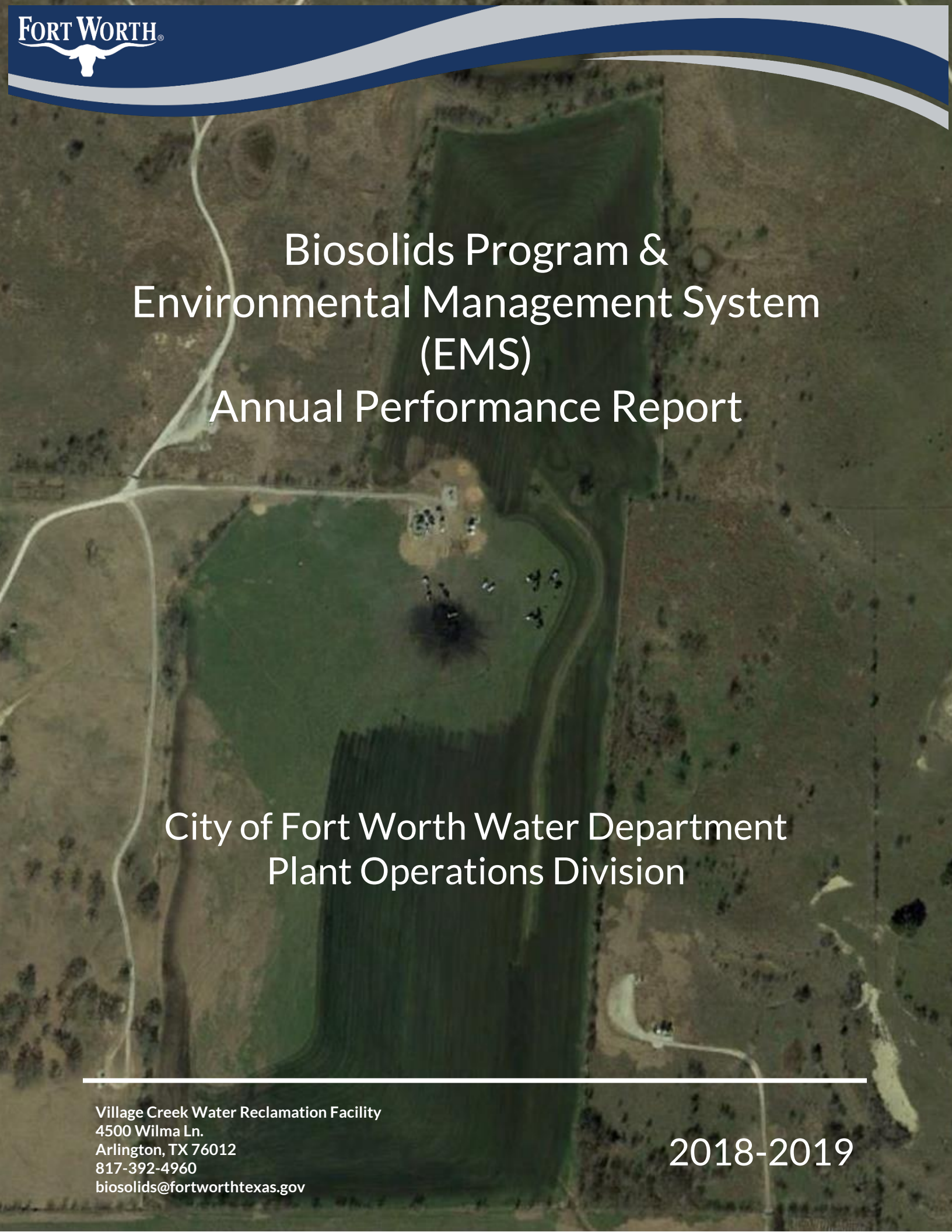

Biosolids Program & Environmental Management System (EMS) Annual Performance Report

City of Fort Worth Water Department
Plant Operations Division

Village Creek Water Reclamation Facility
4500 Wilma Ln.
Arlington, TX 76012
817-392-4960
biosolids@fortworthtexas.gov

2018-2019

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INTRODUCTION

The City of Fort Worth's biosolids program is a public/private partnership in which the contractor, Renda Environmental, Inc. (REI), is responsible for processing, dewatering, transporting, and performing beneficial land application of biosolids produced from the Village Creek Water Reclamation Facility (VCWRF). REI is under contract to provide these services until March 31, 2020.

Annual Performance Report (APR)

This APR summarizes Fort Worth's Biosolids Program performance, biosolids production and reuse, goals and objectives, EMS activities, public outreach, and the commitment towards continual improvement. This report and other biosolids information on operations and activities are detailed on the City's website.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

The biosolids EMS is a systematic approach that helps the City to continually improve activities that are associated with environmental performance. The National Biosolids Partnership (NBP) sets standards and guidelines that the City's EMS must achieve in order to receive and maintain NBP certification. A properly implemented EMS assists the City's Biosolids Program with the following:

- Identifying the overall goals and objectives of the Biosolids Program
- Creating a series of management practices to meet the goals and objectives
- Managing biosolids activities and monitoring and measuring the effectiveness of the program
- Taking corrective and preventative measures if the management practices are not operating correctly
- Conducting audits of the Biosolids EMS Program
- Requiring management involvement to make changes to the program as needed

National Biosolids Partnership (NBP)

The National Biosolids Partnership is a voluntary partnership between the National Association of Clean Water Agencies (NACWA) and Water Environment Federation (WEF). NBP is committed to developing and advancing environmentally sound and sustainable biosolids best management practices through comprehensive management systems. The mission of the NBP is to advance the understanding and adoption of effective practices in biosolids management and offer:

- Education and training;
- Technical assistance;
- An information clearinghouse; and
- An EMS-based third-party certification program for biosolids management systems.

Due to the maturity of the Fort Worth Biosolids Program, the City continues to certify at the Platinum Level with the NBP.

Figure 5. The City of Fort Worth's EMS has been certified by the NBP since July 2005.

PROGRAM SUMMARY

The following information summarizes the breadth of the Biosolids Program and its EMS. During 2018-2019 reporting year, the Biosolids Program utilized approximately 20% of the total Plant Operations Division budget. Isolating the wastewater budget from the total budget for the Plant Operations Division, biosolids utilized 39%.

Beneficial Reuse and Disposal

During the past reporting year (August 1, 2018-July 31, 2019), the City of Fort Worth's Biosolids Program beneficially reused and recycled 99.5% (excluding lime) of its Class AB biosolids and landfilled 0.5%.

Goals and Objectives

Every quarter, goals and objectives for the biosolids program are updated. During the reporting year, the biosolids program has been making progress towards 5 goals. These goals include:

- **Increasing digested feed sludge to 5%**
  The purpose of this goal was to look into new thickening technology (rotary drum thickeners) that could replace the Dissolved Air Flotation Thickeners (DAFTs). In April 2017, the scope of the thickening project associated with this goal changed to include improvements to the Gravity Belt Thickeners (GBTs) and replacing the Gravity Thickeners. Project design reached 60% in May 2019, and it is estimated that the project will reach 100% design completion by December 2019.
- **Increasing percent solids of biosolids (prior to lime addition) by 3%**
  This goal was created in December 2014 during a year the biosolids program was experiencing dewatering and odor issues and after the ferric chloride system was brought online to mitigate these issues. The average percent solids for biosolids (prior to lime addition) for 2014 was 15.25%. The effectiveness of the ferric chloride addition (along with chlorine dioxide) has been apparent with relatively consistent yearly averages for percent solids of 16.90, 17.10, 16.62, and 16.86 for 2015, 2016, 2017, and 2018 respectively. During the reporting period, refurbishment work began on one of the four original belt-filter presses. Work on this press is nearing completion and it should be back in service by October 4, 2019. At that time, a second press will be taken offline for refurbishment.
- **Increasing biosolids storage capacity from 1.3 MG to 6.3 MG**
  This goal was developed in June 2015 for the purpose of increasing sludge storage capacity to allow for more flexibility during inclement weather and operational and maintenance situations, which will help improve biosolids management practices and odor performance. Construction of a 5 million gallon concrete storage tank began in December 2018. Foundation work has been completed and the walls put in place. Preload activities (shockcrete; wrapping with steel cables) are underway and should be completed by October 2019. Work still needs to be done on the electrical infrastructure and yard piping. The project is expected to be completed by February 2020.
- **Increase the input of concerns for biosolids.**
  A new goal was developed in March 2019, to increase biosolids feedback from the public by 10%, with a focus on trying to obtain comments from stakeholders. Action plans included developing an on-line biosolids survey, advertising the survey on the land application signs and Frequently Asked Questions (FAQs) sheets, and evaluating responses. The survey has been developed and posted on-line as of July 2, 2019. Additionally, a pilot biosolids-only presentation was given at University of Texas at Arlington (UTA) on December 4, 2018. Based on the success of that presentation, an action plan was developed to increase biosolids-only presentations. Four more are scheduled at Texas Christian University (TCU) and UTA in November and December 2019, respectively. In the future, the same number of biosolids only presentations will likely be given twice every year, during the fall and spring semesters.
- **Reducing the amount of lime (tons) used per month by 50%**
  In late 2016, chlorine dioxide was formally approved to be used for improving odor performance of the biosolids as well as eliminating pathogens. The addition of chlorine dioxide (working in tandem with ferric chloride) has improved odors as well as increased percent solids of the biosolids. In March 2018, a lime reduction study was conducted to determine if lowering the pH from 12 to 11 would allow for effective pathogen control. Due to weather delays and peak flow basin usage, the study was never completed. Furthermore, the City has decided to stick with Vector Attraction Reduction Alternative #6 for permit

compliance, which mandates a pH adjustment to 12. As such, lime usage will not be reduced and this goal & objective has been closed out.

