

**FILE COPY**

**STATEMENT OF BASIS  
CITY OF ST. GEORGE  
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER  
UPDES PERMIT NUMBER: UT0024686  
UPDES BIOSOLIDS PERMIT NUMBER: UTL-024686  
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR000000  
MAJOR MUNICIPAL**

**FACILITY CONTACTS**

Person Name:	Ben Ford	Person Name:	Daniel Morrison
Position:	General Manager	Position:	Pretreatment Coordinator
Phone Number:	(435) 627-4268	Phone Number:	(435) 627-4273
Person Name:	Eric Richins	Person Name:	Leslie Wentland
Position:	Plant Superintendent	Position:	Laboratory Director
Phone Number:	(435) 627-4272	Phone Number:	(435) 627-4269
Person Name:	Eric Richins		
Position:	Biosolids Coordinator		
Phone Number:	(435) 627-4272		
Facility Name:	City of St. George		
Mailing and Facility Address:	3780 South 1550 West St. George, Utah 84790		
Telephone:	(435) 627-4266		

**DESCRIPTION OF FACILITY**

St. George Regional water reclamation facility (SGWRF) began discharging in 1990 with a 5 MGD design capacity, was upgraded in 1994 to an 8.5 MGD capacity, and the latest upgrade was completed in 1999 bringing the plant design capacity to an average daily flow of 17 MGD. This treatment plant is serving St. George and the surrounding areas of Ivins, Santa Clara and Washington City.

The treatment facilities consist of four 54 inch influent screw pumps, two submersible pumps, two mechanical bar screens, two air lift grit chambers, one bio selector, four oxidation ditches, six clarifiers, two low pressure ultraviolet disinfection systems, one medium pressure ultraviolet disinfection system, and two cascade aeration systems. Sludge is currently wasted from the clarifiers into two gravity thickeners. The sludge is then transferred to the post aethothermal thermophilic aerobic digestion (ATAD) holding tank and then pumped into the solids building feeding two centrifuges for de-watering purposes. The sludge is transported to the County Landfill for composting, which produces a Class A sludge.

The treatment plant has two discharge points, a 27 inch pipe and a 48 inch pipe located adjacent to each other. Both discharge points discharge on the southeast side of the treatment plant, the north bank of the Virgin River, approximately one and one half miles (1.5 miles) southwest of where the Virgin River crosses under the I-15 Interstate Highway, in Washington County, Utah, at approximate latitude 37° 02' 16" and longitude 113° 37' 50", with outfall STORET Number 495006.

### **SUMMARY OF CHANGES FROM PREVIOUS PERMIT**

Reuse requirements have been added to the St George permit. Previously, the reuse monitoring and reporting requirements for the SGWRF were outlined in the Construction Permit with Operating Conditions issued on April 6, 2005. The SGWRF delivers Type I reuse for irrigation of public parks and golf courses in the area.

The limits for ammonia and silver have changed due to a new waste load analysis. The limit for ammonia is more stringent than the previous permit. The limit for silver is less stringent than the previous permit.

### **DISCHARGE**

#### **DESCRIPTION OF DISCHARGE**

The City of St. George has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis. There were no significant violations reported on the DMRs in the last five years.

<u>Outfall</u>	<u>Description of Discharge Point</u>
001	The 27 inch discharge pipe is located on the southeast side of the treatment plant, about 400 feet from the north bank of the Virgin River, approximately one and one half (1.5) miles southwest of where the Virgin River crosses under the I-15 Interstate Highway, in Washington County, Utah at approximate latitude 37°02'16" and longitude 113°37'50".
002	The 48 inch pipe lies adjacent to the 27 inch pipe and is located on the southeast side of the treatment plant, about 400 feet from the north bank of the Virgin River, approximately one and one half (1.5) miles southwest of where the Virgin River crosses under the I-15 Interstate Highway, in Washington County, Utah at approximate latitude 37°02'16" and longitude 113°37'50".

<u>Outfall</u>	<u>Description of Reuse Discharge Point</u>
001R	Located at latitude 37°02'19" and longitude 113°37'53". Type I effluent is used to irrigate public parks and golf courses in the area. The reuse compliance monitoring point is at the discharge compliance point for Outfalls 001 and 002.

#### **RECEIVING WATERS AND STREAM CLASSIFICATION**

The discharge flows directly into the Virgin River which is Class 2B, 3B, and 4, according to *Utah Administrative Code (UAC) R317-2-13*:

- Class 2B -Protected for secondary contact recreation such as boating, wading, or similar uses.
- 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 4 -Protected for agricultural uses including irrigation of crops and stock watering.

