate and scrub channels
- Reduce residuals storage time
- Spray chemicals on residuals (NaOCl)
- Provide grit and screenings washing
- Provide non-adsorbent surfaces with good coating systems
- Provide good building ventilation with odorous areas negative to nonodorous areas
- Enclose and ventilate odorous equipment, channels and area separately from other areas
- Provide biological scrubbers to treat odorous ventilation system discharge air

Maintenance Considerations

- Provide ability to hose down
- Conduct regular inspections
- Avoid on-slab drainage
- Clean equipment thoroughly
- Check digester relief valves, cover gaps, system pressures

Providing odor scrubbers where necessary is the last design consideration listed above. In the past, activated carbon or chemical scrubbers were commonly used at wastewater facilities. However, these technologies have several drawbacks including the high cost of media or chemical replacement and use and the dangers and inconvenience of using chemicals such as chlorine and caustic in chemical scrubbers. Recently, biological scrubbers in the form of either engineered systems or as biofiltration using mulch beds have been developed to remove odors. These types of systems are currently the best process solution for handling odorous air from treatment facilities.

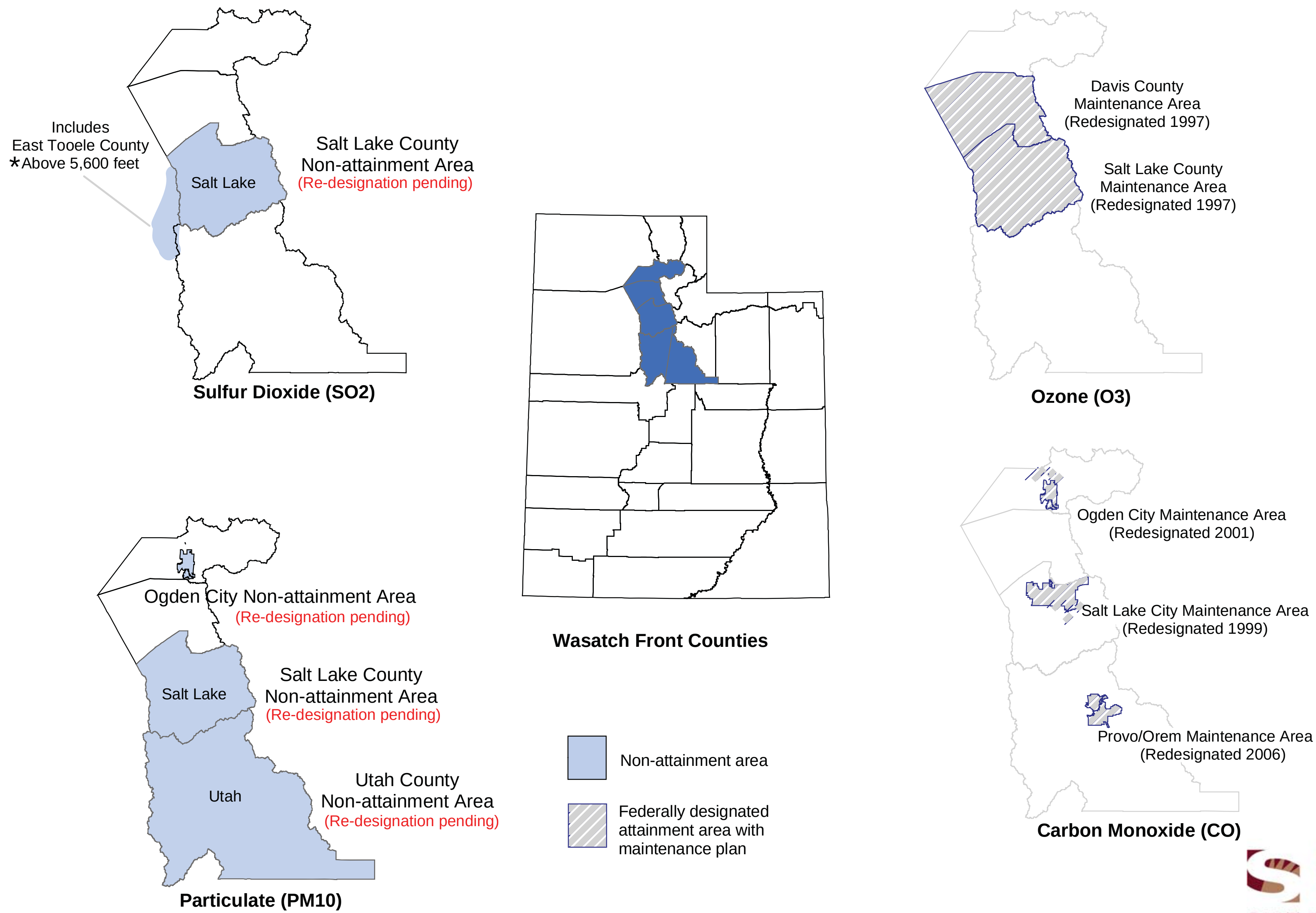
4.1.10. Air Emissions

Municipal wastewater treatment is a minor but important source of greenhouse gas (GHG) and smog forming gas (SFG) emissions. Greenhouse gases include methane (CH_4), carbon dioxide (CO_2), nitrous oxide (N_2O) and non-methane volatile organic compounds (VOCs) while SFG include nitrogen oxides (NOx) and VOCs. Compared to other major sources such as the energy industry and transportation sectors, the wastewater-related contribution of GHG and SFG is small. However, the release of these gases is increasingly important especially in sensitive non-attainment areas (Figure 4-9) such as Salt Lake County where air emissions are strictly regulated and because of efforts to reduce carbon emissions related to global warming.

Methane is primarily produced by anaerobic microorganisms during the anaerobic digestion of biosolids. Most of this methane is captured and burned as a fuel source or flared off. Some release of methane may occur as fugitive emissions from anaerobic digesters with floating covers (from between the cover and tank wall) and also may be released from other processes such as primary clarification when septic conditions are allowed to develop.

Carbon dioxide is emitted from aerobic wastewater treatment systems through the oxidation of organic matter (BOD); from endogenous respiration of microbial cell mass; as a by-product of anaerobic digestion during the combustion of methane; and from the on-site combustion of fossil fuels such as natural gas or diesel fuel. Incineration of dewatered residual solids, practiced at a small number of plants, also results in emissions of carbon dioxide. Nitrous oxide emissions result from the bacterial utilization of protienaceous matter in wastewater while nitrogen oxides emissions result from combustion processes such as in cogeneration or biosolids incineration.

On-site releases of GHG and SFG are not the only air emissions that can be attributed to wastewater facilities. There are releases upstream of the treatment plant, specifically from power generation, which are normally allocated to the energy industry, but in fact are directly related to wastewater treatment and can be highly influenced by the type of treatment process employed. For example, in plants that have primary clarifiers and anaerobic digesters, optimal recovery and use of digester gas in a cogeneration facility will help the treatment facility to reduce on-site consumption of natural gas and reduce reliance on upstream power generation. This greatly reduces the overall release of carbon dioxide as compared to a plant that is completely aerobic. In a completely aerobic plant, imported power is required to produce air to oxidize the organic matter to carbon dioxide which is released to the atmosphere. The upstream power also releases carbon dioxide. The difference in overall emissions can be significant. Monteith, et al., (2005) reports that the carbon dioxide emission rate from a conventional activated sludge facility with anaerobic digestion is between 0.148 and 0.369 kg/M^3 of wastewater treated.



SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

NATIONAL AMBIENT AIR QUALITY STANDARDS
AREAS OF NON-ATTAINMENT AND MAINTENANCE (UPDATED JULY 2006)
FIGURE 4-9

BROWN AND CALDWELL

In contrast, the strictly aerobic process of extended aeration activated sludge with aerobic digestion releases between 0.832 and 0.994 kg/M^3, an approximate four fold increase. With the likely increased focus on GHG, SFG and carbon emissions in the future, the selection of treatment processes that minimize emissions from both within the plant and outside power sources will become an increasingly important factor in the wastewater planning process.

4.1.11. Noise Control

Like odors, noise associated with wastewater treatment facilities is emerging as a significant concern as residential developments encroach on plant sites. The SVWRF and Snyderville Basin Water Reclamation District's East Canyon Treatment Facility are two local Utah examples of where noise became a concern as housing developments were constructed overlooking the plant sites. In both cases, large surface aerators running continuously on the oxidation ditches were a major source of noise. Noise muffling enclosures were constructed over the aerators to attenuate the noise to acceptable levels.

While mechanical equipment such as aerators, blowers, pumps and generators are often major sources of noise at treatment facilities, other activities such as sludge handling using loaders and truck traffic also contribute to noise problems. In the design of new facilities and expansion projects, noise standards are more frequently being set to address potential problems. Design criteria to address these noise standards are now becoming a part of project requirements similar to the design criteria for the liquid treatment processes. As an example, for the John's Creek Plant north of Atlanta, GA, a new state-of-the-art MBR facility, the noise standard was set as no more than a three decibel increase in the noise level over ambient conditions at the plant boundary. This type of standard has required significant monitoring studies, has influenced process and equipment selection, has affected the architectural design of buildings, and has led to the installation of multiple layers of noise attenuation devises and baffles where ever there are equipment and openings that could emit noise. It is expected that noise generation and suppression will become an increasingly important issue in the future for wastewater facility design.

4.1.12. Compounds of Emerging Concern (CECs) - Endocrine Disrupting Compounds (EDCs), Pharmaceuticals and Personal Care Products (PPCPs), Toxic Organic Compounds (TOCs)

Municipal wastewater treatment facilities must comply with discharge limits for BOD, TSS, and other conventional pollutants. Treatment facilities must also comply with limits on toxic metals and known toxic organic compounds in accordance with 40 CFR 122, Appendix D, Table II (Organic Toxic Pollutants). The process utilized at treatment facilities for these constituents is usually biological secondary treatment, with most facilities utilizing the activated sludge process or similar processes. It is anticipated that regulations promulgated in the future may add new compounds to the regulatory list based on the development of evidence such as occurrence and toxicological studies that justifies their inclusion. These compounds are generally referred to as compounds of emerging concern (CEC).

Among the CECs that may be regulated in the future, natural and synthetic chemicals known as endocrine disrupting compounds (EDCs) and pharmaceutical and personal care products (PPCPs) are potential candidates. Studies indicating that some of these chemicals can mimic the activity of natural endocrine hormones have existed for more than 70 years and target these compounds as suspected causative agents in disruption of wildlife reproductive health (Snyder et al., 2003). Although contamination from these chemicals may originate from non-point sources, a significant contribution comes from municipal wastewater treatment plants (Daughton and Ternes, 1999). Municipal WWTPs act as persistent point-sources of CECs, and trace concentrations of these chemicals have been observed in conventional secondary and tertiary wastewater discharges in the U.S. and abroad (Clara et al., 2005; Joss et al., 2004; Eriksson et al., 2003; Snyder, 2001).

CECs have not been subject to examination in the past mostly due to analytical limitations that prevented detection and quantification of trace concentrations of these compounds (Ollers et al., 2001; Osemwengie and Steinberg, 2001). The advancement of analytical techniques now allows identification and quantification of these compounds at parts per billion (ppb or μg/L) or parts per trillion (ppt or ng/L) range (Sedlak, 2000). The presence of CECs in the environment may pose a problem for two reasons: 1) their effects are likely to occur at very low concentrations, and 2) their presence in effluent from municipal WWTPs is mostly due to the activities of individuals rather than regulated industrial discharges (Snyder et al., 2001; Daughton and Ternes, 1999). Consequently, understanding the ability of wastewater treatment plants to remove and prevent the passage of CECs into the environment has become a critical concern.

Currently, there is considerable research effort addressing the identification, occurrence, fate and effects of CECs in the environment and the identification, occurrence and removal in wastewater treatment processes. In the water/wastewater industry, CECs are of particular concern, not only because of potential environmental effects, but because of potential human exposure through consumption of tainted water. This is of significant concern in the area of water reuse where direct or indirect entry of treated wastewater into the water supply may occur. For wastewater treatment processes, the major efforts are focusing on the use of membrane technology including MBRs and RO for primary removal CECs followed by advanced oxidation processes such as peroxide/UV for polishing. It is expected that future wastewater/reuse treatment systems may be regulated for certain CECs and may require advanced treatment processes for their removal.

4.1.13. Alternate Disinfection – Replacing Liquid Chlorine, UV, Sodium Hypochlorite, Peroxide/UV, Ozone

Traditionally, chlorine gas has been used for disinfection of wastewater because of its low cost and efficacy. Chlorine gas is usually provided in liquid form in either one ton cylinders or bulk delivery which is stored in on-site tanks. Recently, because of safety issues and security concerns associated with storage of liquid chlorine gas, alternate disinfection methods are becoming more prevalent. Ultraviolet light (UV) and liquid sodium hypochlorite (bleach) solutions are the two most common replacement systems in existing facilities and are also commonly designed into new treatment plants. These disinfection methods are discussed in more detail below in Sections 4.2.4 and 4.2.5. Other disinfection options include ozone which is commonly used in drinking water treatment and peroxide/UV as well as several other less prevalent processes. As mentioned in Section 4.2.8, processes such as peroxide/UV that generate hydroxyl radicals are considered advanced oxidation processes and not only provide disinfection, but also oxidize trace organic material including many CECs.

The SVWRF was the first plant in Salt Lake County to eliminate liquid chlorine gas and replace it with a combination of UV disinfection and sodium hypochlorite. SVWRF completed this work in 2002, prior to the Winter Olympics. It is expected that the other treatment systems in Salt Lake County will eventually follow SVWRF's lead and implement alternate disinfection methods in the near future.

4.2 BIOSOLIDS

Biosolids are the nutrient-rich solid organic material resulting from the treatment of domestic wastewater. Biosolids originate from the suspended solids entering the wastewater plant and from the solids produced by microorganism growth in the treatment process. These two types of solids are referred to as primary sludge and secondary or waste activated sludge, respectively. Biosolids differ from the "sludge" in that they are treated to standards required for recycling. Approximately 30 million pounds of dry solids from wastewater treatment are generated each day in the United States. Most of these solids are treated on-site and subsequently applied to agricultural lands in accordance with regulations developed by the U.S. Environmental Protection Agency (40 CFR, Part 503). The land application regulations cover both chemical (metals and toxic organics) and biological contaminants in the biosolids. Depending on the concentration of pathogens, biosolids intended for land application are classified as either Class A or Class B. Unclassified biosolids are not allowed to be land applied and must be disposed of in a landfill or monofill.

The following sections provide a review of the regulations, technologies, and issues concerning biosolids. The review primarily focuses on the regulations and the processes necessary to produce Class A biosolids, the highest quality biosolids, since this is the area that has the most relevance for future management of biosolids from wastewater treatment processes. Processes such as conventional aerobic and anaerobic digestion that produce unclassified or Class B biosolids and solids thickening and dewatering processes are not covered, although there continue to be significant improvements in the design of these systems and the equipment associated with them.

4.2.1. Class A Biosolids

The Class A criteria require that the concentrations of three classes of pathogens; bacteria, enteric viruses, and helminths (intestinal worms), are below specified detection limits. The Class A requirements are:

- Fecal coliform less than 1,000 per gram dry solids:
- *Salmonella* less than 3 MPN per 4 grams dry solids
- Enteroviruses less than 1 PFU per 4 grams dry solids
- Helminth ova less than 1 viable ovum per 4 grams dry solids

All other biosolids are designated as Class B, with corresponding restrictions on distribution and the types of crops that can be grown on land to which Class B biosolids are applied, as well as restrictions on public access to the land. Since no such restrictions exist for the distribution and agricultural or landscaping use of Class A biosolids, there is an incentive for municipalities to produce Class A biosolids at the wastewater treatment plant. Table 4-1 provides a comparison of the restrictions on land application of Class A and Class B biosolids.

TABLE 4-1. COMPARISON OF CLASS A AND CLASS B BIOSOLIDS USE AND RESTRICTION

Feature	Class A	Class B
Lawn or Home Garden use	Yes	No
Public Distribution	Yes	No
Application to Public Access Areas	Yes	No
Restrictions on Food Crop Harvesting	No	14, 20 or 38 months after application
Restricted Public Access	No	30 days or 1 year
Restricted Grazing or “Other” Crop Harvest	No	30 days

The EPA regulations (40 CFR, Part 503) specify various methods by which Class A biosolids can be achieved. The six alternative methods in the regulations are:

- Alternative 1: Time and Temperature
- Alternative 2: Temperature and pH
- Alternatives 3 and 4: Documented Virus and Helminth Ova Destruction
- Alternative 5: PFRP Treatment Processes
- Alternative 6: Treatment with a PFRP-Equivalent Process

In the list of alternatives above, there are several sludge treatment processes pre-approved as achieving Class A product if certain operating conditions are met. In general, these processes rely on either chemical or thermal destruction of the pathogens in the sludge. Any process other than those pre-approved by EPA must be evaluated on a case-by-case basis to demonstrate that it can meet the Class A criteria. Processes proposed to achieve Class A status must be evaluated and approved by an EPA committee called the Pathogen Equivalency Committee (PEC). Class A equivalency can be sought and granted for either a specific treatment plant (site-specific equivalency) or for a generic process (national equivalency). The six alternatives for achieving Class A biosolids are outlined in more detail below:

4.2.1.1. Alternative 1: Time and Temperature

The time and temperature requirement is based on EPA equations 2 and 3, (see Figures 4-10 through 4-12 below) that require the solids to be held in a batch at a given temperature for an equation-derived amount of time. Equation 2 is for higher solids concentrations and the shorter liquid detention times and requires longer hold times at corresponding temperatures than Equation 3.

Figure 4-10

EPA Equation 2

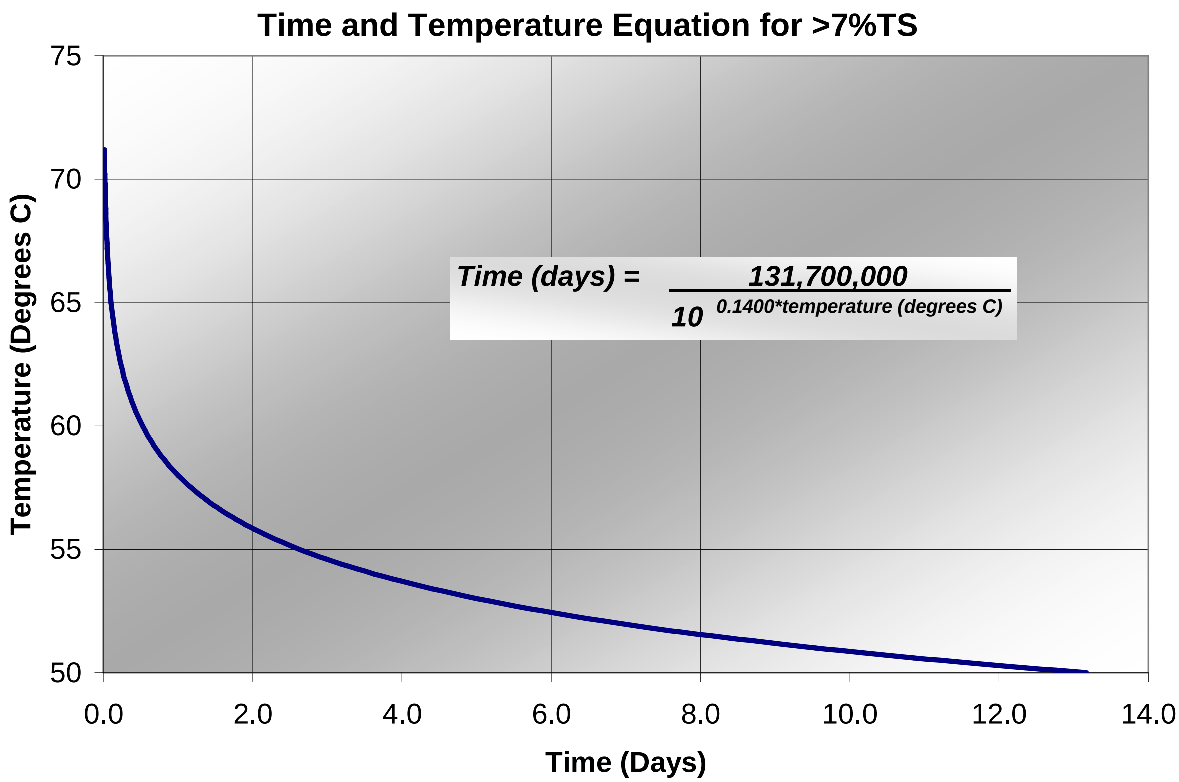


Figure 4-11

EPA Equation 2

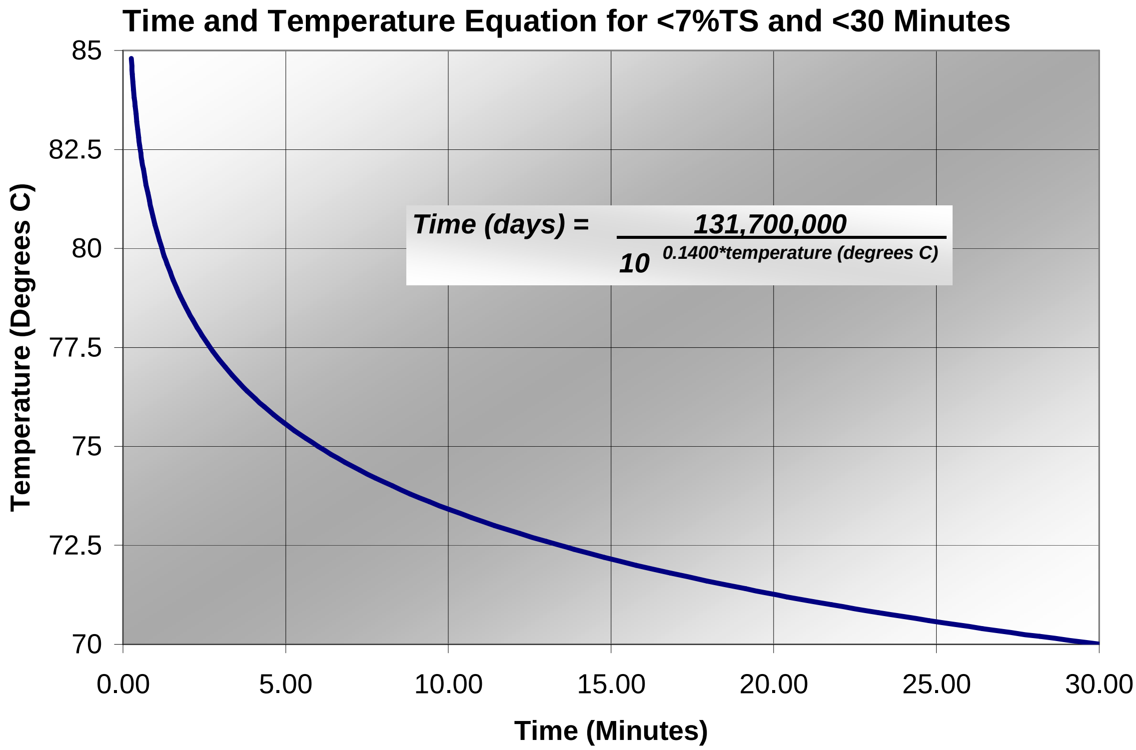
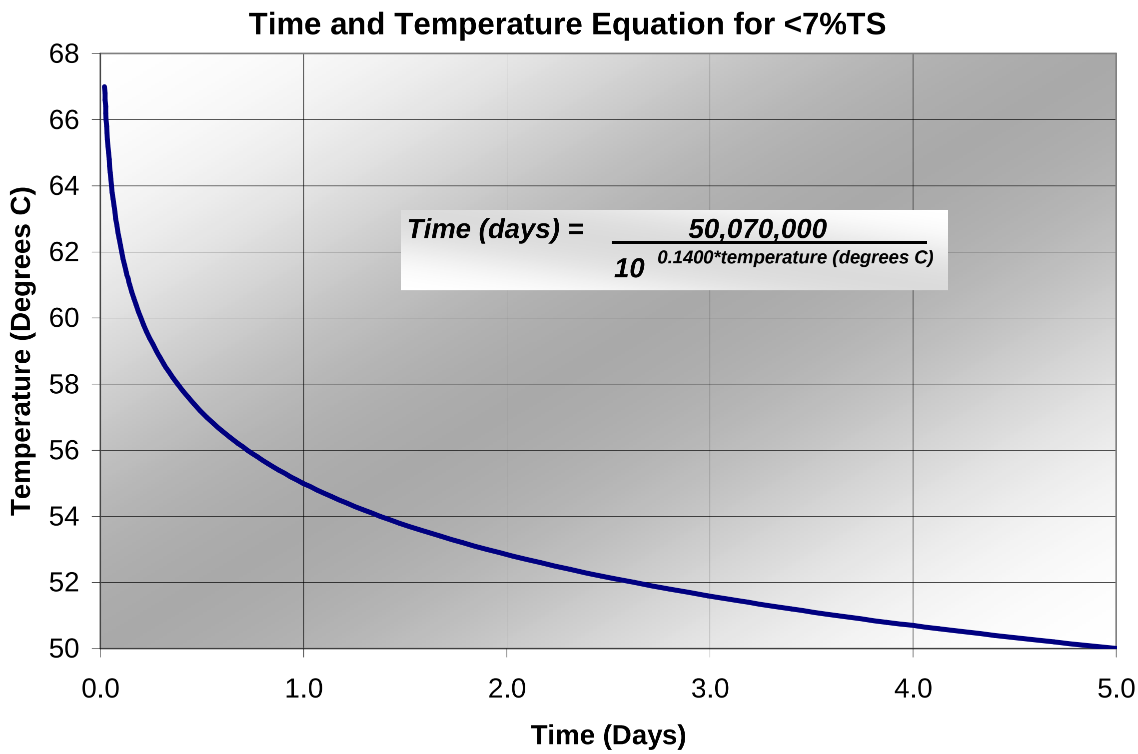


Figure 4-12

EPA Equation 3



4.2.1.2. Alternative 2: Temperature and pH

For Alternative 2, the biosolids must meet three pH and temperature criteria during processing:

- pH greater than 12 for 72 hours
- Temperature greater than 52 deg C for 12 hours or longer while pH greater than 12
- After initial 72 hours, biosolids must be dried to greater than 50 percent TS

4.2.1.3. Alternatives 3 and 4: Documented Virus and Helminth Ova Destruction or Non-Existence

For Alternatives 3 and 4 it must be proven at full scale that:

- Either pathogens of concern (Ascaris or poliovirus) are not in the raw sludge, or
- Prove that no pathogens exist in the system though sampling

Full-scale sampling is required. Some facilities have gained EPA Regional approval with ongoing monitoring required.

4.2.1.4. Alternative 5: Treatment with a PFRP Process

Alternative 5 involves employing a Process to Further Reduce Pathogens (PFRP) as listed in Part 503. These processes include:

- Composting: 3 days at greater than 55 deg C (15 days with 5 turns for windrow).
- Heat drying: at greater than 80 deg C, to less than 10 % moisture.
- Liquid heat treatment: at greater than 180 deg C for greater than 30 min.
- ATAD (thermophilic aerobic digestion) at 55 to 60 deg C at greater than 10 day MCRT – batch required.
- Beta or Gamma ray irradiation: 1 megarad (Mrad) at 20 deg C.
- Pasteurization: greater than 70 deg C for greater than 30 min.

4.2.1.5. Alternative 6: Treatment with a PFRP-Equivalent Process

For a PFRP-Equivalent Process, proof is required that the process inactivates 2-log densities of *Ascaris* and 3-log densities of enteric viruses. This can be negotiated with the PEC for national equivalency or the EPA Region for site-specific equivalency. Pilot-scale work with spiked organisms is required and scale-up issues must be addressed.

4.2.2. Class A Biosolids Processes

Although there are numerous processes with multiple variations that can be used to produce Class A biosolids, there are a few processes that are currently more common than others or are expected to be more applicable to Utah treatment facilities in the future. For example, composting (Alternative 5) is one of the more simple and straightforward processes and is commonly employed to achieve Class A biosolids. In some areas of the country lime stabilization (Alternative 2) is relatively common since there is an agricultural need for material with a high pH to supplement low alkalinity soils. In Utah, most soils are already alkaline so lime stabilized biosolids are a less attractive product for land application. The three processes that are likely to have significant applicability for producing Class A biosolids at wastewater treatment facilities in Salt Lake County in the future are presented below.

4.2.2.1 Thermophilic-Mesophilic Anaerobic Digestion (Temperature Phased, or TPAD)

Conventional mesophilic anaerobic digestion such as currently employed at the CVWRF and SLCWRF is a time tested and established process for wastewater biosolids stabilization. This process is designated as a PSRP (Process to Significantly Reduce Pathogens) at SRTs greater than 15 days and temperatures of 35 degrees C. The resulting biosolids meet Class B pathogen destruction requirements. Conventional anaerobic digesters are typically operated at a volatile solids loading rater of 0.1 to 0.2 lb/ft3/day and achieve volatile solids destruction greater than 50 percent.

Recently, a number of plants have converted their anaerobic digestion operations from mesophilic to thermophilic temperatures in the range of 50 to 60 degrees C. These conversions have been undertaken for a variety of reasons, including: to increase volatile solids destruction, to increase process capacity, and to improve pathogen destruction. Most often the temperature of the first stage of digestion is increased to the theromophilic range and the second stage remains in the mesophilic range. In this configuration the process is referred to a temperature phased anaerobic digestion (TPAD).

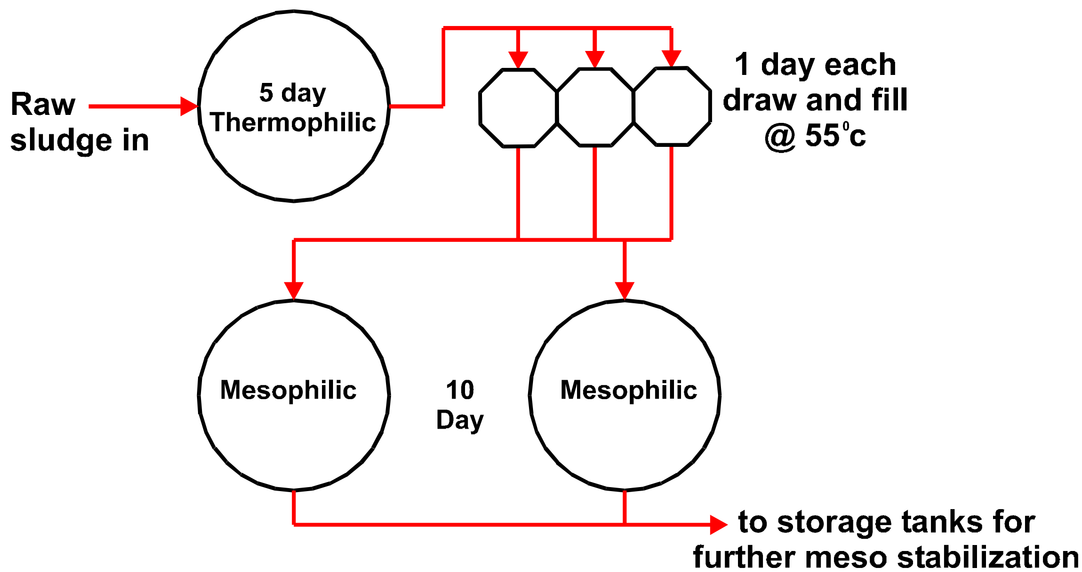
While the improvements in pathogen destruction at the higher temperatures at a given contact time is not disputed, the ability for these systems to produce biosolids meeting Class A requirements as defined in the Part 503 regulations has been addressed on an application-by-application basis. The most commonly used alternatives for thermophilic anaerobic digestion are:

- Alternative 1: Time and Temperature
- Alternatives 3 and 4: Documented Virus and Helminth Ova Destruction
- Alternative 6: Treatment with a PFRP-Equivalent Process

In general, Alternative 1 requires the least amount of additional investigation and is the most commonly used alternative. The most common operational criteria are temperatures near 55 degrees C and a batch detention time of approximately 24 hours. This is due to good operational stability at this temperature and a practical batch time. With the use of this process, Class A biosolids are produced directly from the digestion process and further treatment such as composting or heat drying is not required. Figure 4-13 shows a typical TPAD digester configuration for achieving Class A biosolids. There are numerous other configurations that can also be devised to meet the requirements.

Figure 4-13

Typical TPAD Batch Process Configuration For Class A Biosolids



There are a number of issues with thermophilic-mesophilic digestion and batch processes that need to be considered when modifying existing systems or designing new systems. These include:

- An increased reliance on heat exchanger performance and temperature reliability
- Digester mixing is much more critical
- There are multiple processes to operate and control

- Batch process operations require valve reliability
- There is increased energy use at higher temperatures
- More capital requirements to construct a system

However, there are also significant benefits including:

- Pathogen reduction
- Increased volatile solids reduction
- Increased digester gas production
- Improved biosolids dewatering
- Better biosolids product stability
- Better foam and scum control
- Higher rate of digestion results in a reduced system footprint
- Further processing to achieve Class A is not required which can result in an overall reduction in facilities and costs

In summary, high temperature digestion works well and can be configured to produce a Class A product directly from the digestion process.

4.2.2.2 Composting

Composting of biosolids is one of the most frequently used methods for achieving Class A product. There are three basic composting methods with numerous variations that are used in the wastewater industry. The three composing methods are described below:

Aerated Static Pile. Dewatered biosolids are mixed with a bulking agent such as wood chips and stacked into long piles over a ventilation system through which air is transferred to the composting material. After active composting, when the pile starts to cool down, the material is moved into a curing pile. The bulking agent is often screened out and reused in this composting method.

Figure 4-14

Example of Aerated Static Pile

Windrow. Dewatered biosolids are mixed with a bulking agent and stacked in long piles or windrows. There is no active ventilation of the piles so they are periodically turned to increase the amount of oxygen. This periodic mixing is essential to move outer material inward so it is subjected to the higher temperatures deep within the pile. A number of turning devices are available, the most common being a large self-propelled machine (Scarab or Wildcat) that straddles the composting pile and turns the material with a toothed rotor. As with aerated static pile composting, the material is moved into curing piles after active composting.

Figure 4-15

Example of Windrow Compost Pile Being Turned

In-Vessel. A mixture of dewatered biosolids and bulking agent is fed into a silo, tunnel, channel, or other vessel. Augers, conveyors, rams, or other devices are used to aerate, mix, and move the product through the vessel to the discharge point. Air is blown into the mixture during composting. After active composting, the finished product is usually stored in a pile for curing prior to distribution.

Figure 4-16

Example of In-Vessel System

All three composting methods require the use of bulking agents. Woodchips, and saw dust are commonly used, but many other materials are suitable. The following types of materials can be used as bulking agents:

- Agricultural by-products, such as manure, animal bedding or crop residues.
- Yard trimmings, including grass clippings, leaves, stumps, twigs, tree prunings, Christmas trees, and other vegetative matter from land clearing activities.
- Food by-products, including damaged fruits and vegetables, coffee grounds, nut shells and hulls.
- Industrial by-products from wood processing, forestry, brewery and pharmaceutical operations. Paper goods, paper mill residues, and biodegradable packaging materials can also be used.

- Municipal solid waste. If municipal solid waste is used in compost, it is put through a mechanical separation process prior to its use to remove non-biodegradable items such as metal, glass, and plastics.

As indicated above in Section 4.2.1.4, the length of time biosolids are composted at a specific temperature is important in determining the eventual use of the compost end product. 40 CFR Part 503 defines time and temperature requirements for both Class A and Class B products. For Class A composting using the in-vessel or aerated static pile for 3 days at greater than 55 degrees C is required while 15 days with 5 turns is required for the windrow method. The production of a Class B product is not always economically justified since the product cannot be used without restrictions and the additional expense to reach Class A requirements is usually minimal.

4.2.2.3. Thermal Sludge Drying

Thermal drying technology is based on removal of water from dewatered solids by heating of the solids and evaporation. This accomplishes both volume and weight reduction. Typically, dewatered solids (at approximately 20 to 30 percent dry solids) are delivered to a thermal drying system, where most of the water is removed via evaporation, resulting in a product containing approximately 90 percent dry solids.

Significant thermal energy must be transferred to the solids to increase temperature in the drying process. This energy can be provided by combustion of a variety of fuels (natural gas, digester gas, heating oil, wood, etc.), by a reuse of waste heat, or by electrical power. The high temperatures used in thermal drying assure that the time and temperature requirements for Class A biosolids production are met. Drying also meets the EPA vector attraction reduction standards by desiccating the wastewater solids to greater than 90 percent solids.

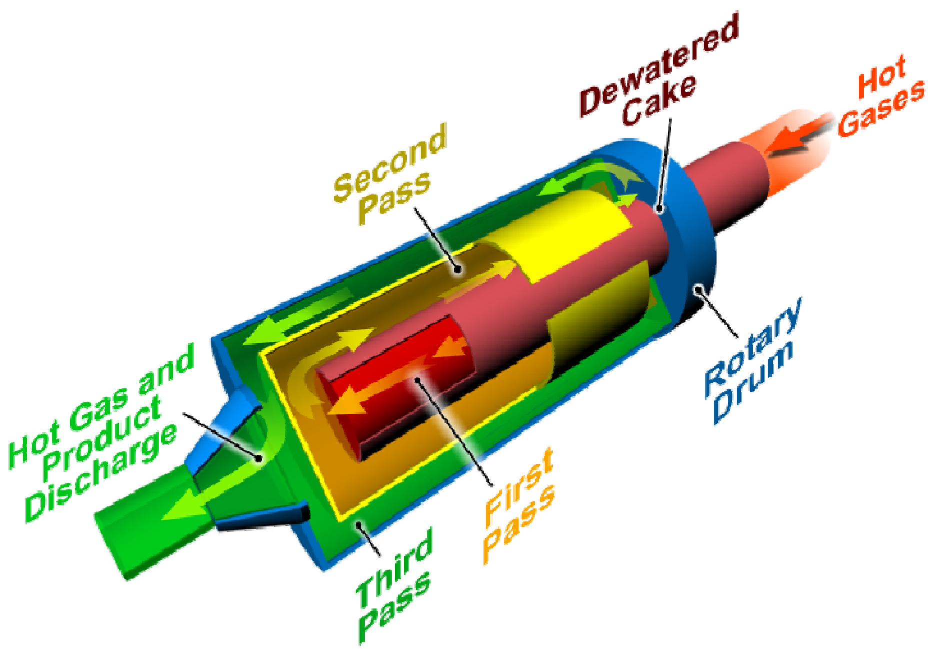
Although high temperatures are used in thermal drying, the temperatures are generally low enough to prevent burning of the organic matter. Thus, the organic matter is preserved in the dried material. Thermal drying systems may produce a variety of forms of dry material, including fine dust, flakes, small pellets, or larger fragments, depending on the type of thermal drying system used, the characteristics of biosolids processed, and the use intended for the product. Thermal drying typically must be preceded by, or done in conjunction with a dewatering process such as centrifuges or belt presses.

Thermal drying systems are typically classified in two primary categories, direct and indirect. This classification is based on the way that the heat is transferred to the solids in the process. The two categories are summarized in more detail below:

Direct Drying. In direct dryers, hot air and gas flow through a process vessel and come into direct contact with the dewatered solids. The contact between the hot air and cold solids provides the transfer of heat, which causes evaporation of water. The hot air/gas can be produced by almost any source of heat, but most often is produced by a gas or oil-fired furnace. The predominant types of direct drying equipment are rotary drum dryers, flash dryers, and belt dryers. A schematic diagram of a typical rotary drum drying system is shown in Figure 4-17. In this type of system, the heat supply is via a fuel-burning furnace that exhausts into the dryer drum. The dried material is separated from the warm exhaust gas and is then screened and processed for either recycling back to the dryer or routed to storage silos. The exhaust air/gas is cooled and part of it is recycled back to the dryer. The remainder of the air/gas is treated in air pollution control equipment and then vented to the atmosphere.

Figure 4-17

Schematic of Direct Drum Dryer



Indirect Drying. With indirect thermal dryers, solid metal walls separate the wet solids from the heat transfer medium which is usually steam, hot water, or oil. Heat is transferred from the heat transfer medium to the metal wall and then from the metal wall into the cold solids. The solids temperature is elevated by contact with hot metal surfaces but the solids are never in direct contact with the primary heating medium. Indirect thermal drying equipment includes vertical tray dryers, horizontal vessel (paddle, disc or auger) dryers, and an indirect-type of fluidized bed dryer. A schematic of a typical indirect dryer is shown in Figure 4-18 and a simplified process schematic is shown in Figure 4-19. In this type of system, the heat supply is via a fuel-burning furnace that exhausts to a heat exchanger to heat oil, which is recirculated through the dryer.

Figure 4-18

Schematic of Indirect Auger Type Dryer

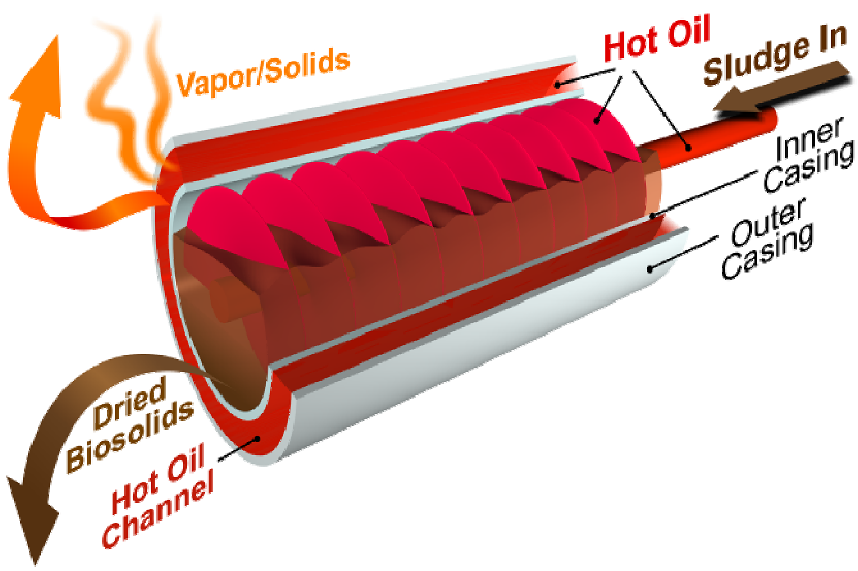
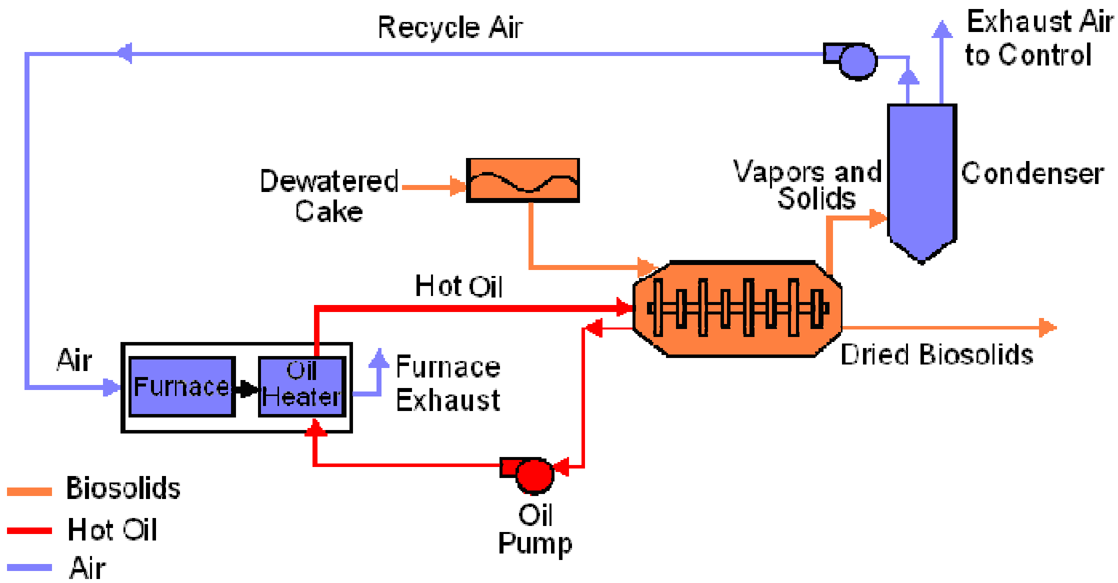


Figure 4-19

Simplified Process Schematic of Indirect Drying



In this system, the dryer exhaust consists primarily of water vapor and a small quantity of air which inadvertently enters the dryer with the wet feed. The exhaust from the dryer is sent to a condenser where the water vapor is condensed and sent back to the treatment plant and the small air flow (containing some non-condensable organics) is sent to the furnace for use as combustion air. Thus, the odors and VOCs in the process exhaust are destroyed by thermal oxidation in the furnace.

4.2.3. Sludge Pretreatment and Disintegration

Sludge pretreatment or disintegration methods focus on increasing waste activated sludge (WAS) volatile solids reduction (VSR) by pulverizing the WAS cells to increase the digestible substrate to the digesters. These methods have recently been developed and are increasingly common as treatment plants around the country seek to maximize process efficiency and minimize solids production. The sludge disintegration process is added upstream of the anaerobic digester and can consist of one or more of the following pretreatment methods:

- Physical – breakdown by mechanical means, such as pressure, temperature and cavitation

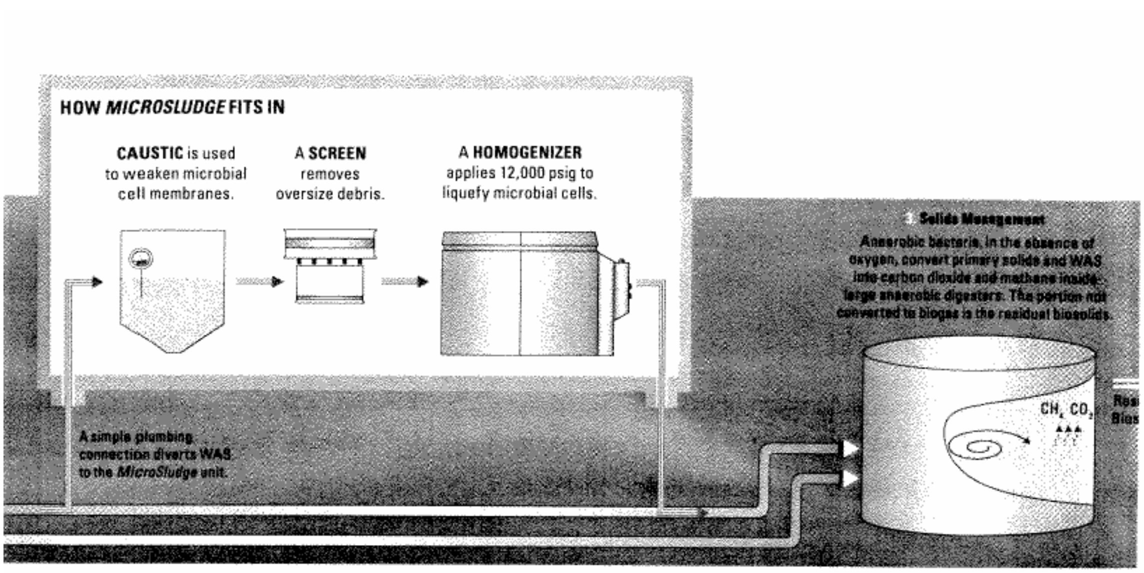
- Chemical – breakdown by changing the pH, with acid or alkali addition
- Biological – biological decomposition by microbial action

Since primary sludge is readily digestible, primary sludge is usually not processed though a disintegration step but is fed directly to the anaerobic digesters. Only the WAS is processed in the pretreatment step. A general overview of two physical disintegration processes is provided below.

MicroSludge. MicroSludge™ is a patented pretreatment process from Canada. MicroSludge uses alkaline pretreatment to weaken cell membranes and a 12,000 psig homogenizer as shown in Figure 4-20. The homogenizer provides an enormous and sudden pressure change to burst the microbial cells, resulting in liquefied WAS that is readily converted to biogas. Full scale pilot testing has occurred in Chilliwack, British Columbia and observed VSR increases by 15 to 20 percent.

Figure 4-20.

MicroSludge™ Simplified Flow Schematic



Ultrasound. Ultrasound technology produces cavitation in the liquid waste stream. The implosion of the cavitation bubbles creates localized hot spots, with temperatures up to 4,000 K and pressures of 14,900 psi. Chemical oxidants including free radicals and peroxide are also formed. The mechanism lyses the cells and liquefies the waste sludge similar to the MicroSludge process above.

4.2.4. Cogeneration

Wastewater treatment is an energy intensive process due to the many large pumps, blowers and mechanical equipment devices used in the treatment process. However, treatment plants with anaerobic digesters produce large amounts of digester gas, which is about 60 percent methane and 40 percent carbon dioxide. Digester gas fueled cogeneration systems are frequently used to produce electrical energy and can provide a significant fraction of the electrical power used at a typical treatment facility. In addition to electricity, cogeneration systems produce hot water which is used for digester and building space heating. There are currently three types of generation systems that are used with digester gas; internal combustion reciprocating engines, fuel cells and microturbines.

Microturbines are small, high-speed combustion gas turbine generators produced in the size range of 30 kW to 250 kW. Microturbines can produce both electric power and heat and are primarily used in smaller facilities that cannot support use of a larger internal combustion engine generator. Microturbines were developed from high-speed turbochargers originally developed for large reciprocating engines, and usually have innovative air bearings for reduced friction and maintenance. The efficiency of microturbines is generally around 20 to 30 percent.

Internal combustion reciprocating engines are the most common technology used for digester gas cogeneration at wastewater treatment plants because they are a familiar technology and usually more cost effective when compared to microturbines or fuel cells. Currently, lean-burn spark-ignition internal combustion engines are used and are widely available in sizes from about 60 kW to over 6,000 kW. Lean-burn engines are, by far, the most popular type of WWTP digester gas fuel prime mover, because of their low exhaust emissions. Lean-burn engines offer the advantages of good fuel economy and the ability to use low pressure digester gas, at 2 psig or less. This helps reduce the cost and complexity of fuel compression. There is currently a program being carried out by several engine manufacturers to develop the next generation of digester gas engine, which is called the Aries Engine. The Aries Engine delivers approximately 41 percent net electrical efficiency compared to 33 to 36 percent for current lean-burn engine technology.

Fuel cells are electrochemical devices that efficiently convert chemical energy in a hydrogen-rich fuel to electrical power and heat. Similar to a battery, a fuel cell is composed of many individual cells. Cells are grouped together to form a stack. Each consists of an anode, cathode and electrolyte. A hydrogen-rich fuel, such as digester gas and oxygen, is supplied to the stack, where it reacts with the cells to produce electric current. However, while a battery has a fixed supply of energy, fuel is continuously added to a fuel cell enabling production of electricity for a long time. The reaction byproducts are CO_2 and water.

Fuel cells are an emerging technology for the efficient, clean generation of electrical power from natural gas and the methane found in digester gas. Molten carbonate fuel cells (MCFCs or "Direct" fuel cells) can achieve conversion efficiencies of 50 to 60 percent and up to 80 percent if the heat produced during the catalytic reaction is captured and used. As indicated above, conventional cogeneration equipment such as reciprocating engines and microturbines achieve lower efficiencies. Other advantages of fuel cells include few moving parts, modular design, and negligible emission of pollutants.

For fuel cells to be competitive in the power generation market, the cost of manufacturing must be reduced. Fuel cell makers often cite a market entry price of about $1,200 per kilowatt as the price point where fuel cells could compete successfully with micro turbines and engine generators. Current fuel cell costs are roughly double that entry estimate, but manufacturing techniques and volume of production are driving costs down. In the future, fuel cells could be a practical alternative to existing cogeneration technology where power production is in the range of 200 kW to 2,000 kW.

4.2.5. Food Processing Byproducts and Fats, Oils and Grease, (FOG) Digestion/Waste To Energy

Disposal of fats, oils and grease (FOG) from restaurant grease interceptors and byproducts from food processors directly in the anaerobic digestion process can provide significant benefits to a wastewater utility. The first major benefit is that collection system problems related to FOG buildup in sewer lines may be reduced since a convenient and economical location is provided for grease haulers to dispose of their wastes. This results in more frequent interceptor pumping and less frequent line cleaning for the utility. The second major benefit is the potential revenue generated from accepting FOG wastes. Revenue can be enhanced by collection of tipping fees from waste haulers and increases in power production from gas resulting from the degradation of FOG in the digestion process. It is expected that there will be increasing activity in this area at the two Salt Lake County treatment facilities with cogeneration systems (SLCWRF and CVWRF) as power costs increase and as disposal sites for this material are restricted in the future.

The economic benefits can be substantial and there is a significant interest in this potential energy source from wastewater utilities around the country. The City of Riverside, California which operates a 33 mgd (average daily flow) treatment plant recently completed a full-scale side-by-side digester study and reported an increase in gas production of 117 percent in the digester fed approximately 20,000 gal/day of FOG waste. The estimated annual economic benefit from full scale operation was $1,000,000/year. Redwood City, California has achieved similar results in a FOG program that has been in operation since 1986. The Redwood plant accepts about 3,000 gal/day of FOG waste which is directly injected in the anaerobic digesters. They have reported a total annual economic benefit of $198,000/year, not including the reduced collection system maintenance and other environmental benefits (“Fattening the Bottom Line”, WE&T, August, 2005). The East Bay Municipal Utilities Department has implemented a program to augment the feed to its digesters with food processing byproducts such as slaughter house waste and expired soda products and has increased electrical power production from 3 MW to 6 MW, which covers nearly all of the power demand at the treatment facility.

4.3 WATER RECLAMATION AND REUSE

There has been significant interest and activity in wastewater reclamation and reuse in states facing water shortages such as California over the past 10 to 15 years. With the recent drought and projected future population growth, reuse is gaining interest in Utah as well. Utah rules define two classifications of reuse water Type I and Type II. Type I reuse water is the highest quality reuse water and is allowed to be used for the following applications:

- Residential irrigation, including landscape irrigation at individual houses.
- Urban uses, which includes non-residential landscape irrigation, golf course irrigation, toilet flushing, fire protection, and other uses with similar potential for human exposure. Internal building uses of reuse water are not allowed in individual residences; and are only permitted in situations where maintenance access to the building's utilities is strictly controlled and limited only to the services of a professional plumbing entity. Projects involving effluent reuse within a building must be approved by the local building code official.
- Irrigation of food crops where the applied reuse water is likely to have direct contact with the edible part, including spray irrigation of food crops.
- Irrigation of pasture for milking animals.
- Reservoirs and impoundments of wastewater where direct human contact is likely to occur.

Type II reuse water is lower quality than Type I water and is permitted to be used for the following applications:

- Irrigation of sod farms, silviculture, limited access highway rights of way, and other areas where human access is restricted or unlikely to occur.
- Irrigation of food crops where the applied reuse water is not likely to have direct contact with the edible part, whether the food will be processed or not (spray irrigation not allowed).
- Irrigation of animal feed crops other than pasture used for milking animals.

- Impoundments of wastewater where direct human contact is not allowed or is unlikely to occur.
- Cooling water. Use for cooling towers which produce aerosols in populated areas may have special restrictions imposed.
- Soil compaction or dust control in construction areas.

Most reuse applications in an urban environment such as Salt Lake County would require the production of Type I reuse water. The production of Type I reuse water requires high quality secondary effluent with a BOD less than 10 mg/L. Filtration and disinfection processes are also required to produce a turbidity less than 2 NTU, a fecal coliform level of non-detect, and a residual chlorine concentration of greater than 1.0 mg/L after 30 minutes of contact time. For specific uses such as those impacted by salinity or dissolved solids additional treatment beyond that required for Type I reuse may be required. There are a number of treatment processes that are currently used to produce reuse water of Type I quality or greater and these are outlined below.

4.3.1. Membrane Bioreactors

Membrane Bioreactors (MBRs) were discussed above in Section 4.1.1 regarding their use in wastewater treatment processes. MBRs are an advanced treatment process recognized by the California Department of Health Services as capable of producing "disinfected tertiary recycled water" acceptable for the highest levels of non-potable reuse when coupled with appropriate disinfection (i.e., meet Title 22 criteria for non-restricted recreational impoundments). Because the MBR process combines the processes of activated sludge and membrane separation, providing secondary and tertiary treatment in a single unit process, the use of MBRs for wastewater treatment can be highly advantageous when water reuse is a consideration.

4.3.2. Granular Media Filtration

Granular media filtration is one of the earliest and most well known methods of water treatment. Operated successfully for many years in the potable water sector, this technology has been converted to provide supplemental treatment of wastewater effluents for the purpose of reuse. Filtration combines both physical and chemical processes to remove solids by passing the wastewater through a granular media bed. Removal of suspended material can be enhanced by the addition of chemical coagulants and polymers. Granular media filtration can be used as a final treatment stage preceding disinfection or, as part of a series of tertiary treatment processes. When coupled with appropriate disinfection, granular media filtration is capable of meeting California Recycled Water Criteria (Title 22, criteria).[19]

A number of individual filtration system designs have been implemented for the purpose of water reuse. Granular media filters generally fall under the following categories (see Table 4-2):

TABLE 4-2 GRANULAR MEDIA FILTRATION TECHNOLOGIES

Category	Typical Operation	Manufacturer	Typical Hydraulic Loading Rate (gpm/ft^2)
Conventional deep bed	Semicontinuous	Nonpropietary	5
Shallow bed	Continuous	Aqua-Aerobics (Aqua ABF), Infilco-Degremont (ABW)	2
Upflow/downflow deep bed continuous backwash	Continuous	Andritz Ruthner (Hydrasand), Applied Process Technology , Centra-flo Parkson (Dynasand), WesTech (Technasaand)	5
Shallow pulsed bed	Semicontinuous	US Filter (Hydroclear)	5

Although numerous in design, common elements to all filtration systems include the mechanisms by which particle capture occurs. The principal mechanisms that contribute to the removal of suspended particles are as follows:

- Straining
- Sedimentation

- Impaction
- Interception
- Adhesion

Once in contact with the filter medium, chemical and/or physical bonding (i.e., electrostatic, electrokinetic and van der Waals forces) hold the particles until filter backwashing (a reversal of flow) occurs.