- **Design, build, operate & maintain a new biosolids processing facility**
  The Biosolids Master Plan was finished in January 2019. This document calls for the construction of a new biosolids processing facility to produce Class A biosolids via thermal drying. The City is moving aggressively to get this project in motion. Contract documents are currently being developed and issued for a third party contractor to design, build, operate and maintain the proposed processing facility. The current schedule is to have the new facility built and in operation by the summer of 2022.

- **Grit Improvement Project**
  The purpose of this project is to improve the influent grit removal process at Village Creek. The improvements are designed to remove 95% of 105-micron particles or larger, which will help reduce grit repair related activities throughout Village Creek. The project also includes a low-lift influent lift station to route flow from the south around to the headworks building.

Audits

An internal audit was conducted on August 28 and 29, 2019. A third-party EMS external audit was held on October 24 through 26, 2018. The results of the audit were highly positive, as it was first audit that had no major or minor nonconformances in 12 years. Copies of these reports can be found on the City's biosolids EMS webpage.

Public Outreach

The 2018-2019 reporting year saw a continuation of public outreach efforts for the Fort Worth Biosolids Program. Infotubes with Frequently Asked Question (FAQs) sheets continued to be available at the land application site entrances. From August 2018 to July 2019, 27 land application sites received biosolids application and approximately 44% of the FAQ sheets that were made available at these sites were taken; an increase from last year.

From August 2018 to July 2019, 728 individuals experienced a tour at VCWRF. These tours include information regarding the biosolids program. Tour numbers were down compared to last year due to limited available manpower (position vacancies). However, with the position vacancies now filled, it is likely that tour numbers will increase for the next reporting year.

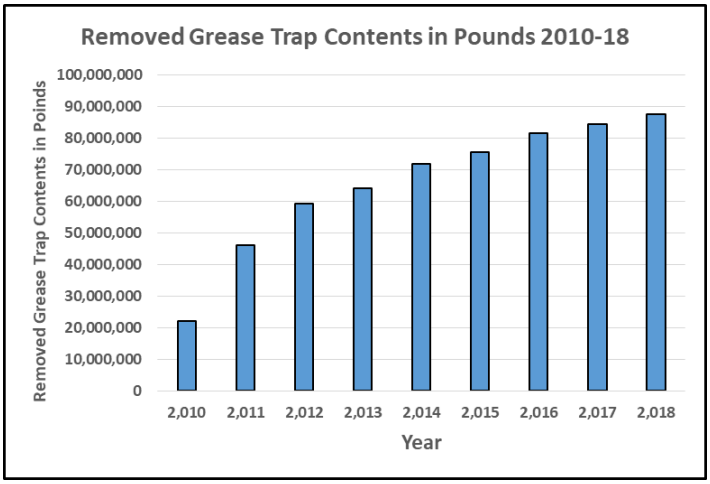
Pretreatment Services

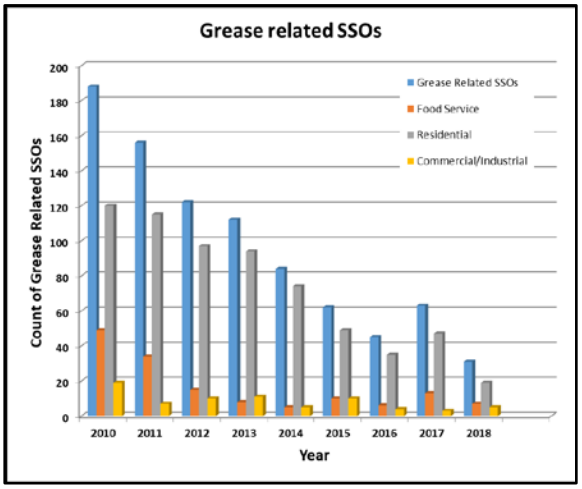
Every November, Pretreatment Services recognizes those industrial facilities that have achieved compliance excellence and performance by complying with regulatory and permit requirements. In November 2018, 99 of 140 industries were 100% compliant. Of these industries, 1 facility received a Platinum award (20 or more years of 100% compliance), 7 facilities received a Stewardship award (11 or more years of 100% compliance), 50 received a Partnership award (3-10 years of 100% compliance), 19 received an Associate award (2 years of 100 % compliance) and 22 received a Star award (1 year of 100% compliance). Three industries received Pollution Prevention awards for their efforts in using materials, processes, or practices that reduce or eliminate wastes and one facility received Industry of the year award for a Fort Worth industry that has demonstrated 5 or more years of consistent compliance and significant pollution prevention activities.

Pretreatment Services continues to have success with their Fats, Oil, and Grease (FOG) Abatement Program that regulates Food Services Establishments (FSEs). The following graphs illustrate the decline in sanitary sewer overflows the City has experienced as a result of the FOG Abatement Program and the quantity of grease removed from grease traps.

Pretreatment services also has a comprehensive monitoring program that samples the collection system, as well as the influent and effluent of the Village Creek Water Reclamation Facility on a monthly basis. Any abnormal data from the monthly monitoring at VCWRF can be investigated using data from the system-wide sampling. A follow-up plan that segregates the locations of interest is used to conduct investigations, inspections and monitoring of

facilities in the surrounding areas. Heavy metals have consistently been under the Maximum Allowable Headworks Loadings (MAHL).





All of Pretreatment Service's efforts protect the Village Creek Water Reclamation Facility and ensure that effluent discharges comply with state and federal requirements. In turn, this protects the quality of the biosolids as, it too, is tested monthly for heavy metals and other pollutants of concern.

ACCOMPLISHMENTS FOR 2018-2019 REPORTING YEAR

- Since the last reporting year, the Biosolids Program has made progress toward achieving its EMS goals and objectives. A copy of the current goals and objectives is included in Appendix B.

- The Biosolids Communication Plan was finalized in October 2018. This plan serves as a living document to be revised and expanded as public outreach strategies change or are implemented. The overall objectives of the Plan is to inform the public of the existence of the program, educate them on its process and scope, and correct misinformation regarding the safety and environmental aspects of biosolids.

- The Biosolids Program saw an addition of 18 new land application sites this past reporting year. This is the largest number of site additions in one reporting year since 2005. The strong demand for the City of Fort Worth's biosolids indicate this type of fertilizer/soil amendment continues to be an attractive option for local farmers and ranchers.

- The Biosolids Master Plan was completed in January 2019. This document is being used as a roadmap to help the City transition to a new biosolids processing solution for the next two decades. The City is currently developing and issuing contract documents to have a third party company design, build, operate and maintain a new biosolids facility that will produce Class A biosolids, as called for in the Master Plan.

- No Corrective Action Notices (CANs) were issued during the reporting period.

BIOSOLIDS MANAGEMENT PROGRAM

Annual Biosolids Reporting Period	August 1st, 2018 to July 31st, 2019
Registration/Permit Number:	TPDES #10494-013
Transporter No.:	TCEQ--#21942(Renda Environmental, Inc.) TXDOT--#45267C (Renda Environmental, Inc.)
Type of biosolids produced:	Class AB (TCEQ)
Amount of biosolids beneficially reused/recycled:	29,878.98 dry tons (without lime)
Amount of biosolids beneficially reused/recycled:	27,105.8 dry metric tonnes (without lime)
Percentage of biosolids beneficially reused/recycled:	99.5%

Biosolids Production

The City of Fort Worth produces biosolids at the City's dewatering facility located north VCWRF. During 2018-2019, 29,878.9 dry tons (without lime) of biosolids were produced. Due to inclement weather and odor concerns, 148.6 dry tons were landfilled.

The biosolids are anaerobically digested and dewatered by belt filter press to produce a cake product that is 16% to 18% solid (without lime). Lime is added to the biosolids after dewatering to ensure compliance with the pathogen requirements in the Texas Pollutant Discharge Elimination System (TPDES) permit. The biosolids are then land applied by Renda Environmental, Inc., the City's contractor.

Table 1. Number of Biosolids Program landowners per county plus site acreage.