**BASIS FOR EFFLUENT LIMITATIONS**

Limitations on total suspended solids (TSS), E-coli, pH and percent removal for BOD<sub>5</sub> and TSS are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The oil and grease is based on best professional judgment (BPJ).

BOD<sub>5</sub>, WET, ammonia, dissolved oxygen (DO) and silver (Ag) limits are water quality limited and based on the WLA which is appended.

The receiving stream, the Virgin River, has a total maximum daily limit (TMDL) for total dissolved solids. Based on a new site specific TDS criteria set for this segment, the new TDS load for SGWRF will be 61,065 tons/year. That was calculated using the current plant design capacity of 17 MGD and the new TDS criteria of 2,360 mg/L.

SGWRF is required to comply with the Colorado River Basin Salinity Forum (Forum) policies, as per *UAC R317-2-4*, to further control TDS loading within the Colorado River Basin of Utah. In accordance with Forum policy, on October 29, 1996 SGWRF submitted to DWQ a TDS demonstration which stated that it was not practicable to meet the 400 mg/L incremental increase requirement of the Forum policy and were subsequently given a variance. Although SGWRF must continue to implement the following TDS practices as stated in the permit:

1. Continue monitoring and reporting both the influent and effluent TDS on a weekly basis.
2. Continue to minimize the groundwater entering into your collection system as practicable through appropriate operation and maintenance procedures,
3. Through written communication, encourage those systems discharging into your system to undertake to minimize the groundwater entering their systems and report to you on the same
4. Through written communication, and any other suitable means, encourage appropriate dischargers to your system to minimize their TDS loadings through good housekeeping procedures.
5. Submit, with your next renewal application, a report summarizing efforts taken to undertake item 2, 3 and 4 above stating the average TDS level each year, and discuss the reasons for any increase in the average TDS level.

Type I reuse limitations for Outfall 001R are based upon *UAC R317-3-11*.

The permit limitations are:

Parameter	Outfalls 001, 002: Effluent Limitations			
	Maximum Monthly Average	Maximum Weekly Average	Daily Minimum	Daily Maximum
Flow, MGD	17	NA	NA	NA

BOD <sub>5</sub> , mg/L	17	24	NA	NA
BOD <sub>5</sub> Min. % Removal	85	NA	NA	NA
TSS, mg/L	25	35	NA	NA
TSS Min. % Removal	85	NA	NA	NA
E-coli, No./100 ml	126	157	NA	NA
DO, mg/l	NA	NA	5.5	NA
Ammonia, mg/L as N	3.2	NA	NA	16.7
WET, Chronic Biomonitoring	NA	NA	NA	Pass
Oil & Grease, mg/L	NA	NA	NA	10
Silver, mg/L	NA	NA	NA	0.14
Total Dissolved Solids, mg/l	NA	NA	NA	2,360
pH, Standard Units	NA	NA	6.5	9.0

NA – Not Applicable.

Parameter	Outfall 001R: Type I Reuse Limitations				
	Maximum Monthly Avg	Max Weekly Avg	Daily Min	Daily Avg	Daily Max
Turbidity, NTU	NA	NA	NA	2	5
BOD <sub>5</sub> , mg/L	10	NA	NA	NA	NA
E-Coli, No./100mL	NA	ND a/	NA	NA	9
pH, Standard Units	NA	NA	6	NA	9

a/ The weekly median E. coli concentration shall be non-detect.

NA – Not Applicable

### SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same as in the previous permit. The permit will require reports to be submitted monthly and quarterly, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Lab sheets for biomonitoring must be attached to the biomonitoring DMR. Lab sheets for metals and toxic organics must be attached to the quarterly DMRs.

Self-Monitoring and Reporting Requirements			
Parameter	Frequency	Sample Type	Units
Total Flow	Continuous	Recorder	MGD
BOD <sub>5</sub> , Influent Effluent	5 X Weekly	Composite	mg/L
	5 X Weekly	Composite	mg/L
TSS, Influent Effluent	5 X Weekly	Composite	mg/L
	5 X Weekly	Composite	mg/L
E-coli	5 X Weekly	Grab	mg/L

DO	5 X Weekly	Grab	mg/L
Ammonia (as N)	4 X Weekly	Grab	mg/L
WET, Chronic Biomonitoring	Quarterly	Composite	Pass/Fail
Oil & Grease	Monthly	Grab	mg/L
Silver	Quarterly	Composite	mg/L
TDS	Weekly	Grab	mg/L
pH	5 X Weekly	Grab	SU
Metals, Influent	Quarterly	Composite	mg/L
Effluent	Quarterly	Composite	mg/L
Organic Toxics	Annually	Grab	mg/L