In the filtration process, solids are retained on the media which requires backwashing to flush out the accumulated solids. In semicontinuous (conventional) filter operation, backwashing occurs sequentially after the filtering period has ended. Backwashing can be triggered by automatic timing, pressure differential or effluent turbidity. In continuous filter operation, filtration and backwashing phases occur simultaneously. Parkson's DyanSand filter, shown below with optional aeration for denitrification, is one example of continuous filter operation (courtesy of Parkson Corp.). The major advantages and disadvantages of granular media filtration are summarized below:

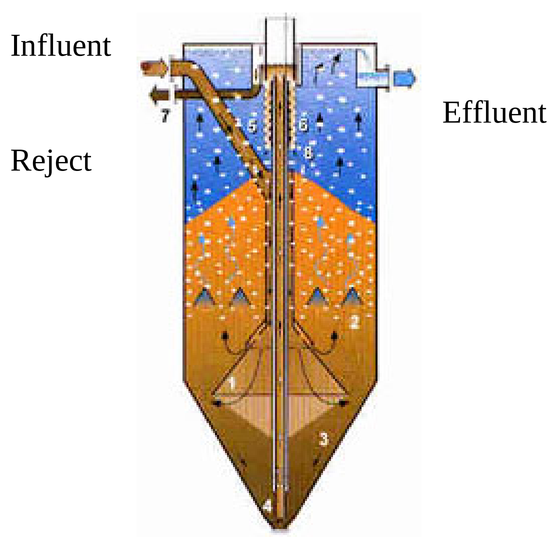


Figure 4-21 Example of Parkson Dynasand Upflow Filter.

Advantages

- + Relatively low capital cost when compared to other alternatives.
- + Proven technology.
- + Used extensively for removal of suspended solids (including particulate BOD) and chemically precipitated phosphorous.

Disadvantages

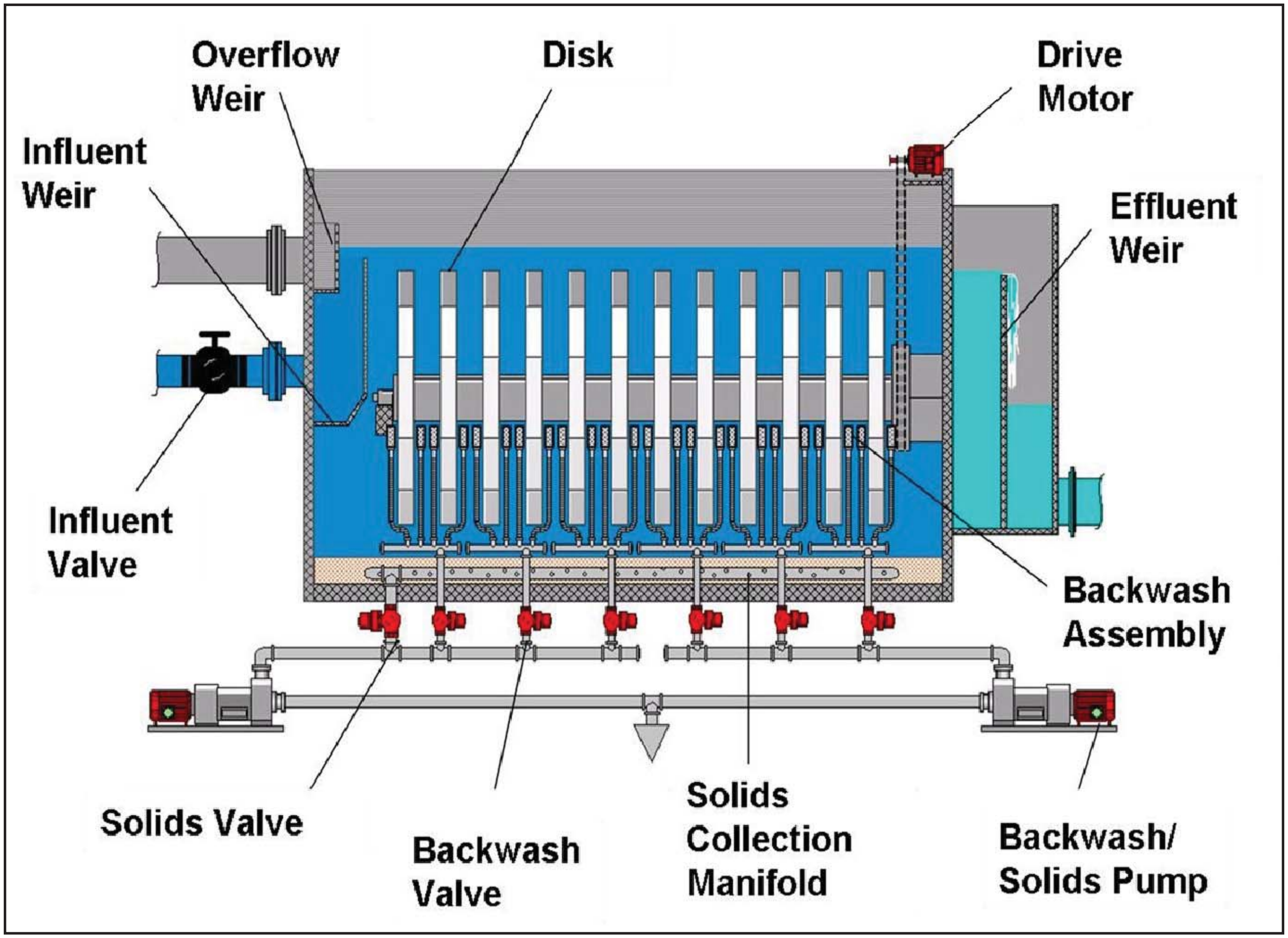
- \- Although the operation can be completely automated, the process requires close operator attention and careful, routine maintenance.
- \- Reliability is dependent on upstream processes and resultant solids loading on the filter.

4.3.4. Disk Filters

Disk or "cloth media" filters are a relatively new technology designed for a variety of tertiary treatment applications. Coupled with appropriate disinfection, this technology is capable of producing reuse quality effluent, and is an accepted filtration technology for Title 22 applications. Typical cloth filter media consists of nylon and polyester type fiber or woven stainless steel mesh capable of removing fine particulate matter. Filters are typically arranged as vertical disks in concrete or fabricated stainless-steel tanks.

Manufacturers of disk filters include Aqua-Aerobics (AquaDisk), US Filter-Kruger (Hydrotech Discfilter), and Huber Technologies (RoDisc). These systems entail a series of vertical disks that support the media. In the Aqua-Aerobic system, flow passes from outside the disk to the inside. Solids are captured in the tank and removed by sludge pumps. A diagram of this system is shown in Figure 4-22 (courtesy of Aqua-Aerobics).

The flow path for the US Filter-Kruger and Huber Technologies systems is opposite that of the Aqua Aerobic system with influent passing from inside to outside the disk. Backwashing is triggered by water level differential or automatic timing. During a backwash event, the disks are



SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

AQUA-AEROBIC AQUA DISK FILTER SYSTEM

FIGURE 4-22

BROWN AND CALDWELL

slowly rotated to maintain continuous filtration. The major advantages and disadvantages of fabric media disk filtration are summarized below:

Advantages

+ Small footprint.
+ Continuous operation.
+ Better able to handle fluctuations in upstream treatment plant processes.
+ High solids loading capacity.
+ Low power requirements.

Disadvantages

- Relatively new technology.
- Some types of cloth media require replacement.

4.3.5. Ultraviolet Radiation Disinfection

Ultraviolet (UV) radiation is a non-chemical (physical) disinfection technology. When applied to water and wastewater it effectively renders ineffective pathogenic microorganisms, including protozoa, bacteria, and viruses. Studies have also shown the effectiveness of UV disinfection of inactivating both giardia and cryptosporidium cysts.

Over the past two decades UV radiation has moved into the mainstream of disinfection technologies. During that time UV has been successfully used to disinfect wastewater treatment plant effluents for discharge and reuse.

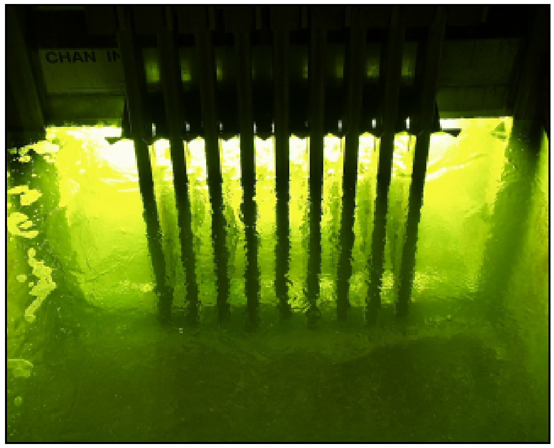


Figure 4-23. UV Light Disinfection System with Horizontal Bulbs (End View of Bulb Racks)

The UV disinfection process is accomplished when a thin layer of water is exposed to UV light emitted from a mercury vapor arc lamp. Multiple lamps may be required to achieve an appropriate level of coverage and UV dose. The UV light is absorbed by the microorganisms and damages their DNA. The organisms can be either killed or merely inactivated and prevented from further reproduction. In some cases the organisms may be able to repair damaged DNA and regrowth downstream of the UV process can occur. Because microorganism kill and inactivation is only accomplished when UV light is transmitted through the water to the target organism, it is necessary that lamps be kept free from slime and precipitates and that the water be relatively free of suspended solids and UV light absorbing compounds (e.g., dyes, iron and other dissolved metals, etc.). The major advantages and disadvantages of UV disinfection are summarized below:

<u>Advantages</u>

+ Proven and effective disinfection method
+ No residual toxicity
+ More effective than chlorine in inactivating most viruses, spores and cysts
+ Does not increase level of TDS in treated effluent
+ Improved safety compared to the use of chlorine gas and chemical disinfectants
+ Small footprint

Disadvantages

- No immediate measure of whether disinfection was successful
- No residual effect
- Potential for regrowth
- Energy-intensive
- Relatively expensive
- No auxiliary uses

4.3.6. Chlorine Disinfection

The most common method of disinfection is chlorination. In contrast to UV radiation, chlorination is a chemical treatment method, which relies on the addition of a strong oxidant to the water. As is the case with all types of disinfection, the purpose of chlorination in the water treatment process is to reduce disease-producing microorganisms (pathogens) to an acceptable level. Chlorine can be provided in three different forms for disinfection; chlorine gas (Cl_2), sodium hypochlorite (NaOCl), and calcium hypochlorite [$Ca(OCl)_2$].

The active agent in the chlorination process is hypochlorous acid (HOCl). Effective chlorination occurs by adding the chemical to the water where it is allowed to remain for a period of time to allow sufficient contact between the microorganisms and the HOCl. Some of the chlorine is consumed through oxidation of chemical impurities and therefore is not available for its intended purpose. High levels of impurities such as total suspended solids (TSS) or biochemical oxygen demand (BOD) in the water requires greater chemical doses to achieve adequate disinfection. To combat this, water must be treated appropriately to remove TSS and BOD to the maximum extent possible prior to chlorination.

A critical element of chlorination is the presence of a chlorine residual in the treated effluent, which provides a certain level of protection as the water leaves the treatment facility. This residual is of particular importance in reuse applications to provide continuing protection after the water leaves the treatment facility. The residual is provided by the free chlorine (HOCL) and combined chlorine (chloramines) which are formed when the chlorine reacts with ammonia present in the wastewater. However, at certain levels, chlorine residuals can be toxic to various forms of aquatic life. Chlorine also reacts with organic materials and forms small amounts of trihalomethanes (THMs) which are carcinogens and must therefore be strictly monitored in drinking water. However, this is not usually a consideration for wastewater or reclaimed water unless toxicity results or applications such as groundwater recharge are considered.

Chlorine gas is the least expensive of the of chlorine disinfection alternatives and is therefore used in many large treatment works. Cl_2 is a stable compound and thus can be stored for long periods of time. Liquefied Cl_2 is stored in compressed-gas cylinders ranging from 150 lb capacity for small systems; to 1 ton cylinders for medium capacity systems; to bulk tanks and rail cars up to 80 tons capacity for large systems. A chlorine gas system must be managed with care since chlorine gas is extremely toxic. Chlorine gas scrubbers and detection systems are usually provided as backup protection in the event of a gas leak. Because of the high level of toxicity and the associated liability, many treatment plants have or are contemplating switching disinfection methods to UV or liquid chlorine based systems.

Sodium hypochlorite (bleach) is more expensive than chlorine gas but is much safer to handle. NaOCl is available for purchase in bulk quantities or can be produced onsite. When purchased in bulk quantities, NaOCl is supplied as a liquid, typically with between 3 and 15 percent available chlorine. Because NaOCl is not stable and will decay due to elevated temperatures and exposure to sunlight, bulk quantities should be stored indoors at temperatures below 85°F and in corrosion resistant tanks.

NaOCl can be produced onsite from a sodium chloride salt solution and electricity. The generation facilities typically produce a NaOCl solution of less than one percent. At low concentrations, the degradation rate of NaOCl is so low as to be of no concern, but storage volumes may be large. Onsite generation is especially advantageous for small systems and in remote areas where delivery of bulk NaOCl is limited. The primary disadvantages of onsite NaOCl generation are the cost of equipment and the resources required.

Calcium hypochlorite is available of purchase in bulk quantities in either dry or wet form. In dry form $Ca(OCl)_2$ is available as pellets, granules, tablets or as powder. Because of its oxidizing properties, $Ca(OCl)_2$ should be stored in corrosion resistant containers and be kept in a cool and dry location away from other chemicals. Like NaOCl, $Ca(OCl)_2$ is more expensive than chlorine gas and loses its strength during storage. A key disadvantage of $Ca(OCl)_2$ is its tendency to crystallize, thus clogging metering pumps, piping and valves.

The advantages and disadvantages of the three types of chlorination discussed in this section are as follows:

Advantages

+ Well established technology
+ Effective disinfectant
+ Residual can be maintained and monitored
+ Availability for auxiliary uses
+ Relatively inexpensive (primarily gas)

Disadvantages

- Toxic chemical (not hypochlorite forms)
- Requires long contact time
- At low dosages, may be less effective at destroying some viruses, spores and cysts
- Residual toxicity
- Formation of THMs
- TDS level of effluent is increased with hypochlorite forms
- Acid generation may occur
- Increased safety regulations (primarily for liquid gas)

4.3.7. Micro, Ultrafiltration and Reverse Osmosis (RO) Membrane Technology

Membrane technology is defined as a separation process that uses a selective barrier to remove undesirable constituents from a process stream. Multiple categories of membranes exist depending on the size of pores within the membranes and the driving force used to separate contaminants. Membrane types include (in decreasing pore size) microfiltration, ultrafiltration, nanofiltration and reverse osmosis (RO) (see Figure 4-2, in Section 4.1.1). The driving force behind the separation process includes pressure, concentration, electrical potential, and temperature. The use of submerged membranes in the MBR form of the activated sludge process was discussed above in Sections 4.1.1 and 4.3.1.

Membranes can also be used as a separate process in conjunction with other treatment processes to remove specific categories of pollutants and achieve the desired treatment results. Micro and ultrafiltration membranes can be placed after the activated sludge process to achieve similar results as an MBR system (e.g. Title 22 reuse). These types of membranes primarily remove suspended solids. Tighter membranes, such as nanofiltration and RO can used as a polishing step following the MBR process or following stand alone micro and/or ultrafiltration that would follow a conventional activated sludge process. Nanofiltration removes material down to the molecular level including larger organic compounds while RO removes virtually all molecules from the water. Effluent that is treated by RO is similar to deionized or distilled water and is free of nearly all ions and organic molecules. It can be used for groundwater recharge, industrial purposes such as boiler make-up and process water applications or for flow blending to lower the overall TDS concentrations of a water to a desirable level.

Most RO membranes in water reuse applications are supplied with hollow fibers contained within a pressure vessel, or immersed in a tank or basin. An example of a pressurized, hollow tube RO system is shown below (courtesy of KOCH Membrane Systems):

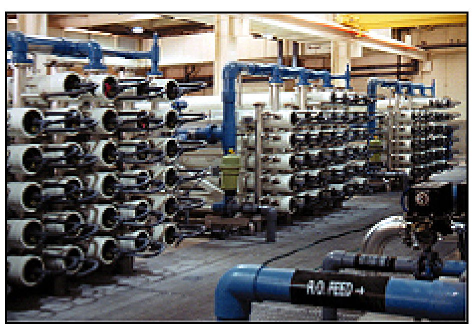


Figure 4-24. Example of RO Hollow Fiber System Showing Several Banks of Membranes.

Flow path through the membranes is predominantly from outside the hollow fiber tubes to inside (outside-in) versus inside the tubes to outside (inside-out). Most membrane manufacturers favor this flow direction because the membranes are easier to clean and are less prone to foul or plug. An effective RO pretreatment system is essential to assure a long and reliable membrane operating life. Micro and ultrafiltration membranes are commonly used to supply the feed water necessary for proper RO operation.

Table 4-3 below presents micro and ultrafiltration membrane manufacturers approved for Title 22 water reuse.

TABLE 4-3 ULTRA AND MICROFILTRATION MEMBRANE MANUFACTURERS		
Manufacturer	**Pore Size**	**Membrane Material**
Zenon (Cycle –Let, Zeeweed)	0.005, 0.02	Polymer Fiber
US Filter (Memcor)	0.1, 0.2	Polypropylene Polyvinylidene Fluoride
Pall	0.1	Polyvinylidene Fluoride
Kubota	0.4	Polyethylene
GE, formerly Ionics Inc.	0.05	Polyethersulfone

Membranes are typically backwashed on a cycle to prevent fouling or plugging. As the effectiveness of normal backwashing decreases, (i.e. failure to reach initial trans-membrane pressure) a clean in place (CIP) is performed. A CIP sequence typically involves the use of sodium hypochlorite and citric acid washes to remove scale and biological growth (fouling) from the membranes.

Advantages:

+ Small footprint
+ Excellent water quality
+ Modular design

Disadvantages:

- Requires pretreatment to be effective
- Potential for high capital and operating costs
- Membranes require replacement

4.3.8. Electrodialysis Reversal (EDR) Membrane Technology

Electrodialysis Reversal (EDR) is another membrane process that has been used primarily for treating brackish or high total dissolved solids (TDS) water. EDR is a proprietary process marketed and manufactured by GE Water and Process Technology, formerly Ionics Incorporated. In EDR, electric energy is used to transfer ionized salts from the feedwater through the membranes. An electrical stage is compromised of one anode and one cathode separated by a series of anionic and cationic membranes and spacers. The anionic membranes permit the passage of negatively charged ions (anions) while deflecting positively charged ions (cations). The cationic membranes permit the passage of cations while deflecting anions. Spacers are placed between the membranes and are designed to separate brine and product water streams. An EDR design is illustrated in Figure 4-25 (courtesy of General Electric, formerly Ionics Inc.).

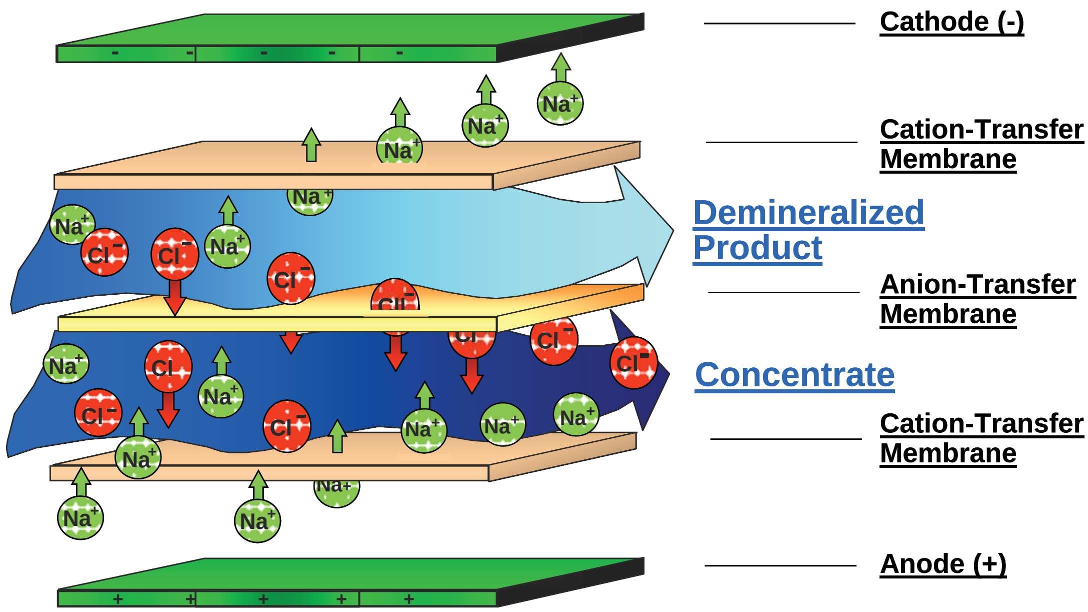
A local Utah example of this technology will be the new water treatment plant currently being designed at the Barton Well Field to treat arsenic- and perchlorate-contaminated groundwater.

Each electrical stage has two hydraulic stages (i.e., water passes through each electrical stage twice). This provides a greater residence time in which ion transfer can occur.

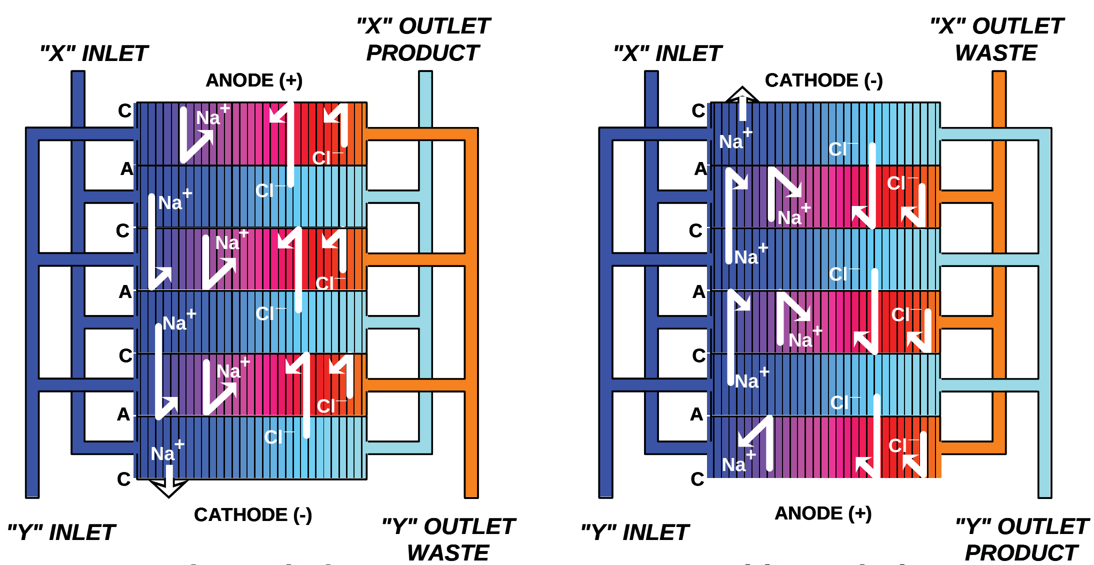
The EDR system undergoes periodic reversal of polarity to help circumvent potential fouling or scaling of the membranes. During a polarity reversal the concentrate and dilute flow streams are switched. Hence, fresh water flushes away any scaling or fouling causing components. The EDR reversal process is also illustrated in Figure 4-25.

In order to meet Title 22 requirements, the EDR system must be coupled with a barrier technology for pathogen removal such as micro or ultrafiltration. Unlike a pressurized RO system, microorganisms which are non-ionic (no charge) are not removed. EDR is better suited as a polishing step for applications where it is desirable to treat high salinity water. One example would be near coastal regions where a water reuse injection system would be used as a buffer to saltwater intrusion.

Electrodialysis Membrane Configuration and Operation



Electrodialysis System Operation



Negative Polarity **Positive Polarity**

SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

ILLUSTRATION OF THE ELECTRODIALSYSIS PROCESS

FIGURE 4-25

BROWN AND CALDWELL

Advantages:

- + Longer membrane life (between 5 and 10 years)
- + Process is not adversely affected by the presence of silica
- + Excellent water quality
- + Small footprint

Disadvantages:

- \- Potential for high capital and operating costs
- \- Potential for high power costs
- \- Requires pretreatment
- \- Does not meet Title 22 requirements alone

4.3.9. Advanced Oxidation – Peroxide/UV, Ozone, Ozone/Peroxide

Advanced oxidation processes can be used for both disinfection and for removal of trace organic compounds by chemical oxidation. Advanced oxidation has been used for many years in the fields of industrial waste treatment and remediation for the destruction of toxic organic compounds, however, its use in municipal wastewater treatment to this point in time has been minimal. Advanced oxidation is of now of particular interest in the field of municipal wastewater treatment and reuse as a method removing trace amounts of CECs, including EDCs and PPCPs from wastewater facility effluents. Advanced oxidation refers to a process that generates hydroxyl radicals (OH radical) which are one of the most reactive molecules known. With the peroxide/UV form of advanced oxidation, the hydroxyl radicals are formed by splitting hydrogen peroxide (H_2O_2) with UV light to form two radical products. The radicals then react with any organic matter present and oxidize it to either an intermediate organic product or all the way carbon dioxide depending on the amount of oxidant present. Ozone and other advanced oxidation processes rely on the same basic radical reactions, however, the radicals are generated by different mechanisms. Advanced oxidation processes are likely to become increasingly prevalent in the future as regulations on CEC emissions are developed.

4.4 DECENTRALIZED TREATMENT SYSTEMS

4.4.1. Trends and Environmental Importance

Decentralized wastewater management refers to the collection, treatment and disposal of wastewater from individual residences and from small communities, isolated public facilities (e.g., state parks), industrial parks, and other isolated wastewater generators not connected to larger conventional sewer collection and treatment systems. In the United States, more than 60 million people live in homes served by decentralized wastewater collection and treatment systems (Crites and Tchobanoglous, 1998). Although in most instances it is preferable to have centralized facilities, complete centralized sewerage of all areas will never be possible for geographical and economic reasons. Therefore, proper decentralized wastewater management is important for protection of the environment, health and water resources. Crites and Tchobanoglous (1998) outline a number of situations where decentralized wastewater management may be applicable including the following:

- Where a community or facility is remote from existing sewers.
- Where localized water reuse opportunities exist.
- Where the fresh water for domestic use is in short supply.
- Where existing wastewater system capacity is limited and not readily expandable or would require unnecessary disruption of the community.
- Where, for environmental reasons, the quantity of wastewater effluent discharged to the environment must be limited.
- Where residential density is sparse.
- Where regionalization would require political annexation that would be unacceptable.

There are a multitude of options for decentralized wastewater management. A few of the more common options that are currently used or may be applicable in the future in Salt Lake County are summarized in the following sections.

4.4.2. Septic Systems (Conventional and Enhanced)

Septic systems are the most common form of decentralized wastewater management and usually serve individual residences. These systems provide onsite treatment and disposal of the wastewater. Conventional septic systems consist of a septic tank that provides separation and long-term storage of the solids and partial treatment of the wastewater and a subsurface land disposal system for final treatment and disposal of the septic tank effluent. There are a number of enhancements that can be incorporated into septic system design to improve treatment or disposal of the effluent. Some of the common enhancements include:

- The installation of effluent screens or filters on septic tanks that provide enhanced solids removal to protect drain fields and that allow the use of pumps for pressure dosing of shallow soil absorption systems.
- The use of recirculating filters (similar to trickling filters in large WW plants) or aeration zones in the septic tank that allow nitrification of ammonia to occur followed by denitrification in the anaerobic/anoxic zones of the septic tank as the water is recirculated back through the tank. These options provide total nitrogen removal as well as enhanced BOD removal.
- The use of packed bed filters on the septic tank effluent operating in either an intermittent mode or a recirculating mode to provide enhanced biological treatment and solids removal prior to effluent disposal.
- The use of very small aerated membrane systems located in an effluent chamber of the septic tank. These membranes turn the septic tank into a micro MBR system and have recently been introduced by Huber Technologies, a large manufacturer of wastewater treatment equipment.
- The use of shallow soil absorption systems which apply the septic tank effluent to the upper soil layers (approximately 1 foot below the surface) as opposed to several feet below the surface for conventional drain fields. The upper soil layer is more biologically active with both microorganisms and plant root growth and provides better overall removal of pollutants.

Septic systems are regulated by the local county health department and Salt Lake County has an established and experienced program. Although it is generally preferable to connect to conventional sewer systems if at all feasible, septic systems will likely continue to one of the only viable wastewater management options in certain locations. The use of enhanced systems as described above will where necessary should allow the continued use of septic systems while reducing their impacts on the environment and their potential to contribute to ground and surface water quality degradation.

4.4.3. Cluster Systems

Cluster systems refer to the collection and treatment of wastewater from a group or cluster of individual residences or other isolated wastewater generators. Cluster systems are larger than individual septic systems but often use similar treatment and disposal methods. Typically a large septic tank or multiple smaller tanks are used along with a large drain field. Imhoff tanks which were commonly used in the past and include solids separation and digestion zones are also making a comeback and are being used in place of the septic tanks in some systems. Treatment lagoons are another common treatment option that was used in the past for small cluster systems.

Where better water quality for discharge or reuse is required more advanced treatment processes similar to those used in centralized treatment facilities are increasingly being used although at a smaller scale. The development of advanced process instrumentation, computerized control systems, remote process monitoring and control, membrane solids separation and UV disinfection technology has driven the development of these types of systems. There are now numerous small package treatment plants on the market based on the activated sludge process in either an MBR configuration (discussed below) or sequencing batch reactor configuration that are in the size range of a few thousand gallons per day or greater capacity that are applicable to small decentralized cluster systems.

4.4.4. Package Membrane Bioreactor Systems

Package activated sludge systems using a submerged membrane for solids separation are becoming increasingly common for small decentralized treatment. These systems are similar to the larger-scale MBR process described previously in the sections on wastewater treatment and reuse. Typical systems are skid or container mounted and come fully plumbed and wired from the manufacturer. The main connections are influent and effluent piping and power supply. The process usually consists of influent pumping and screening, the aeration tank with membrane separation units and aeration blower, effluent disinfection (usually using UV), a solids holding tank, and process control system. Package treatment plants can be purchased for a capacity of a few thousand gallons per day up to hundreds of thousands of gallons per day.

The primary advantage of the package MBR system is the excellent effluent quality that is produced which results in a wider range of disposal options compared to other treatment processes. Gravity drain fields similar to those used in septic systems are one common disposal option, however, because of the better quality effluent higher infiltration rates (up to double septic system rates) and shorter setback requirements to property boundaries may be allowed. This makes disposal more favorable where available land suitable for disposal is limited. Subsurface infiltration using well systems may also be a disposal option in certain situations. MBR effluent can also meet Type I reuse requirements with proper disinfection which opens up a range of disposal options not available for lesser quality effluents including surface irrigation and land application.

4.4.5. Gray Water Systems

Gray water is defined as wastewater originating from sources other than toilets and kitchens. Wastewater from toilets and kitchens (i.e., sinks, garbage disposals and dishwashers) is called black water. Gray water includes wastewater from showers, bathroom sinks, tubs, and laundry and accounts for about half of the wastewater generated in a typical residence. Gray water has significantly lower pollutant levels than black water but still contains pollutants of regulatory concern including oxygen demand, nitrogen, phosphorus, bacteria, viruses, and suspended and dissolved solids. It is a water resource that can potentially be used for certain applications with less treatment than required for reuse of full-strength wastewater (combined gray water and black water). The use of gray water for irrigation, and other non-potable needs may present an opportunity to conserve and reuse water in certain situations.

Utah recently developed and adopted regulations governing the use of gray water. These regulations are very conservative compared to several other states including Arizona and New Mexico. In developing the rules, the Division of Water Quality (DWQ) was highly concerned with the potential surfacing of gray water and the exposure to people, animals and the environment and adopted a position of placing strict controls on the use of gray water to prevent adverse effects. Based on discussions with DWQ personnel, the DWQ desires to discourage the use of gray water systems except in limited situations where there are no other practical alternatives.

Current Utah rules allow gray water to be used by individual property owners on their own property and limit the use to either subsurface or drip irrigation to minimize potential human and animal exposure. Responsibility of overseeing implementation and regulation of gray water system is delegated to local agencies such as the county health departments. At this time, the Salt Lake Valley Health Department does not have a gray water program in place so it would be difficult to implement gray water systems in the County.

4.5 SITING TRENDS

There are several trends emerging in the siting and integration of wastewater treatment facilities within the communities they serve. These siting and integration trends generally attempt overcome past nuisance problems associated with wastewater treatment facilities and attempt to blend facilities into the surrounding community, make them better neighbors and provide additional community benefits such as environmental education centers and recreational facilities. Several issues relating to the siting and construction of wastewater facilities are discussed below and relevant examples are provided.

4.5.1. Scalping vs. End of Pipe Treatment

Scalping refers to the removal and treatment of flow from a sewer line upstream of the main treatment facility (end of pipe treatment). Scalping can reduce both the flow and loading on the main treatment facility or the collection system. There are three primary situations where scalping may be advantageous:

1. Where the main treatment facility cannot be expanded handle increasing flows or loads;
2. Where the collection system cannot be readily expanded to carry increasing flows to the main treatment facility; and

3. Where an upstream demand for reuse water exists that can be better or more cost effectively satisfied by an upstream scalping facility that is closer to the point of use.

As development occurs in the County (especially on the West side) where there is a need for reuse water for irrigation and the development is a considerable distance from the existing treatment facilities along the Jordan River, upstream scalping facilities may become a viable option for providing additional treatment capacity.

An example of a scalping facility is the recently completed LOTT (Lacy, Olympia, Tumwater and Thurstan County, WA) Martin Way Plant shown in Figure 4-26. In this application, the main Budd Inlet treatment plant on Puget Sound could not be expanded further because of water quality concerns in the receiving water and a restricted plant site. The Martin Way Plant was constructed un an upstream trunk sewer line and is designed to designed to remove and treat 2 mgd (expandable to 5 mgd) to reuse quality standards. The plant thereby eliminates the need to expand the Budd Inlet Plant and provide a source of high quality reuse water for irrigation, a recreational nature area with ponds and wetlands (Figure 4-27), and groundwater recharge.

4.5.2. Architectural Treatments/Blending with Surroundings

As mentioned in the introduction to this section, integration of treatment facilities into the surrounding area is an emerging trend in the construction of new treatment facilities. Thoughtful integration, design and architectural treatment can overcome many of the past nuisances associated with wastewater treatment facilities. Matching architectural styles with the surrounding land use and community is becoming increasingly common. Examples of this concept are provided in Figures 4-28 and 4-29. The Cauley Creek Plant near Atlanta, GA uses a barn theme to integrate the plant buildings the surrounding rural nature of the area, and the Crescent City, CA Facility with blends the plant with seaside community where it is located.

At a more advance level, facilities can be hidden underground or incorporated with other facilities that can be used by the surrounding community. Most of the John’s Creek Plant (Figure 4-30) currently being constructed north of Atlanta, GA is hidden underground with a park-like court yard constructed over the treatment tanks. The buildings at John’s Creek are also designed to blend with the surrounding upscale residential area that surrounds the plant. The John’s Creek Facility is called a “Environmental Campus” and incorporates a tour route through the plant and an environmental education center for students and residents of the community. The North River Plant near New York City (Figure 4-31) is another example of hiding a treatment plant beneath other structures and incorporating other facilities into the plant site for the benefit of the community. The North River Plant was constructed over the Hudson River on a system of piles and encompasses an area of approximately 25 acres. A State Park was then constructed on top of the plant with recreations facilities such as ball and tennis fields to provide additional value to the surrounding community.

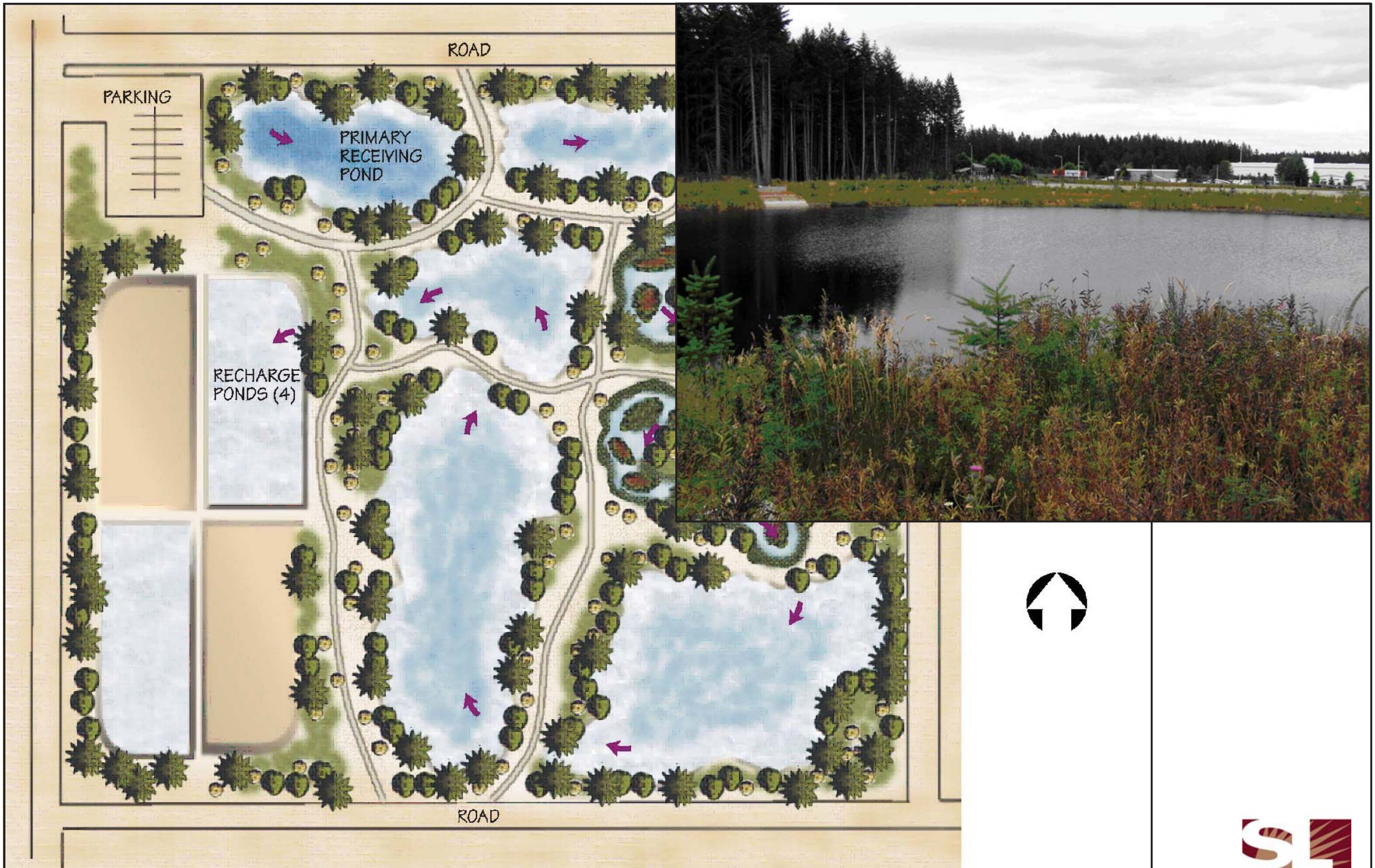
SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

LOTT Martin Way MBR Scalping Facility (5 MGD Capacity on a 3 Acre Site)

Figure 4-26

BROWN AND CALDWELL



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

LOTT Nature Park with Ponds
Wetland and Groundwater Recharge Basins
Figure 4-27

BROWN AND CALDWELL

Example of integrating WWTP Architecture into the Surrounding Land Use (Agricultural Theme)

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

Fulton County WRF - Cauley Creek

Figure 4-28

BROWN AND CALDWELL

Example of intergrating WWTP Architecture into the Surrounding Community Land Use (Sea Side Development)

Salt Lake County

Water Quality Stewardship Plan
Wastewater Element

Crescent City Water Pollution Control, CA

Figure 4-29

BROWN and CALDWELL

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

John's Creek Environmental Campus (WWTP)

Figure 4-30

BROWN AND CALDWELL

Example of a WWTP Beneath a State Park with Community Recreation Facilities on the Surface

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

NYC - North River WWTP

Figure 4-31

BROWN AND CALDWELL

APPENDIX A
REFERENCES

Clara, M., Kreuzinger, N., Strenn, B., Gans, O., and H. Droiss. 2005. The solids retention time – a suitable design parameter to evaluate the capacity of wastewater treatment plants to remove micropollutants. *Water Research.* 39(1):97-106.

Crites and Tchobanoglous. 1998. <u>Small and Decentralized Wastewater Management Systems</u>. WCB/McGraw-Hill.

Daughton C. G. and T.A. Ternes. 1999. Pharmaceutical and Personal Care Products in the Environment: Agents of Subtle Change?, *Env. Health Persp.* 107(6):907-938

Eriksson, E., Auffart, K., Eilersen, A.-M., Henze, M., and A. Ledin. 2003. Household chemicals and personal care products as sources for xenobiotic organic compounds in grey wastewater. *Water SA*. 29(2):135-146.

Joss, A., Andersen, H., Ternes, T., Richie, P., and H. Siegrist. 2004. Removal of estrogens in municipal wastewater treatment under aerobic and anaerobic conditions: consequences for plant optimization. *Env. Sci. Technol.* 38(11):3047-3055.

Monteith, H.D., H.R. Sahely, H.L. MacLean and D.M. Bagley. 2005. A Rational Procedure for Estimation of Greenhouse-Gas Emissions from Municipal Wastewater Treatment Plants. *Water Environment Research.* 77(4):390-403.

Ollers, S.; Singer, H.; Fassler, P. and S. Muller. 2001. Simultaneous quantification of neutral and acidic pharmaceuticals and pesticides at the low-ng/l level in surface and wastewater. *J. Chrom. A.* 911, 225-234.

Osemwengie, L. I. and S. Steinberg. 2001. On-Site Solid-Phase Extraction and Laboratory Analysis of Ultra-Trace Synthetic Musks in Municipal Sewage Effluent Using Gas Chromatography-Mass Spectrometry in the Full-Scan Mode. *J. Chrom. A.* 932, 107-118.

Sedlak, D. L., Gray, J., and K.E. Pinkston. 2000. Understanding Microcontaminants in Recycled Water. *Env. Sci. Technol.* 34(23):508A-515A.

Snyder, S. A., Westerhoff, P., Yoon, Y., and D.L. Sedlak. 2003. Pharmaceuticals, Personal Care Products and Endocrine Disruptors in Water: Implications for the Water Industry. *Env. Eng. Sci.*, 20(5):449-456.

Snyder, S.; Kelly, K., Grange, A., Sovocool, G. W., Snyder, E., and J. Giesy. 2001. Pharmaceuticals and Personal Care Products in the Waters of Lake Mead, Nevada, In *Pharmaceuticals and Personal Care Products in the Environment; Scientific and Regulatory Issues*, Daughton, C. and Jones-Lepp, T. eds., American Chemical Society, Washington DC, Chapter 7.

APPENDIX B

SALT LAKE CITY WATER RECLAMATION FACILITY

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES)
COMBINED FACILITY PERMIT

In an effort to clarify all Water Quality related permit responsibilities under the UPDES permit system and reduce paper work and redundancy this permit effectively combines the provisions of the following permits for **SALT LAKE CITY WATER RECLAMATION FACILITY**:

Major Municipal UPDES Permit No. **UT0021725,** and

UPDES Biosolids Permit No. **UTL021725**

Applicable Provisions of the UPDES Multi-Sector General Permit for Storm Water Discharges, Permit No. **UTR000000**

In compliance with provisions of the Utah *Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended* (the *"Act"*),

SALT LAKE CITY WATER RECLAMATION FACILITY

is hereby authorized to discharge from its wastewater treatment facility to receiving waters named the **OIL DRAIN CANAL** and dispose of biosolids in accordance with specific limitations, outfalls, and other conditions set forth herein.

This permit shall become effective on, January 1, 2004.

This permit expires at midnight on, December 31, 2008.

Signed this 12th day of December 2003.

Don A. Ostler
Executive Secretary
Utah Water Quality Board

DISCHARGE PERMIT NO. UT0021725
BIOSOLIDS PERMIT NO. UTL-021725
STORM WATER PERMIT NO. UTR000000

Table of Contents

I. DISCHARGE – LIMITATIONS AND REPORTING REQUIREMENTS

A. Description of Discharge Points. The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit are violations of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

Outfall Numbers	Location of Discharge Points
001	Discharges to the Oil Drain Canal after passing through 30 acres of wetlands constructed to provide year round habitat for waterfowl and other wildlife. (see below)
003	Discharge directly into Oil Drain Canal. This outfall contains most of the effluent flow

These outfalls are located at approximately 1365 West 2300 North (facility location) at latitude 40°48'51" and longitude 111°55'43".

In 1990, SLCWRF requested a permit modification to reactivate Outfall 001. Approximately one to five million gallons of water per day of secondary treated wastewater is discharged to 30 acres of enhanced wetlands. This water is then discharged back to the Oil Drain Canal through Outfall 003.

B. Narrative Standard. It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by a bioassay or other tests performed in accordance with standard procedures.

C. Specific Limitations and Self-Monitoring Requirements.

NOTE: As in past permits, routine monitoring is required at Outfall 003, but not at Outfall 001. However, violation of any parameter from Outfall 003 will also be viewed as a violation for the same parameter from Outfall 001.

1. Toxicity Limitations for Outfall 003.

Effective immediately, and lasting through the life of this permit, there shall be no acute toxicity in the discharge as defined in *Part VIII*, and determined by test procedures described in *Part VIII. 4 and 5* of this permit.

2. Discharge Water.

a) Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 003. Such discharges shall be limited and monitored by the permittee as specified below:

Parameter	Effluent Limitations			
	Maximum Monthly Average	Maximum Weekly Average	Daily Minimum	Daily Maximum
BOD_5, mg/L BOD_5 Min. % Removal	25 85	35 NA	NA NA	NA NA
TSS, mg/L TSS Min. % Removal	25 85	35 NA	NA NA	NA NA
Fecal Coliforms, No./100mL	200	250	NA	NA
Total Coliforms, No./100mL	2000	2500	NA	NA
WET, Acute Biomonitoring	NA	NA	NA	Pass
pH, Standard Units	NA	NA	6.5	9.0

NA – Not Applicable

Self-Monitoring and Reporting Requirements a/			
Parameter	Frequency	Sample Type	Units
Total Flow b/ c/	Continuous	Recorder	MGD
BOD_5, Influent d/ Effluent	Daily Daily	Composite Composite	mg/L mg/L
TSS, Influent d/ Effluent	Daily Daily	Composite Composite	mg/L mg/L
Fecal Coliforms	Daily	Grab	No./100mL
Total Coliforms	Daily	Grab	No./100mL
WET, Acute Biomonitoring	Quarterly	Composite	Pass/Fail
pH	Daily	Grab	SU
Metals, Influent Effluent	Quarterly Quarterly	Composite Composite	mg/L mg/L
Organic Toxics	Quarterly	Grab	mg/L

a/ See Definitions, *Part VII*, for definition of terms.

b/ Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

c/ If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

d/ In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge.

b) Additional Self-Monitoring and Reporting Requirements.

(1) Influent and Effluent Monitoring and Reporting Requirements. The permittee shall sample and analyze both the influent and effluent quarterly, for the following parameters.

Parameter	Frequency	Sample Type	Units
Total Aluminum	Quarterly	Composite	mg/L
Total Arsenic	Quarterly	Composite	mg/L
Total Cadmium	Quarterly	Composite	mg/L
Total Chromium	Quarterly	Composite	mg/L
Total Copper	Quarterly	Composite	mg/L
Total Cyanide	Quarterly	Composite	mg/L
Total Lead	Quarterly	Composite	mg/L
Total Mercury	Quarterly	Composite/Grab	mg/L
Total Molybdenum	Quarterly	Composite	mg/L
Total Nickel	Quarterly	Composite	mg/L
Total Selenium	Quarterly	Composite	mg/L
Total Silver	Quarterly	Composite	mg/L
Total Zinc	Quarterly	Composite	mg/L

In addition, the permittee shall analyze the treatment facility influent and effluent for the presence of the toxic pollutants listed in *40 CFR 122 Appendix D Table II (Organic Toxic Pollutants)* yearly. The pesticides fraction of *Appendix D, Table II* is suspended unless pesticides are expected to be present.

The results of the analyses of metals, cyanide and toxic organics shall be submitted along with the Discharge Monitoring Report (DMR) at the end of the earliest possible reporting period.

(2) In accordance with the requirements of *40 CFR Part 403.5(c),* the permittee shall determine if there is a need to develop or revise its local limits in order to implement the general and specific prohibitions of *40 CFR Part 403.5 (a)* and *Part 403.5 (b)*. A technical evaluation of the need to develop or revise local limits shall be submitted to the Division within **12 months** of the effective date of this permit. This evaluation should be conducted in accordance with the latest revision of the *Utah Model industrial Pretreatment Program,*

Section 4, Local Limits. If a technical evaluation, which may be based on the *Utah Model Industrial Pretreatment Program, Section 4, Local Limits*, reveals that development or revision of local limits is necessary, the permittee shall submit the proposed local limits revision to the Division of Water Quality in an approvable form, within **12 months** of the Division's determination that a revision is necessary.

(3) The permittee shall do a comprehensive industrial waste survey within 2 years of permit issuance to discover any significant industrial users that may not currently be regulated or monitored.

c) Whole Effluent Testing – Acute Toxicity.

Effective immediately, the permittee shall conduct quarterly acute static replacement toxicity tests on a composite sample of the final effluent. The sample shall be collected at Outfall 003.

The monitoring frequency for acute tests shall be quarterly unless a sample is found to be acutely toxic during a routine test. If that occurs, the monitoring frequency shall become weekly (See *Part I.C.2.d, Accelerated Testing*). Samples shall be collected on a two day progression; i.e., if the first sample is on a Monday, during the next sampling period, the sampling shall begin on a Wednesday, etc.

The replacement static acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. August 1993, EPA/600/4-90/027F* as per *40 CFR 136.3(a) TABLE 1A-LIST OF APPROVED BIOLOGICAL METHODS*, and the *Region VIII EPA NPDES Acute Test Conditions – Static Renewal Whole Effluent Toxicity Test (August, 1997).* In the case of conflicts, the Region VIII procedures will prevail. The permittee shall conduct the 48-hour static replacement toxicity test using Ceriodaphnia dubia and the acute 96-hour static replacement toxicity test using Pimephales promelas (fathead minnow). If necessary for pH adjustment, CO_2 atmosphere can be used.

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the results to be considered valid. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control mortality is achieved. A variance to this requirement may be granted by the Executive Secretary if a mortality of less than 10 percent was observed in higher effluent dilutions.

If the permit contains a total residual chlorine limitation greater than 0.20 mg/L, the permittee may request from the Executive Secretary approval to de-chlorinate the sample, or collect the sample prior to chlorination.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar quarter e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). All test results shall be reported along with the DMR submitted for that reporting period. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Acute Whole Effluent Reporting (August, 1997)* and shall include all chemical and physical data as specified.

If the results for one year of testing indicate no acute toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Executive Secretary may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

d) Accelerated Testing.

When acute toxicity is indicated during routine biomonitoring as specified in this permit, the permittee shall notify the Executive Secretary in writing within five (5) days after becoming aware of the test result. The permittee shall perform an accelerated schedule of biomonitoring to establish whether a pattern of toxicity exists. Accelerated testing will begin within seven (7) days after the permittee becomes aware of the test result. Accelerated testing shall be conducted as specified under *Part I.C.2.e, Pattern of Toxicity*. If the accelerated testing demonstrates no pattern of toxicity, routine monitoring shall be resumed.

e) Pattern of Toxicity.

A pattern of toxicity is defined by the results of a series of up to five (5) biomonitoring tests pursuant to the accelerated testing requirements using 100 percent effluent on the single species found to be more sensitive, once every week for up to five (5) consecutive weeks.

If two (2) consecutive tests (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity) do not result in acute toxicity, no further accelerated testing will be required and no pattern of toxicity will be found to exist. The permittee will provide written verification to the Executive Secretary within five (5) days, and resume routine monitoring.

A pattern of toxicity is established if one of the following occurs:

(1) If two (2) consecutive test results (not including the scheduled quarterly or monthly test, which triggered the search for a pattern of toxicity) indicate acute toxicity, this constitutes an established pattern of toxicity.

(2) If consecutive tests continue to yield differing results each time, the permittee will be required to conduct up to a maximum of five (5) acute tests (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity). If three out of five test results indicate acute toxicity, this will constitute an established pattern of toxicity.

f) Preliminary Toxicity Investigation.

(1) When a pattern of toxicity is detected the permittee will notify the Executive Secretary in writing within five (5) days and begin an evaluation of the possible causes of the toxicity. The permittee will have fifteen (15) working days from demonstration of the pattern to complete a Preliminary Toxicity Investigation (PTI) and submit a written report of the results to the Executive Secretary. The PTI may include, but is not limited to, additional chemical and biological monitoring, examination of pretreatment program records, examination of discharge monitoring reports, a thorough review of the testing protocol, evaluation of treatment processes and chemical use, inspection of material storage and transfer areas to determine if a spill may have occurred, and similar procedures.

(2) If the PTI identifies a probable toxicant and/or a probable source of toxicity the permittee shall submit, as part of its final results written notification of that effect to the Executive Secretary. Within thirty (30) days of completing the PTI the permittee shall submit

for approval a control program to control effluent toxicity and shall proceed to implement such a plan within seven (7) days following approval. The control program, as submitted to or revised by the Executive Secretary, may be incorporated into the permit.

(3) If no probable explanation for toxicity is identified in the PTI, the permittee shall notify the Executive Secretary as part of its final report, along with a schedule for conducting a Phase I Toxicity Reduction Evaluation (TRE) (See *Part I.C.2.g, Toxicity Reduction Evaluation*).

(4) If toxicity spontaneously disappears during the PTI, the permittee shall submit written notification to that effect to the Executive Secretary as part of the reporting requirements of paragraph a. of this section.

g) Toxicity Reduction Evaluation (TRE).

If toxicity is detected during the life of this permit and it is determined by the Executive Secretary that a TRE is necessary, the permittee shall be so notified and shall initiate a TRE immediately thereafter. The purpose of the TRE will be to establish the cause of toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity.

A TRE may include but is not limited to one, all, or a combination of the following:

(5) Phase I – Toxicity Characterization

(6) Phase II – Toxicity Identification Procedures

(7) Phase III – Toxicity Control Procedures

(8) Any other appropriate procedures for toxicity source elimination and control.

If the TRE establishes that the toxicity cannot be immediately eliminated, the permittee shall submit a proposed compliance plan to the Executive Secretary. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the Executive Secretary, this permit may be reopened and modified.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations, the permittee may:

(a) Submit an alternative control program for compliance with the numerical requirements.

(b) If necessary, provide a modified biomonitoring protocol, which compensates for the pollutant(s) being controlled numerically.

If acceptable to the Executive Secretary, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the Executive Secretary, and/or a modified biomonitoring protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the Executive Secretary, shall be considered a violation of this permit.

D. Reporting of Monitoring Results.

1. Discharge Water. Monitoring results obtained during the previous month shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. The first report is due on . If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part VII.G)*, and submitted to the Director, Division of Water Quality and to EPA at the following addresses:

original to: Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870

copy to: Technical Enforcement Program (8ENF-T)
Office of Enforcement,
Compliance Assistance & Environmental Justice
US EPA Region VIII

999 18th Street, Suite 500
Denver, CO 80202-2466

II. BIOSOLIDS REQUIREMENTS

A. Biosolids Treatment and Disposal.

The authorization to dispose of biosolids provided under this permit is limited to those biosolids produced from the treatment works owned and operated by the Salt Lake City Water Reclamation Facility (SLCWRF). The treatment methods and disposal practices are specifically designated below.

1. Treatment. The solids are stabilized in anaerobic digesters with a mean cell residence time of at least 15 days at a minimum temperature of 95^{o} F (35^{o} C). The biosolids are wasted to drying beds and turned mechanically for de-watering.

   Description of Biosolids Disposal Methods:

   a) Class B biosolids may be land applied at agronomic rates for agriculture production.

   b) Class B biosolids may be land applied at up to 5 times the agronomic rate at Utah Kennecott Copper Corporation for land reclamation.

   c) Biosolids may be landfilled (must meet the requirements of *40 CFR 258*, *Utah Administrative Code R315-301-5* and *Section 2.12* of the latest version of the *EPA Region VIII Biosolids Management Handbook* must be followed).

   d) Biosolids may be disposed at ET Technologies, further treated, and used for final cover at the Salt Lake County Landfill.

2. Changes in Treatment Systems and Disposal Practices. Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Executive Secretary at least 180 days in advance. This includes, but is not limited to, the addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change, which would require a major modification of the permit.

B. Specific Limitations and Monitoring Requirements.

1. Class B Metals Limitations.
If the biosolids are to be land applied for agriculture or reclamation purposes the biosolids must meet the metals limitations as described below.

Pollutant	Table 1	Table 2	Table 3	Table 4
All metals concentrations shall be measured and reported on a dry weight basis	Daily Maximum mg/Kg a/	Cumulative Loading Kg/Ha	Monthly Average mg/Kg a/	Annual Loading Kg/Ha/365 day Period
Total Arsenic	75	41	41	2.0
Total Cadmium	85	9	39	1.9
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15
Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	75.0	N/A
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5.0
Total Zinc	7500	2800	2800	140

2. Class B Pathogen Limitations.
If the biosolids are to be land applied for agriculture or reclamation purposes the biosolids must meet the pathogen limitations as described below.

Fecal Coliform Limits		The process to significantly reduce pathogens will be met by:
Fecal coliform shall be < 2,000,000 MPN/g of total solids.	**OR**	The solids from the primary and secondary clarifiers are stabilized in anaerobic digesters with a mean cell residence time of at least 15 days at a minimum of 95^{o} F (36.6^{o} C) a/.