Landowner Participation by County				
Counties	**Landowners**	**Noticed Sites**	**Noticed Acres**	**Percent of Total Acreage**
Denton	2	2	250	0.4%
Ellis	3	8	2,692	5%
Hill	9	22	6,909	12%
Hood	4	7	7,783	13%
Johnson	18	38	16.064	27%
Parker	4	4	12,389	21%
Tarrant	5	5	2,192	4%
Wise	18	24	11,507	19%
TOTAL	**54**	**89**	**59,786**	**100%**

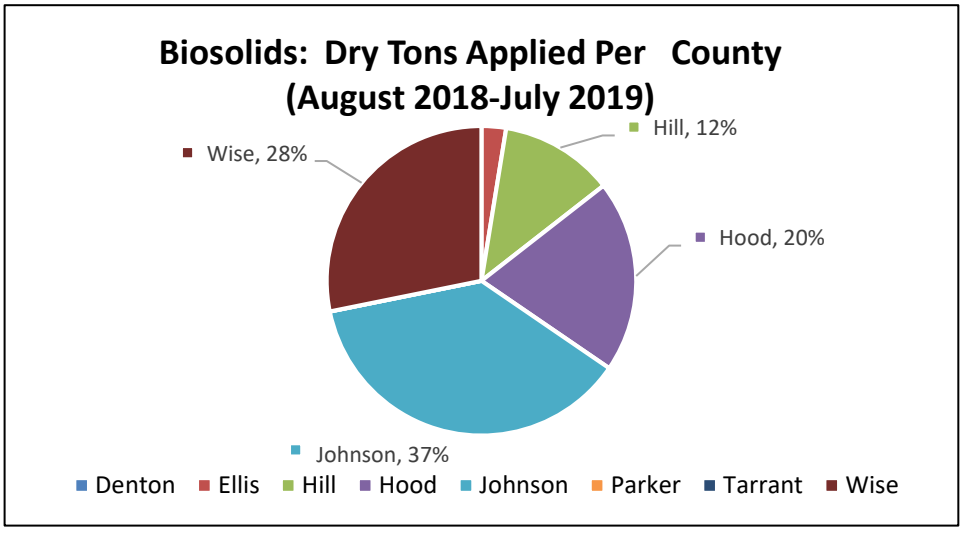


Figure 3. Percent of dry tons applied in each county during August 2018-July 2019.

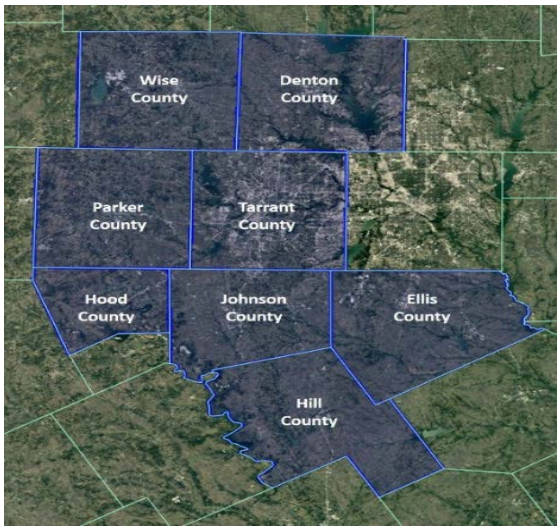


Figure 4. Counties in the City's Biosolids Program that can receive land application.

Beneficial Reuse Options and Management Practices
Biosolids produced at VCWRF were properly processed, monitored, and agronomically land applied to thousands of acres of farm and pasture land in neighboring counties. The biosolids serve as an excellent soil amendment and add to the nutrient value to crops and grasses. For the 2018-2019 reporting year, Wise, Hood, Johnson, Ellis, and Hill counties received land application of biosolids.

Contractor Performance
Biosolids operations in Fort Worth are handled by REI. REI operates and maintains the belt filter presses and all auxiliary equipment and continually monitors and tracks the amount of biosolids applied to each land application site.

REI is responsible for:

- Operation of the dewatering facility and further processing of the biosolids by belt-filter press dewatering;
- Transportation of biosolids material;
- Land application to beneficially reuse the biosolids produced at VCWRF;
- Posting signage at land application sites that include contact information;
- Daily odor monitoring at land application sites and;
- Performing necessary biosolids sampling for permit compliance.

City Oversight/Inspections
City personnel perform daily visits and inspections to the dewatering facility and land application sites to ensure that the contractor is following best management practices concerning biosolids dewatering, transportation and land application.

While a site is undergoing land application, City personnel will perform a site inspection detailing weather conditions, truck conditions, haul road conditions, and overall site conditions. An olfactometer is used to help quantify odors and establish an odor monitoring history at the land application sites.

When a land application site reaches completion, a final close-out visit is conducted by City personnel. This final site visit is performed to ensure that all biosolids material has been properly applied and all equipment has been removed. From August 1, 2018 to July 31, 2019, city personnel performed 270 land application site visits.

Monitoring and Measurement
By City contract, REI uses an independent certified laboratory to analyze the biosolids produced at VCWRF. Samples of biosolids are taken from the process areas and analyzed for fecal coliform, pathogens, metals, Polychlorinated Biphenyls (PCBs), Toxicity Characteristic Leaching Procedure (TCLP), pH, and percent solids. Sampling frequency is established by the TPDES permit for VCWRF. By contract, REI must meet or exceed regulatory requirements detailed in the TPDES permit which can be found summarized in Table 2.

Biosolids samples are analyzed monthly for metals and PCBs. For 2018-2019, all metal concentrations were significantly below Table 1 ceiling concentration limits and Table 3 pollutant concentrations as required by 40 CFR 503 and 30 TAC 312, for the use or disposal of sewage sludge. The metals and PCB concentrations are shown in Table 3. In addition, the City and REI collect biosolids samples which undergo Toxicity Characteristic Leaching Procedure (TCLP) analysis. Three TCLP samples were collected during the 2017-2018 reporting year. All samples were compliant with TCLP standards.

Table 2. Monitoring Requirements associated with the City's Biosolids Program

TPDES CLASS AB BIOSOLIDS MONITORING METHODS AND FREQUENCY	
Pathogen Control	30 TAC 312.82 (a) Alternative 4
	• Fecal Coliform Density <1000 MPN* • Enteric Virus Density <1 Plaque-forming unit per 4 gram total solids** • Viable Helminth Ova Density <1 per 4 grams total solids**
Vector Attraction Reduction	30 TAC 312.83 (b) (1-8) Alternative 1 or 6
	• Alternative 6: pH of sewage sludge shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for two hours and then remain at a pH of 11.5 or higher for an additional 22 hours
MONITORED ITEM	**FREQUENCY**
Fecal Coliform	Two (2) times per month
Pathogens	Two (2) times per month
Metals	Monthly
PCBs	Monthly
TCLP	Two (2) times per year
pH	Operation Process-Daily; Regulatory Compliance- Weekly (if using Alternative 6 for Vector Attraction Reduction)
% Total Solids	Daily
* Most Probable Number	
** Dry Weight Basis	

During the 2018-2019 reporting period the Fort Worth Biosolids Program was compliant with the following TPDES monitoring requirements:

- Helminth Ova
- Enteric Virus
- Metals
- Toxicity Characteristic Leaching Procedure (TCLP)
- Polychlorinated Biphenyl (PCB)
- Odor Log Monitoring Requirements
- Fecal Coliform

In August 2018 and April 2019, the City attempted to use Vector Attraction Reduction Alternative #1 for permit compliance. However, less than optimal volatile solids performance in the anaerobic digesters resulted in the City switching back to Vector Attraction Reduction Alternative #6 for regulatory compliance. Alternative #6 was used for most of year. It is important to note that during the 2 months when Vector Attraction Reduction Alternative #1 was being utilized, VCWRF continued to add lime to the biosolids to adjust the pH to over 12. Maintaining a pH of 12 ensured good pathogen kill even during those times when the volatile solids reduction performance was not optimal.

Table 3. VCWRF's permit required metal sampling results from August 2018 to July 2019.

