

BIOSOLIDS EMS MANUAL

ELEMENT 3.0

CRITICAL CONTROL POINTS



REVISION	EFFECTIVE DATE	APPROVAL SIGNATURE
11	August 04, 2016	

PURPOSE

This element identifies the Critical Control Points and Operational Controls within the City of Fort Worth’s Biosolids Value Chain. Critical Control Points must be properly managed to assure that the Biosolids Beneficial Reuse/Recycling Program meets applicable legal, quality and public acceptance requirements.

SCOPE

This element pertains to all management categories and processes in the Biosolids Value Chain as shown in the attached Village Creek Water Reclamation Facility diagram and the attached EMS Master Table.

KEY WORDS

- Biosolids Value Chain
- Biosolids EMS Manager
- Critical Control Points
- EMS Management Team
- Environmental Impact
- Operational Controls

RESPONSIBILITY

The roles and responsibilities of each department and organization involved in the Biosolids Value Chain are fully defined in EMS Element 7.0 Roles and Responsibilities. During the development of the Critical Control Points, the responsible divisions were identified for each critical control point and listed on the attached Environmental Management System (EMS) Master Table.

PROCEDURE

- **Identify Critical Control Points**
The EMS Management Team used the guidelines presented in the NBP’s National Manual of Good Practice for Biosolids and the Biosolids Environmental Management System Guidance Manual to establish groupings of biosolids management practices applicable to the Fort Worth program as shown in the attached EMS Master Table.
- **Identify Critical Control Point Operational Controls**
After identifying the Critical Control Points, the EMS Management Team identified the unit processes, events, activities and other requirements within each Critical Control Point. They then went one step farther and identified the ordinances, regulations, standard operating procedures, work practices, etc. within each control point. These are also listed in the attached EMS Master Table.
- **Identify the Environmental Impacts at the Critical Control Points**
Once the EMS Management Team established the Critical Control Points and Operational Procedures, they identified any environmental impacts associated with the control points. The team considered both normal operating conditions and emergency or abnormal operating conditions during their evaluation as specified in the EMS Guidance Manual.

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- **Review and Update Critical Control Points**

The EMS Manager and EMS Coordinator are responsible for ensuring that the list of critical control points is kept up to date. If critical control points are added or deleted from the list then the EMS Management Team will be notified by email or other means, and allowed to provide feedback if necessary. Also, during the annual EMS Management review the EMS Management Team will be shown a complete list of all critical control points. Feedback provided during this meeting will be incorporated into the Critical Control Points Master Table.

EMS Management Team makes appropriate changes to the critical control points at this time. If a new process is added or if major modifications are made to existing systems, the EMS Management Team makes the necessary changes to the critical control points when the new or modified systems are brought on line.

- **Notification**

Once the critical control point(s) or environmental impact(s) are changed for the new systems, the Biosolids EMS Manager will notify the NBP and assigned Third Party Auditor in writing of the change.

REFERENCES

- BMP Guidance Manual, (NBP): <http://ww.weftec.org/Biosolids/page.aspx?id=7733>
- Code of Good Practice, (NBP): <http://ww.weftec.org/Biosolids/page.aspx?id=7733>
- Manual of Good Practice for Biosolids, (NBP): <http://ww.weftec.org/Biosolids/page.aspx?id=7733>
- Contractor SOPs
- VCWRF SOPs

EMS Cross References

- Element 2.0 Biosolids Management Policy
- Element 3.0 Critical Control Points
- Element 4.0 Legal and Other Requirements
- Element 6.0 Public Participation in Planning
- Element 10.0 Operational Control of Critical Control Points
- Element 13.0 Monitoring and Measurement
- Element 17.0 Periodic Management Review of Performance

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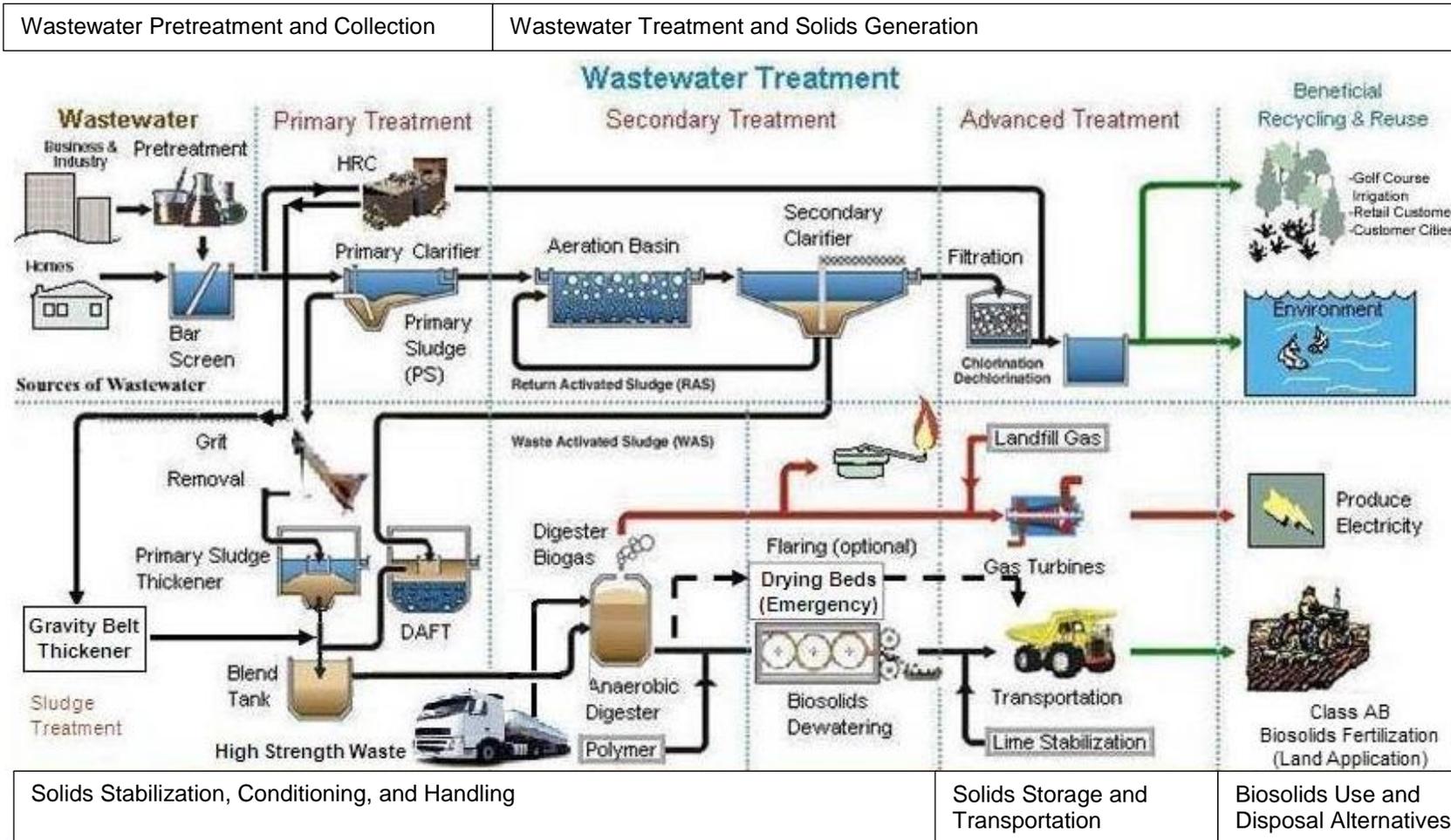
CRITICAL CONTROL POINTS