3. Vector Attraction Reduction Requirements a/.

If the biosolids are to be land applied for agriculture or reclamation purposes the biosolids must meet the vector attraction reduction requirement as described below.

a. The SLCWRF will meet vector attraction reduction through a 38% reduction of the volatile solids through time and temperature of the digesters.

a/ There are additional pathogen reduction and vector attraction reduction alternatives available in *40 CFR 503.32* and *40 CFR 503.33.* If the permittee intends to use one of these alternatives the Executive Secretary and the EPA must be informed at least 30 days prior to its use. This change may be made without additional public notice.

4. Self-Monitoring Requirements

a. At a minimum, upon the effective date of this permit, all metals, pathogens and applicable vector attraction reduction requirements shall be monitored according to *40 CFR 503.16,*as described below.

Minimum Frequency of Monitoring	
Dry Metric Tons (DMT) of Biosolids Disposed Per Year	Monitoring Frequency
> 290 to < 1,500, DMT	Four times per year
> 1,500 to < 15,000, DMT	Six times per year

b. Deep soil monitoring for nitrate-nitrogen is required for all land application sites (does not apply to sites where biosolids are applied less than once every five years). A minimum of six sample sites for each 320 (or less) acre area are to be collected. These samples are to be collected down to either 5 feet or to the confining layer, whichever is shallower. Each one-foot increment is to be a composite with the other samples from the site and one analysis for nitrate is to be done for each increment. Samples are required to be taken once every five years for non-irrigated sites or annually for irrigated sites.

c. Soil monitoring for phosphorus (reported as P) is required for all land application sites (does not apply to sites where biosolids are applied less than once every five years). Six samples of one-foot depth each are to be collected for each

320-acre area and composited. Samples are required to be taken once every five years for non-irrigated sites or annually for irrigated sites.

d. Sample collection, preservation and analysis shall be performed in a manner consistent with the requirements of *40 CFR Part 503* and/or other criteria specified in this permit. Metals analysis is to be performed using *Method SW 846* with *Method 3050* used for digestion. For the digestion procedure, an amount of biosolids equivalent to one gram dry weight shall be used. The methods are also described in the latest version of the *Region VIII Biosolids Management Handbook*. Monitoring for soil nitrate and phosphorus is to be performed using the methods in *Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties*. Page, A. L., Ed., American Society of Agronomy and Soil Science Society of America, Madison, WI, 1982.

e. The Executive Secretary may request additional monitoring for specific pollutants derived from biosolids if the data shows a potential for concern.

f. After two years of monitoring at the frequency specified, the permittee may request that the Executive Secretary reduce the sampling frequency for the chemical pollutants in Part II.C.1. The frequency cannot be reduced to less than once per year for land applied biosolids for any parameter. The frequency also cannot be reduced for any of the pathogen or vector attraction reduction requirements listed in this permit.

C. <u>Site Restrictions</u>

If the biosolids are Class B with respect to pathogens, the SLCWRF shall comply with all applicable site restrictions listed below:

1. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application.

2. Food crops with harvested parts below the land surface shall not be harvested for 20 months after application if the biosolids remains on the land surface for four months or more prior to incorporation into the soil.

3. Other food crops and feed crops shall not be harvested from the land for 30 days after application.

4. Animals shall not be allowed to graze on the land for 30 days after application.

5. Turf grown on land where biosolids is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.

6. Public access to land with a high potential for public exposure shall be restricted for one year after application.

7. Public access to land with a low potential for public exposure shall be restricted for 30 days after application.

D. <u>Management Practices for Application of Biosolids to Land</u>

The permittee shall operate and maintain the land application site operations in accordance with the following requirements:

1. The permittee shall provide to the Executive Secretary and the EPA within 90 days of the effective date of this permit a land application plan.

2. Application of biosolids shall be conducted in a manner that will not contaminate the groundwater or impair the use classification for that water underlying the sites.

3. Application of biosolids shall be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application sites. Biosolids shall not be applied to land 10 meters or less from waters of the United States (as defined in *40 CFR 122.2*).

4. No person shall apply biosolids for beneficial use to frozen, ice-covered, or snow-covered land where the slope of such land is greater than three percent and is less than or equal to six percent unless one of the following requirements is met:

   a. there is 80 percent vegetative ground cover; or,

   b. approval has been obtained based upon a plan demonstrating adequate runoff containment measures.

5. Application of biosolids is prohibited to frozen, ice-covered, or snow covered sites where the slope of the site exceeds six percent.

6. Biosolids shall not be applied to sites where the available phosphorous content of the soil exceeds the following:

   a. 100 ppm as determined by the sodium bicarbonate extraction method

   b. 50 ppm as determined by the AB-DPTA extraction method

   c. 170 ppm as determined by the Bray P1 extraction method

7. Application of biosolids shall be conducted in a manner that does not exceed the agronomic rate for available nitrogen of the crops grown on the site. At a minimum, the permittee is required to follow the methods for calculating agronomic rate outlined in the latest version of the *Region VIII Biosolids Management Handbook* (other methods may be approved by the Executive Secretary). The treatment plant shall provide written notification to the applier of the biosolids of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids. Written permission from the Executive Secretary is required to exceed the agronomic rate.

   The permittee may request the limits of Part II, D., 6 and 7 be modified if different limits would be justified based on local conditions. The limits are required to be developed in cooperation with the local agricultural extension office or university.

8. Biosolids shall not be applied to any site area with standing surface water. If the annual high groundwater level is known or suspected to be within five feet of the surface, additional deep soil monitoring for nitrate-nitrogen as described in Part II.4.c. is to be performed. At a minimum, this additional monitoring will involve a collection of more samples in the affected area and possibly more frequent sampling. The exact number of samples to be collected will be outlined in a deep soil monitoring plan to be submitted to the Executive Secretary and the EPA within 90 days of the effective date of this permit. The plan is subject to approval by the Executive Secretary.

9. The specified cover crop shall be planted during the next available planting season. If this does not occur, the permittee shall notify the Executive Secretary in writing. Additional restrictions may be placed on the application of the biosolids on that site on a case-by-case basis to control nitrate movement. Deep soil monitoring may be increased under the discretion of the Executive Secretary.

10. When weather and or soil conditions prevent adherence to the biosolids application procedure, biosolids shall not be applied on the site.

11. For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

    a. The name and address of the person who prepared the biosolids for sale or give away for application to the land.

    b. A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

    c. The annual whole biosolids application rate for the biosolids that do not cause the annual metals loading rates in Table 4 (Part II.C.1.) to be exceeded.

12. Biosolids subject to the cumulative pollutant loading rates in Table 2 (Part II.C.1.) shall not be applied to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in Table 2 have been reached.

13. If the treatment plant applies the biosolids, it shall provide the owner or leaseholder of the land on which the biosolids are applied notice and necessary information to comply with the requirements in this permit.

14. The permittee shall inspect the application of the biosolids to active sites to prevent malfunctions and deterioration, operator errors and discharges, which may cause or lead to the release of biosolids to the environment or a threat to human health. The permittee must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment. The permittee shall keep an inspection log or summary including at least the date and time of inspection, the printed name and the handwritten signature of the inspector, a notation of observations made and the date and nature of any repairs or corrective action.

E. Special Conditions on Biosolids Storage

Permanent storage of biosolids is prohibited. Biosolids shall not be temporarily stored for more than two years. Written permission to store biosolids for more than two years must be obtained from the Executive Secretary. Storage of biosolids for more than two years will be allowed only if it is determined that significant treatment is occurring.

F. Representative Sampling.

Biosolids samples used to measure compliance with Part II.B. of this Permit shall be collected at locations representative of the quality of biosolids generated at the treatment works and immediately prior to land application.

G. Reporting of Monitoring Results.

The permittee shall provide the results of all monitoring performed in accordance with Part II.B., and information on management practices, biosolids treatment, site restrictions and certifications shall be provided no later than February 19 of each year. Each report is for the previous calendar year. If no biosolids were sold or given away during the reporting period, "no biosolids were sold or given away" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the *Signatory Requirements (see Part IV)*, and submitted to the Utah Division of Water Quality and the EPA at the following addresses:

Original to: Biosolids Coordinator
Utah Division of Water Quality
P. O. Box 144870
Salt Lake City Utah, 84114-4870

Copy to: Biosolids Coordinator, 8P-W-P
U. S. Environmental Protection Agency
Region VIII
999 18th Street, Suite 500
Denver, Colorado 80202-2466

H. Additional Record Keeping Requirements Specific to Biosolids.

1. If so notified by the Executive Secretary the permittee may be required to add additional record keeping if information provided indicates that this is necessary to protect public health and the environment.

2. The permittee is required to keep the following information for at least 5 years:

   a) Concentration of each metal in Table 3 (Part II.B.1.).

   b) A description of how the pathogen reduction requirements in Part II.B.2. were met.

   c) A description of how the vector attraction reduction requirements in Part II.B.3. were met.

   d) A description of how the management practices in Part II.C. were met (if necessary).

   e) The following certification statement:

"I certify under the penalty of law, that the metals requirements, the pathogen requirements, and the vector attraction requirements in Part II.B., the site restrictions and the management practices in Part II.C have been met. This determination has been made under my direction and supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, the vector attraction reduction requirements and the management practices have been met. I am aware that there are significant penalties for false certification including the possibility of imprisonment."

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and 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 the life of the permit. Data collected on site, copies of Biosolids Report forms, and a copy of this UPDES biosolids-only permit must be maintained on site during the duration of activity at the permitted location.

III. STORM WATER REQUIREMENTS

A. Coverage of This Section.

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to storm water discharges from **Salt Lake City Water Reclamation Facility**.

   a) Site Coverage. Storm water discharges from the following portions of the **Salt Lake City Water Reclamation Facility** may be eligible for coverage under this permit: biosolids drying beds, haul or access roads on which transportation of biosolids may occur, grit screen cleaning areas, chemical loading, unloading and storage areas, salt or sand storage areas, vehicle or equipment storage and maintenance areas, or any other wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of sewage sludge that are located within the confines of the facility that may have the reasonable expectation of potential to contribute to pollutants in storm water discharge

B. Prohibition of Non-Storm Water Discharges.

1. The following non-storm water discharges may be authorized under this permit provided the non-storm water component of the discharge is in compliance with this section; discharges from fire fighting activities; fire hydrant flushing; potable water sources including waterline flushing; drinking fountain water; irrigation drainage and lawn watering; routine external building wash down water where detergents or other compounds have not been used in the process; pavement wash waters where spills or leaks of toxic or hazardous materials (including oils and fuels) have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated compressor condensate; uncontaminated springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

C. Storm Water Pollution Prevention Plan Requirements.

1. Contents of the Plan. The plan shall include, at a minimum, the following items:

   a) Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team who are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

   b) Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility.

Each plan shall identify all activities and significant materials, which may be reasonably expected to have the potential as a significant pollutant source. Each plan shall include, at a minimum:

1) Drainage. A site map indicating drainage areas and storm water outfalls. For each area of the facility that generates storm water discharges associated with the waste water treatment related activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow and an identification of the types of pollutants that are likely to be present in storm water discharges associated with the activity. Factors to consider include the toxicity of the pollutant; quantity of chemicals used, produced or discharged; the likelihood of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified. The site map shall include but not be limited to:

    (a) Drainage direction and discharge points from all wastewater associated activities including but not limited to grit screen cleaning, bio-solids drying beds and transport, chemical/material loading, unloading and storage areas, vehicle maintenance areas, salt or sand storage areas.

    (b) Location of any erosion and sediment control structure or other control measures utilized for reducing pollutants in storm water runoff.

    (c) Location of bio-solids drying beds where exposed to precipitation or where the transportation of bio-solids may be spilled onto internal roadways or tracked off site.

    (d) Location where grit screen cleaning or other routinely performed industrial activities are located and are exposed to precipitation.

    (e) Location of any handling, loading, unloading or storage of chemicals or potential pollutants such as caustics, hydraulic fluids, lubricants, solvents or other petroleum products, or hazardous wastes and where these may be exposed to precipitation.

    (f) Locations where any major spills or leaks of toxic or hazardous materials have occurred.

    (g) Location of any sand or salt piles.

    (h) Location of fueling stations or vehicle and equipment maintenance and cleaning areas that are exposed to precipitation.

    (i) Location of receiving streams or other surface water bodies.

    (j) Locations of outfalls and the types of discharges contained in the drainage areas of the outfalls.

2) Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of 3 years prior to the effective date of this permit and the present; method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of 3 years prior to the effective date of this permit and the present; the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

3) Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility after the date of 3 years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

4) Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility, including a summary of sampling data collected during the term of this permit.

5) Summary of Potential Pollutant Sources and Risk Assessment. A narrative description of the potential pollutant sources from the following activities associated with treatment works: access roads/rail lines; loading and unloading operations; outdoor storage activities; material handling sites; outdoor vehicle storage or maintenance sites; significant dust or particulate generating processes; and onsite waste disposal practices. Specific potential pollutants shall be identified where known.

6) Measures and Controls. **Salt Lake City Water Reclamation Facility** shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

7) Good Housekeeping. All areas that may contribute pollutants to storm waters discharges shall be maintained in a clean, orderly manner. These are practices that would minimize the generation of pollutants at the source or before it would be necessary to employ sediment ponds or other control measures at the discharge outlets. Where applicable, such measures or other equivalent measures would include the following: sweepers and covered storage to minimize dust generation and storm runoff; conservation of vegetation where possible to minimize erosion; sweeping of haul roads, bio-solids access points, and exits to reduce or eliminate off site tracking; sweeping of sand or salt storage areas to minimize entrainment in storm water runoff; collection, removal, and proper disposal of waste oils and other fluids resulting from

vehicle and equipment maintenance; other equivalent measures to address identified potential sources of pollution.

8) Preventive Maintenance. A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices (e.g., cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

9) Spill Prevention and Response Procedures. Areas where potential spills that can contribute pollutants to storm water discharges can occur, and their accompanying drainage points, shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures and equipment for cleaning up spills shall be identified in the plan and made available to the appropriate personnel.

10) Inspections. In addition to the comprehensive site evaluation required under paragraph (*Part III.C.1.b.16)* of this section, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility on a periodic basis. The following areas shall be included in all inspections: access roads/rail lines, equipment storage and maintenance areas (both indoor and outdoor areas); fueling; material handling areas, residual treatment, storage, and disposal areas; and wastewater treatment areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained. The use of a checklist developed by the facility is encouraged.

11) Employee Training. Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify how often training will take place, but training should be held at least annually (once per calendar year). Employee training must, at a minimum, address the following areas when applicable to a facility: petroleum product management; process chemical management; spill prevention and control; fueling procedures; general good housekeeping practices; proper procedures for using fertilizers, herbicides and pesticides.

12) Record keeping and Internal Reporting Procedures. A description of incidents (such as spills, or other discharges), along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

13) Non-storm Water Discharges.

   (a) Certification. The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with *Part VII.G* of this permit.

   (b) Exceptions. Except for flows from fire fighting activities, sources of non-storm water listed in *Part III.B.* (Prohibition of Non-storm Water Discharges) of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

   (c) Failure to Certify. Any facility that is unable to provide the certification required (testing for non-storm water discharges), must notify the *Executive Secretary* within 180 days after the effective date of this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible. Non-storm water discharges to waters of the State, which are not, authorized by a *UPDES* permit are unlawful, and must be terminated.

14) Sediment and Erosion Control. The plan shall identify areas, which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion.

15) Management of Runoff. The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the generation or source(s) of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures that the permittee determines to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity *Part III.C.1.b* (Description of Potential Pollutant Sources) of this permit] shall be considered when determining reasonable and appropriate measures. Appropriate measures or other equivalent measures may include: vegetative swales and practices, reuse of

collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, wet detention/retention devices and discharging storm water through the waste water facility for treatment.

16) Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but in no case less than once a year. Such evaluations shall provide:

(a) Areas contributing to a storm water discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

(b) Based on the results of the evaluation, the description of potential pollutant sources identified in the plan in accordance with *Part III.C.1.b* (Description of Potential Pollutant Sources) of this section and pollution prevention measures and controls identified in the plan in accordance with *Part III.C.1.b.6* (Measures and Controls) of this section shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than 12 weeks after the evaluation.

(c) A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph *i.* (above) shall be made and retained as part of the storm water pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with *Part VII.G* (Signatory Requirements) of this permit.

17) Deadlines for Plan Preparation and Compliance. **Salt Lake City Water Reclamation Facility** shall prepare and implement a plan in compliance with the provisions of this section within 270 days of the effective date of this permit.

18) Keeping Plans Current. **Salt Lake City Water Reclamation Facility** shall amend the plan whenever there is a change in design, construction, operation,

or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the state or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified by the plan, or in otherwise achieving the general objective of controlling pollutants in storm water discharges associated with the activities at the facility.

D. Monitoring and Reporting Requirements.

1. Quarterly Visual Examination of Storm Water Quality. Facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination must be made at least once in each of the following designated periods during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event: January through March; April through June; July through September; and October through December.

   a) Sample and Data Collection. Examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

   b) Visual Storm Water Discharge Examination Reports. Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

   c) Representative Discharge. When **Salt Lake City Water Reclamation Facility** has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the observation data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

d) Adverse Conditions. When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the results of the visual examination. Adverse weather conditions, which may prohibit the collection of samples, include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

e) Inactive and Unstaffed Site. When a discharger is unable to conduct visual storm water examinations at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirement as long as the facility remains inactive and unstaffed. The facility must maintain a certification with the pollution prevention plan stating that the site is inactive and unstaffed so that performing visual examinations during a qualifying event is not feasible.

IV. INDUSTRIAL PRETREATMENT PROGRAM

A. The permittee has been delegated primary responsibility for enforcing against discharges prohibited by *40 CFR 403.5* and applying and enforcing any national Pretreatment Standards established by the United States Environmental Protection Agency in accordance with Section 307 (b) and (c) of *The Clean Water Act (CWA)*, as amended by *The Water Quality Act (WQA), of 1987*.

The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, and procedures described in the permittee's approved Pretreatment Program submission. Such program commits the permittee to do the following:

2. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the pretreatment standards. At a minimum, all significant industrial users shall be inspected and sampled by the permittee at least once per year;

2. Control through permit, order, or similar means, the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements;

3. Require development, as necessary, of compliance schedules by each industrial user for the installation of control technologies to meet applicable pretreatment standards;

4. Maintain and update industrial user information as necessary, to ensure that all IUs are properly permitted and/or controlled at all times;

5. Enforce all applicable pretreatment standards and requirements and obtain appropriate remedies for noncompliance by any industrial user;

6. Annually publish a list of industrial users that were determined to be in significant noncompliance during the previous year. The notice must be published before March 28 of the following year;

7. Maintain an adequate revenue structure and staffing level for continued implementation of the Pretreatment Program.

8. Evaluate all significant industrial users at least once every two years to determine if they need to develop a slug prevention plan. If a slug prevention plan is required, the permittee shall insure that the plan contains at least the minimum elements required in *40 CFR 403.8(f)(2)(v);*

9. Notify all significant industrial users of their obligation to comply with applicable requirements under *Subtitles C and D* of the *Resource Conservation and Recovery Act (RCRA)*; and

10. Develop, implement, and maintain an enforcement response plan as required by *40 CFR 403.8(f)(5)* which shall, at a minimum,

    a) Describe how the POTW will investigate instances of noncompliance;

    b) Describe the types of escalating enforcement responses the POTW will take in response to all anticipated type of industrial user violations; and

    c) Describe the time periods within which such responses will be taken and identify the POTW staff position(s) responsible for pursuing these actions.

11. Establish and enforce specific local limits as necessary to implement the provisions of the *40 CFR Parts 403.5(a)* and *(b)*, and as required by *40 CFR Part 403.5(c)*.

B. The permittee is required to modify its pretreatment program, as necessary, to reflect changes in the regulations of *40 CFR 403*. Such modifications shall be completed within the time frame set forth by the applicable regulations. Modification of the approved pretreatment program must be done in accordance with the requirements of *40 CFR 403.18*. Modifications of the approved program which result in less stringent industrial user requirements shall not be effective until after approval has been granted by the Executive Secretary.

C. The permittee shall provide the Division of Water Quality and EPA with an annual report briefly describing the permittee's pretreatment program activities over the previous calendar year. Reports shall be submitted no later than March 28 of each year. These annual reports shall, at a minimum, include:

1. An updated listing of the permittee's industrial users.

2. A descriptive summary of the compliance activities including numbers of any major enforcement actions, i.e., administrative orders, penalties, civil actions, etc.

3. An assessment of the compliance status of the permittee's industrial users and the effectiveness of the permittee's Pretreatment Program in meeting its needs and objectives.

4. A summary of all sampling data taken of the influent and effluent for those pollutants listed in *Part I.C.*

5. A description of all substantive changes made to the permittee's pretreatment program referenced in *Section B* of this section. Substantive changes include, but are not limited to, any change in any ordinance, major modification in the program's administrative structure or operating agreement(s), a significant reduction in monitoring, or a change in the method of funding the program.

6. Other information as may be determined necessary by the Executive Secretary.

D. Pretreatment standards (*40 CFR 403.5*) specifically prohibit the introduction of the following pollutants into the waste treatment system from any source of non-domestic discharge:

1. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140^{o}F (60^{o}C);

2. Pollutants, which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;

3. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference;

4. Any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a discharge at such volume or strength as to cause interference in the POTW;

5. Heat in amounts, which will inhibit biological activity in the POTW, resulting in interference, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104^{o}F (40^{o}C);

6. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

7. Pollutants, which result in the presence of toxic gases, vapor, or fumes within the POTW in a quantity that may cause worker health or safety problems;

8. Any trucked or hauled pollutants, except at discharge points designated by the POTW; or

9. Any pollutant that causes pass through or interference at the POTW.

10. Any specific pollutant which exceeds any local limitation established by the POTW in accordance with the requirement of *40 CFR 403.5(c)* and *40 CFR 403.5(d).*

E. In addition to the general and specific limitations expressed in *Part A and D* of this section, applicable National Categorical Pretreatment Standards must be met by all industrial users of the POTW. These standards are published in the federal regulations at *40 CFR 405* et. seq.

F. *UCA 19-5-104* provides that the State may issue a notice to the POTW stating that a determination has been made that appropriate enforcement action must be taken against an industrial user for noncompliance with any pretreatment requirements within 30 days. The issuance of such notice shall not be construed to limit the authority of the Executive Secretary.

G. The Executive Secretary retains the right to take legal action against any industrial user and/or POTW for those cases where a permit violation has occurred because of the failure of an industrial user to meet an applicable pretreatment standard.

V. MONITORING, RECORDING & ADDITIONAL REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10 and 40CFR Part 503*, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The *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 six months per violation, or by both.

D. Compliance Schedules. 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.

E. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* and *40 CFR 503* 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 or the Biosolids Report Form. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

F. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements:
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

G. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and 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 five years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location.

H. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 538-6146, or 24-hour answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

   a) Any noncompliance which may endanger health or the environment;

   b) Any unanticipated bypass, which exceeds any effluent limitation in the permit (See *Part VI.G, Bypass of Treatment Facilities.)*;

   c) Any upset which exceeds any effluent limitation in the permit (See *Part VI.H, Upset Conditions*.);

   d) Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit; or,

   e) Violation of any of the Table 3 metals limits, the pathogen limits, the vector attraction reduction limits or the management practices for biosolids that have been sold or given away.

3. A written submission shall also be provided within five days of the time that 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;

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

e) Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Executive Secretary may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 538-6146.

5. Reports shall be submitted to the addresses in *Part I.D, Reporting of Monitoring Results*.

I. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part I.D* are submitted. The reports shall contain the information listed in *Part IV.F*.

J. Inspection and Entry. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. 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 the permit;

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

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, including but not limited to, biosolids treatment, collection, storage facilities or area, transport vehicles and containers, and land application sites;

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location, including, but not limited to, digested biosolids before dewatering, dewatered biosolids, biosolids transfer or staging areas, any ground or surface waters at the land application sites or biosolids, soils, or vegetation on the land application sites; and,

5. The permittee shall make the necessary arrangements with the landowner or leaseholder to obtain permission or clearance, the Executive Secretary, or authorized representative, upon the presentation of credentials and other

documents as may be required by law, will be permitted to enter without delay for the purposes of performing their responsibilities.

VI. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The *Act* provides that any person who violates a permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions or the Act is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at *Part VI.G, Bypass of Treatment Facilities* and *Part VI.H, Upset Conditions*, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. 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.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment. The permittee shall also take all reasonable steps to minimize or prevent any land application in violation of this permit.

E. 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 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.

F. Removed Substances. Collected screening, grit, solids, sludge, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to *paragraph 2 and 3* of this section.

2. Prohibition of Bypass.

   a) Bypass is prohibited, and the Executive Secretary may take enforcement action against a permittee for bypass, unless:

      1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;

      2) There were no feasible alternatives to 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 preventive maintenance, and

      3) The permittee submitted notices as required under *section VI.G.3*.

   b) The executive Secretary may approve an anticipated bypass, after considering its adverse effects, if the Executive Secretary determines that it will meet the three conditions listed in *sections VI.G.2.a (1), (2) and (3)*.

3. Notice.

   a) Anticipated bypass. Except as provided above in *section VI.G.2* and below in *section VI.G.3.b*, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Executive Secretary:

      1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages:

      2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Executive Secretary in advance of any changes to the bypass schedule;

3) Description of specific measures to be taken to minimize environmental and public health impacts;

4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and,

6) Any additional information requested by the Executive Secretary.

b) Emergency Bypass. Where ninety days advance notice is not possible, the permittee must notify the Executive Secretary, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Executive Secretary the information in *section VI.G.3.a.(1) through (6)* to the extent practicable.

c) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass to the Executive Secretary as required under *Part IV.H*, Twenty Four Hour Reporting. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of P*aragraph 2* of this section are met. Executive Secretary's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. 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:

a) An upset occurred and that the permittee can identify the cause(s) of the upset;

b) The permitted facility was at the time being properly operated;

c) The permittee submitted notice of the upset as required under *Part V.H, Twenty-four Hour Notice of Noncompliance Reporting*; and,

d) The permittee complied with any remedial measures required under *Part VI.D, Duty to Mitigate*.

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

VII.GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of parameters discharged or pollutant sold or given away. This notification applies to pollutants, which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Executive Secretary of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.

F. 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 Executive Secretary, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a) The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,

   b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

3. Changes to authorization. If an authorization under *paragraph VII.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *paragraph VII.G.2.* must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. <u>Penalties for Falsification of Reports</u>. The *Act* 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 $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Executive Secretary. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Executive Secretary at least 20 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee's containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph *2* above.

N. State or Federal Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.

O. Water Quality - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. A revision to the current Water Quality Management Plan is approved and adopted which calls for different effluent limitations than contained in this permit.

P. Biosolids – Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate biosolids limitations (and compliance schedule, if necessary), management practices, other appropriate requirements to protect public health and the environment, or if there have been substantial changes (or such changes are planned) in biosolids use or disposal practices; applicable management practices or numerical limitations for pollutants in biosolids have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittees biosolids use or land application practices do not comply with existing applicable state of federal regulations.

Q. Toxicity Limitation - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;

1. Toxicity is detected, as per *Part I.C.2.c* of this permit, during the duration of this permit.

2. The TRE results indicate that compliance with the toxic limits will require an implementation schedule past the date for compliance and the Executive Secretary agrees with the conclusion.

3. The TRE results indicate that the toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits, and the Executive Secretary agrees that numerical controls are the most appropriate course of action.

4. Following the implementation of numerical control(s) of toxicant(s), the Executive Secretary agrees that a modified biomonitoring protocol is

necessary to compensate for those toxicant that are controlled numerically.

5. The TRE reveals other unique conditions or characteristics, which in the opinion of the permit issuing authority justify the incorporation of unanticipated special conditions in the permit.

R. <u>Storm Water-Reopener Provision</u>. At any time during the duration (life) of this permit, this permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "waters-of-State".

VIII. DEFINITIONS

1. The "30-day (and monthly) average," other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

3. The “7-day (and weekly) average”, other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains Saturday.

4. “Daily Maximum” (Daily Max.) is the maximum value allowable in any single sample or instantaneous measurement.

5. “Composite Samples” shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

   a) Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

   b) Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

   c) Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every “X” gallons of flow); and,

   d) Continuous sample volume, with sample collection rate proportional to flow rate.

6. A “grab” sample, for monitoring requirements, is defined as a single “dip and take” sample collected at a representative point in the discharge stream.

7. An “instantaneous” measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

8. “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 operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

9. “Bypass,” means the diversion of waste streams from any portion of a treatment facility.

10. “Severe Property Damage,” means substantial physical damage to property, damage to the treatment facilities 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.

11. “Executive Secretary,” means Executive Secretary of the Utah Water Quality Board.

12. “EPA,” means the United States Environmental Protection Agency.

13. “Acute Toxicity” occurs when 50 percent or more mortality is observed for either test species at any effluent concentration.

14. “Act,” means the *Utah Water Quality Act*.

15. “CWA,” means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.

16. “Storm Water,” means storm water runoff, snow melt runoff, and surface runoff and drainage.

17. “Biosolids,” means any material or material derived from sewage solids that have been biologically treated.

18. “Dry Weight-Basis,” means 100 percent solids (i.e. zero percent moisture).

19. “Land Application” is the spraying or spreading of biosolids onto the land surface; the injection of biosolids below the land surface; or the incorporation of

biosolids into the land so that the biosolids can either condition the soil or fertilize crops or vegetation grown in the soil. Land application includes distribution and marketing (i.e. the selling or giving away of the biosolids).

20. "Pathogen," means an organism that is capable of producing an infection or disease in a susceptible host.

21. "Pollutant" for the purposes of this permit is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organisms that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food-chain, could on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms.

22. "Runoff" is rainwater, leachate, or other liquid that drains over any part of a land surface and runs off the land surface.

23. "Similar Container" is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

24. "Total Solids" are the materials in the biosolids that remain as a residue if the biosolids are dried at 103^{o} or 105^{o} Celsius.

25. "Treatment Works" are either Federally owned, publicly owned, or privately owned devices or systems used to treat (including recycling and reclamation) either domestic sewage or a combination of domestic sewage and industrial waste or liquid manure.

26. "Vector Attraction" is the characteristic of biosolids that attracts rodents, flies mosquito's or other organisms capable of transporting infectious agents.

27. "Animals" for the purpose of this permit are domestic livestock.

28. "Annual Whole Sludge Application Rate" is the amount of sewage sludge (dry-weight basis) that can be applied to a unit area of land during a cropping cycle.

29. "Agronomic Rate is the whole sludge application rate (dry-weight basis) designed to: (1) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (2) minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

30. "Annual Pollutant Loading Rate" is the maximum amount of a pollutant (dry-weight basis) that can be applied to a unit area of land during a 365-day period.

31. "Application Site or Land Application Site" means all contiguous areas of a users' property intended for sludge application.

32. "Cumulative Pollutant Loading Rate" is the maximum amount of an inorganic pollutant (dry-weight basis) that can be applied to a unit area of land.

33. "Grit and Screenings" are sand, gravel, cinders, other materials with a high specific gravity and relatively large materials such as rags generated during preliminary treatment of domestic sewage at a treatment works and shall be disposed of according to *40 CFR 258*.

34. "High Potential for Public Contact Site" is land with a high potential for contact by the public. The includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and gold courses.

35. "Low Potential for Public Contact Site" is the land with a low potential for contact by the public. This includes, but is not limited to, farms, ranches, reclamation areas, and other lands which are private lands, restricted public lands, or lands which are not generally accessible to or used by the public.

36. "Monthly Average" is the arithmetic mean of all measurements taken during the month.

37. "Volatile Solids" is the amount of the total solids in sewage sludge lost when the sludge is combusted at 550 degrees Celsius for 15-20 minutes in the presence of excess air.

MAGNA WATER RECLAMATION FACILITY

(will be revised in early 2007)

CENTRAL VALLEY WATER RECLAMATION FACILITY

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES)
COMBINED FACILITY PERMIT

In an effort to clarify all Water Quality related permit responsibilities under the UPDES permit system and reduce paper work and redundancy this permit effectively combines the provisions of the following permits for the Central Valley Water Reclamation Facility (CVWRF) located at, 800 West Central Valley Road, Salt Lake City, Utah:

Major Municipal UPDES Permit No. **UT0024392,** and

UPDES Biosolids Permit No. **UTL-024392**

Includes applicable Provisions of the UPDES Multi-Sector General Permit for Storm Water Discharges, Permit No. **UTR000000**

In compliance with provisions of the Utah *Water Quality Act, Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended* (the *"Act"*),

CENTRAL VALLEY WATER RECLAMATION FACILITY

is hereby authorized to discharge from its wastewater treatment facility to receiving waters named **MILL CREEK** and dispose of biosolids in accordance with specific limitations, outfalls, and other conditions set forth herein.

This permit shall become effective on March 1 2005

This permit expires at midnight on February 28 2010

Signed this 18th day of February, 2005

Walter L. Baker, P.E.
Acting Director
Utah Water Quality Board

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Items of interest — Page Number

I. DISCHARGE – LIMITATIONS AND REPORTING REQUIREMENTS

A. Description of Discharge Point. The authorization to discharge provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit are violations of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

Outfall Number	Location of Discharge Point
001	Outfall 001 is a large concrete channel which discharges directly to Mill Creek, and is located immediately on the northwest side of the treatment plant at about latitude 40°42'31" and longitude 111°54'57", approximately 800 West and 3400 South in South Salt Lake City, Salt Lake County, Utah.

B. Narrative Standard. It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by a bioassay or other tests performed in accordance with standard procedures.

C. Specific Limitations and Self-Monitoring Requirements.

1. Toxicity Limitations for Outfall 001.

   Effective immediately, and lasting through the life of this permit, there shall be no acute or chronic toxicity in the discharge as defined in *Part VIII*, and determined by test procedures described in *Part VIII. 4, 5 and 6* of this permit.

2. Discharge Water.

   a) Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below:

Parameter	Effluent Limitations			
	Maximum Monthly Avg.	Maximum Weekly Avg.	Daily Minimum	Daily Maximum
$CBOD_5$, mg/L				
Summer (Jul-Sep)	16.0	27.0	NA	NA
Fall (Oct-Dec)	20.0	28.0	NA	NA
Winter (Jan-Mar)	20.0	28.0	NA	NA
Spring (Apr-Jun)	20.0	28.0	NA	NA
$CBOD_5$ Min. % Removal	85	NA	NA	NA
TSS, mg/L	25	35	NA	NA
TSS Min. % Removal	85	NA	NA	NA
Fecal Coliforms, No./100mL	200	250	NA	NA
Total Coliforms, No./100mL	2000	2500	NA	NA
pH, Standard Units	NA	NA	6.5	9.0
Ammonia (as N), mg/L				
Summer (Jul-Sep)	5.8	NA	NA	13.1
Fall (Oct-Dec)	7.2	NA	NA	16.4
Winter (Jan-Mar)	5.8	NA	NA	13.3
Spring (Apr-Jun)	9.6	NA	NA	25.1
TRC, mg/L				
Summer (Jul-Sep)	0.026	NA	NA	0.034
Fall (Oct-Dec)	0.021	NA	NA	0.029
Winter (Jan-Mar)	0.022	NA	NA	0.030
Spring (Apr-Jun)	0.021	NA	NA	0.029
DO, mg/L	NA	NA	5.0	NA
WET				
Acute Biomonitoring	NA	NA	NA	Pass
Chronic Biomonitoring	NA	NA	NA	Pass
Oil & Grease, mg/L (when sheen observed)	NA	NA	NA	10.0

NA – Not Applicable

Self-Monitoring and Reporting Requirements a/			
Parameter	Frequency	Sample Type	Units
Total Flow b/ c/	Continuous	Recorder	MGD
$CBOD_5$, Effluent d/ Influent	4 x Weekly 4 x Weekly	Composite Composite	mg/L mg/L
TSS, Effluent d/ Influent	4 x Weekly 4 x Weekly	Composite Composite	mg/L mg/L
Fecal Coliforms	4 x Weekly	Grab	No./100mL
Total Coliforms	4 x Weekly	Grab	No./100mL
pH	Daily	Grab	SU
Ammonia	4 x Weekly	Grab	mg/L
TRC	Daily	Grab	mg/L
DO	Daily	Grab	mg/L
Phosphorus, Total e/	Monthly	Grab	mg/L
Nitrate, NO3 e/	Monthly	Grab	mg/L
Nitrite, NO2 e/	Monthly	Grab	mg/L
WET, Acute Biomonitoring***** Chronic Biomonitoring	Quarterly Quarterly	Composite Composite	Pass/Fail Pass/Fail
Oil & Grease	When Sheen Observed	Grab	mg/L
Metals, Influent Effluent	Quarterly Quarterly	Composite Composite	mg/L mg/L
Organic Toxics	Yearly	Grab	mg/L

*The ceriodaphnia will be tested during the 1st and 3rd quarters and the fathead minnows will be tested during the 2nd and 4th quarters.

a/ See Definitions, *Part VIII*, for definition of terms.

b/ Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

c/ If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

d/ In addition to monitoring and reporting the final discharge, influent samples shall be taken and analyzed at the same frequency as required above for effluent and reported to determine compliance with 85% minimum removal limit addressed above.

e/ Total Phosphorus, Nitrate (NO3), and Nitrite (NO2) are being sampled in support of the work being done for the TMDL currently underway for the Lower Jordan River. The Pollutants Of Concern will be monitored and reported by the facility on a monthly basis, but will not have a limit associated with them. At the end of each Calendar year of sampling for these POC's, Central Valley will report the results of all sampling done for the POC.

b) Additional Self-Monitoring and Reporting Requirements.

(1) Influent and Effluent Monitoring and Reporting Requirements. The permittee shall sample and analyze both the influent and effluent quarterly, for the following parameters.

Parameter	Frequency	Sample Type	Units
Total Arsenic	Quarterly	Composite	mg/L
Total Cadmium	Quarterly	Composite	mg/L
Total Chromium	Quarterly	Composite	mg/L
Total Copper	Quarterly	Composite	mg/L
Total Cyanide	Quarterly	Composite	mg/L
Total Lead	Quarterly	Composite	mg/L
Total Mercury	Quarterly	Composite	mg/L
Total Molybdenum	Quarterly	Composite	mg/L
Total Nickel	Quarterly	Composite	mg/L
Total Selenium	Quarterly	Composite	mg/L
Total Silver	Quarterly	Composite	mg/L
Total Zinc	Quarterly	Composite	mg/L

In addition, the permittee shall analyze the treatment facility influent and effluent for the presence of the toxic pollutants listed in *40 CFR 122 Appendix D Table II (Organic Toxic Pollutants)* yearly. The pesticides fraction of *Appendix D, Table II* is suspended unless pesticides are expected to be present.

The results of the analyses of metals, cyanide and toxic organics shall be submitted along with the Discharge Monitoring Report (DMR) at the end of the earliest possible reporting period.

(2) In accordance with the requirements of *40 CFR Part 403.5(c),* the permittee shall determine if there is a need to develop or revise its local limits in order to implement the general and specific prohibitions of *40 CFR Part 403.5 (a)* and *Part 403.5 (b)*. A technical evaluation of the need to develop or revise local limits shall be submitted to the Division within **12 months** of the effective date of this permit. This evaluation should be conducted in accordance with the latest revision of the *Utah Model industrial Pretreatment Program, Section 4, Local Limits*. If a technical evaluation, which may be based on the *Utah Model Industrial Pretreatment Program, Section 4, Local Limits*, reveals that development or revision of local limits is necessary, the permittee shall submit the proposed local limits revision to the Division of Water Quality in an

approvable form, within **12 months** of the Division's determination that a revision is necessary.

c) Whole Effluent Testing – Acute Toxicity.

Effective immediately, the permittee shall conduct quarterly acute static replacement toxicity tests on a composite sample of the final effluent. The sample shall be collected at Outfall 001.

The monitoring frequency for acute tests shall be quarterly unless a sample is found to be acutely toxic during a routine test. If that occurs, the monitoring frequency shall become weekly (See *Part I.C.2.e, Accelerated Testing*). Samples shall be collected on a two day progression; i.e., if the first sample is on a Monday, during the next sampling period, the sampling shall begin on a Wednesday, etc.

The replacement static acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. August 1993, EPA/600/4-90/027F* as per *40 CFR 136.3(a) TABLE 1A-LIST OF APPROVED BIOLOGICAL METHODS*, and the *Region VIII EPA NPDES Acute Test Conditions – Static Renewal Whole Effluent Toxicity Test (August, 1997).* In the case of conflicts, the Region VIII procedures will prevail. The permittee shall conduct the 48-hour static replacement toxicity test using Ceriodaphnia dubia and the acute 96-hour static replacement toxicity test using Pimephales promelas (fathead minnow). If necessary for pH adjustment, CO_2 atmosphere can be used.

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the results to be considered valid. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control mortality is achieved. A variance to this requirement may be granted by the Executive Secretary if a mortality of less than 10 percent was observed in higher effluent dilutions.

If the permit contains a total residual chlorine limitation greater than 0.20 mg/L, the permittee may request from the Executive Secretary approval to de-chlorinate the sample, or collect the sample prior to chlorination.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar quarter e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). All test results shall be reported along with the DMR submitted for that reporting period. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Acute Whole Effluent Reporting (August, 1997)* and shall include all chemical and physical data as specified.

If the results for one year of testing indicate no acute toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Executive Secretary may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

d) Whole Effluent Testing – Chronic Toxicity.

Effective immediately, the permittee shall quarterly, conduct chronic short-term toxicity tests on a composite sample of the final effluent. The sample shall be collected at Outfall 001.

The monitoring frequency shall be quarterly. Samples shall be collected on a two-day progression; i.e., if the first sample is on a Monday, during the next sampling period, sampling shall be on a Wednesday. If chronic toxicity is detected, the test shall be repeated in less than four weeks from the date the initial sample was taken. The need for any additional samples, and/or a Toxicity Reduction Evaluation (TRE, see *Part I.C.2.h*), shall be determined by the Executive Secretary. If the second test shows no chronic toxicity, routine monitoring shall be resumed.

The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms. Third Edition. July 1994, EPA-600-4-91-002* as per 40 CFR 136.3(a) *TABLE 1A-LIST OF APPROVED BIOLOGICAL METHODS,* and the *Region VIII EPA NPDES Chronic Test Conditions - Static Renewal Whole Effluent Toxicity Test (August, 1997)*. In case of conflicts, the Region VIII procedure will prevail. Test species shall consist of Ceriodaphnia dubia and Pimephales promelas (fathead minnow).

Chronic toxicity occurs when the survival, growth, or reproduction for either test species, when exposed to a dilution of 37 percent effluent or lower, is significantly less (at 95% confidence level) than that of the control specimens. Dilutions of 37 percent only will be required, plus the control. If any of the acceptable control performance criteria are not met, the test shall be considered invalid.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar quarter (e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). All test results shall be reported along with the DMR submitted for that reporting period. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Chronic Whole Effluent Reporting (August, 1997)* and shall include all the physical testing as specified.

If the results for one year of testing indicate no chronic toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Executive Secretary may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

The current Utah whole effluent toxicity (WET) policy is in the process of being updated and revised to assure its consistency with the Environmental Protection Agency′s national and regional WET policy. When said revised WET policy has been finalized and officially adopted, this permit will be reopened and modified to incorporate satisfactory follow-up chronic toxicity language (chronic pattern of toxicity, PTI and/or TIE/TRE, etc.) without a public notice, as warranted and appropriate.

e) Accelerated Testing.

When acute toxicity is indicated during routine biomonitoring as specified in this permit, the permittee shall notify the Executive Secretary in writing within five (5) days after becoming aware of the test result. The permittee shall perform an accelerated schedule of biomonitoring to establish whether a pattern of toxicity exists. Accelerated testing will begin within seven (7) days after the permittee becomes aware of the test result. Accelerated testing shall be conducted as specified under *Part I.C.2.f, Pattern of Toxicity*. If the accelerated testing demonstrates no pattern of toxicity, routine monitoring shall be resumed.

f) Pattern of Toxicity.

A pattern of toxicity is defined by the results of a series of up to five (5) biomonitoring tests pursuant to the accelerated testing requirements using 100 percent effluent on the single species found to be more sensitive, once every week for up to five (5) consecutive weeks.

If two (2) consecutive tests (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity) do not result in acute toxicity, no further accelerated testing will be required and no pattern of toxicity will be found to exist. The permittee will provide written verification to the Executive Secretary within five (5) days, and resume routine monitoring.

A pattern of toxicity is established if one of the following occurs:

a. If two (2) consecutive test results (not including the scheduled quarterly or monthly test, which triggered the search for a pattern of toxicity) indicate acute toxicity, this constitutes an established pattern of toxicity.

b. If consecutive tests continue to yield differing results each time, the permittee will be required to conduct up to a maximum of five (5) acute tests (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity). If three out of five test results indicate acute toxicity, this will constitute an established pattern of toxicity.

g) Preliminary Toxicity Investigation.

(1) When a pattern of toxicity is detected the permittee will notify the Executive Secretary in writing within five (5) days and begin an evaluation of the possible causes of the toxicity. The permittee will have fifteen (15) working days from demonstration of the pattern to complete a Preliminary Toxicity Investigation (PTI) and submit a written report of the results to the Executive Secretary. The PTI may include, but is not

limited to, additional chemical and biological monitoring, examination of pretreatment program records, examination of discharge monitoring reports, a thorough review of the testing protocol, evaluation of treatment processes and chemical use, inspection of material storage and transfer areas to determine if a spill may have occurred, and similar procedures.

(2) If the PTI identifies a probable toxicant and/or a probable source of toxicity the permittee shall submit, as part of its final results written notification of that effect to the Executive Secretary. Within thirty (30) days of completing the PTI the permittee shall submit for approval a control program to control effluent toxicity and shall proceed to implement such a plan within seven (7) days following approval. The control program, as submitted to or revised by the Executive Secretary, may be incorporated into the permit.

(3) If no probable explanation for toxicity is identified in the PTI, the permittee shall notify the Executive Secretary as part of its final report, along with a schedule for conducting a Phase I Toxicity Reduction Evaluation (TRE) (See *Part I.C.2.h, Toxicity Reduction Evaluation*).

(4) If toxicity spontaneously disappears during the PTI, the permittee shall submit written notification to that effect to the Executive Secretary as part of the reporting requirements of paragraph a. of this section.

h) Toxicity Reduction Evaluation (TRE).

If toxicity is detected during the life of this permit and it is determined by the Executive Secretary that a TRE is necessary, the permittee shall be so notified and shall initiate a TRE immediately thereafter. The purpose of the TRE will be to establish the cause of toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity.

A TRE may include but is not limited to one, all, or a combination of the following:

c. Phase I – Toxicity Characterization

d. Phase II – Toxicity Identification Procedures

e. Phase III – Toxicity Control Procedures

f. Any other appropriate procedures for toxicity source elimination and control.

If the TRE establishes that the toxicity cannot be immediately eliminated, the permittee shall submit a proposed compliance plan to the Executive Secretary. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the Executive Secretary, this permit may be reopened and modified.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations, the permittee may:

(a) Submit an alternative control program for compliance with the numerical requirements.

(b) If necessary, provide a modified biomonitoring protocol, which compensates for the pollutant(s) being controlled numerically.

If acceptable to the Executive Secretary, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the Executive Secretary, and/or a modified biomonitoring protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the Executive Secretary, shall be considered a violation of this permit.

D. Reporting of Monitoring Results.

1. Discharge Water. Monitoring results obtained during the previous month shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. The first report is due on April 28, 2005. If no discharge occurs during the reporting period, “no discharge” shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory*

Requirements (see Part VII.G), and submitted to the Director, Division of Water Quality and to EPA at the following addresses:

original to:	Department of Environmental Quality Division of Water Quality 288 North 1460 West PO Box 144870 Salt Lake City, Utah 84114-4870
copy to:	Technical Enforcement Program (8ENF-T) Office of Enforcement, Compliance Assistance & Environmental Justice US EPA Region VIII 999 18th Street, Suite 500 Denver, CO 80202-2466

II. BIOSOLIDS REQUIREMENTS

A. Description of Treatment and Disposal.

The authorization to dispose of biosolids provided under this permit is limited to those biosolids produced from the treatment works owned and operated by the Central Valley Water Reclamation Facility (CVWRF). The method and sites for disposal are specifically designated below.

1. Treatment.

    a. Class A biosolids produced at the CVWRF are stabilized in anaerobic digesters with a minimum retention time of at least 15 days and a temperature of at least 95^0F (35^0C) and are de-watered with belt filter presses. The de-watered biosolids are composted at, 55^0C (131^0F) for a minimum of 15 days, and turned at least 5 times during those 15 days.

    b. Class B biosolids produced at the CVWRF are stabilized in anaerobic digesters with a minimum retention time of least 15 days and a temperature of a least 95^0F (35^0C) and are de-watered with belt filter presses.

2. Disposal Method.

    a. Class A biosolids are sold or given away to the public.

    b. Class B biosolids are land applied for agriculture production.

    c. Biosolids that do meet Class B standards are land filled.

3. Changes in Treatment Systems and Disposal Practices.

    Should the CVWRF change their disposal methods or the biosolids generation and handling processes of the plant, the CVWRF must notify the Executive Secretary at least 180 days in advance. This includes, but is not limited to, the addition or removal of any biosolids treatment units (e.g., digesters, drying beds, etc.) and/or any other change that would require a major modification of the permit.

    For any biosolids that are landfilled, the requirements of *Utah Administrative Code R315-301-5* and *Section 2.12* of the latest version of the *EPA Region VIII Biosolids Management Handbook* must be followed.

B. Specific Limitations and Self-Monitoring Requirements.

All biosolids generated by this facility that is composted and sold or given away to the public shall meet the requirements of *Part II.B.1 (Table 3), 2, 3,*and *4* listed below.

All other biosolids that are land applied shall meet the requirements of *Part II.B.1, 2, 3,* and *4* listed below.

1. Metals Limitations

   a. The maximum metals concentrations listed in Table 1 and the cumulative pollutant loadings in Table 2; <u>or</u>

   b. The maximum metals concentrations in Table 1 and the monthly average pollutant concentrations in Table 3;

   If the metal concentrations in the biosolids no longer meet the Class A limitations in Table 3, the Class B limitations in Table 2 and/or Table 4 must be used. The permittee shall determine cumulative pollutant loadings and/or annual pollutant loadings for each land application site.

Pollutant	Table 1	Table 2	Table 3	Table 4
All metals concentrations shall be measured and reported on a dry weight basis	Daily Maximum mg/Kg <u>a</u>/	Cumulative Loading Kg/Ha	Monthly Average mg/Kg <u>a</u>/	Annual Loading Kg/Ha/365 day Period
Total Arsenic	75	41	41	2.0
Total Cadmium	85	9	39	1.9
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15
Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	75.0	N/A
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5.0
Total Zinc	7500	2800	2800	140

<u>a</u>/ See Part I.A. for definition of terms.

2. Pathogen Reduction Requirements.

   If the biosolids are to be sold or given away in a bag or a similar container for application to lawns and home gardens it shall meet the Class A pathogen limitations as described below. If the biosolids do not meet these pathogen limitations, the biosolids cannot be sold or given away.

Class A Pathogen Requirements a/

Fecal Coliform or *Salmonella* Limits		The process to further reduce pathogens will be met by:
Fecal Coliform shall be < 1000 MPN/g of total solids **OR** *Salmonella* shall be <3 MPN/4g of total solids b/	**AND**	Composting using the windrow method, the temperature of the biosolids is maintained at, at least 55^{o} C (131^{o}F) or higher for at least 15 days or longer, with a minimum of 5 turnings of the windrows during the 15 days. a/

If the biosolids are to be land applied to agricultural land, the biosolids shall meet Class B requirements (including the site restrictions and management practices) as described below. If the biosolids do not meet Class B requirements, the biosolids cannot be land applied.

Class B Pathogen Requirements a/

Fecal Coliforms shall be less than 2,000,000 most probable number (MPN). b/

3. Vector Attraction Reduction Requirements a/

All biosolids land applied shall meet vector attraction reduction by a 38% reduction in volatile solids.

a/ There are additional pathogen reduction and vector attraction reduction alternatives available in *40 CFR 503.32* and *40 CFR 503.33*. If the permittee intends to use one of these alternatives the Executive Secretary and the EPA must be informed at least 30 days prior to its use. This change may be made without additional public notic

b/ Based on a minimum of seven (7) samples of biosolids collected over a two-week period (or as approved by the Executive Secretary in your sampling and analysis plan).

4. Self-Monitoring Requirements

a. At a minimum, upon the effective date of this permit, all metals, pathogens and applicable vector attraction reduction requirements shall be monitored according to *40 CFR 503.16.*

Minimum Frequency of Monitoring (Dry Metric Tons (DMT))	
Amount of Biosolids Disposed Per Year	Monitoring Frequency
> 0 to < 290 DMT	Once per year
> 290 to < 1,500 DMT	Four times per year
> 1,500 to < 15,000 DMT	Six times per year

Accordingly, CVWRF shall monitor biosolids at least six times per year.

b. Deep soil monitoring for nitrate-nitrogen is required for all land application sites (does not apply to biosolids compost that is sold or given away, or sites where biosolids are applied less than once every five years). A minimum of six sample sites for each 320 (or less) acre area are to be collected. These samples are to be collected down to either 5 feet or to the confining layer, whichever is shallower. Each one-foot increment is to be a composite with the other samples from the site and one analysis for nitrate is to be done for each increment. Samples are required to be taken once every five years for non-irrigated sites or annually for irrigated sites.

c. Soil monitoring for phosphorus (reported as P) is required for all land application sites (does not apply to biosolids compost that is sold or given away, or sites where biosolids are applied less than once every five years). Six samples of one foot depth each are to be collected for each 320 acre area and composited. Samples are required to be taken once every five years for non-irrigated sites or annually for irrigated sites.

d. Sample collection, preservation and analysis shall be performed in a manner consistent with the requirements of *40 CFR Part 503* and/or other criteria specified in this permit. Metals analysis is to be performed using *Method SW 846* with *Method 3050* used for digestion. For the digestion procedure, a 1 –2 gram sample (wet weight) of biosolids shall be used and reported on a dry weight basis. The methods are also described in the latest version of the *Region VIII Biosolids Management Handbook*. Monitoring for soil nitrate and phosphorus is to be performed using the methods in *Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties*. Page, A. L., Ed., American Society of Agronomy and Soil Science Society of America, Madison, WI, 1982.

e. The Executive Secretary may request additional monitoring for specific pollutants derived from biosolids if the data shows a potential for concern.

f. After two years of monitoring at the frequency specified, the permittee may request that the Executive Secretary reduce the sampling frequency for the heavy metals. The frequency cannot be reduced to less than once per year for land applied biosolids for any parameter. The frequency also cannot be reduced for any of the pathogen or vector attraction reduction requirements listed in this permit.

If pollutant concentrations in the biosolids no longer meet the limitations in Table 3, the limitations in Table 2 and/or Table 4 must be used. The permittee shall determine cumulative pollutant loadings and/or annual pollutant loadings for each land application site.

C. Site Restrictions

If the biosolids are Class B with respect to pathogens, the CVWRF shall comply with all applicable site restrictions listed below:

1. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application.

2. Food crops with harvested parts below the land surface shall not be harvested for 20 months after application if the biosolids remains on the land surface for four months or more prior to incorporation into the soil.

3. Other food crops and feed crops shall not be harvested from the land for 30 days after application.

4. Animals shall not be allowed to graze on the land for 30 days after application.

5. Turf grown on land where biosolids is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.

6. Public access to land with a high potential for public exposure shall be restricted for one year after application.

7. Public access to land with a low potential for public exposure shall be restricted for 30 days after application.

D. Management Practices for Application of Biosolids to Land

The permittee shall operate and maintain the land application site operations in accordance with the following requirements:

1. The permittee shall provide to the Executive Secretary and the EPA within 90 days of the effective date of this permit a land application plan.

2. Application of biosolids shall be conducted in a manner that will not contaminate the groundwater or impair the use classification for that water underlying the sites.

3. Application of biosolids shall be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application sites. Biosolids shall not be applied to land 10 meters or less from waters of the United States (as defined in *40 CFR 122.2*).

4. No person shall apply biosolids for beneficial use to frozen, ice-covered, or snow-covered land where the slope of such land is greater than three percent and is less than or equal to six percent unless one of the following requirements is met:

   a. there is 80 percent vegetative ground cover; or,

   b. approval has been obtained based upon a plan demonstrating adequate runoff containment measures.

5. Application of biosolids is prohibited to frozen, ice-covered, or snow covered sites where the slope of the site exceeds six percent.

6. Biosolids shall not be applied to sites where the available phosphorous content of the soil exceeds the following:

   a. 100 ppm as determined by the sodium bicarbonate extraction method

   b. 50 ppm as determined by the AB-DPTA extraction method

   c. 170 ppm by the Bray P1 extraction method

7. Application of biosolids shall be conducted in a manner that does not exceed the agronomic rate for available nitrogen of the crops grown on the site. At a minimum, the permittee is required to follow the

methods for calculating agronomic rate outlined in the latest version of the *Region VIII Biosolids Management Handbook* (other methods may be approved by the Executive Secretary). The treatment plant shall provide written notification to the applier of the biosolids of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids. Written permission from the Executive Secretary is required to exceed the agronomic rate.

The permittee may request the limits of Part II, D., 6 and 7 be modified if different limits would be justified based on local conditions. The limits are required to be developed in cooperation with the local agricultural extension office or university.

8. Biosolids shall not be applied to any site area with standing surface water. If the annual high groundwater level is known or suspected to be within five feet of the surface, additional deep soil monitoring for nitrate-nitrogen as described in *Part II.B.4.b* is to be performed. At a minimum, this additional monitoring will involve a collection of more samples in the affected area and possibly more frequent sampling. The exact number of samples to be collected will be outlined in a deep soil monitoring plan to be submitted to the Executive Secretary and the EPA within 90 days of the effective date of this permit. The plan is subject to approval by the Executive Secretary.