METAL AND PCB CONCENTRATION (REPORTED IN MG/KG DRY WEIGHT BASIS)											
Year 2017-2018	As mg/kg	Cd mg/kg	Cr mg/kg	Cu mg/kg	Pb mg/kg	Hg mg/kg	Mo mg/kg	Ni mg/kg	Se mg/kg	Zn mg/kg	PCB mg/kg
NPDES Permit Limits (Table 1)	*75*	*85*	*3000*	*4300*	*840*	*57*	*75*	*420*	*100*	*7500*	*n/a*
NPDES Permit Limits (Table 3)	*41*	*39*	*1200*	*1500*	*300*	*17*	*****	*420*	*36*	*2800*	*n/a*
August	12.00	0.00	28.40	366.00	16.50	0.22	42.30	21.20	0.00	576	0.00
September	0.00	0.00	10.20	117.00	5.50	0.33	0.00	8.10	0.00	154	0.00
October	16.10	2.90	39.80	435.00	26.90	0.51	27.30	28.90	0.00	539	0.00
November	16.20	0.00	34.60	365.00	18.80	0.31	0.00	23.70	12.90	499	0.00
December	12.50	0.00	36.30	417.00	21.20	0.39	0.00	22.90	0.00	566	0.00
January	10.40	0.00	48.50	444.00	21.20	0.53	23.90	30.00	9.80	633	0.00
February	8.50	0.00	35.50	338.00	11.10	0.39	0.00	19.70	9.30	442	0.00
March	7.50	0.00	42.20	438.00	21.40	0.54	0.00	25.70	0.00	555	0.00
April	7.70	0.00	35.20	414.00	20.20	0.49	0.00	18.20	0.00	523	0.00
May	11.00	0.00	33.50	376.00	18.20	0.31	0.00	21.40	6.10	519	0.00
June	8.30	0.00	28.30	320.00	20.40	0.33	0.00	12.50	5.00	424	0.00
July	7.70	0.00	46.30	465.00	23.10	0.35	0.00	33.10	0.00	609	0.00
Yearly Avg. Metals Conc.	**9.83**	**0.24**	**34.90**	**374.58**	**18.71**	**0.39**	**7.79**	**22.86**	**3.59**	**5.03**	**ND**
Highest Monthly Conc.	**16.20**	**2.90**	**48.50**	**465.00**	**26.90**	**0.54**	**42.30**	**33.10**	**12.90**	**633.00**	**ND**
***No limit established by federal regulations											
Pathogen Requirement Achieved: Class AB				Pathogen Reduction Alternative Used: Alternative 4				Vector Attraction Reduction Alternative Used: Alternative 6			

EMS Activities and Timeline

The EMS manual was updated periodically throughout the reporting year. The following table indicates additional biosolids EMS activities conducted during the past year.

Table 4. EMS activities and associated dates.

2018-2019 EMS Activities	Date
Goals and Objectives updates	Quarterly (September, December, March, June)
EMS Internal Audit	August 28-29, 2019
EMS Performance Report	October 07, 2018
EMS Management Review	October 09, 2018
EMS External Third-Party Audit	October 24-26, 2018

Goals and Objectives

The City has established goals and objectives to help improve selected biosolids management activities. These goals are updated every quarter in order to track their progress and to establish new goals and objectives when appropriate. The list of goals and objectives, which were last updated on September 24, 2019, are included in Appendix B of this report. A summary of these goals is on pages 3 and 4 of this document.

Corrective Action Notices (CANs)

As defined in EMS Element 14, Corrective Actions are "specific actions and steps taken to correct an organization's nonconformance(s) to environmental policies, procedures, and other requirements, and to mitigate any residual impacts to the environment." The Fort Worth Biosolids EMS Program has a policy in place to create a CAN for any identified nonconformance, as well as any identified opportunities for improvement, which are those changes that are recommended but not required. The City has been diligent in developing CANs for noncompliance issues as they relate directly to the biosolids program. Due to the maturity of the City's Biosolids Program, the number of CANs has decreased in the last few years. All CANs for the 2018-2019 year have been summarized in Appendix A.

LEGAL REQUIREMENTS

VCWRF regularly reviews federal, state, and local rules and regulations that may have an impact on biosolids management activities. There were no major regulatory changes during the reporting period.

SPILLS, EMERGENCY ACTIONS, AND RESPONSE

There were no spills during the 2018-2019 reporting year.

PUBLIC OUTREACH AND PARTICIPATION PROGRAM

Tour surveys during VCWRF tours continue to be collected. During 2018-2019, 31 university classes, 10 high school classes and 3 other interested parties, experienced a tour of VCWRF. Tour surveys gauge how much the general public knows about biosolids before and after the tour, and opinions on land application of biosolids. Data is collected and analyzed regarding opinions about biosolids and how they may relate to age, gender, and education level.

The 2018-2019 year saw improvements in the Biosolids Program's public outreach efforts. During the previous three years, the previous communications and public outreach goal was to address public concerns regarding biosolids. As a direct result of several action plans, the Water Department significantly increased public feedback. However, a large amount of feedback was garnered from a general plant tour and it was difficult to discern if some comments were specifically about biosolids or the wastewater treatment process. The feedback also tended to be from the general public, rather than stakeholders directly affected by biosolids land application. A new goal was created to address this issue, with action plans to create an on-line survey to target residences around land application sites, biosolids only presentations, and an additional survey.

This year, the general tour survey data from the calendar years 2016 through 2018 were analyzed to establish a baseline of public feedback. Over the last three calendar years, there were a total of 193 comments about biosolids made from tour attendees, Out of those comments, a total of 55 people expressed concerns about biosolids (28% of the biosolids commenters). Based on the data, pharmaceuticals has the highest number of people mentioning it as a concern, at 24% of the concern comments. The average number of biosolids concerns raised per year is 18. This data will allow the Biosolids Program to formulate a goal in the near future to specifically address concerns about pharmaceuticals, through an education and outreach campaign.

FUTURE PLANS/ADVANCES IN BIOSOLIDS TECHNOLOGY

Belt-Filter Press Refurbishment: Four of the existing belt presses are past their service life and need to be rebuilt. In September 2018, City Council approved funding for the refurbishment project. Refurbishment work on one of the presses began in the spring of 2019 and is nearing completion. The press should be operational by the first week in October 2019, at which time refurbishment work will begin on the second belt press.

Liquid Sludge Storage Tank: City Council approved the storage tank project in September 2018. This project consists of a 5 million gallon liquid sludge storage tank that will allow the City to halt biosolids production during extended wet weather events. The increased storage volume and aeration will help improve the odor performance of biosolids during land application. Construction started in December 2018 and is scheduled to be completed by February 2020.

New Biosolids Processing Facility: The Biosolids Master Plan calls for the construction of a new facility that will utilize thermal drying to achieve Class A biosolids. The City is in the process of reviewing proposals from qualified vendors to do this work. Each proposal shall be evaluated for the technologies that will be utilized to produce a high quality beneficial reuse product in a cost effective manner.

CONTACT INFORMATION

If you have comments on this report or any other biosolids related items please call or email.

Village Creek Water Reclamation Facility	817-392-4960
Biosolids EMS Manager	817-392-4965
Biosolids Program Email	biosolids@fortworthtexas.gov

To find out more information about the City of Fort Worth Biosolids Beneficial Reuse/Recycling program and the EMS visit our website: http://fortworthtexas.gov/water/biosolids/

To find out more information on biosolids in general, biosolids facts, regulation requirements, and about the national Biosolids Partnership EMS program, visit the website: http://www.biosolids.org

APPENDIX A: CORRECTIVE ACTION NOTICES 2018-2019

Note: There were no new corrective action notices created during the reporting period.

CORRECTIVE ACTION NOTICES AUGUST 1, 2017-JULY 31, 2018					
CAN #	**Date**	**Non-Conformance Issue**	**Scheduled Completion Date**	**Actual Completion Date**	**Close-Out Date**
2017-03	09/18/17	CAP 17-01 Primary Sludge Grit System	09/26/17	09/28/17	09/28/17
2017-04	09/18/17	CAP 17-02 Energy Saving Performance Contract	09/26/17	09/28/17	09/29/17
2017-05	09/18/17	CAP 17-03 MCC Switchgear Replacement	09/26/17	09/28/17	09/30/17
2017-06	09/18/17	CAP 17-04 Digester Cleaning	09/26/17	09/28/17	10/01/17
2017-07	09/18/17	CAP 17-05 New FeCl3 Pump Station	09/26/17	09/28/17	10/02/17
2017-08	09/18/17	CAP 17-06 ClO2 mixing-repairs, upgrades, improvements	09/26/17	09/28/17	10/03/17
2017-09	09/18/17	CAP 17-07 Prepare facility for next contract cycle, including possible Dewatering Facility Expansion	09/26/17	09/28/17	10/04/17
2017-10	09/28/17	Requirement 10.1: On September 28, 2017 at 1:05 pm, Renda Environmental, Incorporated was land applying biosolids at WSCT2, despite recent rains having saturated the soil.	02/28/18	04/09/18	04/09/18
2017-11	09/28/17	Requirement 8.1: During Sludge Year 2016-2017, a biosolids newsletter was not provided to the VCWRF on a semi-annual basis, as required.	02/28/18	04/25/18	05/03/18
2017-12	09/28/17	Requirement 14.4: Ferric chloride is now an established treatment process that is used to improve biosolids dewatering and odor characteristics. However, this process experienced various operational and maintenance related issues during late August and early September of 2017.	10/02/17	10/04/17	10/09/17
2017-13	11/08/17	Requirement 7.2: Appoint an individual with overall responsibility for ensuring that the Biosolids Management Program (BMP) is implemented and maintained.	05/31/18	01/09/18	01/12/08
2017-14	11/08/17	The City of Fort Worth has not fully implemented the requirements from Elements 6 and 9	03/21/18	10/01/18	10/01/18
2017-15	12/05/17	Requirement 8.1: Establish and maintain a training program to ensure that employees responsible for specific biosolids management activities and for the implementation of various BMP functions are competent in performing their assigned tasks and duties. The training program shall provide general awareness of the BMP and how each employee's assigned roles and responsibilities relate to the entire biosolids value chain.	12/06/17	12/14/17	12/14/17
2018-01	03/14/18	Requirement 10.1: Village Creek Procedures do not include a requirement to notify the state in the event of any noncompliance with TPDES Permit No. WQ0010494013.	03/31/18	04/09/18	04/09/18
2018-02	03/22/18	Element 5 -- Consider using the Biosolids Master Plan as a source of near-term Goals and Objectives	06/30/18	06/28/18	07/09/18
2018-03	07/09/18	Requirement 10.1 Develop and implement standard operating procedures, work management practices or other appropriate methods at all critical control points throughout the biosolids value chain to effectively manage potential environmental impacts. (Chemical System Failure--Ferric chloride, Chlorine dioxide)	09/30/18	Not complete	