REVISION HISTORY

Revision #	Date	Revision Description
11	08/04/2016	Merged element to new format, updated review criteria, updated Critical Control Points table
10	10/06/2014	Updated Biosolids Value Chain graphic, updated Critical Control Points table
09	08/05/2013	Updated references, updated Critical Control Points—EMS Master Table
08	07/29/2011	Update Critical Control Points – EMS Master Table, correct typographical errors
07	06/13/2011	Update Critical Control Points – EMS Master Table
06	01/26/2011	Correct typographical error
05	11/16/2010	Update references
04	05/15/2008	Audit (YR2) 2007
03	06/29/2007	Audit (YR1) 2006
02	11/29/2004	2004 Issue
01.a	10/18/2004	Internal Audit Revisions
01	10/01/2004	Approval Draft
SR	01/30/2004	Issued for Status Review

BIOSOLIDS EMS MANUAL ELEMENT 3.0/FIGURE 3.1 VCWRF BIOSOLIDS VALUE CHAIN



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CRITICAL CONTROL POINTS-MASTER TABLE



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS	ROLES & RESPONSIBILITIES	OPERATIONAL CONTROLS						MONITORING ACTIVITIES		ENVIRONMENTAL IMPACTS
			REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	Activity			
								Frequency			
Public Acceptance and Biosolids Communications	Regulatory Requirements	<ul style="list-style-type: none"> VCWRF Regulatory/ Environmental Administrator 	<ul style="list-style-type: none"> TPDES Permit TAC Title 30 Ch. 312 	<ul style="list-style-type: none"> EMS Element 4 	N/A	EMS Manual	N/A	Element 4.0 Table updates/revisions	Annually	<ul style="list-style-type: none"> Air Quality Surface and Ground Water Quality Biosolids Quality Reclaimed Water Quality Public Perception and Acceptance 	
	Public Outreach	<ul style="list-style-type: none"> VCWRF Contractor Media Relations and Communications Coordinator 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> EMS Elements 6 & 9 	<ul style="list-style-type: none"> Pamphlets Brochures Presentations City's Website 	EMS Manual	<ul style="list-style-type: none"> Public Input on Biosolids Program (positive & negative) 	<ul style="list-style-type: none"> VCWRF Tours Tour Surveys Complaint investigations 	<ul style="list-style-type: none"> Continual and Ongoing If necessary 	<ul style="list-style-type: none"> Public Perception and Acceptance 	
Wastewater Pretreatment & Collections	Significant Industrial User Discharges	<ul style="list-style-type: none"> Pretreatment Services Central Laboratory Contractor Customer Cities 	<ul style="list-style-type: none"> TPDES Permit 40 CFR Part 403 40 CFR Parts 405-471 30 TAC Chapter 315 Fort Worth Pretreatment Ordinance Customer City Ordinances & Contracts SIU Permits 	<ul style="list-style-type: none"> Pretreatment SOP's Sampling SOP's Enforcement Response Plan Industrial User Surveys SDCP (Slug Discharge Control Plan) TOMP (Toxic Organic Management Plan) BMP's (Best Management Practices) Biosolids Sampling SOP's (Contractor) Central Laboratory SOP's 	<ul style="list-style-type: none"> Pretreatment Data Management System Industrial User Files Guidelines for Self-Monitoring 	<ul style="list-style-type: none"> Pretreatment Services Customer City Contractor Central Laboratory 	<ul style="list-style-type: none"> TPDES Discharge Limits Pollutants in the Influent & Effluent -30 TAC 307 and 40 CFR Part 122 Appendix D Table III Pollutants and discharges regulated by SIU Permit Biosolids pollutants as required by TPDES Permit Reclaimed Water pollutants required by TPDES Permit Flow 	<ul style="list-style-type: none"> WWTP Influent and Effluent Monitoring SIU sampling by Control Authority SIU self monitoring SIU Inspections by Control Authority Biosolids Monitoring Activities Reclaimed Water Monitoring Activities Flow 	<ul style="list-style-type: none"> Frequency dictated by TPDES Permit minimum 2/yr variable minimum 1/yr metals 1/mo; PCB's 1/mo; pH 1/wk; fecal 2/mo; pathogens 2/mo; TCLP 2/yr fecal 2/week; turbidity 2/wk. CBOD 2/wk Continuous 	<ul style="list-style-type: none"> Air Quality Surface and Ground Water Quality Biosolids Quality Reclaimed Water Quality 	
	Wholesale Customer Discharges	<ul style="list-style-type: none"> Pretreatment Services Central Laboratory Contractor 	<ul style="list-style-type: none"> 40 CFR Part 403 30 TAC Chapter 315 Customer City Ordinances & Contracts 	<ul style="list-style-type: none"> Pretreatment SOP's Sampling SOP's Central Laboratory SOP's Biosolids Sampling SOP's (Contractor) 	<ul style="list-style-type: none"> Pretreatment Data Management System 	<ul style="list-style-type: none"> Pretreatment Services Customer City Contractor Central Laboratory 	<ul style="list-style-type: none"> TPDES Discharge Limits Pollutants in the Influent & Effluent -30 TAC 307 and 40 CFR Part 122 Appendix D Table III Biosolids pollutants as required by TPDES Permit Reclaimed Water pollutants required by TPDES Permit Flow 	<ul style="list-style-type: none"> Wholesale Customer City Monitoring WWTP Influent and Effluent Monitoring Biosolids Monitoring Activities Reclaimed Water Monitoring Activities Flow 	<ul style="list-style-type: none"> 3/year (metals, Oil & grease, BOD, TSS, COD) Frequency dictated by TPDES Permit metals 1/mo; PCB's 1/mo; pH 1/wk; fecal 2/mo; pathogens 2/mo; TCLP 2/yr fecal 2/wk; turbidity 2/wk; CBOD 2/wk Continuous 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution Biosolids Quality Reclaimed Water Quality 	