9. The specified cover crop shall be planted during the next available planting season. If this does not occur, the permittee shall notify the Executive Secretary in writing. Additional restrictions may be placed on the application of the biosolids on that site on a case-by-case basis to control nitrate movement. Deep soil monitoring may be increased under the discretion of the Executive Secretary.

10. When weather and or soil conditions prevent adherence to the biosolids application procedure, biosolids shall not be applied on the site.

11. For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

    a. The name and address of the person who prepared the biosolids for sale or give away for application to the land.

    b. A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

c. The annual whole biosolids application rate for the biosolids that do not cause the annual metals loading rates in Table 4 (Part II.B.1.) to be exceeded.

12. Biosolids subject to the cumulative pollutant loading rates in Table 2 (Part II.B.1.) shall not be applied to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in Table 2 have been reached.

13. If the treatment plant applies the biosolids, it shall provide the owner or lease holder of the land on which the biosolids are applied notice and necessary information to comply with the requirements in this permit.

14. For biosolids or material derived from biosolids that are stored in piles for one year or longer, measures shall be taken to ensure that erosion (whether by wind or water) does not occur. However, best management practices should also be used for piles used for biosolids treatment. If a treatment pile is considered to have caused a problem, best management practices could be added as a requirement in the next permit renewal.

15. The permittee shall inspect the application of the biosolids to active sites to prevent malfunctions and deterioration, operator errors and discharges, which may cause or lead to the release of biosolids to the environment or a threat to human health. The permittee must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment. The permittee shall keep an inspection log or summary including at least the date and time of inspection, the printed name and the handwritten signature of the inspector, a notation of observations made and the date and nature of any repairs or corrective action.

E. Special Conditions on Biosolids Storage

Permanent storage of biosolids is prohibited. Biosolids shall not be temporarily stored for more than two years. Written permission to store biosolids for more than two years must be obtained from the Executive Secretary. Storage of biosolids for more than two years will be allowed only if it is determined that significant treatment is occurring.

F. Representative Sampling.

Biosolids samples used to measure compliance with Part II.B. of this Permit shall be collected at locations representative of the quality of biosolids generated at the treatment works and immediately prior to land application.

G. Reporting of Monitoring Results.

The permittee shall provide the results of all monitoring performed in accordance with Part II.B., and information on management practices, biosolids treatment, site restrictions and certifications shall be provided no later than February 19 of each year. Each report is for the previous calendar year. If no biosolids were sold or given away during the reporting period, "no biosolids were sold or given away" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the *Signatory Requirements (see Part IV)*, and submitted to the Utah Division of Water Quality and the EPA at the following addresses:

Original to: Biosolids Coordinator
Utah Division of Water Quality
P. O. Box 144870
Salt Lake City Utah, 84114-4870

Copy to: Biosolids Coordinator, 8P-W-P
U. S. Environmental Protection Agency
Region VIII
999 18th Street, Suite 500
Denver, Colorado 80202-2466

H. Additional Record Keeping Requirements Specific to Biosolids.

1. If so notified by the Executive Secretary the permittee may be required to add additional record keeping if information provided indicates that this is necessary to protect public health and the environment.

2. The permittee is required to keep the following information for at least 5 years:

   a) Concentration of each heavy metal in Table 3 (Part II.B.1.).

   b) A description of how the pathogen reduction requirements in Part II.B.2. were met.

   c) A description of how the vector attraction reduction requirements in Part II.B.3. were met.

d) A description of how the management practices in Part II.C. were met (if necessary).

e) The following certification statement:

"I certify under the penalty of law, that the heavy metals requirements, the pathogen requirements, and the vector attraction requirements in Part II.B., the site restrictions the management practices in Part II.C have been met. This determination has been made under my direction and supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, the vector attraction reduction requirements and the management practices have been met. I am aware that there are significant penalties for false certification including the possibility of imprisonment."

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and 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 the life of the permit. Data collected on site, copies of Biosolids Report forms, and a copy of this UPDES biosolids-only permit must be maintained on site during the duration of activity at the permitted location.

III. STORM WATER REQUIREMENTS

A. Coverage of This Section.

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to storm water discharges from the CVWRF.

(3) Site Coverage. Storm water discharges from the following portions of the CVWRF may be eligible for coverage under this permit: biosolids drying beds, haul or access roads on which transportation of biosolids may occur, grit screen cleaning areas, chemical loading, unloading and storage areas, salt or sand storage areas, vehicle or equipment storage and maintenance areas, or any other wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of sewage sludge that are located within the confines of the facility that may have the reasonable expectation of potential to contribute to pollutants in storm water discharge

B. Prohibition of Non-Storm Water Discharges.

1. The following non-storm water discharges may be authorized under this permit provided the non-storm water component of the discharge is in compliance with this section; discharges from fire fighting activities; fire hydrant flushing; potable water sources including waterline flushing; drinking fountain water; irrigation drainage and lawn watering; routine external building wash down water where detergents or other compounds have not been used in the process; pavement wash waters where spills or leaks of toxic or hazardous materials (including oils and fuels) have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated compressor condensate; uncontaminated springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

C. Storm Water Pollution Prevention Plan Requirements.

1. Contents of the Plan. The plan shall include, at a minimum, the following items:

a) Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team who are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

b) Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials, which may be reasonably expected to have the potential as a significant pollutant source. Each plan shall include, at a minimum:

1) Drainage. A site map indicating drainage areas and storm water outfalls. For each area of the facility that generates storm water discharges associated with the waste water treatment related activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow and an identification of the types of pollutants that are likely to be present in storm water discharges associated with the activity. Factors to consider include the toxicity of the pollutant; quantity of chemicals used, produced or discharged; the likelihood of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified. The site map shall include but not be limited to:

i. Drainage direction and discharge points from all wastewater associated activities including but not limited to grit screen cleaning, bio-solids drying beds and transport, chemical/material loading, unloading and storage areas, vehicle maintenance areas, salt or sand storage areas.

ii. Location of any erosion and sediment control structure or other control measures utilized for reducing pollutants in storm water runoff.

iii. Location of bio-solids drying beds where exposed to precipitation or where the transportation of bio-solids may be spilled onto internal roadways or tracked off site.

iv. Location where grit screen cleaning or other routinely performed industrial activities are located and are exposed to precipitation.

v. Location of any handling, loading, unloading or storage of chemicals or potential pollutants such as caustics, hydraulic fluids, lubricants, solvents or other petroleum products, or hazardous wastes and where these may be exposed to precipitation.

vi. Locations where any major spills or leaks of toxic or hazardous materials have occurred.

vii. Location of any sand or salt piles.

viii. Location of fueling stations or vehicle and equipment maintenance and cleaning areas that are exposed to precipitation.

ix. Location of receiving streams or other surface water bodies.

x. Locations of outfalls and the types of discharges contained in the drainage areas of the outfalls.

2) Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of 3 years prior to the effective date of this permit and the present; method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of 3 years prior to the effective date of this permit and the present; the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

3) Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility after the date of 3 years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

4) Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility, including a summary of sampling data collected during the term of this permit.

5) Summary of Potential Pollutant Sources and Risk Assessment. A narrative description of the potential pollutant sources from the following activities associated with treatment works: access roads/rail lines; loading and unloading operations; outdoor storage activities; material handling sites; outdoor vehicle storage or maintenance sites; significant dust or particulate generating processes; and onsite waste disposal practices. Specific potential

pollutants shall be identified where known.

6) Measures and Controls. CVWRF shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

7) Good Housekeeping. All areas that may contribute pollutants to storm waters discharges shall be maintained in a clean, orderly manner. These are practices that would minimize the generation of pollutants at the source or before it would be necessary to employ sediment ponds or other control measures at the discharge outlets. Where applicable, such measures or other equivalent measures would include the following: sweepers and covered storage to minimize dust generation and storm runoff; conservation of vegetation where possible to minimize erosion; sweeping of haul roads, bio-solids access points, and exits to reduce or eliminate off site tracking; sweeping of sand or salt storage areas to minimize entrainment in storm water runoff; collection, removal, and proper disposal of waste oils and other fluids resulting from vehicle and equipment maintenance; other equivalent measures to address identified potential sources of pollution.

8) Preventive Maintenance. A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices (e.g., cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

9) Spill Prevention and Response Procedures. Areas where potential spills that can contribute pollutants to storm water discharges can occur, and their accompanying drainage points, shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures and equipment for cleaning up spills shall be identified in the plan and made available to the appropriate personnel.

10) Inspections. In addition to the comprehensive site evaluation required under paragraph (*Part III.C.1.b.16)* of this section, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility on a periodic basis. The

following areas shall be included in all inspections: access roads/rail lines, equipment storage and maintenance areas (both indoor and outdoor areas); fueling; material handling areas, residual treatment, storage, and disposal areas; and wastewater treatment areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained. The use of a checklist developed by the facility is encouraged.

11) Employee Training. Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify how often training will take place, but training should be held at least annually (once per calendar year). Employee training must, at a minimum, address the following areas when applicable to a facility: petroleum product management; process chemical management; spill prevention and control; fueling procedures; general good housekeeping practices; proper procedures for using fertilizers, herbicides and pesticides.

12) Record keeping and Internal Reporting Procedures. A description of incidents (such as spills, or other discharges), along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

13) Non-storm Water Discharges.

a. Certification. The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with *Part VII.G.* of this permit.

b. Exceptions. Except for flows from fire fighting activities, sources of non-storm water listed in *Part III.B*. (Prohibition of Non-storm Water Discharges) of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

c. Failure to Certify. Any facility that is unable to provide the certification required (testing for non-storm water discharges), must notify the *Executive Secretary* within 180 days after the effective date of this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible. Non-storm water discharges to waters of the State, which are not, authorized by a *UPDES* permit are unlawful, and must be terminated.

14) Sediment and Erosion Control. The plan shall identify areas, which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion.

15) Management of Runoff. The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the generation or source(s) of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures that the permittee determines to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity *Part III.C.1.b* (Description of Potential Pollutant Sources) of this permit] shall be considered when determining reasonable and appropriate measures. Appropriate measures or other equivalent measures may include: vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, wet detention/retention devices and discharging storm water through the waste water facility for treatment.

16) Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but in no case less than once a year. Such

evaluations shall provide:

(a) Areas contributing to a storm water discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

(b) Based on the results of the evaluation, the description of potential pollutant sources identified in the plan in accordance with *Part III.C.1.b* (Description of Potential Pollutant Sources) of this section and pollution prevention measures and controls identified in the plan in accordance with *Part III.C.1.b.6* (Measures and Controls) of this section shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than 12 weeks after the evaluation.

(c) A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph *i.* (above) shall be made and retained as part of the storm water pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with *Part VII.G* (Signatory Requirements) of this permit.

17) Deadlines for Plan Preparation and Compliance. CVWRF shall prepare and implement a plan in compliance with the provisions of this section within 270 days of the effective date of this permit.

18) Keeping Plans Current. CVWRF shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the

discharge of pollutants to the waters of the state or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified by the plan, or in otherwise achieving the general objective of controlling pollutants in storm water discharges associated with the activities at the facility.

D. Monitoring and Reporting Requirements.

1. Quarterly Visual Examination of Storm Water Quality. Facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination must be made at least once in each of the following designated periods during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event: January through March; April through June; July through September; and October through December.

   a) Sample and Data Collection. Examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

   b) Visual Storm Water Discharge Examination Reports. Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

   c) Representative Discharge. When CVWRF has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the observation data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

d) Adverse Conditions. When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the results of the visual examination. Adverse weather conditions, which may prohibit the collection of samples, include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

e) Inactive and Unstaffed Site. When a discharger is unable to conduct visual storm water examinations at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirement as long as the facility remains inactive and unstaffed. The facility must maintain a certification with the pollution prevention plan stating that the site is inactive and unstaffed so that performing visual examinations during a qualifying event is not feasible.

IV. INDUSTRIAL PRETREATMENT PROGRAM

A. The permittee has been delegated primary responsibility for enforcing against discharges prohibited by *40 CFR 403.5* and applying and enforcing any national Pretreatment Standards established by the United States Environmental Protection Agency in accordance with Section 307 (b) and (c) of *The Clean Water Act (CWA),* as amended by *The Water Quality Act (WQA), of 1987*.

The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, and procedures described in the permittee's approved Pretreatment Program submission. Such program commits the permittee to do the following:

1. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the pretreatment standards. At a minimum, all significant industrial users shall be inspected and sampled by the permittee at least once per year;

2. Control through permit, order, or similar means, the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements;

3. Require development, as necessary, of compliance schedules by each industrial user for the installation of control technologies to meet applicable pretreatment standards;

4. Maintain and update industrial user information as necessary, to ensure that all IUs are properly permitted and/or controlled at all times;

5. Enforce all applicable pretreatment standards and requirements and obtain appropriate remedies for noncompliance by any industrial user;

6. Annually publish a list of industrial users that were determined to be in significant noncompliance during the previous year. The notice must be published before March 28 of the following year;

7. Maintain an adequate revenue structure and staffing level for continued implementation of the Pretreatment Program.

8. Evaluate all significant industrial users at least once every two years to determine if they need to develop a slug prevention plan. If a slug prevention plan is required, the permittee shall insure that the plan contains at least the minimum elements required in *40 CFR 403.8(f)(2)(v);*

9. Notify all significant industrial users of their obligation to comply with applicable requirements under *Subtitles C and D* of the *Resource Conservation and Recovery Act (RCRA)*; and

10. Develop, implement, and maintain an enforcement response plan as required by *40 CFR 403.8(f)(5)* which shall, at a minimum,

    a) Describe how the POTW will investigate instances of noncompliance;

    b) Describe the types of escalating enforcement responses the POTW will take in response to all anticipated type of industrial user violations; and

    c) Describe the time periods within which such responses will be taken and identify the POTW staff position(s) responsible for pursuing these actions.

11. Establish and enforce specific local limits as necessary to implement the provisions of the *40 CFR Parts 403.5(a)* and *(b)*, and as required by *40 CFR Part 403.5(c)*.

B. The permittee is required to modify its pretreatment program, as necessary, to reflect changes in the regulations of *40 CFR 403*. Such modifications shall be completed within the time frame set forth by the applicable regulations. Modification of the approved pretreatment program must be done in accordance with the requirements of *40 CFR 403.18*. Modifications of the approved program which result in less stringent industrial user requirements shall not be effective until after approval has been granted by the Executive Secretary.

C. The permittee shall provide the Division of Water Quality and EPA with an annual report briefly describing the permittee's pretreatment program activities over the previous calendar year. Reports shall be submitted no later than March 28 of each year. These annual reports shall, at a minimum, include:

1. An updated listing of the permittee's industrial users.

2. A descriptive summary of the compliance activities including numbers of any major enforcement actions, i.e., administrative orders, penalties, civil actions, etc.

3. An assessment of the compliance status of the permittee's industrial users and the effectiveness of the permittee's Pretreatment Program in meeting its needs and objectives.

4. A summary of all sampling data taken of the influent and effluent for those pollutants listed in *Part I.C.*

5. A description of all substantive changes made to the permittee's pretreatment program referenced in *Section B* of this section. Substantive changes include, but are not limited to, any change in any ordinance, major modification in the program's administrative structure or operating agreement(s), a significant reduction in monitoring, or a change in the method of funding the program.

6. Other information as may be determined necessary by the Executive Secretary.

D. Pretreatment standards (*40 CFR 403.5*) specifically prohibit the introduction of the following pollutants into the waste treatment system from any source of non-domestic discharge:

1. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, waste streams with a closed cup flashpoint of less than 140^{o}F (60^{o}C);

2. Pollutants, which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;

3. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference;

4. Any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a discharge at such volume or strength as to cause interference in the POTW;

5. Heat in amounts, which will inhibit biological activity in the POTW, resulting in interference, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104^{o}F (40^{o}C);

6. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

7. Pollutants, which result in the presence of toxic gases, vapor, or fumes within the POTW in a quantity that may cause worker health or safety problems;

8. Any trucked or hauled pollutants, except at discharge points designated by the POTW; or

9. Any pollutant that causes pass through or interference at the POTW.

10. Any specific pollutant which exceeds any local limitation established by the POTW in accordance with the requirement of *40 CFR 403.5(c)* and *40 CFR 403.5(d)*.

E. In addition to the general and specific limitations expressed in *Part A and D* of this section, applicable National Categorical Pretreatment Standards must be met by all industrial users of the POTW. These standards are published in the federal regulations at *40 CFR 405* et. seq.

F. *UCA 19-5-104* provides that the State may issue a notice to the POTW stating that a determination has been made that appropriate enforcement action must be taken against an industrial user for noncompliance with any pretreatment requirements within 30 days. The issuance of such notice shall not be construed to limit the authority of the Executive Secretary.

G. The Executive Secretary retains the right to take legal action against any industrial user and/or POTW for those cases where a permit violation has occurred because of the failure of an industrial user to meet an applicable pretreatment standard.

V. MONITORING, RECORDING & ADDITIONAL REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I, II, & III* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10 and 40CFR Part 503,* unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The *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 six months per violation, or by both.

D. Compliance Schedules. 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.

E. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* and *40 CFR 503* 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 or the Biosolids Report Form. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

F. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements:
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

G. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and 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 five years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location.

H. <u>Twenty-four Hour Notice of Noncompliance Reporting</u>.

1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 538-6146, or 24-hour answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

   a) Any noncompliance which may endanger health or the environment;

   b) Any unanticipated bypass, which exceeds any effluent limitation in the permit (See *Part VI.G, Bypass of Treatment Facilities.)*;

   c) Any upset which exceeds any effluent limitation in the permit (See *Part VI.H, Upset Conditions*.);

   d) Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit; or,

   e) Violation of any of the Table 3 metals limits, the pathogen limits, the vector attraction reduction limits or the management practices for biosolids that have been sold or given away.

3. A written submission shall also be provided within five days of the time that 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;

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

e) Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Executive Secretary may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 538-6146.

5. Reports shall be submitted to the addresses in *Part I.D, Reporting of Monitoring Results*.

I. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part I.D* are submitted. The reports shall contain the information listed in *Part IV.F*.

J. Inspection and Entry. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. 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 the permit;

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

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, including but not limited to, biosolids treatment, collection, storage facilities or area, transport vehicles and containers, and land application sites;

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location, including, but not limited to, digested biosolids before dewatering, dewatered biosolids, biosolids transfer or staging areas, any ground or surface waters at the land application sites or biosolids, soils, or vegetation on the land application sites; and,

5. The permittee shall make the necessary arrangements with the landowner or leaseholder to obtain permission or clearance, the Executive Secretary, or authorized representative, upon the presentation of credentials and other

documents as may be required by law, will be permitted to enter without delay for the purposes of performing their responsibilities.

VI. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The *Act* provides that any person who violates a permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions or the Act is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at *Part VI.G, Bypass of Treatment Facilities* and *Part VI.H, Upset Conditions*, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. 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.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment. The permittee shall also take all reasonable steps to minimize or prevent any land application in violation of this permit.

E. 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 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.

F. Removed Substances. Collected screening, grit, solids, sludge, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to *paragraph 2 and 3* of this section.

2. Prohibition of Bypass.

   a) Bypass is prohibited, and the Executive Secretary may take enforcement action against a permittee for bypass, unless:

      1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;

      2) There were no feasible alternatives to 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 preventive maintenance, and

      3) The permittee submitted notices as required under *section VI.G.3*.

   b) The executive Secretary may approve an anticipated bypass, after considering its adverse effects, if the Executive Secretary determines that it will meet the three conditions listed in *sections VI.G.2.a (1), (2) and (3)*.

3. Notice.

   a) Anticipated bypass. Except as provided above in *section VI.G.2* and below in *section VI.G.3.b*, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Executive Secretary:

      1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages:

      2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify

the Executive Secretary in advance of any changes to the bypass schedule;

3) Description of specific measures to be taken to minimize environmental and public health impacts;

4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and,

6) Any additional information requested by the Executive Secretary.

b) Emergency Bypass. Where ninety days advance notice is not possible, the permittee must notify the Executive Secretary, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Executive Secretary the information in *section VI.G.3.a.(1) through (6)* to the extent practicable.

c) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass to the Executive Secretary as required under *Part V.H*, Twenty-four Hour Notice of Noncompliance Reporting. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of P*aragraph 2* of this section are met. Executive Secretary's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. 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:

a) An upset occurred and that the permittee can identify the cause(s) of the upset;

b) The permitted facility was at the time being properly operated;

c) The permittee submitted notice of the upset as required under *Part V.H, Twenty-four Hour Notice of Noncompliance Reporting*; and,

d) The permittee complied with any remedial measures required under *Part VI.D, Duty to Mitigate*.

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

VII.GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of parameters discharged or pollutant sold or given away. This notification applies to pollutants, which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Executive Secretary of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.

F. 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 Executive Secretary, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.

1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a) The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,

   b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

3. Changes to authorization. If an authorization under *paragraph VII.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *paragraph VII.G.2.* must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports. The *Act* 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 $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Executive Secretary. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Executive Secretary at least 20 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee's containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph *2* above.

N. State or Federal Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.

O. Water Quality - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. A revision to the current Water Quality Management Plan is approved and adopted which calls for different effluent limitations than contained in this permit.

P. Biosolids – Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate biosolids limitations (and compliance schedule, if necessary), management practices, other appropriate requirements to protect public health and the environment, or if there have been substantial changes (or such changes are planned) in biosolids use or disposal practices; applicable management practices or numerical limitations for pollutants in biosolids have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittees biosolids use or land application practices do not comply with existing applicable state of federal regulations.

Q. Toxicity Limitation - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;

1. Toxicity is detected, as per Part I.C.2.c and d of this permit, during the duration of this permit.

2. The TRE results indicate that compliance with the toxic limits will require an implementation schedule past the date for compliance and the Executive Secretary agrees with the conclusion.

3. The TRE results indicate that the toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits, and the Executive

Secretary agrees that numerical controls are the most appropriate course of action.

4. Following the implementation of numerical control(s) of toxicant(s), the Executive Secretary agrees that a modified biomonitoring protocol is necessary to compensate for those toxicant that are controlled numerically.

5. The TRE reveals other unique conditions or characteristics, which in the opinion of the permit issuing authority justify the incorporation of unanticipated special conditions in the permit.

R. <u>Storm Water-Reopener Provision</u>. At any time during the duration (life) of this permit, this permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "waters-of-State".

S. <u>Total Maximum Daily Load-Reopener Provision</u>. This permit may be reopened and modified (following proper administrative procedures) to include Total Maximum Daily Load (TMDL) monitoring, related effluent limits, a compliance schedule, a compliance date, additional or modified numerical limitations, or any other conditions related to the TMDL Process and activity in effected impaired water body.

VIII. DEFINITIONS

1. The "30-day (and monthly) average," other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

2. The "7-day (and weekly) average", other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains Saturday.

3. "Daily Maximum" (Daily Max.) is the maximum value allowable in any single sample or instantaneous measurement.

4. "Composite Samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

   a) Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

   b) Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

   c) Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,

   d) Continuous sample volume, with sample collection rate proportional to flow rate.

5. A "grab" sample, for monitoring requirements, is defined as a single "dip and take" sample collected at a representative point in the discharge stream.

6. An “instantaneous” measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

7. “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 operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

8. “Bypass,” means the diversion of waste streams from any portion of a treatment facility.

9. “Severe Property Damage,” means substantial physical damage to property, damage to the treatment facilities 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.

10. “Executive Secretary,” means Executive Secretary of the Utah Water Quality Board.

11. “EPA,” means the United States Environmental Protection Agency.

12. “Acute Toxicity” occurs when 50 percent or more mortality is observed for either test species at any effluent concentration.

13. "Chronic toxicity" occurs when the survival, growth, or reproduction for either test species exposed to a dilution of percent effluent (or lower) is significantly less (at the 95 percent confidence level) than the survival, growth or reproduction of the control specimens.

14. “Act,” means the *Utah Water Quality Act*.

15. “CWA,” means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.

16. “Storm Water,” means storm water runoff, snow melt runoff, and surface runoff and drainage.

17. “Biosolids,” means any material or material derived from sewage solids that have been biologically treated.

18. “Dry Weight-Basis,” means 100 percent solids (i.e. zero percent moisture).

19. "Land Application" is the spraying or spreading of biosolids onto the land surface; the injection of biosolids below the land surface; or the incorporation of biosolids into the land so that the biosolids can either condition the soil or fertilize crops or vegetation grown in the soil. Land application includes distribution and marketing (i.e. the selling or giving away of the biosolids).

20. "Pathogen," means an organism that is capable of producing an infection or disease in a susceptible host.

21. "Pollutant" for the purposes of this permit is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organisms that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food-chain, could on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms.

22. "Runoff" is rainwater, leachate, or other liquid that drains over any part of a land surface and runs off the land surface.

23. "Similar Container" is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

24. "Total Solids" are the materials in the biosolids that remain as a residue if the biosolids are dried at 103^{o} or 105^{o} Celsius.

25. "Treatment Works" are either Federally owned, publicly owned, or privately owned devices or systems used to treat (including recycling and reclamation) either domestic sewage or a combination of domestic sewage and industrial waste or liquid manure.

26. "Vector Attraction" is the characteristic of biosolids that attracts rodents, flies mosquito's or other organisms capable of transporting infectious agents.

27. "Animals" for the purpose of this permit are domestic livestock.

28. "Annual Whole Sludge Application Rate" is the amount of sewage sludge (dry-weight basis) that can be applied to a unit area of land during a cropping cycle.

29. "Agronomic Rate is the whole sludge application rate (dry-weight basis) designed to: (1) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (2) minimize the amount of nitrogen in the sewage sludge that

passes below the root zone of the crop or vegetation grown on the land to the ground water.

30. “Annual Pollutant Loading Rate” is the maximum amount of a pollutant (dry-weight basis) that can be applied to a unit area of land during a 365-day period.

31. “Application Site or Land Application Site” means all contiguous areas of a users’ property intended for sludge application.

32. “Cumulative Pollutant Loading Rate” is the maximum amount of an inorganic pollutant (dry-weight basis) that can be applied to a unit area of land.

33. “Grit and Screenings” are sand, gravel, cinders, other materials with a high specific gravity and relatively large materials such as rags generated during preliminary treatment of domestic sewage at a treatment works and shall be disposed of according to *40 CFR 258*.

34. “High Potential for Public Contact Site” is land with a high potential for contact by the public. The includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and gold courses.

35. “Low Potential for Public Contact Site” is the land with a low potential for contact by the public. This includes, but is not limited to, farms, ranches, reclamation areas, and other lands which are private lands, restricted public lands, or lands which are not generally accessible to or used by the public.

36. “Monthly Average” is the arithmetic mean of all measurements taken during the month.

37. “Volatile Solids” is the amount of the total solids in sewage sludge lost when the sludge is combusted at 550 degrees Celsius for 15-20 minutes in the presence of excess air.

SOUTH VALLEY WATER RECLAMATION FACILITY

STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
SALT LAKE CITY, UTAH

UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES)
COMBINED FACILITY PERMIT

In an effort to clarify all permit responsibilities under the UPDES permit system and reduce paper work and redundancy this permit effectively combines the provisions of the following permits for the **SOUTH VALLEY WATER RECLAMATION FACILITY** located at, 7495 South 1300 West, Salt Lake City, Utah:

Major Municipal UPDES Permit No. **UT0024384,** and

UPDES Biosolids Permit No. **UTL024384**

Includes applicable Provisions of the UPDES Multi-Sector General Permit for Storm Water Discharges, Permit No. **UTR000000**

In compliance with provisions of the Utah *Water Quality Act*, *Title 19, Chapter 5, Utah Code Annotated ("UCA") 1953, as amended* (the *"Act"*),

SOUTH VALLEY WATER RECLAMATION FACILITY

is hereby authorized to discharge from its wastewater treatment facility to receiving waters named **JORDAN RIVER** and dispose of biosolids in accordance with specific limitations, outfalls, and other conditions set forth herein.

This permit shall become effective on July 1, 2005.

This permit expires at midnight on February 28, 2010.

Signed this the 22nd day of June, 2005.

____

Walter L. Baker, P.E.
Executive Secretary
Utah Water Quality Board

DISCHARGE PERMIT NO. UT0024384
BIOSOLIDS PERMIT NO. UTL-024384
STORM WATER PERMIT NO. UTR000000

Table of Contents

I. DISCHARGE – LIMITATIONS AND REPORTING REQUIREMENTS

A. Description of Discharge Point. The authorization to discharge treated wastewater provided under this permit is limited to those outfalls specifically designated below as discharge locations. Discharges at any location not authorized under a UPDES permit are violations of the *Act* and may be subject to penalties under the *Act*. Knowingly discharging from an unauthorized location or failing to report an unauthorized discharge may be subject to criminal penalties as provided under the *Act*.

Outfall Number	Location of Discharge Point
001	A 60-inch pipe runs from the northeast side of the plant to the Jordan River, discharging at latitude 40°36'41" and longitude 111°55'34".

B. Narrative Standard. It shall be unlawful, and a violation of this permit, for the permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum, or other nuisances such as color, odor or taste, or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by a bioassay or other tests performed in accordance with standard procedures.

C. Specific Limitations and Self-Monitoring Requirements.

1. Toxicity Limitations for Outfall 001.

Effective immediately, and lasting through the life of this permit, there shall be no acute or chronic toxicity in the discharge as defined in *Part VIII*, and determined by test procedures described in *Part VIII. 5, 6 and 7* of this permit.

2. Discharge Water.

a) Effective immediately and lasting the duration of this permit, the permittee is authorized to discharge from Outfall 001. Such discharges shall be limited and monitored by the permittee as specified below:

Parameter	Effluent Limitations			
	Maximum Monthly Avg.	Maximum Weekly Avg.	Daily Minimum	Daily Maximum
$CBOD_5$, mg/L	12	20	NA	NA
$CBOD_5$ Min. % Removal	85	NA	NA	NA

TSS, mg/L TSS Min. % Removal	25 85	35 NA	NA NA	NA NA
E. Coli, No./100mL	126	157	NA	NA
pH, Standard Units	NA	NA	6.5	9.0
Total Ammonia (as N), mg/L Summer (Jul-Sep) Fall (Oct-Dec) Winter (Jan-Mar) Spring (Apr-Jun)	 4.0 4.0 4.0 5.2	 NA NA NA NA	 NA NA NA NA	 13.1 16.2 10.6 11.3
TRC mg/L Summer (Jul-Sep) Fall (Oct-Dec) Winter (Jan-Mar) Spring (Apr-Jun	 0.024 0.020 0.022 0.020	 NA NA NA NA	 NA NA NA NA	 0.030 0.027 0.028 0.027
DO, mg/L	NA	NA	5.0	NA
WET Acute Biomonitoring Chronic Biomonitoring	 NA NA	 NA NA	 NA NA	 Pass Pass
Oil & Grease, mg/L (when sheen observed)	 NA	 NA	 NA	 10.0

NA – Not Applicable

Self-Monitoring and Reporting Requirements a/			
Parameter	Frequency	Sample Type	Units
Total Flow b/ c/	Continuous	Recorder	MGD
$CBOD_5$, Influent d/ Effluent	3 x Weekly 3 x Weekly	Composite Composite	mg/L mg/L
TSS, Influent d/ Effluent	3 x Weekly 3 x Weekly	Composite Composite	mg/L mg/L
E. Coli	3 x Weekly	Grab	No./100mL
pH	5 x Weekly	Grab	SU
Ammonia	3 x Weekly	Grab	mg/L
TRC e/	6 x Weekly	Grab	mg/L
DO	5 x Weekly	Grab	mg/L
Phosphorus, Total f/	Monthly	Grab/Composite	mg/L
Nitrate, NO3 f/	Monthly	Grab/Composite	mg/L
Nitrite, NO2 f/	Monthly	Grab/Composite	mg/L
WET - Biomonitoring Ceriodaphnia - Acute Ceriodaphnia - Chronic Fathead Minnows - Acute Fathead Minnows - Chronic	 1st & 3rd Quarter 2nd & 4th Quarter 2nd & 4th Quarter 1st & 3rd Quarter	 Composite Composite Composite Composite	 Pass/Fail Pass/Fail Pass/Fail Pass/Fail

Oil & Grease	When Sheen Observed	Grab	mg/L
Metals, Influent Effluent	Quarterly Quarterly	Composite Composite	mg/L mg/L
Organic Toxics	Yearly	Grab	mg/L

a/ See Definitions, *Part VII*, for definition of terms.

b/ Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

c/ If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

d/ In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent using the same frequency and sample type as required for this constituent in the discharge.

e/ Total residual chlorine monitoring frequency is reduced from daily to 6 times a week. The chlorine disinfection is a back up system to the ultra violet system and therefore should not be needed unless the ultra violet system has a failure and is by passed. The new TRC limits are low enough to require analysis in the onsite lab which is open only 6 days a week. Frequency reduction will remove a requirement that the lab be opened for a 7th day. In case of a bypass on any day the lab is closed, South Valley will bring in lab personnel to open the lab for TRC analysis.

f/ Total Phosphorus, Nitrate (NO3), and Nitrite (NO2) are being sampled in support of the work being done for the TMDL currently underway for the Lower Jordan River. The Pollutants Of Concern will be monitored and reported by the facility on a annual basis, but will not have a limit associated with them. At the end of each Calendar year of sampling for these POC's, South Valley will report the results of all sampling done for the POC's to the TMDL section.

b) Additional Self-Monitoring and Reporting Requirements.

(1) Influent and Effluent Monitoring and Reporting Requirements. The permittee shall sample and analyze both the influent and effluent quarterly, for the following parameters.

Parameter	Frequency	Sample Type	Units
Total Arsenic	Quarterly	Composite	mg/L
Total Cadmium	Quarterly	Composite	mg/L
Total Chromium	Quarterly	Composite	mg/L
Total Copper	Quarterly	Composite	mg/L
Total Cyanide	Quarterly	Composite	mg/L
Total Lead	Quarterly	Composite	mg/L
Total Mercury	Quarterly	Composite/Grab	mg/L
Total Molybdenum	Quarterly	Composite	mg/L
Total Nickel	Quarterly	Composite	mg/L
Total Selenium	Quarterly	Composite	mg/L

Total Silver	Quarterly	Composite	mg/L
Total Zinc	Quarterly	Composite	mg/L

In addition, the permittee shall analyze the treatment facility influent and effluent for the presence of the toxic pollutants listed in *40 CFR 122 Appendix D Table II (Organic Toxic Pollutants)* yearly. The pesticides fraction of *Appendix D, Table II* is not required to be analyzed unless pesticides are expected to be present.

The results of the analyses of metals, cyanide and toxic organics shall be submitted along with the Discharge Monitoring Report (DMR) at the end of the earliest possible reporting period.

(2) In accordance with the requirements of *40 CFR Part 403.5(c)*, the permittee shall determine if there is a need to develop or revise its local limits in order to implement the general and specific prohibitions of *40 CFR Part 403.5 (a)* and *Part 403.5 (b)*. A technical evaluation of the need to develop or revise local limits shall be submitted to the Division within **12 months** of the effective date of this permit. This evaluation should be conducted in accordance with the latest revision of the *Utah Model industrial Pretreatment Program, Section 4, Local Limits*. If a technical evaluation, which may be based on the *Utah Model Industrial Pretreatment Program, Section 4, Local Limits*, reveals that development or revision of local limits is necessary, the permittee shall submit the proposed local limits revision to the Division of Water Quality in an approvable form, within **12 months** of the Division's determination that a revision is necessary.

c) Whole Effluent Testing – Acute Toxicity.

Effective immediately, the permittee shall conduct quarterly acute static replacement toxicity tests on a composite sample of the final effluent. The sample shall be collected at Outfall 001.

The monitoring frequency for acute tests shall be quarterly unless a sample is found to be acutely toxic during a routine test. If that occurs, the monitoring frequency shall become weekly (See *Part I.C.2.e, Accelerated Testing*). Samples shall be collected on a two day progression; i.e., if the first sample is on a Monday, during the next sampling period, the sampling shall begin on a Wednesday, etc.

The replacement static acute toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fourth Edition. August 1993, EPA/600/4-90/027F* as per *40 CFR 136.3(a) TABLE 1A-LIST OF APPROVED BIOLOGICAL METHODS*, and the *Region VIII EPA NPDES Acute Test Conditions – Static Renewal Whole Effluent Toxicity Test (August, 1997)*. In the case of conflicts, the Region VIII procedures will prevail. The permittee shall conduct the 48-hour static replacement toxicity test using Ceriodaphnia dubia and the acute 96-hour static replacement toxicity test using Pimephales promelas (fathead minnow). If necessary for pH adjustment, CO2 atmosphere can be used.

Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Mortality in the control must simultaneously be 10 percent or less for the results to be considered valid. If more than 10 percent control mortality occurs, the test shall be repeated until satisfactory control mortality is achieved. A variance to this requirement may be granted by the Executive Secretary if a mortality of less than 10 percent was observed in higher effluent dilutions.

If the permit contains a total residual chlorine limitation greater than 0.20 mg/L, the permittee may request from the Executive Secretary approval to de-chlorinate the sample, or collect the sample prior to chlorination.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar quarter e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). All test results shall be reported along with the DMR submitted for that reporting period. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Acute Whole Effluent Reporting (August, 1997)* and shall include all chemical and physical data as specified.

If the results for one year of testing indicate no acute toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Executive Secretary may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

d) Whole Effluent Testing – Chronic Toxicity.

Effective immediately, the permittee shall quarterly, conduct chronic short-term toxicity tests on a composite sample of the final effluent. The sample shall be collected at Outfall 001.

The monitoring frequency shall be quarterly. Samples shall be collected on a two-day progression; i.e., if the first sample is on a Monday, during the next sampling period, sampling shall be on a Wednesday. If chronic toxicity is detected, the test shall be repeated in less than four weeks from the date the initial sample was taken. The need for any additional samples, and/or a Toxicity Reduction Evaluation (TRE, see *Part I.C.2.h*), shall be determined by the Executive Secretary. If the second test shows no chronic toxicity, routine monitoring shall be resumed.

The chronic toxicity tests shall be conducted in general accordance with the procedures set out in the latest revision of *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms. Third Edition. July 1994, EPA-600-4-91-002* as per 40 CFR 136.3(a) *TABLE 1A-LIST OF APPROVED BIOLOGICAL METHODS,* and the *Region VIII EPA NPDES Chronic Test Conditions - Static Renewal Whole Effluent Toxicity Test (August, 1997)*. In case of conflicts, the Region VIII procedure will prevail. Test species shall consist of Ceriodaphnia dubia and Pimephales promelas (fathead minnow).

Chronic toxicity occurs when the survival, growth, or reproduction for either test species, when exposed to a dilution of 46 percent effluent or lower, is significantly less (at 95% confidence level) than that of the control specimens. Dilutions of 46 percent only will be required, plus the control. If any of the acceptable control performance criteria are not met, the test shall be considered invalid.

Quarterly test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the end of the reporting calendar quarter (e.g., biomonitoring results for the calendar quarter ending March 31 shall be reported with the DMR due April 28, with the remaining biomonitoring reports submitted with DMRs due each July 28, October 28, and January 28). All test results shall be reported along with the DMR submitted for that reporting period. The format for the report shall be consistent with the latest revision of the *Region VIII Guidance for Chronic Whole Effluent Reporting (August, 1997)* and shall include all the physical testing as specified.

If the results for one year of testing indicate no chronic toxicity, the permittee may request a reduction in testing frequency and/or reduction to one species. The Executive Secretary may approve, partially approve, or deny the request based on results and other available information. If approval is given, the modification will take place without a public notice.

The current Utah whole effluent toxicity (WET) policy is in the process of being updated and revised to assure its consistency with the Environmental Protection Agency's national and regional WET policy. When said revised WET policy has been finalized and officially adopted, this permit will be reopened and modified to incorporate satisfactory follow-up chronic toxicity language (chronic pattern of toxicity, PTI and/or TIE/TRE, etc.) without a public notice, as warranted and appropriate.

e) Accelerated Testing.

When acute toxicity is indicated during routine biomonitoring as specified in this permit, the permittee shall notify the Executive Secretary in writing within five (5) days after becoming aware of the test result. The permittee shall perform an accelerated schedule of biomonitoring to establish whether a pattern of toxicity exists. Accelerated testing will begin within seven (7) days after the permittee becomes aware of the test result. Accelerated testing shall be conducted as specified under *Part I.C.2.f, Pattern of Toxicity*. If the accelerated testing demonstrates no pattern of toxicity, routine monitoring shall be resumed.

f) Pattern of Toxicity.

A pattern of toxicity is defined by the results of a series of up to five (5) biomonitoring tests pursuant to the accelerated testing requirements using 100 percent effluent on the single species found to be more sensitive, once every week for up to five (5) consecutive weeks.

If two (2) consecutive tests (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity) do not result in acute toxicity, no further accelerated testing will be required and no pattern of toxicity will be found to exist. The permittee will provide written verification to the Executive Secretary within five (5) days, and resume routine monitoring.

A pattern of toxicity is established if one of the following occurs:

(1) If two (2) consecutive test results (not including the scheduled quarterly or monthly test, which triggered the search for a pattern of toxicity) indicate acute toxicity, this constitutes an established pattern of toxicity.

(2) If consecutive tests continue to yield differing results each time, the permittee will be required to conduct up to a maximum of five (5) acute tests (not including the scheduled quarterly or monthly test which triggered the search for a pattern of toxicity). If three out of five test results indicate acute toxicity, this will constitute an established pattern of toxicity.

g) Preliminary Toxicity Investigation.

(1) When a pattern of toxicity is detected the permittee will notify the Executive Secretary in writing within five (5) days and begin an evaluation of the possible causes of the toxicity. The permittee will have fifteen (15) working days from demonstration of the pattern to complete a Preliminary Toxicity Investigation (PTI) and submit a written report of the results to the Executive Secretary. The PTI may include, but is not limited to, additional chemical and biological monitoring, examination of pretreatment program records, examination of discharge monitoring reports, a thorough review of the testing protocol, evaluation of treatment processes and chemical use, inspection of material storage and transfer areas to determine if a spill may have occurred, and similar procedures.

(2) If the PTI identifies a probable toxicant and/or a probable source of toxicity the permittee shall submit, as part of its final results written notification of that effect to the Executive Secretary. Within thirty (30) days of completing the PTI the permittee shall submit for approval a control program to control effluent toxicity and shall proceed to implement such a plan within seven (7) days following approval. The control program, as submitted to or revised by the Executive Secretary, may be incorporated into the permit.

(3) If no probable explanation for toxicity is identified in the PTI, the permittee shall notify the Executive Secretary as part of its final report, along with a schedule for conducting a Phase I Toxicity Reduction Evaluation (TRE) (See *Part I.C.2.h, Toxicity Reduction Evaluation*).

(4) If toxicity spontaneously disappears during the PTI, the permittee shall submit written notification to that effect to the Executive Secretary as part of the reporting requirements of paragraph a. of this section.

h) Toxicity Reduction Evaluation (TRE).

If toxicity is detected during the life of this permit and it is determined by the Executive Secretary that a TRE is necessary, the permittee shall be so notified and shall initiate a TRE immediately thereafter. The purpose of the TRE will be to establish the cause of toxicity, locate the source(s) of the toxicity, and control or provide treatment for the toxicity.

A TRE may include but is not limited to one, all, or a combination of the following:

(1) Phase I – Toxicity Characterization

(2) Phase II – Toxicity Identification Procedures

(3) Phase III – Toxicity Control Procedures

(4) Any other appropriate procedures for toxicity source elimination and control.

If the TRE establishes that the toxicity cannot be immediately eliminated, the permittee shall submit a proposed compliance plan to the Executive Secretary. The plan shall include the proposed approach to control toxicity and a proposed compliance schedule for achieving control. If the approach and schedule are acceptable to the Executive Secretary, this permit may be reopened and modified.

If the TRE shows that the toxicity is caused by a toxicant(s) that may be controlled with specific numerical limitations, the permittee may:

(a) Submit an alternative control program for compliance with the numerical requirements.

(b) If necessary, provide a modified biomonitoring protocol, which compensates for the pollutant(s) being controlled numerically.

If acceptable to the Executive Secretary, this permit may be reopened and modified to incorporate any additional numerical limitations, a modified compliance schedule if judged necessary by the Executive Secretary, and/or a modified biomonitoring protocol.

Failure to conduct an adequate TRE, or failure to submit a plan or program as described above, or the submittal of a plan or program judged inadequate by the Executive Secretary, shall be considered a violation of this permit.

D. Reporting of Monitoring Results.

1. Discharge Water. Monitoring results obtained during the previous month shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), post-marked no later than the 28th day of the month following the completed reporting period. The first report is due on April 28th, 2005. If no discharge occurs during the reporting period, "no discharge" shall be reported. Legible copies of these, and all other reports including whole effluent toxicity (WET) test reports required herein, shall be signed and certified in accordance with the requirements of *Signatory Requirements (see Part VII.G*), and submitted to the Director, Division of Water Quality and to EPA at the following addresses:

original to: Department of Environmental Quality
Division of Water Quality
288 North 1460 West
PO Box 144870
Salt Lake City, Utah 84114-4870

copy to: Technical Enforcement Program (8ENF-T)
Office of Enforcement,
Compliance Assistance & Environmental Justice
US EPA Region VIII
999 18th Street, Suite 500
Denver, CO 80202-2466

II. BIOSOLIDS REQUIREMENTS

A. Biosolids Treatment and Disposal.

The authorization to dispose of biosolids provided under this permit is limited to those biosolids produced from the treatment works owned and operated by the South Valley Water Reclamation Facility (SVWRF). The treatment methods and disposal practices are specifically designated below.

1. Treatment. The biosolids are stabilized in oxidation ditches with a mean cell residence time of 14 days, and de-watered with belt presses to about 15% solids. All biosolids that are land applied will require further treatment for pathogen and vector attraction reduction. These treatment methods may include, but are not limited to composting, lime stabilization or solar drying.

2. Description of Biosolids Disposal Method.

    a) Class A biosolids may be sold or given away to the public for lawn and garden use.

    b) The solids are processed meet at least Class B requirements and land applied for agriculture production.

    c) Class B biosolids may be land applied at up to 5 times the agronomic rate at Utah Kennecott Copper Corporation for land reclamation.

    d) Biosolids are landfilled (must meet the requirements of *40 CFR 258, Utah Administrative Code R315-301-5* and *Section 2.12* of the latest version of the *EPA Region VIII Biosolids Management Handbook* must be followed).

    e) Biosolids are mono-filled on property owned by the SVWRF.

    f) Biosolids are disposed at ET Technologies, further treated, and used for final cover at the Salt Lake County Landfill.

3. Changes in Treatment Systems and Disposal Practices. Should the permittee change their disposal methods or the biosolids generation and handling processes of the plant, the permittee must notify the Executive Secretary at least 180 days in advance. This includes, but is not limited to, the addition or removal of any biosolids treatment units (i.e., digesters, drying beds, belt presses, etc.) and/or any other change, which would require a major modification of the permit.

B. Specific Limitations and Monitoring Requirements.

1. Class A Metals Limitations.

All biosolids that are composted for sale or give away in a bag or similar container for application to home lawns and home gardens must the requirements of *Part II.B.1, 3, 5,* and *6* listed below, if the biosolids do meet these requirements the biosolids cannot be sold or given away.

Table 3, Exceptional Quality Biosolids Limitations, mg/kg	
Total Arsenic	41.0
Total Cadmium	39.0
Total Copper	1500.0
Total Lead	300.0
Total Mercury	17.0
Total Molybdenum	75.0
Total Nickel	420.0
Total Selenium	100.0
Total Zinc	2800.0

2. Class B Metals Limitations.

All biosolids generated by this facility to be land applied for agriculture or reclamation purposes must meet the requirements of *Part II.B.2, 4,5* and *6* listed below, if the biosolids do meet these requirements the biosolids cannot be land applied.

Pollutant	Table 1	Table 2	Table 3	Table 4
All metals concentrations shall be measured and reported on a dry weight basis	Daily Maximum mg/Kg a/	Cumulative Loading Kg/Ha	Monthly Average mg/Kg a/	Annual Loading Kg/Ha/365 day Period
Total Arsenic	75	41	41	2.0
Total Cadmium	85	9	39	1.9
Total Copper	4300	1500	1500	75
Total Lead	840	300	300	15

Total Mercury	57	17	17	0.85
Total Molybdenum	75	N/A	75.0	N/A
Total Nickel	420	420	420	21
Total Selenium	100	100	100	5.0
Total Zinc	7500	2800	2800	140

3. Class A Pathogen Limitations.

All biosolids sold or given away in a bag or a similar container for application to lawns and home gardens must meet the pathogen limitations as described below. If the pathogen limitations are not met, the biosolids cannot be sold or given away.

Fecal Coliform or *Salmonella* Limits		The process to further reduce pathogens will be met by:
Salmonella shall be <3 MPN/4g of total solids **OR** Fecal Coliform shall be < 1000 MPN/g of total solids	**AND**	Composting using the windrow method, the temperature of the biosolids is maintained at 55^{o} C (131^{o}F) or higher for 15 days or longer, with a minimum of 5 turnings of the windrows during the 15 days a/ **OR** Sufficient lime is added to the solids to raise the pH of the solids to 12 after two hours of contact a/.

4. Class B Pathogen Limitations.

If the biosolids are to be land applied, the biosolids shall meet Class B requirements as described below (including the site restrictions). If the biosolids do not meet Class B pathogen requirements, the biosolids cannot be land applied.

Fecal Coliform Limits	**OR**	The process to significantly reduce pathogens will be met by:

Fecal coliform shall be < 2,000,000 MPN/g of total solids.		Composting using the windrow method, the temperature of the biosolids is maintained at 40^{o} C (131^{o}F) or higher for 15 days or longer, with a minimum of 5 turnings of the windrows during the 15 days a/.

5. Vector Attraction Reduction Requirements a/

If the biosolids are to be land applied, the biosolids shall meet vector attraction reduction requirements as described below. If the biosolids do not meet one of vector attraction requirements below, the biosolids cannot be land applied.

a. Vector attraction reduction shall be met through aerobic treatment of the solids for at least 14 days at over 40^{o} C (104^{o} F) with an average temperature of over 45^{o} C (113^{o} F).

b. The addition of lime to raise the pH of the solids to at least 12 and maintain the pH of at least 12 without the addition of more alkali for an additional 22 hours.

c. The solids shall be at least at 90%.

d. Incorporation into the soil within six hours after land application.

a/ There are additional pathogen reduction and vector attraction reduction alternatives available in *40 CFR 503.32* and *40 CFR 503.33*. If the permittee intends to use one of these alternatives the Executive Secretary and the EPA must be informed at least 30 days prior to its use. This change may be made without additional public notice.

6. Self-Monitoring Requirements

   a. At a minimum, upon the effective date of this permit, all metals, pathogens and applicable vector attraction reduction requirements shall be monitored according to *40 CFR 503.16.*

Minimum Frequency of Monitoring	
Dry Metric Tons (DMT) of Biosolids Disposed Per Year	Monitoring Frequency
> 0 to < 290, DMT	Once per year
> 290 to < 1,500, DMT	Four times per year
> 1,500 to < 15,000, DMT	Six times per year
> 15,000, DMT	Twelve times per year

   b. Deep soil monitoring for nitrate-nitrogen is required for all land application sites (does not apply to biosolids that are composted for sale or giveaway, or sites where biosolids are applied less than once every five years). A minimum of six sample sites for each 320 (or less) acre area are to be collected. These samples are to be collected down to either 5 feet or to the confining layer, whichever is shallower. Each one-foot increment is to be a composite with the other samples from the site and one analysis for nitrate is to be done for each increment. Samples are required to be taken once every five years for non-irrigated sites or annually for irrigated sites.

   c. Soil monitoring for phosphorus (reported as P) is required for all land application sites (does not apply to biosolids that are composted for sale or giveaway, or sites where biosolids are applied less than once every five years). Six samples of one-foot depth each are to be collected for each 320 acre area and composited. Samples are required to be taken once every five years for non-irrigated sites or annually for irrigated sites.

   d. Sample collection, preservation and analysis shall be performed in a manner consistent with the requirements of *40 CFR Part 503* and/or other criteria specified in this permit. Metals analysis is to be performed using *Method SW 846* with *Method 3050* used for digestion. For the digestion procedure, an amount of biosolids equivalent to one gram dry weight shall be used. The methods are also described in the latest version of the *Region VIII Biosolids Management Handbook*. Monitoring for soil nitrate and phosphorus is to be performed using the methods in *Methods of Soil Analysis, Part 2. Chemical and Microbiological Properties*. Page, A. L., Ed., American Society of Agronomy and Soil Science Society of America, Madison, WI, 1982.

e. The Executive Secretary may request additional monitoring for specific pollutants derived from biosolids if the data shows a potential for concern.

f. After two years of monitoring at the frequency specified, the permittee may request that the Executive Secretary reduce the sampling frequency for the chemical pollutants in Part I.C.1. The frequency cannot be reduced to less than once per year for land applied biosolids for any parameter. The frequency also cannot be reduced for any of the pathogen or vector attraction reduction requirements listed in this permit.

C. Site Restrictions

If the biosolids are Class B with respect to pathogens, the SVWRF shall comply with all applicable site restrictions listed below:

1. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application.

2. Food crops with harvested parts below the land surface shall not be harvested for 20 months after application if the biosolids remains on the land surface for four months or more prior to incorporation into the soil.

3. Other food crops and feed crops shall not be harvested from the land for 30 days after application.

4. Animals shall not be allowed to graze on the land for 30 days after application.

5. Turf grown on land where biosolids is applied shall not be harvested for one year after application if the harvested turf is placed on either land with a high potential for public exposure or a lawn.

6. Public access to land with a high potential for public exposure shall be restricted for one year after application.

7. Public access to land with a low potential for public exposure shall be restricted for 30 days after application.

D. Management Practices for Application of Biosolids to Land

The permittee shall operate and maintain the land application site operations in accordance with the following requirements:

1. The permittee shall provide to the Executive Secretary and the EPA within 90 days of the effective date of this permit a land application plan.

2. Application of biosolids shall be conducted in a manner that will not contaminate the groundwater or impair the use classification for that water underlying the sites.

3. Application of biosolids shall be conducted in a manner that will not cause a violation of any receiving water quality standard from discharges of surface runoff from the land application sites. Biosolids shall not be applied to land 10 meters or less from waters of the United States (as defined in *40 CFR 122.2*).

4. No person shall apply biosolids for beneficial use to frozen, ice-covered, or snow-covered land where the slope of such land is greater than three percent and is less than or equal to six percent unless one of the following requirements is met:

   a. there is 80 percent vegetative ground cover; or,

   b. approval has been obtained based upon a plan demonstrating adequate runoff containment measures.

5. Application of biosolids is prohibited to frozen, ice-covered, or snow covered sites where the slope of the site exceeds six percent.

6. Biosolids shall not be applied to sites where the available phosphorous content of the soil exceeds the following:

   a. 100 ppm as determined by the sodium bicarbonate extraction method

   b. 50 ppm as determined by the AB-DPTA extraction method

   c. 170 ppm as determined by the Bray P1 extraction method

7. Application of biosolids shall be conducted in a manner that does not exceed the agronomic rate for available nitrogen of the crops grown on the site. At a minimum, the permittee is required to follow the methods for calculating agronomic rate outlined in the latest version of the *Region VIII Biosolids Management Handbook* (other methods may be approved by the Executive Secretary). The treatment plant shall provide written notification to the applier of the biosolids of the concentration of total nitrogen (as N on a dry weight basis) in the biosolids. Written permission from the Executive Secretary is required to exceed the agronomic rate.

The permittee may request the limits of Part II, D., 6 and 7 be modified if different limits would be justified based on local conditions. The limits are required to be developed in cooperation with the local agricultural extension office or university.

8. Biosolids shall not be applied to any site area with standing surface water. If the annual high groundwater level is known or suspected to be within five feet of the surface, additional deep soil monitoring for nitrate-nitrogen as described in Part I..4.c. is to be performed. At a minimum, this additional monitoring will involve a collection of more samples in the affected area and possibly more frequent sampling. The exact number of samples to be collected will be outlined in a deep soil monitoring plan to be submitted to the Executive Secretary and the EPA within 90 days of the effective date of this permit. The plan is subject to approval by the Executive Secretary.

9. The specified cover crop shall be planted during the next available planting season. If this does not occur, the permittee shall notify the Executive Secretary in writing. Additional restrictions may be placed on the application of the biosolids on that site on a case-by-case basis to control nitrate movement. Deep soil monitoring may be increased under the discretion of the Executive Secretary.

10. When weather and or soil conditions prevent adherence to the biosolids application procedure, biosolids shall not be applied on the site.

11. For biosolids that are sold or given away, an information sheet shall be provided to the person who receives the biosolids. The label or information sheet shall contain:

    a. The name and address of the person who prepared the biosolids for sale or give away for application to the land.

    b. A statement that prohibits the application of the biosolids to the land except in accordance with the instructions on the label or information sheet.

    c. The annual whole biosolids application rate for the biosolids that do not cause the annual metals loading rates in Table 4 (Part II.C.1.) to be exceeded.

12. Biosolids subject to the cumulative pollutant loading rates in Table 2 (Part II.C.1.) shall not be applied to agricultural land, forest, a public contact site, or a reclamation site if any of the cumulative pollutant loading rates in Table 2 have been reached.

13. If the treatment plant applies the biosolids, it shall provide the owner or lease-holder of the land on which the biosolids are applied notice and necessary information to comply with the requirements in this permit.

14. The permittee shall inspect the application of the biosolids to active sites to prevent malfunctions and deterioration, operator errors and discharges, which may cause or lead to the release of biosolids to the environment or a threat to human health. The permittee must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment. The permittee shall keep an inspection log or summary including at least the date and time of inspection, the printed name and the handwritten signature of the inspector, a notation of observations made and the date and nature of any repairs or corrective action.

E. Special Conditions on Biosolids Storage

Permanent storage of biosolids is prohibited. Biosolids shall not be temporarily stored for more than two years. Written permission to store biosolids for more than two years must be obtained from the Executive Secretary. Storage of biosolids for more than two years will be allowed only if it is determined that significant treatment is occurring.

F. Representative Sampling.

Biosolids samples used to measure compliance with Part II.B. of this Permit shall be collected at locations representative of the quality of biosolids generated at the treatment works and immediately prior to land application.