Outfall 001R: Self-Monitoring and Reporting Requirements for Type I Reuse			
Parameter	Frequency	Sample Type	Units
Total Flow	Continuous	Recorder	MGD
BOD <sub>5</sub>	Once per week	Composite	mg/L
Turbidity	Continuous	Recorder	NTU
E-Coli.	Daily	Grab	No./100mL
TRC	Continuous	Recorder	mg/L
pH	Daily/Continuous	Grab/Recorder	SU

### **BIOSOLIDS (SEWAGE SLUDGE)**

#### **DESCRIPTION OF TREATMENT AND DISPOSAL**

The St. George Water Reclamation Facility (SGWRF) is required to submit an annual biosolids report to the Utah Division of Water Quality (DWQ), on or before February 19, for the previous year. The SGWRF submitted their 2010 annual biosolids report on February 16, 2011. The last inspection conducted by the DWQ of the SGWRF biosolids program was May 5, 2010. The SGWRF was in compliance of every aspect of their program at that time. The SGWRF stabilizes the solids (sewage sludge) with an oxidation ditch which has mean cell resident time of about 45 days. After the solids are stabilized, the solids are dewatered with centrifuges to about twenty three percent solids. The solids are hauled to the Washington County Landfill (WCL) where some of the solids are mixed with green waste for composting. The mixture is then formed into windrows and the “process to further reduce pathogens” (PFRP) is begun. Once the compost has met the EPA and State requirements of 40 CFR 503 for Class A biosolids (compost), the compost is then cured for about three to four months for odor reduction. The compost is then sold or given away to the public. If the compost pad does not have space to compost all of the solids, the solids are buried in the landfill. In 2010, the SGWRF produced 3,031 dry metric tons of solids (DMT), and of that, 1,404 DMT were mixed with green waste, composted, and sold at the WCL, along with 612 DMT of compost left over from 2009. The other 1,129 DMT were disposed in the WCL. The SGWRF had 498 DMT of compost stored from 2010, to be sold in 2011.

#### **Future Disposal Methods**

The SGWRF intends to continue composting biosolids to meet Class A requirements for sale or giveaway, or dispose of the biosolids at the WCL for the life of this permit. If the SGWRF needs, or wants to change their disposal methods, the SGWRF will need to notify the Utah Division of

Water Quality, at least 180 days in advance of any changes.

### **SUBSTANTIVE CHANGES**

There are not any substantive permit changes in this permit.

### **BIOSOLIDS LIMITATIONS AND SELF-MONITORING REQUIREMENTS**

Under *40 CFR 503.16(a)(1)*, the self-monitoring requirements are based upon the amount of biosolids disposed per year and shall be monitored according to the chart below.

<b>Minimum Frequency of Monitoring Based Upon Dry Metric Tons (DMT)</b>	
<b>Amount of Biosolids Sold or given Away Per Year</b>	<b>Monitoring Frequency</b>
> 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

Since the SGWRF sold or gave away more than 1,500 DMT in 2010, the biosolids shall be monitored at least four times per year.

### **BIOSOLIDS LIMITATIONS**

#### **Heavy Metals**

#### **Class A Biosolids for Home Lawn and Garden Use**

The intent of the heavy metals regulations of Table 3, *40 CFR 503.13* is to ensure the heavy metals do not build up in the soil in home lawn and gardens to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. D. I.* of the permit) to be handed out to all people who are receiving and land applying Class A biosolids to their lawns and gardens. If the instructions of the information sheet are followed to any reasonable degree, the Class A biosolids will be able to be land applied year after year, to the same lawns and garden plots without any deleterious effects to the environment. The information sheet must be provided to the public, because the permittee is not required, nor able to track the quantity of Class A biosolids that are land applied to home lawns and gardens.

#### **Class A Requirements With Regards to Heavy Metals**

If the biosolids are to be applied to a lawn or home garden, the biosolids shall not exceed the maximum heavy metals in Table 1 and the monthly average pollutant concentrations in *Table 3* (see the *Table 1* and *Table 3* below). If the biosolids do not meet these requirements, the biosolids cannot be sold or given away for applications to home lawns and gardens.