APPENDIX B: CURRENT GOALS AND OBJECTIVES

GOAL: Improve sludge thickening

Objective: Increase digested feed sludge to 5%

ACTION PLAN: VCWRF Thickening Project	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	KEY OUTCOMES
1. Hire Consultant For Design Work	Ana Peña, Engineering Mgr.	June 15, 2015	Complete (June 15, 2015)	• Environmental Performance • Improve Biosolids Management Practices
2. Finalize Scope of Work	Ana Peña, Engineering Mgr.	July 15, 2015	Complete (July 15, 2015)	
3. Finish conceptual design	Russell Redder, PE	June 30, 2018	Complete (August 31, 2018)	
4. Final design phase (100%)	Maria Wang, PE	December 1, 2019	Not complete	
5. Project out to bid	Maria Wang, PE	February 1, 2020	Not complete	
6. Begin construction	Maria Wang, PE	August 1, 2020	Not complete	
7. Finish construction	Maria Wang, PE	June 2022	Not complete	

Notes/Comments:

The purpose is to look into a new thickening technology that will replace the DAFTs.

- March 2016: No changes.
- June 2016: Conceptual design date moved forward as it has not been completed.
- September 2016: Conceptual design date moved forward as it has not been completed.
- December 2016: A pilot project has been completed and the City is currently waiting for recommendations for which thickening technology would be best to implement.
- March 2017: Scope of the project changed after the initial pilot study. The conceptual design changed as a result and therefore VCWRF is still awaiting a finished conceptual design.
- June 2017: In April 2017 the scope of the project changed to include improvements to the GBTs and replacement of the gravity thickeners. The project is still in the conceptual design phase and VC is waiting for the PER (preliminary engineering report).
- September 2017: The contract for the design phase was completed in September 2017 and includes finalizing the PER.
- December 2017**:** The consultant has moved into the final design phase and the estimated completion is December 2018. There are no other updates at this time.
- March 2018: The conceptual design phase was delayed due to the consultant having to recalculate sludge flows so as not to over/under design the dewatering equipment (GBTs, rotary drum thickeners).
- June 2018: Preliminary Engineering Report (PER) is expected by the end of the month.
- September 2018: A workshop was held on September 11, 2018, with Freese & Nichols to settle design issues and discuss a schedule to move the project forward.
- December 2018: Design issues have caused delays and the project is currently between the 30%-60% design phase.
- March 2019: Design phase is at 30% and comments have not yet been submitted.
- June 2019: The project is at 60% design review and the City relayed comments to Freese & Nichols on May 28th. Freese & Nichols is now working toward the 90% design review phase.
- Sept 2019: Project is nearing 90% design phase completion, and expected to reach 100% by December 2019.

GOAL: Grit Improvement Project

Objective: Reduce Work Orders Associated with Grit Repair Activities by 50%

ACTION PLAN: Grit Removal Project	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	KEY OUTCOMES
1. Consultant Hired for Design Work	Ana Pena, PE	May 2, 2017	Completed (May 2, 2017)	• Environmental Performance • Improve Biosolids Management Practices
2. Complete Hydraulic Modeling	Maria Wang, PE	October 30, 2019	Not Complete	
3. Complete 90% Design	Maria Wang, PE	November 22, 2019	Not Complete	
4. Complete 100 % Design	Maria Wang, PE	Feb 28, 2020	Not Complete	
5. Project out to bid	Maria Wang, PE	May 1, 2020		
6. Begin Construction	Maria Wang, PE	October 1, 2020	Not Complete	
7. Finnish Construction	Maria Wang, PE	December 1, 2022	Not Complete	
8. One Year Evaluation Period to Determine Effectiveness (Reduction in Grit Related Work Orders)	Prasad Vattakunnel	December 1, 2023	Not Complete	

Notes/Comments:

- **June 2019**: The purpose of this project is to improve the influent grit removal process at Village Creek. The improvements are designed to remove 95% of 105-micron particles or larger. This will reduce grit repair related activities throughout Village Creek and improve clarifier performance. The project also includes a low-lift influent lift station to route flow from the south around to the headworks building. Note: Baseline work order data is being compiled and will be included with the next update.
- **Sept 2019**: Hydraulic modeling is being finalized. Project should reach 90& completion by November 2019.

GOAL: Increase percent solids of biosolids (prior to lime addition)				
Objective: Increase percent solids of biosolids (prior to lime addition) by 3%				
ACTION PLAN: **Dewatering Facility Upgrades**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Hire consultant	Steven L. Nutter-Biosolids EMS Mgr.	April 18, 2014	Complete (April 18, 2014)	• Environmental Performance • Regulatory Compliance • Improve Biosolids Management Practices
2. Electrical System Evaluation	Steven L. Nutter-Biosolids EMS Mgr.	July 11, 2014	Complete (August 27, 2014)	
3. Final Design	Steven L. Nutter-Biosolids EMS Mgr.	September 30, 2014	Complete (August 29, 2014)	
4. Funding approved by City Council	Steven L. Nutter-Biosolids EMS Mgr.	October 16, 2015	Complete (October 16, 2015)	
5. Start construction on 6th belt press, polymer, and lime systems.	Steven L. Nutter-Biosolids EMS Mgr.	August 01, 2016	Complete (May 2, 2016)	
6. Finish construction of 6th belt press, new polymer, and lime systems.	Steven L. Nutter-Biosolids EMS Mgr.	January 31, 2017	Complete (March 24, 2017)	
7. Optimize polymer system	Steven L. Nutter-Biosolids EMS Mgr.	April 30, 2018	Complete (April 30, 2018)	
8. Optimize 6th belt press	Steven L. Nutter-Biosolids EMS Mgr.	July 31, 2018	Complete (July 17, 2018)	
ACTION PLAN: **Replace/Refurbish Belt Presses**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Develop Bid Specifications	Steven L. Nutter-Biosolids EMS Mgr.	September 12, 2017	Completed	
2. Award bid and obtain funding by City Council	Steven L. Nutter-Biosolids EMS Mgr.	August 7, 2018	Completed (August 2, 2018)	
3. Finish onsite rehab of one belt press	Steven L. Nutter-Biosolids EMS Mgr.	October 4, 2019	Not complete	
4. Start onsite rehab of second belt press	Steven L. Nutter-Biosolids EMS Mgr.	October 7, 2019	Not complete	
5. Finish onsite rehab of second belt press	Steven L. Nutter-Biosolids EMS Mgr.	May 1, 2020	Not complete	
ACTION PLAN: COMPLETED **Increase dewaterability at the belt presses**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Corroborate the presence of struvite (collect samples)	Steven L. Nutter-Biosolids EMS Mgr. Ana Peña, Engineering Mgr.	July 7, 2014	Complete (July 7, 2014)	
2. Install ferric sulfate addition station	Steven L. Nutter-Biosolids EMS Mgr. Ana Peña, Engineering Mgr.	August 18, 2014	Complete (August 18, 2014)	
3. Install ferric chloride addition station	Steven L. Nutter-Biosolids EMS Mgr. Ana Peña, Engineering Mgr.	November 25, 2014	Complete (November 24, 2014)	
4. Installation of Total Solids and Total Suspended Solids meters	Steven L. Nutter-Biosolids EMS Mgr. Ana Peña, Engineering Mgr.	April 30, 2015	Complete (April 30, 2015)	
5. Optimize the dosage of ferric chloride	Steven L. Nutter-Biosolids EMS Mgr. Ana Peña, Engineering Mgr.	June 1, 2016	Complete (June 10, 2016)	

Notes/Comments:

- After ferric sulfate was added, it was determined that the dosage and the chemical itself were not as effective as needed. Therefore a switch was made to ferric chloride, which resulted in a different feed station being built to accommodate the volume necessary to achieve an effective dosage. The addition of ferric chloride should result in the added benefits of minimizing struvite buildup at the dewatering facility and reducing odors.
- Dosage optimization was supposed to be complete by May, but because the HRC was in use (which adds Ferric sulfate), an increase in percent solids could not be attributed to the ferric chloride alone. Therefore, the milestone complete date was changed.
- The TSS meter was relocated in August 2015. As of September 2015, the ferric chloride contract is being extended through the end of the year. Ferric Chloride dose optimization is still being determined.
- As of December 2015, the ferric chloride contract has been extended through the end of January.
- **March 2016:** Ferric chloride has not been optimized yet because VCWRF operations are getting ready to start feeding ferric sulfate in the primaries. This will alter the post-digestion treatment with ferric chloride.
- **June 2016:** During the spring of 2016 ferric sulfate was fed into primary clarifiers 1-6. During this period VC personnel were collecting data to evaluate the effectiveness of the chemical treatment activities. On June 10th, 2016 Tech Services presented the data to senior management at VC. Based on this information the decision was made to perform post digestion treatment with ferric chloride at a concentration of 2 gallons ferric chloride per 1,000 gallons of liquid sludge. If ferric sulfate treatment in the primary area is expanded or reduced then post digestion treatment activities will be reevaluated.
- **September 2016:** Installation of a 6th belt press, lime mixing system, and polymer system has been completed. However, not all of the supporting equipment (pumps, etc.) have arrived on site, and electrical and instrumentation work continues.
- December 2016: The 6th belt press, lime system, and polymer system are undergoing troubleshooting.
- **March 2017:** Construction on the 6th belt press, polymer system, and lime pug mill have been completed. However, troubleshooting activities are still underway. These include 1) 6th belt press tracking and distribution issues, and 2) polymer system performance evaluation is still underway.
- **June 2017**: Work continues to optimize both the newly installed belt press and automated polymer feed system
- September 2017**:** Bid specifications for belt press refurbishment completed. Polymer system optimization delayed due to equipment problems with flow meters. Replacement parts have been ordered and equipment is scheduled to be repaired by November 1, 2017. 6th belt press continues to have issues with tracking and servo motors and drives. Andritz is working to troubleshoot these issues.
- **December 2017:** Additional work is being performed on the polymer system to improve reliability with the addition of float switches and a new enclosure. The expected completion date is February 28th, 2018. Work has continued on the newly installed 6th belt press. Due to performance issues, Andritz is in the process of converting the 6th press from the electric-mechanical combined tensioning and tracking to a separate hydraulic tensioning and tracking. This should improve performance and reliability. The conversion should be completed by the end of January with an additional two months for troubleshooting.
- **March 2018**: 6th Belt press – The belt press is operational, however, Andritz continues to work on it to optimize performance. This includes installation of tension shaft guide pins, fixing the hydraulic pressure switch wiring issue, installation of the HMI program and the modification of the lifter for the sludge leveler. Work will be performed on the polymer system to improve reliability with the addition of float switches and a new enclosure. Additional polymer parts have been shipped to the Dewatering facility and installation work is scheduled to be completed by April 30th, 2018. Refurbish Belt Presses – bid specifications have been submitted to the Purchasing Department for processing prior to bid issuance.
- **June 2018**: 6th Belt press: Conversion to hydraulic tensioning/tracking is complete. Sludge and polymer flows to the press are being optimized. The project is expected to be completed by July 2018. Polymer Feed System: A float control system was added to the new polymer system in April 2018. The system is working as expected and optimization is complete. Refurbish Belt Presses: Andritz was the only bidder for the belt press refurbishment project, which is expected to go to City Council for approval on August 7, 2018. Refurbishment work on two of the belt presses will commence soon thereafter.
- **September 2018**: City Council approved Refurbishment project on August 7, 2018. The City is currently working with Andritz to invoice some of the replacement parts before the end of the fiscal year (Sept 30, 2018). Andritz is tentatively scheduled to begin work on one of the belt presses in late November 2018.
- December 2018: The City is waiting for Andritz to submit a formal project schedule and timeline.
- **March 2019**: Andritz has started refurbishment work on Belt Press #2. Rollers, motors and other parts have been stripped from the frame for refurbishment/replacement. Andritz has notified the City that the metal frame needs to be recoated. Andritz has submitted a cost estimate to the City for this work and the City is evaluating it.
- **June 2019:** Andrtiz continues to work on rehabbing belt-press #2. Several additional items have been added to the scope of work, including resurfacing of the metal frames. The belt press is estimated to be shipped back to the City on July 26th.
- **Sept 2019:** Refurbishment work on Belt Press #2 is almost complete and it should be back in operation by the first week in October. Work on the next press will start shortly thereafter.

GOAL: Increase biosolids storage capacity

Objective: ***Increase biosolids storage capacity from 1.3MG to 6.3 MG***

ACTION PLAN: Install liquid sludge storage tanks	RESPONSIBLE PARTY	MILESTONE COMPLETION DATE	STATUS	
1. Hire Consultant for Design Work	Steven L. Nutter-Biosolids EMS Mgr.	April 20, 2015	Complete (April 20, 2015)	• Environmental Performance • Improve Biosolids Management Practices
2. Finalize Scope of Work	Steven L. Nutter-Biosolids EMS Mgr.	July 10, 2015	Complete (July 10, 2015)	
3. City Council Approval	Steven L. Nutter-Biosolids EMS Mgr.	March 31, 2016	Completed (March 29, 2016)	
4. Finish Conceptual design	Steven L. Nutter-Biosolids EMS Mgr.	March 01, 2017	Complete (March 01, 2017)	
5. Final design phase	Steven L. Nutter-Biosolids EMS Mgr.	May 30, 2018	Complete (June 8, 2018)	
6. Project bid closes	Steven L. Nutter-Biosolids EMS Mgr.	June 21, 2018	Complete (June 21, 2018)	
7. Project Awarded (City Council Approval)	Steven L. Nutter-Biosolids EMS Mgr.	September 30, 2018	Complete (September 11, 2018)	
8. Begin construction	Steven L. Nutter-Biosolids EMS Mgr.	December 01, 2018	Complete (December 20, 2018)	
9. Finish construction	Steven L. Nutter-Biosolids EMS Mgr.	March 31, 2020	Not complete	

Notes/Comments:

- **March 2016:** Completion dates have been moved forward.
- **June 2016:** The sixth belt press has been put in place, but is not fully installed/online.
- September 2016**:** Liquid sludge storage tank project has completed the preliminary design phase (conceptual design completed).
- **December 2016**: Facility expansion-Dewatering technologies are being evaluated; Liquid storage tanks-Tank capacities are being evaluated.
- **March 2017:** The City is in the process of reevaluating its long-term biosolids strategy due to the changing regulatory environment and potential cost drivers. The belt press facility expansion is on hold until this evaluation is complete.
- **June 2017:** Currently work is underway to achieve 60% design phase on the tank project.
- **September 2017:** Consultant is still working to achieve 60% design.
- **December 2017:** Sixty percent (60%) design drawings were delivered to the City at the end of December 2017. City staff is reviewing the drawings and preparing comments. The next step is the 90% design phase.
- **March 2018:** Ninety percent design phase was completed March 19, 2018. The next step is to finalize the design.
- **June 2018:** The 100% design phase is complete. The bid phase closed on June 21, 2018, and will be presented to City Council for approval by September 2018.
- **September 2018:** City Council approved the storage tank project on September 11, 2018. A construction schedule has not been created yet, but one should be in place by early November 2018.
- **December 2018:** Site prep work and excavations began December 2018.
- **March 2019:** While excavating it was discovered that the existing filtrate line runs underneath the foundation for the new tank. Therefore, a new filtrate return line was installed and the old line is in the process of being demolished. Engineers are currently reassessing the foundation design to verify its adequacy.
- **June 2019:** Foundation design has been modified and select fill is being added to support the reconfigured design. Work has started on the chemical station and electrical room.
- **September 2019:** Concrete walls have been put in place and preload is underway (shockcrete, wrapping with steel cables). Preload is expected to be completed by early October 2019. Work continues on the electrical room and ferric chloride storage tanks. Yard piping work will commence in October.