G. Reporting of Monitoring Results.

The permittee shall provide the results of all monitoring performed in accordance with Part II.B., and information on management practices, biosolids treatment, site restrictions and certifications shall be provided no later than February 19 of each year. Each report is for the previous calendar year. If no biosolids were sold or given away during the reporting period, "no biosolids were sold or given away" shall be reported. Legible copies of these, and all other reports required herein, shall be signed and certified in accordance with the *Signatory Requirements (see Part IV)*, and submitted to the Utah Division of Water Quality and the EPA at the following addresses:

Original to: Biosolids Coordinator
Utah Division of Water Quality
P. O. Box 144870
Salt Lake City Utah, 84114-4870

Copy to: Biosolids Coordinator, 8P-W-P
U. S. Environmental Protection Agency

Region VIII
999 18th Street, Suite 500
Denver, Colorado 80202-2466

H. Additional Record Keeping Requirements Specific to Biosolids.

1. If so notified by the Executive Secretary the permittee may be required to add additional record keeping if information provided indicates that this is necessary to protect public health and the environment.

2. The permittee is required to keep the following information for at least 5 years:

   a) Concentration of each heavy metal in Table 3 (Part II.B.1.).

   b) A description of how the pathogen reduction requirements in Part II.B.2. were met.

   c) A description of how the vector attraction reduction requirements in Part II.B.3. were met.

   d) A description of how the management practices in Part II.C. were met (if necessary).

   e) The following certification statement:

   "I certify under the penalty of law, that the heavy metals requirements, the pathogen requirements, and the vector attraction requirements in Part II.B., the site restrictions the management practices in Part II.C have been met. This determination has been made under my direction and supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information used to determine that the pathogen requirements, the vector attraction reduction requirements and the management practices have been met. I am aware that there are significant penalties for false certification including the possibility of imprisonment."

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and 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 the life of the permit. Data collected on site, copies of Biosolids Report forms, and a copy of this UPDES biosolids-only permit must be maintained on site during the duration of activity at the permitted location.

III. STORM WATER REQUIREMENTS

A. Coverage of This Section.

1. Discharges Covered Under This Section. The requirements listed under this section shall apply to storm water discharges from the South Valley Water Reclamation Facility (SVWRF).

   a) Site Coverage. Storm water discharges from the following portions of the SVWRF may be eligible for coverage under this permit: biosolids drying beds, haul or access roads on which transportation of biosolids may occur, grit screen cleaning areas, chemical loading, unloading and storage areas, salt or sand storage areas, vehicle or equipment storage and maintenance areas, or any other wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of sewage sludge that are located within the confines of the facility that may have the reasonable expectation of potential to contribute to pollutants in storm water discharge

B. Prohibition of Non-Storm Water Discharges.

1. The following non-storm water discharges may be authorized under this permit provided the non-storm water component of the discharge is in compliance with this section; discharges from fire fighting activities; fire hydrant flushing; potable water sources including waterline flushing; drinking fountain water; irrigation drainage and lawn watering; routine external building wash down water where detergents or other compounds have not been used in the process; pavement wash waters where spills or leaks of toxic or hazardous materials (including oils and fuels) have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated compressor condensate; uncontaminated springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

C. Storm Water Pollution Prevention Plan Requirements.

1. Contents of the Plan. The plan shall include, at a minimum, the following items:

   a) Pollution Prevention Team. Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team who are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

   b) Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility.

Each plan shall identify all activities and significant materials, which may be reasonably expected to have the potential as a significant pollutant source. Each plan shall include, at a minimum:

1) Drainage. A site map indicating drainage areas and storm water outfalls. For each area of the facility that generates storm water discharges associated with the waste water treatment related activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow and an identification of the types of pollutants that are likely to be present in storm water discharges associated with the activity. Factors to consider include the toxicity of the pollutant; quantity of chemicals used, produced or discharged; the likelihood of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants. Flows with a significant potential for causing erosion shall be identified. The site map shall include but not be limited to:

   (a) Drainage direction and discharge points from all wastewater associated activities including but not limited to grit screen cleaning, bio-solids drying beds and transport, chemical/material loading, unloading and storage areas, vehicle maintenance areas, salt or sand storage areas.

   (b) Location of any erosion and sediment control structure or other control measures utilized for reducing pollutants in storm water runoff.

   (c) Location of bio-solids drying beds where exposed to precipitation or where the transportation of bio-solids may be spilled onto internal roadways or tracked off site.

   (d) Location where grit screen cleaning or other routinely performed industrial activities are located and are exposed to precipitation.

   (e) Location of any handling, loading, unloading or storage of chemicals or potential pollutants such as caustics, hydraulic fluids, lubricants, solvents or other petroleum products, or hazardous wastes and where these may be exposed to precipitation.

   (f) Locations where any major spills or leaks of toxic or hazardous materials have occurred.

   (g) Location of any sand or salt piles.

   (h) Location of fueling stations or vehicle and equipment maintenance and cleaning areas that are exposed to precipitation.

   (i) Location of receiving streams or other surface water bodies.

   (j) Locations of outfalls and the types of discharges contained in the drainage areas of the outfalls.

2) Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of 3 years prior to the effective date of the permit and the present; method and location of onsite storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of 3 years prior to the effective date of the permit and the present; the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

3) Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility after the date of 3 years prior to the effective date of this permit. Such list shall be updated as appropriate during the term of the permit.

4) Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility, including a summary of sampling data collected during the term of this permit.

5) Summary of Potential Pollutant Sources and Risk Assessment. A narrative description of the potential pollutant sources from the following activities associated with treatment works: access roads/rail lines; loading and unloading operations; outdoor storage activities; material handling sites; outdoor vehicle storage or maintenance sites; significant dust or particulate generating processes; and onsite waste disposal practices. Specific potential pollutants shall be identified where known.

6) Measures and Controls. SVWRF shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

7) Good Housekeeping. All areas that may contribute pollutants to storm waters discharges shall be maintained in a clean, orderly manner. These are practices that would minimize the generation of pollutants at the source or before it would be necessary to employ sediment ponds or other control measures at the discharge outlets. Where applicable, such measures or other equivalent measures would include the following: sweepers and covered storage to minimize dust generation and storm runoff; conservation of vegetation where possible to minimize erosion; sweeping of haul roads, bio-solids access points, and exits to reduce or eliminate off site tracking; sweeping of sand or salt storage areas to minimize entrainment in storm water runoff; collection, removal, and proper disposal of waste oils and other fluids resulting from vehicle and equipment maintenance; other equivalent measures to address

identified potential sources of pollution.

8) Preventive Maintenance. A preventive maintenance program shall involve timely inspection and maintenance of storm water management devices (e.g., cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

9) Spill Prevention and Response Procedures. Areas where potential spills that can contribute pollutants to storm water discharges can occur, and their accompanying drainage points, shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures and equipment for cleaning up spills shall be identified in the plan and made available to the appropriate personnel.

10) Inspections. In addition to the comprehensive site evaluation required under paragraph (*Part III.C.1.b.16)* of this section, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility on a periodic basis. The following areas shall be included in all inspections: access roads/rail lines, equipment storage and maintenance areas (both indoor and outdoor areas); fueling; material handling areas, residual treatment, storage, and disposal areas; and wastewater treatment areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained. The use of a checklist developed by the facility is encouraged.

11) Employee Training. Employee training programs shall inform personnel responsible for implementing activities identified in the storm water pollution prevention plan or otherwise responsible for storm water management at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The pollution prevention plan shall identify how often training will take place, but training should be held at least annually (once per calendar year). Employee training must, at a minimum, address the following areas when applicable to a facility: petroleum product management; process chemical management; spill prevention and control; fueling procedures; general good housekeeping practices; proper procedures for using fertilizers, herbicides and pesticides.

12) Record keeping and Internal Reporting Procedures. A description of incidents (such as spills, or other discharges), along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

13) Non-storm Water Discharges.

(a) Certification. The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the onsite drainage points that were directly observed during the test. Certifications shall be signed in accordance with *Part VII.G* of this permit.

(b) Exceptions. Except for flows from fire fighting activities, sources of non-storm water listed in *Part III.B*. (Prohibition of Non-storm Water Discharges) of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

(c) Failure to Certify. Any facility that is unable to provide the certification required (testing for non-storm water discharges), must notify the *Executive Secretary* within 180 days after the effective date of this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible. Non-storm water discharges to waters of the State, which are not, authorized by a *UPDES* permit are unlawful, and must be terminated.

14) Sediment and Erosion Control. The plan shall identify areas, which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and/or stabilization measures to be used to limit erosion.

15) Management of Runoff. The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the generation or source(s) of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures that the permittee determines to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity *Part III.C.1.b* (Description of Potential Pollutant Sources) of this permit] shall be considered when determining reasonable and appropriate measures. Appropriate measures or other equivalent measures may include: vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet

controls (such as oil/water separators), snow management activities, infiltration devices, wet detention/retention devices and discharging storm water through the waste water facility for treatment.

16) Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but in no case less than once a year. Such evaluations shall provide:

(a) Areas contributing to a storm water discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Measures to reduce pollutant loadings shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. Structural storm water management measures, sediment and erosion control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

(b) Based on the results of the evaluation, the description of potential pollutant sources identified in the plan in accordance with *Part III.C.1.b* (Description of Potential Pollutant Sources) of this section and pollution prevention measures and controls identified in the plan in accordance with *Part III.C.1.b.6* (Measures and Controls) of this section shall be revised as appropriate within 2 weeks of such evaluation and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than 12 weeks after the evaluation.

(c) A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph *i.* (above) shall be made and retained as part of the storm water pollution prevention plan for at least 3 years after the date of the evaluation. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the storm water pollution prevention plan and this permit. The report shall be signed in accordance with *Part VII.G* (Signatory Requirements) of this permit.

17) Deadlines for Plan Preparation and Compliance. SVWRF shall prepare and implement a plan in compliance with the provisions of this section within 270 days of the effective date of this permit.

18) Keeping Plans Current. SVWRF shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the state or if the storm water pollution prevention plan proves to be

ineffective in eliminating or significantly minimizing pollutants from sources identified by the plan, or in otherwise achieving the general objective of controlling pollutants in storm water discharges associated with the activities at the facility.

D. Monitoring and Reporting Requirements.

1. Quarterly Visual Examination of Storm Water Quality. Facilities shall perform and document a visual examination of a storm water discharge associated with industrial activity from each outfall, except discharges exempted below. The examination must be made at least once in each of the following designated periods during daylight hours unless there is insufficient rainfall or snow melt to produce a runoff event: January through March; April through June; July through September; and October through December.

   a) Sample and Data Collection. Examinations shall be made of samples collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed 1 hour) of when the runoff or snowmelt begins discharging. The examinations shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution. The examination must be conducted in a well lit area. No analytical tests are required to be performed on the samples. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where practicable, the same individual should carry out the collection and examination of discharges for entire permit term.

   b) Visual Storm Water Discharge Examination Reports. Visual examination reports must be maintained onsite in the pollution prevention plan. The report shall include the examination date and time, examination personnel, the nature of the discharge (i.e., runoff or snow melt), visual quality of the storm water discharge (including observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of storm water pollution), and probable sources of any observed storm water contamination.

   c) Representative Discharge. When SVWRF has two or more outfalls that, based on a consideration of industrial activity, significant materials, and management practices and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may collect a sample of effluent of one of such outfalls and report that the observation data also applies to the substantially identical outfall(s) provided that the permittee includes in the storm water pollution prevention plan a description of the location of the outfalls and explains in detail why the outfalls are expected to discharge substantially identical effluents. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area [e.g., low (under 40 percent), medium (40 to 65 percent), or high (above 65 percent)] shall be provided in the plan.

d) Adverse Conditions. When a discharger is unable to collect samples over the course of the visual examination period as a result of adverse climatic conditions, the discharger must document the reason for not performing the visual examination and retain this documentation onsite with the results of the visual examination. Adverse weather conditions, which may prohibit the collection of samples, include weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

e) Inactive and Unstaffed Site. When a discharger is unable to conduct visual storm water examinations at an inactive and unstaffed site, the operator of the facility may exercise a waiver of the monitoring requirement as long as the facility remains inactive and unstaffed. The facility must maintain a certification with the pollution prevention plan stating that the site is inactive and unstaffed so that performing visual examinations during a qualifying event is not feasible.

IV. INDUSTRIAL PRETREATMENT PROGRAM

A. The permittee has been delegated primary responsibility for enforcing against discharges prohibited by *40 CFR 403.5* and applying and enforcing any national Pretreatment Standards established by the United States Environmental Protection Agency in accordance with Section 307 (b) and (c) of *The Clean Water Act (CWA)*, as amended by *The Water Quality Act (WQA), of 1987*.

The permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, and procedures described in the permittee's approved Pretreatment Program submission. Such program commits the permittee to do the following:

2. Carry out inspection, surveillance, and monitoring procedures which will determine, independent of information supplied by the industrial user, whether the industrial user is in compliance with the pretreatment standards. At a minimum, all significant industrial users shall be inspected and sampled by the permittee at least once per year;

2. Control through permit, order, or similar means, the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements;

3. Require development, as necessary, of compliance schedules by each industrial user for the installation of control technologies to meet applicable pretreatment standards;

4. Maintain and update industrial user information as necessary, to ensure that all IUs are properly permitted and/or controlled at all times;

5. Enforce all applicable pretreatment standards and requirements and obtain appropriate remedies for noncompliance by any industrial user;

6. Annually publish a list of industrial users that were determined to be in significant noncompliance during the previous year. The notice must be published before March 28 of the following year;

7. Maintain an adequate revenue structure and staffing level for continued implementation of the Pretreatment Program.

8. Evaluate all significant industrial users at least once every two years to determine if they need to develop a slug prevention plan. If a slug prevention plan is required, the permittee shall insure that the plan contains at least the minimum elements required in *40 CFR 403.8(f)(2)(v);*

9. Notify all significant industrial users of their obligation to comply with applicable requirements under *Subtitles C and D* of the *Resource Conservation and Recovery Act (RCRA)*; and

10. Develop, implement, and maintain an enforcement response plan as required by *40 CFR 403.8(f)(5)* which shall, at a minimum,

    a) Describe how the POTW will investigate instances of noncompliance;

    b) Describe the types of escalating enforcement responses the POTW will take in response to all anticipated type of industrial user violations; and

    c) Describe the time periods within which such responses will be taken and identify the POTW staff position(s) responsible for pursuing these actions.

11. Establish and enforce specific local limits as necessary to implement the provisions of the *40 CFR Parts 403.5(a)* and *(b)*, and as required by *40 CFR Part 403.5(c)*.

B. The permittee is required to modify its pretreatment program, as necessary, to reflect changes in the regulations of *40 CFR 403*. Such modifications shall be completed within the time frame set forth by the applicable regulations. Modification of the approved pretreatment program must be done in accordance with the requirements of *40 CFR 403.18*. Modifications of the approved program which result in less stringent industrial user requirements shall not be effective until after approval has been granted by the Executive Secretary.

C. The permittee shall provide the Division of Water Quality and EPA with an annual report briefly describing the permittee's pretreatment program activities over the previous calendar year. Reports shall be submitted no later than March 28 of each year. These annual reports shall, at a minimum, include:

1. An updated listing of the permittee's industrial users.

2. A descriptive summary of the compliance activities including numbers of any major enforcement actions, i.e., administrative orders, penalties, civil actions, etc.

3. An assessment of the compliance status of the permittee's industrial users and the effectiveness of the permittee's Pretreatment Program in meeting its needs and objectives.

4. A summary of all sampling data taken of the influent and effluent for those pollutants listed in *Part I.C.*

5. A description of all substantive changes made to the permittee's pretreatment program referenced in *Section B* of this section. Substantive changes include, but are not limited to, any change in any ordinance, major modification in the

program's administrative structure or operating agreement(s), a significant reduction in monitoring, or a change in the method of funding the program.

6. Other information as may be determined necessary by the Executive Secretary.

D. Pretreatment standards (*40 CFR 403.5*) specifically prohibit the introduction of the following pollutants into the waste treatment system from any source of non-domestic discharge:

1. Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140^{o}F (60^{o}C);

2. Pollutants, which will cause corrosive structural damage to the POTW, but in no case, discharges with a pH lower than 5.0;

3. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW resulting in interference;

4. Any pollutant, including oxygen demanding pollutants (BOD, etc.), released in a discharge at such volume or strength as to cause interference in the POTW;

5. Heat in amounts, which will inhibit biological activity in the POTW, resulting in interference, but in no case, heat in such quantities that the influent to the sewage treatment works exceeds 104^{o}F (40^{o}C);

6. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

7. Pollutants, which result in the presence of toxic gases, vapor, or fumes within the POTW in a quantity that may cause worker health or safety problems;

8. Any trucked or hauled pollutants, except at discharge points designated by the POTW; or

9. Any pollutant that causes pass through or interference at the POTW.

10. Any specific pollutant which exceeds any local limitation established by the POTW in accordance with the requirement of *40 CFR 403.5(c)* and *40 CFR 403.5(d).*

E. In addition to the general and specific limitations expressed in *Part A and D* of this section, applicable National Categorical Pretreatment Standards must be met by all industrial users of the POTW. These standards are published in the federal regulations at *40 CFR 405* et. seq.

F. *UCA 19-5-104* provides that the State may issue a notice to the POTW stating that a determination has been made that appropriate enforcement action must be taken against an industrial user for noncompliance with any pretreatment requirements within 30 days. The issuance of such notice shall not be construed to limit the authority of the Executive Secretary.

G. The Executive Secretary retains the right to take legal action against any industrial user and/or POTW for those cases where a permit violation has occurred because of the failure of an industrial user to meet an applicable pretreatment standard.

V. MONITORING, RECORDING & ADDITIONAL REPORTING REQUIREMENTS

A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under *Part I* shall be collected from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge. Sludge samples shall be collected at a location representative of the quality of sludge immediately prior to the use-disposal practice.

B. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under *Utah Administrative Code ("UAC") R317-2-10 and 40CFR Part 503*, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The *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 six months per violation, or by both.

D. Compliance Schedules. 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.

E. Additional Monitoring by the Permittee. If the permittee monitors any parameter more frequently than required by this permit, using test procedures approved under *UAC R317-2-10* and *40 CFR 503* 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 or the Biosolids Report Form. Such increased frequency shall also be indicated. Only those parameters required by the permit need to be reported.

F. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements:
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

G. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and 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 five years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time. A copy of this UPDES permit must be maintained on site during the duration of activity at the permitted location.

H. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall (orally) report any noncompliance including transportation accidents, spills, and uncontrolled runoff from biosolids transfer or land application sites which may seriously endanger health or environment, as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of circumstances. The report shall be made to the Division of Water Quality, (801) 538-6146, or 24-hour answering service (801) 536-4123.

2. The following occurrences of noncompliance shall be reported by telephone (801) 536-4123 as soon as possible but no later than 24 hours from the time the permittee becomes aware of the circumstances:

   a) Any noncompliance which may endanger health or the environment;

   b) Any unanticipated bypass, which exceeds any effluent limitation in the permit (See *Part VI.G, Bypass of Treatment Facilities.)*;

   c) Any upset which exceeds any effluent limitation in the permit (See *Part VI.H, Upset Conditions*.);

   d) Violation of a maximum daily discharge limitation for any of the pollutants listed in the permit; or,

   e) Violation of any of the Table 3 metals limits, the pathogen limits, the vector attraction reduction limits or the management practices for biosolids that have been sold or given away.

3. A written submission shall also be provided within five days of the time that 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;

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

e) Steps taken, if any, to mitigate the adverse impacts on the environment and human health during the noncompliance period.

4. The Executive Secretary may waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Division of Water Quality, (801) 538-6146.

5. Reports shall be submitted to the addresses in *Part I.D, Reporting of Monitoring Results*.

I. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours shall be reported at the time that monitoring reports for *Part I.D* are submitted. The reports shall contain the information listed in *Part IV.F*.

J. Inspection and Entry. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. 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 the permit;

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

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, including but not limited to, biosolids treatment, collection, storage facilities or area, transport vehicles and containers, and land application sites;

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the *Act*, any substances or parameters at any location, including, but not limited to, digested biosolids before dewatering, dewatered biosolids, biosolids transfer or staging areas, any ground or surface waters at the land application sites or biosolids, soils, or vegetation on the land application sites; and,

5. The permittee shall make the necessary arrangements with the landowner or leaseholder to obtain permission or clearance, the Executive Secretary, or authorized representative, upon the presentation of credentials and other

documents as may be required by law, will be permitted to enter without delay for the purposes of performing their responsibilities.

VI. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The *Act* provides that any person who violates a permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions or the Act is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day. Except as provided at *Part VI.G, Bypass of Treatment Facilities* and *Part VI.H, Upset Conditions*, nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. 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.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment. The permittee shall also take all reasonable steps to minimize or prevent any land application in violation of this permit.

E. 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 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.

F. Removed Substances. Collected screening, grit, solids, sludge, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard. Sludge/digester supernatant and filter backwash shall not directly enter either the final effluent or waters of the state by any other direct route.

G. Bypass of Treatment Facilities.

1. Bypass Not Exceeding Limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to *paragraph 2 and 3* of this section.

2. Prohibition of Bypass.

   a) Bypass is prohibited, and the Executive Secretary may take enforcement action against a permittee for bypass, unless:

      1) Bypass was unavoidable to prevent loss of human life, personal injury, or severe property damage;

      2) There were no feasible alternatives to 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 judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance, and

      3) The permittee submitted notices as required under *section VI.G.3*.

   b) The executive Secretary may approve an anticipated bypass, after considering its adverse effects, if the Executive Secretary determines that it will meet the three conditions listed in *sections VI.G.2.a (1), (2) and (3)*.

3. Notice.

   a) Anticipated bypass. Except as provided above in *section VI.G.2* and below in *section VI.G.3.b*, if the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least ninety days before the date of bypass. The prior notice shall include the following unless otherwise waived by the Executive Secretary:

      1) Evaluation of alternative to bypass, including cost-benefit analysis containing an assessment of anticipated resource damages:

      2) A specific bypass plan describing the work to be performed including scheduled dates and times. The permittee must notify the Executive Secretary in advance of any changes to the bypass schedule;

3) Description of specific measures to be taken to minimize environmental and public health impacts;

4) A notification plan sufficient to alert all downstream users, the public and others reasonably expected to be impacted by the bypass;

5) A water quality assessment plan to include sufficient monitoring of the receiving water before, during and following the bypass to enable evaluation of public health risks and environmental impacts; and,

6) Any additional information requested by the Executive Secretary.

b) Emergency Bypass. Where ninety days advance notice is not possible, the permittee must notify the Executive Secretary, and the Director of the Department of Natural Resources, as soon as it becomes aware of the need to bypass and provide to the Executive Secretary the information in *section VI.G.3.a.(1) through (6)* to the extent practicable.

c) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass to the Executive Secretary as required under *Part V.H*, Twenty Four Hour Reporting. The permittee shall also immediately notify the Director of the Department of Natural Resources, the public and downstream users and shall implement measures to minimize impacts to public health and environment to the extent practicable.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of P*aragraph 2* of this section are met. Executive Secretary's administrative determination regarding a claim of upset cannot be judiciously challenged by the permittee until such time as an action is initiated for noncompliance.

2. 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:

a) An upset occurred and that the permittee can identify the cause(s) of the upset;

b) The permitted facility was at the time being properly operated;

c) The permittee submitted notice of the upset as required under *Part V.H, Twenty-four Hour Notice of Noncompliance Reporting*; and,

d) The permittee complied with any remedial measures required under *Part VI.D, Duty to Mitigate*.

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

VII. GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of parameters discharged or pollutant sold or given away. This notification applies to pollutants, which are not subject to effluent limitations in the permit. In addition, if there are any planned substantial changes to the permittee's existing sludge facilities or their manner of operation or to current sludge management practices of storage and disposal, the permittee shall give notice to the Executive Secretary of any planned changes at least 30 days prior to their implementation.

B. Anticipated Noncompliance. The permittee shall give advance notice to the Executive Secretary of any planned changes in the permitted facility or activity, which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.

F. 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 Executive Secretary, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.

   1. All permit applications shall be signed by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a) The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,

   b) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

3. Changes to authorization. If an authorization under *paragraph VII.G.2* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *paragraph VII.G.2.* must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. <u>Penalties for Falsification of Reports</u>. The *Act* 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 $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential under *UAC R317-8-3.2*, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the office of Executive Secretary. As required by the *Act*, permit applications, permits and effluent data shall not be considered confidential.

J. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the permittee of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under the *Act*.

K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

L. Severability. The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

M. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Executive Secretary at least 20 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee's containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph *2* above.

N. State or Federal Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.

O. Water Quality - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate effluent limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. Water Quality Standards for the receiving water(s) to which the permittee discharges are modified in such a manner as to require different effluent limits than contained in this permit.

2. A final wasteload allocation is developed and approved by the State and/or EPA for incorporation in this permit.

3. A revision to the current Water Quality Management Plan is approved and adopted which calls for different effluent limitations than contained in this permit.

P. Biosolids – Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate biosolids limitations (and compliance schedule, if necessary), management practices, other appropriate requirements to protect public health and the environment, or if there have been substantial changes (or such changes are planned) in biosolids use or disposal practices; applicable management practices or numerical limitations for pollutants in biosolids have been promulgated which are more stringent than the requirements in this permit; and/or it has been determined that the permittees biosolids use or land application practices do not comply with existing applicable state of federal regulations.

Q. Toxicity Limitation - Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include, whole effluent toxicity (WET) limitations, a compliance date, a compliance schedule, a change in the whole effluent toxicity (biomonitoring) protocol, additional or modified numerical limitations, or any other conditions related to the control of toxicants if one or more of the following events occur;

1. Toxicity is detected, as per Part I.C.2.c and d of this permit, during the duration of this permit.

2. The TRE results indicate that compliance with the toxic limits will require an implementation schedule past the date for compliance and the Executive Secretary agrees with the conclusion.

3. The TRE results indicate that the toxicant(s) represent pollutant(s) that may be controlled with specific numerical limits, and the Executive Secretary agrees that numerical controls are the most appropriate course of action.

4. Following the implementation of numerical control(s) of toxicant(s), the Executive Secretary agrees that a modified biomonitoring protocol is

necessary to compensate for those toxicant that are controlled numerically.

5. The TRE reveals other unique conditions or characteristics, which in the opinion of the permit issuing authority justify the incorporation of unanticipated special conditions in the permit.

R. Storm Water-Reopener Provision. At any time during the duration (life) of this permit, this permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "waters-of-State".

S. Total Maximum Daily Load-Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include Total Maximum Daily Load (TMDL) monitoring, related effluent limits, a compliance schedule, a compliance date, additional or modified numerical limitations, or any other conditions related to the TMDL Process and activity in effected impaired water body.

VIII. DEFINITIONS

1. The "30-day (and monthly) average," other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 30-day period or calendar month, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The calendar month shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms.

3. The "7-day (and weekly) average", other than for fecal coliform bacteria and total coliform bacteria, is the arithmetic average of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. Geometric means shall be calculated for fecal coliform bacteria and total coliform bacteria. The 7-day and weekly averages are applicable only to those effluent characteristics for which there are 7-day average effluent limitations. The calendar week, which begins on Sunday and ends on Saturday, shall be used for purposes of reporting self-monitoring data on discharge monitoring report forms. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for that calendar week shall be included in the data for the month that contains Saturday.

4. "Daily Maximum" (Daily Max.) is the maximum value allowable in any single sample or instantaneous measurement.

5. "Composite Samples" shall be flow proportioned. The composite sample shall, as a minimum, contain at least four (4) samples collected over the compositing period. Unless otherwise specified, the time between the collection of the first sample and the last sample shall not be less than six (6) hours nor more than 24 hours. Acceptable methods for preparation of composite samples are as follows:

    a) Constant time interval between samples, sample volume proportional to flow rate at time of sampling;

    b) Constant time interval between samples, sample volume proportional to total flow (volume) since last sample. For the first sample, the flow rate at the time the sample was collected may be used;

    c) Constant sample volume, time interval between samples proportional to flow (i.e., sample taken every "X" gallons of flow); and,

    d) Continuous sample volume, with sample collection rate proportional to flow rate.

6. A “grab” sample, for monitoring requirements, is defined as a single “dip and take” sample collected at a representative point in the discharge stream.

7. An “instantaneous” measurement, for monitoring requirements, is defined as a single reading, observation, or measurement.

8. “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 operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

9. “Bypass,” means the diversion of waste streams from any portion of a treatment facility.

10. “Severe Property Damage,” means substantial physical damage to property, damage to the treatment facilities 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.

11. “Executive Secretary,” means Executive Secretary of the Utah Water Quality Board.

12. “EPA,” means the United States Environmental Protection Agency.

13. “Acute Toxicity” occurs when 50 percent or more mortality is observed for either test species at any effluent concentration.

14. "Chronic toxicity" occurs when the survival, growth, or reproduction for either test species exposed to a dilution of 46 percent effluent (or lower) is significantly less (at the 95 percent confidence level) than the survival, growth or reproduction of the control specimens.

15. “Act,” means the *Utah Water Quality Act*.

16. “CWA,” means *The Federal Water Pollution Control Act*, as amended, by *The Clean Water Act of 1987*.

17. “Storm Water,” means storm water runoff, snow melt runoff, and surface runoff and drainage.

18. “Biosolids,” means any material or material derived from sewage solids that have been biologically treated.

19. "Dry Weight-Basis," means 100 percent solids (i.e. zero percent moisture).

20. "Land Application" is the spraying or spreading of biosolids onto the land surface; the injection of biosolids below the land surface; or the incorporation of biosolids into the land so that the biosolids can either condition the soil or fertilize crops or vegetation grown in the soil. Land application includes distribution and marketing (i.e. the selling or giving away of the biosolids).

21. "Pathogen," means an organism that is capable of producing an infection or disease in a susceptible host.

22. "Pollutant" for the purposes of this permit is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organisms that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food-chain, could on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction), or physical deformations in either organisms or offspring of the organisms.

23. "Runoff" is rainwater, leachate, or other liquid that drains over any part of a land surface and runs off the land surface.

24. "Similar Container" is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

25. "Total Solids" are the materials in the biosolids that remain as a residue if the biosolids are dried at 103^{o} or 105^{o} Celsius.

26. "Treatment Works" are either Federally owned, publicly owned, or privately owned devices or systems used to treat (including recycling and reclamation) either domestic sewage or a combination of domestic sewage and industrial waste or liquid manure.

27. "Vector Attraction" is the characteristic of biosolids that attracts rodents, flies mosquito's or other organisms capable of transporting infectious agents.

28. "Animals" for the purpose of this permit are domestic livestock.

29. "Annual Whole Sludge Application Rate" is the amount of sewage sludge (dry-weight basis) that can be applied to a unit area of land during a cropping cycle.

30. "Agronomic Rate is the whole sludge application rate (dry-weight basis) designed to: (1) provide the amount of nitrogen needed by the crop or vegetation grown on the land; and (2) minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

31. "Annual Pollutant Loading Rate" is the maximum amount of a pollutant (dry-weight basis) that can be applied to a unit area of land during a 365-day period.

32. "Application Site or Land Application Site" means all contiguous areas of a users' property intended for sludge application.

33. "Cumulative Pollutant Loading Rate" is the maximum amount of an inorganic pollutant (dry-weight basis) that can be applied to a unit area of land.

34. "Grit and Screenings" are sand, gravel, cinders, other materials with a high specific gravity and relatively large materials such as rags generated during preliminary treatment of domestic sewage at a treatment works and shall be disposed of according to *40 CFR 258*.

35. "High Potential for Public Contact Site" is land with a high potential for contact by the public. The includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and gold courses.

36. "Low Potential for Public Contact Site" is the land with a low potential for contact by the public. This includes, but is not limited to, farms, ranches, reclamation areas, and other lands which are private lands, restricted public lands, or lands which are not generally accessible to or used by the public.

37. "Monthly Average" is the arithmetic mean of all measurements taken during the month.

38. "Volatile Solids" is the amount of the total solids in sewage sludge lost when the sludge is combusted at 550 degrees Celsius for 15-20 minutes in the presence of excess air.

PROPOSED RIVERTON WATER RECLAMATION FACILITY

OLENE S. WALKER
Governor

GAYLE F. McKEACHNIE
Lieutenant Governor

State of Utah

Department of
Environmental Quality

October 22, 2004

Larry Bowen
Bowen Collins & Associates
756 East 12200 South
Draper, Utah 84020

Dear Mr. Bowen:

Subject: Discharge Limits for proposed Riverton Water Reclamation Facility

In the meeting on September 30, 2004 we discussed the possible limits for a future facility to be built in the Riverton area along the Jordan River to treat municipal wastewater. The purpose was to try and insure that a fifth facility could be allowed along the river and maintain quality, while determining UPDES permit limits for all facilities.

During the meeting the limits we came up with are listed in the table below.

	Effluent			
Season	Flow, MGD	D.O.	BOD	Ammonia
Winter	15	5	15	5
Spring	15	5	15	5
Summer	10	5	15	4
Fall	15	5	15	4

Good luck with your development and planning. I look forward to working with you when you are ready to apply for a discharge permit. If you have any questions, please contact me at (801) 538-7020.

Sincerely,

Dan Griffin, Environmental Engineer
Division of Water Quality
Permits & Compliance Section

DG:dg
Enclosure

DRAFT TECHNICAL MEMORANDUM NO. 2

SALT LAKE COUNTY
WATER QUALITY STEWARDSHIP PLAN
WASTEWATER ELEMENT

FOR

SALT LAKE COUNTY

MAY 2007

BROWN AND CALDWELL

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1.0 INTRODUCTION

There are several activities occurring in Salt Lake County related to wastewater management that require the original (October 1978) 208 Water Quality Management Plan to be revisited. The geographic scope of development requires a comprehensive planning process to assure that best solutions to wastewater treatment and water quality are achieved. Brown and Caldwell has been contracted by Stantec Consulting to evaluate the planning components necessary to revisit the wastewater element of the 208 Water Quality Management Plan. The information gathered in this initial phase of the process will be used to help develop future wastewater management alternatives. The geographic proximity of each collection/treatment provider along with trends in wastewater treatment technology will, in large measure, dictate the formulation of feasible wastewater management alternatives.

At this time, Salt Lake County, the State designated Areawide Water Quality Management Planning Agency, has limited knowledge of existing sewer agency master planning information, plans for expansion and impediments to accepting new wastewater flows. The siting of a wastewater treatment facility in Riverton is but one example of the urgent need to understand the issues surrounding wastewater management in Salt Lake County.

Questions posed concerning capacity, costs, treatment technologies, reuse, biosolids management, and the future plans of the wastewater agencies is the basis for undertaking this planning effort which will allow Salt Lake County, and affected stakeholders, to make knowledgeable planning decisions that are critical to protecting water quality and public health and will allow the highest and best use of the wastewater resource.

This draft technical memorandum is the second of two technical memorandum developed during Phase I planning activities to present initial findings. This technical memorandum includes information gathered on current federal and state regulations, anticipated regulations, and a summary of the proposed planning process developed during Phase 1 workshops. At the conclusion of the project, a final report will be developed encompassing the results of both Phase 1 technical memorandums, Phase 2 reporting, and any comments received.

This technical memorandum is divided into sections that discuss the following:

Section 1.0	*Introduction* — This section provides relevant background of the project and an overview of Brown and Caldwell's approach.
Section 2.0	*Current Regulatory Standards and Trends* — This section presents a summary of current federal, and state standards and future regulatory outlook including the Jordan River Total Maximum Daily Load (TMDL) and water quality standard development on the Great Salt Lake.
Section 3.0	*Permitting Process and Planning Framework* — This section presents an overview of the current planning and permitting process, a summary of the 208 Plan amendment process undertaken for the Riverton plant for South Valley Sewer District, and a summary of the proposed permitting process as developed during technical workshops with SL County and stakeholder groups.

1.1 PROJECT BACKGROUND

In 1978, Salt Lake County completed its Areawide Water Quality Management Plan in accordance with section 208 of the Clean Water Act. This plan has served as a guiding document for nearly 28 years. The Plan was published in 1978, updated in 1982 and recommended for amendment in 2007. Published in 1978, updated in 1982 and recommended for amendment in 2007. In August of 2005, a request was made to amend the Areawide Water Quality Management Plan for a new wastewater treatment facility in Riverton. In the process of re-visiting the 1978 plan, it became apparent that numerous factors such as land-use, population projections, jurisdictional boundaries, water quality requirements/impairments, water supply/use, and wastewater treatment processes have changed significantly since 1978. In addition, planned developments along the West Bench of the Salt Lake valley will generate a significant quantity of wastewater flow, as these currently unserviced areas are developed and will require wastewater conveyance and treatment services. As a result, the Salt Lake County Council allocated monies into the 2006 budget to initiate the development of a Water Quality Stewardship Plan (WaQSP), which will update the existing Areawide Water Quality

Management Plan. This WaQSP will update the essential elements found in the original Areawide Water Quality Management Plan.

1.2 PROJECT APPROACH

The following task descriptions outline the consultant services completed during Phase 1 of the wastewater element of the WaQSP for Technical Memorandum No. 2. Phase 2 of the project commenced in January 2007 and includes those tasks necessary to evaluate wastewater flow projections with regards to current and planned ultimate treatment capacity at each of the existing four Publicly Owned Treatment Works (POTW) servicing Salt Lake County wastewater treatment facilities. Phase 1 and Phase 2 tasks are being coordinated with the other elements of the Salt Lake County Watershed and Salt Lake County Water Quality Stewardship planning efforts.

The following consultant services are summarized in this technical memorandum:

Task 1 – Project Initiation and Understanding (included in Technical Memorandum No. 1)

Task 2 – Wastewater Treatment Technology Review (a review of treatment technology is summarized in Technical Memorandum No.1)

Task 2.1 – Describe Regulatory Setting. Consultant will review current and planned regulatory programs that impact or could impact wastewater management and treatment technologies in Salt Lake County. The primary focuses of this subtask include Jordan River water quality standards; the Jordan River TMDL process; water quality standard development for the Great Salt Lake and Farmington Bay; existing and possible future wastewater treatment discharge limits; reclaimed water standards and trends including blending with surface water, direct landscape irrigation, aquifer storage and commercial building toilet flushing. The description of regulatory programs will also include requirements for biosolids disposal on land as well as give-away or sale of biosolids to the public.

Task 3 – Define County Role in Wastewater Management

Task 3.1 – Preparation and Meetings with Stakeholders. Consultant will prepare for and conduct meetings with stakeholder groups to identify and consider the concerns in development of wastewater management plan framework for the Salt Lake County WaQSP.

Task 3.2 – Compile and Review Stakeholder Concerns. Consultant will compile the concerns from key stakeholders and will integrate the information into the framework for the regional wastewater planning process. The concerns compiled will be reviewed and will serve as the partial basis for conceiving and developing a viable wastewater resource management plan for Salt Lake County.

Task 3.3 – Develop Regional Wastewater Planning Procedures and Requirements. Consultant will identify critical planning elements for future wastewater treatment and water reclamation facilities to serve as a framework to achieve the goals and objectives of the Salt Lake County WaQSP and the statutory requirements of Section 208 of the Clean Water Act. Consultant will develop a decision making process to identify the best long-term options for wastewater management that considers the values and concerns of citizens, interest groups, key agencies and policy makers. The defined process will strive to ensure that public values and agency policy are integrated into the overall decision making process with full recognition of technical, environmental, public health, and financial considerations.

Task 4 – Reports and Meetings (ongoing)

Consultant will participate in up to five progress meetings with County and Stantec personnel during performance of activities of the planning process scoping efforts and seven meetings with stakeholders identified in Task 3.1. Consultant will conduct follow-up discussions with Stakeholders, the County, and Stantec to clarify consultant questions. These meetings will consist of regular meetings with the County and Stantec, stakeholder workshops, and the POTW Advisory Group to the Jordan River Watershed Council.

2.0 CURRENT REGULATORY STANDARDS AND TRENDS

Current environmental regulations at federal, state and local levels (Salt Lake Valley Health Department Regulation 13), which have direct application to the wastewater element of the Water Quality Stewardship Plan (WaQSP), were researched and are presented in this section. Wastewater regulations are of primary importance for the development of the wastewater element of the stewardship plan. However, not every aspect of water/wastewater protection is translated into wastewater regulations and, therefore, some programs and guidelines such as the State's stormwater program and water reuse guidelines are also referenced. In addition to wastewater regulation, there are several other environmental regulations that directly and indirectly affect water and wastewater systems operation such as solid and hazard waste, air emission, safety, erosion and sediment control, environmental impact, among others. These regulations are also presented in this section.

2.1 FEDERAL REGULATIONS

Federal laws designed to promote public health by protecting the Nation's air, water, and soil are developed and enforced by the United States Environmental Protection Agency (EPA). The EPA is organized into ten different regions that are responsible for execution of the Agency's programs. Utah is located in EPA's Region 8 which also includes Colorado, Montana, North Dakota, South Dakota, Wyoming, and 27 sovereign tribal nations. EPA's Region 8 office is located in Denver, Colorado. Contact information is located below:

EPA Region 8 Office
US EPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129
303-312-6312
800-227-8917

A list of federal regulations pertinent to wastewater planning is presented in the following sections. A copy of the rule and additional background information can be found by following the web address below each regulation.

2.1.1 WATER AND WASTEWATER REGULATIONS (INCLUDING NPDES, STORMWATER, WATER REUSE, WETLANDS AND PRETREATMENT)

- The Clean Water Act (CWA)
  http://www.access.gpo.gov/uscode/title33/chapter26_.html
- The Safe Drinking Water Act (SDWA)

  http://assembler.law.cornell.edu/uscode/html/uscode42/usc_sup_01_42_10_6A_20_XII.html
- The NPDES system, Section 402 of the CWA
  http://www.epa.gov/owow/wetlands/laws/section402.html
- Stormwater Regulations – Phases I and II of the NPDES Stormwater Program
  http://cfpub1.epa.gov/npdes/regs.cfm?program_id=6
  http://cfpub.epa.gov/npdes/stormwater/swphases.cfm
  http://cfpub1.epa.gov/npdes/home.cfm?program_id=6
- Wetlands – Section 404 of CWA
  www.epa.gov/owow/wetlands/laws/
- Water Reuse: EPA Guidelines for Water Reuse
  http://www.epa.gov/ORD/NRMRL/pubs/625r04108/625r04108.pdf
- Wastewater Pretreatment Program – 40 CFR Part 403
  http://cfpub1.epa.gov/npdes/home.cfm?program_id=3
  http://www.access.gpo.gov/nara/cfr/waisidx_02/40cfr403_02.html

2.1.2 SOLID AND HAZARD WASTE (INCLUDING SLUDGE MANAGEMENT AND REUSE)

- The Resource Conservation and Recovery Act (RCRA), also known as the Solid Waste Disposal Act

  http://www.access.gpo.gov/uscode/title42/chapter82_.html
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)

  http://www.access.gpo.gov/uscode/title42/chapter103_.html

- The Emergency Planning & Community Right-To-Know Act (EPCRA)

  http://www.access.gpo.gov/uscode/title42/chapter116_.html

- EPA's Sewage Sludge Management Program

  www.epa.gov/docs/fedrgstr/EPA-WATER/1997/March/Day-11/w5879.htm

2.1.3 AIR EMISSIONS

- The Clean Air Act (CAA)

  http://www.epa.gov/oar/caa/contents.html

2.1.4 SAFETY AND SECURITY

- The Occupational Safety and Health Act

  http://www.access.gpo.gov/uscode/title29/chapter15_.html

- Public Health Security and Bioterrorism Preparedness and Response Act (The Bioterrorism Bill)

  http://www.awwa.org/Advocacy/govtaff/legislat/leg_lib.cfm

2.1.5 ADDITIONAL FEDERAL REGULATIONS

- National Environmental Policy Act of 1969 (NEPA)

  http://ceq.eh.doe.gov/nepa/regs/nepa/nepaeqia.htm

- The Pollution Prevention Act (PPA)

  http://www.epa.gov/opptintr/p2home/p2policy/act1990.htm

- The Endangered Species Act (ESA)

  http://www.access.gpo.gov/uscode/title16/chapter35_.html

- The Conservation Title of the Farm Security and Rural Investment Act (2002 Farm Bill)

  http://www.awwa.org/Advocacy/govtaff/legislat/leg_lib.cfm

2.2 UTAH STATE REGULATIONS

The Utah Administrative Code (UAC) is a compilation of the administrative law of Utah as published by the Division of Administrative Rules (DAR). The UAC is Utah's equivalent to the EPA's Code of Federal Regulations (CFRs). Revisions to the UAC are handled through the DAR on a monthly basis. Utah has primacy (i.e. the primary responsibility for administering and enforcing regulations) for all rules and while able to enforce more stringent requirements, must justify those through the EPA. The complete body of laws can be found on the State's website at http://www.rules.utah.gov/main.

The UAC is generally organized alphabetically by department, board, or commission, then agency. Utah's environmental laws are located under the environmental section of the UAC and are as follows:

- Title R305. Administration.
- Title R307. Air Quality.
- Title R309. Drinking Water.
- Title R311. Environmental Response and Remediation.
- Title R313. Radiation Control.
- Title R315. Solid and Hazardous Waste.
- Title R317. Water Quality.

The Department of Environmental Quality, Division of Water Quality (DWQ) is the governing agency for regulations directly related to wastewater and wastewater treatment works in Utah. The Division's organizational chart is shown in Figure 2-1 and their functional organizational chart in Figure 2-2.

2.3 SALT LAKE VALLEY HEALTH DEPARTMENT (REGULATION 13)

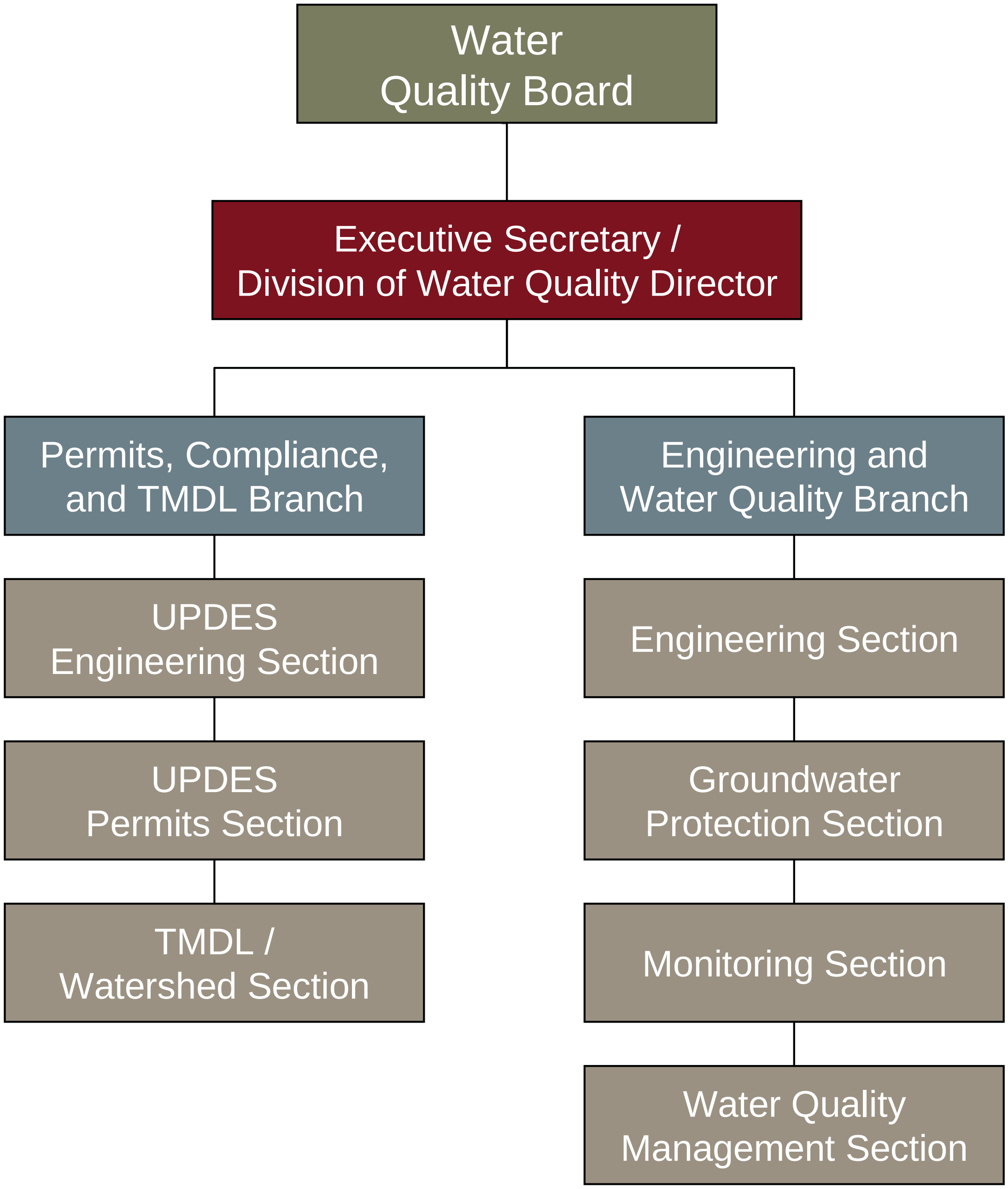
Applicable Salt Lake Valley Health Department (SLVHD) regulations pertaining to wastewater management and planning in Salt Lake County include Health Regulation 13 Waste Water Disposal. The stated purpose of Regulation 13 is to "provide for the health, safety, and general welfare of the citizens of Salt Lake County and protect the environment through the regulation of illegal discharge of wastewater and pollutants to the maximum extent practicable as required by federal, state, and local law". The specific objectives of this regulation are to:

1. Mandate connections of buildings to a public sewer system when the sewer is available to property.

2. Permit and regulate the installation and use of onsite wastewater systems.

3. Require and regulate toilet facilities.

4. Prohibit the illegal discharge of wastewater.



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

DEQ Division of Water Quality Organizational Chart

Figure 2-1

BROWN AND CALDWELL

Division of Water Quality

Department of Environmental Quality

FUNCTIONAL ORGANIZATIONAL CHART

Telephone Number for all Division Staff Members is: (801) 538-6146

Division Director
Walter L Baker

Administrative Services & Finance
Stacy Carroll

Executive Assistant to the Director
Faye B. Bell

Permits, Compliance, and Monitoring Branch
John Whitehead

Branch Secretary
Monique Rodriguez

Engineering and Water Quality Management Branch
Harry L. Judd

Branch Secretary
Mary Fugate

UPDES Engineering Section
John Kennington

- UPDES Permit Issuance
  - Industrial
  - Municipal
  - Federal
  - General
  - Biosolids
- Compliance Inspections
- Enforcement
- Industrial Pretreatment
- Emergency Response
- Sanitary/Combined Sewer Overflow (SSO/CSO)

TMDL/Watershed Section
Carl Adams

- TMDL Development
- TMDL Implementation (Tracking)
- Watershed Planning
- EIS Reviews

UPDES Permits Section
Mike Herkimer

- UPDES Permit Issuance
  - Industrial
  - Municipal
  - Federal
  - General
  - Stormwater
  - CAFO
- Compliance Inspections
- Enforcement
- PCS - Data Base Mngt
- Biomonitoring Mngt/TRE
- Industrial Pretreatment
- Emergency Response
- Sanitary/Combined Sewer Overflow (SSO/CSO)

Ground Water Protection Section
Robert Herbert

- Ground Water Quality Standards
- Ground Water Classification
- GW Permit Management
- GW Technology Transfer
- Underground Injection Control
- Compliance Inspections
- Enforcement
- Technical Assistance
- Data Base Mngt (FURS/GW)
- Groundwater Cleanups

Engineering Section
Ed Macauley, P.E.

- Federal Revolving Loans
- State Revolving Loans
- Hardship Grants
- CIB Project Administration
- Construction Permits (Fin. Asst.)
- Needs Survey
- WW Operator Certification
- O&M Training
- Technical Assistance
- Construction Permits
  - Municipal
  - Industrial
  - Agricultural
  - Storm Sewers
  - Underground WW Disposal
- Technology Evaluation
- Local Health Department Liaison
- On-Site WW Disposal
- On-Site WW Certification
- O & M Inspections
- Technical Assistance

Monitoring Section
Richard Denton

- Biological Monitoring
- Special Studies
- Intensive Surveys
- Laboratory Quality Assurance
- Ground Water Monitoring
- Volunteer/Coop. Monitoring
- Lake & Stream Monitoring
- STORET Database
- Non Point Source Monitoring
- Compliance Monitoring

Water Quality Management Section
Ying Ying Macauley

- Water Quality Standards
- 401 WQ Certification/Wetlands
- WQ Assessment & Reporting
- 303(d) List
- 305(b) Report
- Wasteload Allocation/Permits
- Nonpoint Source Program
  - AFO/CAFO
  - 319 Grants Management
- 604b Grants Management
- EIS Reviews
- Biomonitoring

2.2.1 ENVIRONMENTAL QUALITY, WATER QUALITY (TITLE R317)

Regulations governing design, construction, permitting, funding, training, and operation of wastewater treatment works in Utah are contained in the Utah Code annotated under Utah R317, Environmental Quality, Water Quality. The subsections of R317 are as follows:

TABLE 2-1 UTAH CODE R317

No.	Title
R317-1	Definitions and General Requirements
R317-2	Standards of Quality for Waters of the State.
R317-3	Design Requirements for Wastewater Collection, Treatment and Disposal Systems.
R317-4	Onsite Wastewater Systems.
R317-5	Large Underground Wastewater Disposal Systems.
R317-6	Ground Water Quality Protection.
R317-7	Underground Injection Control (UIC) Program.
R317-8	Utah Pollutant Discharge Elimination System (UPDES).
R317-9	Administrative Procedures.
R317-10	Certification of Wastewater Works Operators.
R317-11	Certification Required designing, inspecting and maintaining Underground Wastewater Disposal Systems, or Conduct Percolation and Soil Tests for Underground Wastewater Disposal Systems.
R317-100	Utah State Project Priority System for the Utah Wastewater Project Assistance Program.
R317-101	Utah Wastewater Project Assistance Program.
R317-102	Utah Wastewater State Revolving Fund (SRF) Program.
R317-401	R317-401. Gray water Systems.
R317-550	Rules for Waste Disposal By Liquid Scavenger Operations.
R317-560	R317-560. Rules for the Design, Construction, and Maintenance of Vault Privies and Earthen Pit Privies.

2.4 ANTICIPATED LEGISLATION

2.4.1 FEDERAL

Environmental regulations are constantly being updated, reviewed, and created in order to take into consideration new findings as well as to facilitate their implementation. This section presents the legislations that are currently being introduced to the U.S. Congress. The new legislation is divided into environmental protection, infrastructure funding, and water and wastewater, and water resources. A brief summary of the proposed legislation before the 110th Congress (2007-2008) as well as their status and sponsors are presented below:

Environmental Protection

- [110th] S.167 : A bill to amend the Clean Air Act to require the Secretary of Energy to provide grants to eligible entities to carry out research, development, and demonstration projects of cellulosic ethanol and construct infrastructure that enables retail gas stations to dispense cellulosic ethanol for vehicle fuel to reduce the consumption of petroleum-based fuel.
  Sponsor: Sen Boxer, Barbara [CA] (introduced 1/4/2007) Cosponsors (None)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/4/2007 Referred to Senate committee. Status: Read the second time and referred to the Committee on Environment and Public Works.

- [110th] S.272 : A bill to amend Wetlands Loan Act (Public Law) 87-383 to reauthorize appropriations to promote the conservation of migratory waterfowl and to offset or prevent the serious loss of important wetland and other waterfowl habitat essential to the preservation of migratory waterfowl, and for other purposes.
  Sponsor: Sen Coleman, Norm [MN] (introduced 1/11/2007) Cosponsors (None)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/11/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.280 : A bill to provide for a program to accelerate the reduction of greenhouse gas emissions in the United States by establishing a market-driven system of greenhouse gas tradeable allowances, to support the deployment of new climate change-related technologies, and to ensure benefits to consumers from the trading in such allowances, and for other purposes.
  Sponsor: Sen Lieberman, Joseph I. [CT] (introduced 1/12/2007) Cosponsors (9)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/12/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.309 : A bill to amend the Clean Air Act to reduce emissions of carbon dioxide, and for other purposes.
  Sponsor: Sen Sanders, Bernard [VT] (introduced 1/16/2007) Cosponsors (11)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/16/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.386 : A bill to amend the Clean Air Act to require a higher volume of renewable fuel derived from cellulosic biomass, and for other purposes.
  Sponsor: Sen Chambliss, Saxby [GA] (introduced 1/24/2007) Cosponsors (None)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/24/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.452 : A bill to amend Bankruptcy Code Title 11, United States Code, to ensure that liable entities meet environmental cleanup obligations, and for other purposes.
  Sponsor: Sen Cantwell, Maria [WA] (introduced 1/31/2007) Cosponsors (2)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/31/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.658 : A bill to amend the Endangered Species Act of 1973 to improve the process for listing, recovery planning, and delisting, and for other purposes.
  Sponsor: Sen Thomas, Craig [WY] (introduced 2/16/2007) Cosponsors (5)
  Committees: Senate Environment and Public Works
  Latest Major Action: 2/16/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.725 : A bill to amend the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 to reauthorize and improve that Act.
  Sponsor: Sen Levin, Carl [MI] (introduced 3/1/2007) Cosponsors (2)
  Committees: Senate Environment and Public Works
  Latest Major Action: 3/1/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.742 : A bill to amend the Toxic Substances Control Act to reduce the health risks posed by asbestos-containing products, and for other purposes.
  Sponsor: Sen Murray, Patty [WA] (introduced 3/1/2007) Cosponsors (12)
  Committees: Senate Environment and Public Works
  Latest Major Action: 3/1/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.843 : A bill to provide for the establishment of a national mercury monitoring program.
  Sponsor: Sen Collins, Susan M. [ME] (introduced 3/12/2007) Cosponsors (2)
  Committees: Senate Environment and Public Works
  Latest Major Action: 3/12/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

Infrastructure Funding

- [110th] S.775 : A bill to establish a National Commission on the Infrastructure of the United States.
  Sponsor: Sen Carper, Thomas R. [DE] (introduced 3/6/2007) Cosponsors (3)

Committees: Senate Environment and Public Works

Latest Major Action: 3/6/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

Water and Wastewater

- [110th] H.R.569 : To amend the Federal Water Pollution Control Act to authorize appropriations for sewer overflow control grants.
  Sponsor: Rep Pascrell, Bill, Jr. [NJ-8] (introduced 1/18/2007) Cosponsors (19)
  Committees: House Transportation and Infrastructure; Senate Environment and Public Works House Reports: 110-16
  Latest Major Action: 3/8/2007 Referred to Senate committee. Status: Received in the Senate and Read twice and referred to the Committee on Environment and Public Works.