#### **Class B Requirements for Agriculture and Reclamation Sites**

The intent of the heavy metals regulations of Tables 1, 2 and 3, of *40 CFR 503.13* is to ensure that heavy metals do not build up in the soil at farms, forest land, and land reclamation sites to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. D. 11.* of the permit) to be handed out to all people who are receiving and land applying Class B biosolids to farms, ranches, and land reclamation sites. If the biosolids are land applied according to the regulations of *40 CFR 503.13*, to any

reasonable degree, the Class B biosolids will be able to be land applied year after year, to the same farms, ranches, and land reclamation sites without any deleterious effects to the environment.

**Class B Requirements With Regards to Heavy Metals**

If the biosolids are to be land applied to agricultural land, forest land, a public contact site or a reclamation site it must meet at all times:

The maximum heavy metals listed in *Table 1* and the heavy metals loading rates in *Table 2*; or

The maximum heavy metals in *Table 1* and the monthly heavy metals concentrations in *Table 3*.

If the biosolids do not meet these requirements they cannot be land applied.

40 CFR, 503.13, Tables 1, 2, and 3 of Heavy Metal Limitations

Heavy Metals	Table 1	Table 2	Table 3
All heavy metals concentrations shall be measured and reported	Daily Maximum mg/Kg <u>a/b/c/</u>	Cumulative Loading Rate Kg/Ha <u>a/</u>	Monthly Average Concentration mg/Kg <u>a/b/c/d/</u>
Total Arsenic	75	41	41
Total Cadmium	85	39	39
Total Copper	4300	1500	1500
Total Lead	840	300	300
Total Mercury	57	17	17
Total Molybdenum	75	N/A	N/A
Total Nickel	420	420	420
Total Selenium	100	100	100
Total Zinc	7500	2800	2800

a/ See Part VIII. of the permit for definition of terms.

b/ The limitations represent the maximum allowable levels of heavy metals in any biosolids intended for land application.

- c/ Any violation of these limitations shall be reported in accordance with the requirements of Part III.G., 1,2, 3, and 4 of the permit.
- d/ These limitations represent the maximum allowable levels of heavy metals based on an average of all samples taken during a 30-day period.

**Pathogen Limitations**

**Class A Requirements for Land Application**

If biosolids are sold or given away to the public for home lawn and garden use the biosolids need to be treated by a specific process to further reduce pathogens (PFRP), and meet a microbiological limit of less than less than 3 most probable number (MPN) of *Salmonella* per 4 grams of total solids (or less than 1,000 most probable number (MPN/g) of fecal coliform per gram of total solids) to be considered Class A biosolids. The SGWRF will use a method of composting to accomplish the PFRP (*Using the windrow method of composting, the temperature needs to be maintained at 55° C (131° F) or higher for fifteen days, with a minimum of five turnings during those fifteen days, or composting using the static aerated pile method, the temperature of the biosolids is maintained at 55° C (131° F) or higher for at least 3 days (40 CFR 503.32(a)(8)(ii).*

The practice of sale or giveaway to the public is an acceptable use of biosolids of this quality as long as the biosolids continue to meet Class A standards with respect to pathogens. If the biosolids do not meet Class A pathogen standards the biosolids cannot be sold or given away for to the public, and the SGWRF will need find another method of beneficial use or disposal.

**Vector Attraction Reduction Requirements**

The SGWRF needs to meet a method of vector attraction reduction (VAR) if the biosolids are to be land applied. The SGWRF may be accomplish the VAR two different ways:

Composting - using the static aerated pile method, or the windrow method of composting, the temperature of the biosolids is maintained at 40° C (104° F) or higher for at least 14 days under (*40 CFR) 503.33(b) (5).*

**Landfill Monitoring**

Under *40 CFR 258*, the landfill monitoring requirements include a paint filter test to determine if the biosolids exhibit free liquid. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill (*40 CFR 258.28(c)(1).*

**METALS MONITORING DATA**

The SGWRF was required to sample for metals at least four times in 2010. They sampled six times. All biosolids land applied in 2010 met *Table 3* of *40 CFR 503.13*, therefore the SGWRF biosolids qualify as EQ with regards to metals. The monitoring data is below.

**Metals Monitoring Data 2010 (Compost)**

Heavy Metals	SGWRF 2010, Yearly Average,	SGWRF 2010, Yearly Maximum,	40 CFR 503.13, Table 3,
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	(6 samples) mg/Kg	(6 samples) mg/Kg	(Exceptional Quality) mg/Kg
Arsenic	9.9	11.8	41.0
Cadmium	0.6	0.7	39.0
Copper	185	238	1,500.0
Lead	16.7	52.7	300.0
Mercury	0.68	0.89	17.0
Molybdenum	4.9	5.48	75.0
Nickel	8.9	9.68	420.0
Selenium	7.0	9.68	100.0
Zinc	331.0	376.0	2,800.0

### **PATHOGEN MONITORING DATA**

The SGWRF was required to monitor the finished compost for fecal coliform or salmonella at least four times in 2010 (each monitoring episode consist of seven samples, and all must below 1,000 MPN of fecal coliform.) They chose to sample for fecal coliform, and sampled six times. The monitoring data is below.