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS	ROLES & RESPONSIBILITIES	OPERATIONAL CONTROLS						MONITORING ACTIVITIES		ENVIRONMENTAL IMPACTS
			REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	Activity			
								Frequency			
Wastewater Pretreatment & Collections (continued)	Commercial Facilities and Small Industrial Users • Monitored • Unmonitored	• Pretreatment Services • Central Laboratory • Contractor	• 40 CFR Part 403 • 30 TAC Chapter 315 • Fort Worth Pretreatment Ordinance	• Pretreatment SOP's • Sampling SOP's • Central Laboratory SOP's • Biosolids Sampling SOP's (Contractor)	• Code of Management Practices for Silver-Imaging Facilities • Best Management Practices for Non-Monitored Commercial Users • Pretreatment Data Management System	• Pretreatment Services • VOWRF • Customer City • Contractor • Central Laboratory	• Local Limits • Prohibited Discharge Stds	• Local Limits	• as needed	• Air Quality • Surface and Groundwater Pollution • Biosolids Quality • Reclaimed Water Quality	
	Classed High Strength Users (Restaurants, etc.)	• Pretreatment Services • Central Laboratory • Contractor	• 40 CFR Part 403 • 30 TAC Chapter 315 • Fort Worth Pretreatment Ordinance • Grease/Grit Trap Permits	• Pretreatment SOP's • Sampling SOP's • Central Laboratory SOP's • Biosolids Sampling SOP's (Contractor)	• Best Management Practices for Non-Monitored Commercial Users • Pretreatment Data Management System	• Pretreatment Services • Customer City • Contractor • Central Laboratory	• Oil & Grease • BOD, TSS, COD • Local Limits • Prohibited Discharge Stds	• Oil & Grease • BOD, TSS, COD • Local Limits	• as needed • as needed • as needed	• Air Quality • Surface and Groundwater Pollution • Biosolids Quality • Reclaimed Water Quality	
	Septage Hauling	• Pretreatment Services • Central Laboratory • Contractor	• 40 CFR Part 403 • 30 TAC Chapter 315 • Fort Worth Pretreatment Ordinance • Waste Hauler Permit	• Pretreatment SOP's • Sampling SOP's • Central Laboratory SOP's • Biosolids Sampling SOP's (Contractor)	• Pretreatment Data Management System	• Pretreatment Services • Customer City • Contractor • Central Laboratory	• Local Limits • Prohibited Discharge Stds	• Local Limits	• as needed	• Air Quality • Surface and Groundwater Pollution • Biosolids Quality • Reclaimed Water Quality	
	Groundwater Remediation Discharges	• Pretreatment Services • Central Laboratory • Contractor	• 40 CFR Part 403 • 30 TAC Chapter 315 • Fort Worth Pretreatment Ordinance • Groundwater Contract	• Pretreatment SOP's • Sampling SOP's • Central Laboratory SOP's • Biosolids Sampling SOP's (Contractor)	• Pretreatment Data Management System	• Pretreatment Services • Customer City • Contractor • Central Laboratory	• Local Limits • Pollutants of Concern • Prohibited Discharge Stds	• Local Limits • Pollutants of Concern	• as needed • as needed	• Air Quality • Surface and Groundwater Pollution • Biosolids Quality • Reclaimed Water Quality	
	Residential User Discharges	• Pretreatment Services • Central Laboratory • Contractor	• 40 CFR Part 403 • 30 TAC Chapter 315 • Fort Worth Pretreatment Ordinance	• Pretreatment SOP's • Sampling SOP's • Central Laboratory SOP's • Biosolids Sampling SOP's (Contractor)	• Pretreatment Data Management System	• Pretreatment Services • Customer City • Contractor • Central Laboratory	• Local Limits (if applicable) • Prohibited Discharge Stds	• Local Limits	• as needed	• Air Quality • Surface and Groundwater Pollution • Biosolids Quality • Reclaimed Water Quality	