- [110th] H.R.700 : To amend the Federal Water Pollution Control Act to extend the pilot program for alternative water source projects.
  Sponsor: Rep McNerney, Jerry [CA-11] (introduced 1/29/2007) Cosponsors (2)
  Committees: House Transportation and Infrastructure; Senate Environment and Public Works House Reports: 110-15
  Latest Major Action: 3/9/2007 Referred to Senate committee. Status: Received in the Senate and Read twice and referred to the Committee on Environment and Public Works.

- [110th] H.R.720 : To amend the Federal Water Pollution Control Act to authorize appropriations for State water pollution control revolving funds, and for other purposes.
  Sponsor: Rep Oberstar, James L. [MN-8] (introduced 1/30/2007) Cosponsors (32)
  Committees: House Transportation and Infrastructure; Senate Environment and Public Works
  House Reports: 110-30
  Latest Major Action: 3/12/2007 Referred to Senate committee. Status: Received

in the Senate and Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.24 : A bill to amend the Safe Drinking Water Act to require a health advisory and monitoring of drinking water for perchlorate.
  Sponsor: Sen Boxer, Barbara [CA] (introduced 1/4/2007) Cosponsors (2)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/4/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.150 : A bill to amend the Safe Drinking Water Act to protect the health of pregnant women, fetuses, infants, and children by requiring a health advisory and drinking water standard for perchlorate.
  Sponsor: Sen Boxer, Barbara [CA] (introduced 1/4/2007) Cosponsors (2)
  Committees: Senate Environment and Public Works
  Latest Major Action: 1/4/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

- [110th] S.836 : A bill to amend the Federal Water Pollution Control Act to authorize appropriations for sewer overflow control grants.
  Sponsor: Sen Lautenberg, Frank R. [NJ] (introduced 3/9/2007) Cosponsors (3)
  Committees: Senate Environment and Public Works
  Latest Major Action: 3/9/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

Water Resources

- 110th] S.564 : A bill to modernize water resources planning, and for other purposes.
  Sponsor: Sen Feingold, Russell D. [WI] (introduced 2/13/2007) Cosponsors (1)
  Committees: Senate Environment and Public Works
  Latest Major Action: 2/13/2007 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works.

2.4.2 STATE

The following table gives information for State water quality rules which are currently under revision. The official publication for announcing such changes is the Utah State Bulletin, published on the 1st and 15th of each month by the Division of Administrative Rules (DAR) and available on their web site www.rules.utah.gov. Descriptions of each rule change can be found on the states website.

TABLE 2-2 CURRENT PROPOSED CHANGES

Subject	Rule Number	Contact Person	Public Hearing	Comments Close	Expected Effective Date
Tax Exemption for Pollution Control Facilities	R317-12	Ed Macauley	None	1/31/07	3/6/07
Water Quality Standards Amended notice changing hearing dates and extending public comment period	R317-2	Bill Moellmer	January 23rd, 2007, 1:00 p.m., Southeastern Utah District Health Department, 28 South 100 East, Price; and January 24, 2007 12:00 noon, Cannon Heath Building, 288 N 1460 W, Room 125, Salt Lake City, UT.	2/6/2007	2/16/2007

TABLE 2-3 RECENTLY COMPLETED RULE ACTIONS

Subject	Rule Number	Contact Person	Action Taken
Certification Required to Design ... Underground Wastewater Disposal Systems	R317-11	Judy Etherington	Made Effective 1/26/07
Ground Water Quality Protection	R317-6	Shelly Quick	Made Effective 1/19/07
Ground Water Implementation	R317-6-6	Dan Hall	Made Effective 1/19/07
Rule Text: General Requirements Incorporated material: Tables 2a, 2b and 2c of NRCS Standard Waste Storage Facility Code 313, August 30, 2006	R317-1-2	Dan Hall	Made Effective 1/19/07
TMDLs	R317-1-7	Carl Adams	Made Effective 1/19/07
Alternative Wastewater Systems	R317-4	Ed Macauley	Made Effective 5/19/06
Alternative Wastewater Systems (Variance Amendment, Option1)	R317-4	Kiran Bhayani	no action taken - rule lapsed
Alternative Wastewater Systems (Variance Amendment, Option 2)	R317-4	Kiran Bhayani	no action taken - rule lapsed
Alternative Wastewater Systems - Change in Proposed Rule DAR Rule Form Proposed rule text	R317-4	Kiran Bhayani	no action taken - rule lapsed
Alternative Wastewater Systems	R317-4	Kiran Bhayani	no action taken - rule lapsed
Definitions and General Requirements	R317-1	John Kennington	Made Effective 8/22/05

In addition to the above, the State of Utah DWQ was contacted for further information on future wastewater rule updates. The following notes were developed based on this discussion:

- The DWQ is now authorized to issue permits for reuse facilities and they want to change the rules to allow them to issue operating permits for all types of facilities including non-discharging facilities such as containment lagoons (i.e., anyone currently without a UPDES permit)
- The DWQ will be revising R317 Part 3 which governs the design requirements for wastewater collection, treatment and disposal systems in the near future. The current rule is out-of-date and does not cover any of the newer processes such as Cannibal, MBR's, etc. This effort will begin in early 2007.
- The DWQ just finished rewriting R317 Part 4 which governs onsite wastewater systems.
- R317 Part 5 which governs large underground wastewater disposal systems needs to be rewritten soon.
- The DWQ is currently doing minor work on R317 Part 11 concerning the Certification Required to Design, Inspect and Maintain Underground Wastewater Disposal Systems, or Conduct Percolation and Soil Tests for Underground Wastewater Disposal Systems.

2.5 JORDAN RIVER AND EMIGRATION CREEK WATER QUALITY STANDARDS AND TMDL PROCESS

The following section includes summary information on the Jordan River and Emigration Total Maximum Daily Load (TMDL) process (as adapted in part from the County's website) as well as an update on the current TMDL schedule. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive on a daily basis and still meet water quality standards. The TMDL process consists of the following steps:

1. Review existing water quality data

2. Identify sources and causes of pollutants
3. Identify water quality goals
4. Establish the amount of pollutant that can be allowed in total
5. Allocate allowable pollutant loads
6. Identify and implement measures to achieve and maintain water quality standards
7. Monitor to assure that goals are met

The division of Water Quality Board has grouped the waters of the state of Utah into classes so as to protect against controllable pollution the beneficial uses designated within each class as set forth below. Surface waters of the state of Utah are hereby classified as shown (reference Utah Code R317-2-13).

Class 1 -- Protected for use as a raw water source for domestic water systems.

Class 1A -- Reserved.

Class 1B -- Reserved.

Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water

Class 2 -- Protected for recreational use and aesthetics.

Class 2A -- Protected for primary contact recreation such as swimming.

Class 2B -- Protected for secondary contact recreation such as boating, wading, or similar uses.

Class 3 -- Protected for use by aquatic wildlife.

Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.

Class 3B -- Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.

Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

Class 5 -- The Great Salt Lake. Protected for primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary aquatic organisms in their food chain, and mineral extraction.

2.5.1 JORDAN RIVER TMDL

In 1998, the DWQ found that dissolved oxygen (DO) levels in the Jordan River were not meeting class 3B requirements. Subsequently, in the summer of 2004, the Salt Lake County Water Resources Planning and Restoration Program conducted a water quality assessment of the Jordan River to determine the sources and causes of the DO impairments. Data collected as part of this assessment indicate high levels of both pathogen indicator organisms and phosphorus in the Jordan River. This data, as well as conclusions drawn from the data, are found in the 2005 publication of the Jordan River Water Quality Total Maximum Daily Load Assessment located at the County's website www.waterresources.slco.org.

The Jordan River has been listed as water quality impaired for: Dissolved Oxygen (DO), Salinity, Total Dissolved Solids (TDS), Chlorides and Temperature (Table 2-4). Sections of the River are anticipated to be listed for Pathogens and Total Phosphorus.

TABLE 2-4 JORDAN RIVER WATER CLASSES

Assessment Unit Description	Class	Impaired Constituent
Jordan River from Farmington Bay upstream 6.1 miles	3C	Dissolved Oxygen
Jordan River from Farmington Bay upstream 6.1 miles	4	Salinity, TDS, and Chlorides
Jordan River from 6.3 miles upstream to North Temple	3B	Dissolved Oxygen
Jordan River from Bluffdale to Narrows	3A	Temperature
* Jordan River 2100 S. to Cudahy Ln. (Anticipated listing)	2B	Pathogens
* Jordan River 5400 S. to Cudahy Ln. (Anticipated listing)	2B, 3B	E. Coli

The Jordan River TMDL timetable will likely extend past development of the WaQSP and includes study areas outside of Salt Lake County.

2.5.2 EMIGRATION CREEK TMDL

Emigration Creek is a 3rd order tributary of the Jordan River supporting 2B-Non-contact recreation and 3A-Coldwater fishery beneficial uses. In 2002, Salt Lake County conducted a water quality assessment of Emigration Creek and found high fecal coliform levels. This data was published in 2003 in the Emigration Watershed Non-Point Pollution Assessment: Coliform Bacteria Water Quality Analysis located at the County's website www.waterresources.slco.org. Emigration Creek is currently listed as impaired for E. Coli. The County is in the initial water quality assessment phase of the TMDL process. In this phase, five major water quality datasets have been examined. After reviewing these major datasets, several gaps have been identified including:

- Insufficient seasonal E. Coli data
- Insufficient diurnal E. Coli data
- Insufficient flow data/characterization

In order to fill these datasets, the DWQ is working in conjunction with Salt Lake County to install four stage discharge meters along Emigration Creek to augment existing flow data. Seasonal water quality grab samples will be taken at the four metered flow locations as well as Rotary Park and Burr Fork. The Emigration Creek TMDL timetable will likely extend past development of the WaQSP.

2.6 GREAT SALT LAKE WATER QUALITY STANDARDS DEVELOPMENT

The following section includes summary information on the Great Salt Lake and Farmington Bay water quality standard development (as adapted in part from the State's DWQ website).

2.6.1 GREAT SALT LAKE

Currently the Great Salt Lake has no numeric water quality criteria. The Department of Environmental Quality (DEQ) has established the Great Salt Lake Water Quality Steering Committee ("GSL Water Quality Steering Committee") to guide the process of developing numeric standards for the lake. This group consists of federal and state regulatory agencies, other public entities, conservation organizations, recreation groups, and industrial users of the lake.

The overall objective of the study is to set site-specific numeric water quality standards for open waters of the Great Salt Lake. The initial focus is on selenium. Under the Steering Committee's oversight, a science panel will evaluate existing selenium studies on the Lake and conduct additional work, where necessary. The committee will consider the science panel's work, and then make a recommendation to the Water Quality Board. If the Board accepts the recommendation, the standard will be sent out for public comment before the action is final.

Mercury is also a concern and is currently being studied by the DEQ DWQ. DEQ has initiated a Mercury Work Group (MWG) to coordinate and collaborate mercury studies and investigations ongoing in the Great Salt Lake and Utah.

2.6.1 FARMINGTON BAY

Farmington Bay was not initially listed on Utah's 303(d) list of impaired waters. In response to rising concerns that the nutrient load to Farmington Bay may be exceeding the assimilatory capacity of the wetlands the DWQ has applied for and received EPA grant money to begin developing assessment methods. Currently there are no EPA recommendations for water quality nutrient criteria for wetlands. The methods developed during this project will be used to set site specific water quality standards for nutrients as well as perform 30(b)/303(d) assessments of the Farmington Bay wetlands. This process is ongoing and will likely extend past the development of the WaQSP.

2.7 RECLAIMED/REUSE WATER REQUIREMENTS

Regulations governing the recycling of wastewater in Utah emphasize the protection of public health. Reuse water regulations have been developed to greatly reduce or eliminate pathogens if human contact with the reclaimed water occurs. To reduce the risk of human uptake of pathogens, disinfection is required in most applications.

2.7.1 STANDARDS

Regulations governing construction of wastewater treatment works in Utah are contained in the Utah Code Annotated under Utah R317-3, Design Requirements for Wastewater Collection, Treatment and Disposal Systems. Utah R317-1-4, Utilization and Isolation of Domestic Wastewater Treatment Works Effluent, contains requirements for reuse of treated domestic wastewater. In addition to specifying treatment requirements and reclaimed water quality for Type I and Type II effluent, there are regulations concerning record keeping, distribution system design, and signage.

A Reuse Project Plan must be submitted to the Division of Water Quality and to the local health department in accordance with R317-1-4.2. Details of the treatment requirements for Level I (where human exposure is likely) and Level II (where human exposure is unlikely) can be found in R317-1-4.3 (A) and (B) and R317-1-4.4 (A) and (B), respectively. Type I and Type II requirements are summarized in Table 2-56. The additional requirements found in Table 2-6 must also be taken into consideration.

TABLE 2-5 TYPE I AND TYPE II REQUIRED TREATMENT PROCESSES AND RECLAIMED WATER QUALITY STANDARDS

REQUIRED TREATMENT PROCESSES	
TYPE I	**TYPE II**
1) Secondary treatment process should produce effluent in which both the BOD and total suspended solids concentrations do not exceed 25 mg/l as a monthly mean.[1] 2) Filtration, which includes passing the wastewater through filter media such as sand and/or anthracite or approved membrane processes. 3) Disinfection to destroy, inactivate, or remove pathogenic microorganisms by chemical, physical, or biological means.[2]	1) Secondary treatment process should produce effluent in which both the BOD and total suspended solids concentrations do not exceed 25 mg/l as a monthly mean. 2) Disinfection to destroy, inactivate, or remove pathogenic microorganisms by chemical, physical, or biological means.
WATER QUALITY STANDARDS	
TYPE I	**TYPE II**
1) Monthly arithmetic mean of BOD: 10 mg/l[3] 2) Daily arithmetic mean turbidity: 2 NTU[4] 3) Turbidity at any time: 5 NTU 4) Weekly median fecal coliform concentration: none detected[5] 5) Total residual chlorine: 1.0 mg/l[6] 6) pH: between 6 and 9[7]	1) Monthly arithmetic mean of BOD: 25 mg/l 2) Monthly arithmetic mean total suspended solids (TSS): 25 mg/l 3) Weekly mean TSS: 35 mg/l 4) Weekly median coliform concentration: 200 organisms/100 ml[8] 5) pH: between 6 and 9

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[1] Secondary treatment processes may include activated sludge, trickling filters, rotating biological contactors, oxidation ditches, and stabilization ponds.
[2] Disinfection may be accomplished by chlorination, ozonation, or other chemical disinfectants, UV radiation, membrane processes, or other approved processes.
[3] Daily composite samples must be taken and be comprised of at least six flow proportionate samples taken over a 24-hour period.
[4] The turbidity shall be measured continuously and the standard shall be met prior to disinfection. If the turbidity standard cannot be met, but it can be demonstrated to the satisfaction of the Executive Secretary (ES) that there exists a consistent correlation between turbidity and TSS, then an alternate turbidity standard may be established.
[5] Daily grab samples shall be taken and no sample shall exceed 14 organisms/100 ml.
[6] The total residual chlorine shall be measured continuously and shall at no time be less than 1.0 mg/l after 30 minutes contact time at peak flow. If an alternative disinfection process is used, it must be demonstrated to the satisfaction of the ES that the alternative process is comparable to that achieved by chlorination with a 1 mg/l residual after 30 minutes contact time. If the effectiveness cannot be related to chlorination, then the process must be demonstrated by testing for pathogen destruction as determined by the ES. A 1.0 mg/l total chlorine residual is required after disinfection and before the reclaimed water goes into the distribution system.
[7] The pH shall be determined by daily grab samples.
[8] No sample shall exceed 800 organisms/100 ml.

TABLE 2-6 ADDITIONAL REQUIREMENTS FOR TYPE I AND TYPE II TREATED WASTEWATER
ADDITIONAL REQUIREMENTS FOR TYPE I TREATED WASTEWATER
1. An alternative disposal option or diversion to storage must be automatically activated if turbidity exceeds or chlorine residual drops below the instantaneous required value for more than 5 minutes. 2. Any irrigation must be at least 50 feet from any potable water well. Impoundments of reclaimed water, if not sealed, must be at least 500 feet from any potable water well. 3. Requirements for ground water discharge permits, if required, shall be determined in accordance with R317-6. 4. For residential landscape irrigation at individual homes, additional quality control restrictions may be required by the Executive Secretary. Proposals for such uses should also be submitted to the local health authority to determine any conditions they may require.
ADDITIONAL REQUIREMENTS FOR TYPE II TREATED WASTEWATER
1. An alternative disposal option or diversion to storage must be available in case quality requirements are not met. 2. Any irrigation must be at least 300 feet from any potable water well. Spray irrigation must be at least 300 feet from areas intended for public access. This distance may be reduced or increased by the Executive Secretary, based on the type of spray irrigation equipment used and other factors. Impoundments of reclaimed water, if not sealed, must be at least 500 feet from any potable water well. 3. Requirements for ground water discharge permits, if required, shall be determined in accordance with R317-6. 4. Public access to effluent storage and irrigation or disposal sites shall be restricted by a stock-tight fence or other comparable means which shall be posted and controlled to exclude the public.

2.8 GRAY WATER REQUIREMENTS

Although seen as a viable reuse alternative in other States, gray water systems have yet to see widespread use in Utah. Gray water (i.e. wastewater generated from domestic processes such as washing dishes, laundry and bathing) systems are generally found in rural, single family residences where other wastewater disposal options are limited. However, due to increasing emphasis on water reuse and recycling efforts, gray water systems continue to gain attention locally and nationwide. State rules and regulations concerning the use of gray water can be obtained from the DEQ website and from the Salt Lake Valley Health Department (SLVHD). Utah rules pertaining to general definitions, administrative, and approval requirements for gray water systems can be found in Utah Code R317-401, Sections 1 through 4.

2.8.1 STANDARDS

In comparison to other nearby States, Utah's rules appear to be more restrictive, not only from an administrative and approval standpoint, but also to the adherence to a set of prescribed detailed design requirements and conditions. This is readily apparent by comparing the Utah administrative requirements in Table 2-7 to the requirements for surrounding states of Arizona and New Mexico.

TABLE 2-7

COMPARISON OF UTAH GRAY WATER PROVISIONS AND SURROUNDING STATES

	Permit Required	Allowed flow (gpd)	Overflow to sewer	Tank cover	ID as non potable	No runoff from lot	No discharge to surface water	No ponding	Avoid people and pets	No spraying	No vegetable watering	Setback distances	No public nuisance	No hazmat
Arizona		400	x	x	x	x	x	x	x	x	x			x
Colorado	x													
Nevada	x	sfd only	x			x	x	x		x				
New Mexico		250	x	x	x	x	x	x	x	x	x	x	x	x
Utah	x	sfd only	x	x	x	x	x	x		x	x	x		

sfd = single family dwelling

2.9 BIOSOLIDS REQUIREMENTS

Disposal of biosolids (i.e. solids or semisolids obtained from treated wastewater) by land application is regulated under the U.S. EPA 40 CFR Part 503 biosolids rule and Utah's federal equivalent Title R315 Solid and Hazardous Waste. This regulation classifies biosolids as Class A or Class B based on pathogen levels remaining in the biosolids after stabilization. Aerobically digested biosolids are designated Class B and have site and time restrictions on land application and disposal whereas Class A biosolids have no disposal restrictions.

2.9.1 STANDARDS (U.S. EPA PART 503 REGULATIONS)

The U.S. EPA 40 CFR Part 503 regulations for biosolids contains five sub-parts including general provisions, requirements for land application, surface disposal, pathogen and vector attraction reduction, and incineration. For each of the disposal practices, the regulation outlines general requirements, pollutant limits, management practices, operational standards, monitoring, record keeping, and reporting.

Subpart B of the rule specifies requirements for land application of biosolids. There are several options for land disposal, all of which are equally protective of human health and the environment. In general, land application of biosolids must meet three conditions: 1) limitations of pollutants in the biosolids, 2) pathogen reduction requirements and 3) vector attraction reduction requirements.

Pollutant Limitations

1) All biosolids must meet the ceiling concentrations for the 10 metal pollutants listed in the first column of Table 2-8. If the limit for any one of the pollutants is exceeded, the sludge may not be land applied. Alternative disposal sites must be utilized or further processing must be performed.

2) Biosolids applied to the land must also meet either pollutant concentration limits or cumulative pollutant loading rate limits in columns 3 and 4 of Table 2-8. The product of the pollutant concentration and annual sludge application rate shall not exceed the annual pollutant loading rate in column 5 of Table 2-8.

3) Either Class A or Class B pathogen reduction requirements and site restrictions must be met before biosolids can be land applied. Pathogen reduction requirements will be covered in detail in this Section. If biosolids are designated Class B, then site restrictions must be followed.

4) One out of the six options for vector attraction reduction as shown in Table 2-8 must be met before biosolids can be land applied.

TABLE 2-8
POLLUTANT LIMITS FOR LAND APPLICATION

Pollutant	Ceiling Concentration Limits (mg/kg)	Pollutant Concentration Limits (mg/kg)	Cumulative Pollutant Loading Rate Limits (kg/ha)	Annual Pollutant Loading Rate Limits (kg/h a/yr)
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Chromium	N/A	N/A	N/A	N/A
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum	75	N/A	N/A	N/A
Nickel	420	420	420	21
Selenium	100	100	100	5.0
Zinc	7,500	2,800	2,800	140

Pathogen Reduction

Pathogen reduction alternatives ensure that pathogen levels in biosolids are reduced to levels considered safe for the biosolids to be land applied. Subpart D presents criteria for classifying biosolids as either Class A or Class B. If indicator pathogens such as *Salmonella* sp. bacteria, enteric viruses (e coli), and viable helminth ova are reduced to nearly undetectable limits, the biosolids meet the Class A designation. Biosolids are designated as Class B if the indicator pathogens are detectable but are below levels that pose a threat to humans and the environment. Land application and usage restrictions for Class B biosolids are designed to prevent exposure to the pathogens while natural processes further reduce pathogens before the site is used for purposes which may affect humans.

Part 503 Subpart D lists six alternatives for treating biosolids to meet Class A pathogen reduction requirements. In general, the objective is to reduce pathogens below detectable limits defined as:

- The density of the *Salmonella* sp. bacteria in the biosolids must be less than 3 most probable number (MPN) per 4 grams of total solids (dry weight basis).

- Enteric Viruses must be less that 1 MPN per 4 grams of total solids.

- Viable helminth ova must be less that 1 MPN per 4 grams of total solids.

The six Class A stabilization alternatives are summarized in Table 2-9 and include alternatives from 40 CFR Part 257 “Processes that Further Reduce Pathogens” (PFRPs) and equivalent technologies.

After municipal sludge has been treated using one of the six Class A alternatives for pathogen reduction, the potential for regrowth of pathogenic bacteria exists. To insure that significant regrowth has not occurred, Class A pathogen reduction alternatives also require the following at the time of disposal, use, or preparation for sale.

- *Either* the density of fecal coliform in the biosolids must be less than 1000 MPN per gram total solids (dry weight basis);

- *Or* the density of the *Salmonella* sp. bacteria in the biosolids must be less than 3 MPN per 4 grams of total solids (dry weight basis).

TABLE 2-9 SUMMARY OF ALTERNATIVES FOR MEETING CLASS A PATHOGEN REDUCTION REQUIREMENTS
Alternative 1: Thermally Treated Sewage Sludge Biosolids must be subjected to one of four time-temperature regimes.
Alternative 2: Alkaline Treatment of Sewage Sludge Biosolids must meet specific pH, temperature, and air-drying requirements.
Alternative 3: Other Processes Demonstrate that the process can reduce enteric viruses and viable helminth ova. Maintain operating conditions used in the demonstration after pathogen reduction demonstration is completed.
Alternative 4: Unknown Processes Biosolids must be treated for pathogens — Salmonella sp. or fecal coliform, enteric viruses and viable helminth ova — at the time the biosolids are used or disposed.
Alternative 5: Processes to Further Reduce Pathogens Biosolids must be treated in one of the Processes to Further Reduce Pathogens (PFRP) from 40 CFR Part 257 listed in Appendix B of 40 CFR Part 503.
Alternative 6: Processes Equivalent to PFRP Biosolids must be treated in a process equivalent to one of the PFRPs, as determined by the permitting authority.

Class B pathogen requirements can be met using one of three alternatives, as listed in Table 2-10. Unlike Class A biosolids in which pathogens are below detectable limits, Class B biosolids contain limited amounts of pathogens. For this reason, the Class B requirements for land application of biosolids also include site restrictions for certain periods of time after application until environmental conditions have further reduced pathogens as listed below:

- Harvesting of food is restricted from 14 to 38 months depending on type of crop and its degree of contact with the soil/biosolids.
- Animal grazing is restricted for 30 days.

- Turf harvesting is restricted for 1 year.
- Public access is restricted from 30 days to 1 year depending on potential for public exposure.

TABLE 2-10 SUMMARY OF CLASS B PATHOGEN REQUIREMENTS
Alternative 1: Monitoring of Indicator Organisms Test for fecal coliform density as an indicator for all pathogens. The geometric mean of seven samples shall be less than 2 million MPNs per gram per total solids or less than 2 million colony forming units (CFUs) per gram of total solids at the time of use or disposal.
Alternative 2: Biosolids Treated in PSRP Biosolids must be treated in one of the Processes to Significantly Reduce Pathogens (PSRP). PSRP processes include aerobic digestion, air drying, anaerobic digestion, composting, and lime stabilization as outlined in 40 CFR Part 257.
Alternative 3: Biosolids Treated in a Process Equivalent to a PSRP Biosolids must be treated in a process equivalent to one of the PSRPs, as determined by the permitting authority.

Vector Attraction Reduction

Vectors are any living organism capable of transmitting a pathogen from one organism to another. Vectors for sewage sludge pathogens are most likely to be insects, rodents, and birds. The 503 regulations contain 12 options to show that the biosolids have reduced attractiveness to vectors. Options 11 and 12 apply only to sludge disposed at landfill and domestic septage (septic tank waste) respectively. The vector attraction reduction options are shown in Table 2-11.

TABLE 2-11 SUMMARY OF VECTOR ATTRACTION REDUCTION OPTIONS	
Option 1:	Reduce the mass of volatile solids by a minimum of 38 percent.
Option 2:	Demonstrate volatile solids reduction with additional anaerobic digestion in a laboratory bench-scale unit.
Option 3:	Demonstrate volatile solids reduction with additional aerobic digestion in a laboratory bench-scale unit
Option 4:	Meet a specific oxygen uptake rate for aerobically treated biosolids.
Option 5:	Use aerobic processes at greater than 40°C (average temperature 45°C, 113°F) for 14 days or longer.
Option 6:	Add alkaline material to raise the pH under specified conditions.
Option 7:	Reduce moisture content of biosolids that do not contain unstabilized solids from other than primary treatment to at least 75 percent solids.
Option 8:	Reduce moisture content of the biosolids with unstabilized solids to at least 10 percent (90 percent total solids).
Option 9:	Inject biosolids beneath the soil surface within a specified time, depending on the level of pathogen treatment.
Option 10:	Incorporate biosolids applied to or placed on the land surface within specified time periods after application to or placement on the land surface.
Option 11:	Biosolids placed on a surface disposal site must be covered with soil or other material at the end of each operating day.
Option 12:	Adjust pH of septage to greater than 12 measured at 25°C (77°F). pH must remain greater than 12 for 30 minutes without addition of more alkaline material.

3.0 PERMITTING PROCESS AND PLANNING FRAMEWORK

The purpose of this section is to document the preliminary planning and permitting process, as developed through two stakeholder workshops held during Phase 1 with Salt Lake County and stakeholders, as well as to identify those elements that are important to future wastewater planning. A review of the current process, as experienced through siting of the new Riverton Wastewater Treatment Facility, is summarized to gain an understanding of the issues surrounding wastewater management in Salt Lake County. Finally, attributes of the proposed planning process are reviewed as a means for further discussion and evaluation during Phase 2 and subsequent stages of the planning study.

3.1 CURRENT PLANNING PROCESS DESCRIPTION

The original Areawide Water Quality Management Plan was developed in accordance with section 208 of the Clean Water Act. During the course of planning, the 208 Project Steering Committee recognized the value of forming an on-going Areawide Water Quality Management Agency. This need was met in October of 1977 when the Salt Lake County Commission unanimously voted for an ordinance that created the Salt Lake County Department of Water Quality and Water Pollution Control. The County was subsequently designated as the designated planning agency. A copy of this ordinance is included in Appendix A. The Areawide Water Quality Management Plan defines the role of the County planning agency as follows:

- Continuing planning, including annual update and recertification of the Areawide Water Quality Management Plan through required channels.

- Ongoing definition and clarification of roles and responsibilities, through regular meetings and continuing discussions with all agencies involved, to formulate, review, and adopt or modify goals or objectives.

- Administrative staff assistance and professional consultant studies where needed, to help attain water quality goals.

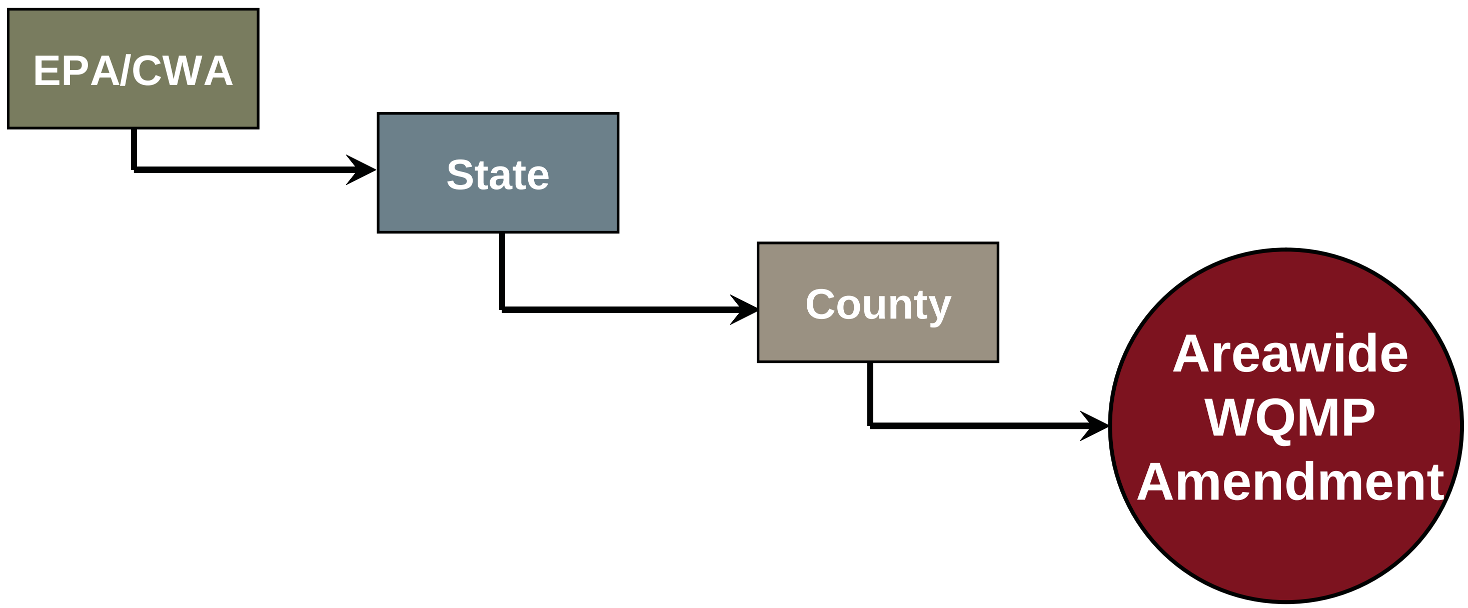
- Ongoing evaluation of the program, including review of monitoring and testing activities, and facilities planning and approval procedures.

- Public education process to obtain local understanding, support, and cooperation in efforts to improve water quality.
- Recommendations to regulatory agencies for appropriate changes in policies, standards, or legislation, to meet changing conditions or requirements with respect to water quality.
- Coordination of planning and implementation efforts with neighboring areawide planning organizations.
- Adequate financing for the activities listed.

The original planning and management organization chart and channels for public participation can be found in Section 7 Implementation of the 208 Plan. The initial 208 Plan planning authority followed the general flow down chart as shown in Figure 3-1.

3.2 CURRENT PERMITTING PROCESS DESCRIPTION

The current permitting process for construction of new wastewater treatment facilities, expansions, and major process upgrades is defined through the State's UPDES standards and related regulations under Title R317 Water Quality. Plan approval through the County as well as local siting and land use regulations also apply. Figure 3-2 presents the current permitting process as it applies to new facilities, upgrades and expansions, industrial facilities and reuse/scalping facilities.



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

208 PLANNING AUTHORITY

Figure 3-1

BROWN AND CALDWELL

	County	State	Local	
New Facility	Plan Approval	UPDES Permit/ Construction Permit	Siting/Land Use	**FACILITY**
Upgrade/ Expansion		Construction Permit		
Satellite Treatment or Scalping Facility	Plan Approval	Construction/Reuse Permit Groundwater Permit	Siting/Land Use	
Industrial	Plan Approval	UPDES Permit/ Construction Permit	Siting/Land Use	

SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

CURRENT PERMITTING PROCESS

Figure 3-2

BROWN AND CALDWELL

3.2.1 RIVERTON PLANT SITING EXAMPLE

Since inception of the Areawide Water Quality Management Plan in 1978 and implementation of the plan's recommendations to consolidate existing facilities, there has been no official request to amend the plan until recently. In 2002, the South Valley Water Reclamation Facility (SVWRF) completed a study consisting of national experts and designated as the Blue Ribbon Panel to review plant improvements required to meet the projected growth needs of the service area.

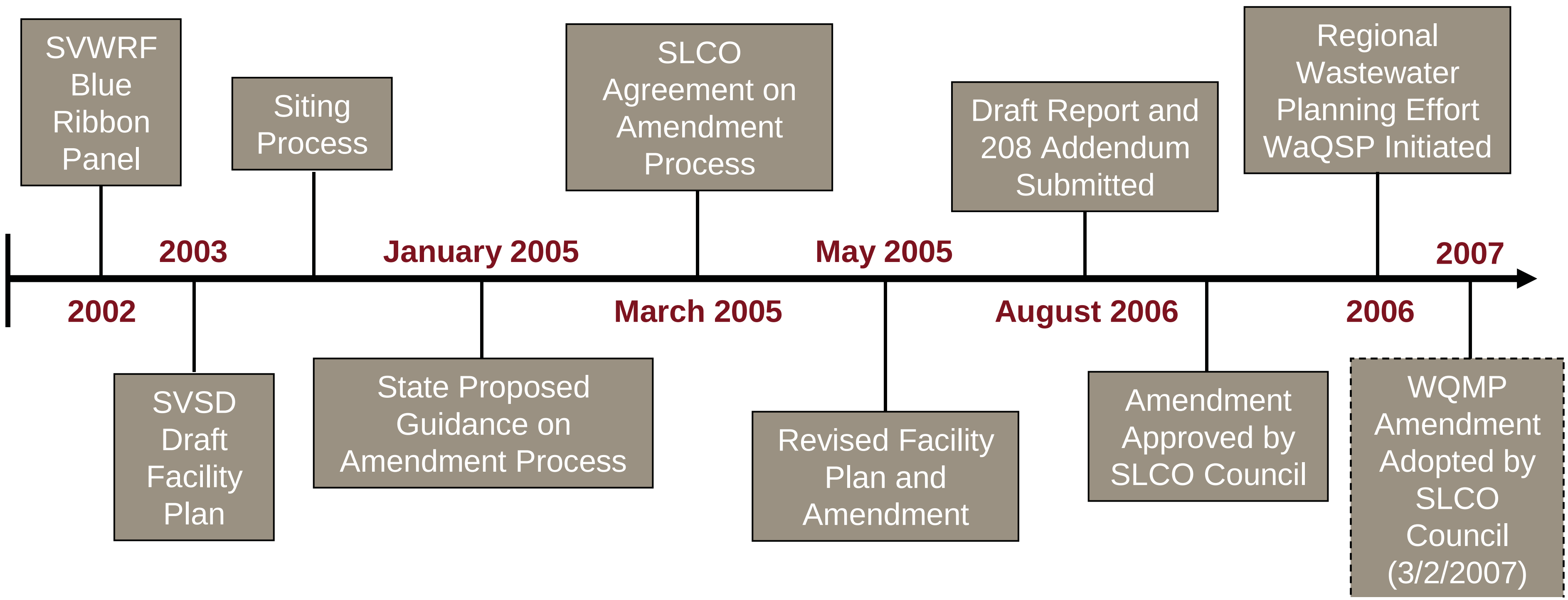
Concern by the South Valley Sewer District (SVSD) over rising costs of providing additional plant capacity at the SVWRF as well as limited sewer conveyance capacity prompted the District to pursue masterplanning for a new treatment facility. SVSD completed a Draft Facility Plan in 2003 that evaluated flow and loading conditions, potential sites, alternative treatment processes and costs for the new facility. SVSD submitted the facility plan to the State Division of Water Quality (DWQ) in support of their request to create a new discharge into the Jordan River. Concurrently, SVSD began the process for obtaining a conditional use permit for siting the facility in the City of Riverton.

In January 2005 the DWQ replied that the original Areawide Water Quality Management Plan Water Quality Management Plan would need to be amended by Salt Lake County before the State would act on issuing a new discharge permit. In December 2005 the Salt Lake County Council conditionally approved SVSD's request to amend the Areawide Water Quality Management Plan subject to seven environmental and facility siting conditions.

Subsequent to Salt Lake County's conditional approval of the amendment request, the conditional use permit was revoked by the Riverton Board of Adjustment requiring SVSD to seek resolution in District Court. When the court ruled in favor of the Board of Adjustment, SVSD initiated negotiations with the group opposed to siting of the facility in Riverton. Successful resolution of opposition issues has resulted in the lawsuit being vacated.

The SVSD facility plan was revised and submitted to the Salt Lake County Council in August, 2006 as a Areawide Water Quality Management Plan addendum. In March of 2007 (after the lawsuit was vacated), the Salt Lake County Council adopted the Areawide Water Quality Management Plan addendum (a copy of the Council approval is included in Appendix B).

Figure 3-3 summarizes the major events related to the SVSD Areawide Water Quality Management Plan addendum process.



SALT LAKE COUNTY

Water Quality Stewardship Plan
Wastewater Element

SVSD 208 Amendment Process

Figure 3-3

BROWN AND CALDWELL

Several issues became evident during reactivation of the Areawide Water Quality Management Plan addendum process. The limitations of the original Areawide Water Quality Management Plan after thirty years of inactivity were apparent. First, Salt Lake County and SVSD were apparently unaware that Areawide Water Quality Management Plan concurrence was a requirement. It also was clear that the initial SVSD approach did not gain public acceptance, and perceived environmental and governance issues were not adequately addressed at the local level.

Establishing a modern and enforceable planning framework for future wastewater facilities in Salt Lake County has been exacerbated and convoluted by the absence of an active regional wastewater process for the last 30 years. Meeting the requirement for Areawide Water Quality Management Plan concurrence put the County in a reactive mode with respect to approval of the proposed SVSD facility because a fifth wastewater treatment facility in Salt Lake County was not envisioned in the original Areawide Water Quality Management Plan. Although the County has now approved the SVSD Areawide Water Quality Management Plan amendment request, the challenge of planning for significant growth along the Westbench still remains. It is clear that a comprehensive and enforceable wastewater planning process is in the best interest of all citizens in Salt Lake County.

3.3 PROPOSED PLANNING FRAMEWORK

A series of ongoing workshops with Salt Lake County and stakeholders are planned to evaluate the future of wastewater planning within the region. Two workshops were held as part of Phase 1 activities and form the basis of this section. Attendance sheets from both workshops are located in Appendix C. Phase 2 activities include additional workshops with the POTW Advisory Group to the Jordan River Watershed Council as well an additional workshop with the larger stakeholder group to further develop the proposed planning process. The concepts presented here are preliminary and will likely evolve as the planning process matures.

3.3.1 PLANNING CONCEPTS

Several innovative planning concepts were presented during the workshops as a primer for future discussions. They are as follows:

Development of Community Values

The new planning process must achieve, to the highest degree possible, a community consensus on future wastewater management. Development of community values was recommended as a guide to help gain plan consensus. Community values can be developed through:

- Focus groups
- Stakeholder interviews
- Public presentation and outreach programs

Community values can be used to guide solutions and future plan amendments and would ultimately reflect public and political support. In the Lacy, Olympia, Tumwater and Thruston County, Washington (LOTT) planning example presented in Workshop 2, community values were established through many mechanisms including:

- Elected Officials
- Phone Surveys (Over 1000 area residents participated)
- Newsletter Responses
- Multiple Community Workshops
- Stakeholder Interviews
- Active / Influential Individuals and Elected Officials
- Officially Recognized By Elected Officials

An example of the LOTT's community values are presented in Table 3-1. LOTT's community values have been utilized as a guiding tool for all future wastewater planning efforts with great success.

TABLE 3-1 LOTT'S EXAMPLE OF COMMUNITY VALUES	
1. Maximize Use of Existing Treatment Capacity 2. Prepare a Plan Meeting Current and Future Needs 3. Maximize Benefits to the Environment 4. Control Costs 5. Value Treated Effluent as a Resource	6. Produce Multiple Community Benefits 7. Conduct an Open Facilities Planning Process 8. Equitable Distribution of Costs 9. Equitable and Accountable Public Representation 10. Integrate LOTT Plan with Other Infrastructure Requirements

Wastewater as a Resource

The traditional approach to wastewater facilities planning focuses on getting rid of a problem or treating wastewater to a point clean enough so that it can be acceptably disposed into the environment. Placed in the context of the following four types of capacity, the sequence of traditional wastewater planning first examines collecting, then carrying the wastewater to some location where it can be treated and disposed as indicated in the following sequence.

Collection → Conveyance → Treatment → Disposal

Under a proposed new process, planning will focus on treated water as a resource and how, as a valuable commodity, it might be used in environmentally beneficial ways. With use as a starting point, then planning moves to level of treatment required, to conveyance, and finally to collection of wastewater as shown below.

Resource Use → Treatment → Conveyance → Collection

This paradigm reversal is possible because small treatment systems can be efficiently sited close to where the treated water is needed. Traditional thinking is based on where the treated water can be disposed with least impact. As with municipal solid waste, the emphasis is on gathering and disposing at an acceptable central location. By recognizing the value of highly treated water it is possible to serve water-dependent needs where and as they occur.

For example, if a use for reclaimed water can be served by a new satellite facility which can be located close to the use, such that it redirects flows from an interceptor reaching maximum capacity, several favorable things can happen:

1. Flows are removed from the receiving POTW, leaving capacity in reserve for future new connections.
2. Reclaimed water is used which reduces dependence on the regional system of aquifers and surface supplies, which may off-set a use of potable water.
3. Locating the treatment facility close to reclaimed water use saves infrastructure costs.
4. Redirecting flows away from a heavily utilized interceptor delays the need to upgrade or install parallel pipes to serve future flows.

Attributes of a Future Permit Process

Attributes for a future permit process were developed as a starting point in evaluating improvements to the existing process. Attributes were developed based on insight gained from the current addendum process as well as discussions through workshops help with Salt Lake County staff and the stakeholder workshops. They are as follows:

- Protect public health and environment
- Clearly defined process
- Based on community values
- Meets current and future needs
- Mitigates public acceptance, environmental and governance issues beforehand
- Emphasis on sustainable resource

These attributes will be carried forward to planned workshops during Phase 2 activities for further development.

Proposed Direction for the Future

Proposed direction for future regional wastewater planning efforts will include:

1. A regional programmatic approach
2. A transparent environmental and public process that
    - Identifies community values
    - Includes stakeholder and public involvement
    - Develops public and political support and buy-in
3. Environmentally responsive facility planning with emphasis on sustainability
4. Includes planning and permitting requirements for design and construction of all future wastewater treatment works

The preliminary, proposed permitting and planning process as developed during the Phase 1 of the WaQSP wastewater element will be further defined during Phase 2 activities.

APPENDIX A

SALT LAKE COUNTY PLANNING ORDNANCE

ENABLING ORDINANCE

ORDINANCE NO. 615

AN ORDINANCE ENACTING TITLE 7, CHAPTER 5, SECTIONS 1 THROUGH 9, INCLUSIVE, OF THE REVISED ORDINANCES OF SALT LAKE COUNTY, 1966, AS AMENDED, ENTITLED "WATER QUALITY AND WATER POLLUTION CONTROL"; WHICH ESTABLISHES A SALT LAKE COUNTY WATER QUALITY AND WATER POLLUTION CONTROL DEPARTMENT, AN ADVISORY COUNCIL TO THE SALT LAKE COUNTY COMMISSION FOR SAID DEPARTMENT, AND POLICY DEVELOPMENT AND EVALUATION COMMITTEES TO AID THE COUNCIL; AND FURTHER PROVIDES AREAS OF CONCERN AND ACTIVITY FOR BOTH COUNCIL AND COMMITTEES.

The Board of County Commissioners of the County of Salt Lake ordains as follows:

SECTION I. That Title 7, Chapter 5, SECTIONS 1 through 9, inclusive, of the Revised Ordinances of Salt Lake County, 1966, as amended, entitled "Water Quality and Water Pollution Control," is hereby enacted as follows:

CHAPTER 5

WATER QUALITY AND WATER POLLUTION CONTROL

Sections:

WATER QUALITY AND WATER POLLUTION CONTROL ORDINANCE

Sec. 7-5-1. PREAMBLE. In order to facilitate the performance of the responsibilities of the Board of County Commissioners of Salt Lake County to enforce all laws and regulations for the prevention of water pollution, and to assist in fulfilling the flood control responsibilities of the Commission, there is hereby established a department to be known as the "Salt Lake County Water Quality and Water Pollution Control Department", hereinafter referred to in this chapter as the "Department."

No provision herein shall be construed tq permit or encourage the regulation, allocation or reallocation of water rights or of culinary water collection or distribution systems.

Sec. 7-5-2. ADVISORY COUNCIL. There is hereby established as an advisory council to the Salt Lake County Board of Commissioners a "Salt Lake County Water Quality and Water Pollution Control Council" hereinafter referred to in this chapter as the "Council."

Sec. 7-5-3. COMPOSITION OF ADVISORY COUNCIL. The Council established in Section 7-5-2 above, is comprised of one representative from each of the interest groups and organizations affected by the planning for compliance to, and enforcement of, laws, ordinances and regulations, intended to prevent pollution of the general hydrologic system and specific surface and underground waters in Salt Lake County.

Sec. 7-5-4. POLICY DEVELOPMENT AND PROGRAM EVALUATION COMMITTEES. The following interest groups and organizations are entitled to membership on the Council:

1. Real Estate Development and Construction Group;
2. Wastewater Treatment and Collection Organizations;
3. Agriculture and Soil Conservation Group;
4. Water Supply Organizations;
5. Salt Lake County Flood Control Department and Municipal Public Works and Public Improvements Departments within Salt Lake County and other Drainage authorities;
6. Salt Lake County Planning Commission and Municipal Planning and Zoning authorities within Salt Lake County;
7. Individuals and organizations concerned with the preservation and enhancement of land areas and waters for recreational purposes, including operators of recreational facilities and government agencies of the United States, the State of Utah, Salt Lake County and municipalities within Salt Lake County responsible for maintenance and enforcement of laws, regulations and policies related thereto;
8. Industrial organizations whose operations effect

the water quality of the hydrologic system in Salt Lake County or who are involved in research and development of water pollution control or water purification technology;

9. All other individuals, groups, and organizations not described above, having an interest in the operation of the Department and the prevention of pollution of the hydrologic system in Salt Lake County;

10. In addition to the representative from each of the groups defined above, a member of the Salt Lake County Commission, the director of the Salt Lake City-County Health Department, a member of the Salt Lake City Commission and a representative from each of the North, Central and South regional sewage treatment plants shall be members of the Council. The regional sewage treatment area represented by the chairperson of the Wastewater Treatment and Collection organizations shall not be entitled to double representation by additional Council memberships provided herein. The chairperson of that committee shall also be the representative of the regional plant area represented.

Each of the nine interest groups and organizations set forth above shall convene separately and be known as "policy development and program evaluation committees," and shall elect by majority vote a council representative from each committee, who shall also serve as chairperson of each committee, and, who shall be approved by the County Commission before being seated on the Council.

Each committee shall be entitled to a seat on the Council for the purpose of representing the interest of each committee and for the purpose of participating in the decisions, the formation of policies and to generally serve the purposes for which the Council is organized.

Sec. 7-5-5. SELECTION OF COMMITTEE MEMBERS AND TERMS OF OFFICE.

(a) Appointment to each committee shall be by the Board of County Commissioners after receiving nominations from each specific interest group, provided however, that each municipality, improvement district, sanitary district, or other government agency is entitled to participate in such committees as deal with the specific area of interest corresponding to the direct official district or other government agency. Any committee member may designate a substitute member for any particular purpose.

(b) Nominations for membership on the policy development and program evaluation committees shall be received in writing by the Board of Commissioners of Salt Lake County annually.

Membership on the policy development and program evaluation committees shall not be restricted to a specific number of individuals unless the Board of Commissioners of Salt Lake County determines and finds that restriction of membership to any particular committee is necessary to prevent disruption of the committee's work or prevent over-representation by a specific special interest group or organization.

The term of office for any single committee representative to the Council shall not exceed three (3) years, but the term of office may be set at a shorter period than three (3) years upon a vote by a majority of the membership of each committee. By majority vote any committee may remove its representative from the Council. Any committee representative may serve more than one term and may designate a substitute representative for any particular meeting.

(c) To provide for overlapping terms of office, the first representative to the Council shall serve terms of office staggered as follows:

(1) Four (4) members for a term of one (1) year,
(2) Four (4) members for a term of two (2) years,
(3) All other members for a term of three (3) years.

At the first Council meeting, each member other than the Director of the City-County Health Department, the member of the Board of

County Commissioners and the member of the Salt Lake City Commission, shall draw lots to determine the term of office served by each member.

(d) The members of the Wastewater Treatment and Collection organizations from the regional areas not represented by the chairperson Council member shall elect by a majority vote, a representative for each regional area to the Council subject to the approval of the County Commission. The term of office and the procedure for removal from office shall be the same as that established by this ordinance for any single committee representative to the Council.

Sec. 7-5-6. DUTIES OF COUNCIL. The Council may meet as often as deemed necessary, shall elect by majority vote a chairperson and a vice chairperson, one of whom shall represent a committee with a particular interest in non-point source pollution, and shall:

(a) In conjunction with the Department prepare an annual update and recommend recertification of a long-range, comprehensive water quality management plan.

(b) Review and evaluate the progress of all phases of the water quality management plan implementation.

(c) Coordinate the planning activities of all water quality management agencies and interest groups.

(d) Promote the best management practices (BMP's) and nonstructural solutions for water quality problems.

(e) Recommend construction priorities in Salt Lake County for water quality management facilities.

(f) Recommend legislation for improvement of state and local action and funding programs affecting water quality.

(g) Provide for public education and continuing public participation in water quality matters.

(h) Encourage continuing review of new developments and considerations of innovative practices in technological, legal, and administrative aspects of water quality management.

Sec. 7-5-7. DUTIES OF POLICY DEVELOPMENT AND PROGRAM

EVALUATION COMMITTEES. Each policy development and program evaluation committee within the area of it's expertise, shall:

(a) Develop recommendations for policies and procedures pertaining to the committee's specific field of responsibility, for adoption and promulgation by the Council of the Board of County Commissioners of Salt Lake County.

(b) Annually, or more often, if needed, identify and appraise all sources, or potential sources, of pollution within the purview of the committee. Review statutes and ordinances pertaining to such pollution sources and recommend that regulatory agencies are designated, and possess adequate statutory authority, and are conducting effective pollution control programs.

(c) Recommend legislative action, or ordinance action, where needed, to improve regulatory provisions.

(d) Regularly review existing water quality standards, pertaining to the committee's field of interest, recommend changes as needed, and insure publication of such standards to agencies or persons concerned.

(e) Maintain liaison with each implementation agency involved in the committee's field of interest and insure coordination of activities relevant to that field.

(f) Develop recommendations for contracts or memorandums of agreement between implementation agencies and Salt Lake County or the Council.

(g) Receive and evaluate reports, questions, recommendations, or problems referred by the Council for study by the committee--and recommend appropriate actions by the Board of County Commissioners of Salt Lake County, the staff, or the responsible agency.

(h) Recommend construction priorities within the committee's field of expertise.

Sec. 7-5-8. DUTIES OF DEPARTMENT. The Department, under the direction of the Board of County Commissioners and in conjunction with the Council shall:

(a) Encourage a "planning philosophy" and assist in identifying roles among all cognizant levels and functions of government and other entities.

(b) Develop and recommend a basic 20 year water quality plan for Salt Lake County, provide for a continuous planning process and prepare documentation for the annual plan update and recertification.

(c) Propose legislative action required to achieve effective water quality management.

(d) Coordinate policies and implementation with other area wide water quality programs, air quality programs, solid waste disposal planning, etc.

(e) Develop and help implement programs for public education and participation.

(f) Assist the Salt Lake County Commission, and all local agencies concerned with water quality, in communicating with state and federal govenment agencies.

(g) Seek, obtain and administer on behalf of Salt Lake County, loans and grants for comprehensive water quality planning.

(h) Upon request from local entities, assist local entities in preparing and processing grant applications for water quality improvement projects.

(i) Administer and develop contracts for study programs and consulting activities.

(j) Establish, obtain approval for, and administer the departmental budget.

(k) Investigate and evaluate major pollution problems, including conducting cooperative monitoring of pollution problems, and encourage and assist management agencies in planning and implementation of solutions.

(l) Conduct research and/or supervise contract research and development to develop best management practices (BMP's) in non-point source pollution control.

(m) Encourage coordination and consistent policies and practices among local agencies, in planning and zoning, subdivision development, etc.

(n) Promote coordination in water quality control among water providers and purveyors.

(o) Review adequacy and assist in improving water quality monitoring, testing, and permit compliance activities.

(p) Continually review new research in water quality management by universities, industries, or government/non-profit agencies and assure availability of new information or developments to local agencies and organizations.

(q) Conduct such other activities as directed by the Council or the Board of County Commissioners and attend meetings of the program development and evaluation committees.

Sec. 7-5-9. SEVERABILITY. If any provision, clause, sentence or paragraph of this ordinance or the application thereof to any person or circumstance shall be held to be invalid, such invalidity shall not affect the other provisions or applications of this ordinance which can be given effect independent from the invalid provision or application, and to this end the provisions of this ordinance are hereby declared to be severable.

SECTION II. That this ordinance shall become effective within 15 days after the enactment thereof, if, within the 15-day period, it has been published in a newspaper of general circulation within the County of Salt Lake. If not published at such time, then immediately upon its first publication thereafter.

Approved and Passed this 31st day of October, 1977.

BOARD OF COUNTY COMMISSIONERS
OF SALT LAKE COUNTY

By ______________________
WILLIAM E. DUNN, Chairman

ATTEST:

Commissioner Dunn voting "Aye"
Commissioner Kutulas voting "Aye"
Commissioner Hutchinson voting "Aye"

APPENDIX B

SALT LAKE COUNTY COUNCIL
208 PLAN ADDENDUM APPROVAL

BEFORE THE SALT LAKE COUNTY COUNCIL
SALT LAKE COUNTY, STATE OF UTAH

In the Matter of the Request for an Amendment to the Countywide 208 Water Quality Management Plan	* * *	Findings, Determination and Request for Certification of Amendment of Water Quality Management Plan

Salt Lake County is the designated area-wide water quality management agency. The South Valley Sewer District requested the Council to amend the County's area-wide Water Quality Regional Management Plan to allow for an additional discharge to the upper Jordan planning area.

FINDINGS

1. The South Valley Sewer District ("South Valley") is a special district organized and existing under the laws of the State of Utah, with its principal place of business in Salt Lake County, Utah.

2. In 1978, the State of Utah designated Salt Lake County ("County") as the area-wide regional water quality planning agency under Section 208 of the Federal Water Pollution Control Act[1] ("Act").

3. In October 1978, the County released an area-wide Water Quality Management Plan ("WQMP"). The WQMP was intended to establish water quality management planning goals for, among other things, discharges from wastewater treatment facilities within the County.

4. The Act also requires that point source discharges be consistent with the planning goals of the WQMP.

5. The point source section of the WQMP includes an analysis of the treatment plant siting alternatives. The WQMP recommended the consolidation of wastewater treatment in three regional treatment plants.

6. South Valley provides sanitary sewer services in the southern end of the County, including areas located in Sandy City, Draper City, Bluffdate City, Herriman City, Riverton City, South Jordan City and portions of unincorporated areas of the County.

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[1] As amended by the Clean Water Act of 1977 and the Water Quality Act of 1987.

7. South Valley is a part owner in the South Valley Water Reclamation Facility ("SVWRF") which operates a wastewater treatment plant in West Jordan City, Utah.

8. South Valley's proposed treatment plant in Riverton, Utah, will discharge treated effluent to the Jordan River. The Utah Department of Environmental Quality, Division of Water Quality ("DWQ"), recommended that the WQMP be amended to support the issuance of a UPDES discharge permit to South Valley for the proposed treatment plant and, in January 2005, outlined possible procedures for evaluating the proposed construction of an additional treatment plant in the upper Jordan planning area.