#### **SGWRF Fecal Monitoring Data 2010 (Compost)**

Geomean of 245 samples (episodes)	Yearly Maximum
30.44	333.0

### **REPORTING AND RECORD KEEPING REQUIREMENTS**

#### Record keeping

The record keeping requirements from *40 CFR 503.17* are included under *Part III.F.* of the permit. The amount of time the records must be maintained are dependent on the quality of the biosolids in regards to the metals concentrations. If the biosolids continue to meet the Class A metals limitations of *Table 3 of 40 CFR 503.13*, and are sold or given away and land applied the records must be retained for a minimum of five years. If the biosolids do not meet Class A standards with regards to heavy metals, and meet Class B standards and are land applied, the records must be maintained perpetually. If the biosolids are disposed in a landfill the records must also retained for a minimum of five years.

#### Reporting

The SGWRF must report annually as required in *40 CFR 503.18*. This report is to include the results of all monitoring performed in accordance with *Part III.C.* of the permit, information on management practices, biosolids treatment, and certifications. This report is due no later than **February 19** of each year. Each report is for the previous calendar year.

### **STORM WATER**

#### **STORMWATER REQUIREMENTS**

Storm water provisions are included in this combined UPDES permit.

The storm water requirements are based on the UPDES Multi-Sector General Permit for Storm Water Discharges for Industrial Activity, General Permit No. UTR000000 (MSGP). All sections of the MSGP that pertain to discharges from wastewater treatment plants have been included and sections which are redundant or do not pertain have been deleted.

The permit requires the preparation and implementation of a storm water pollution prevention plan for all areas within the confines of the plant. Elements of this plan are required to include: 1. The development of a pollution prevention team: 2. Development of drainage maps and materials stockpiles: 3. An inventory of exposed materials: 4. Spill reporting and response procedures: 5. A preventative maintenance program: 6. Employee training: 7. Certification that storm water discharges are not mixed with non-storm water discharges: 8. Compliance site evaluations and potential pollutant source identification, and: 9. Visual examinations of storm water discharges.

The City of St. George is currently covered under the UPDES Multi Sector General Permit for Industrial Activities.

### **PRETREATMENT REQUIREMENTS**

The pretreatment requirements remain the same as in the current permit with the permittee administering an approved pretreatment program. Any substantial changes to the program must be submitted for approval to the Division of Water Quality. Authority to require a pretreatment program is provided for in *19-5-108 UCA, 1953 ann.* and *UAC R317-8-8*.

The permittee will be required to perform an annual evaluation of the need to revise or develop technically based local limits to implement the general and specific prohibitions of *40 CFR, Part 403.5(a)* and *Part 403.5(b)*. This evaluation may indicate that present local limits are sufficiently protective, or that they must be revised. As part of this evaluation, the permit requires quarterly influent and effluent monitoring for metals and yearly organic toxics listed in *R317-8-7.5* and sludge monitoring for potential pollutants listed in *40 CFR 503*.

### **BIOMONITORING REQUIREMENTS**

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the *State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring)*. Authority to require effluent biomonitoring is provided in *Permit Conditions, UAC R317-8-4.2, Permit Provisions, UAC R317-8-5.3* and *Water Quality Standards, UAC R317-2-5* and *R317 -2-7.2*.

Since the permittee is a major municipal discharger, with a significant pretreatment program the renewal permit will require whole effluent acute and chronic limits with chronic toxicity testing. It is anticipated that the chronic testing will not only indicate chronic toxicity, but also screen for acute toxicity. The permit will contain toxicity reopener language. (Description of monitoring frequency, species being monitored and Numerical Toxicity Limit if necessary)

The permit will contain the standard requirements for additional testing if chronic toxicity is detected

and a TRE (Toxicity Reduction Evaluation) as necessary.

**PERMIT DURATION**

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by  
Jennifer Robinson, Discharge  
Mark Schmitz, Biosolids  
Matthew Garn, Pretreatment  
Kim Shelly, Reuse  
Michael George, Storm Water  
Utah Division of Water Quality

DRAFT

DRAFT