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS		ROLES & RESPONSIBILITIES	OPERATIONAL CONTROLS					MONITORING ACTIVITIES		ENVIRONMENTAL IMPACTS
				REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	Activity		
									Frequency		
Wastewater Treatment and Solids Generation	Preliminary Treatment-Screening	Headworks Influent	<ul style="list-style-type: none"> VC Operations VC Maintenance VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Influent Flow SOP (INFL 01.001-02.001) Headworks SOP (HDWK 01.001) Central Laboratory SOP's 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Headworks Primary Office Central Laboratory 	<ul style="list-style-type: none"> Ammonia BOD Flow TSS 	<ul style="list-style-type: none"> Ammonia BOD BOD (C Box and E Box) COD Flow -MGD Pretreatment Influent Monitoring TSS TSS (C Box and E Box) 	<ul style="list-style-type: none"> daily daily 1/week 3/week continuous 1/month daily daily 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution
		Headworks - Bar Screens	<ul style="list-style-type: none"> VC Operations VC Maintenance VC Tech Services 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Headworks SOP (HDWK 01.001, 02.001, 02.002, 04.001, 04.002, 05.001) 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Headworks Primary Office 	<ul style="list-style-type: none"> Flow Screenings 	<ul style="list-style-type: none"> Flow -MGD Roll off Boxes (screenings) 	<ul style="list-style-type: none"> continuous as needed 	<ul style="list-style-type: none"> Air Quality Screenings to Landfill Potential for cross media contamination Biosolids Quality
		Headworks - Fine Bar Screens	<ul style="list-style-type: none"> VC Operations VC Maintenance VC Tech Services 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Headworks SOP (HDWK 03.001, 03.002, 02.002, 04.003, 05.001) 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Headworks Primary Office 	<ul style="list-style-type: none"> Flow Screenings 	<ul style="list-style-type: none"> Flow -MGD Roll off Boxes (screenings) 	<ul style="list-style-type: none"> continuous as needed 	<ul style="list-style-type: none"> Air Quality Screenings to Landfill Potential for cross media contamination Biosolids Quality
	Primary Treatment-Clarification and Storage	Primary Clarifiers	<ul style="list-style-type: none"> VC Operations VC Maintenance VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Primary Clarification SOP (PRIM 01.001-04.001) Central Laboratory SOP's 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Headworks Primary Office 	<ul style="list-style-type: none"> Detention Time Flow Settleable Solids Sludge Blanket 	<ul style="list-style-type: none"> Detention Time Flow Settleable Solids Sludge Blanket 	<ul style="list-style-type: none"> continuous continuous 3/week daily 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution Biosolids Quality
		Primary Effluent Pumps	<ul style="list-style-type: none"> VC Operations VC Maintenance VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Primary Clarification SOP (PRIM 05.001) Central Laboratory SOP's 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Headworks Primary Office 	<ul style="list-style-type: none"> Flow 	<ul style="list-style-type: none"> Flow -MGD BOD (inflow for aeration basins) TSS (inflow for aeration basins) COD (inflow for aeration basins) Settleable Solids 	<ul style="list-style-type: none"> continuous 5/week daily 2/week 3/week 	<ul style="list-style-type: none"> Surface and Groundwater Pollution
		High Rate Clarifier (HRC)	<ul style="list-style-type: none"> VC Operations VC Maintenance VC Tech Services Central Laboratory Pretreatment Services 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> High Rate Clarification SOP (HRCN 01.001-07.001) Pretreatment Sampling SOP Central Laboratory SOP's 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory VCWRF HRC Building Pretreatment Services 	<ul style="list-style-type: none"> Ammonia BOD Flow TSS Turbidity pH BOD 	<ul style="list-style-type: none"> Ammonia CBOD Flow TSS Turbidity pH BOD 	<ul style="list-style-type: none"> as needed - when in operation 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS	ROLES & RESPONSIBILITIES	OPERATIONAL CONTROLS							ENVIRONMENTAL IMPACTS	
			REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	MONITORING ACTIVITIES			
								Activity	Frequency		
Wastewater Treatment and Solids Generation (continued)	Secondary Treatment - Clarification and Storage	Aeration Basins	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Secondary Treatment SOP (SECY 01.001-02.003) Central Laboratory SOP's 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Filter Building (1-20 Filters), SO2 Office Central Laboratory 	<ul style="list-style-type: none"> Detention Time DO F/M Ratio (loading rate) Flow Microscopic Observation MLSS MLVSS Settleability Sludge Age pH WAS 	<ul style="list-style-type: none"> Detention Time DO F/M Ratio-loading rate Flow Microscopic Observation MLSS MLVSS Settleability test Sludge Age pH WAS 	<ul style="list-style-type: none"> continuous continuous calculated daily continuous 1/week daily daily 2/day calculated daily 1/week continuous 	<ul style="list-style-type: none"> Air Quality Biosolids Quality
		Secondary Clarifiers	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Secondary Treatment SOP (SECY 01.001, 03.001, 04.001-05.001) Central Laboratory SOP's 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Filter Building (1-20 Filters), SO2 Office Central Laboratory 	<ul style="list-style-type: none"> Ammonia Area Wide BOD & TSS Detention Time Flow Nitrates & Nitrites RAS (return rate) Return sludge % solids Settleability Sludge Level Waste sludge % solids 	<ul style="list-style-type: none"> Ammonia Area Wide BOD & TSS Detention Time Flow Nitrates & Nitrites RAS (return rate) Return sludge % solids Settleability Sludge Level Waste sludge % solids 	<ul style="list-style-type: none"> as needed daily continuous continuous Mar-Oct 1/wk; Nov-Feb 3/wk continuous daily 2/day 2/shift daily 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution Biosolids Quality
		Filtration	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Filtration SOP (FILF 01.001-04.001) 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Filter Building (1-20 Filters), SO2 Office Central Laboratory 	<ul style="list-style-type: none"> Backwash Rate Backwash Solids Sample BOD Filtration Rate Flow Head Loss In TSS & out TSS 	<ul style="list-style-type: none"> Backwash Rate Backwash Solids Sample BOD Filtration Rate Flow Head Loss In TSS & out TSS 	<ul style="list-style-type: none"> continuous daily daily continuous continuous continuous daily 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution
		Chlorination / Dechlorination	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Disinfection SOP (DSFN 01.001-05.002) 	N/A	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library SO2 Office 	<ul style="list-style-type: none"> Detention Time Dosage (poundage) Flow Residual on both 	<ul style="list-style-type: none"> Detention Time Monitor Dosage -poundage Flow Residual on both 	<ul style="list-style-type: none"> continuous continuous continuous continuous 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution
		Maintenance	<ul style="list-style-type: none"> VC Maintenance VC Plant Admin VC Plant Operations 	N/A	<ul style="list-style-type: none"> Maximo VCWRF SOPs 	<ul style="list-style-type: none"> PM Task Sheets 	<ul style="list-style-type: none"> VCWRF Computer Network 	N/A	<ul style="list-style-type: none"> Maximo Work Order System 	<ul style="list-style-type: none"> daily 	<ul style="list-style-type: none"> Surface and Groundwater Pollution Air Quality Biosolids
	Discharges	Effluent to River	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Monthly Effluent Report Central Laboratory SOP's 	N/A	<ul style="list-style-type: none"> VCWRF Administration Regulatory/Environmental Administrator Central Laboratory 	<ul style="list-style-type: none"> Effluent Monitoring for Characteristics Listed in Effluent Limitations and Monitoring Requirements -See Table in Permit Biomonitoring Cl2 Residual DO pH 	<ul style="list-style-type: none"> Flow CBOD TSS Ammonia/Nitrogen E.coli Effluent Chronic Biomonitoring-Freshwater <ul style="list-style-type: none"> 1. Water Flea (Ceriodaphnia dubia) 2. Fathead Minnow (Pimephales promelas) Effluent 24 Hour Acute Biomonitoring Cl2 Residual DO pH 	<ul style="list-style-type: none"> continuous daily daily daily 5/week quarterly biannually continuous continuous daily 	<ul style="list-style-type: none"> Surface and Groundwater Pollution
		Reclaimed Water	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services VC Maintenance Central Laboratory 	<ul style="list-style-type: none"> Reclaimed Water Permit 	<ul style="list-style-type: none"> Reclaimed Water SOP (RCLM 01.001-05.002) Operations Manual Pump Station #1 (Draft) Central Laboratory SOP's Reclaimed Water System Operations and Maintenance Manual (Draft) 	N/A	<ul style="list-style-type: none"> VCWRF Administration Regulatory/Environmental Administrator Filter Building (1-20 Filters) Central Laboratory 	<ul style="list-style-type: none"> CBODS Fecal Flow Turbidity COD 	<ul style="list-style-type: none"> CBODS Fecal (monthly, daily max) Flow Turbidity COD 	<ul style="list-style-type: none"> 2/week 2/week continuous 2/week 1/week 	<ul style="list-style-type: none"> Surface and Groundwater Pollution