9. In support of its request to amend the WQMP, South Valley represented that:

A. Other owner entities deliver sewage to the SVWRF plant for treatment.

B. The SVWRF plant has a limited treatment capacity.

C. Each party using the SVWRF plant is allocated a volume of sewage that it can send to the SVWRF plant for treatment proportionate to its ownership.

D. South Valley has exceeded its owned treatment capacity at the SVWRF plant.

E. Expansion of the SVWRF plant would be difficult due to environmental and cost constraints.

F. West Jordan City will not allow expansion of the SVWRF treatment plant.

G. A new treatment plant must be constructed for South Valley to meet the demands on service in its service area.

10. The County and DWQ subsequently developed a process to review South Valley's facility plan and request to amend the WQMP. The County review process included:

A. The County contracted with URS Corporation ("URS") for an independent review of the Bowen Collins & Associates treatment capacity study.

B. The Engineering Division reviewed the South Valley facility plan and the assumptions contained in the original WQMP.

C. The Engineering Division reviewed DWQ's evaluation of the potential impact on the Jordan River.

D. The Council held three separate public hearings pursuant to notice and received public comments on the proposed amendment, as follows:

1. October 17, 2005

   Council Chambers
   Salt Lake County Government Center
   2001 South State Street
   Salt Lake City, Utah

2. November 3, 2005

   Riverton City Hall Auditorium
   12830 South 1700 West
   Riverton, Utah

3. November 14, 2005.

   Council Chambers
   Salt Lake County Government Center
   2001 South State Street
   Salt Lake City, Utah

Representatives from the County's Flood Control & Engineering Division, Bowen Collins & Associates (South Valley's consultant), and URS presented their technical findings at these meetings. The public was given opportunities to ask questions and submit comments.

11. Based on the review of the WQMP, the proposed amendment, and after notice and hearings, the Council made the following determinations:

A. The independent review of the Bowen Collins & Associates study by URS confirmed that the maximum treatment capacity at the SVWRF treatment plant is 80 million gallons per day ("MGD"). Based on conservative population and flow projections, the volume of sewage generated from the ultimate build out of the SVWRF service area is 110 MGD.

B. The SVWRF plant cannot be expanded to meet the ultimate build-out demands within its service area due to extreme cost.

C. A new plant will be required to meet the ultimate build-out treatment demands in the SVWRF service area.

12. On December 13, 2005, the Council approved South Valley's request to amend the WQMP to allow for an additional discharge to the Jordan River for the upper Jordan planning area, subject to the following seven (7) conditions:

A. The plant should be as environmentally friendly and sensitive as possible, such as providing treated water for wetlands enhancement. Any wetland mitigation should be done at two for one minimum.

B. All open space and buffer property around the proposed treatment plant site should be protected by an "Ecosystem Stewardship Easement" granted to the County, rather than a typical conservation easement granted to a special interest group.

C. Access roads are restricted to Bangerter Highway. No access will be provided to the treatment plant from Lovers Lane, except for emergency access. This restriction is applied only to access for the new treatment plant.

D. The proposed south access road to Bangerter Highway should be moved to the west to avoid wetland, flood plain and other environmental issues.

E. The new treatment plant is required to develop a "Property Management Plan" for the site and provide an annual budget to implement and maintain this plan.

F. South Valley must forward a final site plan to the Salt Lake County Flood Control Engineering Division for meander corridor and flood control approvals.

G. The South Valley plant is capped at the 30 MGD capacity. Any additional expansion beyond the 30 million gallons will require an additional amendment to the 208 Water Quality Plan.

13. The Council's approval of the request to amend the WQMP and conditions were confirmed in a letter addressed to the DWQ dated December 13, 2005. A copy of the letter is attached as Exhibit "A".

14. In order to resolve issues associated with a conditional use permit necessary to construct the treatment plant, South Valley has agreed to use a Membrane Bio-Reactor process at the Riverton site instead of a Staged Aeration system. The membrane process will result in enhanced water quality and a smaller footprint of disturbance.

15. On February 13, 2007, South Valley appeared before the Council and requested a modification of two of the conditions previously imposed on the WQMP amendment, as follows:

A. Condition No. C be amended to read in its entirety as follows: No access will be provided to the treatment plant from Lovers Lane, except emergency access.

B. Condition No. D be amended to read in its entirety as follows: The south access road will be designed to minimize impacts to wetlands and the flood plain.

16. South Valley's request for modification and amendments A and B was considered by the Council and unanimously approved on February 20, 2007.

DETERMINATION

The County's review of the WQMP, following public notice and comment, has determined that the original assumptions in the WQMP for population growth, rate of growth and resultant wastewater flows have been exceeded. The independent review of the Bowen Collins & Associates report by URS confirms that the maximum treatment capacity of the SVWRF plant is less than the projected build-out demand in its service area. The SVWRF plant cannot be expanded to meet the increased demand.

APPROVAL

Based on the foregoing, the Council recommends that South Valley's request to amend the WQMP as approved on December 13, 2005, and modified on February 20, 2007, be and is hereby ratified and adopted by the County.

REQUEST FOR CERTIFICATION

Based on the foregoing, the Council respectfully requests that the Governor certify the amendment of the WQMP. After the amendment has been certified by the Governor, it will be submitted by the DWQ to Region VIII of the Environmental Protection Agency for approval.

DATED this _____ day of March, 2007.

SALT LAKE COUNTY COUNCIL:

By ______________________________
Mark A. Crockett, Chair

C27.wpd

APPROVED AS TO FORM
Salt Lake County District Attorney's Office
By ______________________
Deputy District Attorney
Date March 2, 2007

APPENDIX C

STAKEHOLDER WORKSHOP NOS. 1 AND 2

ATTENDANCE LISTS

Attendance Sheet
Salt Lake County
Water Quality Stewardship Plan
Wastewater Planning Element--Workshop #1
November 29, 2006

Name	Organization	Email Address	Phone Number	Comments
Blain Dietrich	Bluffdale City	bdietrich@bluffdale.com		
Larry Bowen	Bowen Collins	lbowen@bowencollins.com		
Brandon Heidelberger	Brown and Caldwell	bheidelberger@brwncald.com		
Phil Heck	Brown and Caldwell	pheck@brwncald.com		
Jim Olson	Brown and Caldwell	jolson@brwncald.com		
Thomas Holstrom	Central Valley Water Rec.	holstromt@cvwrf.org		
Reed N. Fisher	Central Valley Water Rec.	fisherr@cvwrf.org		
Corby Talbot	City of South Salt Lake	ctalbot@southsaltlakecity.com		
Jim Faulkner	Cottonwood Imp. Dist.	faulkner@cidstate.ut.us		
Paul Krauth	DWQ	pkrauth@utah.gov		
Ed Macauley	DWQ	emacauley@utah.gov		
Jim Harris	DWQ	jamesharris@utah.gov		
Adam Ginsberg	Gilson	aginsberg@gilsonengineering.com		
David McLean	Jordan Valley Water	dmclean@jvwcd.org		
Carl Eriksson	Kearns Imp Dist.	ceriksson@kearnsid.org		
John Birkinshaw	Kennecott Land	john.birkinshaw@kennecott.com		
Jeff Lachowski	Kennecott Land	jeff.lachowski@kennecott.com		

Name	Organization	Email Address	Phone Number	Comments
Steve Williams	Magna Water	stevew@magnawater.com		
Ed Hansen	Magna Water	hansen@magnawater.com		
David Eckhoff	Review Committee	deckhoff@xmission.com		
Jon Adams	Salt Lake City	jon.adams@slcgov.com		
Nancy Groberg	Sandy Suburban	ngroberg@sandysid.com		
Jerry Knight	Sandy Suburban	jknight@sandysid.com		
Neil Stack	SL Co. Energy	nstack@slcd.org		
Linda Hamilton	SL County	lhamilton@slco.org		
Steve Burgon	SL County	sburgon@slco.org		
Natalie Rees	SL County	nrees@slco.org		
Steve Jensen	SL County	sfjensen@slco.org		
Terry Way	SL County	tway@slco.org		
Don Telford	SLC S.S.D. #1	don@slcssd1.org		
Nicholas von Stackelberg	Stantec	nvonstackelberg@stantec.com		
Hugh Hedges	SVWRF	hhedges@svwrf.com		
Laura McIndoe	Town of Alta	ljm@townofalta.com		
Roger Payne	West Jordan City	rogerp@wjordan.com		
Terry Holzworth	Review Committee	rholzworth@bigfoot.com		

Attendance Sheet
Salt Lake County
Water Quality Stewardship Plan
Wastewater Planning Element--Workshop #2
December 18, 2006

Name	Organization	Email Address	Phone Number	Comments
Blain Dietrich	Bluffdale City	bdietrich@bluffdale.com		
Larry Bowen	Bowen Collins	lbowen@bowencollins.com	(801) 652-2629	
Brandon Heidelberger	Brown and Caldwell	bheidelberger@brwncald.com		
Phil Heck	Brown and Caldwell	pheck@brwncald.com	(801) 316-9802	
Jim Olson	Brown and Caldwell	jolson@brwncald.com		
Thomas Holstrom	Central Valley Water Rec.	holstromt@cvwrf.org	(801) 973-9100	
Reed N. Fisher	Central Valley Water Rec.	fisherr@cvwrf.org	(801) 973-9100	
Corby Talbot	City of South Salt Lake	ctalbot@southsaltlakecity.com		
Jim Faulkner	Cottonwood Imp. Dist.	faulkner@cidstate.ut.us	(801) 943-7671	
Paul Krauth	DWQ	pkrauth@utah.gov	(801) 538-6018	
Ed Macauley	DWQ	emacauley@utah.gov	(801) 538-6940	
Jim Harris	DWQ	jamesharris@utah.gov	(801) 538-6825	
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David McLean	Jordan Valley Water	dmclean@jvwcd.org	(801) 565-4300	
Carl Eriksson	Kearns Imp Dist.	ceriksson@kearnsid.org	(801) 968-1011	
John Birkinshaw	Kennecott Land	john.birkinshaw@kennecott.com	(801) 743-4625	
Jeff Lachowski	Kennecott Land	jeff.lachowski@kennecott.com	(801) 743-4672	

Name	Organization	Email Address	Phone Number	Comments
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Ed Hansen	Magna Water	hansen@magnawater.com		
David Eckhoff	Review Committee	deckhoff@xmission.com	(801) 272-2702	
Jon Adams	Salt Lake City	jon.adams@slcgov.com	(801) 799-4000	
Nancy Groberg	Sandy Suburban	ngroberg@sandysid.com	(801) 561-7662	
Jerry Knight	Sandy Suburban	jknight@sandysid.com	(801) 561-7662	
Neil Stack	SL Co. Energy	nstack@slcd.org	(801) 468-2711	
Linda Hamilton	SL County	lhamilton@slco.org		
Steve Burgon	SL County	sburgon@slco.org		
Natalie Rees	SL County	nrees@slco.org	(801) 468-3656	
Steve Jensen	SL County	sfjensen@slco.org		
Terry Way	SL County	tway@slco.org	(801) 468-2711	
Don Telford	SLC S.S.D. #1	don@slcssd1.org		
Nicholas von Stackelberg	Stantec	nvonstackelberg@stantec.com		
Hugh Hedges	SVWRF	hhedges@svwrf.com	(801) 495-5441	
Laura McIndoe	Town of Alta	ljm@townofalta.com		
Roger Payne	West Jordan City	rogerp@wjordan.com		
Terry Holzworth	Review Committee	rholzworth@bigfoot.com	(801) 255-1913	
Scott Baird	SL County	sbaird@slco.org	(801) 468-2711	
Van King	Kennecott Land	van.king@kennecott.com	(80) 743-4331	
Tracy Cowdell	Sandy Suburban	tracy@aitsinc.com	(801) 566-7765	

Name	Organization	Email Address	Phone Number	Comments
Dru Whitlock	CH2M Hill	drurywhitlock@ch2m.com	(801) 350-5200	
Cal Schneller	SL County	ckschneller@slco.org	(801) 468-2714	
Tom Roach	SL County	troach@slco.org	(801) 468-2074	
Chris Cleveland	Brown and Caldwell	ccleveland@brwncald.com	(360) 945-7525	
Dennis Pay	City of South Salt Lake	dpay@southsaltlakecity.com	(801) 483-6038	
Ann Ober	SL County	aober@slco.org	(801) 468-3018	
Dal Wayment	South Davis Sewer District	dalwayment@qwest.net	(801) 295-3469	

DRAFT TECHNICAL MEMORANDUM NO. 3

SALT LAKE COUNTY

WATER QUALITY STEWARDSHIP PLAN

WASTEWATER ELEMENT

FOR

SALT LAKE COUNTY

JULY 2007

BROWN AND CALDWELL

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LIST OF FIGURES

1.0 INTRODUCTION

There are several activities occurring in Salt Lake County related to wastewater management that require the original (October 1978) Area-wide Water Quality Management Plan to be revisited. The geographic scope of development requires a comprehensive planning process to assure that best solutions to wastewater treatment and water quality are achieved. Brown and Caldwell has been contracted by Stantec Consulting to evaluate the planning components necessary to revisit the wastewater element of the Area-wide Water Quality Management Plan. The information gathered in this initial phase of the process will be used to help develop future wastewater management alternatives. The geographic proximity of each collection/treatment provider along with trends in wastewater treatment technology will, in large measure, dictate the formulation of feasible wastewater management alternatives.

At this time, Salt Lake County, the State designated Area-wide Water Quality Management Planning Agency, has limited knowledge of existing sewer agency master planning information, plans for expansion and impediments to accepting new wastewater flows. The siting of a wastewater treatment facility in Riverton is but one example of the urgent need to understand the issues surrounding wastewater management in Salt Lake County.

Questions posed concerning capacity, costs, treatment technologies, reuse, biosolids management, and the future plans of the wastewater agencies is the basis for undertaking this planning effort which will allow Salt Lake County, and affected stakeholders, to make knowledgeable planning decisions that are critical to protecting water quality and public health and will allow the highest and best use of the wastewater resource.

This draft technical memorandum is the third and final technical memorandum developed during Phase 1 and Phase 2 planning activities to present initial findings of the WaQSP – Wastewater Element. This technical memorandum includes a summary of preliminary wastewater flow projections for Salt Lake County and an update of the proposed permitting and planning process. At the conclusion of the project, a final chapter in the WaQSP will be developed summarizing the results of all three technical memorandums and any comments received.

This technical memorandum is divided into sections that discuss the following:

Section 1.0 *Introduction* — This section provides relevant background of the project and an overview of Brown and Caldwell's approach.

Section 2.0 *Wastewater Flow Projections* — This section provides a summary of wastewater flow and loading projections to 2030. Projections are based on Traffic Analysis Zone (TAZ) and Wasatch Front Regional Council (WFRC) population and employment projections. In addition, this section includes a summary of flow and routing alternatives in comparing current and ultimate planned Water Reclamation Facility (WRF) capacity to flow projections.

Section 3.0 *Updated Permitting Process and Planning Framework* — This section presents an update of the current planning and permitting process as developed during Phase II technical workshops with SL County and stakeholder groups.

1.1 PROJECT BACKGROUND

In 1978, Salt Lake County completed its Area-wide Water Quality Management Plan in accordance with section 208 of the Clean Water Act. This plan has served as a guiding document for nearly 28 years. The Plan was published in 1978, updated in 1982 and recommended for amendment in 2007. In August of 2005, a request was made to amend the Area-wide Water Quality Management Plan for a new wastewater treatment facility in Riverton. In the process of re-visiting the 1978 plan, it became apparent that numerous factors such as land-use, population projections, jurisdictional boundaries, water quality requirements/impairments, water supply/use, and wastewater treatment processes have changed significantly since 1978. In addition, planned developments along the West Bench of the Salt Lake valley will generate a significant quantity of wastewater flow, as these currently unserviced areas are developed and will require wastewater conveyance and treatment services. As a result, the Salt Lake County Council allocated monies into the 2006 budget to initiate the development of a Water Quality Stewardship Plan (WaQSP), which will update the existing Area-wide Water Quality Management Plan. This WaQSP will update the essential elements found in the original Area-wide Water Quality Management Plan.

1.2 PROJECT APPROACH

The following task descriptions outline the consultant services completed during Phase 2 of the wastewater element of the WaQSP. Phase 2 of the project commenced in January 2007 and includes those tasks necessary to evaluate wastewater flow projections with regards to current and planned ultimate treatment capacity at each of the existing five Publicly Owned Treatment Works (POTW) servicing Salt Lake County. Both Phase I and Phase II tasks are being coordinated with the other elements of the WaQSP.

The following consultant services are summarized in this technical memorandum:

Task 1. Phase 2 Initiation Meeting

The first task of Phase 2 was a project initiation meeting that was attended by County personnel, Stantec and Brown and Caldwell project team members to discuss the Scope of Work and project schedule.

Task 2. Review County Wastewater Planning Authority

Assist Stantec and County with review of Salt Lake County's statutory authority as the designated regional wastewater planning agency under the Clean Water Act. Activities included interviews with regulators, interpretation of statutory documents and development of coherent policy statements that reflect the future direction of WaQSP and ongoing regional planning process.

Task 3. Information Development and Projections

3.1 Data Collection. Compile and summarize the available information comprising the current wastewater collection and treatment setting in Salt Lake County. Information included population data, population projections, development and implementation schedules, and land use projections for proposed developments from WFRC and other readily available sources.

3.2 Projection of Future Wastewater Flows. Future wastewater flows were projected from the available information supplied by Salt Lake County and wastewater agencies. State of Utah design requirements for wastewater collection, treatment and disposal systems and information and guidelines from wastewater reference literature were used as guidance. The projected flows and loadings will be used to generally establish the geographic proximity of future growth relative to existing and previously planned treatment facilities.

3.3 Identify Capacity Shortfalls. The capacity of existing facilities was compared to projected wastewater flows to identify capacity shortfalls as determined from the information and projections determined in Task 3.1 and 3.2.

3.4 Compare Current Wastewater Collection, Treatment and Reuse Setting to the Original Area-wide Water Quality Management Plan. Compare the current wastewater management setting in Salt Lake County to that envisioned in the original Area-wide Water Quality Management Plan. As a supplement to information presented in the Phase 1 technical memo, a direct comparison was made to the major criteria for facilities envisioned in the recommendations of the original Area-wide Water Quality Management Plan. The recently proposed SVSD treatment facility and potential reuse initiatives including decentralized "scalping" facilities were presented.

Task 4. Stakeholder Involvement

4.1 POTW Group Workshops. Two workshops were held with the POTW Advisory Group during Phase 2. The objective of these workshops was to define the regional planning process for new wastewater discharges including "scalping" facilities. The results of the first two POTW workshops were presented to the larger stakeholder group that participated in Phase 1 workshops.

4.2 Full Stakeholder Group Workshop. One workshop was held during Phase 2 with the full Phase 1 stakeholder group. The focus of the workshop was to develop the framework for a county wide wastewater planning process as established from workshops with the POTW work group.

Task 5. Reports and Meetings

5.1 Meetings. Consultant participated in up to three progress meetings with County and Stantec personnel during performance of Phase 2 activities. Consultant conducted follow-up discussions with Stakeholders, the County, and Stantec to clarify consultant questions.

5.2 Prepare Draft Report. Consultant prepared a draft technical memorandum to summarize and present the results and recommendations of Phase 2 activities.

5.3 Prepare Final Report. Consultant incorporated County and Stantec comments on the draft technical memorandum into a final document. All three Technical Memorandum were incorporated into a final chapter for the wastewater element of the WaQSP.

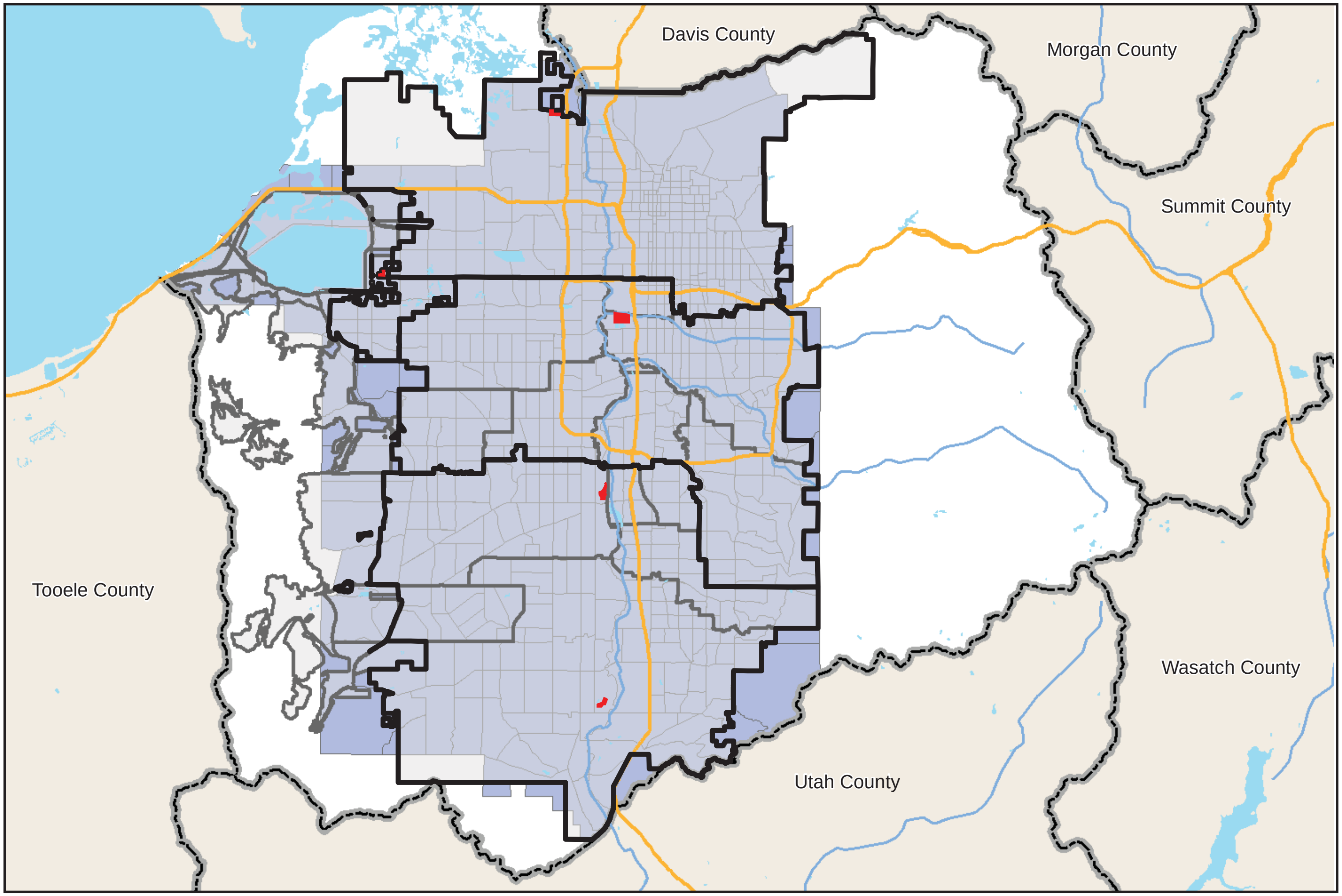
2.0 WASTEWATER FLOW PROJECTIONS

Wastewater flow projections were developed based on existing and projected population and employment information. Traffic Analysis Zone (TAZ) data was used to calculate the population and number of employees for Salt Lake County. TAZ data is generated by the Wasatch Front Regional Council (WFRC). TAZ data is developed in the transportation planning process and consists mainly of aggregations of census blocks and subsets of census tracts. Boundaries are based mainly on streets and natural features and do not necessary coincide with sewer district boundaries. TAZ boundaries are shown in Figure 1.

TAZ data consists of current and predicted future population and employment data. In Salt Lake County, the TAZ data is broken into 615 regions, each covering an average of 450 acres. The TAZ data used for this study has 2005 and predicted 2030 population and employment numbers (including unserviced west-side areas) for each TAZ region. 2050 population and/or build-out projections were not yet available at the time of this evaluation.

The 2005 and 2030 population and number of jobs were summed for all TAZ regions in the current and planned service areas for each existing POTW. Current sewer district boundaries and approximate POTW service areas are shown in Figure 2 and Figure 3 respectively.

Table 1 summarizes the population and employment projections for each WRF service area. Currently, the South Valley WRF service area includes only the first phase of Kennecott Land Development projects (Daybreak) along the west-side bench. The remaining land available along the west-side bench is not currently served by a WRF and is listed separately. The majority of the Kennecott Land Development projects will occur after the study period (2030) and are not included in this report.



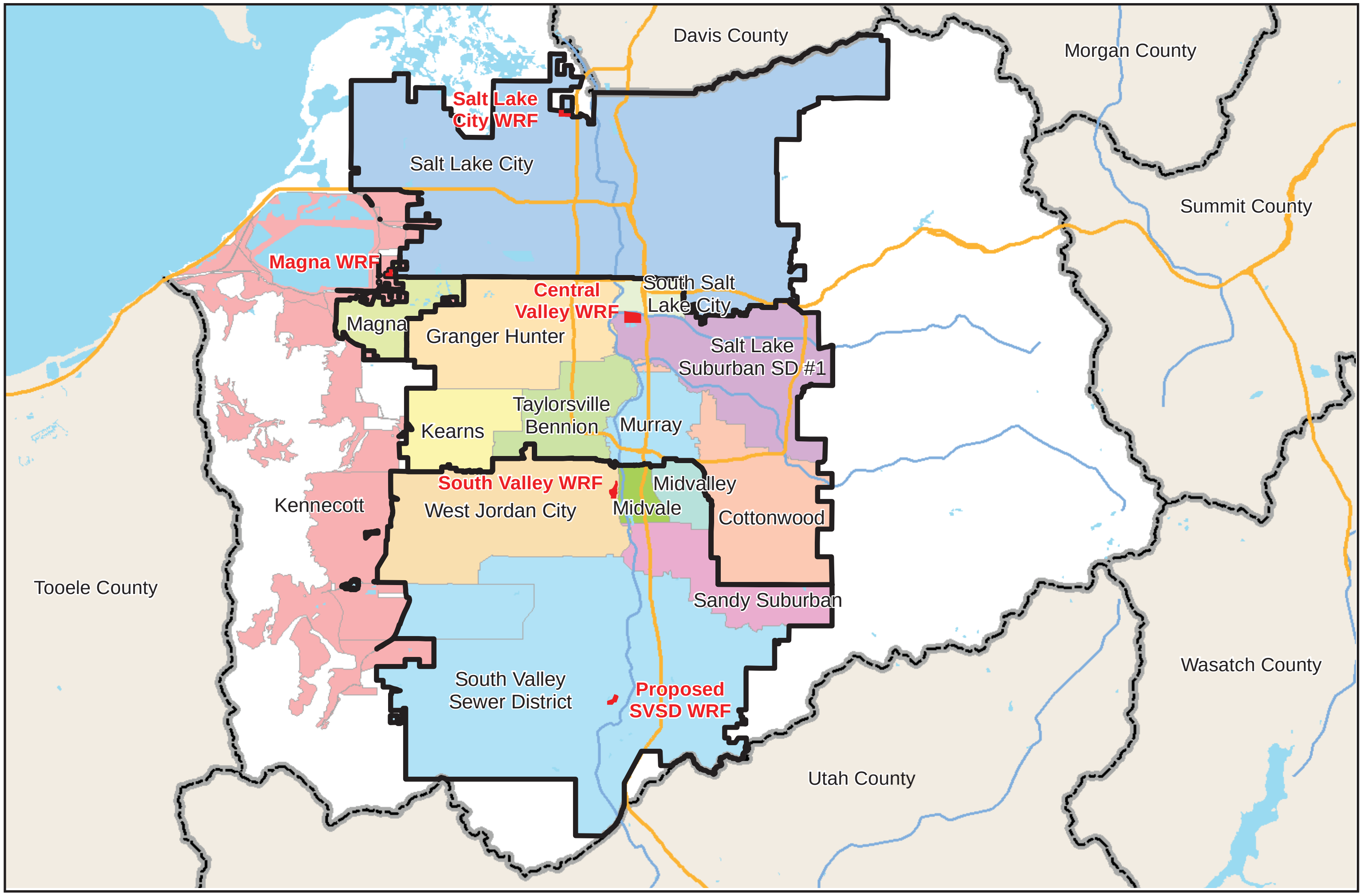
SALT LAKE COUNTY

BROWN AND CALDWELL

Water Quality Stewardship Plan
Wastewater Element

Wasatch Front Regional Council
TAZ Boundaries

Figure 1



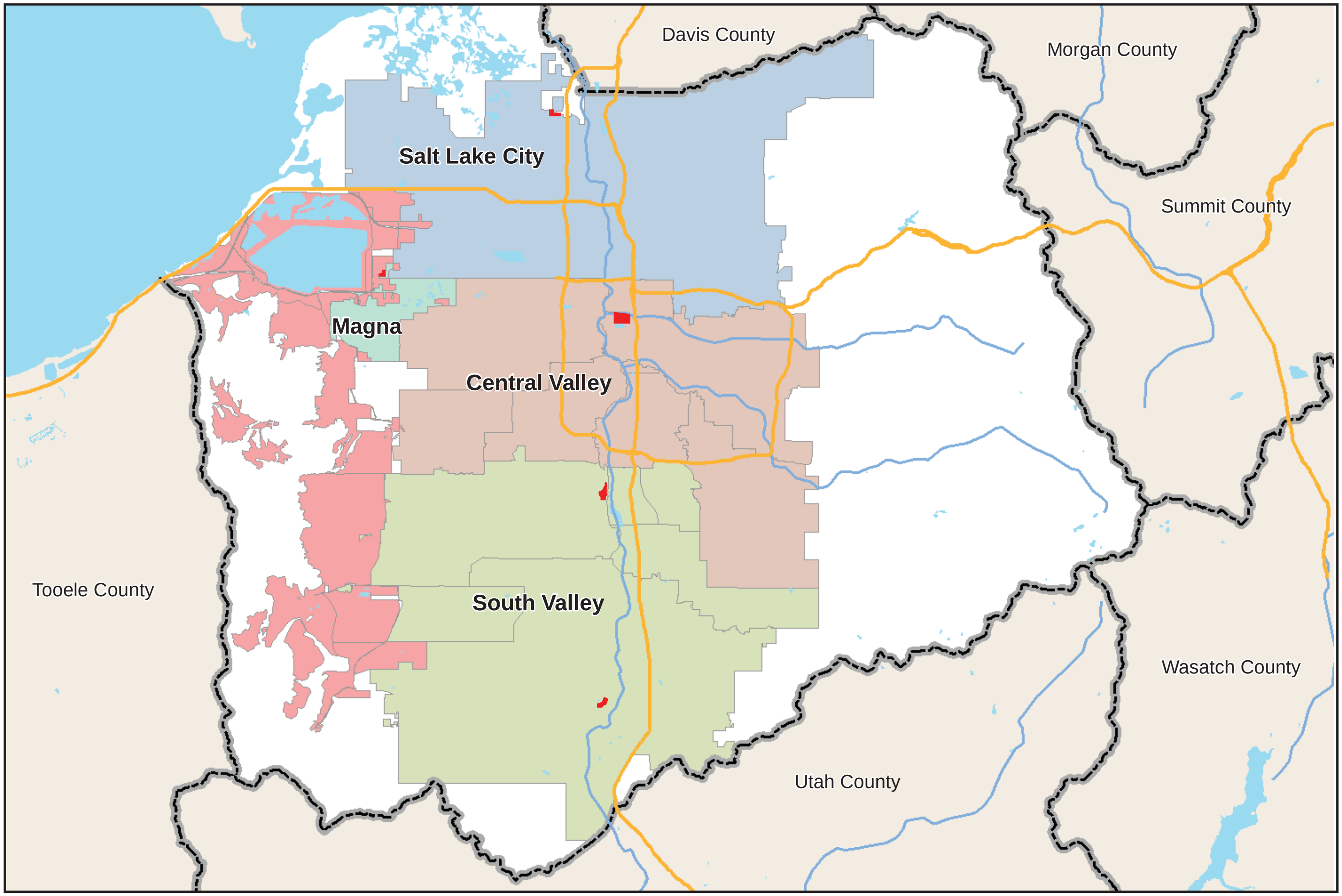
SALT LAKE COUNTY

BROWN AND CALDWELL

Water Quality Stewardship Plan
Wastewater Element

Approximate Sewer District Boundaries

Figure 2



SALT LAKE COUNTY

BROWN AND CALDWELL

Water Quality Stewardship Plan
Wastewater Element

POTW Service Areas

Figure 3

TABLE 1 - 2030 POPULATION PROJECTIONS

Item	Water Reclamation Facility				Unserviced West-side Areas	Total
	Central Valley	Magna	Salt Lake City	South Valley		
Total Area (acres)	74,262	5,291	62,595	99,560	31,830	273,538
2005 Population	470,811	23,610	183,301	286,513	5,004	969,239
2030 Population	591,940	38,218	200,972	549,255	96,465	1,476,850
2005 Employees	196,931	3,260	249,339	95,294	2,657	547,480
2030 Employees	267,590	9,786	282,819	175,049	28,845	764,089

Flows were calculated by multiplying the population and number of employees by flow per capita and employee per day respectively. The flow per capita or employee per day was determined by dividing the recorded 2005 flows (as reported to the State) at each WRF by the number of 2005 residents and employees in each service area. Table 2 presents the calculated residential and employee flow rates. Peak flow rates were calculated using average peaking factors (corresponding to average flow and population) listed in Metcalf and Eddy (Wastewater Engineering, Treatment, Disposal, and Reuse, Third Edition, Metcalf and Eddy, Figure 5-1). 2030 flows were calculated by multiplying project 2030 population and employment numbers by the flow per capita/employee per day.

TABLE 2 - 2030 FLOW PROJECTIONS

Item	Water Reclamation Facility				Total
	Central Valley	Magna	Salt Lake City	South Valley	
Average Plant Flow 2005 (MGD)	53.2	2.4	33.9	28.9	118
Residential Flow (gpcd)	105	100	145	100	--
Employee Flow (gpcd)	20	20	30	10	--
Average Daily Flow, ADF (MGD)	67.5	4.0	37.6	56.7	166
Peak Hour Factor	2.0	3.3	2.5	2.1	--
Peak Hour Flow, PHF (MGD)	135.6	13.1	94	116.2	359

Flows from the unserviced west-side area property owners total approximately 10 mgd average daily flow (ADF).

Load projections for biochemical oxygen demand (BOD) and total suspended solids (TSS) were calculated by multiplying average daily flows by concentrations of 260 mg/L BOD and 300 mg/L TSS respectively. BOD and TSS concentrations are based on design requirements listed in Utah Rule R317-3 Design Requirements for Wastewater Collection, Treatment and Disposal Systems (R317-3-4.3-C1a). 2030 load projections for BOD and TSS are presented in Table 3.

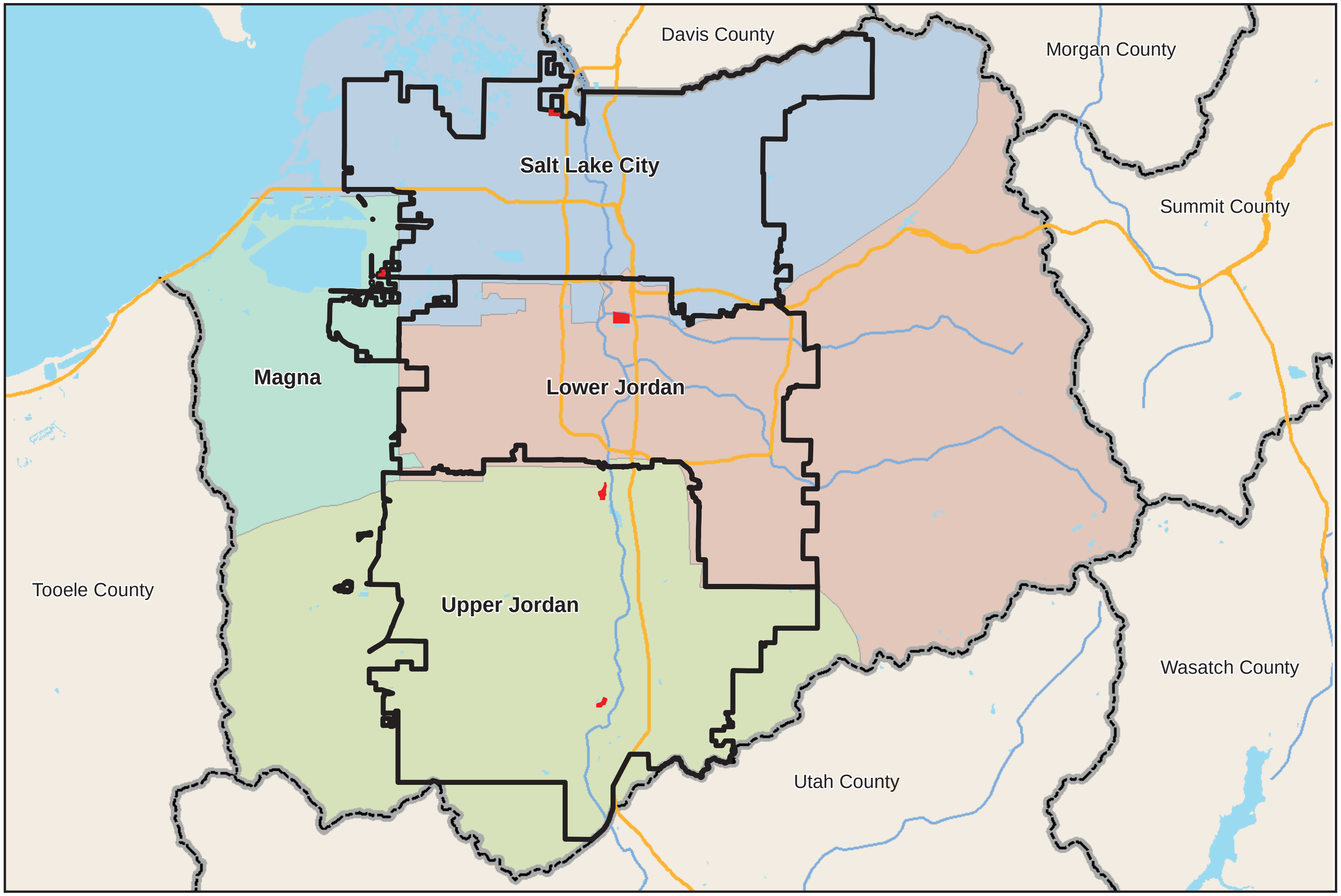
TABLE 3 - 2030 LOADING PROJECTIONS

Item	Water Reclamation Facility				Total
	Central Valley	Magna	Salt Lake City	South Valley (Including Daybreak)	
BOD (mg/L)	260	260	260	260	--
TSS (mg/L)	300	300	300	300	--
Average Daily BOD (ppd)	146,379	8,712	81,587	122,896	359,574
Average Daily TSS (ppd)	168,899	10,052	94,139	141,803	414,893

Loading from the unserviced west-side area property owners totals approximately 23,214 ppd BOD and 26,786 ppd TSS.

2.1 AREA-WIDE WATER QUALITY MANAGEMENT PLAN COMPARISON

As a supplement to projections developed in this analysis, recorded values for flows and loading (2005) are compared to original projections made in the 1978 Area-wide Water Quality Management Plan. Flow projections in the 1978 Area-wide Water Quality Management Plan were developed for the four planning areas consisting of Magna, Salt Lake City, Lower Jordan, and Upper Jordan. Boundaries for each planning area are shown in Figure 4.



SALT LAKE COUNTY

BROWN AND CALDWELL

Water Quality Stewardship Plan
Wastewater Element

Plan Background

Figure 4

Twenty year projections (1980 to 2000) excerpted from the 1978 Area-wide Water Quality Management Plan are presented in Table 4.

TABLE 4 – AREA-WIDE WATER QUALITY MANAGEMENT PLAN PROJECTED AVERAGE DAILY FLOWS

Planning Area	Flow	Year			
		1980	1990	2000	2005 (recorded)
Salt Lake City (SLCWRF)	Flow (mgd)	36.0	36.6	37.1	34
	BOD5 (lb/day)	37,000	37,800	39,500	73,853
Magna (Magna WRF)	Flow	1.2	1.5	1.7	2.4
	BOD5	1,700	2,200	2,500	5,261
Lower Jordan (CVWRF)	Flow	40.0	45.0	51.0	53.4
	BOD5	55,700	63,000	71,300	115,736
Upper Jordan (SVWRF)	Flow	16.0	24.0	32.0	29.5
	BOD5	23,500	35,300	47,000	63,947

The far right column lists 2005 recorded flows from each WRF. In comparison, flow projections made during the original Area-wide Water Quality Management Plan were relatively close to present values. Flows are slightly higher for the Magna WRF and CVWRF and slightly below the SVWRF and SLCWRF. Loading projections however, have increased substantially over original projections. Higher loading can likely be contributed in part to the reduction of infiltration and inflow (I/I), conservation efforts, and other wastewater flow reduction improvements such as low-flow toilets, showerheads, etc.

2.2 ALTERNATIVE ANALYSIS

Projected flows and loadings were used to establish the geographic proximity of future growth relative to existing and planned capacity of wastewater treatment facilities within Salt Lake County. In this analysis the capacity of existing treatment facilities are compared to projected wastewater flows to identify surplus capacity and potential shortfalls (expressed in ADF). At this time, the analysis does not consider flows or capacity required for build-out conditions (i.e. 2050 and beyond). 2050 data is not yet available from the WRFC.

Eight alternatives were developed based on potential flow and routing alternatives of west-side unserviced area property owners. Alternative 1 is the baseline condition and includes only those flows originating from existing WRF service areas. Alternative 2 through Alternative 6 compare projected flows (including west-side unserviced areas plus baseline conditions) to the original four WRF service areas planned in the 1978 Area-wide Water Quality Management Plan. Alternative 7 and Alternative 8 include the planned South Valley Sewer District (SVSD) WRF in Riverton. Flows between the SVWRF and SVSD WRF were split according to projections made in the August 2005 Bowen and Collins Wastewater Treatment Facility Draft Report and 208 Addendum (approximately 22.5 mgd ADF to SVSD WRF in 2030). Alternatives evaluated are as follows:

Alternative 1: Baseline (includes flows only within the existing WRF service area boundaries, i.e. no flows from west-side unserviced areas)

Alternative 2: All west-side unserviced flow to Central Valley (plus baseline conditions)

Alternative 3: 1/3 west-side unserviced flow to Magna and 2/3 west-side unserviced flow to Central Valley (plus baseline conditions)

Alternative 4: 1/3 west-side unserviced flow to Magna, Central Valley, and South Valley (plus baseline conditions)

Alternative 5: All west-side unserviced flow to Magna (plus baseline conditions)

Alternative 6: All west-side unserviced flow to South Valley (plus baseline conditions)

Alternative 7: Includes the proposed SVSD WRF and all west-side unserviced flow to South Valley (plus baseline conditions)

Alternative 8: Includes the proposed SVSD WRF, and all west-side unserviced flow to Central Valley (plus baseline conditions)

2.3 RESULTS AND CONCLUSIONS

Results of the alternative analysis, as presented in the POTW advisory group and stakeholder workshops, are included in Appendix B. The results of the alternative analysis support the following conclusions:

1. Treatment capacity exists or could be readily built at the five facilities identified in the area-wide water quality plan and amendment to meet 2030 flow projections.

2. Conveyance and flow allocation is the biggest challenge in utilizing capacity at the five WRFs.

3. The requirements (flow and treatment) for 2050 and beyond (area build-out) have not been analyzed and are unknown. Future flow and loading projections could necessitate the need for increased expansion at the WRFs or the construction of additional facilities.

4. Based on the current planned capacity at each facility, there is no incentive for area-wide wastewater planning and coordination to meet 2030 flow projections. However, based on stakeholder and regulating agency input, there is a need for area-wide planning and coordination to ensure certainty in the planning and permitting process.

5. Enhanced water quality and regulatory limits, biosolids management, emergency planning, etc. could affect the ultimate planned capacity of the WRFs.

3.0 UPDATED PLANNING AND PERMITTING PROCESS

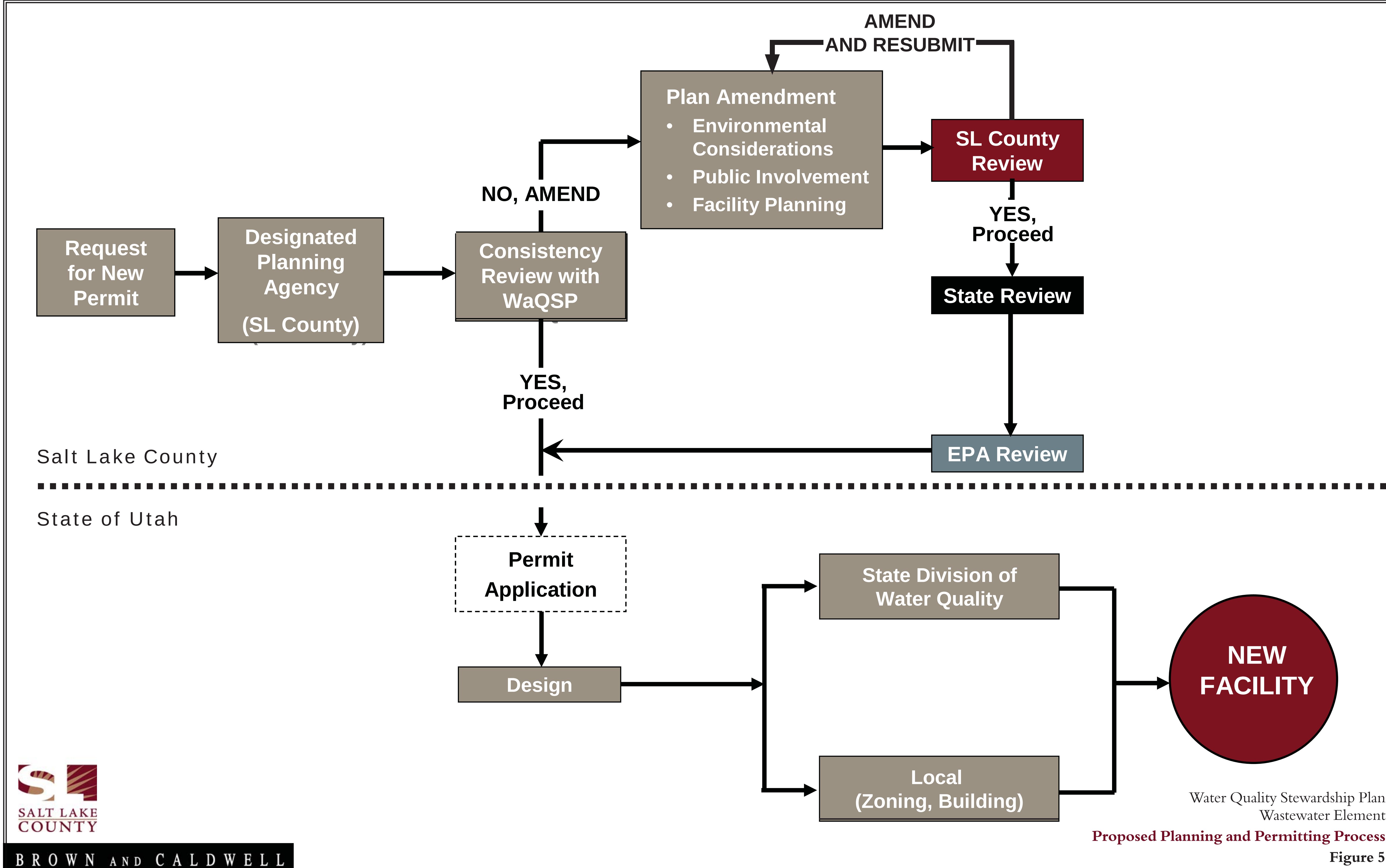
Technical Memorandum No.2 introduced the initial concepts presented to the POTW Advisory Group and larger stakeholder group meetings during Phase I activities. The purpose of this section is to update the approach to the planning and permitting process based on discussions held during the workshops. A series of workshops were held with the POTW Advisory Group to the Jordan River Watershed Council group during Phase 2 activities. The objective of these workshops were to evaluate and define the regional permitting and planning process for all new permits including wastewater discharges, "scalping" facilities, and industrial dischargers.

3.1 BACKGROUND PLANNING AND PERMITTING PROCESS

The overall objective of the permitting and planning process is to develop a regional programmatic approach with a goal of efficient allocation of existing capacity and resources. As discussed in Technical Memorandum No. 2, desired elements of the planning process include the following:

- A regional programmatic approach
- A transparent environmental and public process that:
    1) Identifies community values
    2) Includes stakeholder and public involvement
    3) Develops public and political support and buy-in
- Environmentally responsive facility planning with emphasis on sustainability
- Includes planning and permitting requirements for design and construction of all future wastewater treatment works

Based on input received from stakeholders and as discussed in the workshops, the preliminary process for the new planning and permitting process is presented in Figure 5.



Water Quality Stewardship Plan
Wastewater Element
Proposed Planning and Permitting Process
Figure 5

3.2 RESULTS AND CONCLUSIONS

Results of the stakeholder workshops support the following conclusions and recommended "next steps" for future planning of the wastewater element of the WaQSP:

1. Formalize the planning and permitting process
2. Evaluation of service area build-out conditions to 2050 and beyond
3. Integration of the environmental and public process in the planning and permitting of future discharge facilities
4. Evaluation of County-wide sewer capacity and flow routing alternatives
5. Evaluation of an ongoing County-wide wastewater planning process

APPENDIX A

TAZ DATA

(AVAILABLE ELECTRONICALLY UPON REQUEST)

APPENDIX B

ALTERNATIVE ANALYSIS RESULTS

Alt 1
Baseline
(Current WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

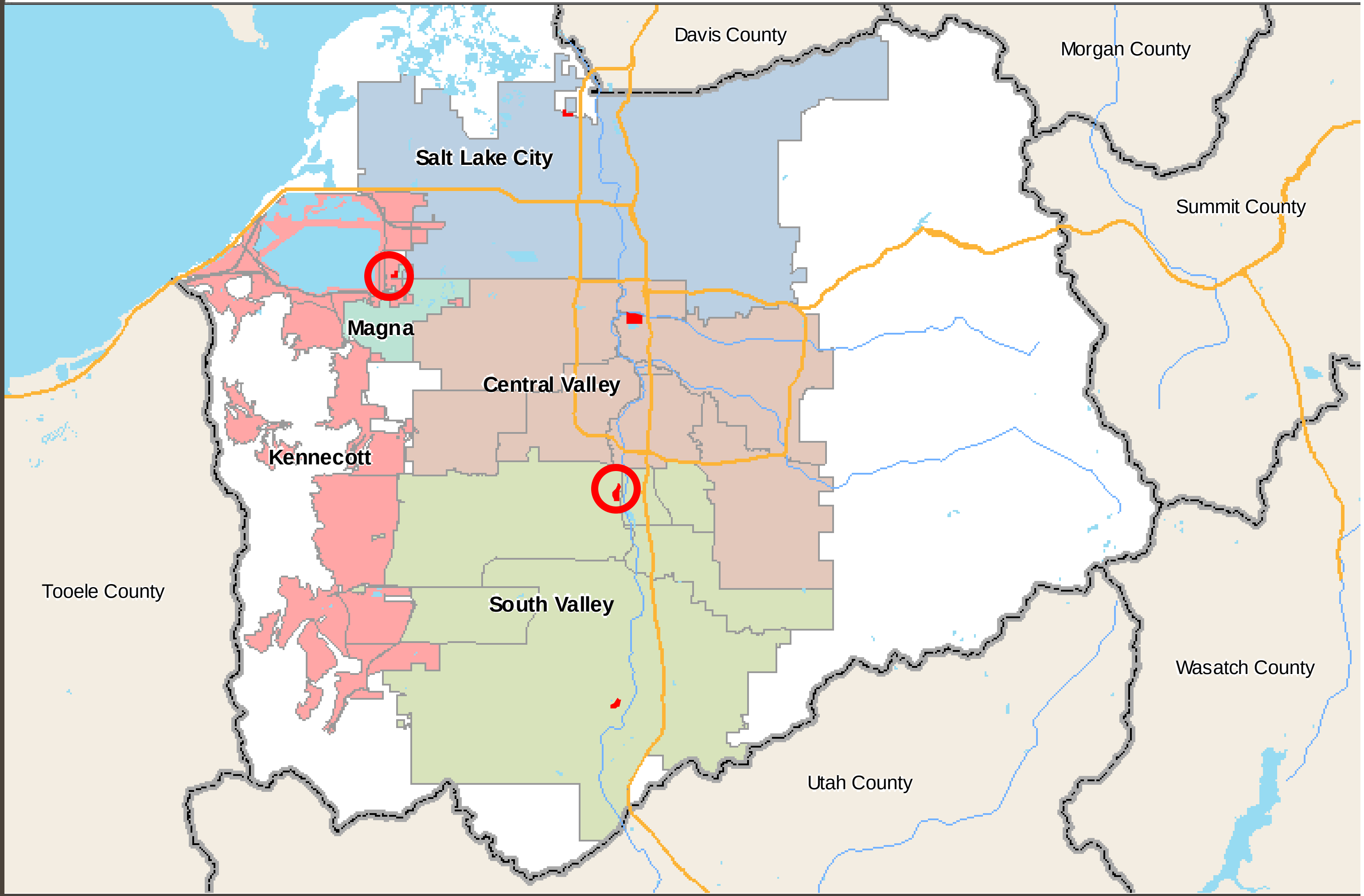
May 4, 2007

Alt 1 – 2030

	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	4	3.3
CVWRF	68	75
SVWRF	57	50

Alt 1 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 0.7
CVWRF	7.5
SVWRF	- 6.7



Alt 1
Baseline
(Ultimate WRF Capacity)

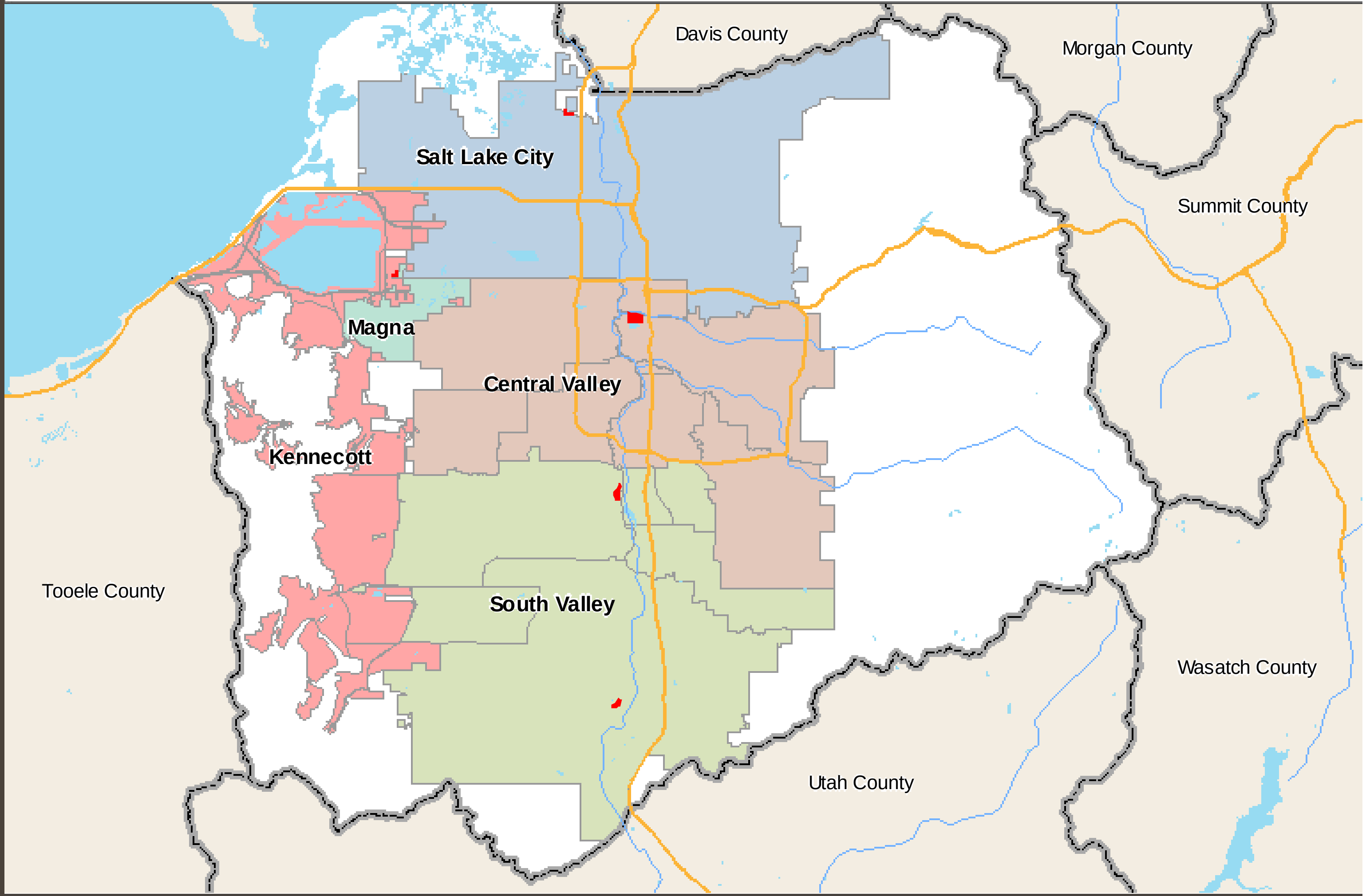
SALT LAKE COUNTY

BROWN AND CALDWELL

May 4, 2007

Alt 1 – 2030	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	4	6
CVWRF	68	100
SVWRF	57	80

Alt 1 – Surplus Capacity	ADF (mgd)
SLCWRF	18.4
Magna WRF	2.0
CVWRF	32.5
SVWRF	23.3



Alt 2
All West-side Bench Flows to Central Valley (Current WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