GOAL: Address public concerns regarding biosolids				
Objective: ***Identify four public concerns regarding biosolids***				
ACTION PLAN: A- COMPLETED Determine concerns based on feedback received from interested parties.	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Identify four (4) public/third party concerns	VCWRF Biosolids personnel	September 15, 2015	Complete (September 23, 2015)	• Improve Public Relations
Concern #1= "The City of Fort Worth biosolids web pages are out of date." *Concern #2= "The EPA and TCEQ standards are not strict enough."* Concern #3= "Too much about biosolids are unknown." Concern #4= "Are there pharmaceuticals and personal care products (PPCPs) in biosolids?"				
2a. For each concern, either contact three (3) interested parties or conduct presentation with one (1) interested party*	VCWRF Biosolids personnel	September 30, 2017	**Concern #1** -Complete (January 13, 2016) **Concern #2** –Complete (March 30, 2017) **Concern #3**-Complete (November 10, 2015) **Concern #4**-Complete (November 10, 2015)	
2b. Create a biosolids specific tour presentation that addresses concerns 2-4.	VCWRF Biosolids personnel	September 30, 2017	Complete (March 30, 2017)	
ACTION PLAN: B- COMPLETED Improve ability to identify concerns via ~~mail-outs~~ FAQs placed in information tubes at land application sites	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Contact the communication and outreach division to determine if mail outs (surveys, fact sheets, etc.) are feasible	VCWRF Biosolids personnel	July 31, 2015	Complete (June 12, 2015)	
2. Determine if the GIS department can acquire mailing addresses for residents around land sites	VCWRF Biosolids personnel	August 7, 2015	Complete (September 14, 2015)	
3. Develop information FAQ to be mailed to interested parties	VCWRF Biosolids personnel	October 15, 2015	Complete (December 21, 2015)	
4. Determine if addresses can be purchased to mail out FAQ	VCWRF Biosolids personnel	October 31, 2015	Complete (December 21, 2015)	
5. Determine if FAQ can be mailed to addresses surrounding land application sites	VCWRF Biosolids personnel	October 31, 2015	Complete (December 21, 2015)	
6. Begin placing FAQ in information tubes attached to site notification signs at land application site entrances	VCWRF Biosolids personnel	March 25, 2016	Complete (March 25, 2016)	
7. Evaluate the effectiveness of the information tubes by tracking the amount of FAQ taken	VCWRF Biosolids personnel	November 30, 2016	Complete (December 29, 2016)	
ACTION PLAN: C-COMPLETED	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
Improve ability to identify concerns using the Water Department's social media accounts				
1. Contact the Communication and Outreach division to determine what content can be posted to the Water Department's social media accounts (Facebook & Twitter)	VCWRF Biosolids personnel	July 31, 2015	Complete (June 12, 2015)	
2. Begin posting biosolids information to Water Department's Facebook account (this will include any facts not listed on the FAQ sheet)	VCWRF Biosolids personnel	March 31, 2017	Complete (September 23, 2017)	

ACTION PLAN: D Improve ability to address public concerns by updating Biosolids webpage	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1a. Update grammar and typographical errors	VCWRF Biosolids personnel	August 31, 2015	Complete (August 17, 2015)	• Improve Public Relations
1b. Remove outdated information	VCWRF Biosolids personnel	August 31, 2015	Complete (September 17, 2015)	
1c. Update tables on web pages	VCWRF Biosolids personnel	August 31, 2015	Complete (January 13, 2016)	
2a. Add additional webpage for biosolids brochure	VCWRF Biosolids personnel	December 31, 2018	Complete (October 25, 2018)	
2b. Add additional webpage for FAQ (developed from 2nd action plan above)	VCWRF Biosolids personnel	December 31, 2018	Complete (October 25, 2018)	
2c. ~~Add additional webpage for facts not listed in the FAQ~~	~~VCWRF Biosolids personnel~~	~~January 31, 2017~~	~~Not complete~~	
ACTION PLAN: E -Completed Improve ability to address or identify concerns via tour survey	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Develop a survey to gauge the public's general knowledge/feelings about biosolids	VCWRF Biosolids personnel	December 31, 2015	Complete (October 29, 2015)	
2. Preliminary implementation of a survey to determine what metrics can be obtained and used for quantifying public outreach responses	VCWRF Biosolids personnel	December 31, 2015	Complete (November 15, 2015)	
3. Begin using survey on a regular basis during tours when possible	VCWRF Biosolids personnel	December 31, 2015	Complete (November 15, 2015)	
4. Evaluate metrics and plot data to determine the effectiveness of survey and tour presentations	VCWRF Biosolids personnel	July 31, 2016	Complete (July 13, 2016)	
ACTION PLAN: F Develop 2 educational videos relating to biosolids.	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Meeting with Water Department public outreach personnel to determine video options	Glory Walker, Biosolids Public Outreach Coordinator	February 01, 2017	Complete (February 01, 2017)	
2. Brainstorming meeting among biosolids personnel to discuss options and approach	VCWRF Biosolids personnel	February 02, 2017	Complete (February 02, 2017)	
3. Determine the themes of videos	VCWRF Biosolids personnel	February 02, 2017	Complete (February 02, 2017)	
4. Determine the method of production	VCWRF Biosolids personnel	April 31, 2018	Complete (March 14, 2018)	
5. Start video production (General Biosolids Information)	VCWRF Biosolids personnel, Communications Specialist	August 31, 2018	Complete (March 14, 2018)	
6. Finalize video for viewing (General Biosolids Information)	VCWRF Biosolids personnel, Communications Specialist	July 31, 2018	Complete (August 13, 2018)	
7. Start video production (Farmer-site in Biosolids Program)	VCWRF Biosolids personnel, Communications Specialist	November 1, 2019	Not Complete	
8. Finalize video for viewing (Farmer-site in Biosolids Program)	VCWRF Biosolids personnel, Communications Specialist	December 13, 2019	Not Complete	

Notes/Comments:

*Contact may involve providing literature or documentation regarding the City's biosolids program or inviting interested parties for tours of the Village Creek Water Reclamation Facility and Dewatering Facility.
•Additional steps may be added to the action plans once feasibility of the outreach activity has been determined.

Action Plan A

- The FAQ addresses Concerns #1 and # 3 and will be available to the public via tours or information tubes attached to land application signs at site entrances.
- March 2016: Concern #1 has been completed, but the date is not known. When details can be acquired, the date will be inserted.
- July 2016: Concern #2 will be addressed in a presentation to be developed by the end of 2016 that will be specific to the biosolids program that can be used for special tour groups or interested parties. Concern #4 was addressed in a brochure that was completed in November but not printed until April 2016.
- September 2016: Concern #2 will be addressed in a presentation to be developed by the end of 2016 that will be specific to the biosolids program that can be used for special tour groups or interested parties.
- December 2016: The tour presentation that will address concern #2 (as well as #3 and #4) is still being developed. This presentation may be incorporated into the tours at Village Creek.
- **March 2017:** The four concerns identified have all been addressed in various public outreach materials.

Action Plan B

- The GIS department was contacted on August 7th regarding whether they were able to gather mailing addresses for residents surrounding land application sites. On September 14, 2015, the GIS department notified biosolids personnel that they were unable to acquire the addresses.
- On December 21, 2015, it was determined that mailing fact sheets is not a viable option for the biosolids program. Instead, fact sheets will be placed in an information tube and attached to the site notification signs located at site entrances. Placing a certain amount of fact sheets in the tubes and counting them during inspections will allow us to keep track of how many are taken introducing a potential metric with which to measure this outreach effort.
- March 2016: Information tubes were attached to site notification signs on 03-25-16 and a certain number of ~~factsheets~~ Frequently Asked Questions were placed inside. This information will be tracked to determine how effective the Information tubes are. Two more steps were added to reflect the change to this action plan.
- July 2016**:** Since Infotubes with FAQs have been posted on land application signs; approximately 34% of them have been taken. Sign/Infotube visibility, site entrance location, and number of FAQs taken per person are all variables that can affect the percent of FAQ taken at land application sites. Data collection for FAQs will be ongoing even after the action plan is completed.
- September 2016: No changes.
- **December 2016:** Since March 2016, 250 FAQs have been placed in infotubes at 19 land application sites. Of those 250 FAQs, 66 (or 26%) have been taken by citizens. As previously mentioned, sign/infotube visibility, site entrance location, and number of FAQs taken per person are all variables that can affect the percent of FAQ taken at land application sites. New infotubes were purchased in November 2016 that allows for higher placement on land application signs, which will increase their visibility and hopefully lead to more FAQs taken by citizens. This action plan is complete. However, data collection for FAQs will continue.

Action Plan C

- When lime is removed, and it can be confirmed that the biosolids odors have improved for the long term, information will begin being posted to the Water Department's Facebook page (where the application is occurring, general information about the biosolids program, etc.)
- March 2016: Completion date has been moved forward for social media postings.
- July 2016: Currently waiting for Chlorine dioxide to be approved for long-term biosolids treatment before posting information to social media regarding biosolids program and biosolids quality.
- September 2016: No changes.
- December 2016: The usage of chlorine dioxide is now in place and biosolids odors have improved. Posting biosolids information to the Water Department's social media accounts is still under evaluation.
- March 2017: The City of Fort Worth is in the process of finalizing its published materials criteria. Once this has been completed, biosolids personnel can revisit posting biosolids related material to the Water Department's social media accounts.
- June 2017: The position responsible for posting information to the Water Department's social media accounts is currently vacant. A public outreach meeting is scheduled for mid-July to discuss whether biosolids information will be able to be posted in the interim.
- September 2017: On September 21, 2017, staff from the Water Department's Communication and Outreach division drafted several biosolids social media posts. After obtaining our approval on the proposed social media posts, the Water Department began posting biosolids information to the department's Facebook account, along with #FWBiosolids on September 23, 2017.