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			REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	Activity			
								Frequency			
Solids Stabilization, Conditioning and Handling	Grit Removal	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Grit Removal SOP (GRIT 01.001-06.001) Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Digester Office 	<ul style="list-style-type: none"> Flow Weight (pressure) 	<ul style="list-style-type: none"> Flow Weight (pressure) 	<ul style="list-style-type: none"> continuous continuous 	<ul style="list-style-type: none"> Air Quality Biosolids Quality 	
	Gravity Thickeners	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Gravity Thickening SOP (THIK 01.001-04.001) Solids Loading Rates Hydraulic Overflow Rates Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Digester Office 	<ul style="list-style-type: none"> %Solids in and out %Solids on overflow and underflow Detention Time Flow 	<ul style="list-style-type: none"> %Solids in and out %Solids on overflow and underflow Detention Time Flow 	<ul style="list-style-type: none"> daily daily continuous continuous 	<ul style="list-style-type: none"> Air Quality Biosolids Quality 	
	Dissolved Air Flotation Thickeners (DAFT)	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Dissolved Air Flotation Thickeners SOP (DAFT 01.001-07.001) Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Filter Building (1-20 Filters) 	<ul style="list-style-type: none"> % Solids Air Bottom Sludge-TS Detention Time Float Sludge-TS Flow Polymer Dosage Substrate-TSS pH TSS on Influent 	<ul style="list-style-type: none"> % Solids (total or volatile?) Air Bottom Sludge-TS Detention Time Float Sludge-TS/VS Flow Polymer Dosage Substrate-TSS pH TSS on Influent 	<ul style="list-style-type: none"> daily 1/shift daily continuous 1/shift continuous 1/shift daily 1/wk 1/shift 	<ul style="list-style-type: none"> Air Quality Biosolids Quality 	
	Gravity Belt Thickeners	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Gravity Belt Thickening SOP (GBTK 01.001-06.001) Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Digester Office 	<ul style="list-style-type: none"> % Solids Detention Time Flow Polymer Dosage 	<ul style="list-style-type: none"> % Solids Detention Time Flow Polymer Dosage 	<ul style="list-style-type: none"> daily continuous continuous continuous when in operation. 	<ul style="list-style-type: none"> Air Quality Biosolids Quality 	
	Maintenance	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Maximo VCWRF SOPs 	<ul style="list-style-type: none"> PM Task Sheets 	<ul style="list-style-type: none"> VCWRF Computer Network 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Maximo Work Order System 	<ul style="list-style-type: none"> daily 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution Biosolids Quality 	
	Scum Removal & Grease Processing	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Scum Handling SOP (SCUM 01.001-03.001) 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Grease Handling Building 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Sludge Quality Biosolids Quality 	