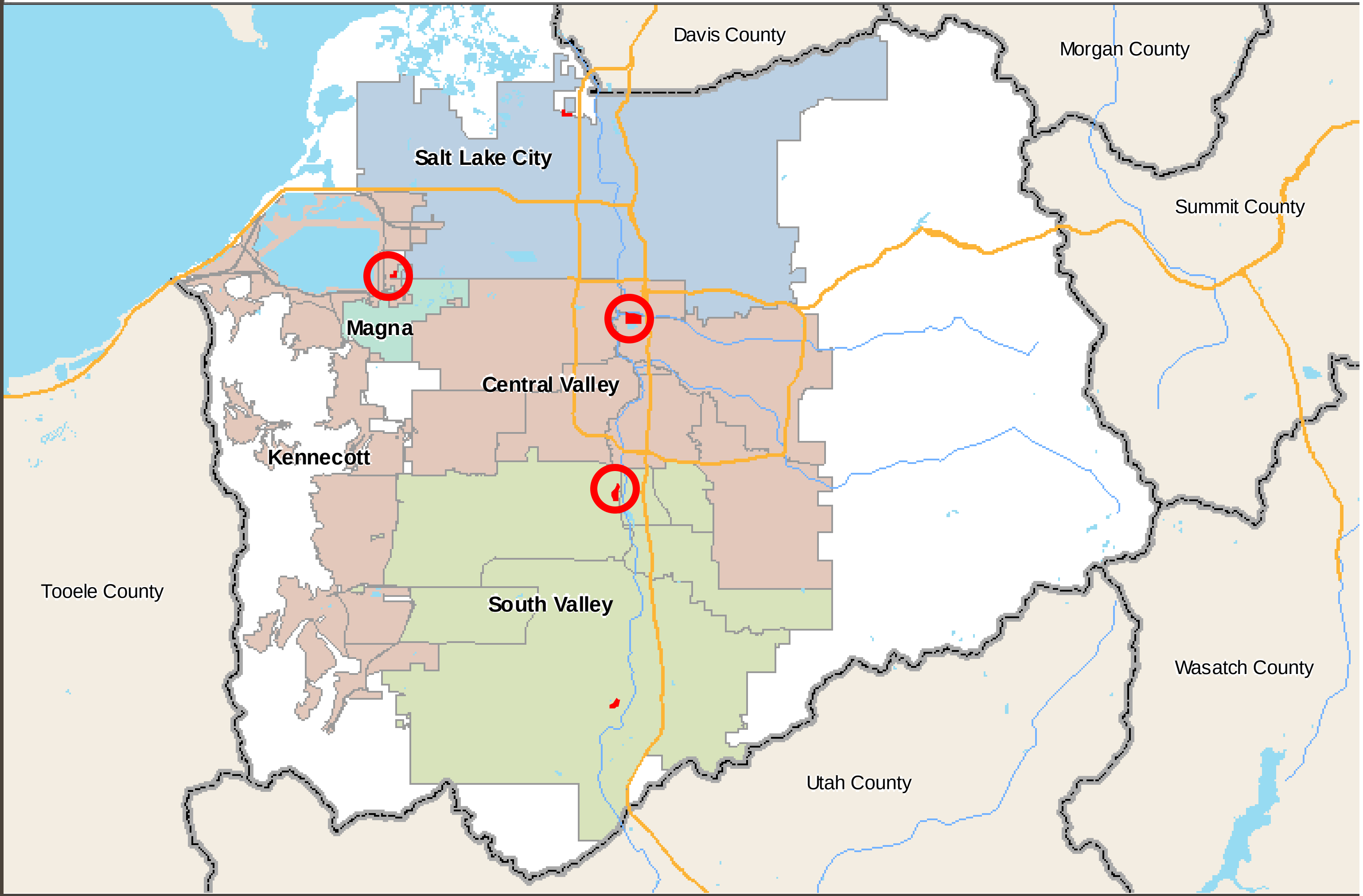
May 4, 2007

Alt 2 – 2030

	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	4	3.3
CVWRF	78	75
SVWRF	57	50

Alt 2 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 0.7
CVWRF	- 3.2
SVWRF	- 6.7



Alt 2
All West-side Bench Flow to Central Valley
(Ultimate WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

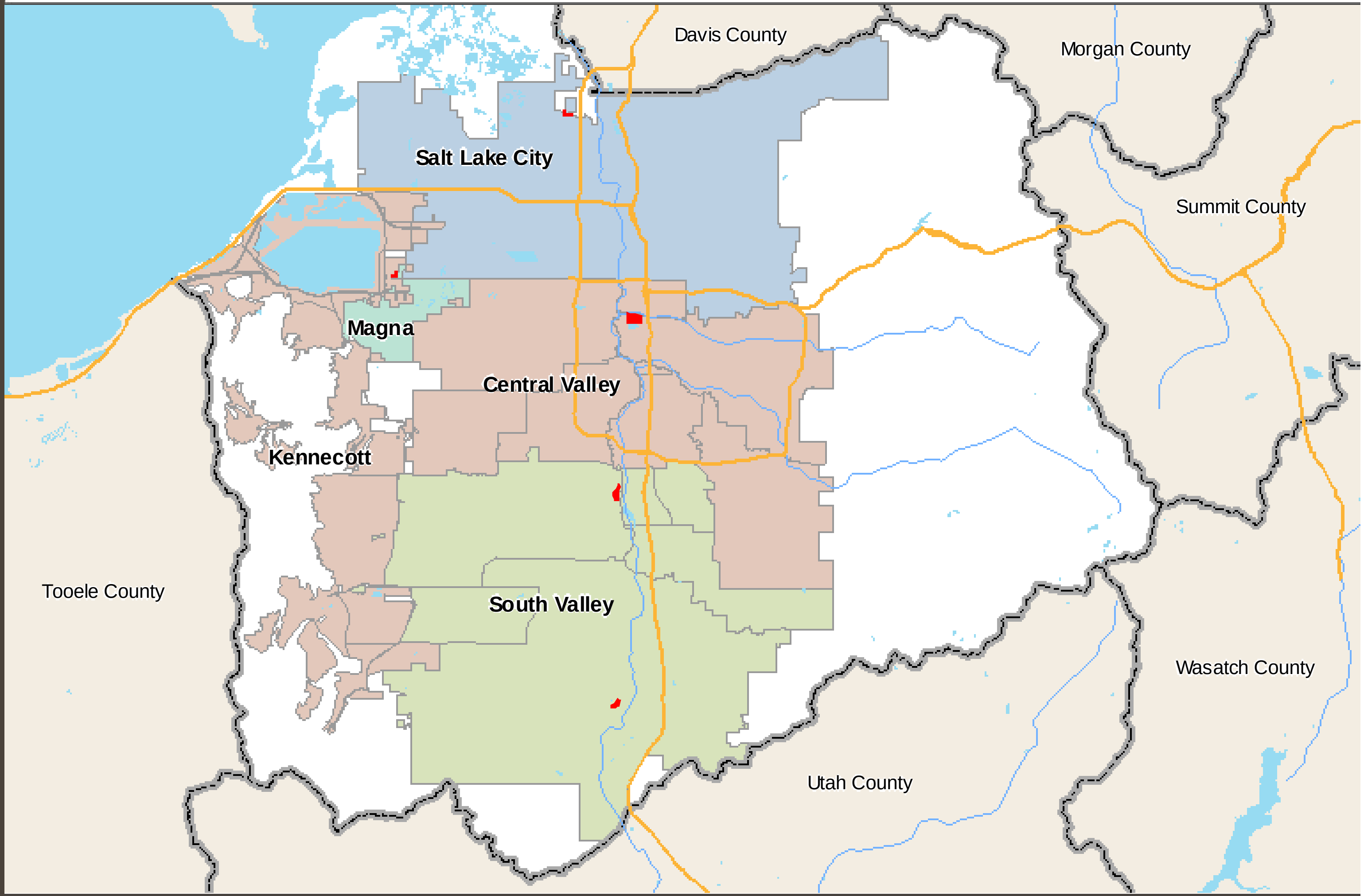
May 4, 2007

Alt 2 – 2030

	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	4	6
CVWRF	78	100
SVWRF	57	80

Alt 2 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	2.0
CVWRF	21.8
SVWRF	23.3



Alt 3
1/3 West-side Bench to Magna, Rest to Central Valley (Current WRF Capacity)

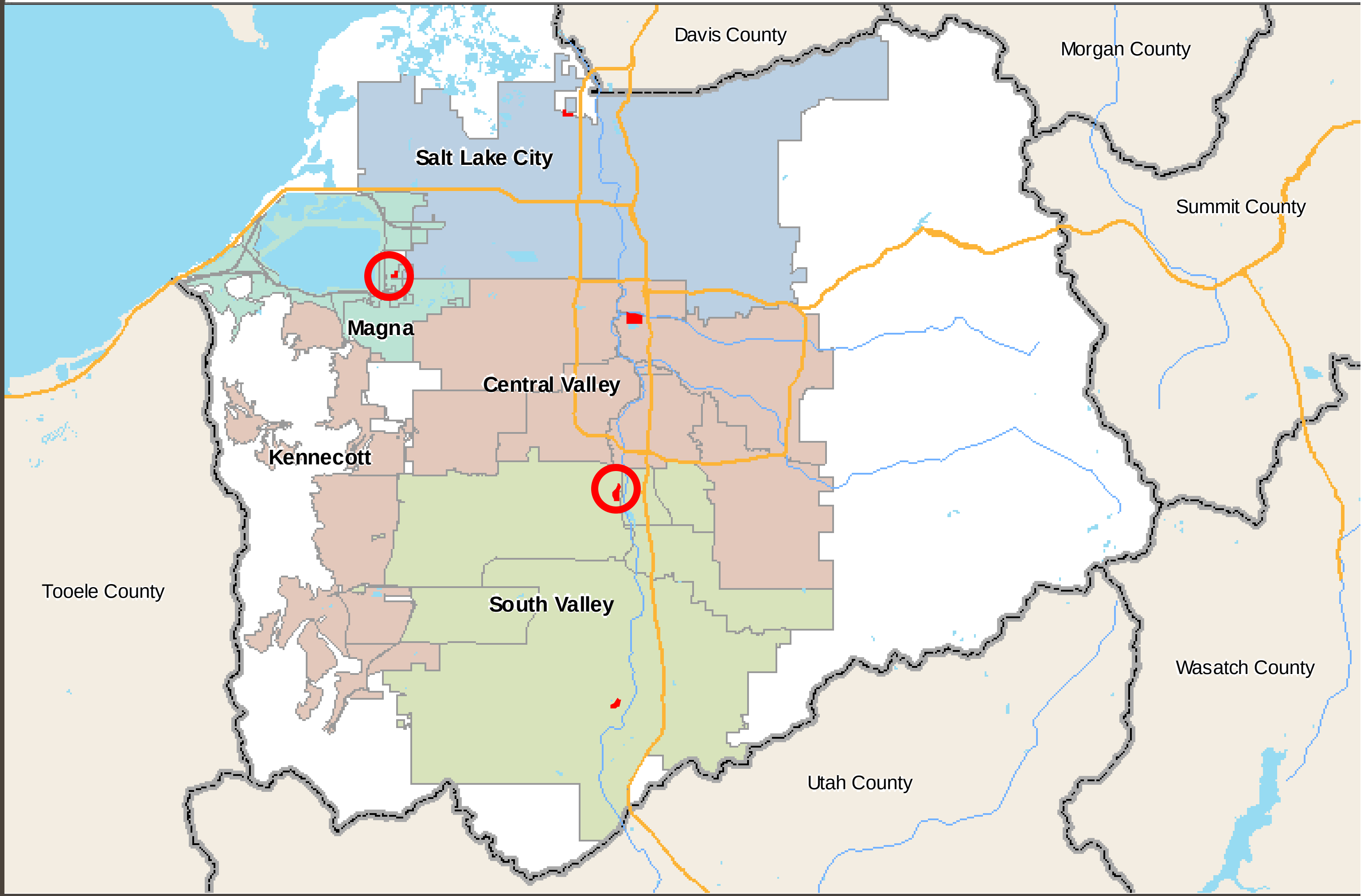
SALT LAKE COUNTY

BROWN AND CALDWELL

May 4, 2007

Alt 3 – 2030	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	12	3.3
CVWRF	70	75
SVWRF	57	50

Alt 3 – Surplus Capacity	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 8.4
CVWRF	4.9
SVWRF	- 6.7



Alt 3
1/3 West-side Bench to Magna, Rest to Central Valley
(Ultimate WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

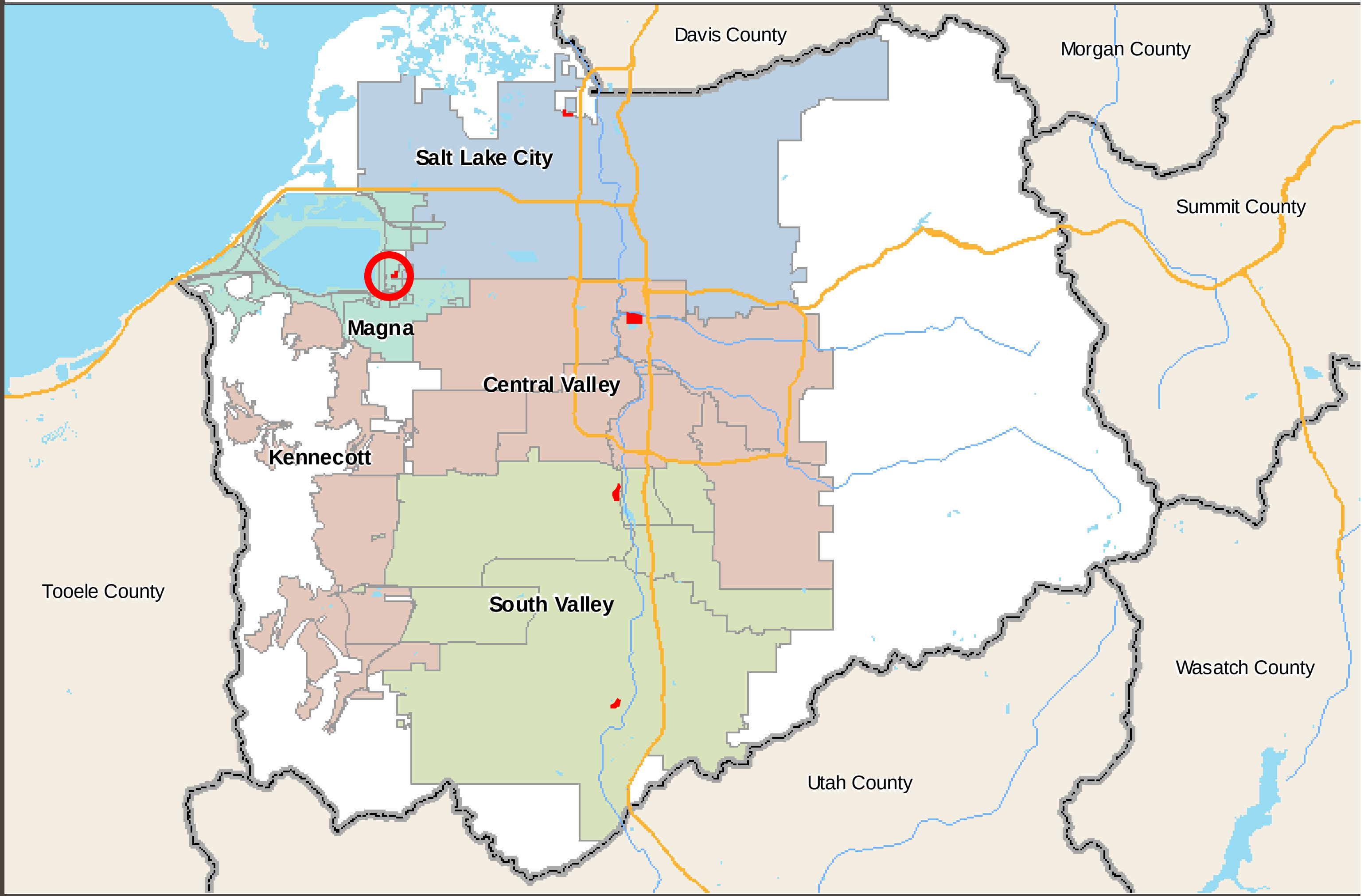
May 4, 2007

Alt 3 – 2030

	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	12	6
CVWRF	70	100
SVWRF	57	80

Alt 3 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 5.7
CVWRF	29.9
SVWRF	23.3



SALT LAKE COUNTY

Alt 4
1/3 West-side Bench Flow Magna, Central Valley, South Valley (Current WRF Capacity)

BROWN AND CALDWELL

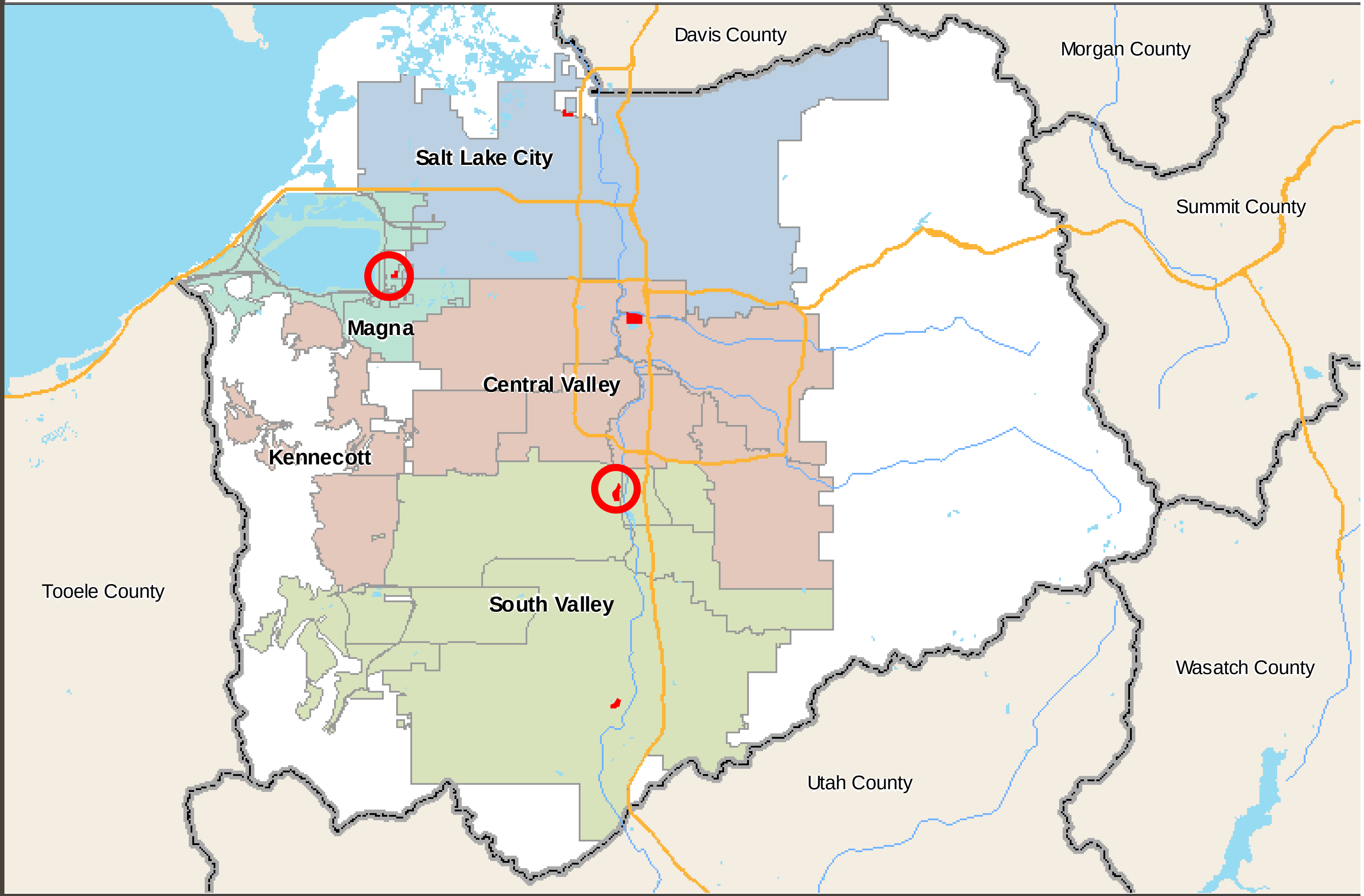
May 4, 2007

Alt 4 – 2030

	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	12	3.3
CVWRF	69	75
SVWRF	57	50

Alt 4 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 8.4
CVWRF	5.7
SVWRF	- 7.4



Alt 4
1/3 West-side Bench Flow Magna, Central Valley, South Valley (Ultimate WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

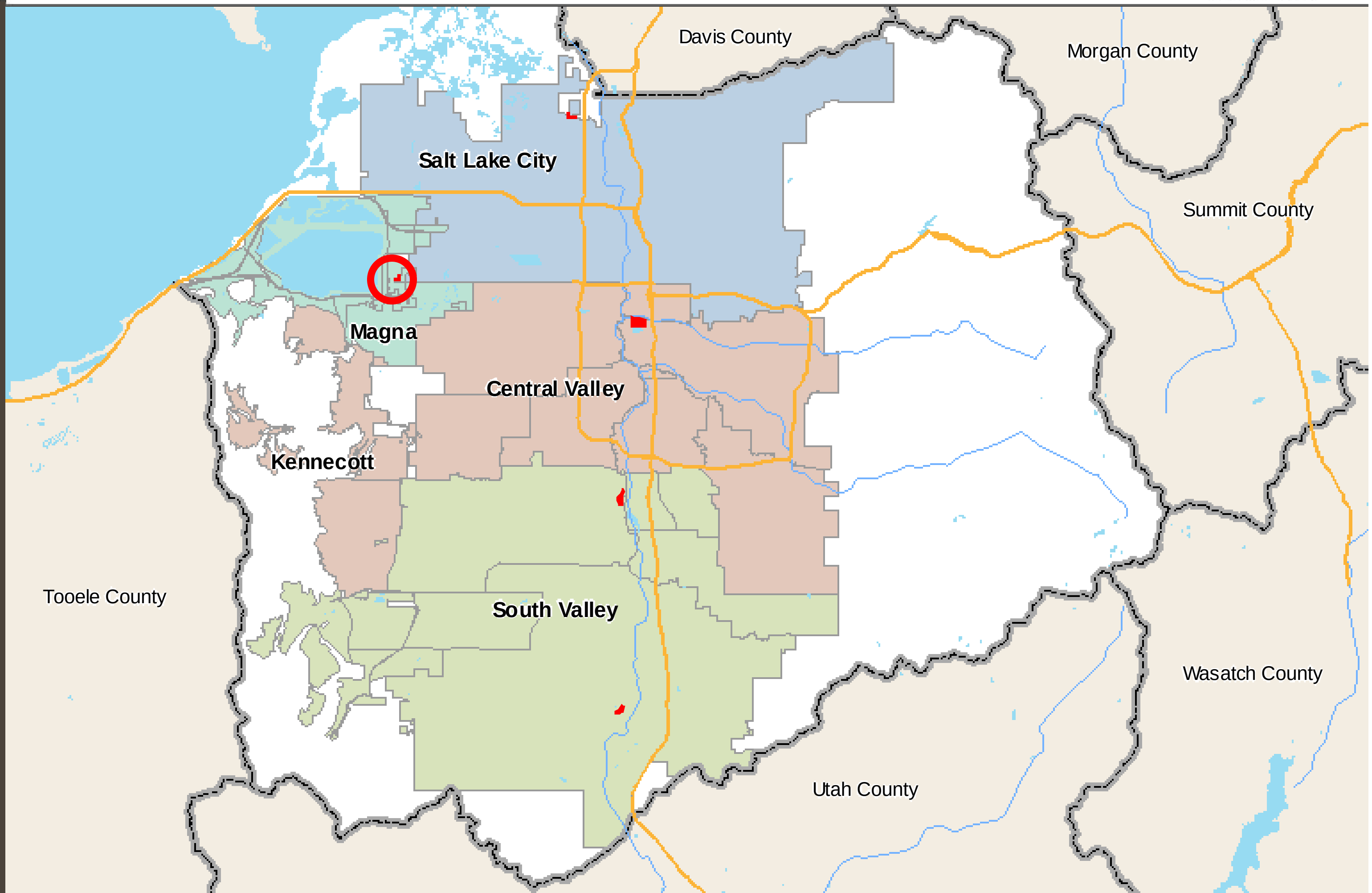
May 4, 2007

Alt 4 – 2030

	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	12	6
CVWRF	69	100
SVWRF	57	80

Alt 4 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 5.7
CVWRF	30.7
SVWRF	22.6



SALT LAKE COUNTY

BROWN AND CALDWELL

Alt 5
All West-side Bench Flow to Magna
(Current WRF Capacity)

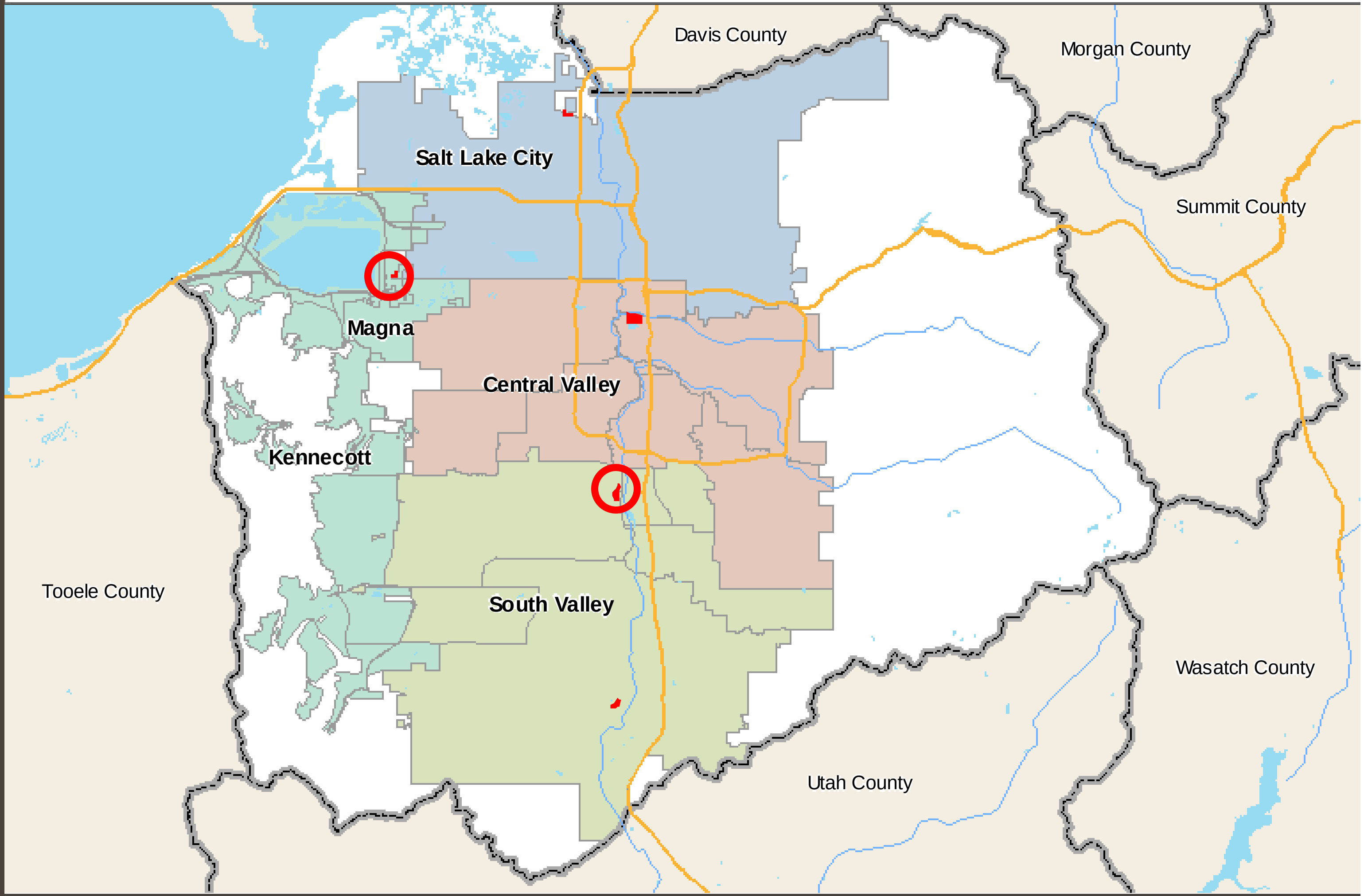
May 4, 2007

Alt 5 – 2030

	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	14	3.3
CVWRF	68	75
SVWRF	57	50

Alt 5 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 10.9
CVWRF	7.5
SVWRF	- 6.7



SALT LAKE COUNTY

BROWN AND CALDWELL

Alt 5
All West-side Bench Flow to Magna
(Ultimate WRF Capacity)

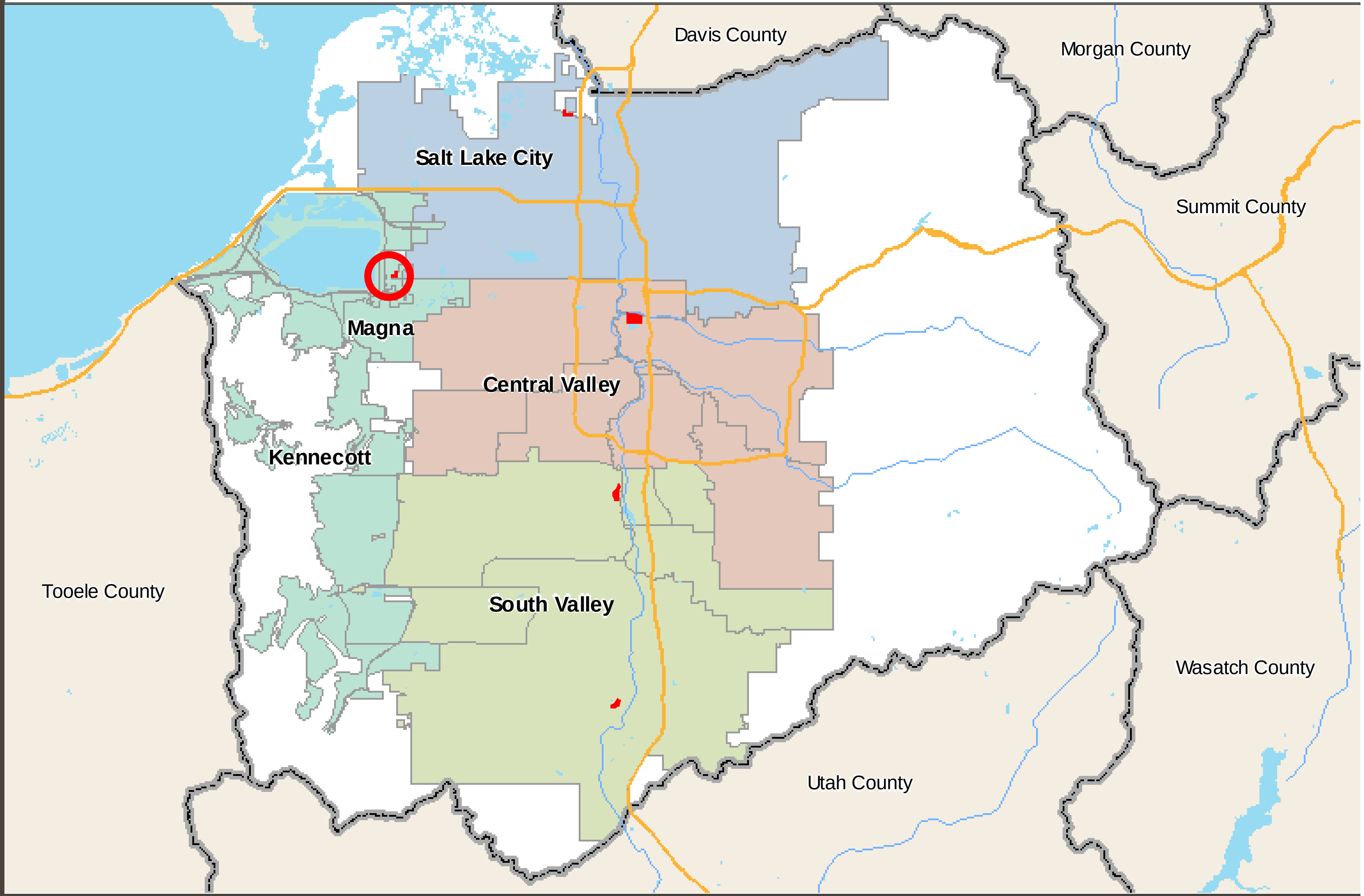
May 4, 2007

Alt 5 – 2030

	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	14	6
CVWRF	68	100
SVWRF	57	80

Alt 5 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 8.2
CVWRF	32.5
SVWRF	23.3



SALT LAKE COUNTY

Alt 6
All West-side Bench Flow to South Valley (Current WRF Capacity)

BROWN AND CALDWELL

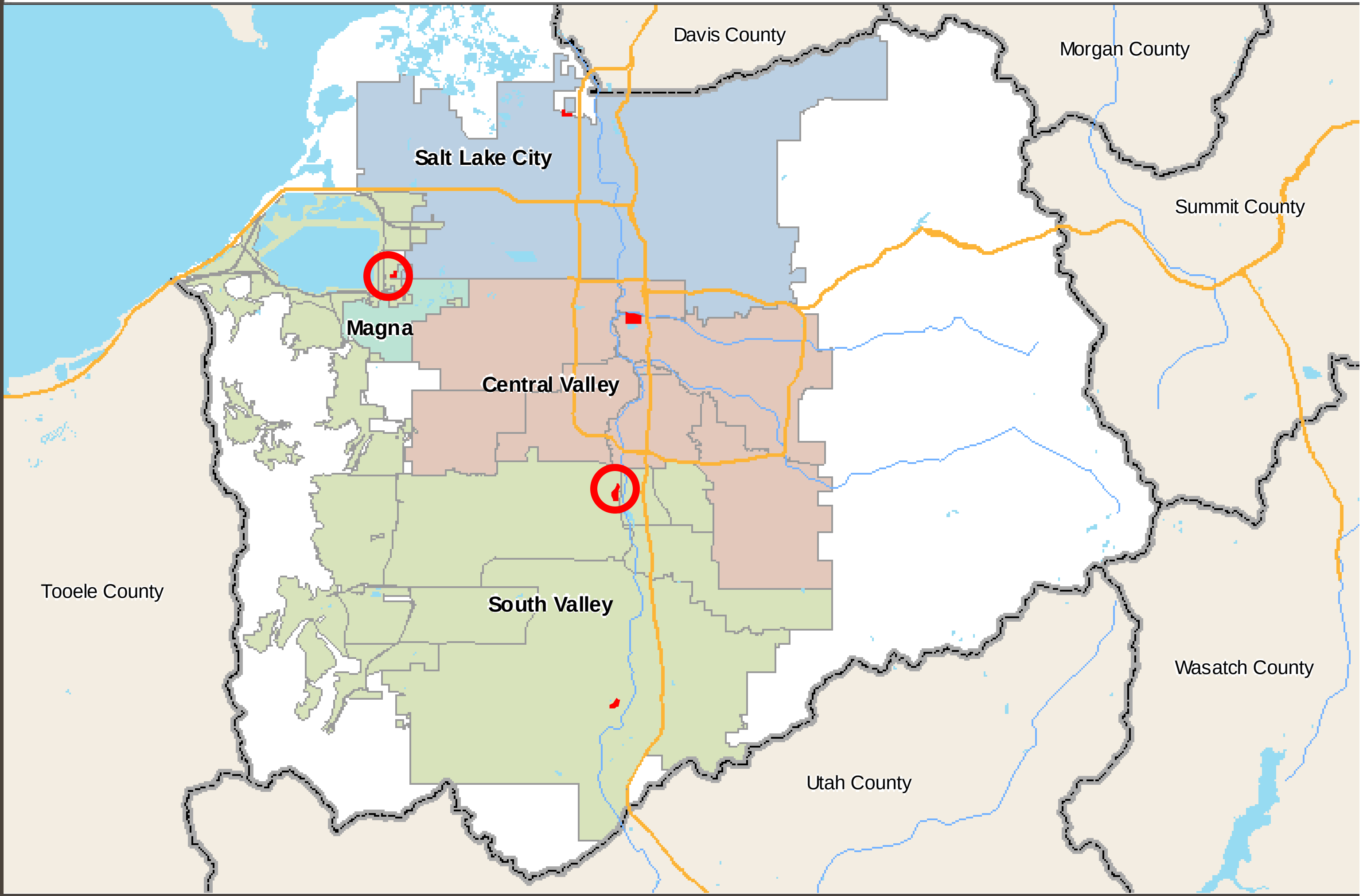
May 4, 2007

Alt 6 – 2030

	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	4	3.3
CVWRF	68	75
SVWRF	67	50

Alt 6 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 0.7
CVWRF	7.5
SVWRF	- 16.6



Alt 6
All West-side Bench Flow to South Valley
(Ultimate WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

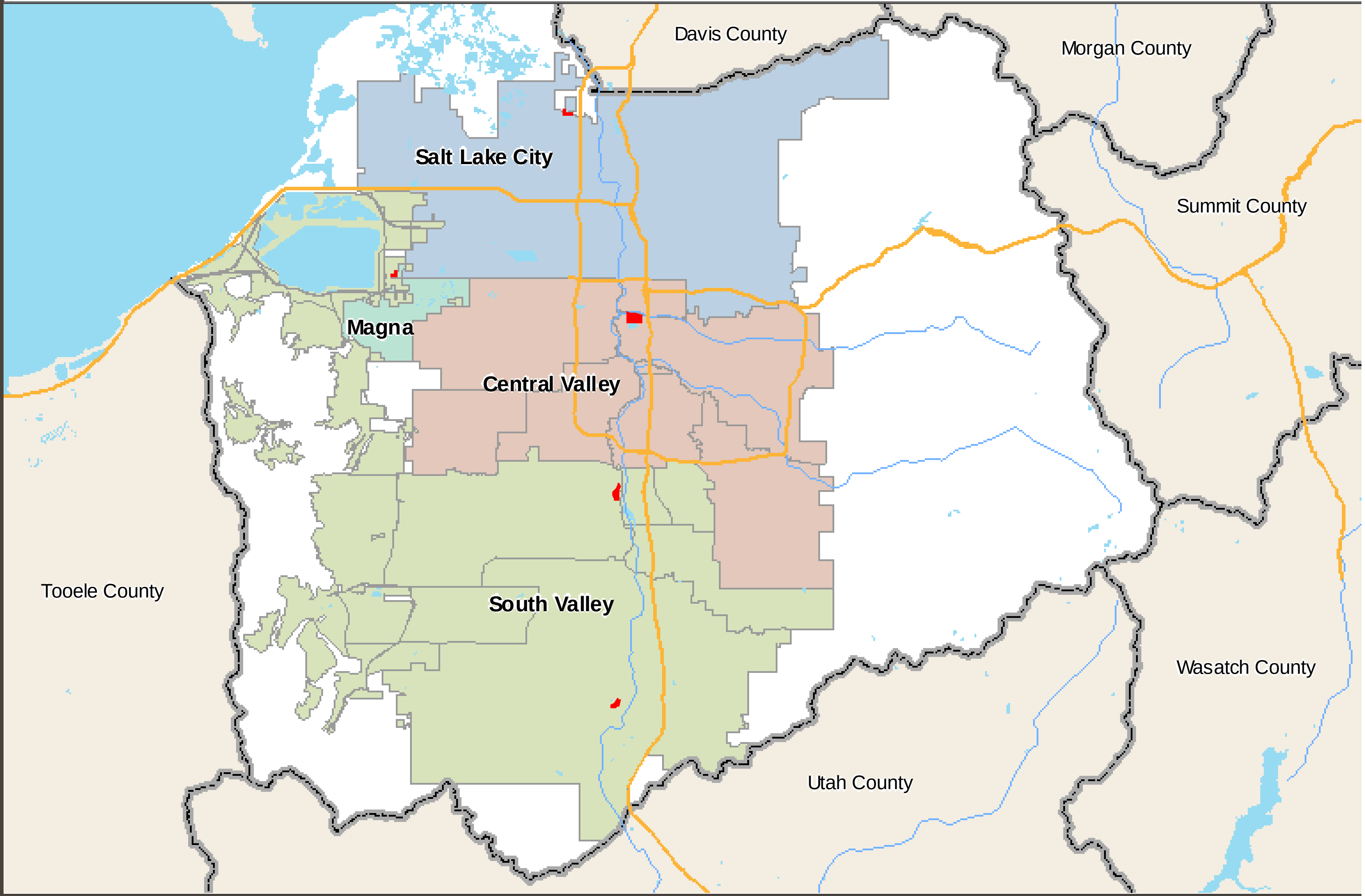
May 4, 2007

Alt 6 – 2030

	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	4	6
CVWRF	68	100
SVWRF	67	80

Alt 6 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	2.0
CVWRF	32.5
SVWRF	13.4



Alt 7
SVSD WRF, All West-side Bench Flow to South Valley (Current WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

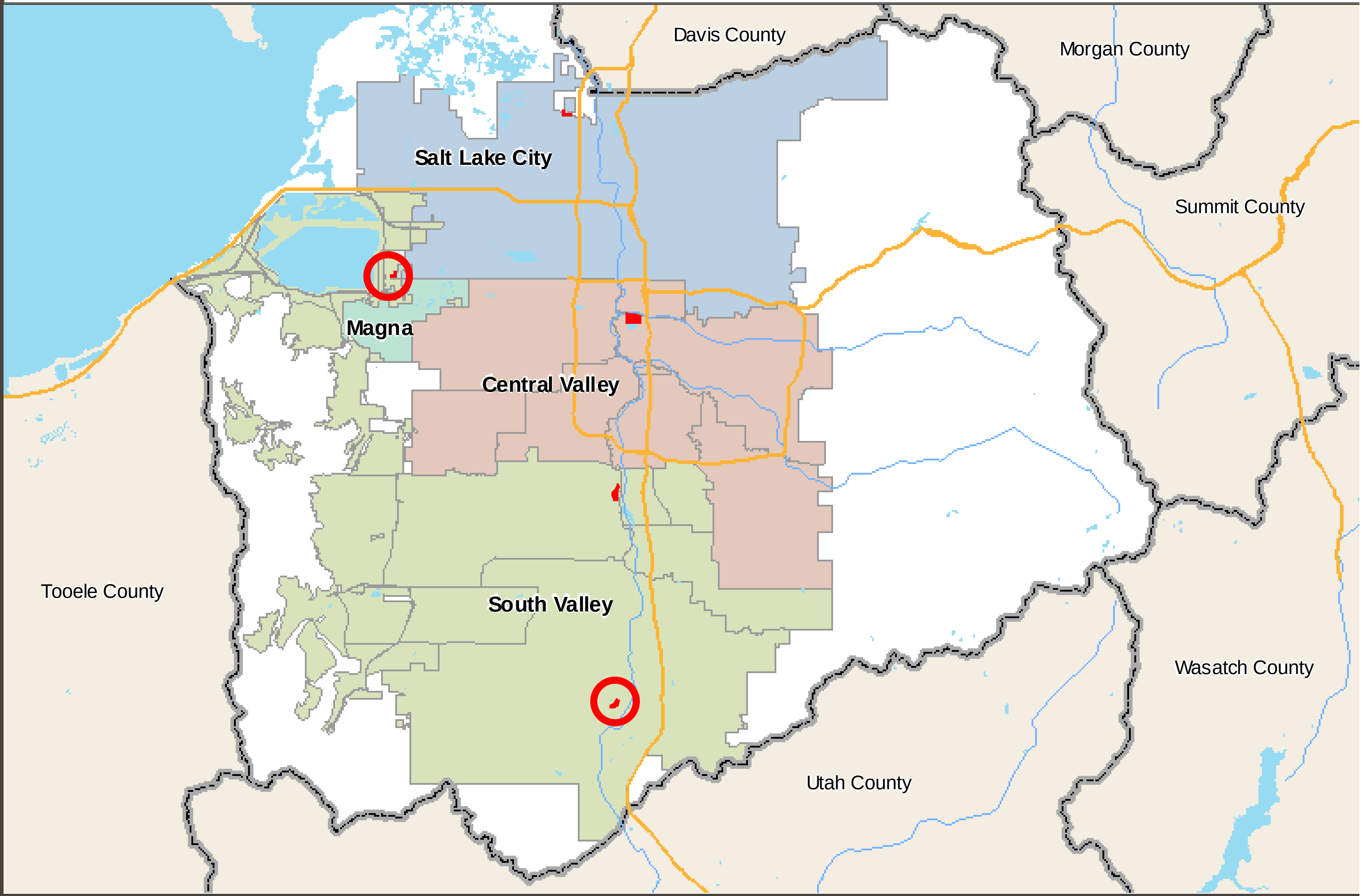
May 4, 2007

Alt 7 – 2030

	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	4	3.3
CVWRF	68	75
SVWRF	44.5	50
SVSD	22.5	15

Alt 7– Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 0.7
CVWRF	7.5
SVWRF	5.5
SVSD	-7.5



Alt 7
SVSD WRF , All West-side Bench Flow to South Valley (Ultimate WRF Capacity)

SALT LAKE COUNTY

BROWN AND CALDWELL

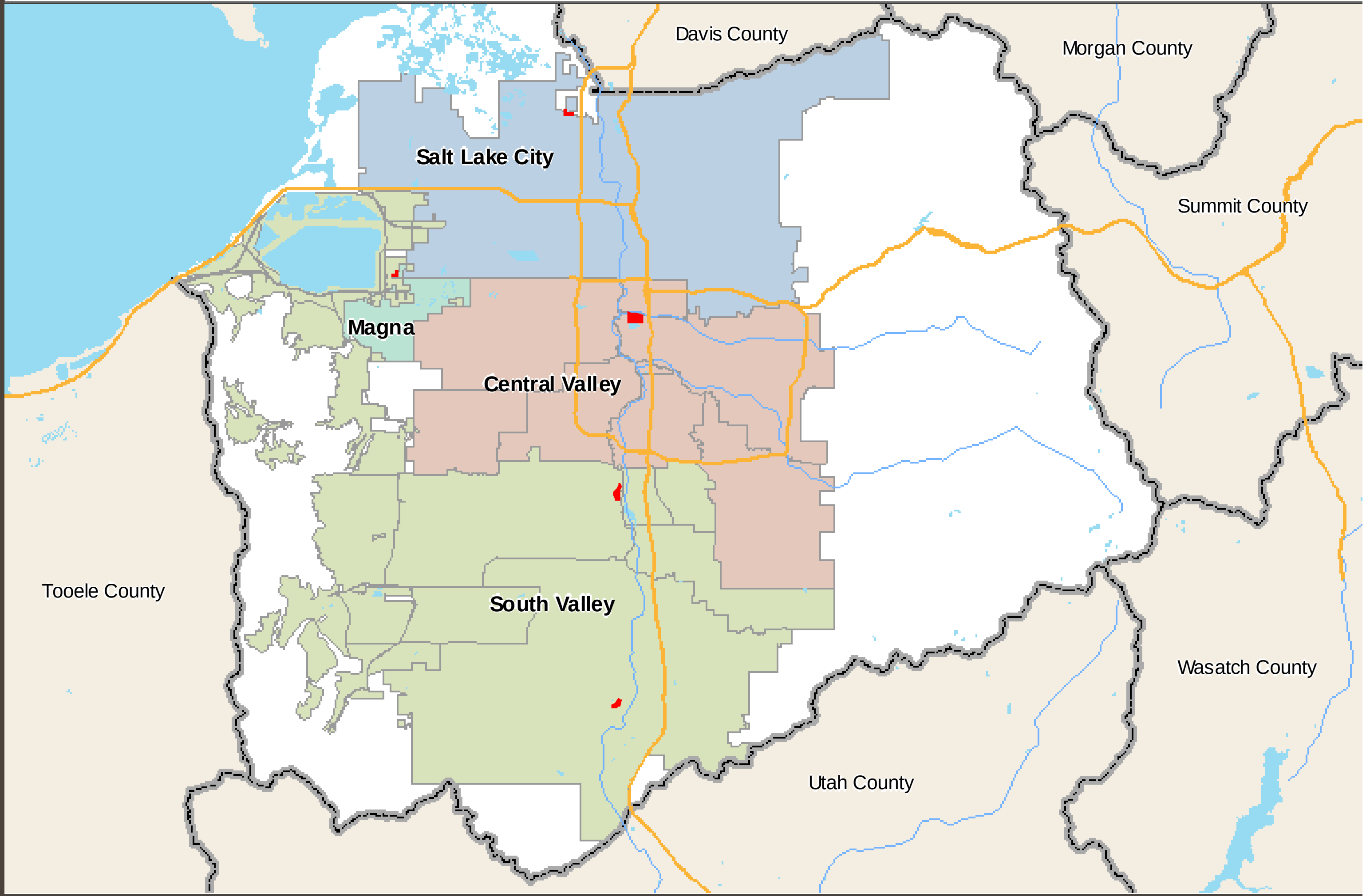
May 4, 2007

Alt 7 – 2030

	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	4	6
CVWRF	68	100
SVWRF	44.5	50
SVSD	22.5	30

Alt 7 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	2.0
CVWRF	32.5
SVWRF	5.5
SVSD	7.5



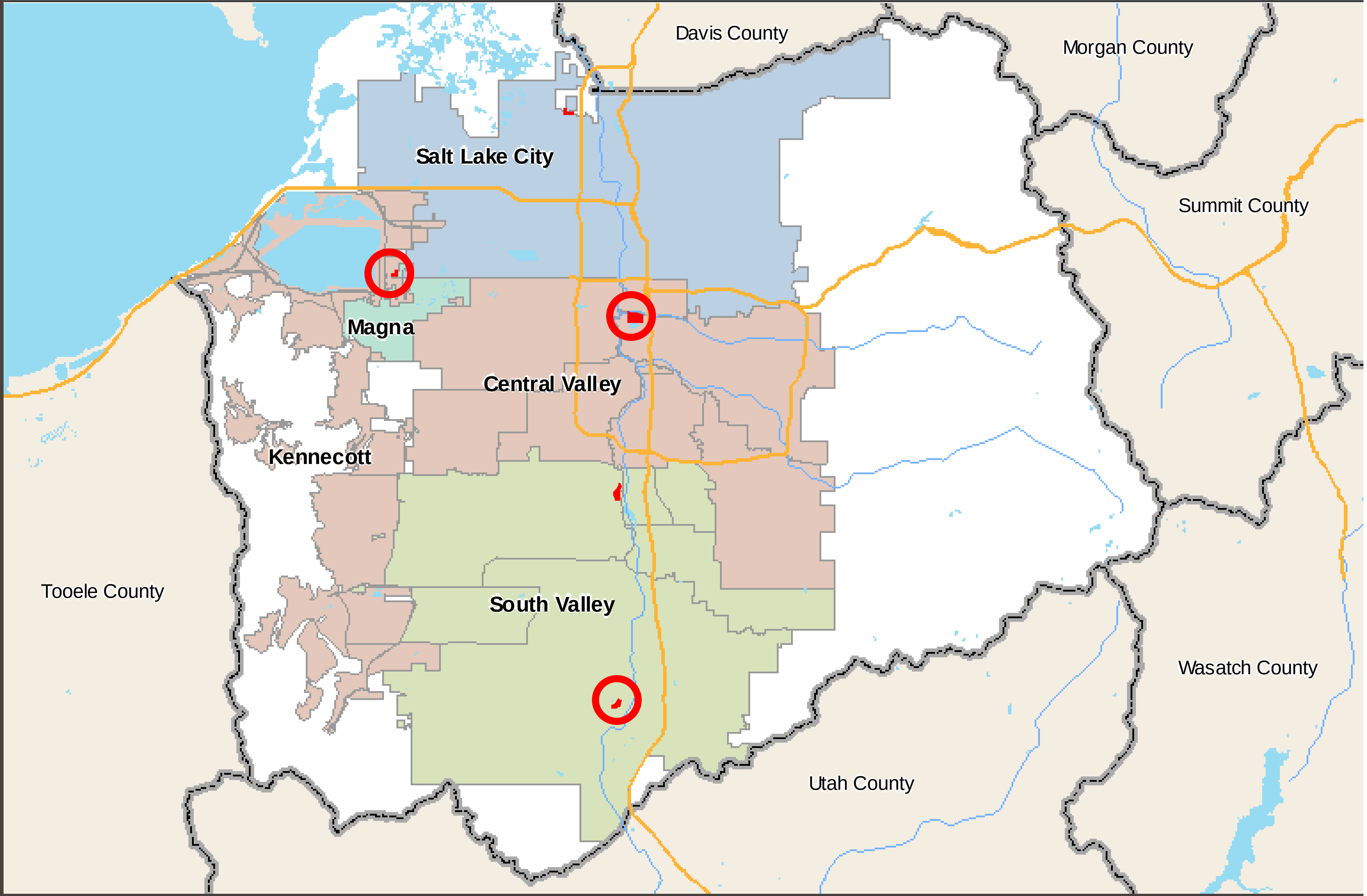
Alt 8
SVSD WRF, All West-side Bench Flow to Central Valley (Current WRF Capacity)

BROWN AND CALDWELL

May 4, 2007

Alt 7 – 2030	2030 Flows	Current Cap
SLCWRF	38	56
Magna WRF	4	3.3
CVWRF	78	75
SVWRF	34.5	50
SVSD	22.5	15

Alt 7– Surplus Capacity	ADF (mgd)
SLCWRF	18.4
Magna WRF	- 0.7
CVWRF	- 3.2
SVWRF	15.5
SVSD	-7.5



BROWN AND CALDWELL

Alt 8
SVSD WRF, All West-side Bench Flow to Central Valley (Ultimate WRF Capacity)

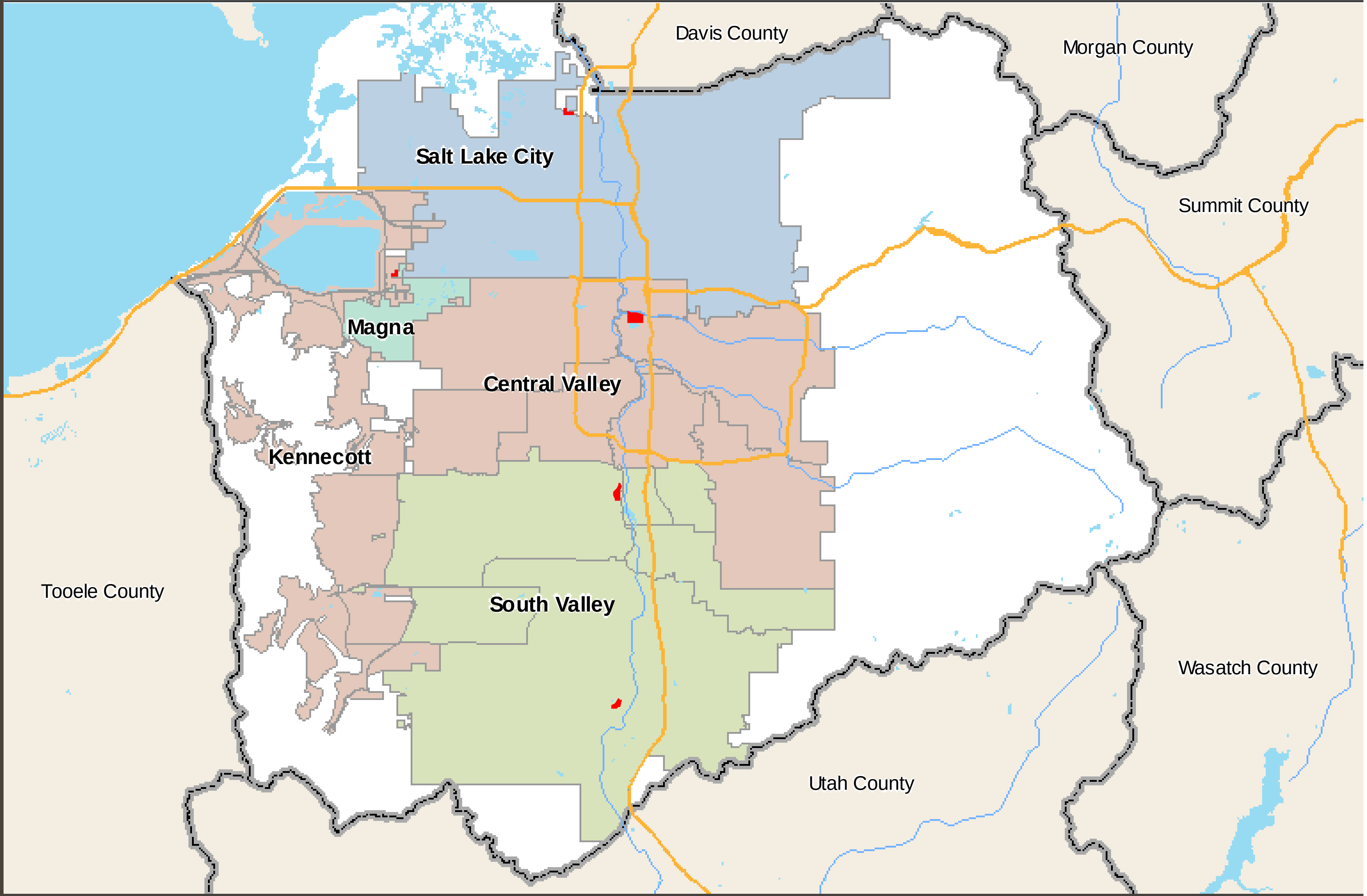
May 4, 2007

Alt 7 – 2030

	2030 Flows	Ultimate Cap
SLCWRF	38	56
Magna WRF	4	6
CVWRF	78	100
SVWRF	34.5	50
SVSD	22.5	30

Alt 7 – Surplus Capacity

	ADF (mgd)
SLCWRF	18.4
Magna WRF	2.0
CVWRF	21.8
SVWRF	15.5
SVSD	7.5



APPENDIX C

STAKEHOLDER WORKSHOP NO. 3

ATTENDANCE LISTS

Salt Lake County Water Quality Stewardship Plan (WaQSP)

WASTEWATER WORKSHOP #3

NAME	ORGANIZATION	PHONE #	EMAIL ADDRESS
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