Action Plan D

- Due to changes to the City's website policies the Water Department's Communication and Outreach division informed biosolids personnel that posting PDF documents to the City's web pages should be avoided as much as possible to comply with the Americans with Disabilities Act (ADA) requirements. Therefore, new information will be added as additional web pages if possible. See Action Plan: Add additional biosolids webpages.
  March 2016: Completion dates have been moved forward due to complications in posting information to the City's website. Step 1c has been completed, but the date is not known. When details can be acquired, the date will be inserted.
- July 2016: Reference material that was used to develop facts not listed in the FAQ is being acquired to be made available to the public when new biosolids web pages can be posted.
- September 2016: No Changes.
- December 2016: Action Plan D-2c is being absorbed by Action Plan C-1. Public Outreach personnel within the Water Department will eventually use biosolids facts on the Water Department's social media accounts to extend biosolids information to the general public.
- March 2017: The City of Fort Worth is in the process of finalizing its published materials criteria. Once this has been completed, biosolids personnel can revisit posting biosolids related material to the ~~Water Department's social media accounts~~ City's website.

- June 2017: In April 2017, the City completed its new Branding and Style Guide for published materials. Biosolids materials will need to be rebranded to abide by the City's requirements before they are posted on the City's website.
- September 2017: The FAQ sheet and About Biosolids sheet were redesigned to comply with the City's Branding and Style Guide. On July 17 and 18, 2017, these outreach materials were emailed to the Water Department's Communication and Outreach division with the understanding that these items would be posted to the website as soon as possible. However, to date, these items have not been posted to the City's website.
- December 2017: Organizational changes to the Water Department have delayed this action item. An additional employee has been hired to work on public outreach efforts in the Water Department. When this individual has been familiarized with the wastewater treatment and biosolids processes, it is anticipated that he/she will be able to assist the Biosolids Program with public outreach efforts.
- March 2018: A new Communications Specialist with the Water Department met with the Biosolids Public Outreach Coordinator on March 14, 2018, to take a wastewater and dewatering plant tour to become familiar with the processes. The future of biosolids public outreach efforts was discussed during this time as well. In the near future, the Communications Specialist will visit a land application site to get more insight into the biosolids program. The intent is to start posting content on social media as soon as the Communications Specialist is familiar with the Biosolids Program.
- **June 2018**: The Communications Specialist in the Customer Care Division met with the Biosolids Public Outreach Coordinator on May 31, 2018, to visit a land application site and observe biosolids land application activities. With more familiarity with the Biosolids Program, the Communications Specialist has begun compiling content for the biosolids pages on the City's website.
- **September 2018**: While progress has been made in regards to public outreach efforts, availability of public outreach personnel has delayed the posting of additional biosolids information for the City's web pages.

Action Plan E

- It is anticipated that possible metrics stemming from the responses gathered from the survey will include: how familiar people are with the term "biosolids,' what people's general attitude is towards biosolids, and if their general attitude changes after seeing a presentation on wastewater treatment and biosolids.
- March 2016: The completion date has been moved forward to accumulate more tour data.
- **July 2016:** Since surveys began being distributed during Village Creek tours in November, 103 comments have been elicited from tour participants. Past tours that did not include a biosolids survey, rarely garnered any feedback about biosolids. Surveys have been an effective tool at eliciting comments and questions, and different metrics have been gathered based on the survey responses. This action plan is complete, but tour data will continue to be collected. Additional notes are available upon request.

Action Plan F

- **March 2017:** New action plan.
- **June 2017:** A meeting will occur in July to discuss the direction of this action plan.
- **September 2017:** The biosolids video project has been delayed due to limited manpower. However, the Village Creek Water Reclamation Facility (VCWRF) recognizes the value in this type of public outreach activity. VCWRF should be able to dedicate more resources to this project in the upcoming year.
- **December 2017:** A meeting was held on 12-14-17 amongst the biosolids personnel to discuss the feasibility of the educational videos. Additional themes were discussed. It is anticipated that additional resources from the Water Department's public outreach personnel will be available in the near future to assist with this project.
- **March 2018:** Water Conservation Specialists recorded a short video with an overview of Village Creek and the Biosolids Program. This video was posted to the City's Water Department Facebook page on World Water Day (3-22-18). This video, along with the Water Conservation Specialists and new Communication Specialist, may serve as a reference for the Biosolids Personnel when developing the educational videos for the Biosolids Program.
- **June 2018:** During the March 14, 2018 meeting, it was decided to use a GoPro to shoot a video for the biosolids educational videos. The Communication Specialist began shooting video on this day while touring VCWRF and the Dewatering Facility. The content of this video will focus on general information regarding the Biosolids Program.
- **September 2018:** A video highlighting the production of biosolids was completed and posted to the City's Water Department Facebook account for public viewing on 08/13/2018. The video was "Liked" 16 times and shared 3 times. The same video was shared on the City's Water Department Twitter account and "Liked" 2 times and viewed 56 times. An additional biosolids video featuring a landowner in the Biosolids Program is still being planned. Due to the availability of personnel and inclement weather, it has been delayed.
- **December 2018**: The production of the biosolids video featuring a landowner has been pushed back to the beginning of January due to the availability of personnel.
- **March 2019:** Production of the landowner educational video is set to start the first week of June 2019.
- **June 2019:** Production was delayed during June but is scheduled to be completed on July 2nd and posted to the Water Departments social media accounts and/or the City's website by July 31st.
- **September 2019:** Production of the landowner educational video was scheduled and delayed multiple times, due to farmer's schedule and the Water Department's public outreach personnel lack of availability. An attempt will be made again later this year.

GOAL: ***Increase the input of concerns regarding biosolids***

Objective: ***Increase the input of concerns by 10%***

ACTION PLAN: **Online Biosolids Survey**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. Develop online survey questions	VCWRF Biosolids personnel	April 30, 2019	Complete (April 30, 2019)	• Improve Public Relations
2. Submit questions to Communication Specialist for review	Communication Specialist	May 1, 2019	Complete (May 1, 2019)	
3. Post survey to City's Website	Communication Specialist	July 31, 2019	Complete (July 2, 2019)	
4. Edit FAQ sheet to include link to online survey	VCWRF Biosolids personnel	August 21, 2019	Complete (July 2, 2019)	
5. Procure "rider" signs for Land Application signs with survey link (or QR code??)	VCWRF Biosolids personnel	November 30, 2019	Not complete	
6. Evaluate and quantify responses to identify concerns	VCWRF Biosolids personnel	August 30, 2020	Not complete	
ACTION PLAN: Increase number of biosolids-only tour presentations	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	
1. Update current tour presentation to include advertisement for future biosolids-only presentations	VCWRF Biosolids personnel	September 1, 2019	Complete (July 2, 2019)	
2. Schedule biosolids-only presentations at TCU and/or UTA 3. (surveys given at beginning and end of presentation)	VCWRF Biosolids personnel	December 31, 2019	Complete (August 22, 2019)	
4. Evaluate biosolids-only survey responses after tours to identify concerns	VCWRF Biosolids personnel	December 31, 2020	Not complete	

Notes/Comments:

- **March 2019:** This is a new public outreach goal to increase the number of concerns we elicit from public outreach efforts.
- **April 2019**: This goal's objective was amended after further evaluating public comment data and determining that 10% was more realistic.
- **June 2019:** The online survey is projected to be posted to the City's website by July 31st.
  Scheduling biosolids-only tours will likely occur during the Fall school semester.
- **August 2019:** Procurement of the "rider" signs was pushed until the end of November 2019, due to budget constraints and a purchasing freeze at the end of the fiscal year (October 2018 through September 2019).

GOAL: Design, Build and Operate New Biosolids Facility				
Objective: Eliminate Production of Class AB Biosolids				
ACTION PLAN: **Grit Removal Project**	**RESPONSIBLE PARTY**	**MILESTONE COMPLETION DATE**	**STATUS**	**KEY OUTCOMES**
1. RFQ Issuance	Steven L. Nutter-Biosolids EMS Mgr	January 10, 2019	Complete (January 10, 2019)	• Environmental Performance • Improve Biosolids Management Practices
2. RFQ Submittals	Steven L. Nutter-Biosolids EMS Mgr	March 7, 2019	Complete (March 7, 2019)	
3. RFP Issuance	Steven L. Nutter-Biosolids EMS Mgr	May 31, 2019	Complete (June 7, 2019)	
4. RFP Submittals	Steven L. Nutter-Biosolids EMS Mgr	August 22, 2019	Complete (September 5, 2019)	
5. Preferred Proponent Notification	Steven L. Nutter-Biosolids EMS Mgr	September 20, 2019	Not Complete	
6. Contract Approval	Steven L. Nutter-Biosolids EMS Mgr	January 31, 2019	Not Complete	
7. Design-Build Notice to Proceed	Steven L. Nutter-Biosolids EMS Mgr	February 3, 2019	Not Complete	
8. Project Acceptance for Production of Class A Biosolids	Steven L. Nutter-Biosolids EMS Mgr	July 31, 2022	Not Complete	
Notes/Comments:				
• **June 2019:** RFP has been issued with a draft contract. RFP submittals are due August 22, 2019. • **September 2019:** RFP submittals have been received and are being reviewed by the City. Preferred Proponent notification should occur before the end of September.				