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS	ROLES & RESPONSIBILITIES	OPERATIONAL CONTROLS						MONITORING ACTIVITIES		ENVIRONMENTAL IMPACTS
			REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	Activity			
								Frequency			
Solids Stabilization, Conditioning and Handling (continued)	Secondary Sludge RAS & WAS	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Secondary Treatment SOP (SECY 01.001, 04.001-05.001) Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Filter Building (1-20 Filters), SO2 Office 	<ul style="list-style-type: none"> Solids capture (95% min.) TS for both RAS and WAS 	<ul style="list-style-type: none"> Solids capture (95% min.) TS 	<ul style="list-style-type: none"> daily-calculated 3/wk 	<ul style="list-style-type: none"> Air Quality Biosolids Quality 	
	Blend Tank	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Digestion SOP (DIGR 03.001) Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Central Laboratory Digester Office 	<ul style="list-style-type: none"> Flow (Primary and Secondary) Max. Height Level Mixing Depth TS VTS pH Alkalinity Volatile Acids 	<ul style="list-style-type: none"> Flow Max. Height Level Mixing Depth TS VTS pH Alkalinity Volatile Acids 	<ul style="list-style-type: none"> continuous continuous continuous daily daily 1/wk 1/wk 1/wk 1/wk 	<ul style="list-style-type: none"> Air Quality Biosolids Quality 	
	Primary Sludge Pumps	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Primary Clarification SOP (PRIM 03.001) Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Headworks Primary Office Central Laboratory 	<ul style="list-style-type: none"> Sludge solids content measurement Sludge blanket TS VTS pH TSS 	<ul style="list-style-type: none"> Sludge solids content measurement Sludge blanket TS VTS pH TSS 	<ul style="list-style-type: none"> continuous 2/shift daily daily daily daily 	<ul style="list-style-type: none"> Sludge Quality 	
	Anaerobic Digestors	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 40 CFR Part 403 	<ul style="list-style-type: none"> Digestion SOP (DIGR 01.001, 02.001) Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Digester Office Central Laboratory 	<ul style="list-style-type: none"> Alkalinity Detention Time Flow Gas Comp. Gas Production Gas Volume Loading (%Solids, % Volatile Solids) pH Temperature Volatile acids Volatile Solids Reduction 	<ul style="list-style-type: none"> Alkalinity Detention Time Flow Gas Comp. Gas Production Gas Volume Loading -%Solids, % Volatile Solids pH Temperature Volatile acids Volatile Solids Reduction 	<ul style="list-style-type: none"> weekly continuous continuous 1/month continuous continuous 1/ week 1/ week continuous 1/ week 1/ week 	<ul style="list-style-type: none"> Air Quality Sludge Quality Biosolids Quality 	
	Digested Sludge Pumping	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Central Laboratory 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Digestion SOP (DIGR 01.001, 07.001) Regulatory Requirements Central Laboratory SOP's 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Digester office, Filter Buildig (Filters 1-20) Central Laboratory 	<ul style="list-style-type: none"> Flow %Solids % Volatile Solids Toxicity Characteristic Leaching Procedure (TCLP) pH Volatile Acids Alkalinity 	<ul style="list-style-type: none"> Flow %Solids % Volatile Solids TCLP pH Volatile acids Alkalinity 	<ul style="list-style-type: none"> continuous 1/ week 1/ week annually 1/ week 1/ week 1/ week 	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution 	
	Co-digestion	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Digestion SOP (DIGR 03.004) 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Digester Office 	<ul style="list-style-type: none"> Temperature Tank level Volume Feed rate to digesters 	<ul style="list-style-type: none"> Temperature Tank level Available volume Feed rate 	<ul style="list-style-type: none"> daily daily daily daily 	<ul style="list-style-type: none"> Sludge Quality Biosolids Quality 	
	Volatile Solids Reduction	<ul style="list-style-type: none"> VC Plant Operations VC Biosolids Personnel 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Biosolids SOP (BSLD 08.001) 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Library 	<ul style="list-style-type: none"> %TS %VS Sludge Flow Co-Digestion Flow 	<ul style="list-style-type: none"> %TS %VS Sludge Flow Co-Digestion Flow 	<ul style="list-style-type: none"> 2/week 	<ul style="list-style-type: none"> Biosolids Quality Vector Attraction Reduction 	
	Maintenance	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Maximo Plant SOPs 	<ul style="list-style-type: none"> PM Task Sheets 	<ul style="list-style-type: none"> VCWRF Computer Network 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Maximo Work Order System 	<ul style="list-style-type: none"> daily 	<ul style="list-style-type: none"> Air Quality 	



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS		ROLES & RESPONSIBILITIES		OPERATIONAL CONTROLS						ENVIRONMENTAL IMPACTS	
					REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	MONITORING ACTIVITIES		
										Activity		Frequency
Solids Stabilization, Conditioning and Handling (continued)	Electricity	Turbine Generators (Contractor Operations)	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Contractor 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 Federaal Operating Permit 01704 NSR Permit 7553 	<ul style="list-style-type: none"> REI Bio-Energy SOP 	<ul style="list-style-type: none"> Project Documents 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library VCWRF Turbine Building SOL Office 	<ul style="list-style-type: none"> Power production Gas consumed-3 sources (digester, landfill, utility) Amount of heat (to heat up digesters) 	<ul style="list-style-type: none"> Power production Gas consumed Amount of heat used 	<ul style="list-style-type: none"> daily daily daily 	<ul style="list-style-type: none"> Air Quality 	
		Heat Recovery Steam Generator (HRSG) & Steam Systems	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> NSR Permit 7553 Federaal Operating Permit 01704 	<ul style="list-style-type: none"> REI Bio-SOP-HRSG REI Bio-SOP-SS 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Heat recovery of exhaust from digester and landfill gas 	<ul style="list-style-type: none"> Amount of steam produced (lbs) 	<ul style="list-style-type: none"> daily 	<ul style="list-style-type: none"> Air Quality 	
		Steam turbine blowers	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> To be developed by Tech Services 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Amount of air going to aeration basins 	<ul style="list-style-type: none"> Amount of air 	<ul style="list-style-type: none"> continuous 	<ul style="list-style-type: none"> Air Quality 	
	Plant Air Quality Control	Stacked Tower	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Stacked Tower SOP to be developed Period of storage Receptors, neighbors, county-Air Quality complaint form Climatic conditions/time (season) of year Physical, chemical, biological characteristics of biosolids 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library VCWRF Associated Process Area 	<ul style="list-style-type: none"> H2S Level of chemicals NaOH Feed Rate Air Quality pH 	<ul style="list-style-type: none"> H2S Level of chemicals- caustic NaOH Feed Rate Air Quality pH 	<ul style="list-style-type: none"> as needed daily daily as needed daily 	<ul style="list-style-type: none"> Air Quality 	
		Biofilters	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Biofilter SOP to be developed Period of storage Receptors, neighbors, county-Air Quality complaint form Climatic conditions/time (season) of year Physical, chemical, biological characteristics of biosolids 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations 	<ul style="list-style-type: none"> Hours of operation H2S Air Quality Sprinklers Fan capacity Weeds Wood Chips 	<ul style="list-style-type: none"> Hours of operation monitoring H2S Air Quality Check sprinklers for working condition Fan capacity Weeds Wood Chips 	<ul style="list-style-type: none"> continuously as needed as needed 1/day continuously as needed as needed/replaced every 3 to 4 yrs 	<ul style="list-style-type: none"> Air Quality 	
		Unit Process enclosure/covers (Plant and Dewatering Site)	<ul style="list-style-type: none"> VC Plant Admin VC Plant Operations VC Tech Services Renda Environmental VC Maintenance 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> Physical, chemical, biological characteristics of biosolids Receptors, neighbors, county-Air Quality complaint form Climatic conditions/time (season) of year Period of storage Process Enclosure Specifications 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> VCWRF Operations VCWRF Library Digester SOP Manual 	<ul style="list-style-type: none"> H2S Air Quality 	<ul style="list-style-type: none"> H2S Air Quality 	<ul style="list-style-type: none"> as needed as needed 	<ul style="list-style-type: none"> Air Quality 	
		<ul style="list-style-type: none"> Packed Tower Scrubbers Weir Covers and Air Capture Primary Clarifiers Covers for Thickeners Biofilter Preventive / Corrective Maintenance 		<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Maximo VCWRF SOPs 	<ul style="list-style-type: none"> PM Task Sheets 	<ul style="list-style-type: none"> VCWRF Computer Network 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Maximo Work Order System 	<ul style="list-style-type: none"> daily 		

BIOSOLIDS EMS MANUAL

ELEMENT 3.0

CRITICAL CONTROL POINTS-MASTER TABLE



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS	ROLES & RESPONSIBILITIES	OPERATIONAL CONTROLS							ENVIRONMENTAL IMPACTS	
			REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	MONITORING ACTIVITIES			
								Activity	Frequency		
Solids Stabilization, Conditioning and Handling (continued)	Belt Press (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental (REI) 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 	<ul style="list-style-type: none"> REI Dewatering Facilities SOP Manual REI Polymer addition/mixing SOP REI Corrective action and emergency procedures SOP REI Biosolids sampling schedule and SOP REI Percent Solids SOP REI Housekeeping SOP 	<ul style="list-style-type: none"> Pumps, belt press, controls maintenance and lubrication schedule Belt press spersonnel training Personnel training records Percent Solids recordkeeping 	SOL Office	Solids testing by oven	Solids testing by oven	daily	Biosolids Quality	
	Post Lime Stabilization (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 	<ul style="list-style-type: none"> REI Dewatering Facilities SOP Manual REI Lime stabilization process SOP REI Lime spill cleanup SOP REI pH testing SOP REI Corrective action and emergency procedures SOP 	<ul style="list-style-type: none"> Lime Silo and mixer maintenance & lube schedule Lime use records pH sampling schedule pH testing records Belt press spersonnel training Belt press personnel training records 	SOL Office	pH	pH	daily	<ul style="list-style-type: none"> Pathogen Control Surface and Groundwater Pollution Air Quality Lime spill 	
	Post Digestion Treatment with Ferric Chloride	<ul style="list-style-type: none"> VC Residuals / Biosolids 	<ul style="list-style-type: none"> TPDES Permit 	<ul style="list-style-type: none"> SOP to be developed 	N/A	N/A	N/A	<ul style="list-style-type: none"> Dosage (gallons/gallons sludge) Tank level 	Tank level	<ul style="list-style-type: none"> Daily Daily 	<ul style="list-style-type: none"> Biosolids Quality Air Quality
	Drying Beds (Emergency Use)	<ul style="list-style-type: none"> VC Residuals / Biosolids 	<ul style="list-style-type: none"> TPDES Permit Water Department 1999 Facilities Plan 	<ul style="list-style-type: none"> Drying bed SOP Emergency Division SOP 	<ul style="list-style-type: none"> Drying bed records 	VCWRF Library	Inactive	N/A	N/A	N/A	<ul style="list-style-type: none"> Air Quality Vector Attraction Surface and Groundwater Pollution
Solids Storage and Transportation	Truck Loading (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 Contractor SOP 	<ul style="list-style-type: none"> REI Transportation SOP Manual REI Certification of scales SOP REI Loader SOP REI Tare weights SOP REI Load ticket SOP REI Overweight truck SOP REI Housekeeping SOP REI Post loading-pre trip SOP Contract documents Regulatory requirements (TxDOT, TCEQ, EPA) REI Dewatering Facility SOP Manual 	<ul style="list-style-type: none"> Certification of scales records Tare weights schedule Tare weights records Load ticket records Driver training Driver training records Post loading-pre trip records VCWRF Sewer Project 460300020 See Element 4.0 Belt press personnel training Belt press personnel training records 	SOL Office	<ul style="list-style-type: none"> Driver/Operator load & tail gate inspection Truck scale calibration Truck tare weight verification Weather & traffic conditions 	<ul style="list-style-type: none"> Driver/Operator load & tail gate inspection Truck scale calibration Truck tare weight verification Weather & traffic conditions 	<ul style="list-style-type: none"> each load quarterly q.tly. at owners request each load 	<ul style="list-style-type: none"> Road damage due to overweight trucks Biosolids Tracked on roads 	
	Transportation Routes (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 	<ul style="list-style-type: none"> REI Vehicle maintenance SOP REI Transportation SOP Manual REI Manifest SOP REI Drivers post loading-pre trip SOP REI Accident and spill response SOP REI Routing SOP VCWRF Sewer Project 4670460300020 Contract documents 	<ul style="list-style-type: none"> Vehicle maintenance records Driver training Driver training records Manifest records Drivers post loading-pre trip records 	SOL Office	<ul style="list-style-type: none"> Log in destination on haul ticket Weather & traffic conditions 	<ul style="list-style-type: none"> Log in destination on haul ticket Weather & traffic conditions 	<ul style="list-style-type: none"> each load daily 	<ul style="list-style-type: none"> Traffic Accidents Biosolids Spill 	
	Truck Unloading (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 	<ul style="list-style-type: none"> REI Transportation SOP Manual REI Land Applications SOP Manual REI Truck loading SOP REI Staging area SOP Regulatory requirements (TxDOT, TCEQ, EPA) 	<ul style="list-style-type: none"> Driver training Driver training records Contract documents VCWRF Sewer Project 460300020 	SOL Office	Site inspection	Site inspection	daily	<ul style="list-style-type: none"> Truck Tipping Over Air Quality Surface and Groundwater Pollution 	
	Spill Prevention / Response (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 	<ul style="list-style-type: none"> REI Spill prevention/response plan 	<ul style="list-style-type: none"> See Element 11 	<ul style="list-style-type: none"> VCWRF Administration SOL Office Truck Cab 	<ul style="list-style-type: none"> Driver/loader Checklist & Observation 	<ul style="list-style-type: none"> Driver/loader Checklist & Observation 	each load	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution 	
	On Site Storage Areas & Truck Loading Areas (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> Sewer Contract PS4670460300020 	<ul style="list-style-type: none"> Contract documents REI Housekeeping SOP REI Storage area SOP Belt press personnel training Belt press personnel training records 	<ul style="list-style-type: none"> VCWRF Sewer Project 4670460300020 REI Transportation SOP Manual REI Land Application SOP Manual REI Dewatering Facility SOP manual 	SOL Office	<ul style="list-style-type: none"> Site Inspection pH sampling 	<ul style="list-style-type: none"> Site Inspection pH sampling 	<ul style="list-style-type: none"> daily 4/day or when belt presses are turned on and off 	<ul style="list-style-type: none"> Biosolids tracked around facility Air Quality 	
	Staging at Land Application Site (Contractor Operation)	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> 40 CFR Part 503.14 	<ul style="list-style-type: none"> REI Staging area SOP Land application crew training Land application crew training records Public complaint SOP Public complaint records 	<ul style="list-style-type: none"> REI Land Application SOP Manual REI Administrative SOP Manual 	SOL Office	Site Inspection	Site Inspection	when used	<ul style="list-style-type: none"> Air Quality Surface and Groundwater Pollution 	
	Wet Weather Storage at SOL	<ul style="list-style-type: none"> VC Residuals / Biosolids Renda Environmental 	<ul style="list-style-type: none"> 40 CFR Part 503 Subpart B 	<ul style="list-style-type: none"> REI SOL pad storage SOP REI Public complaint SOP REI Dewatering Facility SOP manual 	<ul style="list-style-type: none"> REI Land Application SOP Manual Public complaint records REI Belt press personnel training REI Belt press personnel training records REI Administrative SOP Manual 	SOL Office	Site Inspection	Site Inspection	when used	<ul style="list-style-type: none"> Air Quality 	

BIOSOLIDS EMS MANUAL

ELEMENT 3.0

CRITICAL CONTROL POINTS-MASTER TABLE



BIOSOLIDS VALUE CHAIN	CRITICAL CONTROL POINTS	ROLES & RESPONSIBILITIES	OPERATIONAL CONTROLS								ENVIRONMENTAL IMPACTS
			REGULATORY DOCUMENTS	STANDARD OPERATING PROCEDURES	OTHER DOCUMENTS	LOCATION OF SOP	KEY OPERATIONAL PARAMETERS	MONITORING ACTIVITIES			
								Activity	Frequency		
Biosolids Use and Disposal Alternatives	Land Application Sites • Privately Owned • City Owned (Contractor Operation)	• VC Residuals / Biosolids • Renda Environmental	• TPDES Permit • REI SOP • Sewer Contract PS4670460300020	• REI Transportation SOP Manual • REI Truck routing SOP • REI Staging area SOP • REI Land Application SOP Manual • REI Site notification SOP • REI Public complaint SOP • REI Administrative SOP Manual • Regulatory Requirements (EPA, TCEQ)	• Driver training • Driver training records • Land application crew training • Land application crew training records • Site notification records • Public complaint records • See Element 4.0	• SOL Office	• Polychlorinated Biphenyls (PCBs) • Metals • 2 Grab Samples • Pathogen Control • Enteric Viruses & Viable Helminth Ova • Fecal Coliform • TCLP	• Polychlorinated Biphenyls (PCBs) • Metals • Pathogen Control • Raise the pH to 12 • Fecal Coliform • TCLP	• annually, monthly • monthly • Enteric Virus-1/month • Helminth Ova-2/month • Daily when turning belt presses on and off • 2/mo • annually	• Aesthetics • Air Quality	
	Agricultural Land Application Site Selection (Contractor Operation)	• VC Residuals / Biosolids • Renda Environmental	• TPDES Permit • 40 CFR Part 503.12 (j)	• REI Site selection SOP • REI Public complaint SOP • REI Land Application SOP Manual • REI Administrative SOP Manual	• Public complaint records	• SOL Office	• Site Application	• Site Application	• when requested	• Air Quality • Surface and Groundwater Pollution	
	Field Operations (Contractor Operation)	• VC Residuals / Biosolids • Renda Environmental	• 40 CFR Part 503.14	• REI Land application SOP • REI Wet weather SOP • REI Public complaint SOP • REI Biosolids sampling SOP • REI Biosolids Analysis SOP • REI Administrative SOP Manual • REI Dewatering Facility SOP Manual • Regulatory Requirements (EPA, TCEQ)	• Land application crew training • Land application crew training records • Public complaint records • Biosolids analysis records • See Element 4.0	• SOL Office	• Best Management Practices • Site Inspections	• Best Management Practices • Site Inspection	• each site • When site completed or at least 1 /month	• Air Quality • Surface and Groundwater Pollution • Exceeding Loading rate • Exceeding metals loading rate	
	Nutrient Management (Contractor Operation)	• VC Residuals / Biosolids • Renda Environmental	• 40 CFR Part 503.14(d)	• REI Land Application SOP • REI Scheduling SOP • REI Biosolids Sampling SOP • REI Biosolids Analysis SOP • Regulatory requirements	• Land Application Crew Training • Land Application Crew Training Records • REI Dewatering Facility SOP manual • REI Administrative SOP Manual • Biosolids Analysis Records • See Element 4.0	• SOL Office	• Agronomic Rate	• Agronomic Rate Calculation	• each site	• Exceeding Agronomic Loading Rate • Air Quality • Surface and Groundwater Pollution • Poor Crop or Forage Quality • Human and Animal Contact with Pathogens	
	Landfill Disposal of Off-Spec Biosolids (Emergency Use)	• VC Plant Admin • VC Residuals / Biosolids • Renda Environmental	Sewer Contract PS4670460300020 • TPDES Permit • TAC 312, 330	• REI Landfill Disposal SOP	• REI Land Application SOP Manual • VCWRF Sewer Project No. • PS46-070-460300020 • Change Order 4	• VCWRF Library • SOL Office	• Truck Weights	• Truck Weights-each truck load	• when trucks used	• Air Quality • Reduce landfill capacity	